

HONDA GOLDWING®

About this Publication

The GL1500 Service Manual and Electrical Troubleshooting Manual are combined in this single reference source. This manual features a seven-ring binder for easy use.

Service Manual

The GL1500 Service Manual includes all three 1994 models: Aspencade, SE, and Interstate.

Most service procedures are based on the GL1500 Aspencade model. In those instances where service information for the SE and/or Interstate model differs, the text identifies the applicable model or models by the following codes: A (Aspencade), SE (SE), and I (Interstate).

The GL1500 Service Manual is divided into twenty sections. The first (index) page of each section is marked with a black symbol tab identical to the tab seen on this page. The section symbol also appears at the top of each right-hand page of the section as a reference aid.

Section index pages list the contents of each section and give specific page references. Except for the Specifications and General Information sections, "Service Information" follows each index; be sure to read those few lines before you start any procedure to avoid any difficulty once you're in the middle of a job. In most cases a torque reference drawing will appear in Service Information. Torque values are given in the metric standard newton-meters (N-m) and also in foot-pounds (ft-lb.) (See page 1-9 for a specific explanation of the use of metric equivalents.) A system troubleshooting list follows the torque reference drawing, and then the service procedures begin.

Wiring information is found in the appropriate section. Refer to the circuit diagrams in Sections 4, 5, 12, 16, 17, 18, 19, 20.

Sections 1-3 of this manual apply to the whole motorcycle, while sections 4-20 describe parts of the GL1500 grouped according to location. Refer to the Maintenance Schedule (Section 3) to know when service is needed to keep the vehicle in peak operating condition and within EPA-established emissions standards. The first scheduled maintenance is especially important since it helps compensate for the initial wear that occurs during the break-in period.

Electrical Troubleshooting Manual (ETM)

The ETM is located after section 20 of the Service Manual. It includes information for all three models, noting variations between the models. The manual divides the GL1500's electrical systems into individual sections which include circuit schematics.

Three handy reference sections appear at the rear of the ETM: Component Location Photographs, Component Location Index (which gives the number of the photograph in which the component appears), and Component Index (which lists all pages referring to the component).

All information, illustrations, directions and specifications included in this publication are based on the latest product information available at the time of approval for printing. Honda Motor Co., Ltd. reserves the right to make changes at any time without notice and without incurring any obligation whatever.

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9. Clutch



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12. Frame/Suspension



13. Fairing/Body Suspension



14. Brakes



15. Wheels/Tires



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18. Starter/Reverse

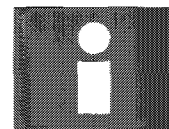


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General Information

Service Safety

IMPORTANT SAFETY NOTICE

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 these 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.

Pay special attention to statements preceded by these symbols

WARNING

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

Some specific warnings and cautions found in this manual follow:

Carbon Monoxide

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

WARNING

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

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

Gasoline

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

WARNING

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

Hot Components

WARNING

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

CAUTION

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

NOTE

- Gives helpful information.
-

Used Engine/Transmission Oil

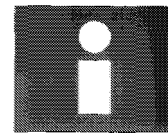
WARNING

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

Battery Hydrogen Gas & Electrolyte

WARNING

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



Brake Dust

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

▲ WARNING

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

Brake Fluid

CAUTION

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

Coolant

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

CAUTION

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

Coolant (cont'd)

If coolant contacts your skin, wash the affected areas immediately with soap and water. If it contacts your eyes, flush them thoroughly with fresh water and get immediate medical attention. If it is swallowed, the victim must be forced to vomit then rinse mouth and throat with fresh water before obtaining medical attention. Because of these dangers, always store coolant in a safe place, away from the reach of children.

Nitrogen Pressure

For shock absorbers with a gas-filled reservoir:

▲ WARNING

- **Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.**
- **The shock absorber contains nitrogen under high pressure. Allowing fire or heat near the shock absorber could lead to an explosion that could result in serious injury.**
- **Failure to release the pressure from a shock absorber before disposing of it may lead to a possible explosion and serious injury if it is heated or pierced.**

To prevent the possibility of an explosion, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber reservoir. Dispose of the oil in a manner acceptable to the Environmental Protection Agency (EPA).

Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber.

General Service Rules

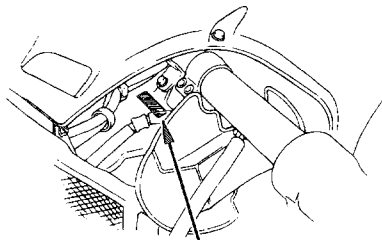
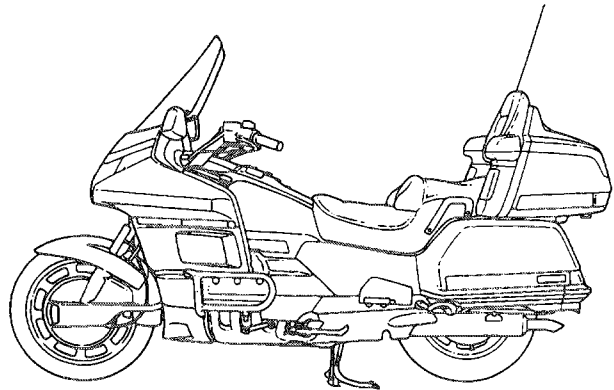
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that do not meet HONDA's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this motorcycle. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the motorcycle.
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 or 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 operations.

General Information

Model Identification

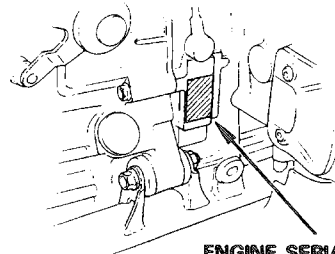
GL1500:

Aspencade
SE
Interstate



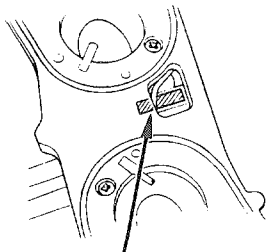
FRAME SERIAL NUMBER

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



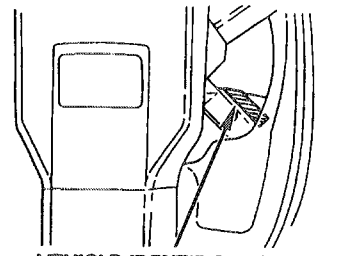
ENGINE SERIAL NUMBER

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



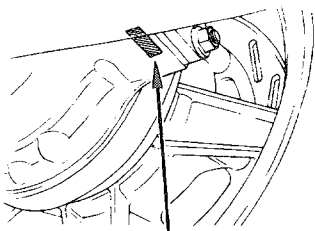
CARBURETOR IDENTIFICATION NUMBER

The carburetor identification numbers are stamped on the carburetor bodies.



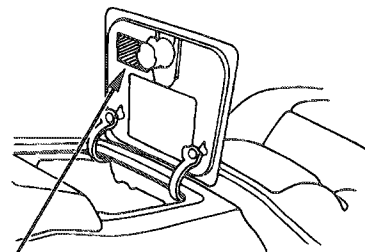
VEHICLE IDENTIFICATION NUMBER (VIN)

The Vehicle Identification Number (VIN) is located on the right side of the frame near the steering head on the Safety Certification Label.



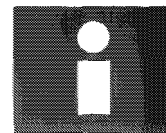
FINAL DRIVE SERIAL NUMBER

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



COLOR LABEL

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



Emission Control Systems

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

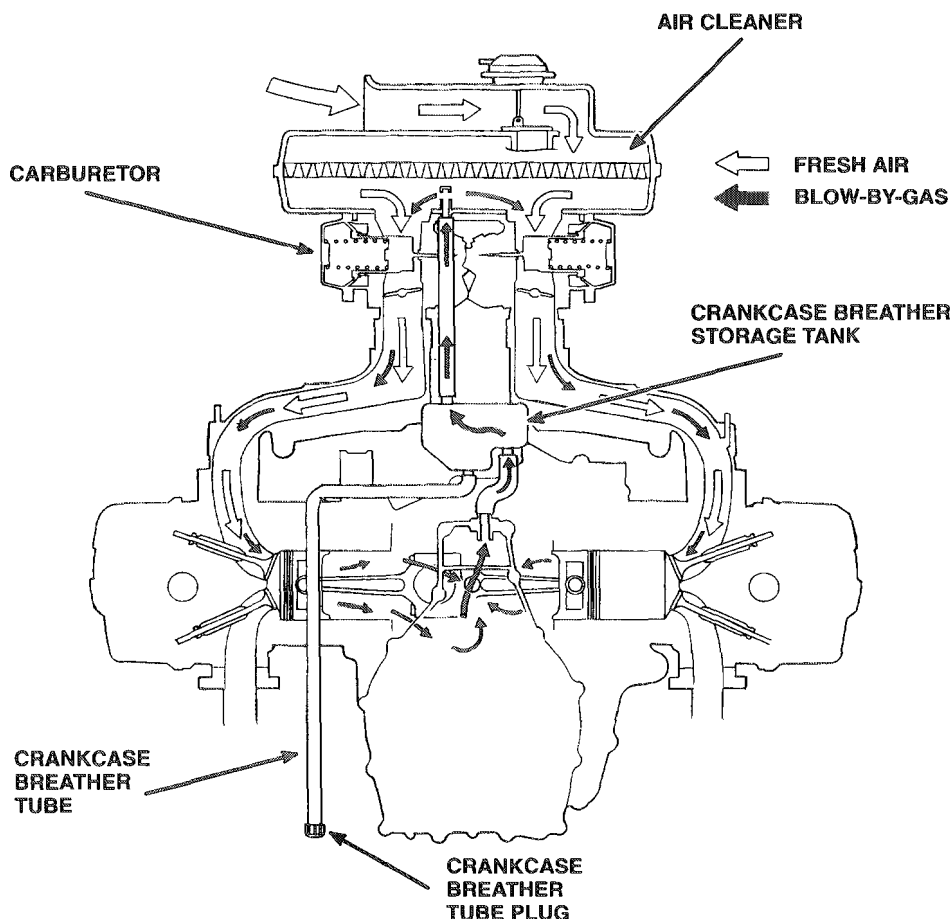
Source of Emissions

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

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

Crankcase Emission Control System

The GL1500 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 crankcase breather storage tank which must be emptied periodically. See the Maintenance Schedule in Section 3.



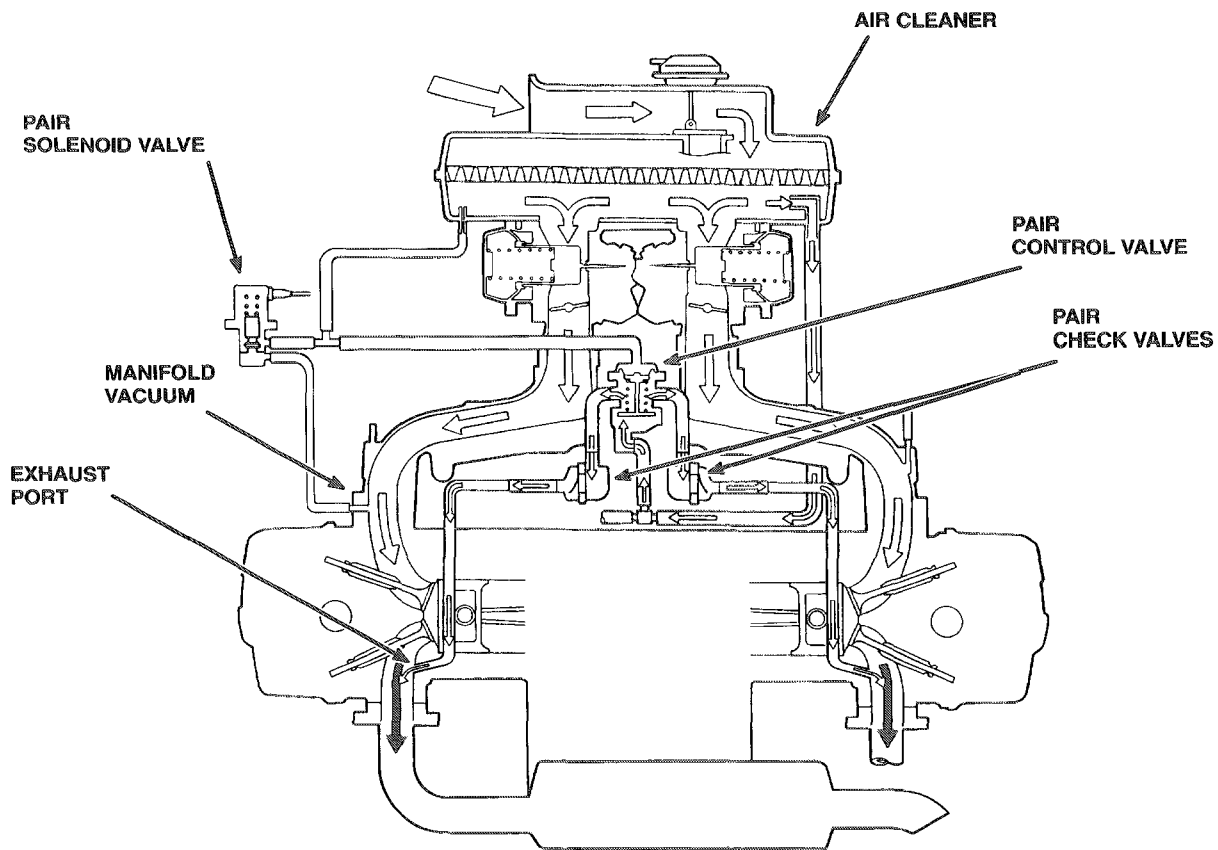
General Information

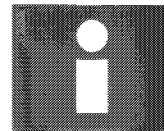
Exhaust Emission Control Systems (Pulse Secondary Air Injection [PAIR] System)

The exhaust emission control system consists of a pulse secondary air injection 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 carbon dioxide and water.

The PAIR check valve prevents reverse air flow through the system. The engine control module reacts to high intake manifold vacuum and signals the PAIR solenoid valve. The manifold vacuum is applied to the PAIR control valve and the PAIR will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

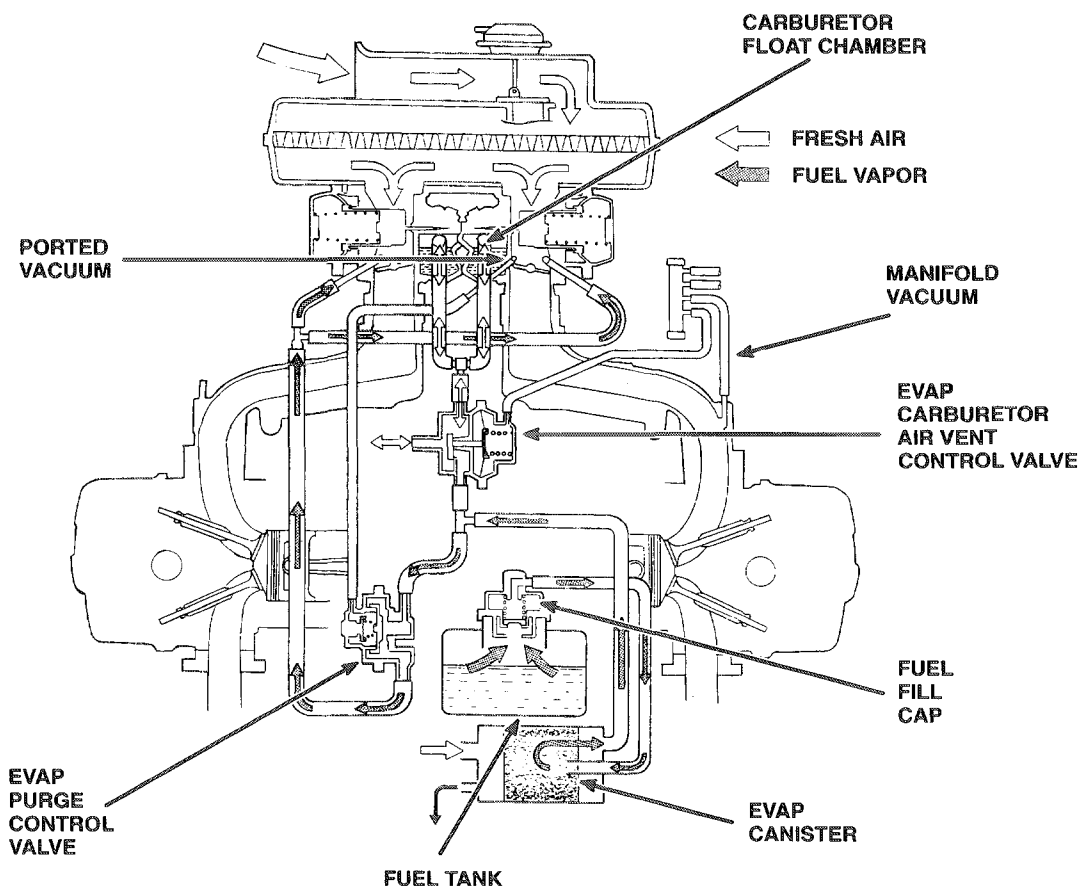
No adjustments to the pulse secondary air injection system should be made, although periodic inspection of the components is recommended.





Evaporative Emission Control System (California model only)

This model complies with California Air Resources Board requirements for evaporative emission regulations. Fuel vapor from the fuel tank and carburetors is routed into an evaporative emission (EVAP) canister and an EVAP storage element in the air cleaner where it is absorbed and stored while the engine is stopped. When the engine is running and the EVAP purge control valve is open, fuel vapor in the EVAP canister and EVAP storage element in the air cleaner is drawn into the engine through the carburetor.



Noise Emission Control System

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

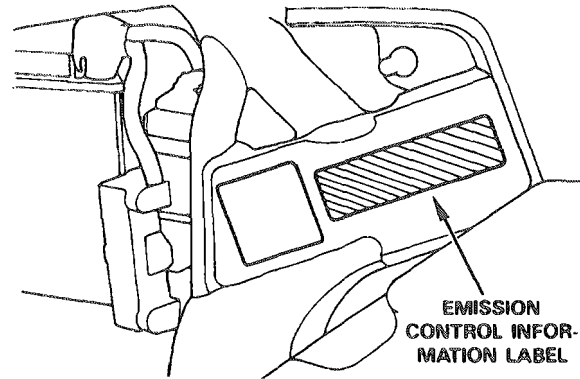
AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

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

General Information

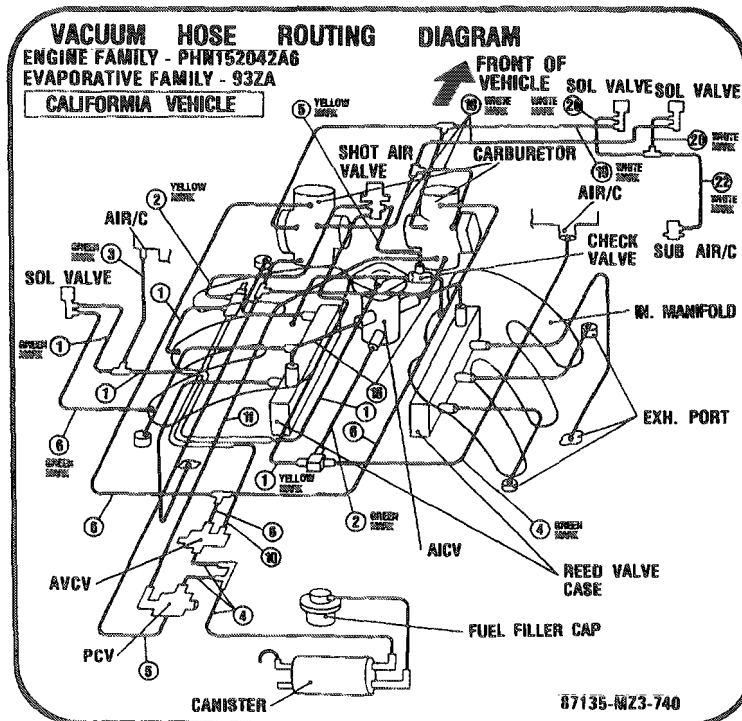
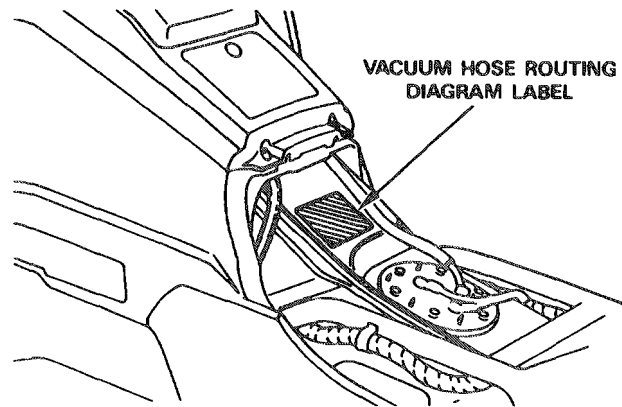
Emission Control Information Labels (U.S.A. only)

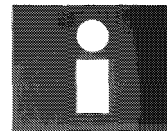
An Emission Control Information Label is located on the right side of the frame as shown. It gives basic tune-up specifications.



Vacuum Hose Routing Diagram Label (California model only)

The Vacuum Hose Routing Diagram Label is on the fuel tank. The seat must be removed to view it. Route the vacuum hoses as shown on this label.





Metric Conversions

To convert from metric to English equivalents, use the following conversion factors.

Given	Multiply By	To Obtain
Torque:		
Newton-meters (N-m)	0.723	Foot Pounds (ft-lb)
Foot Pounds (ft-lb)	1.383	Newton-meters (N-m)
Length:		
Meter (m)	3.281	Feet (ft)
Millimeter (mm)	0.03937	Inches (in)
Feet (ft)	0.3048	Meter (m)
Inches (in)	25.40	Millimeter (mm)
Kilometer (km)	0.6214	Mile (mi)
Mile (mi)	1.609	Kilometer (km)
Pressure:		
Kilogram/Sq. centimeter (kg/cm ²)	14.22	Pounds/Sq. inch (psi)
Pounds/Sq. inch (psi)	0.0703	Kilograms/Sq. centimeter (kg/cm ²)
Temperature:		
Centigrade (C°)	$(C^{\circ} \times 1.8) + 32$	Fahrenheit (F°)
Fahrenheit (F°)	$(F^{\circ} - 32) \div 1.8$	Centigrade (C°)
Capacity:		
Liter (l)	0.2642	Gallon (gal)
Liter (l)	1.0568	Quart (qt)
Quart (qt)	0.9463	Liter (l)
Gallon (gal)	3.785	Liter (l)
Ounce	29.57	Cubic centimeters (cc)
Cubic centimeter	0.339	Ounce (oz)
Volume:		
Cubic centimeter (cc)	0.061	Cubic inches (cu in)
Cubic inches (cu in)	16.39	Cubic centimeters (cc)
Weight:		
Kilogram (kg)	2.205	Pounds (lb)
Gram (g)	0.03527	Ounces (oz)
Pounds (lb)	0.4536	Kilogram (kg)
Ounces (oz)	23.34945	Gram (g)
Speed:		
Kilometer/hour (km/h)	0.6214	Miles/hour (mph)
Miles/hour (mph)	1.609	Kilometer/hour (km/h)

General Information

Honda N.P.S. Part Numbers

Honda N.P.S. numbers contain significant information about the parts they represent. The following examples illustrate the three basic types of N.P.S. numbers.

Standard Numbers (Common Items)

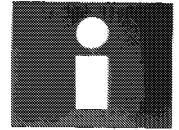
6x42 Hex Bolt	92120-060420Z
Function Number	92
Method of Manufacture	1
Length of Thread	20
Normal Diameter	06
Length Under the Head	042
Material	0
Surface Treatment	Z

Semi-Standard Numbers (seals, O-rings, bearings, etc.)

Front Wheel Dust Seal	91251-300-003
Function	91
Type	2
Detail Number	51
Product Number (where first used)	300
Classification	00
Manufacturer	3

Special Numbers (Non-interchangeable parts)

Left Side Cover	83700-371-305ZA
Function	83
Component	700
Product	371
Classification	305
Color Code	ZA



Tools

Special

DESCRIPTION	TOOL NUMBER	REF. SECTION(S)
Oil filter wrench	07HAA-PJ70100	3
Pilot screw wrench	LMA-MT8010A or 07MMA-MT3010A	4
Hydraulic tappet bleeder	07973-MJ00000	7
Valve guide reamer, 5.5 mm	07984-200000C or 07984-200000D	7
Shim selection gauge	07974-MG90000	7
Piston base head	07JGF-001010A	8
Piston base	07973-6570500	8
Piston pin driver insert	07974-6570400	8
Adj. piston pin driver head	07973-6570210	8
Adj. piston pin driver shaft	07973-6570300	8
Pilot collar	07KMF-MT20200	8
Lock nut wrench, 46 mm	07JMA-MN50100	8
Snap ring pliers	07914-3230001	9, 14
Clutch center holder	07HGB-001000A	9
Oil seal driver attachment	09765-MA10200	9
Clutch outer holder	07JMB-MN50100	8, 9, 10, 18
Lock nut wrench, 46 mm	07JMA-MN50100	9
Mainshaft holder	07JMB-MN50200	10
Lock nut wrench, 30 x 64 mm	07916-MB00001	17
Bearing remover	09736-3710300	17
Remover handle	07936-3710100	17
Remover weight	07936-3710200	17
Attachment, 28 x 30 mm	07946-1870100	17
Bearing driver attachment	07GAD-SD40101	17
Piston ring compressor	07JMG-MN50000A	10
• piston base A	01JMG-MN5012A	10
• piston base B	07JMG-MN50111 (1 pc.)	10
Steering stem socket	07916-3710100	15
Steering stem driver	07946-MB00000	15
Ball race remover	07953-4250002	15
Bearing race remover	07946-3710500	12
Fork seal driver	07947-KA50100	12
Fork seal driver attachment	07947-KF00100	12
Compressor attachment	07959-MB10000	12
Oil seal driver	07965-KE80100	12
Oil seal driver attachment	07965-MA60100	12
Lock nut wrench	KS-HBA-08-469	12
Pivot bearing outer race remover	07936-4150000	12
Fork bolt assembly tool	07KMF-MT20300	12
Pinion joint holder attachment	07924-9690101 (Modified) or 07924-9690102	11
Pinion joint holder	07924-ME40000	11
Retainer wrench	07910-4630100	11
Oil seal driver attachment	07965-MB00100	11
Shaft puller	07931-ME4000A	11
Attachment (ring gear bearing)	07947-6340100	11
Inner base	07965-3710300	11

General Information

Tools (cont'd)

Common

DESCRIPTION	TOOL NUMBER	REF. SECTION(S)
Oil pressure gauge	07506-3000000 – or equivalent	3
Oil pressure gauge attachment	07510-4220100 – commercially available	3
Carburetor vacuum gauge set	07LMJ-001000A or M937B-021-XXXXX	3
Vacuum probe 2"	07LMJ-001010A or M983X-350-XXXXX	3
E.S.I. #320 Tachometer	E.S.I. No. 320	4
Float level gauge	07401-0010000	4
Vacuum pump	ST-AH-260-MC7	4, 12, 16
Pressure pump	ST-AH-255-MC7	4, 12
Valve spring compressor	07757-0010000	7
Valve guide driver, 5.5 mm	07742-0010100	7
Universal holder	07725-0030000	7, 17, 18
Driver	07749-0010000	9, 10, 11, 12, 15, 17, 18
Attachment, 32 x 35 mm	07746-0010100	9, 10, 17
Pilot, 28 mm	07746-0041100	10
Inner driver B	07746-0020100	10, 17
Attachment, 17 mm I.D.	07749-0020300	17
Attachment, 42 x 47 mm	07746-0010300	12, 15, 17
Pilot, 22 mm	07746-0041000	10, 18
Attachment, 62 x 68 mm	07746-0010500	11, 17
Pilot, 30 mm	07746-0040700	17
Pilot, 17 mm	07746-0040400	17
Pilot, 12 mm	07746-0040200	17
Piston ring compressor	Commercially available	8
Bearing remover	Commercially available	15
Pilot, 20 mm	07746-0040500	15, 17, 18
Attachment, 52 x 55 mm	07746-0010400	11, 12
Shock absorber compressor	07959-3290001 or 07GME-0010000	12
Seal remover pump	07971-M01000B	12
Attachment, 37 x 40 mm	07746-0010200	12, 18
Universal bearing puller	07631-0010000 (or equivalent commercially available)	11
Driver, 40 mm I.D.	07746-0030100	11, 17
Attachment, 25 mm I.D.	07746-0030200	11
Attachment, 30 mm I.D.	07746-0030300	17
Adjustable bearing puller	07736-A01000A	11
Digital multimeter	07411-0020000 or KS-AHM-32-003	–
Christie battery charger	MC1012/2	17
Battery tester	07GMJ-0010000	17
Attachment, 35 mm I.D.	07746-0030400	18
Torx bit, T30	Commercially available	18
Flywheel holder	07725-0040000	18
Attachment, 20 mm I.D.	07746-0020400	18
Attachment, 24 x 26 mm	00746-0010700	18

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Specifications

General

	Item	Standard	
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	A: 364 kg (802 lbs), California model: 365 kg (805 lbs) SE: 370 kg (816 lbs), California model: 371 kg (818 lbs) I: 349 kg (769 lbs), California model: 350 kg (771 lbs)	
	Curb Weight	A: 399 kg (879 lbs), California model: 400 kg (882 lbs) SE: 405 kg (893 lbs), California model: 406 kg (895 lbs) I: 385 kg (848 lbs), California model: 386 kg (851 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)	
	Front tire	Air pressure	0-4.0 kg/cm ² (0-57 psi)
		Size	130/70-18 63H
	Rear tire	Air pressure	2.25 kg/cm ² (33 psi)
		Size	160/80-16 75H
		Air pressure	Up to 90 kg (200 lbs) load: 2.50 kg/cm ² (36 psi) Up to maximum weight limit: 2.80 kg/cm ² (41 psi)
	Front brake	Double disc brake	
	Rear brake	Disc brake	
	Fuel capacity	24.0 lit. (6.3 US gal, 5.3 Imp gal)	
	Fuel reserve capacity	5.3 lit (1.4 US gal, 1.2 Imp gal)	
	Caster angle	30°	
	Trail length	111 mm (4.4 in)	
Front fork oil capacity	Left:	A & SE: 372 cc (12.6 US oz, 13.1 Imp oz) I: 361 cc (12.2 US oz, 12.7 Imp oz)	
	Right:	377 cc (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 cc (92.7 cu-in)	
	Compression ratio	9.8:1	
	Valve train	Belt-driven overhead camshaft	
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After oil/filter change	3.7 lit. (3.9 US qt, 3.3 Imp qt)
	Lubrication system	Forced and wet sump	
	Cooling system capacity	4.1 lit. (4.3 US qt, 3.6 Imp qt)	
	Cylinder compression	15.0 kg/cm ² (213 psi)	
	Engine weight	A & SE: 126 kg (278 lbs) I: 124 kg (273 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 rpm	

	Item	Standard	Unit: mm (in)
Carburetion	Carburetor type Throttle bore Carburetor identification No. Pilot screw opening Float level Main jet Slow jet Throttle grip free play Fuel pump flow capacity Carburetor vacuum difference	CV down-draft – (2) 36 mm (1.42 in) A & SE: VD GWE; California model: VD GYD; Canada model: VD G9C I: VD GWF; California model: VD GYE; Canada model: VD G9C See page 4-39 7.5 mm (0.3 in) pri: #80 2nd: #148 #65 5-8 mm (3/16-5/16 in) 640 cc (21.6 oz)/minute Within 40 mm (1.6 in)Hg of each other	
Drive Train	Clutch type Transmission Primary reduction ratio Secondary reduction ratio 1st 2nd Gear ratio 3rd 4th OD Final reduction ratio Gearshift pattern Final drive gear oil capacity	Wet, multi-plate 5-speed, constant mesh 1.592 (78/49) 0.971 (34/35) 2.666 (40/15) 1.722 (31/18) 1.272 (28/22) 0.964 (27/28) 0.758 (22/29) 2.833 (34/12) Left foot operated return system 1-N-2-3-4-OD 140 cc (4.7 US oz, 4.9 Imp oz) (After draining) 170 cc (5.7 US oz, 6.0 Imp oz) (After disassembly)	
Electrical	Ignition Ignition timing "F" mark Starting system Alternator Alternator driven gear damper spring free length Battery capacity Spark plug – Standard – For cold climate (Below 50°C, 41°F) – For extended high speed riding Spark plug gap Firing order Fuses Fusebox Main fuse Reverse fuse	Battery Ignition (Full transistor) TDC @ 800 ± 80 rpm Starting motor A.C. generator, 550 W/5,000 rpm 20.8 mm (0.82 in) 12V-20AH DPR7EA-9 (NGK) X22EPR-U9 (Nippondenso) DPR6EA-9 (NGK) X20EPR-U9 (Nippondenso) DPR8EA-9 (NGK) X24EPR-U9 (Nippondenso) 0.8-0.9 mm (0.031-0.035) 1-4-5-2-3-6 A & SE: 5A x 4, 10A x 4, 15A x 5; I: 5A x 3, 10A x 3, 15A x 5 30A, 55A A & SE: 5A x 2, 65A	
Lights	Headlight Position light Turn signal/position light Indicator light Turn signal indicator Meter illumination LCD unit illumination License light Accessory light Brake and taillight Rear turn signal Cornering light (SE)	12V 45/45W x 2 12V 2cp (3.4W) x 2 12V 32cp (23W)/3cp (8W) x 2 A & SE: 12V 3.4W x 5; 12V 1.7W x 4; I: 12V 3.4 x 3, 12V 1.7W x 2 12V 3W x 2 12V 3.4W x 4 12V 3W x 2 12V 3cp (5W) 12V 3W x 2 12V 32/2cp (27/7W) x 4 12V 32cp (23W) x 2 12V 25W x 2	

Specifications

Standards/Service Limits

Cylinder Head

	Item	Standard	Unit: mm (in)	Service Limit
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 (34.49-40.12/1.48 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
Camshaft	Cam lobe height		36.110-36.190 (1.4217-1.42480)	35.9 (1.41)
	Runout (at inner journals)			0.10 (0.004)
	Journal O.D.	Both inner	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 inner	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/Piston/Crankshaft

Cylinder	Cylinder compression pressure		13.0-17.0 kg/cm ² (185-242 psi)	10 kg/cm ² (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	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		0.015-0.065 (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 Top	0.025-0.055 (0.0010-0.0022)	0.10 (0.004)
		land clearance 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)	

Clutch

	Item	Standard	Unit: mm (in)	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	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)
	Clutch fluid	DOT 4		

Oil Pumps

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)
Scavenging 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)
Pressure relief valve	Relief pressure		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	Cold (At 35°C/95°F) (at oil pressure switch)	Idle speed	1.3 kg/cm ² , (18 psi)	
		5,000 rpm	5.0 kg/cm ² , (71 psi)	
	Hot (At 80°C/176°F) (at oil pressure switch)	Idle speed	0.8 kg/cm ² , (11 psi)	
		5,000 rpm	5.0 kg/cm ² , (71 psi)	
	Oil pressure switch continuity pressure		0.1-0.2 kg/cm ² , (1-3 psi)	

Transmission

Transmission	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)
Gearshift	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)

Cooling

Cooling	Radiator cap relief pressure		0.75-1.05 kg/cm ² (11-15 psi)		
	Thermostat	Begins to open temperature		80°-84°C (176°-182°F)	
		Fully opened temperature		93°-97°C (199°-206°F)	
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.31) min.	
	Carburetor coolant thermal valve	Starts to close		78°-82°C (172°-180°F)	
			California model		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	
	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)	
Boiling point (with 50-50 mixture)	Unpressurized:		107.7°C (226°F)		
	Cap on pressurized:		125.6°C (258°F)		
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)		

Specifications

Standards/Service Limits (cont'd)

Final Drive

	Item	Standard	Unit: mm (in)	Service Limit
Final Drive	Final gear oil	Recommended oil	Hypoid gear oil, SAE #80	
	Capacity:	After disassembly	170 cc (5.7 US oz, 6.0 Imp oz)	
		After draining	140 cc (4.7 US oz, 4.9 Imp oz)	
	Final gear backlash	Difference at 3 points	0.05-0.15 (0.002-0.006)	0.3 (0.01) 0.10 (0.004)
	Ring gear-to-stop pin clearance		0.30-0.60 (0.012-0.024)	
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)
	Drive gear I.D.		26.000-26.016 (1.0236-1.0242)	26.03 (1.025)

Suspension

Fork	Fork spring free length		390.6 (15.38)	382.8 (15.07)
	Fork oil capacity	Left	A & SE: 372 cc (12.6 US oz, 13.1 Imp oz)	
		Right	l: 361 cc (12.2 US oz, 12.7 Imp oz)	
	Fork oil level (from top of tube)		377 cc (12.7 US oz, 13.2 Imp oz)	
	Fork oil		194 (7.6)	
	Fork tube runout		Pro Honda Suspension Fluid SS-8	0.2 (0.01)
Shocks	Right shock absorber air pressure		0-4.0 kg/cm ² (0-57 psi)	
	Right shock absorber oil capacity		140 cc (4.7 US oz, 4.9 Imp oz)	
	Right shock absorber oil		Pro Honda Suspension Fluid SS-7	

Brakes

Front Brakes	Front brake 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)
		Right	Piston O.D.	25.335-25.368 (0.9974-0.9987)	25.310 (0.9965)
			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	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)	
Fluid	Brake fluid (front/rear)		DOT 4		

Wheels/Tires

Item	Standard	Unit: mm (in)	Service Limit
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)

Electrical

Charging	Battery capacity Battery specific gravity (At 20°C/68°F) Full charged Needs charging Battery charging current Alternator Capacity Stator coil resistance Rotor coil resistance Rotor coil slip ring O.D. Charging start Regulator/Rectifier Type (into alternator) Regulated Voltage 900 rpm 1,850 rpm	12V-20AH 1.270-1.290 Below 1.260 2.0 Amperes max. 0.55 kW/5,000 rpm 0.1-0.3 ohms (20°C, 68°F) 2.9-4.0 ohms (20°C, 68°F) 27.0 (1.06) 800-1,000 rpm Transistorized non-adjustable reg./recti. 0-2A, 13.5-15.5 V 1.5 A min, 13.5-15.5 V	26.0 (1.02)
Ignition	Firing order Ignition timing Vacuum advance F mark Advance start Advance cease Ignition coil resistance (At 20°C/68°F) Primary coil Secondary coil With spark plug wire Without spark plug wire Ignition pulse generator coil resistance (At 20°C/68°F) Engine coolant temperature sensor/ Intake air temperature sensor	1-4-5-2-3-6-1 0° TDC at 800 ± 80 rpm 650-750 mmHg (25.6-29.5 inHg) 380-480 mmHg (15.0-18.9 inHg) 2.6-3.2 ohms 20.2-26.8 k ohms 11.7-14.3 k ohms 400-500 ohms 2.0-3.0 k ohms 200-400 ohms	
Starter/Reverse	Starter motor brush length Reverse System Starter relay regulator/regulated current Resister Between relay and unit terminals Between relay terminal and ground	12.5 (0.49) 0.7-1.0A 0.06-0.09 ohms 0.1-0.2 ohms	6.0 (0.24)
Electrical	Oil pressure switch continuity pressure Fuel gauge level sensor resistance (At 20°C/68°F) Empty Reserve Full	0.1-0.2 kg/cm ² (1-3 psi) 90-100 ohms 66-81 ohms 4-10 ohms	

Frame

Item	Qty	Thread dia (mm)	N-m	Torque kg-m	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	
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 12-44
Anti-dive case socket bolt (A & SE)	8	6	8	0.8	6	NOTE 2
(I)	4	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	
Rear wheel 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 (A & SE)	3	8	6	0.6	4	
Air hose special bolt (with seat) (A & SE)	1	10	15	1.5	11	
Outlet air hose joint (A & SE)	2	8	6	0.6	4	
Air pressure sensor (A & SE)	1	8	10	1.0	7	
Air distributor solenoid valve mounting screw (A & SE)	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 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	
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	
NOTES:						
1. Apply sealant to the threads.			5. Stake (2 places).			
2. Apply locking agent to the threads.			6. Apply oil to the threads and flange surfaces.			
3. Apply molybdenum disulfide oil to the threads and flange surfaces.			7. Torque wrench scale reading using a special tool.			
4. Left-handed threads.			8. Apply grease to the threads and flange surfaces.			

Specifications

Torque Values (cont'd)

Frame

Item	Qty	Thread dia (mm)	N-m	Torque kg-m	ft-lb	Remarks
Hydraulic Brake:						
Caliper bleed valve	3	8	6	0.6	4	
Front caliper bracket bolt (A & SE)	2	8	23	2.3	17	
Anti-dive piston bolt (A & SE)	2	6	12	1.2	9	
(I)	1	6	12	1.2	9	
Left front caliper bracket bolt (I)	2	8	31	3.1	22	
Right front caliper bracket bolt (I)	1	8	23	2.3	17	
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	
Others:						
Brake disc bolt	18	8	40	4.0	29	
Miscellaneous:						
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 (SE)	4	6	6	0.6	4.3	
Passenger footrest bracket bolt (SE)	4	8	26	2.6	19	
Passenger footrest cover bolt (I)	2	6	10	1.0	7	
Flairing 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 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	19 (1.0, 7)	6 mm screw and 6 mm flange bolt with 8mm 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)



Maintenance

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Maintenance

Service Information

⚠ 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.
 - 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

- 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 engine oil capacity, see page 2-2.
 - For engine oil filter, see page 3-13.
 - For final drive oil capacity, see page 2-6.
 - For coolant capacity, see page 2-5.
 - For oil pressure switch inspection, see page 19-23.
 - The lubrication system uses two oil pumps; main and scavenging. The main pump picks 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
 - 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 scavenging pump, see Section 8
 - 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

- The fuel tank does not have a drain bolt. While installed on the motorcycle, the fuel tank may be drained by using a vacuum pump to drain fuel from the fuel filler mouth or by jumping a power source to the fuel pump to drain fuel from the fuel tube at the carburetor.
- This motorcycle is equipped with tubeless tires, valves, and wheel rims. Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE." Never mount tires designed for use on automobiles on a motorcycle rim.

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 cartridge	10 N-m (1.0 kg-m, 7 ft-lb)
Final drive gear case filler cap	12 N-m (1.2 kg-m, 9 ft-lb)



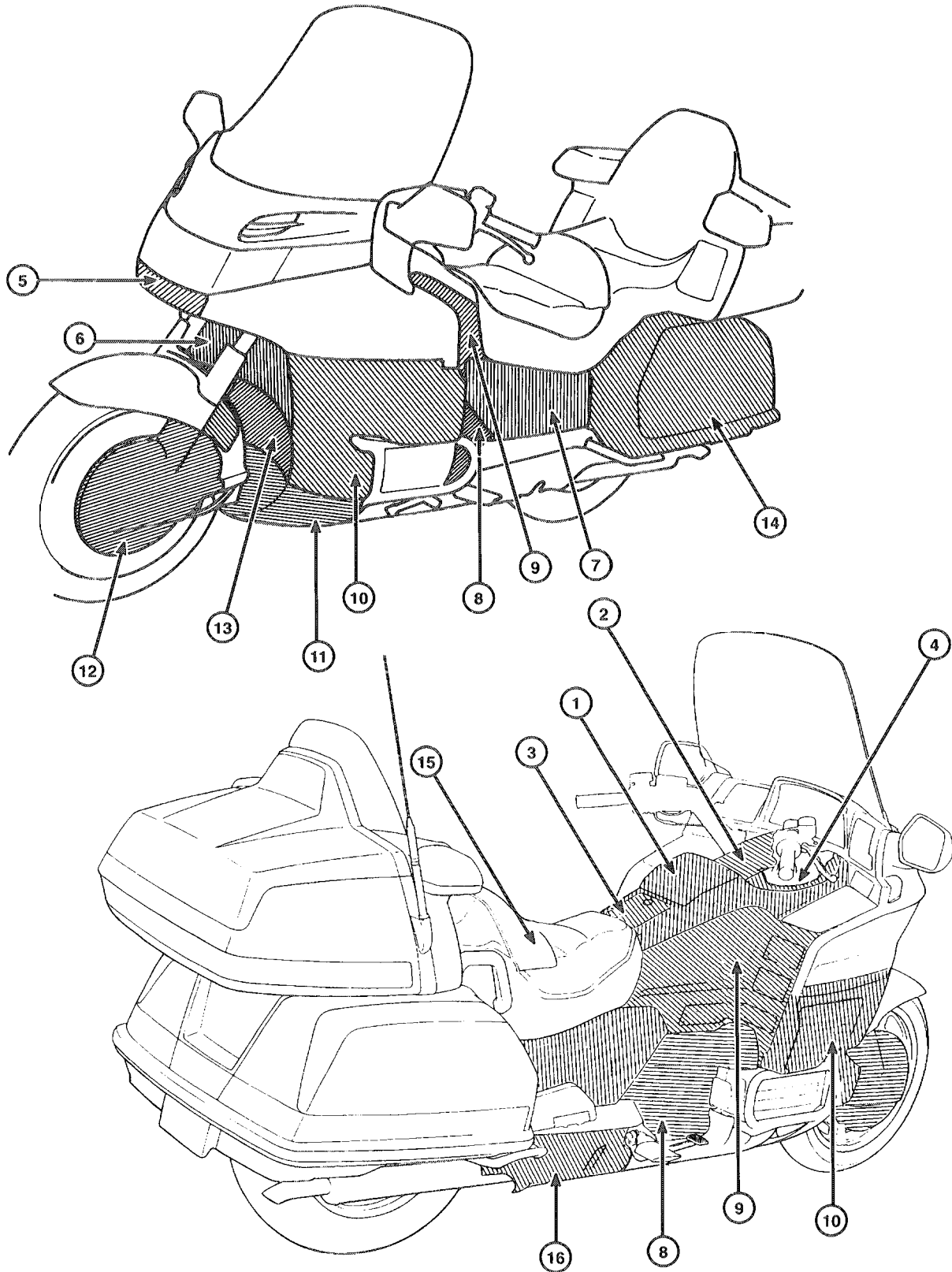
Lubrication Points

Lubrication Point	Lubricant	Remarks
Engine	HONDA 4-stroke Oil or equivalent. API service classification: SF or SG SAE 10W-40	4.3 lit (5.4 US qt, 3.8 Imp qt) at engine assembly 3.5 lit (3.7 US qt, 3.1 Imp qt, oil changes 3.7 lit (3.0 US qt, 3.3 Imp qt) at oil filter and oil change
Final drive gear	Hypoid gear oil, SAE 80	140 cc (4.7 oz) after draining 170 cc (5.7 oz) at assembly
Fork	Pro-Honda Suspension Fluid SS-8 or equivalent	Left: 325 cc (11.0 US oz, 11.4 Imp oz) GL1500 I: 320 cc (10.8 US oz, 11.2 Imp oz) Right: 320 cc (10.8 US oz, 11.2 Imp oz) GL1500 I: 330 cc (11.2 US oz, 11.6 Imp oz)
Rear shock absorber (right)	Pro-Honda Suspension Fluid SS-7 or equivalent	140 cc (4.7 US oz, 4.9 Imp oz)
Shock absorber air hose joint O-rings	Pro-Honda Suspension Fluid SS-7	
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 Windshield adjuster tension plate pivot Reverse drum circumference Reverse drum pivot	Multipurpose grease	
Drive shaft, universal joint Drive shaft pinion joint splines and oil seal Final driven flange splines	Honda Moly 60 paste or equivalent	
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	

Maintenance

Service Information (cont'd)

Service Access Guide





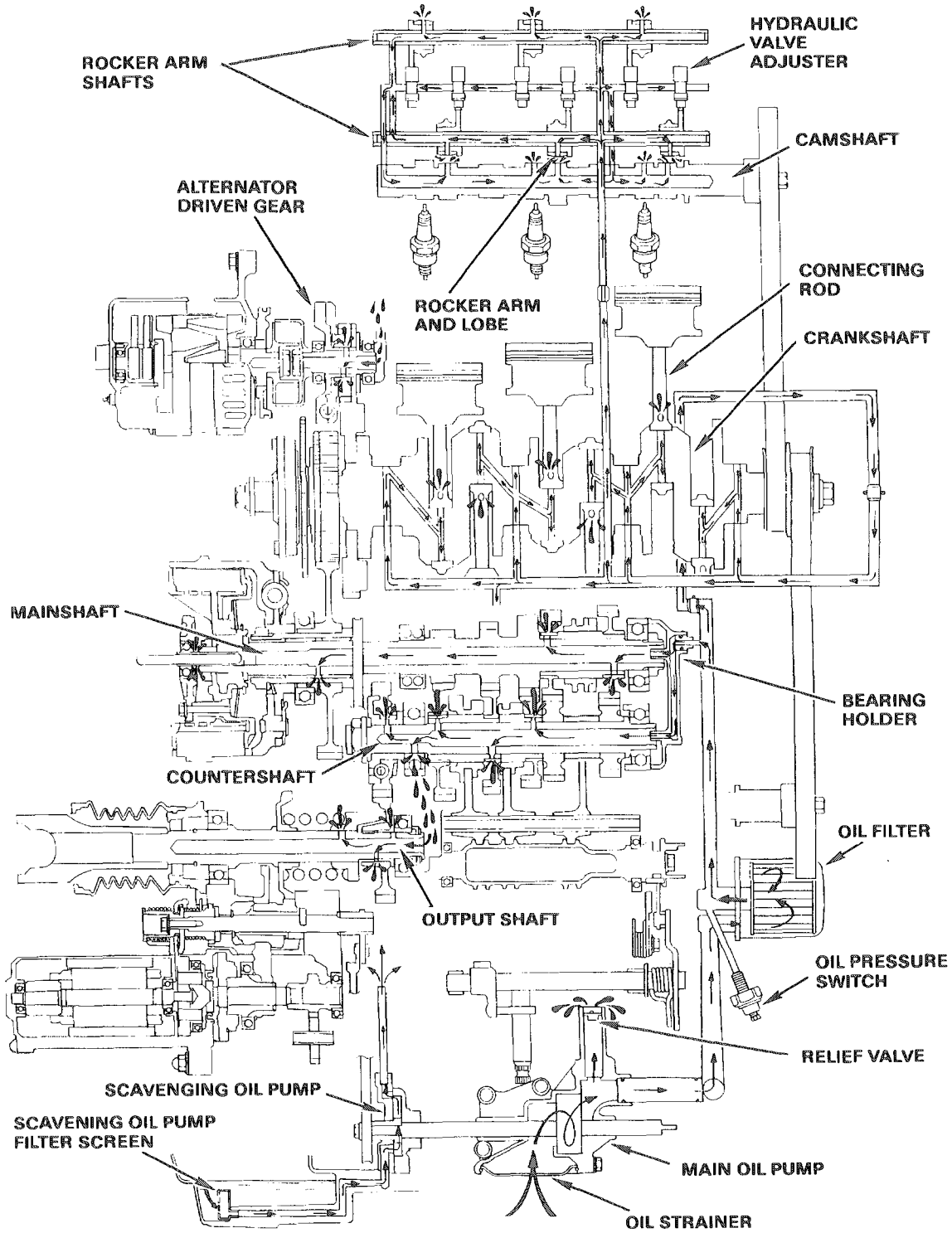
Service Access Guide

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 13 for component removal.

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

Maintenance

Lubrication Diagram





Troubleshooting

Engine will not crank

- Battery or charging system faulty (see Section 17)
- Starter or starter system faulty (see Section 18)
- 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 (see Section 16)
- Fuel filter clogged
- Fuel cap vent clogged

Engine cranks but will not start – cold weather

- Battery weak due to low temperature (see 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
- EVAP purge control valve faulty (California model only)

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 "Engine lacks power" and "Poor performance at high speed" for more detailed troubleshooting information.)

- Alternator voltage low or battery low
- Ignition system faulty (see Section 17)
- Improper ignition timing
- Intake pipe leaks
- Not enough fuel
- Valve springs weak or broken
- Cylinder head gasket blown
- Carburetor malfunction (see 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 (see Section 17)
- Low engine compression
- Low fuel pump pressure
- Improperly adjusted throttle linkage

Afterfires, explosions in muffler

- Ignition system faulty (see Section 17)
- Retarded ignition timing (see 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

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

Maintenance

Troubleshooting (cont'd)

Poor Handling

Check tire and suspension pressures

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

Engine Does Not Start or is Hard to Start

1. Check fuel flow to carburetor
NOT REACHING CARBURETOR →
 - POSSIBLE CAUSE
 - 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

REACHING CARBURETOR ↓
2. Perform spark test
WEAK OR NO SPARK →
 - Ignition system (see Section 16)

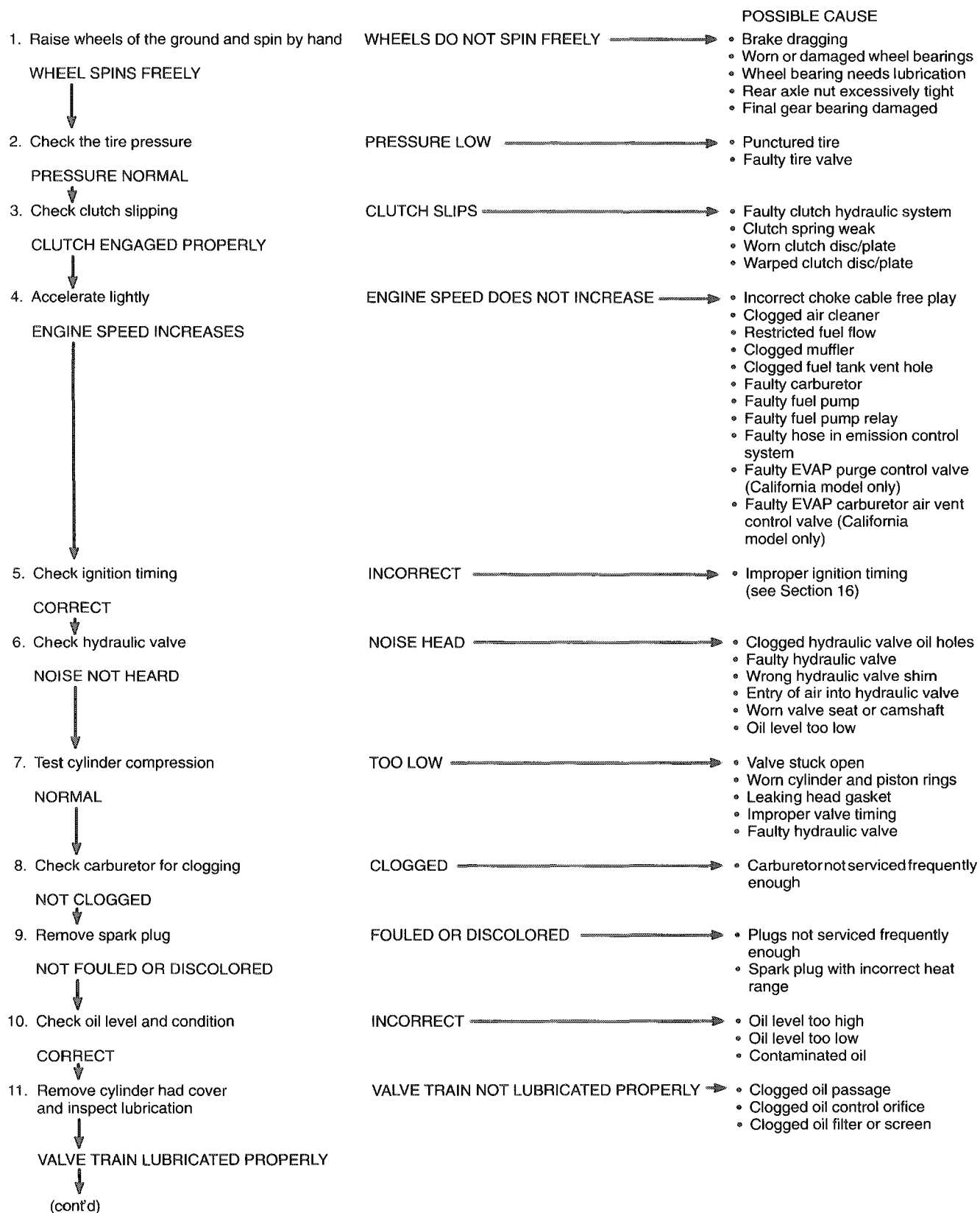
GOOD SPARK ↓
3. Test cylinder compression
LOW COMPRESSION →
 - Low battery charge
 - Improper valve clearance (Faulty hydraulic tappet)
 - Valve stuck open
 - Worn cylinder and piston rings
 - Damaged cylinder head gasket
 - Seized valve
 - Improper valve timing
 - Worn or damaged valve seat
 - Warped 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 (see Section 16)
 - 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 use of the accelerator pump



Engine Lacks Power



Maintenance

Troubleshooting (cont'd)

Engine Lacks Power

12. Check for engine overheating

NOT OVERHEATING



13. Accelerate or run at high speed

ENGINE DOES NOT KNOCK

OVERHEATING →

POSSIBLE CAUSES

- Coolant level too low
- Fan motor not working (thermostatic switch faulty)
- Thermostat stuck closed
- Excessive carbon build-up in combustion chamber
- Use of poor quality fuel
- Improper ignition timing (see Section 16)
- Lean fuel mixture

ENGINE KNOCKS →

- Worn piston and cylinder
- Wrong type of fuel
- Excessive carbon build-up in combustion chamber
- Ignition timing too advanced (see Section 16)
- Lean fuel mixture

Poor Performance at Low and Idle Speeds

1. Check ignition timing and hydraulic valve noise

CORRECT



2. Check carburetor pilot screw adjustment

CORRECT



3. Check for leaking intake pipe and vacuum tubes

NO LEAK



4. Perform spark test

GOOD SPARK

INCORRECT →

- Clogged hydraulic valve oil hoses
- Faulty hydraulic valve
- Improper ignition timing

INCORRECT →

- See pilot screw adjustment (Section 4)

LEAKING →

- Loose carburetor insulator
- Damaged or deteriorated vacuum tubes

WEAK OR INTERMITTENT SPARK →

- See ignition system (Section 16)
- Faulty carburetor air system (see Section 4)

Poor Performance at High Speed

1. Check ignition timing and hydraulic valve noise

CORRECT



2. Disconnect fuel line at carburetor

FUEL FLOWS FREELY



3. Remove Carburetors and clogged jets
NO CLOGGED JETS



4. Check valve timing

CORRECT



5. Check valve spring tension
NOT WEAKENED

INCORRECT →

- Clogged hydraulic valve
- Faulty hydraulic valve
- Improper ignition timing (see Section 16)

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

CLOGGED →

- Carburetor not serviced frequently enough

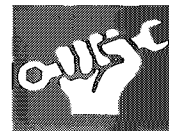
INCORRECT →

- Camshaft pulley not installed properly

WEAK →

- Faulty spring

- Faulty carburetor air system (Section 4)



Hydraulic Valve Adjuster System

Noisy Tappet

1. Check for low oil level.
Ride for five minutes with the engine speed over 3,000 rpm.
Check oil level and condition.

CORRECT



2. Check oil pressure

CORRECT



3. Remove cylinder head cover and check lubrication

CORRECT



4. Remove hydraulic tappet and check it.

CORRECT



5. Disassembly camshaft holder and check parts

INCORRECT



POSSIBLE CAUSE

- Contaminated oil
- Use of poor quality oil

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 passage
- Clogged oil pipe

NOT LUBRICATED PROPERLY



- Clogged camshaft holder oil passage
- Clogged oil control orifice

INCORRECT



- Plunger sticking
- Faulty hydraulic tappet
- Air in hydraulic tappet
- Worn or sticking hydraulic tappet
- Improper hydraulic tappet installation

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

1. Check oil level and condition

CORRECT



2. Check oil pressure

NORMAL



3. Remove hydraulic tappet and check it

CORRECT



4. Disassemble camshaft holder and check parts

CORRECT



5. Check valve and valve seat

CORRECT

INCORRECT



- Contaminated oil
- Use of poor quality oil

INCORRECT



- Use of poor quality oil

INCORRECT



- Sticking hydraulic tappet
- Faulty hydraulic tappet
- Improper hydraulic tappet installation

INCORRECT



- Worn or damaged rocker arm or shaft
- Use of improper shim
- Improper installation

INCORRECT



- Worn valve seat or valve face

CORRECT



- Engine overrevving

Maintenance

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.

	FREQUENCY		NOTE	ODOMETER READING (NOTE 1)								Refer to Page
				x1000 km	1	6.4	12.8	19.2	25.6	32.0	38.4	
	ITEM	x1000 mi		0.6	4	8	12	16	20	24		
EMISSION RELATED ITEMS	*	Fuel Line				I		I		I	3-16	
	*	Throttle Operation				I		I		I	3-16	
	*	Carburetor Choke				I		I		I	3-17	
		Air Cleaner	(Note 2)					R			R	3-18
		Crankcase Breather	(Note 3)		C	C	C	C	C	C	C	3-19
		Spark Plugs				R		R			R	3-19
		Engine Oil		R		R		R			R	3-13
		Engine Oil Filter		R		R		R			R	3-13
	*	Carburetor Synchronization				I		I			I	3-20
	*	Engine Idle Speed		I	I	I	I	I	I	I	I	3-21
		Radiator Coolant	(Note 5)				I		I		R	3-22
	*	Cooling System				I		I			I	3-23
	*	Pulse Secondary Air Injection System				I		I			I	3-24
	*	Evaporative Emission Control System	(Note 4)						I		I	3-24
**	Timing Belt			Every 100,000 mi. (160,000 km)							I	7-5
NON-EMISSION RELATED ITEMS		Final Drive Oil				I		I			R	3-15
		Battery			I	I	I	I	I	I	I	3-25
		Brake Fluid	(Note 5)		I	I	R	I	I	R	R	3-26
		Brake Pad Wear			I	I	I	I	I	I	I	3-26
		Brake System		I		I		I			I	3-27
	*	Brake Light Switch				I		I			I	3-28
	*	Headlight Aim				I		I			I	3-28
		Clutch System				I		I			I	3-29
		Clutch Fluid	(Note 5)		I	I	R	I	I	R	R	3-29
	*	Reverse Operation	A & SE models only			I		I			I	3-30
		Side Stand				I		I			I	3-31
	*	Suspension				I		I			I	3-31
	*	Cruise Valve Element	A & SE models only								R	3-35
	*	Air Pump Element	A & SE models only					C				3-33
	*	Air Drier	A & SE models only				I		I		I	3-34
*	Nuts, Bolts, Fasteners		I		I		I			I	3-35	
**	Wheels/Tires				I		I			I	3-36	
**	Steering Head Bearings		I		I		I			I	3-37	

* 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.

NOTE

- At higher odometer readings, repeat at the frequency interval established here.
- Service more frequently when riding in unusually wet or dust areas.
- Service more frequently when riding in rain or at full throttle.
- California type only.
- Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.



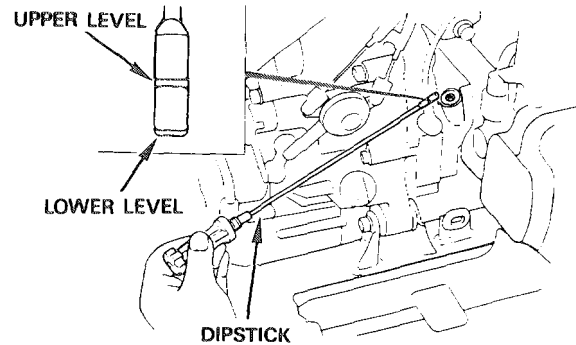
Engine Oil Level

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

Stop the engine and put the motorcycle on its center stand on level ground.

Remove the dipstick, wipe it clean, and insert the dipstick without screwing it in.

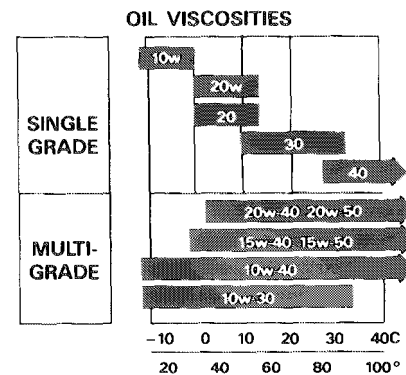
Make sure the oil level is at the upper level mark of the dipstick. If the oil level is low, remove the oil filter cap and add the necessary amount of recommended oil: Honda 4-stroke oil or equivalent API service classification SF or SG, SAE 10W-40.



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

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

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

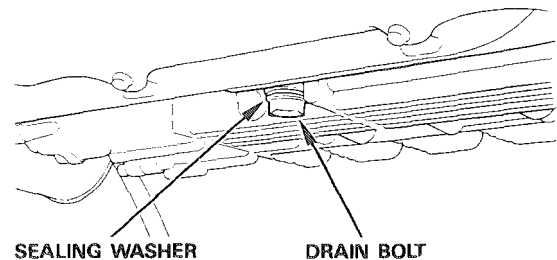


Engine Oil & Filter Change

NOTE

- Change engine oil with the engine warm and 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 (see page 13-11).

Remove the oil filter with a filter wrench and let the remaining oil drain out. Discard the oil filter.

Tool:

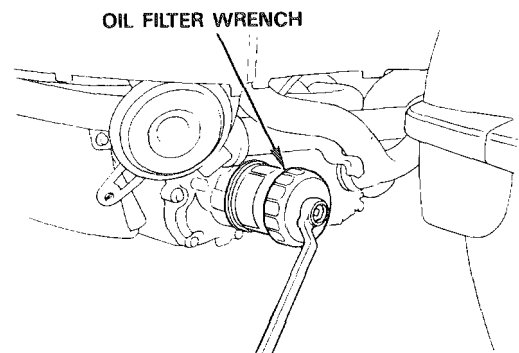
Oil filter wrench
07HAA-PJ70100

Check that the sealing washer on the drain bolt is in good condition. 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. Coat it with oil before installation. Install and tighten the oil filter.

Torque: 10 N-m (1.0 kg-m, 7 ft-lb)



Maintenance

Engine Oil and Filter Change (cont'd)

Fill the engine case with the specified quantity of the recommended oil (see page 2-2). Reinstall the oil filler cap and dipstick.

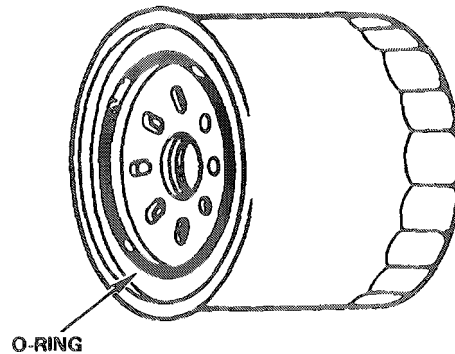
Start the engine and let it idle for a few minutes, then stop the engine.

Make sure that the oil level is at the upper level mark on the dipstick.

Make sure that there are no oil leaks.

Recommended oil:

Honda 4-Stroke Oil or Equivalent
API Service Classification — SF or SG
SAE 10W-40



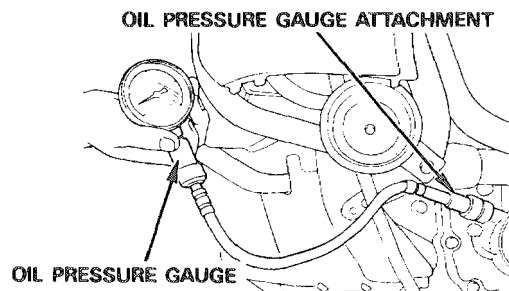
Oil Pressure Check

Remove the under cover (see page 13-11).

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
Commercially available
- Oil pressure gauge attachment
Commercially available



Start the engine and check the oil pressure.

OIL PRESSURE CHART:

Oil Pressure (kg/cm ² , psi)	Idle Speed kPa (kg/cm ² , psi)	5,000 RPM kPa (kg/cm ² , psi)
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.

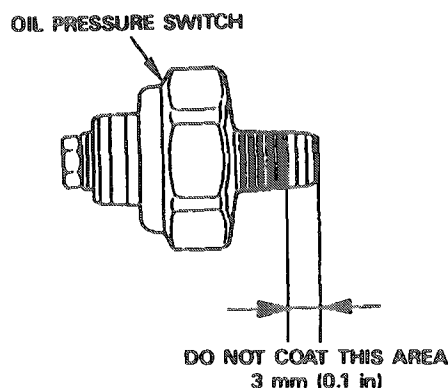
Torque: 12 N-m (1.2 kg-m, 9 ft-lb)

CAUTION

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

Connect the switch wire and install the rubber cover.

Check that the oil pressure warning light goes out a few seconds after turning the ignition switch ON.



Final Drive Oil

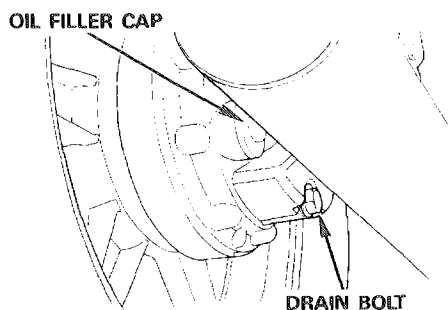
Check

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.

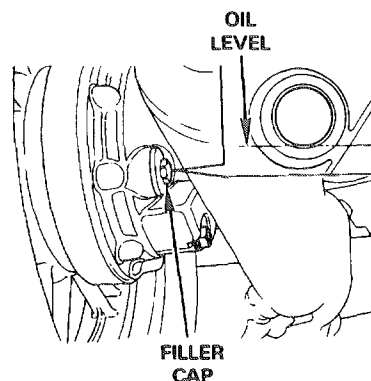
Fill the gear case with the recommended oil to the correct level (the lower edge of the oil filler cap hole).

Oil Capacity: 140 cc (4.7 oz) after draining

Recommended Oil: SAE #80

Install and tighten the filler cap

Torque: 12 N-m (1.2 kg-m, 9 ft-lb)

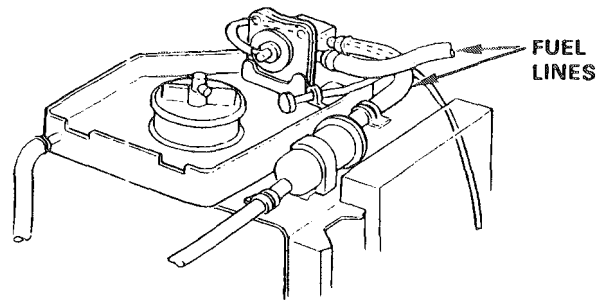


Maintenance

Fuel Line

Remove the seat and top compartment (see page 13-9).

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



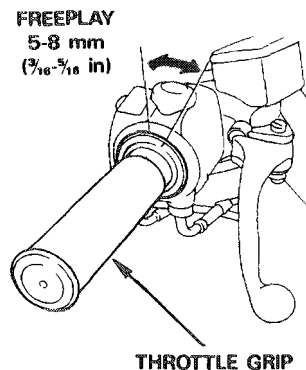
Throttle Operation

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

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

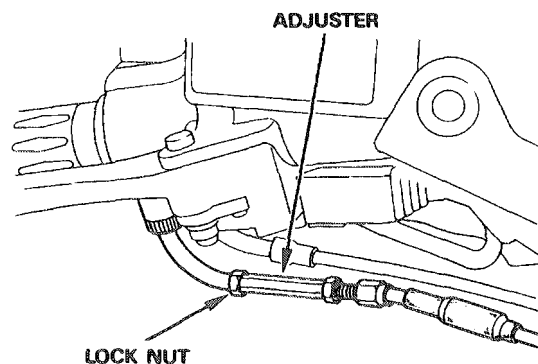
If throttle operation is not smooth, check the inner cable condition. Replace any frayed or kinked cables.

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



Make 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.

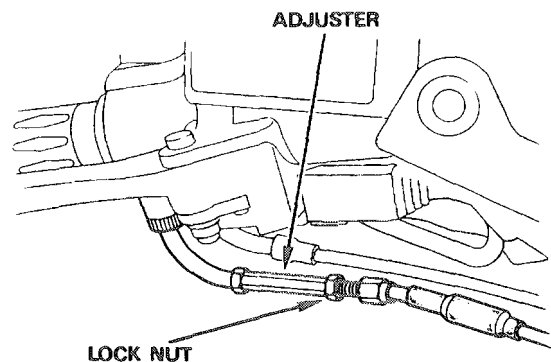




Make major throttle grip free play adjustments with the cable adjuster as shown.

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

Recheck throttle operation and install all removed parts.



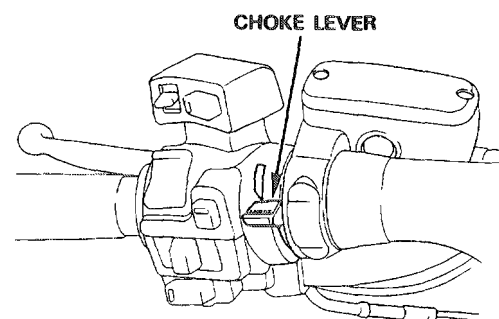
Carburetor Starting Enrichment Valve

The GL1500 choke system uses a fuel enriching circuit controlled by a starting enrichment valve.

The starting enrichment valve opens the enriching circuit via a cable when the choke lever on the handlebar is pulled down.

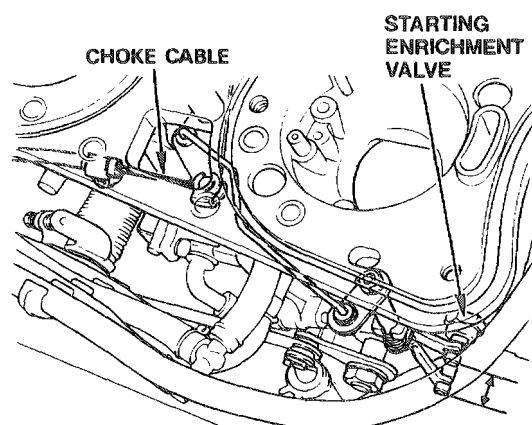
Check for smooth choke lever operation. If operation is not smooth, check the inner cable condition.

Replace the cable if it is frayed or kinked.



Remove the air cleaner housing (see page 4-18).

When operating the choke lever, check for smooth valve operation between the fully closed and fully open positions.

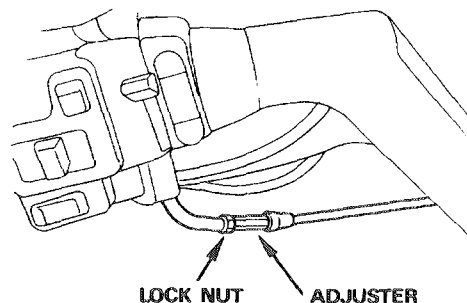


Maintenance

Carburetor Choke (cont'd)

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.



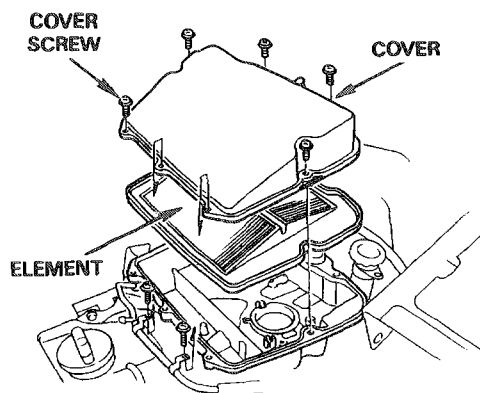
Air Cleaner

Remove the following:

- top compartment (see page 13-9)
- air duct
- air cleaner housing cover
- air cleaner element
- California only: evaporative emission storage element from the air cleaner element

NOTE

- Do not replace the evaporative emission storage element.



Discard the air cleaner element in accordance with the maintenance schedule.

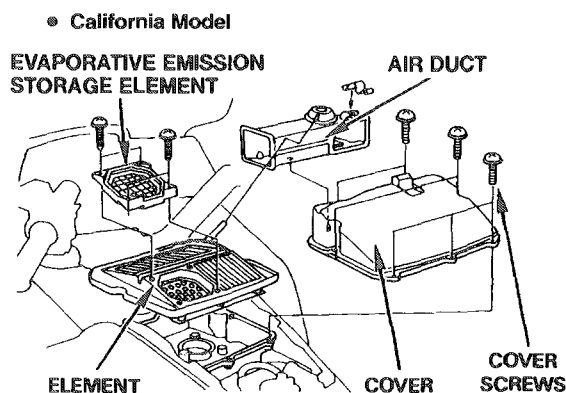
Also, replace the element any time it is excessively dirty or damaged.

Reinstall the evaporative emission storage element in the new air cleaner element.

Install the remaining parts in the reverse order of removal.

NOTE

- Install the air vent pipe with screens as shown.





Crankcase Breather

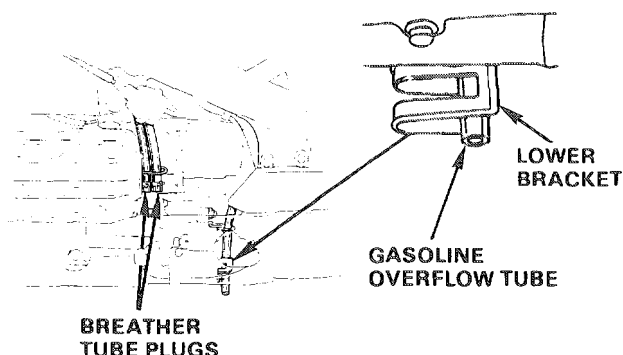
Maintenance

Remove the plugs from the crankcase breather tubes to empty any deposits.

Install the crankcase breather tube plugs.

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.

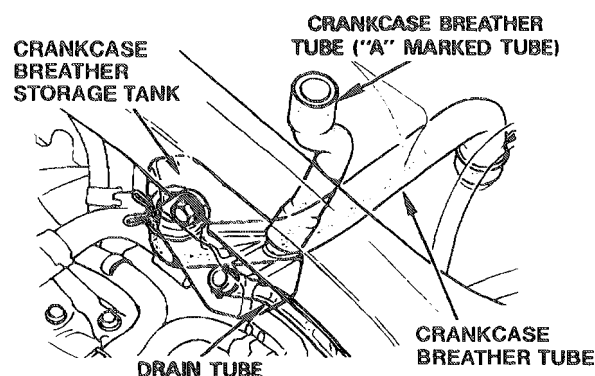


Removal (not necessary for maintenance)

Remove the carburetor (see page 4-19).

Remove the crankcase breather storage tank mounting bolt and crankcase breather storage tank.

Empty any deposits from the storage tank and reinstall it.



Spark Plugs

Remove the fairing lower covers (see page 13-12).

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

Remove and discard the spark plugs.

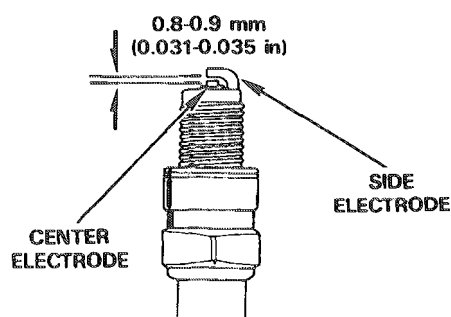
Measure the new spark plug gap with a wire-type feeler gauge

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.



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

Maintenance

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 (see page 13-12).
- right fairing inner cover (see page 13-12).
- No. 6 (GRN) vacuum tube from the left intake manifold vacuum tube joint.
- plug and washer from the right intake manifold.

Install the vacuum gauge attachment into the right intake manifold.

Install the vacuum gauge probes to the intake manifold joints.

Tool:

Carburetor vacuum gauge set

07LMJ-001010A or M937B-021-XXXXX

Vacuum probe 2"

07LMJ-001000A or M983X-350-XXXXX

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

Idle Speed: 800 ± 80 rpm

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

If adjustment is necessary, remove the access plug in the right fairing inner cover, and turn the adjusting screw until the vacuum gauge readings are within specification.

Remove the right cooling fan shroud grommet and insert a screwdriver into the shroud.

NOTE

- The left (base) carburetor cannot be adjusted.

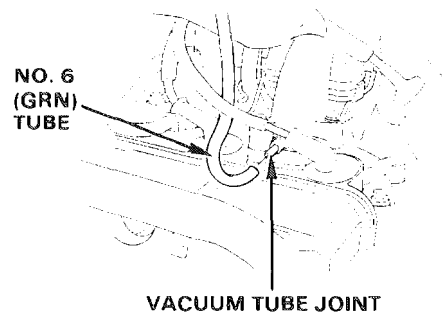
Start the engine and rev it up several times.

Recheck the synchronization and idle speed.

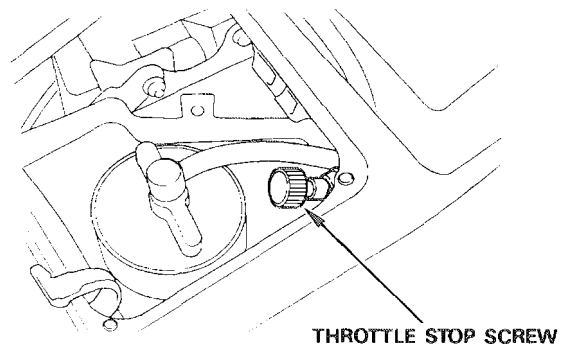
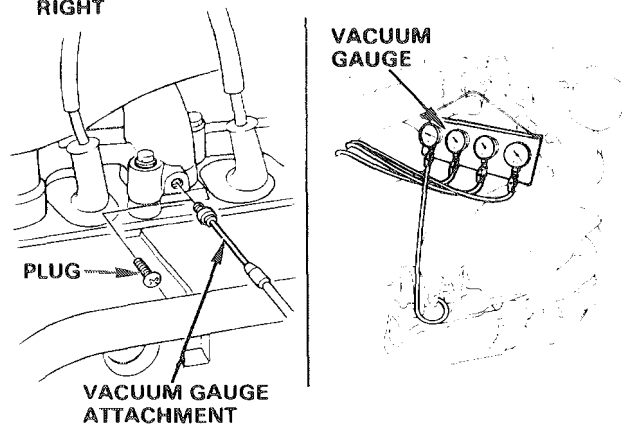
CAUTION

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

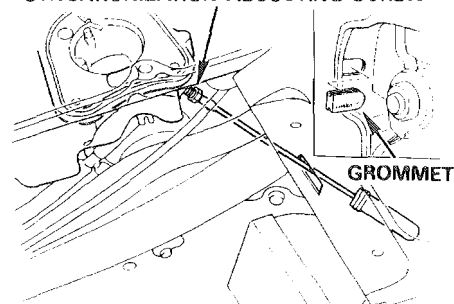
LEFT



RIGHT



SYNCHRONIZATION ADJUSTING SCREW





Carburetor Idle Speed

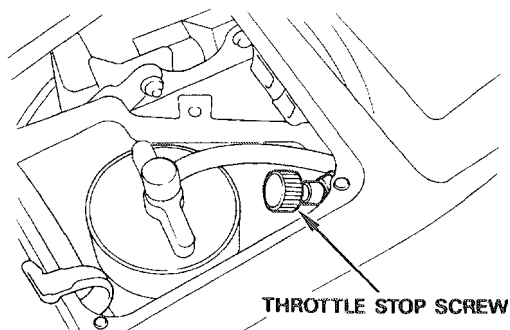
Open the top compartment cover.

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 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 rpm



Cylinder Compression

NOTE

- The engine must be warm for accurate readings.

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

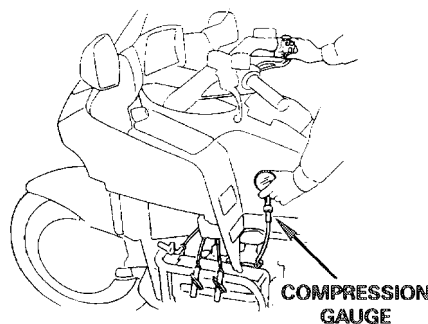
- Crank the engine until the gauge reading stops rising. The maximum reading is usually reached within 4-7 seconds.

Compression pressure: 13.0-17.0 kg/cm² (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.



Maintenance

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 (see page 13-9).

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

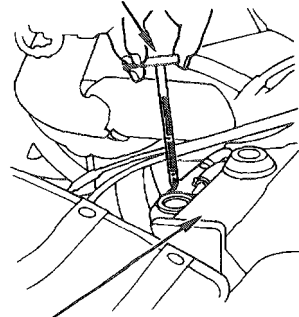
- **Avoid scalding; never remove the radiator cap when the engine is hot. The coolant is under pressure.**

If the reserve tank is empty, remove the top inner cover and radiator cap (see page 5-7).

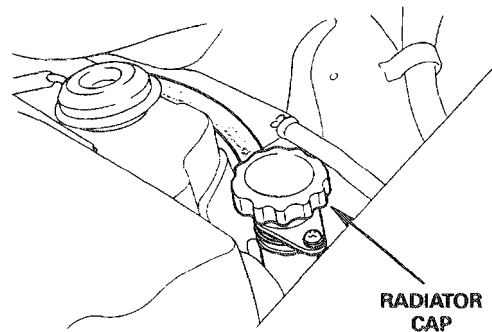
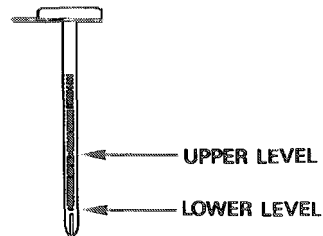
Run the engine for 2-3 minutes to allow air to escape.

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.

RESERVE TANK CAP/LEVEL GAUGE



RESERVE TANK





Cooling System

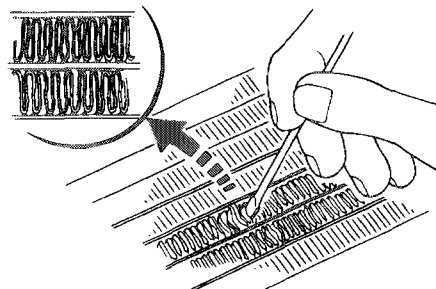
Remove the radiator shroud (see page 13-11).

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 a low pressure water spray.

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

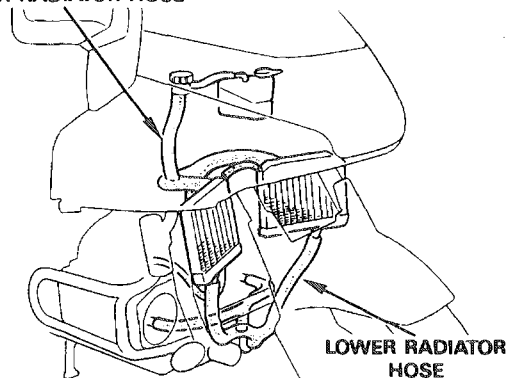


Remove the following:

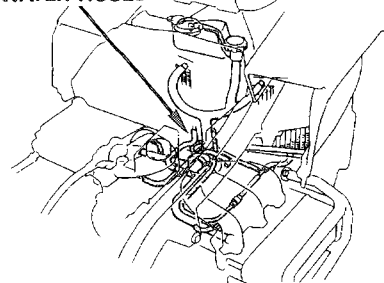
- fairing front cover (see page 13-11).
- under cover (see page 13-11).
- fairing lower cover (see page 13-12).
- right top inner cover (see page 13-9).

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

UPPER RADIATOR HOSE



WATER HOSES



Maintenance

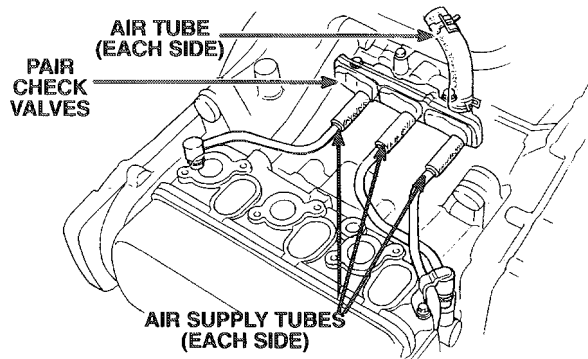
Pulse Secondary Air Injection (PAIR) System

Remove the following:

- fairing lower covers (see page 13-12)
- fairing inner covers (see page 13-12)

Move the heat guard forward.

Using an inspection mirror, check the air supply tubes between the pulse Secondary air injection (PAIR) check valves and exhaust ports for deterioration, damage, or loose connections. Make sure the tubes are not kinked or pinched.



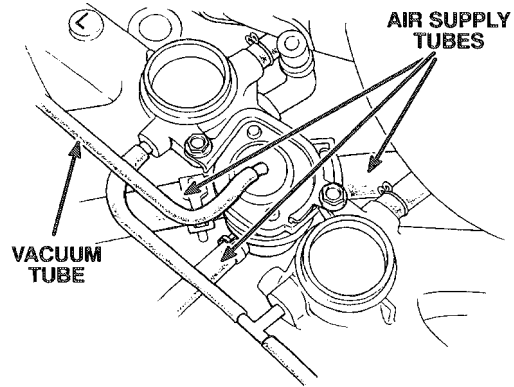
NOTE

- If the tubes show any signs of heat damage, remove the PAIR check valves and inspect for damage (see page 4-57).

Check the vacuum tube between PAIR control valve and intake manifold through PAIR solenoid valve for deterioration, damage or loose connections.

Make sure the tube is not kinked or pinched.

For PAIR solenoid valve inspection, see page 4-58.



Evaporative Emission Control System

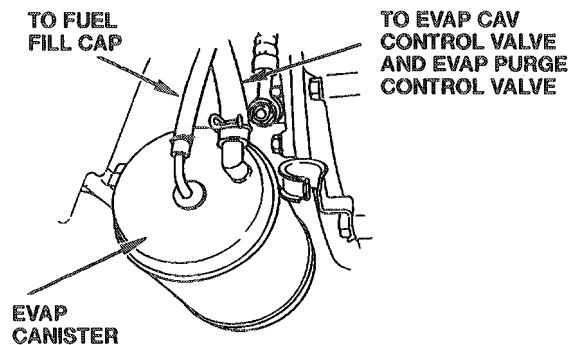
(California model only)

Check the hoses between the fuel fill cap, evaporative emission (EVAP) canister, EVAP purge control valve, EVAP carburetor air vent (CAV) control valve, and carburetor for deterioration, damage, or loose connections.

Also check the tubes for clogging due to bending or twisting.

Check the EVAP canister for cracks or damage.

Refer to the hoses and tubes routing/connection diagram (see pages 4-7 and 4-8).





Battery

Remove the right rear side cover (see page 13-8).

Inspect the battery fluid level in each cell.

⚠ WARNING

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

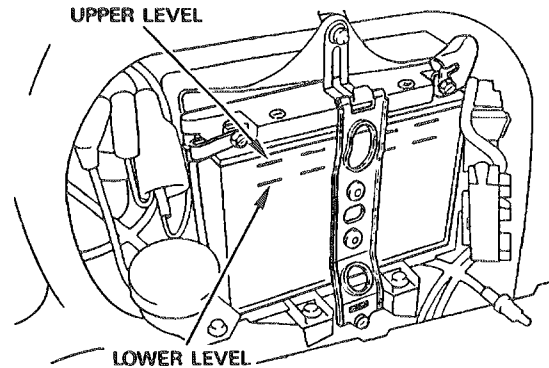
When the fluid level nears the lower level, refill with distilled water to the upper level.

NOTE

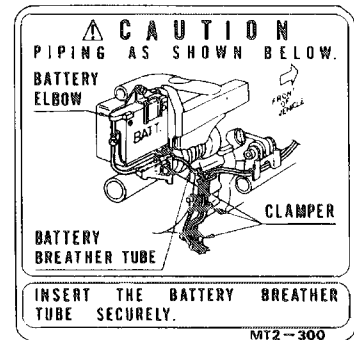
- Add only distilled water. Tap water will shorten the service life of the battery.
- Apply a thin coat of grease to the battery terminals when installing the battery

Replace the battery if sulfation forms or sediments accumulate on the bottom (see page 17-7).

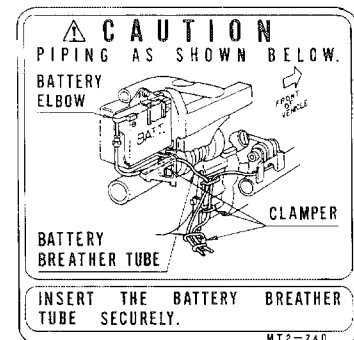
Make sure the battery breather tube is routed as shown by the illustration on the battery caution label.



49 STATE



CALIFORNIA



Maintenance

Brake Fluid

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

Remove the rear right side cover (see page 13-8). 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 and diaphragm.

Fill the reservoir with DOT 4 brake fluid to the upper level mark.

NOTE

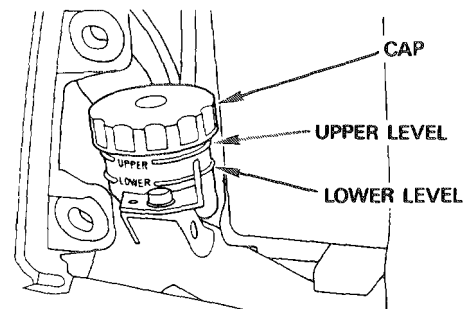
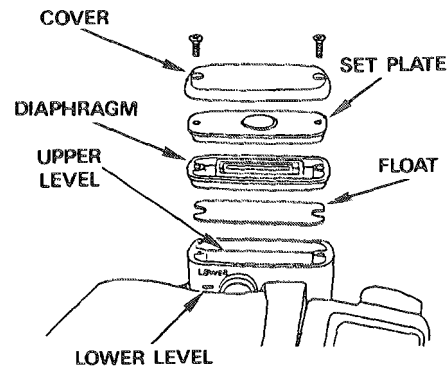
- The front reservoir upper level mark is inside the reservoir.

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 14 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 14-7 for brake pad replacement.

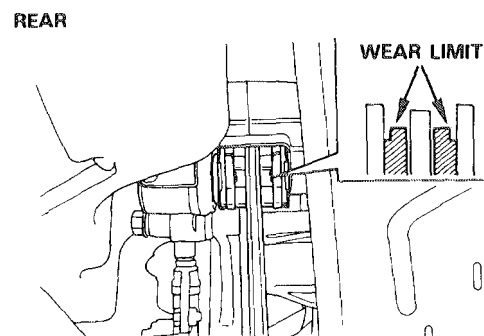
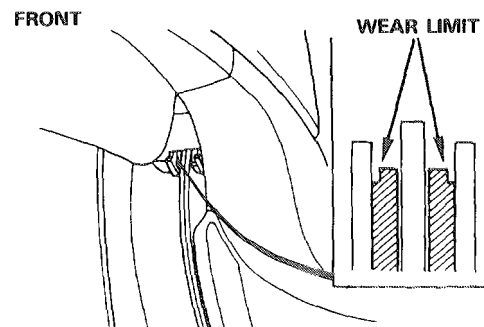
Rear Brake Pad Inspection

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

General Inspection

Remove the following:

- disc covers (see page 13-18).
- fairing lower covers (see page 13-12).
- front side covers (see page 13-8).
- rear side covers (see page 13-8).
- fairing inner covers (see page 13-12).

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

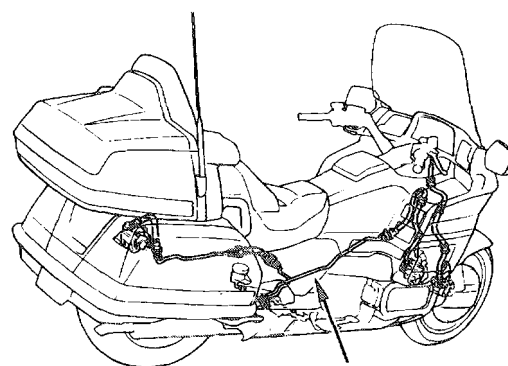
Replace hoses, metal lines and fittings as required.

Brake Pedal Height: 0-10 mm (0-0.4 in)

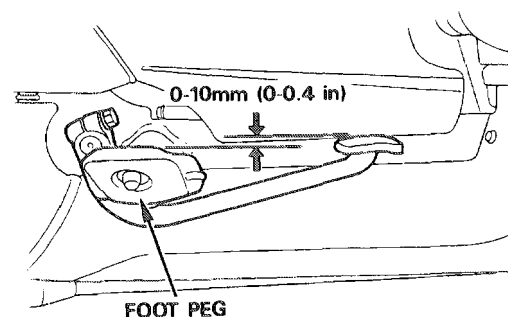
Adjust brake pedal height so the pedal is 0-10 mm (0-0.4 in) above the upper surface of the foot peg.

CAUTION

- Incorrect brake pedal height can cause brake drag.



BRAKE HOSES/METAL LINES



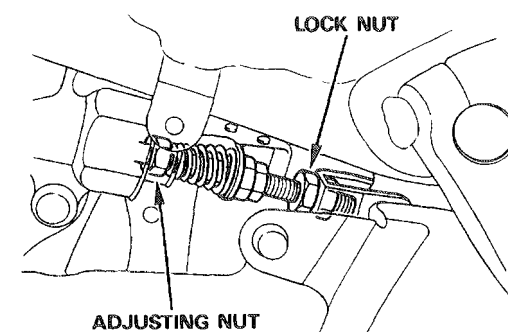
FOOT PEG

To adjust height, remove the right chamber protector (see page 7-28).

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 (see next page).
 - cruise cancel switch (rear brake) (see page 4-72).



ADJUSTING NUT

Maintenance

Brake Light Switch

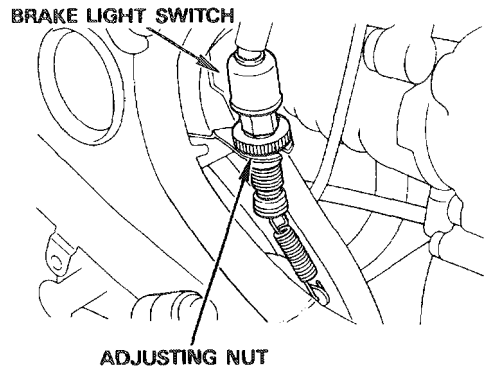
Remove the right front side cover (see page 13-8).

NOTE

- The front brake light 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.

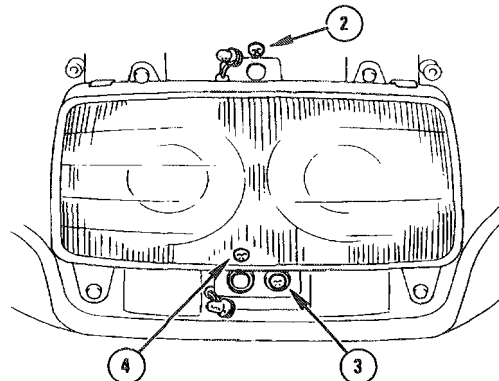
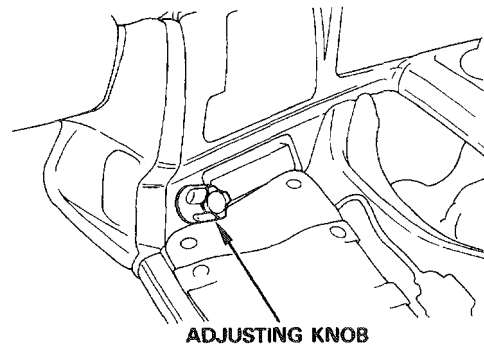
⚠ WARNING

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

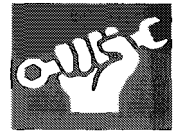
Adjust the headlight beam vertically or horizontally with the adjusting knob or screws as shown in the chart.

NOTE

- When making a minor vertical adjustment, remove the trim holder; when making any horizontal adjustment, remove the front grille.



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



Clutch System

Remove the following (refer to Section 13):

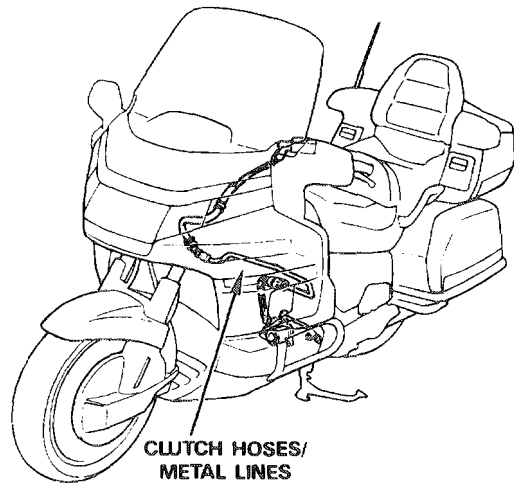
- left rear side cover
- left front side cover
- left fairing inner cover

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

Tighten any loose fittings.

Replace hoses, metal lines, and fittings as required.

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.

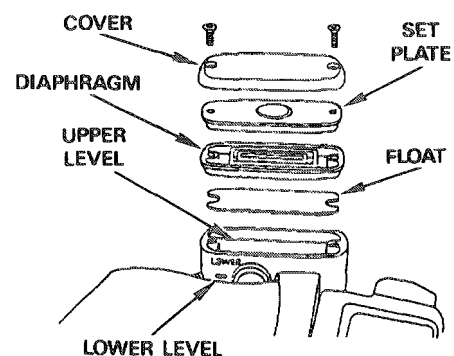
Check the clutch fluid level.

If the level nears the lower eye mark, remove the cover, set plate, and diaphragm.

Fill the reservoir with DOT 4 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.



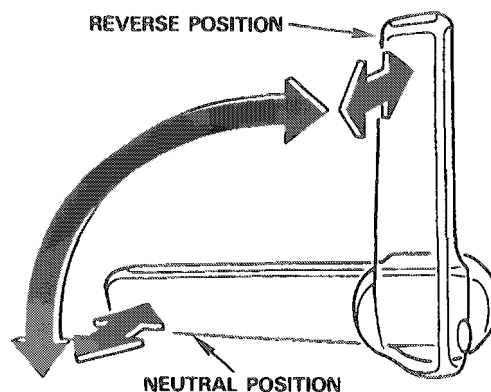
Refer to Section 9 for system bleeding procedures.

Maintenance

Reverse Operation (A & SE only)

Place the motorcycle on its center stand.

Check that the ignition switch is OFF. Remove the right front side cover (see page 13-8). Check for smooth operation of the reverse cables. Lubricate the reverse cables, if necessary.



Reverse Engagement Inspection

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

Shift the reverse lever into the reverse position. 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 index mark A aligns with the reference mark. Measure the index mark B free play.

Standard: 2-3 mm (1/16-1/8 in)

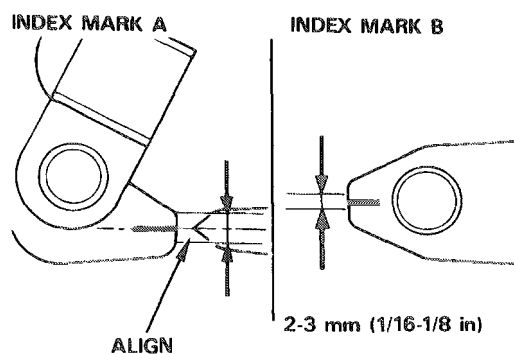
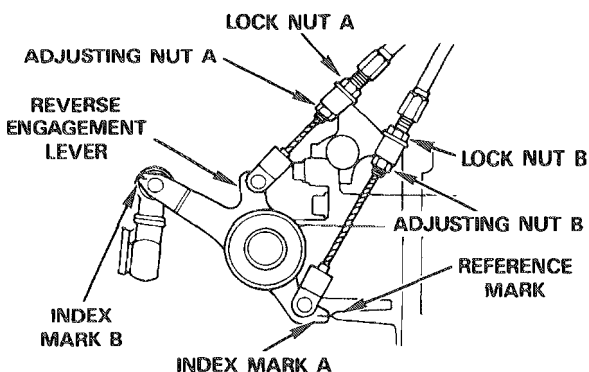
If adjustment is necessary, first adjust the index mark A position, then adjust the index mark B free play, as follows:

Loosen lock nut A and turn adjusting nut A so that index mark A aligns with the reference mark. Then tighten lock nut A.

Next, loosen lock nut B and turn adjusting nut B so the index mark B free play is 2-3 mm (1/16-1/8 in). Then tighten lock nut B.

After adjusting the reverse cables, move the reverse lever and shift into reverse. Repeat shifting into reverse several times.

Recheck the lever alignment and free play.





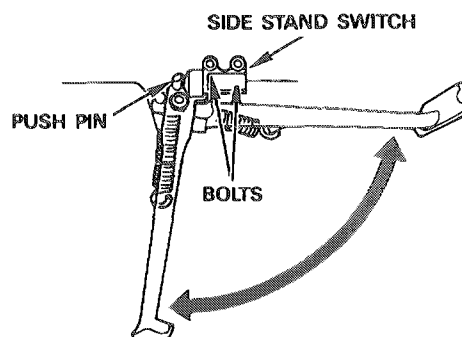
Side Stand

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.
- Lower the side stand.
- The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (see Section 16).

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.

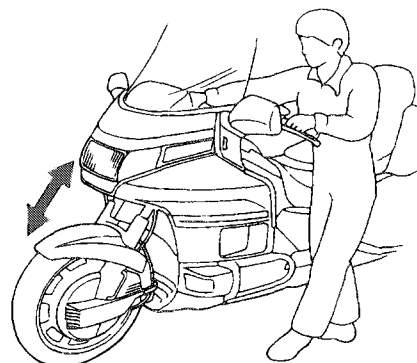
Rear

Place the motorcycle on its 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 (see page 12-26).

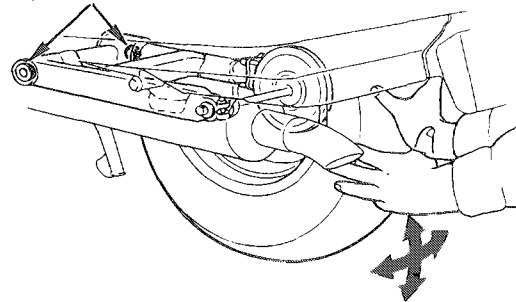
Check the swing arm for damage.

Check the shock absorbers for leaks or damage. A & SE: Inspect the air hoses for deterioration and cracks. Replace parts as required.

Tighten all nuts and bolts.



SWING ARM BEARINGS



Maintenance

Suspension (cont'd)

GL1500 A & SE: 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 appear 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 conditions is: 0-57 psi (0-4.0 kg/cm²).

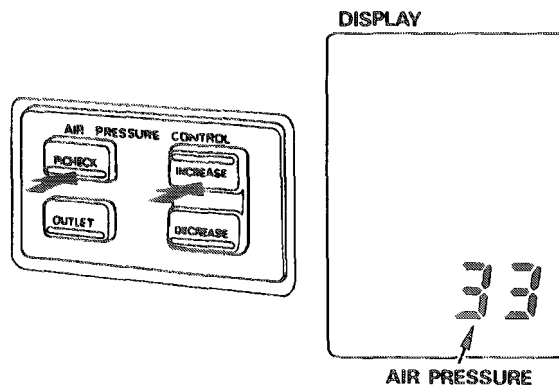
GL1500 I: Place the motorcycle on its center stand on firm level ground.

Open the right saddlebag. Remove the air valve cap.

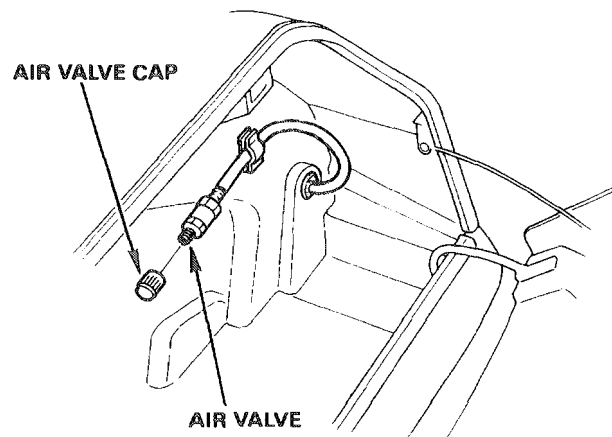
Check the air pressure using a pressure gauge.

NOTE

- Some pressure will be lost when removing the gauge from the valve. Determine the amount of loss and compensate accordingly.
- Do not exceed the recommended air pressure or the ride will be harsh and uncomfortable.
- A small amount of the suspension oil may be released when the air valve is opened to reduce pressure. To prevent getting any oil on the saddlebag, remove the valve from the holder and point it away from the saddlebag before reducing pressure.



Rear Air Pressure	Conditions	
	Rider/Load	Riding Conditions
0 psi (0 kg/cm ²)	One/ No Load	Ordinary or city road riding
57 psi (4.0 kg/cm ²)	Up to maximum weight limit	Rough road riding



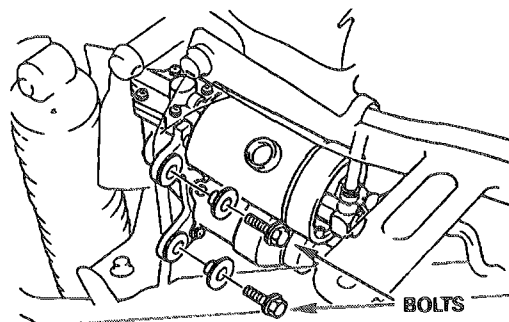
Rear Air Pressure	Conditions	
	Rider/Load	Riding Conditions
0 psi (0 kg/cm ²)	One/ No Load	Ordinary or city road riding
57 psi (4.0 kg/cm ²)	Up to maximum weight limit	Rough road riding



Air Pump Element (A & SE only)

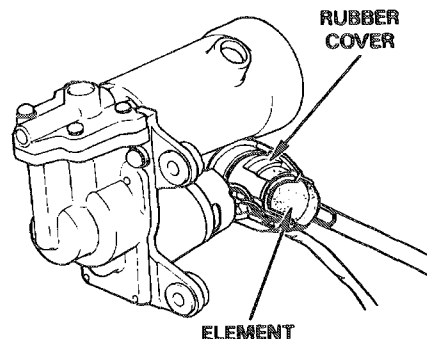
Remove the left saddlebag (see page 13-17).

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.



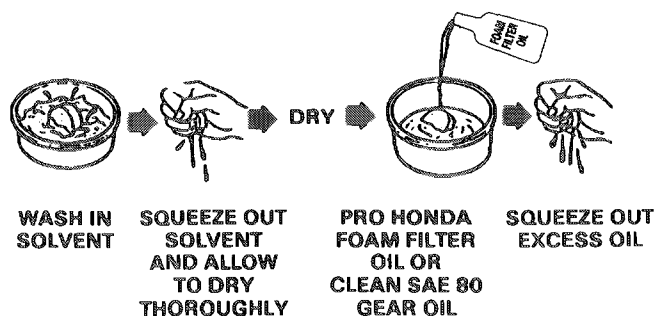
Wash the element in clean, non-flammable cleaning solvent and allow it to dry thoroughly.

⚠ WARNING

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

Soak the element in Pro Honda Foam Filter Oil or equivalent and squeeze out the excess.

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



Maintenance

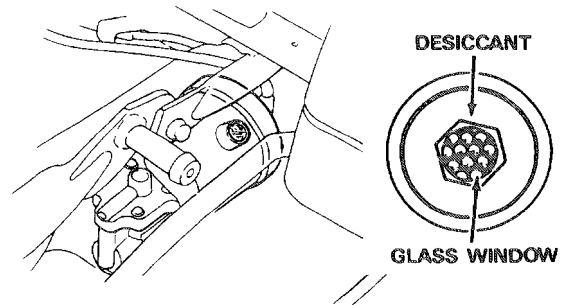
Air Drier (A & SE only)

Inspection

Remove the seat (see page 13-8).

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

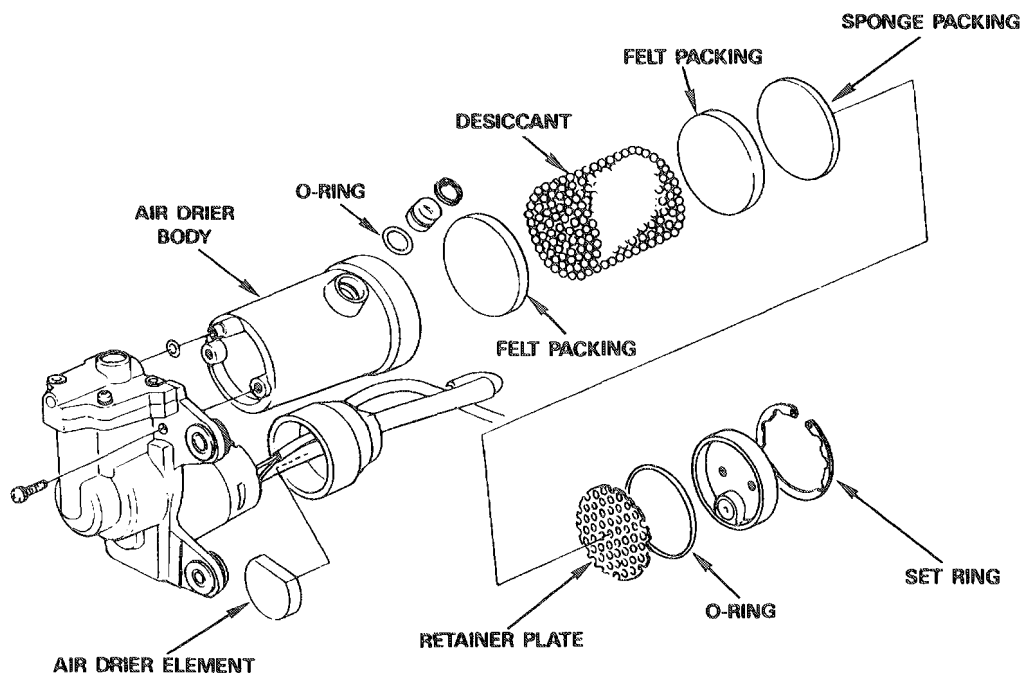
NOTE

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

Remove the air pump from the frame and disconnect the air hoses from the drier (see page 12-31).

Remove the set ring from the air drier cover.

Discard the desiccant. Clean the inside of the drier body with clean and dry cloth. Pack new desiccant. Install in the reverse order of removal.





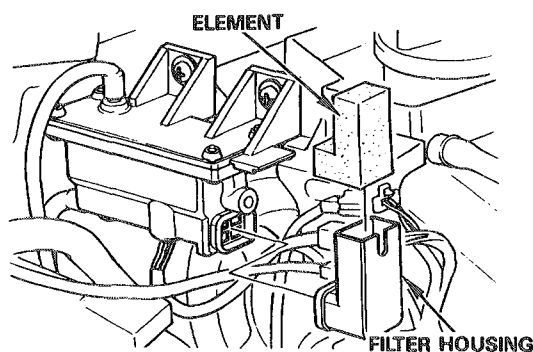
Cruise Valve Element (A & SE only)

Remove the left fairing inner cover (see page 13-12).

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.



Nuts, Bolts, Fasteners

Check that all chassis nuts and bolts are tightened to correct torque values (see page 2-8).

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

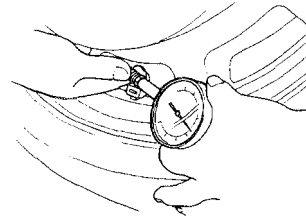
Maintenance

Wheels/Tires

NOTE

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

Check the tires for cuts, imbedded nails, or other sharp objects. 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 kg/cm ² (psi)	Up to maximum weight limit	2.25 (33)	2.80 (41)
	Up to 90 kg (200 lbs) load	2.25 (33)	2.50 (36)
	Maximum weight limit	185 kg (408 lbs)	
Tire Brand Tubeless Only Dunlop		K177F	K177

Check the front and rear wheels for rim runout (see Section 15).

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

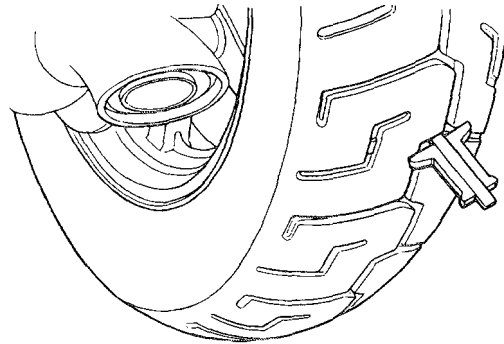
Minimum Tread Depth:

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 Bearings

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

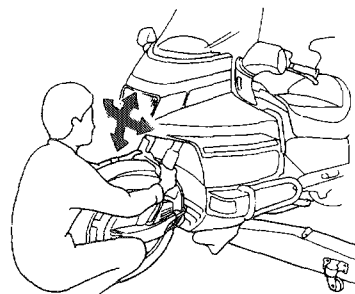
Check that the front wheel turns freely and smoothly from full left to full right.

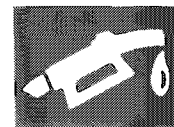
NOTE

- 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 (see Section 12).





Fuel System

Service Information	4-2	Fuel Level Sensor/Gauge	4-44
Troubleshooting	4-9	Air System Circuit	
Fuel Tank	4-15	Diagram	4-45
Auto Fuel Valve	4-16	Engine Control Module ..	4-46
Fuel Filter	4-17	Intake Air Shot Air	
Air Cleaner Housing	4-18	(IASA) System	4-47
Carburetor Removal	4-19	Carburetor Air Jet	
Carburetor Separation ...	4-21	Control System	4-50
Carburetor Disassembly .	4-23	Intake Air Temperature	
Carburetor Assembly	4-26	(IAT) System	4-53
Carburetor Tubes/Hoses .	4-34	Secondary Air	
Carburetor Installation ...	4-36	Injection System	4-55
Intake Manifold	4-37	Evaporative Emission	
Pilot Screw Adjustment ..	4-39	(EVAP) Control System	
Fuel Pump	4-40	(California model only)	4-59
Fuel Reserve Sensors/		Cruise Control	4-61
Indicator	4-43		

Fuel System

Service Information

General

⚠ WARNING

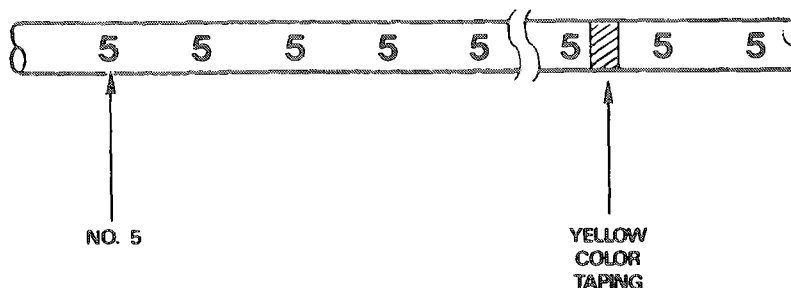
- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Do not smoke or allow flames or sparks in the work area or where gasoline is stored.
 - Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind, resulting in loss of vehicle control.
-

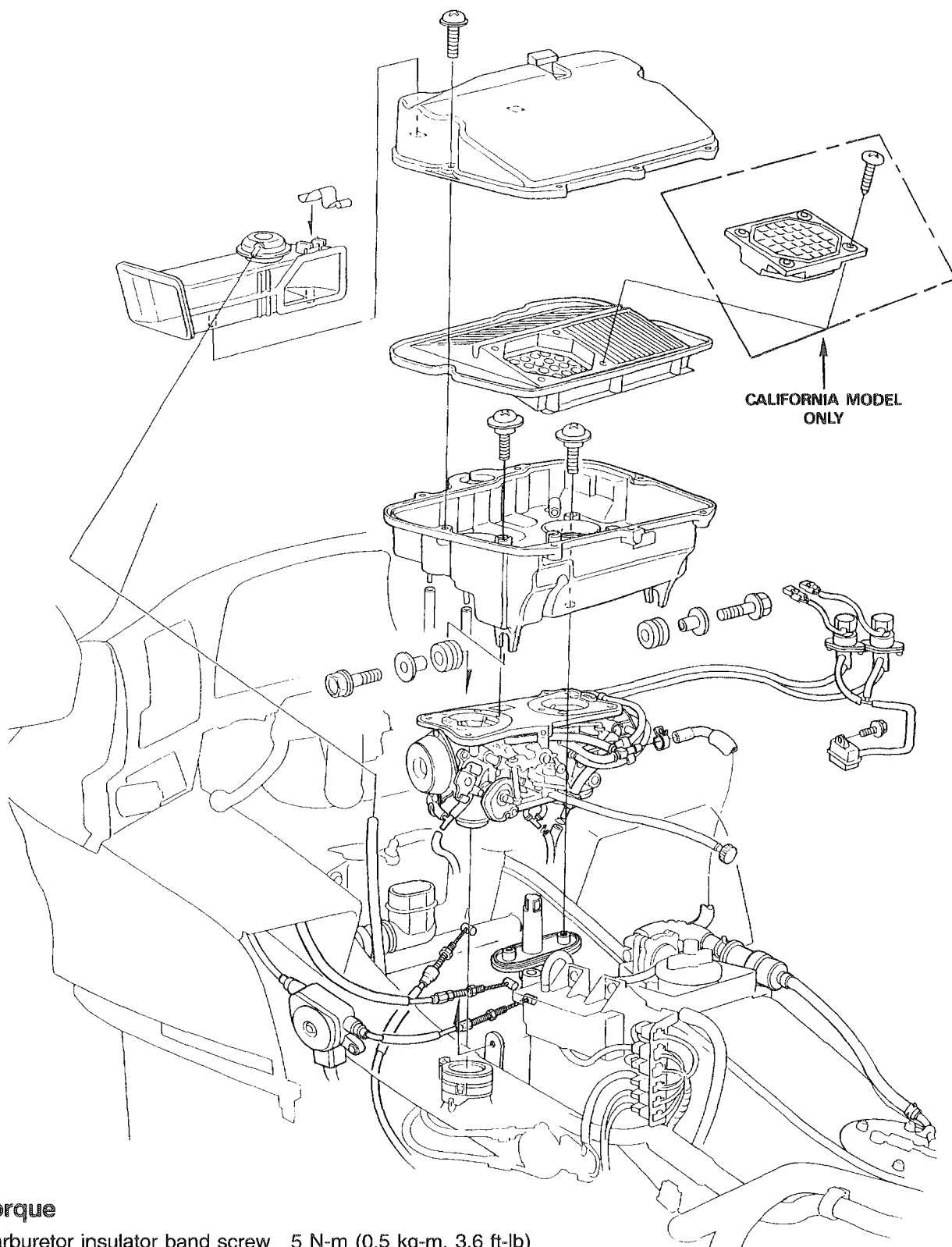
CAUTION

- Connect each numbered tube to the correspondingly numbered part of the solenoid valve, or the 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 starting and driveability complaints. To drain the chambers, remove the radiator shroud (page 13-11) to gain access to the drain plugs, and then insert the screwdriver and loosen the drain plugs.
- Refer to Section 3 for throttle/choke cable adjustment.
- The vacuum chambers, accelerator pump and starting enrichment valve can be removed without removing the carburetor assembly.
- The float chambers must be serviced with the carburetors disassembled.
- When inspecting the fuel pump, reserve sensor, level sensor and air system, check the system components and lines step-by-step according to the Troubleshooting chart.
- To replace the fuel gauge, see Section 19.
- The following air systems have the following components (not including air tubes and hoses):
 - Intake Air Shot Air (IASA) System
 - Carburetor Air Jet Control System
 - Intake Air Temperature (IAT) System
 - IASA Valve, IASA Check Valve
 - Carburetor Air Jet Solenoid Valves, Intake Air Temperature Sensor, Engine Coolant Temperature Sensor, Engine Control Module, Ignition Pulse Generator, Sub Air Cleaner
 - IAT Vacuum Actuator, IAT Control Valve, IAT Check Valve.
- All hoses used in the evaporation emission control system (California Model only) and pulse secondary air injection system are numbered for identification. When connecting one of these hoses, compare the hose number with the vacuum carburetor tubes/hoses, page 4-34.
- Always replace used O-rings and cotter pins with new ones.
- For carburetor synchronization, see page 3-20.
- The Intake Air Shot Air (IASA) System supplies air to the intake manifolds during deceleration to prevent sudden induction of strong manifold vacuum.
- Tube code example:





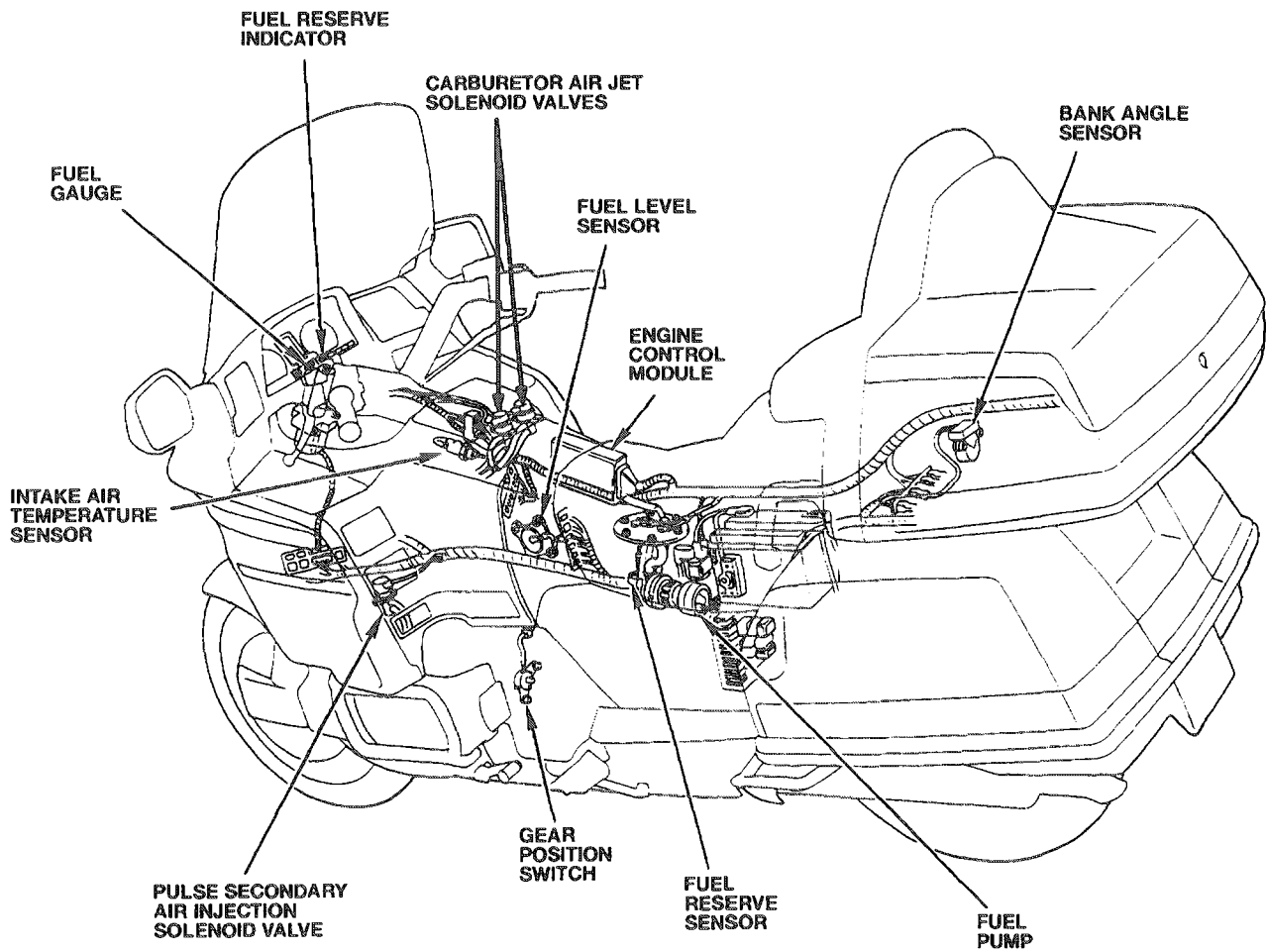
Torque

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

Fuel System

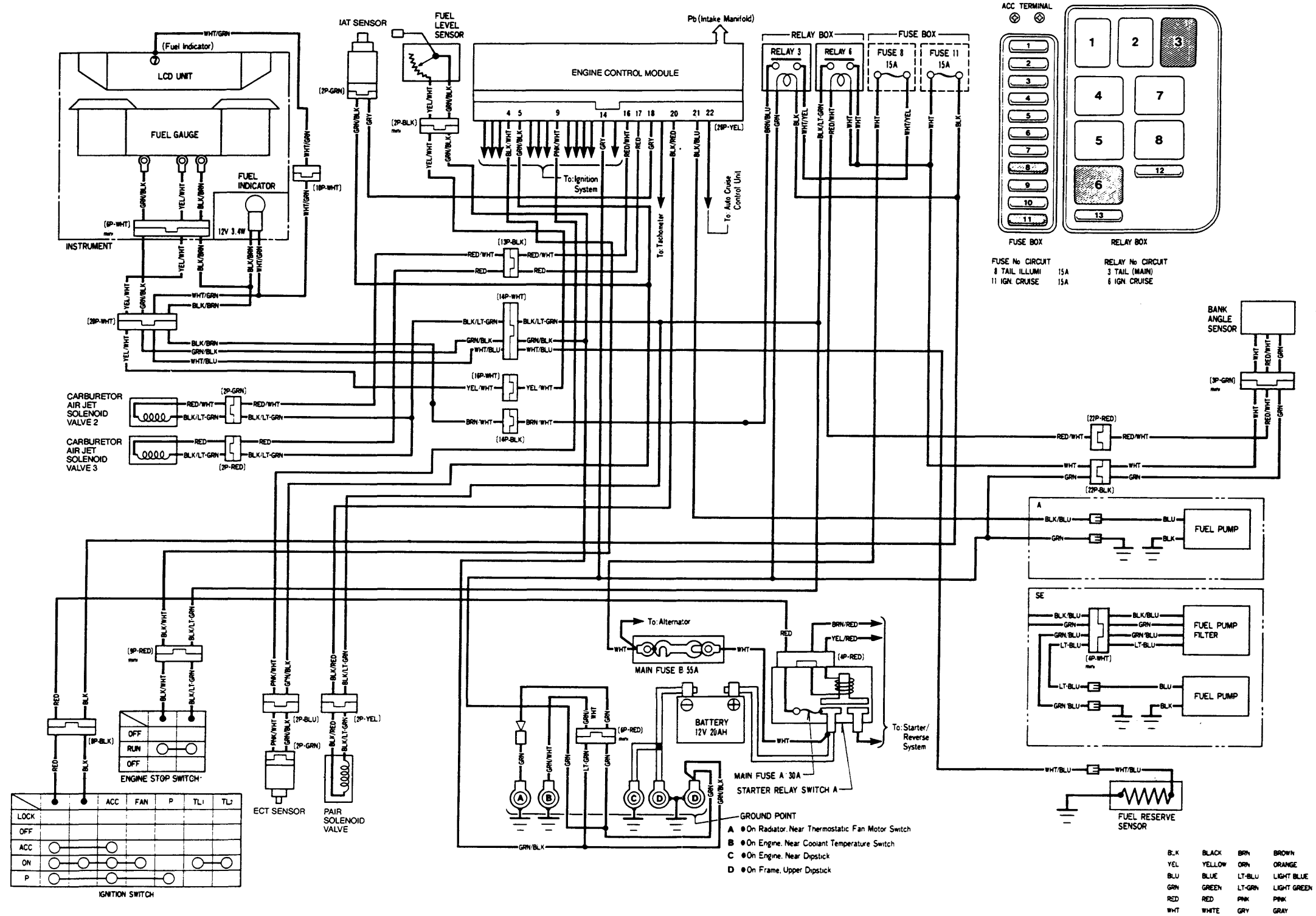
Service Information (cont'd)

System Location





Circuit Diagram: A & SE Models

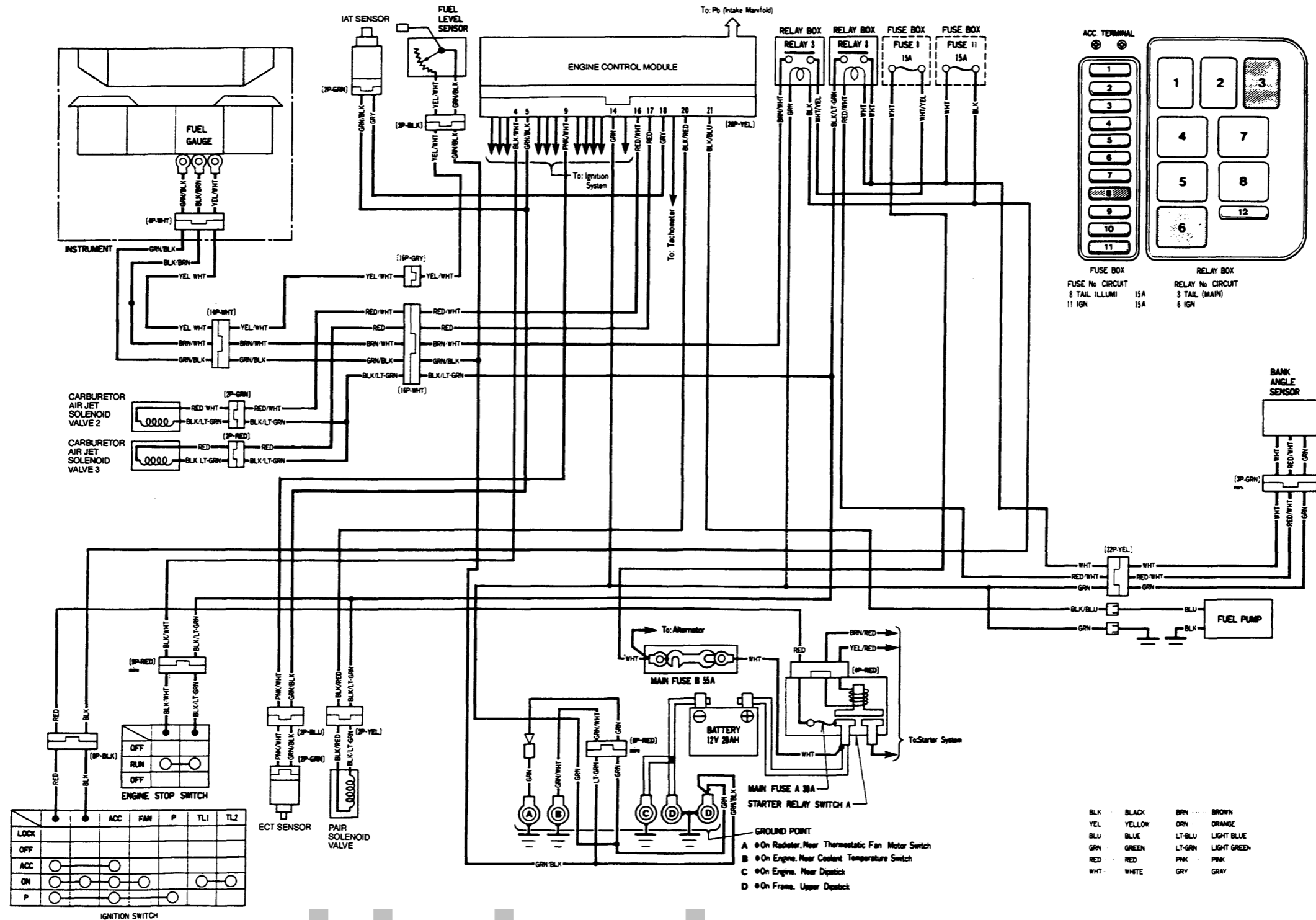


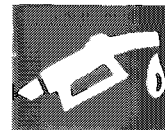
Fuel System

Service Information (cont'd)



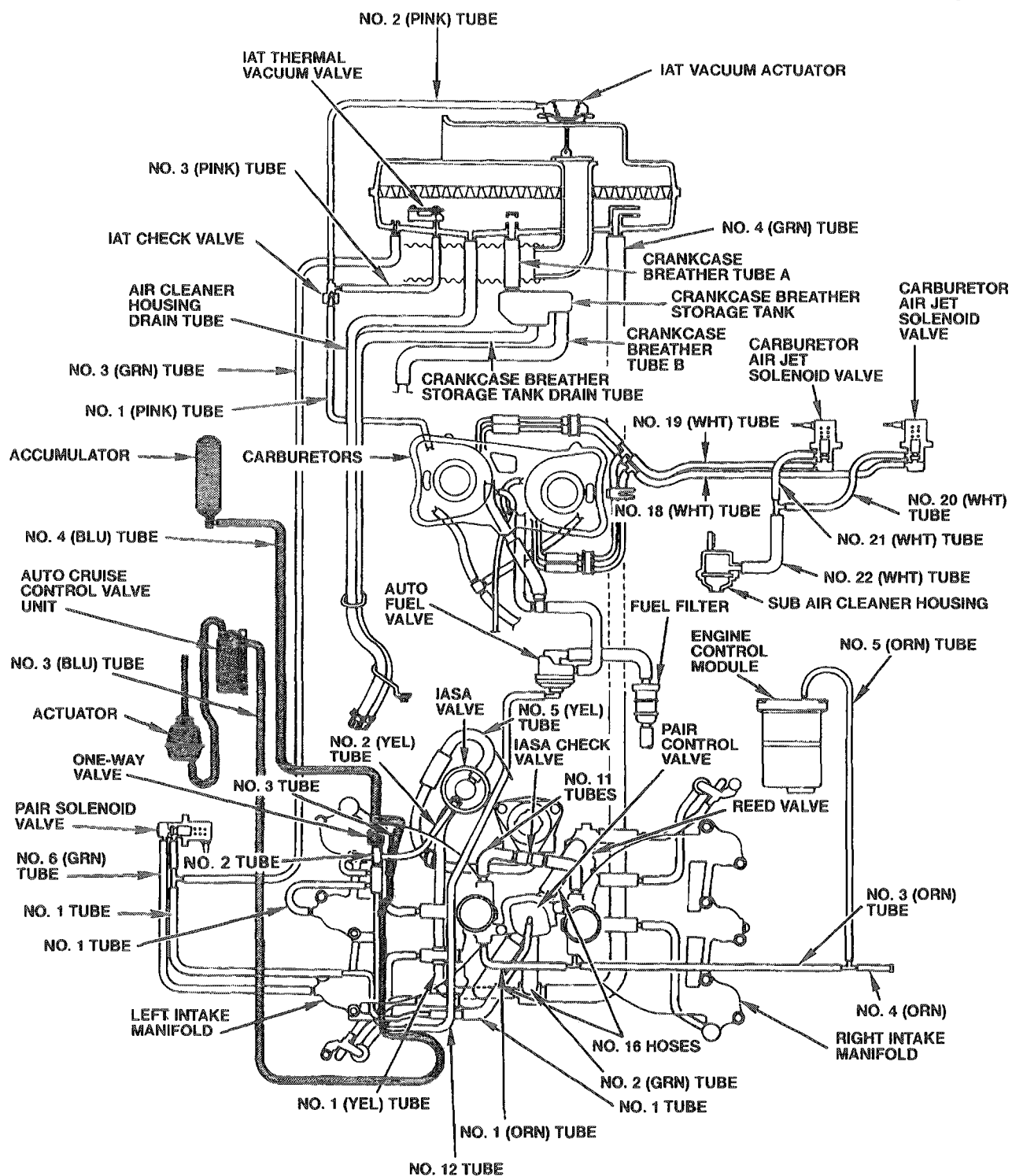
Circuit Diagram: I Model





Hoses and Tubes Routing/Connection

□ : A & SE Only



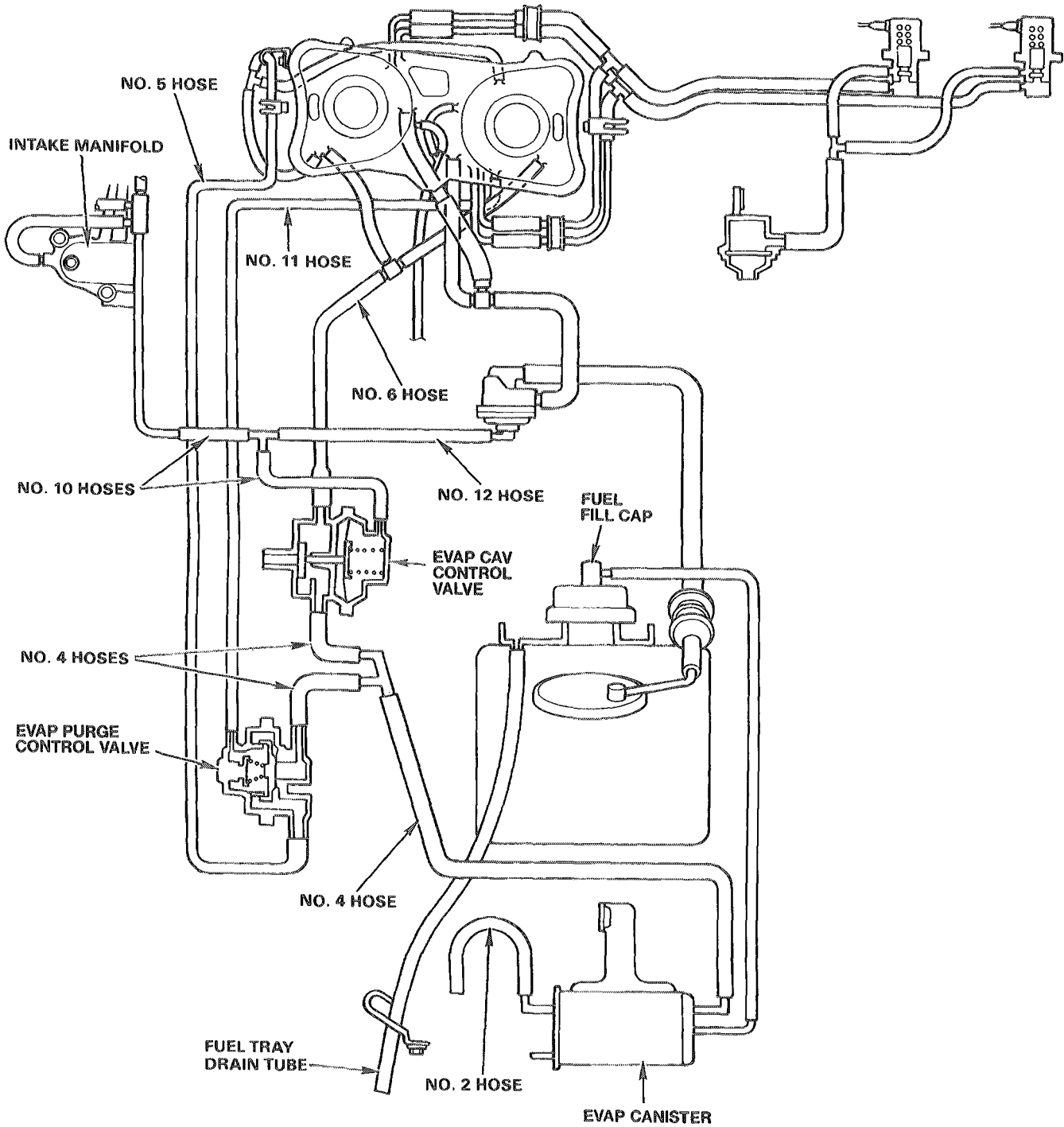
Fuel System

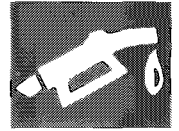
Service Information (cont'd)

Hoses and Tubes Routing/Connection

California:

(Evaporative Emission [EVAP] Control System Hose Routing)





Troubleshooting

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
- Engine flooded with fuel
- No spark at plug (ignition system faulty – see Section 16)
- Air cleaner clogged
- Intake air leak
- Improper starting enrichment valve operation
- Improper throttle operation
- Incorrect choke cable free play
- Fuel tank vent blocked

After burning during deceleration

- Ignition system faulty (see Section 16)
- Lean mixture
- Faulty pulse secondary air injection system
- Faulty hoses of the emission control system

Misfiring during acceleration

- Ignition malfunction (see Section 16)
- Lean mixture

Backfiring

- Ignition malfunction (see Section 16)
- Carburetor malfunction
- Lean mixture

Lean mixture: Insufficient fuel to cylinders

- Clogged fuel jets
- Piston stuck closed
- Faulty float valve
- Float level too low
- Fuel fill cap vent blocked
- Fuel strainer screen (fuel pump) or fuel filter clogged
- Restricted fuel line
- Intake air leak
- Restricted or faulty fuel pump
- Faulty carburetor air jet control system (see page 4-50)

Rich mixture or hesitation

- Clogged air jets
- Faulty float valve

- Float level too high
- Starting enrichment valve stuck open or damaged
- Dirty air cleaner
- Needle and seat faulty or worn
- Faulty carburetor air jet control system (see page 4-50)
- Faulty engine control module or loose or poor contact of related connector terminals (see Section 16)

Engine idles roughly, stalls, or runs poorly

- Air cleaner clogged
- Ignition malfunction (see Section 16)
- Carburetors not synchronized
- Fuel contaminated
- Intake air leak
- Idle speed incorrect
- Rich mixture
- Lean mixture
- Low cylinder compression
- Incorrect pilot screw adjustment
- Starting enrichment valve stuck open
- Faulty hoses of the evaporative emission control system
- Faulty EVAP purge control valve (California model only)
- Faulty EVAP carburetor air vent control valve (California model only)

Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Air cleaner clogged
- Ignition malfunction (see Section 16)
- Faulty carburetor air jet control system (see page 4-50)
- Faulty intake air temperature system (see page 4-53)
- Faulty EVAP carburetor air vent control valve (California model only)
- Faulty hoses of the evaporative emission control system (California model only)

Incorrect fast idle speed

- Incorrect choke cable free play
- Starting enrichment valve stuck
- Starter air line clogged
- Starting enrichment valve not synchronized

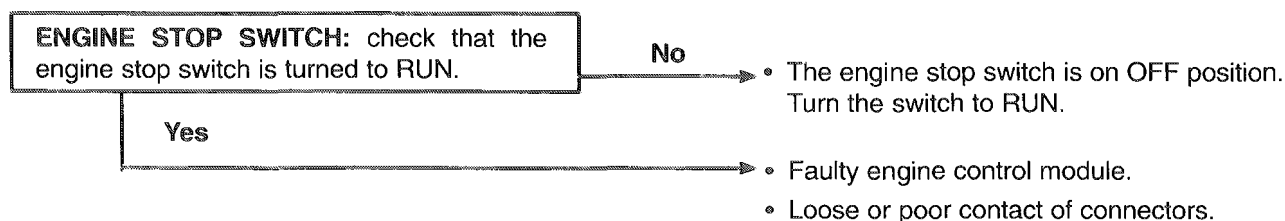
Fuel System

Troubleshooting (cont'd)

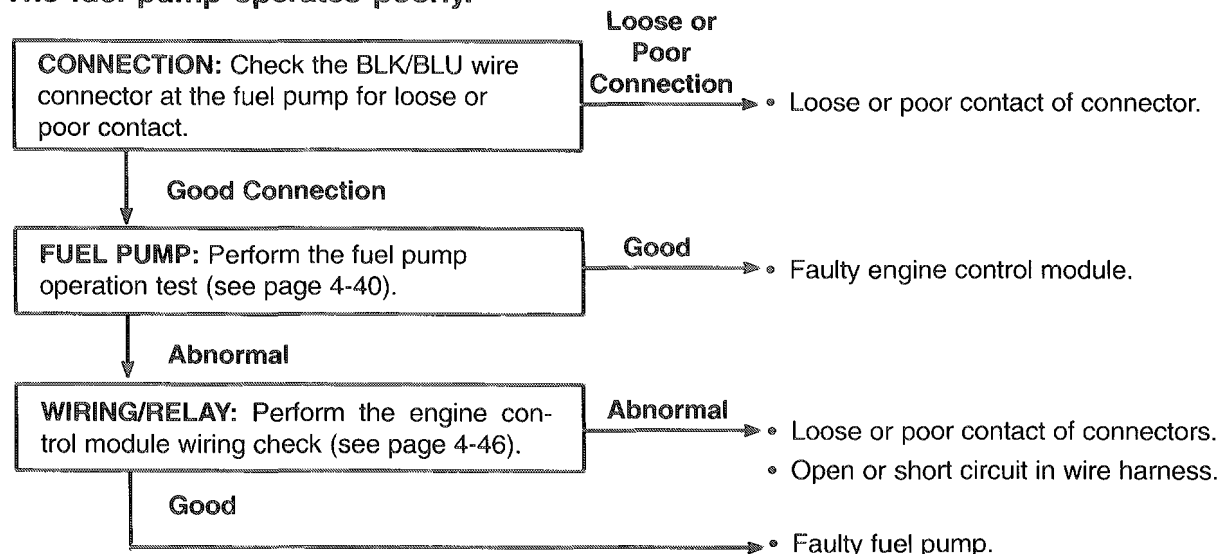
The fuel pump does not operate for a few seconds after the ignition switch has been turned ON.

NOTE

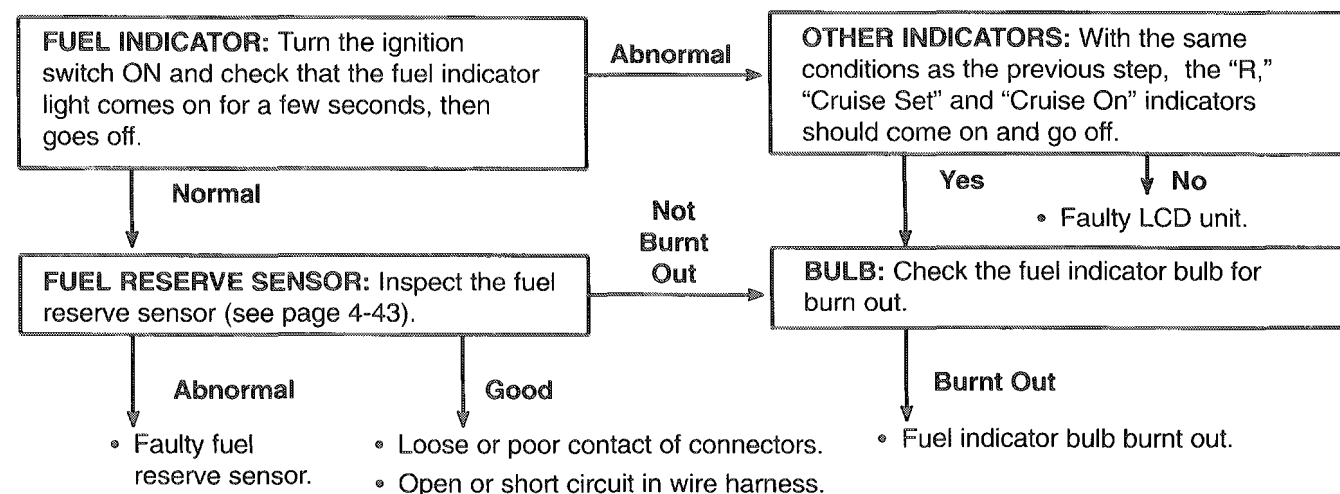
- Be sure that main fuse B and fuse 11 are good. Replace any suspect fuses.



The fuel pump operates poorly.

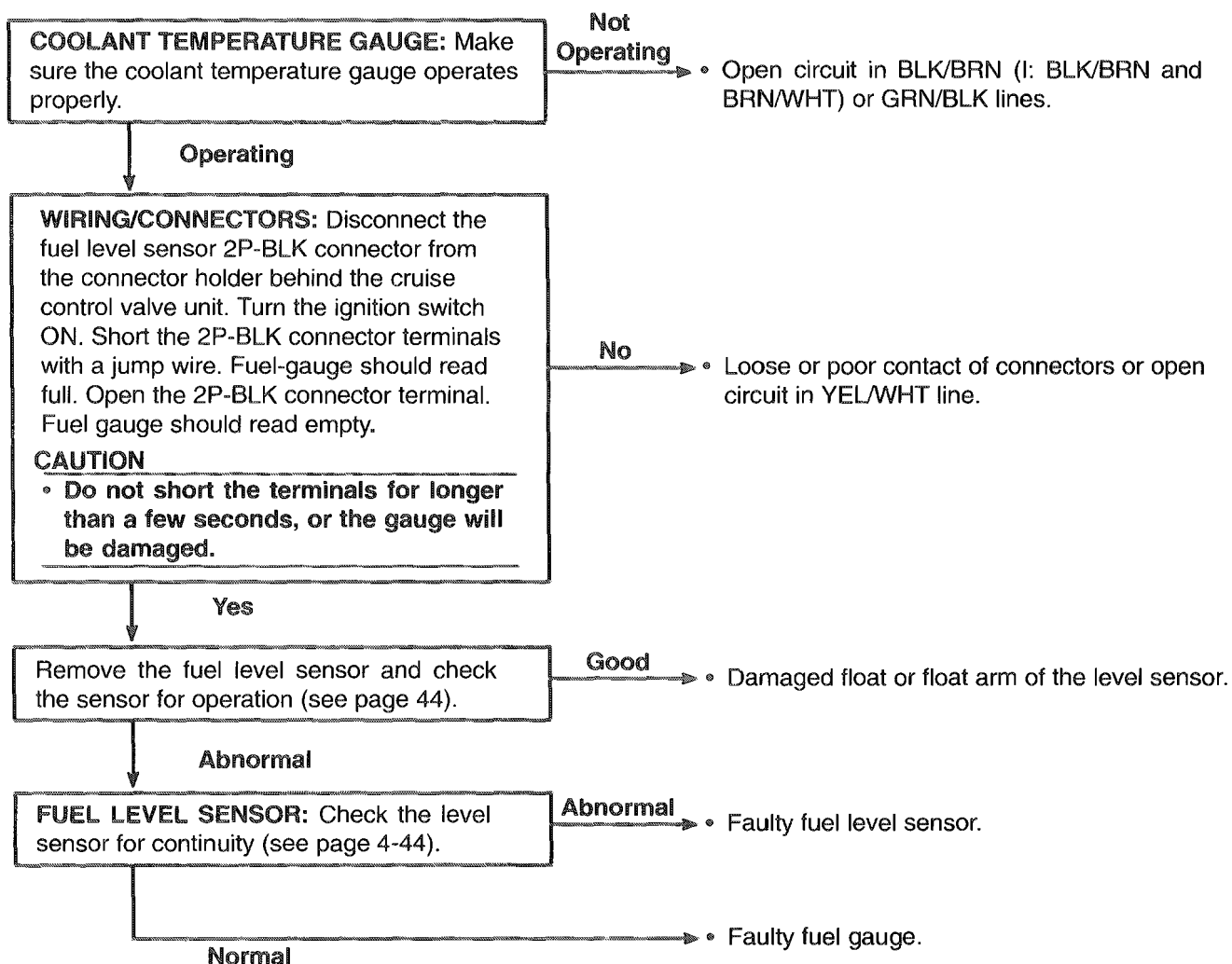


Fuel indicator light does not come on within 3 minutes after the ignition switch has been turned ON with less than 4.0 liters (1.1 gal) of fuel in the tank. (A & SE models only.)





The fuel gauge does not operate properly.



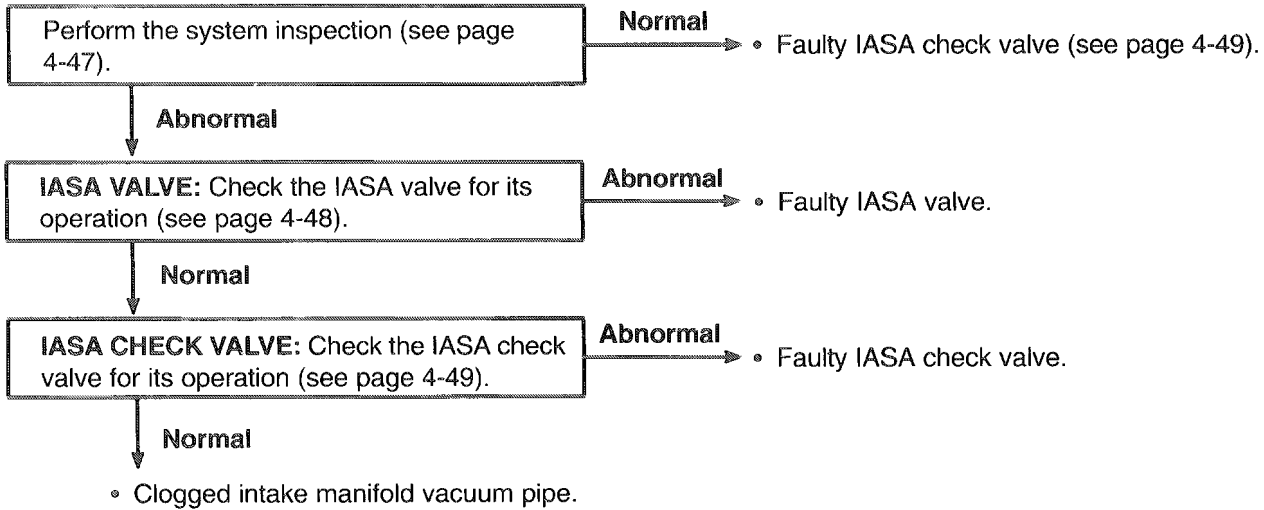
Fuel System

Troubleshooting (cont'd)

Intake Air Shot Air (IASA) 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), No. 11 (YEL).
-



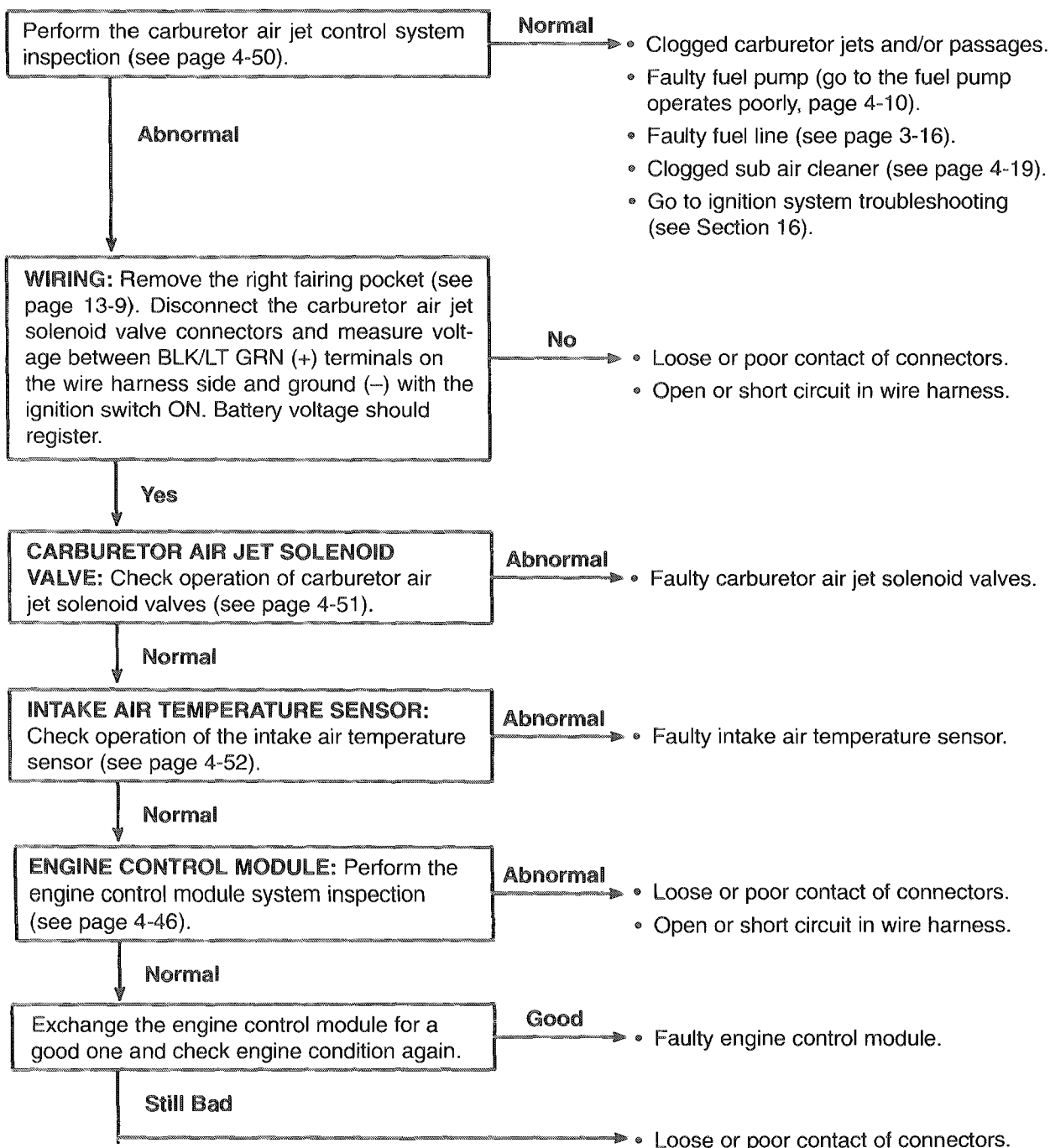


Carburetor Air Jet Control System

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), No. 5 (ORN).

Poor performance (driveability) and poor fuel economy.



Fuel System

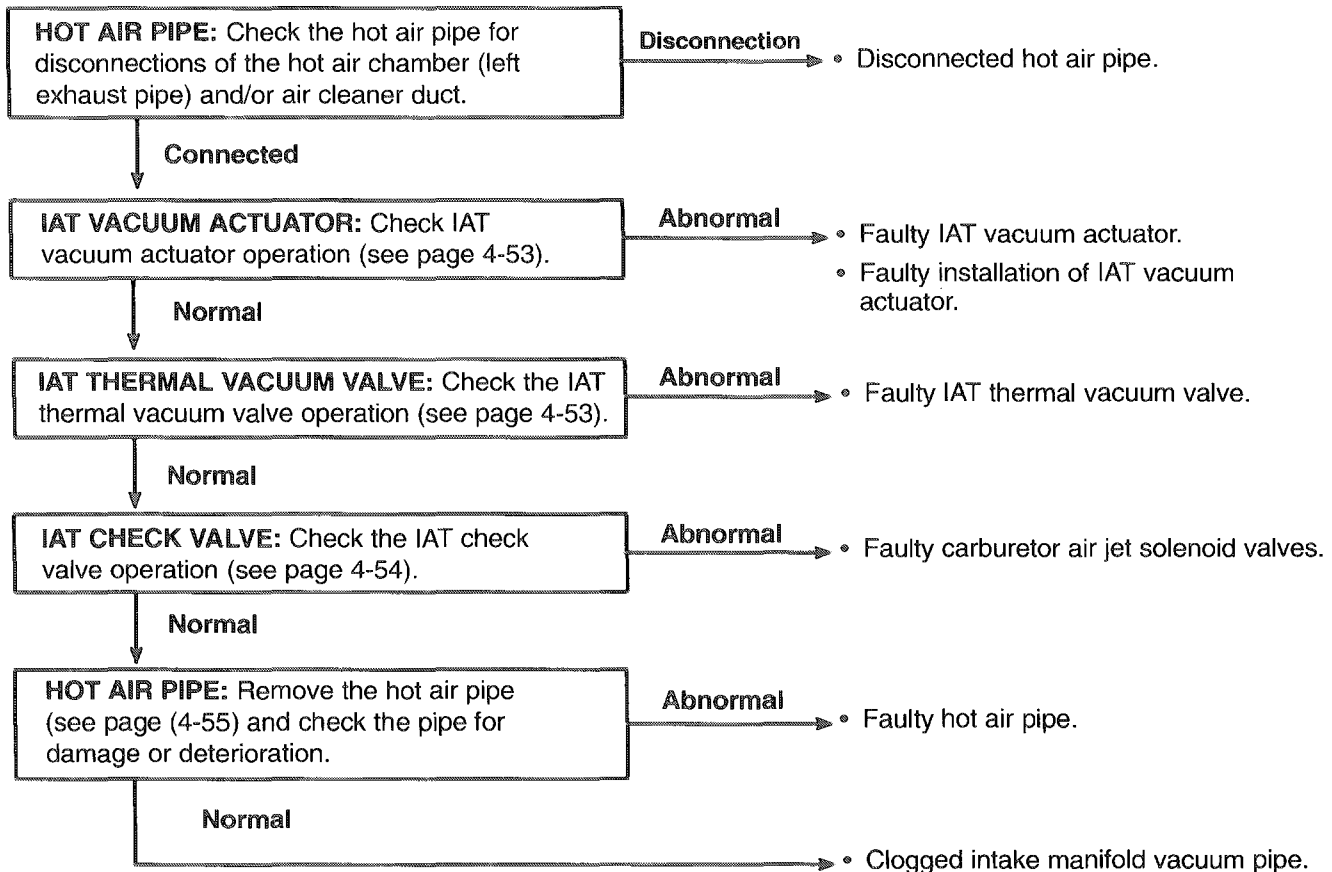
Troubleshooting (cont'd)

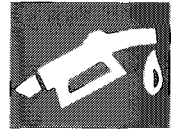
Intake Air Temperature (IAT) System and Accelerator Pump System

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).





Fuel Tank

Removal

Remove the fairing inner covers (page 13-12).

Disconnect the fuel line from the fuel pump.

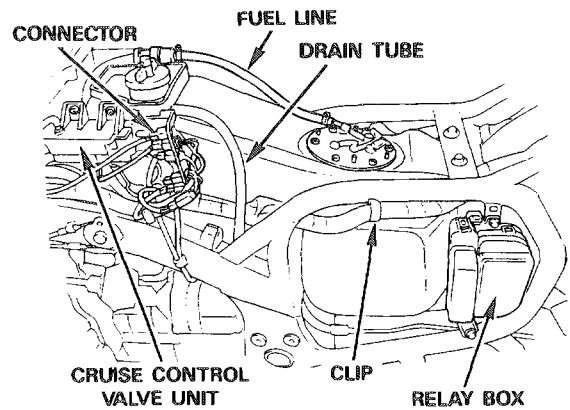
Remove the auto cruise control valve unit and connector holder from the fuel tank.

Remove the relay box from the frame.

Release the main wire harness from the clip.

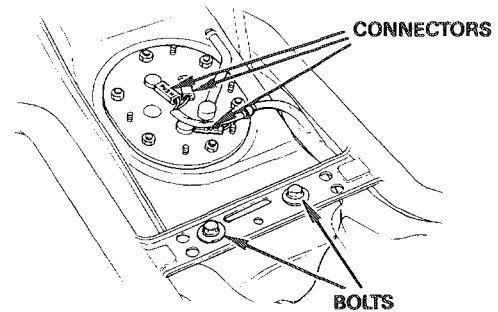
Disconnect the fuel unit 2P-BLK connector of the connector holder.

Disconnect the fuel drain tube from the fuel tray.



Disconnect the fuel pump and reserve sensor (A & SE) connectors from the fuel pump.

Remove the fuel tank mounting bolts.

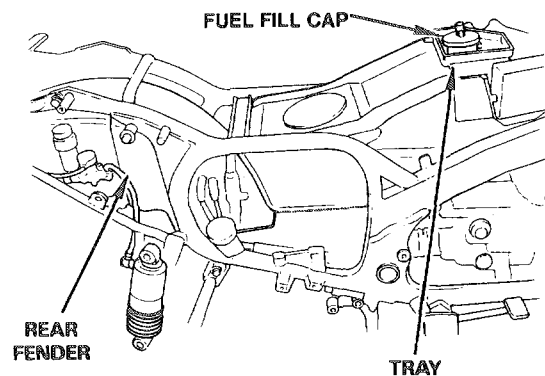


Remove the following:

- rear wheel (see page 15-10).
- rear fender (see page 13-19).
- fuel fill cap.
- fuel tray.

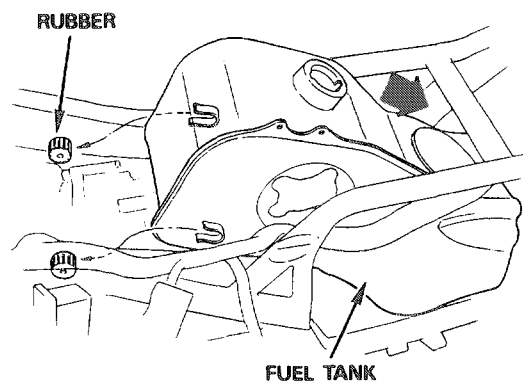
WARNING

- **Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once. Empty gasoline out of the fuel tank into an approved gasoline container, if necessary.**



Remove the fuel tank out the rear of the frame.

Remove the fuel tank front rubbers.



Fuel System

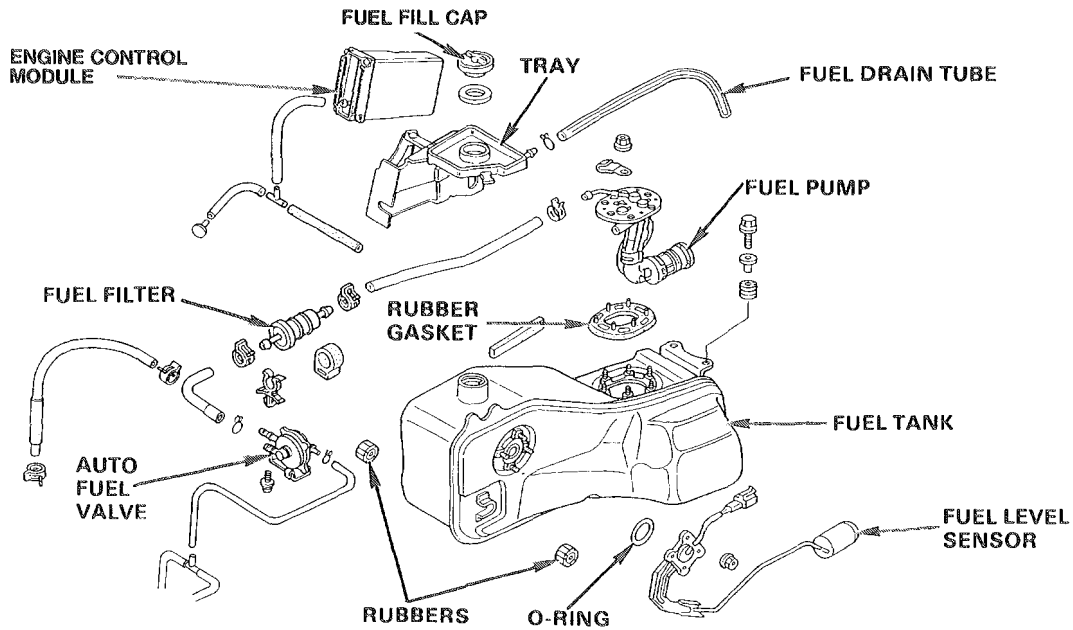
Fuel Tank

Installation

Install the fuel tank in the reverse order of removal.

NOTE

- Check harness and cable routing after installation.
- Connect the BLK/BLU and WHT/BLU connectors with the "Push" marks facing up.

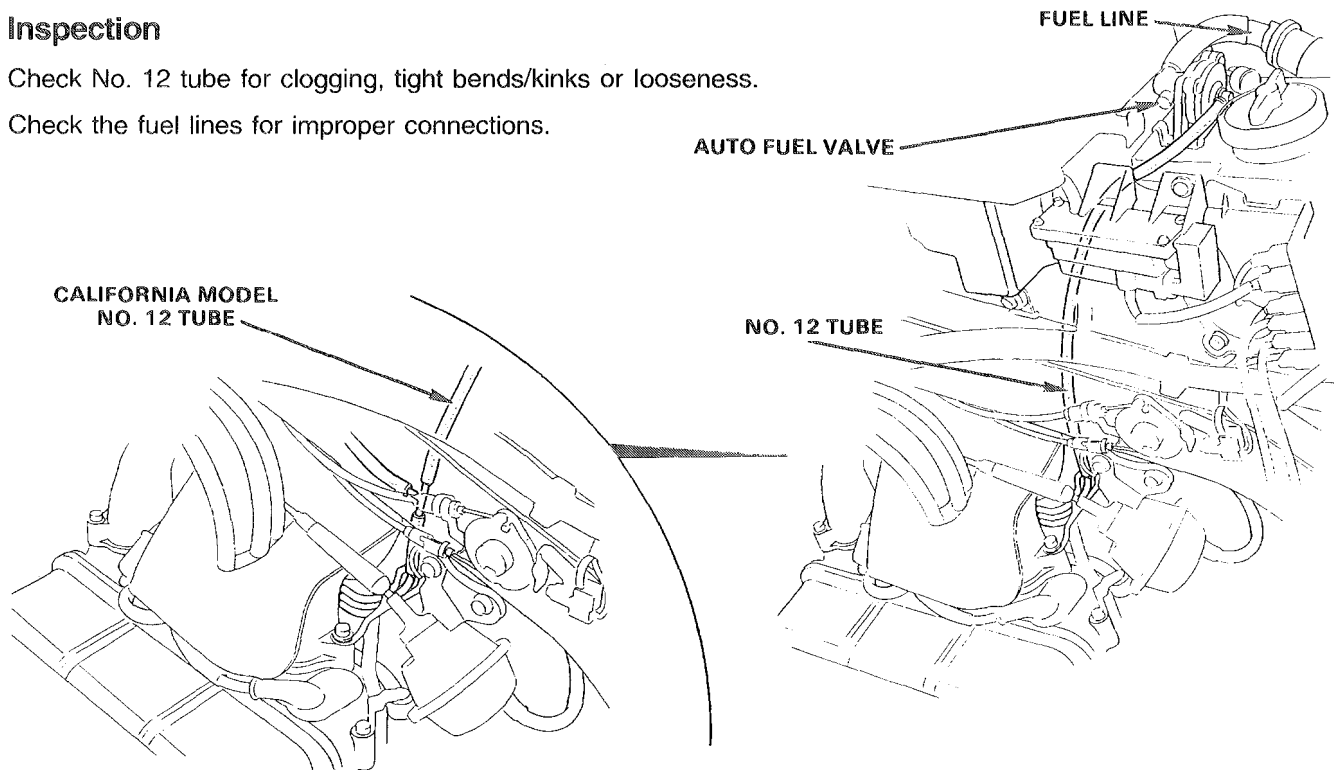


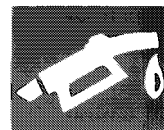
Auto Fuel Valve

Inspection

Check No. 12 tube for clogging, tight bends/kinks or looseness.

Check the fuel lines for improper connections.





Connect a vacuum pump as shown.

Apply the specified vacuum to the auto fuel valve.

Tool:

Vacuum Pump

ST-AH-260-MC7 (U.S.A. only)

Specified Vacuum: 200 mmHg (7.9 inHg)

Vacuum should be maintained.

If the vacuum is not held, replace the fuel valve.

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

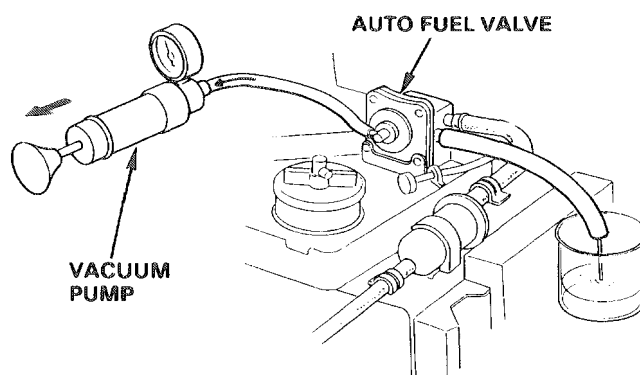
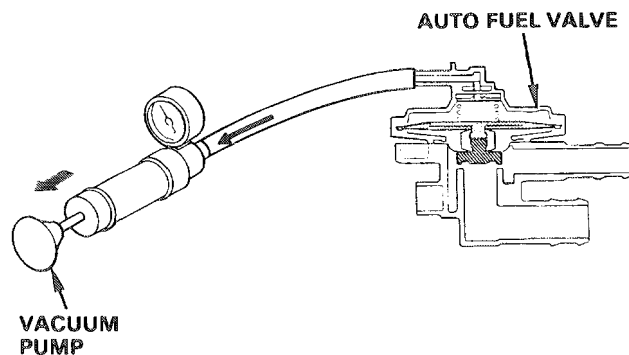
Short the BLK/WHT and BLK/BLU wire connector terminals of engine control module (page 4-40/fuel pump operation test).

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

Then, maintaining the above conditions, apply vacuum to the auto fuel valve.

Vacuum should be maintained and the gasoline should flow out smoothly.

Replace the fuel valve 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 (see page 13-9). Turn the ignition switch OFF.

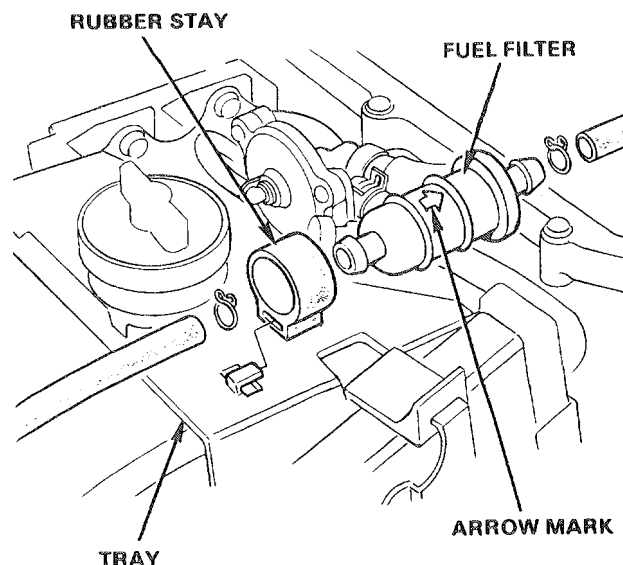
Loosen the hose clamps at each end of the filter. Pull the fuel lines off the fuel filter.

Remove the fuel filter from the rubber stay on the fuel tank tray. Check the filter for clogging.

Replace the fuel filter with a new one, if necessary.

Install the fuel filter with its arrow pointing toward the outlet side.

After installing, start the engine to initiate fuel flow, and check for leaks.



Fuel System

Air Cleaner Housing

Removal

Remove the top compartment (see page 13-9).

Disconnect the No. 2 (PNK) tube from the hot air vacuum actuator.

Remove the clip and air duct.

NOTE

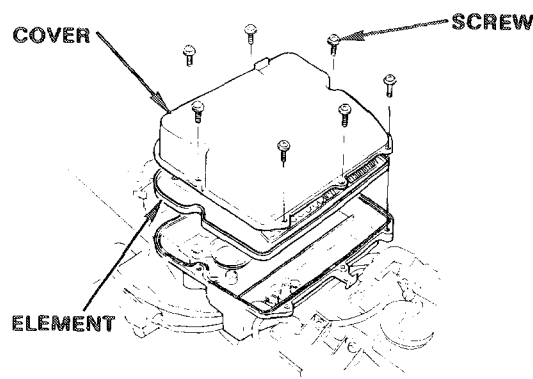
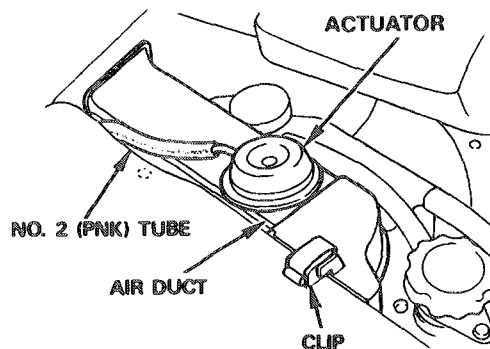
- For hot air control diaphragm removal, see page 4-53.

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

Remove the air cleaner element. (For California models: also remove the EVAP storage element).

NOTE

- Do not drop anything into the carburetors.



Remove the two screws attaching the tube joint onto the air cleaner housing.

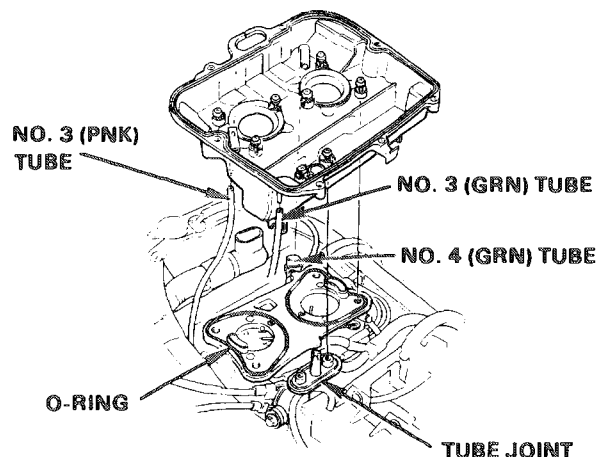
Remove the six screws and remove the air cleaner housing from the carburetor.

Disconnect the No. 3 (GRN), No. 4 (GRN) and No. 3 (PNK) tubes from the air cleaner housing.

Remove the O-rings from the carburetor.

NOTE

- Cover the carburetor main bores with a shop towel to prevent dropping anything into the carburetors.
- For IAT thermal vacuum valve removal, see page 4-53.



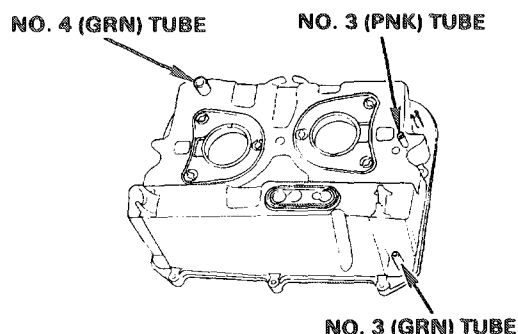
Installation

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

NOTE

- Connect the related hoses to the air hose set plate as shown.

Disconnect the choke linkage sub rod from the starting enrichment (SE) valve arm.





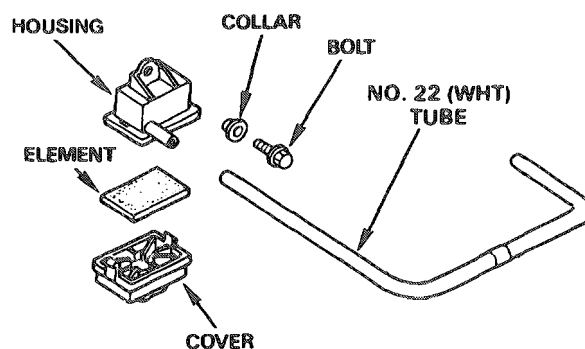
Sub Air Cleaner Housing

Remove the right fairing inner cover (see page 13-12).

Disconnect the No. 22 (WHT) tube from the sub air cleaner housing.

Remove the bolt and collar and remove the sub air cleaner housing from the frame.

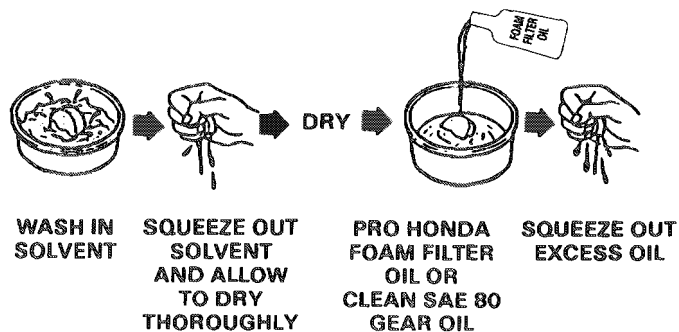
Open the housing cover and remove the sub air cleaner element.



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 Honda Foam Filter Oil or equivalent, or in gear oil (SAE #80-90) and squeeze out the excess.

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



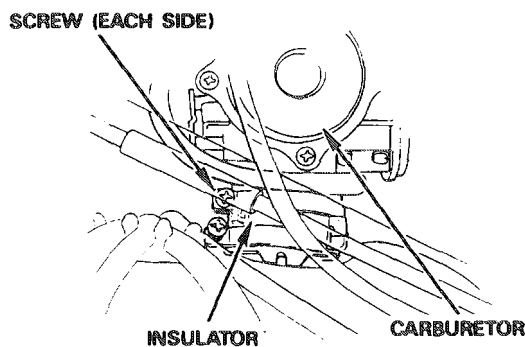
Carburetor Removal

Drain the coolant (see page 5-8).

Remove the following:

- fairing inner covers (see page 13-12).
- air cleaner housing (see page 4-18).

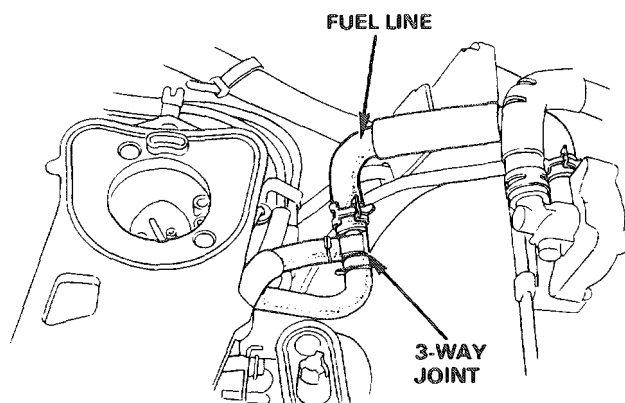
Loosen the carburetor insulator band screws (upper side, near carburetor) and remove the carburetors from insulators.



Disconnect the fuel line from the 3-way joint.

WARNING

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



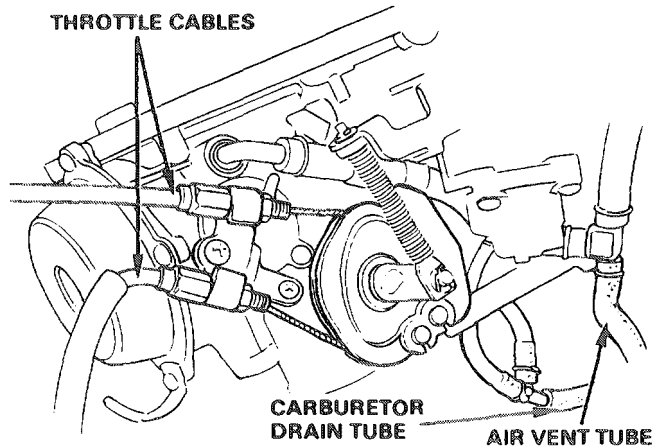
Fuel System

Carburetor Removal (cont'd)

Disconnect the throttle cables from the throttle drum.

Disconnect the air vent tube and carburetor drain tube at each 3-way joint.

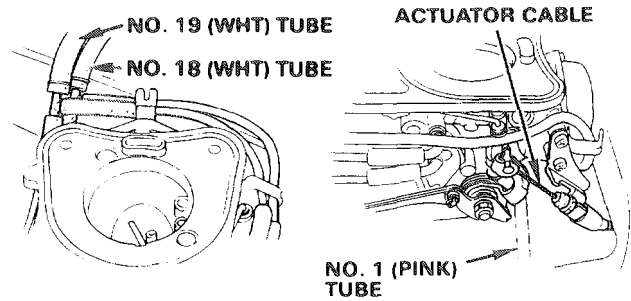
Disconnect the No. 5 and No. 11 tubes from the carburetor (California model only).



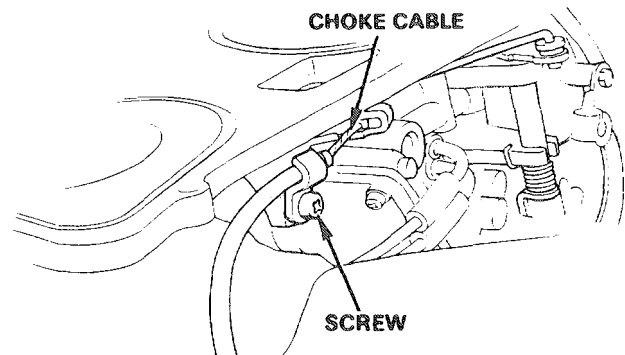
Disconnect the No. 18 (WHT) and No. 19 (WHT) tube at the 3-way joint.

Disconnect the No. 1 (PINK) tube from the carburetor.

A & SE: Disconnect the auto cruise actuator cable from the throttle drum.



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



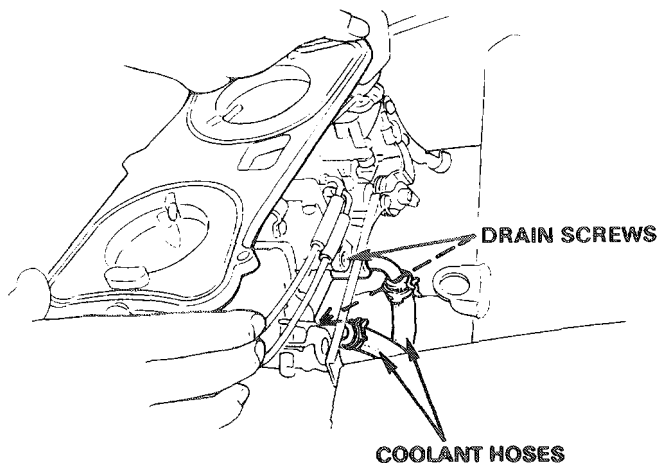
Disconnect the coolant hoses from the carburetor heat riser. Remove carburetor assembly.

NOTE

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

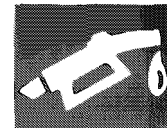
After removal, drain fuel out of the float chambers into a suitable container by loosening drain screws.

For intake manifold service, see page 4-37.



WARNING

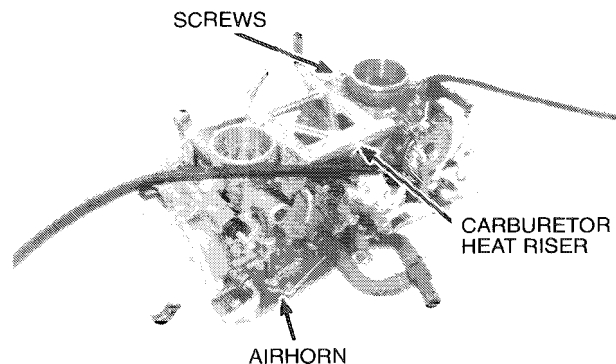
- **Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.**



Carburetor Separation

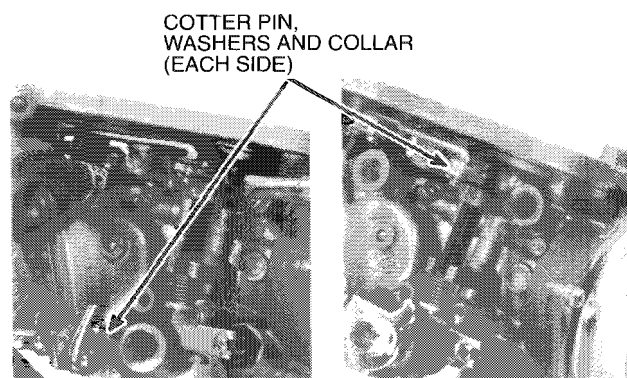
Remove four screws and carburetor heat riser.

Loosen but do not remove the four airhorn screws.



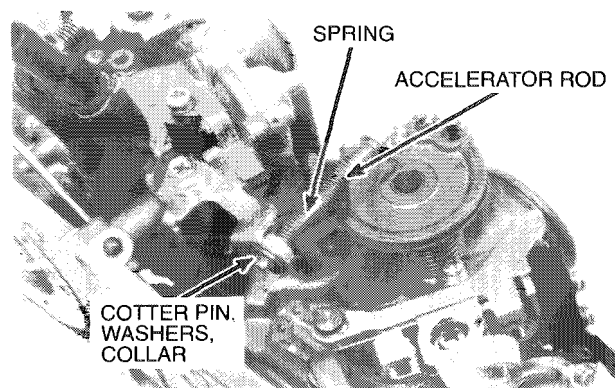
Remove the cotter pin, washers, and collar from the choke linkage sub rod at each carburetor.

Disconnect the choke intake sub rod from the starting enrichment (SE) valve arm.



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

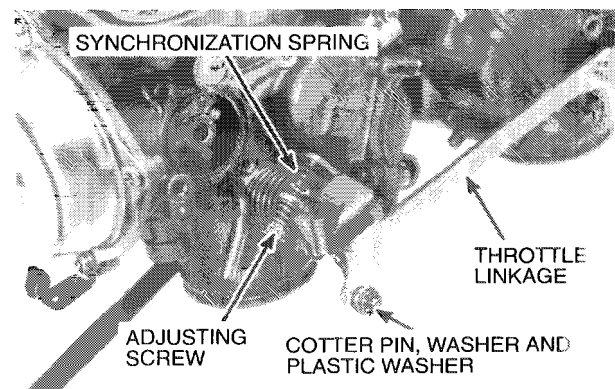
Disconnect the accelerator rod from the accelerator pump arm.



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

Disconnect the throttle linkage from the carburetor.

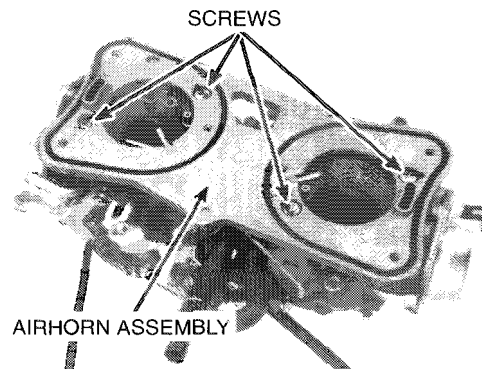
Loosen the adjusting screw and remove the synchronization spring.



Fuel System

Carburetor Separation (cont'd)

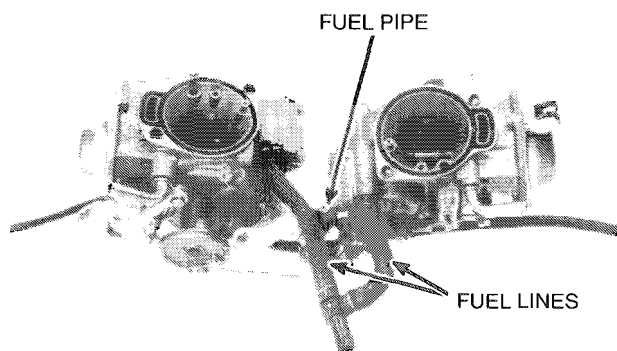
Remove four screws and the carburetor airhorn assembly.



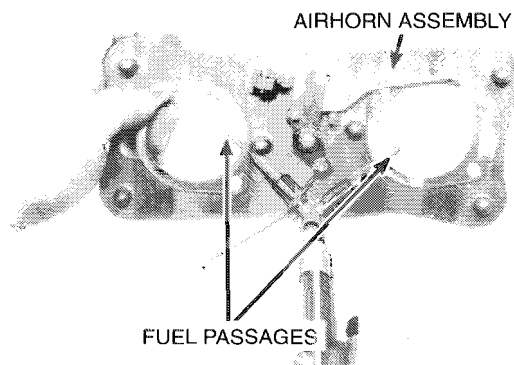
Disconnect the fuel lines from each carburetor.

Remove the accelerator pump fuel pipe.

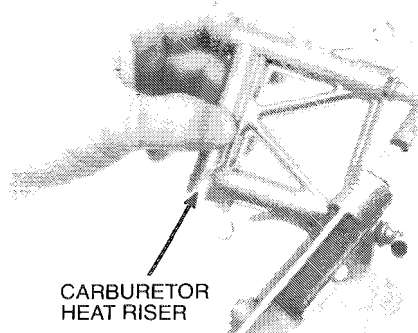
Check the fuel pipe's O-rings for damage or fatigue.

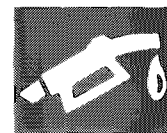


Use compressed air to clean the accelerator pump fuel passages of the airhorn assembly.



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





Carburetor Disassembly

Accelerator Pump

NOTE

- The accelerator pump can be serviced with the 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 the pump cover.

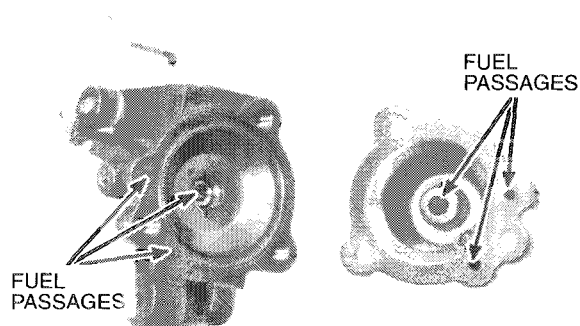
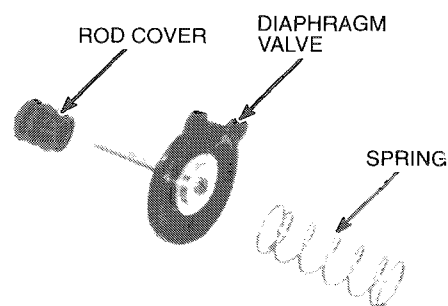
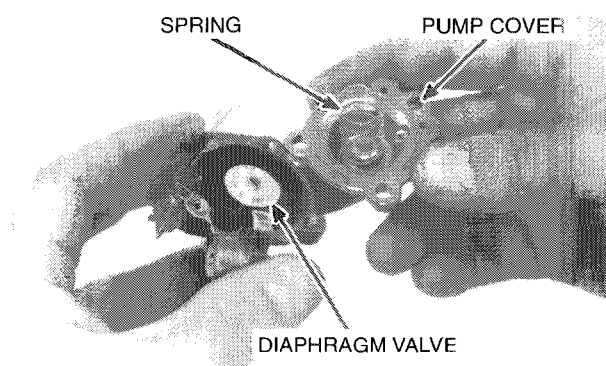
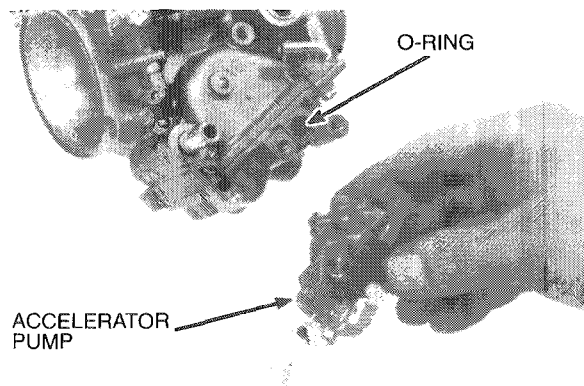
Remove the spring and diaphragm valve.

Check the diaphragm rod cover for fatigue or damage.

Check the spring for damage.

Check the diaphragm valve for pin holes or deterioration.

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



Fuel System

Carburetor Disassembly (cont'd)

Vacuum Chamber

NOTE

- The vacuum chamber can be serviced with the carburetors assembled.

Remove the screws and vacuum chamber cover.

CAUTION

- Do not interchange the 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.

Inspect the diaphragm for pin holes or deterioration.

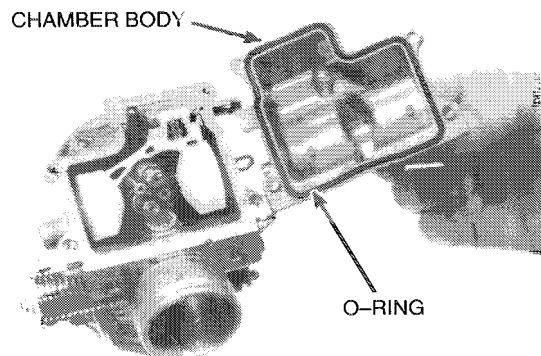
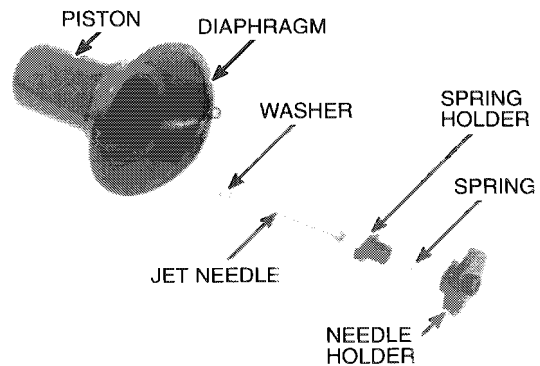
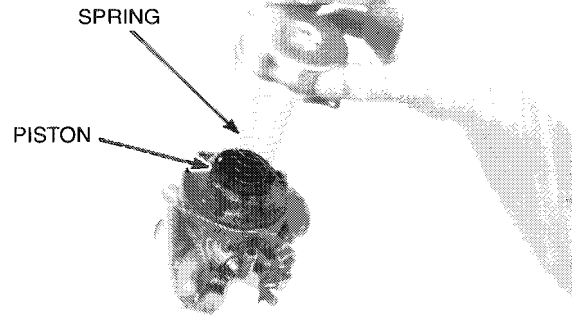
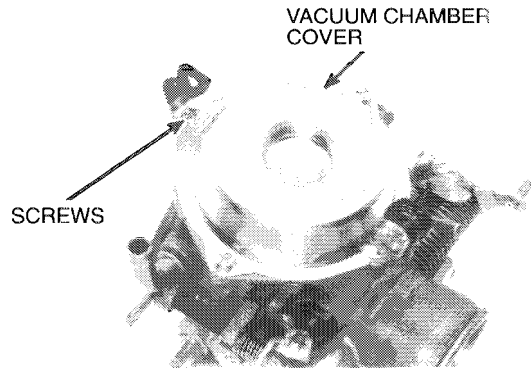
Float Chamber

NOTE

- The float chamber must be serviced with the carburetors disassembled.

Remove the float chamber body.

Check the O-ring for fatigue or damage.

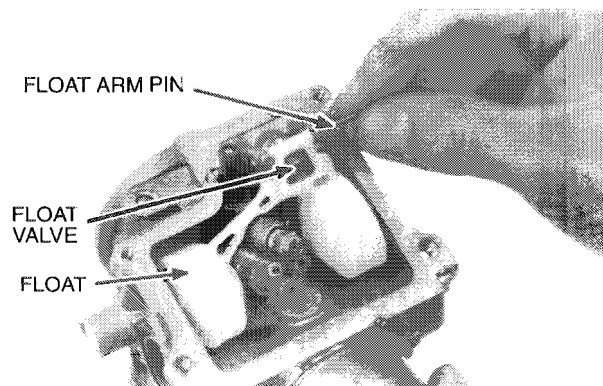




Pull out the float arm pin.

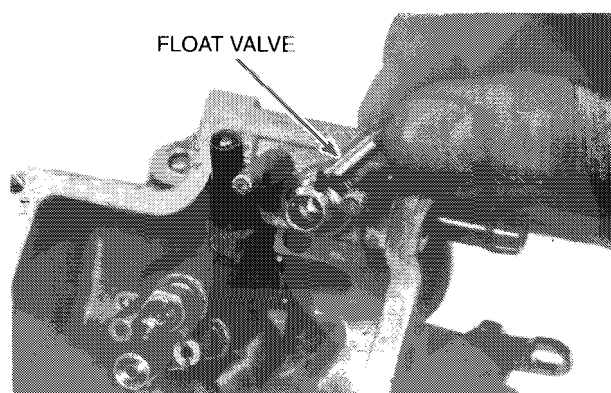
Remove the float and float valve.

Inspect the float for deformation or damage.



Inspect the float valve for grooves and nicks.

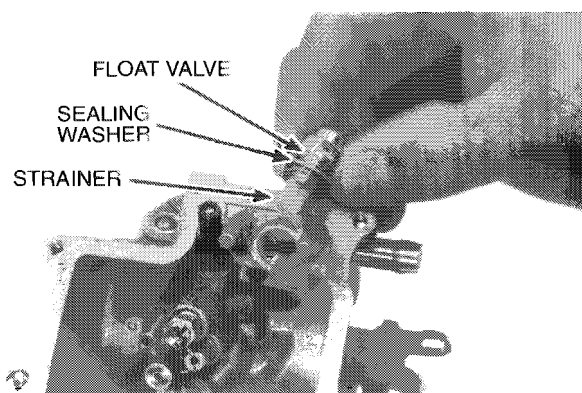
Inspect the operation of the float valve.



Remove the float valve seat from the carburetor body.

Clean the strainer with clean solvent.

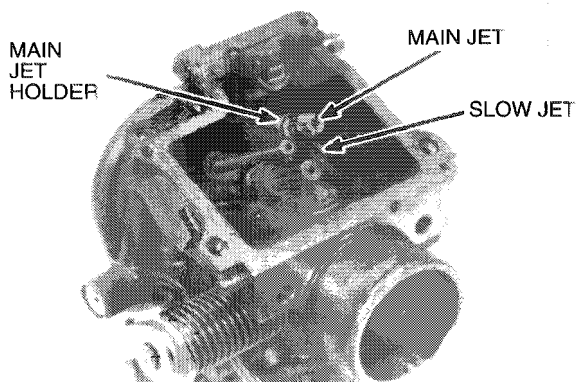
Make sure the sealing washer is in good condition.



Remove the 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 is pressed into the body.



Fuel System

Carburetor Assembly

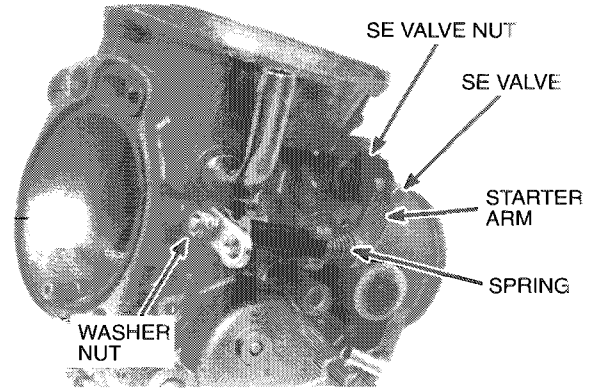
NOTE

- The SE valve can be serviced with the carburetors assembled.

Remove the nut and washer.

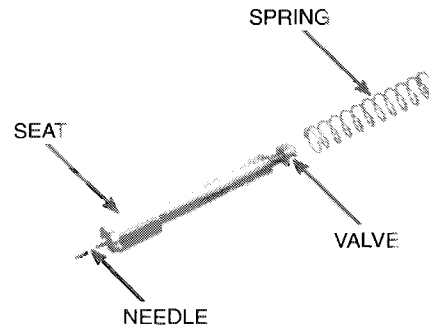
Loosen the starting enrichment (SE) valve nut.

Remove the SE valve with starter arm and spring.



Check the SE 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

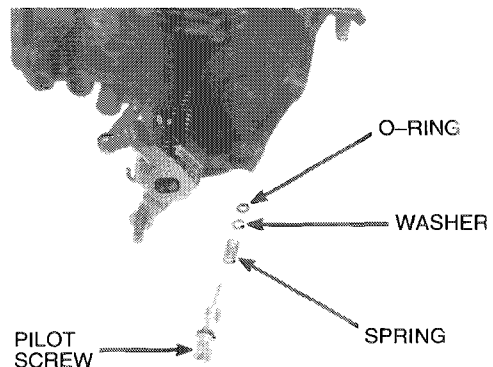
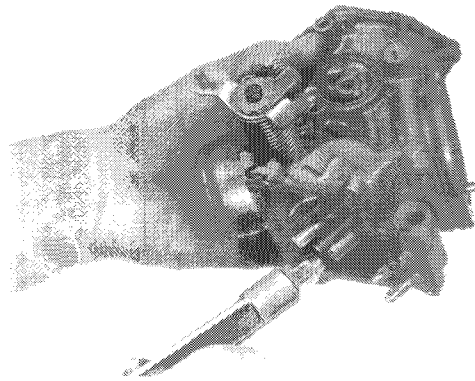
- The pilot screws are factory pre-set and should not be removed unless the carburetors are overhauled.

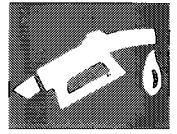
Turn each pilot screw in and carefully count the number of turns before it seats lightly. Make a note of this to use as a reference when reinstalling the pilot screws.

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 they are worn or damaged.

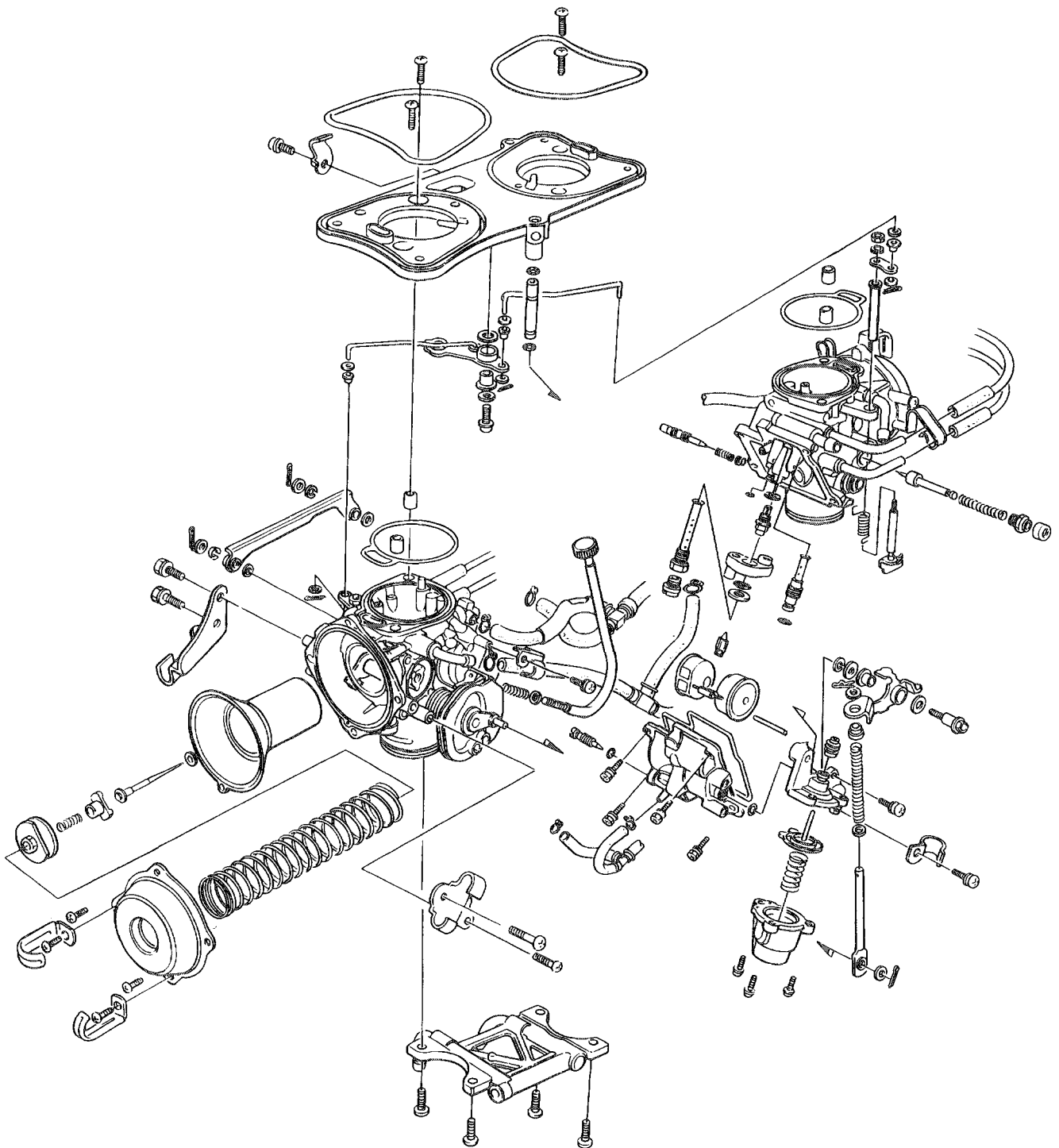




Reassembly is the reverse of disassembly.

CAUTION

- Do not overtighten the main jet holder and float valve seat. Damage to the carburetor will result.



Fuel System

Carburetor Assembly (cont'd)

Pilot Screw

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

If new pilot screws are installed, turn the pilot screws out to the initial opening (see page 4-39).

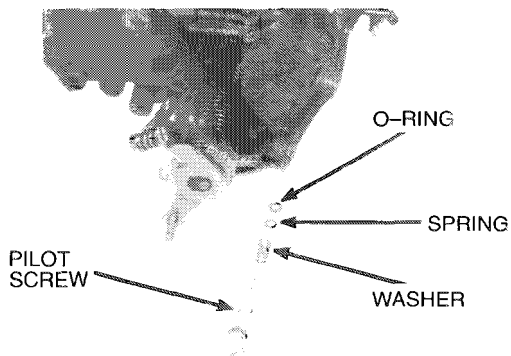
CAUTION

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

Perform a pilot screw adjustment (see page 4-39) if new pilot screws are installed.

NOTE

- If you replace the pilot screw in one carburetor, you must replace the pilot screws in the other carburetor for proper pilot screw adjustment.
-

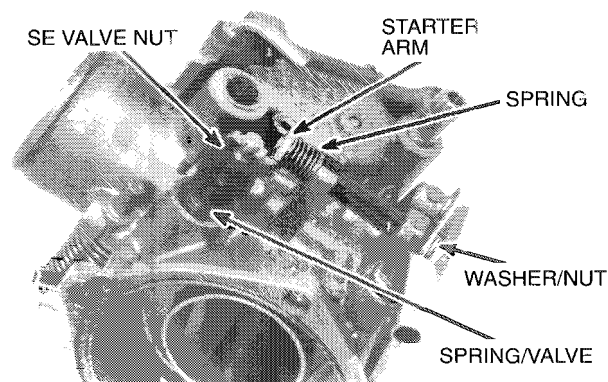


Starting Enrichment (SE) Valve

Install the SE valve, spring, and valve nut, but do not tighten the nut.

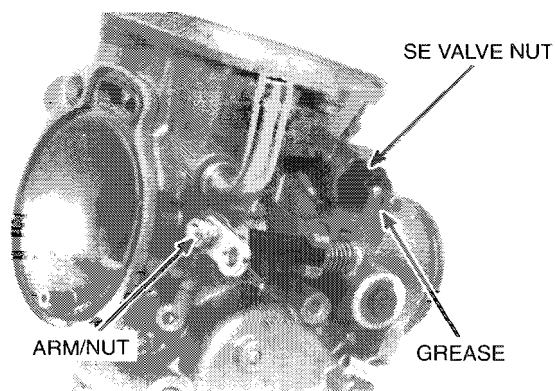
Install the starter arm with the spring, aligning the arm with the valve groove as shown.

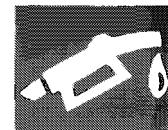
Install the washer and nut onto the starter arm.



Tighten the SE valve nut and starter arm nut securely.

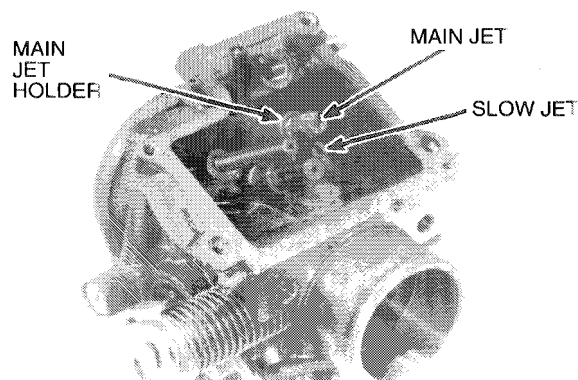
Apply grease to the valve-to-arm groove.





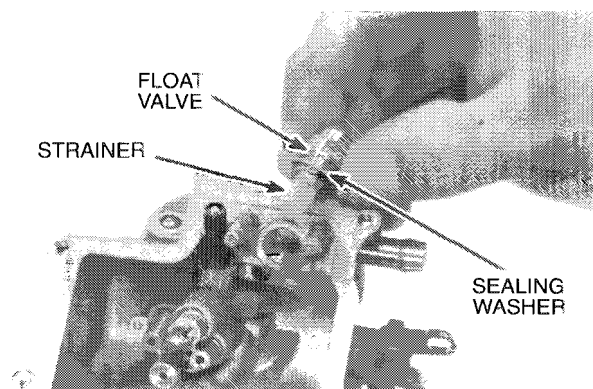
Float Chamber

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



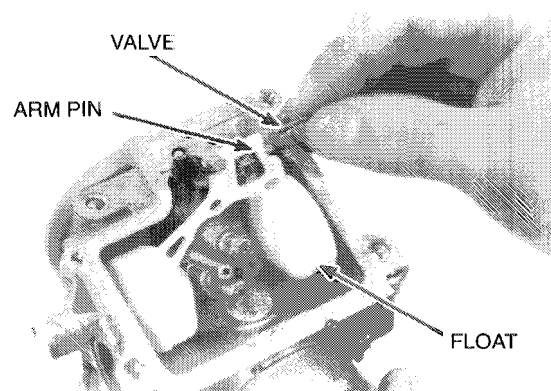
Install the fuel strainer on the float valve.

Install the float valve 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

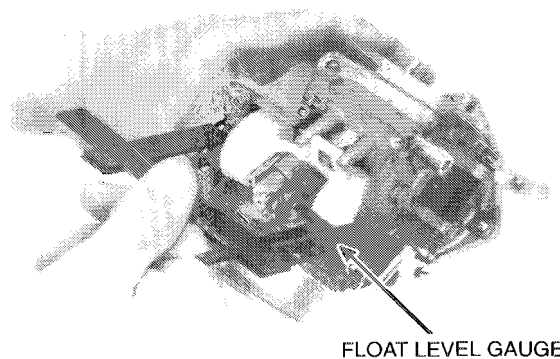
With the float valve seated and the float arm just touching the valve, measure the float level with the float level gauge.

Tool:

Float level gauge
07401-0010000

Adjust if necessary by bending the float arm carefully.

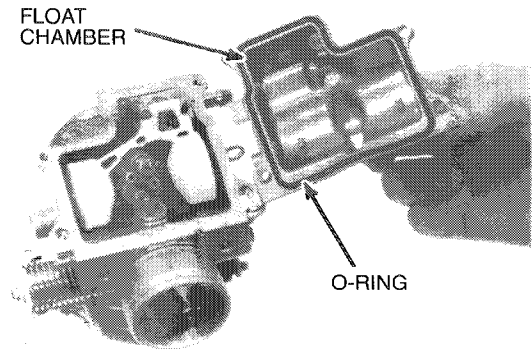
Float Level: 8mm (0.3 in)



Fuel System

Carburetor Assembly (cont'd)

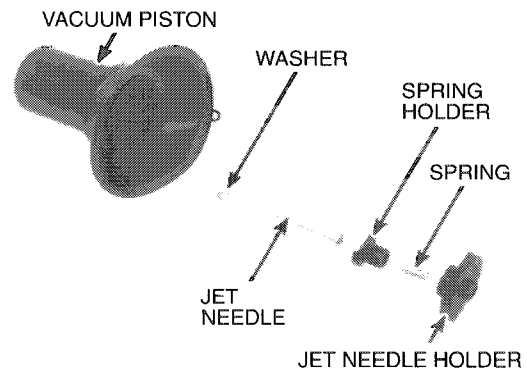
Install a new O-ring and float chamber.



Vacuum Chamber

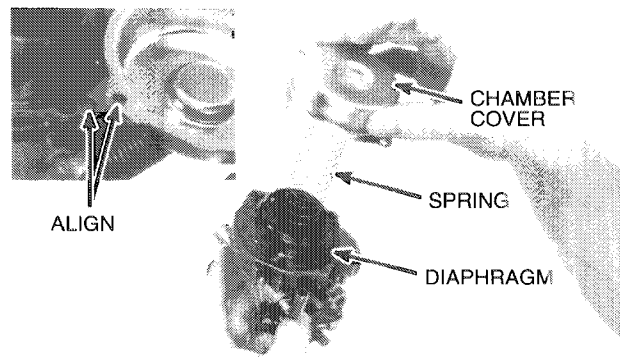
Install the washer, jet needle, spring holder, spring and jet needle holder to the vacuum piston.

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.

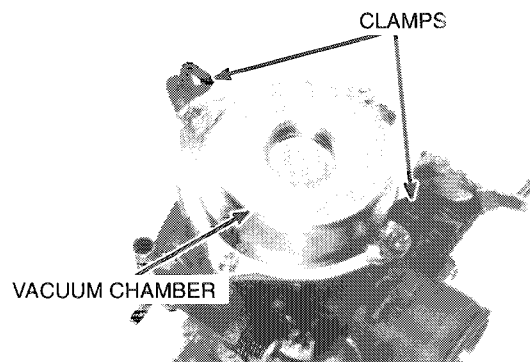
Install the chamber cover with the spring, aligning its cavity with the hole in the carburetor. Secure at least two screws before releasing the vacuum piston.



Install the remaining screws of the vacuum chamber cover.

NOTE

- Do not pinch the diaphragm with the chamber cover.
- Install tube clamps as shown on pages 4-34 and 4-35.

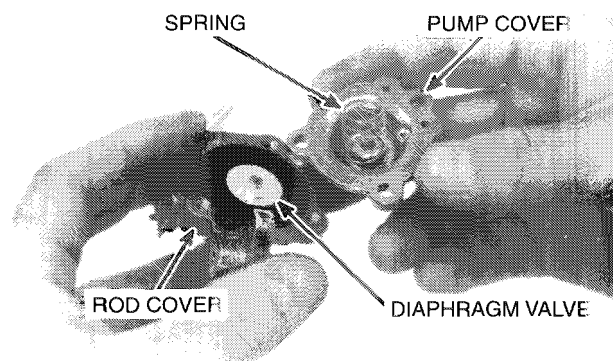




Accelerator Pump

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

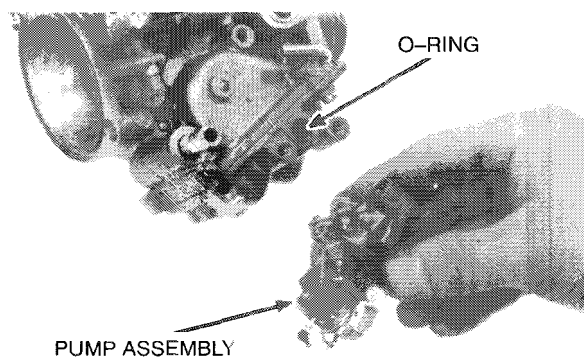
Tighten the cover screws securely.



Install a new O-ring on the float chamber.

Install the accelerator pump onto the chamber.

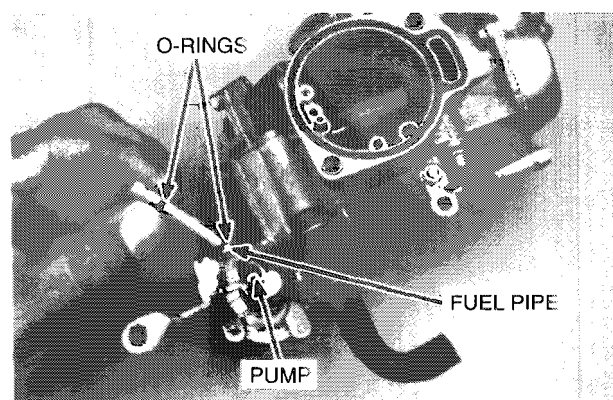
Tighten the screws securely.



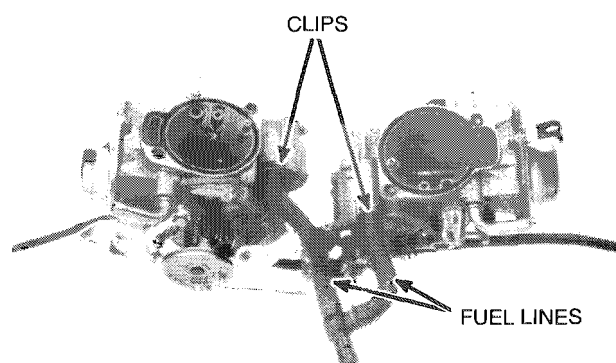
Assembly

Install new O-rings onto the fuel pipe.

Install the pipe on the accelerator pump.



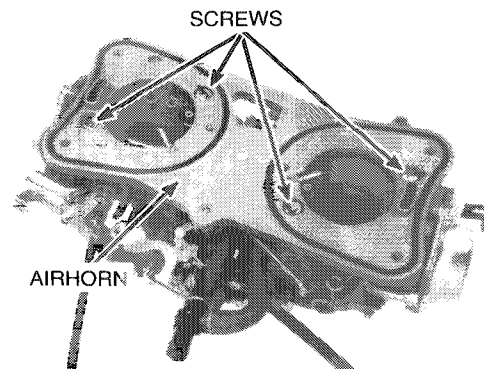
Install the fuel lines as shown. Clip them securely.



Fuel System

Carburetor Assembly (cont'd)

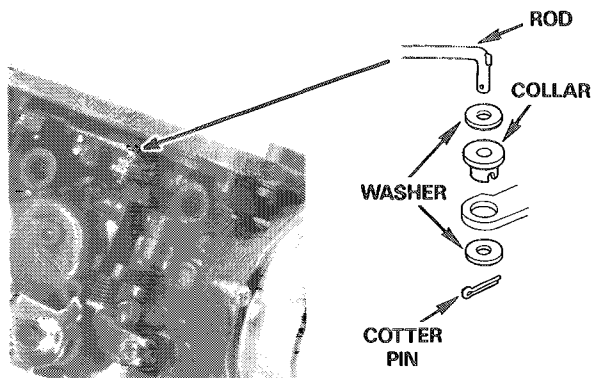
Install the carburetor airhorn and screws, but do not tighten the screws.



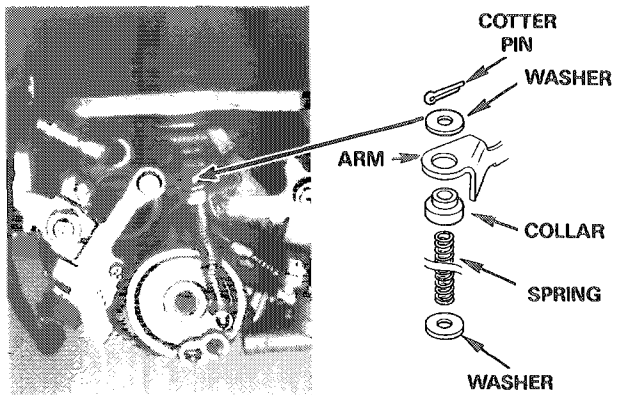
Install the washers and collar as shown.

Insert the choke linkage sub rod into the starting enrichment valve.

Install a new cotter pin (each sub rod).



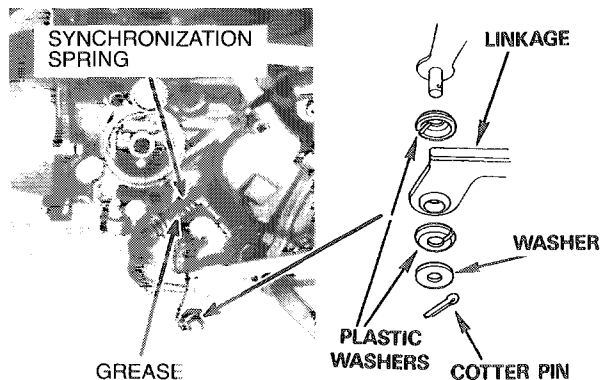
Install the washer, spring, collar, accelerator pump arm, washer, and a new cotter pin on the accelerator rod.

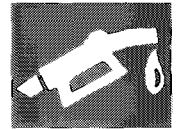


Install the plastic washers, washer, and a new cotter pin on the throttle linkage of the right carburetor.

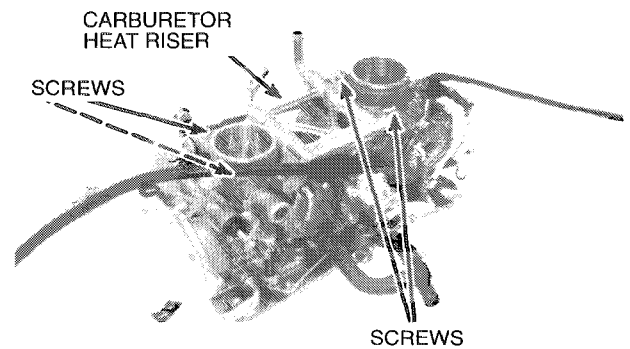
Apply grease to the synchronization adjusting screw end.

Install the synchronization spring.

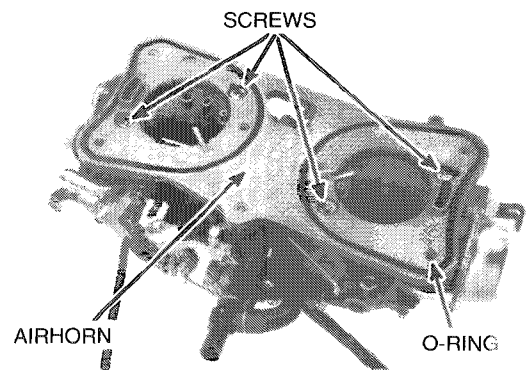




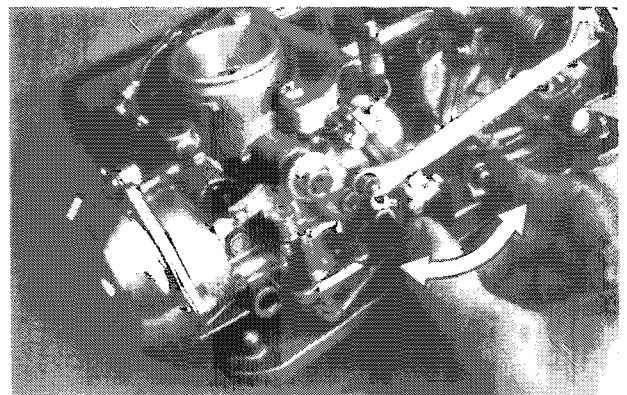
Install the carburetor heat riser and tighten the screws securely.



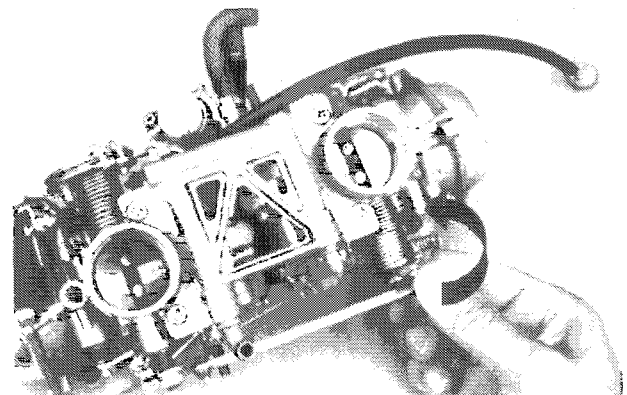
Tighten the carburetor airhorn screws securely.
Install new O-rings on the airhorn grooves.



Check that the choke linkage operates smoothly.



Check that the throttle linkage operates smoothly.



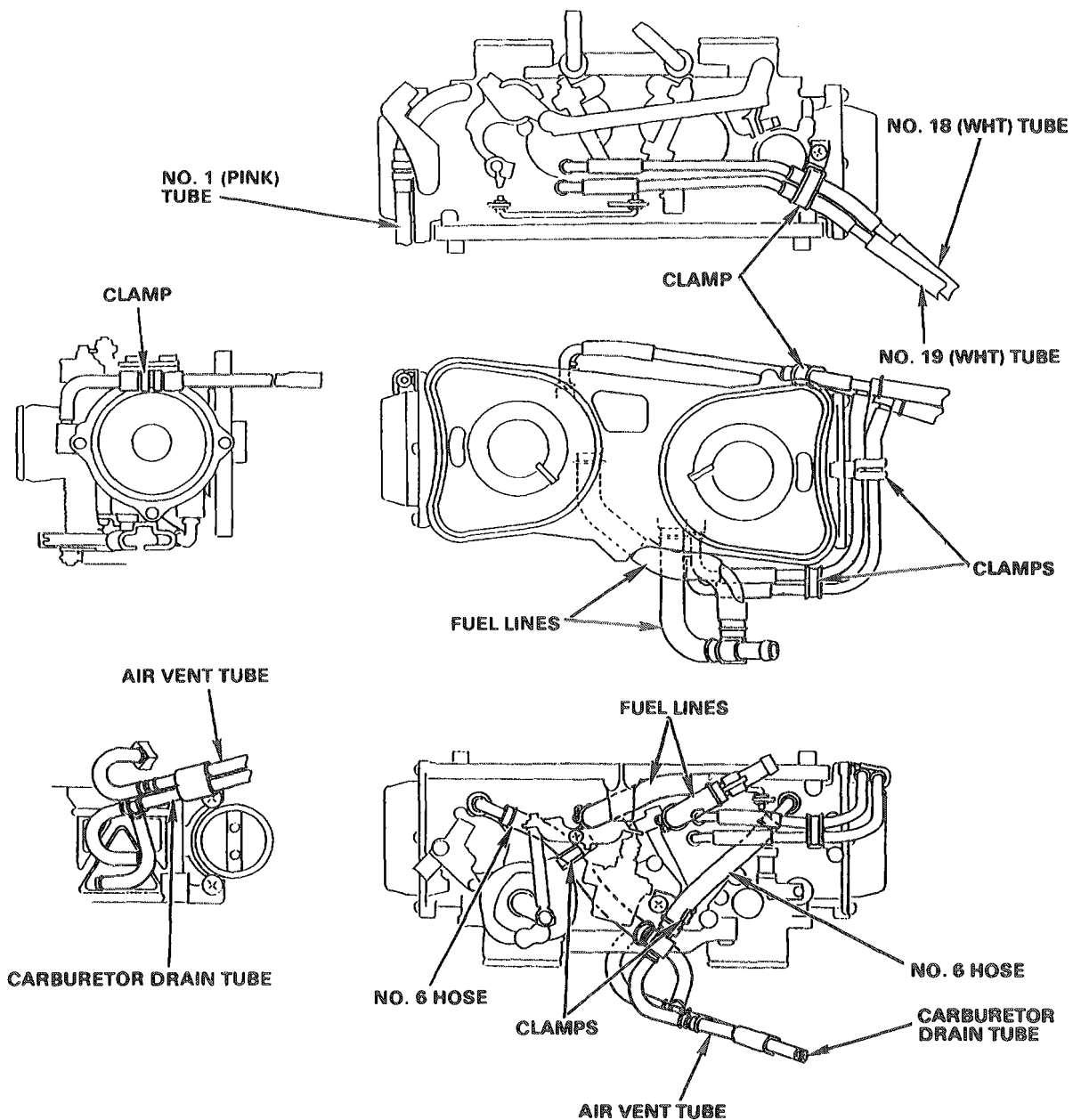
Fuel System

Carburetor Tubes/Hoses

NOTE

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

49-State:



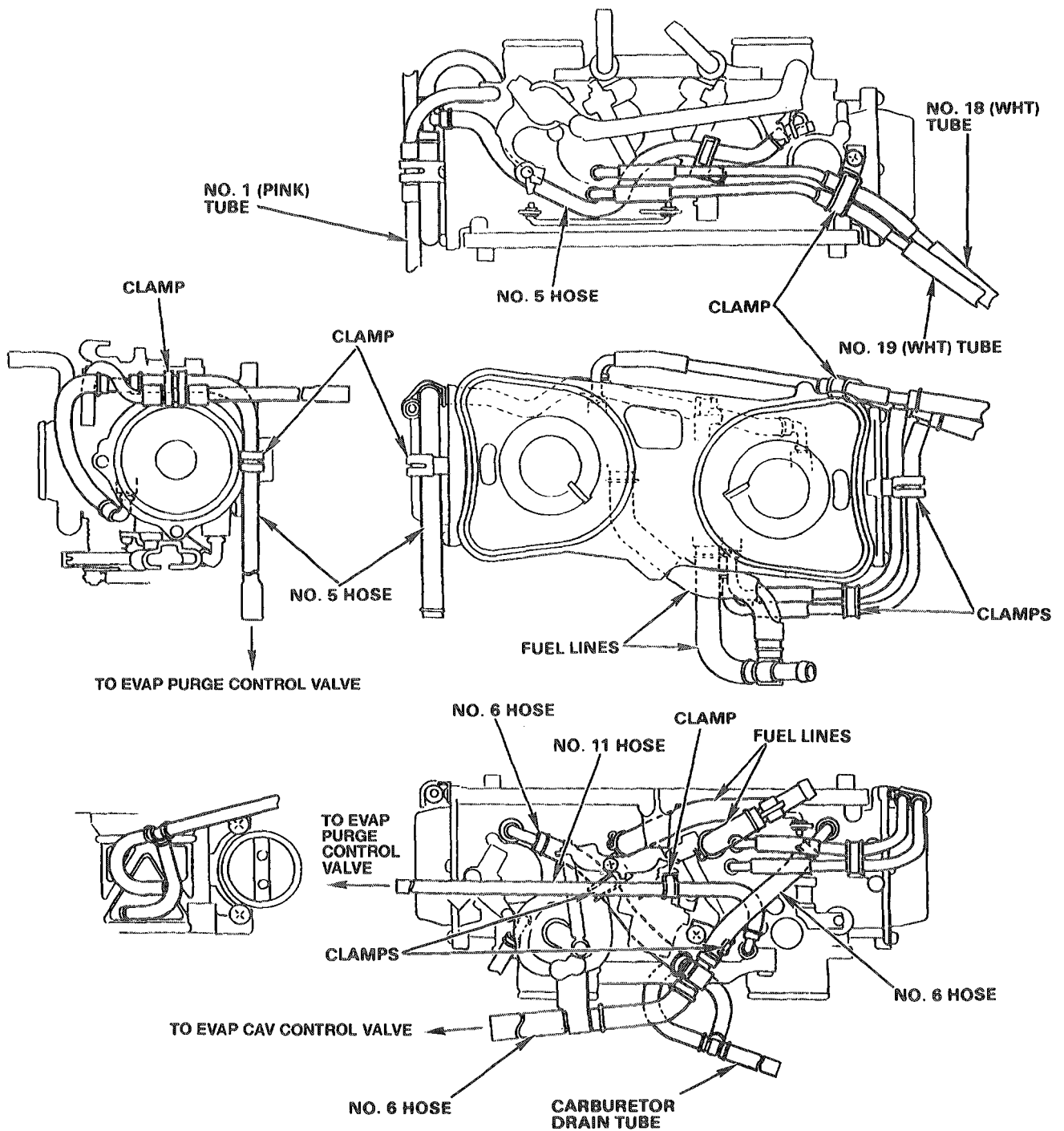


Output Shaft

California:

NOTE

- Refer to 49-State Model for identification of tubes not shown.



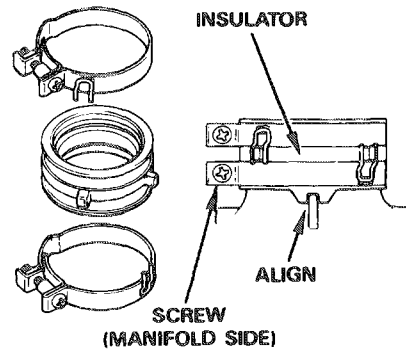
Fuel System

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 on the manifold side.

Torque: 5 N-m (0.5 kg-m, 3.6 ft-lb)

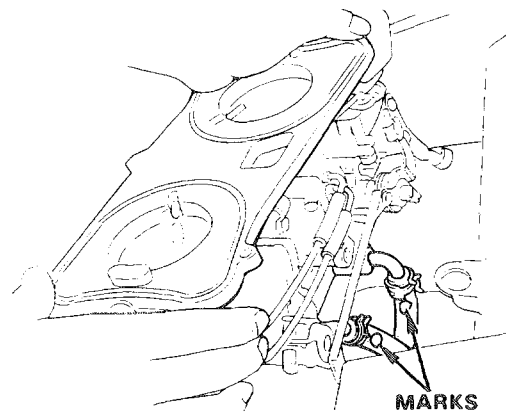


Connect the water hoses to the carburetor heat riser.

NOTE

- Connect the "J" marked hose (with yellow tape) to the left pipe (with yellow paint); the "D" marked hose to the right pipe.
- Take care to avoid pinching or kinking the hoses.

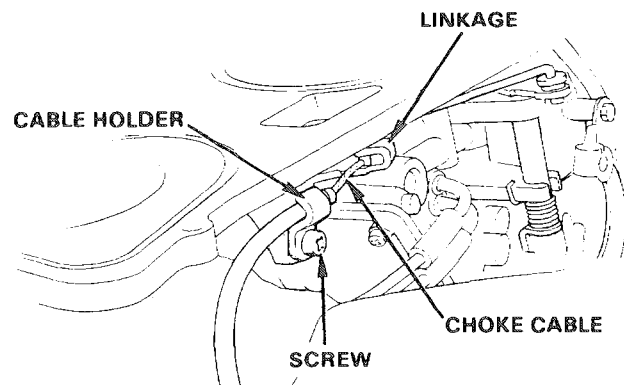
Secure the hoses with clamps.



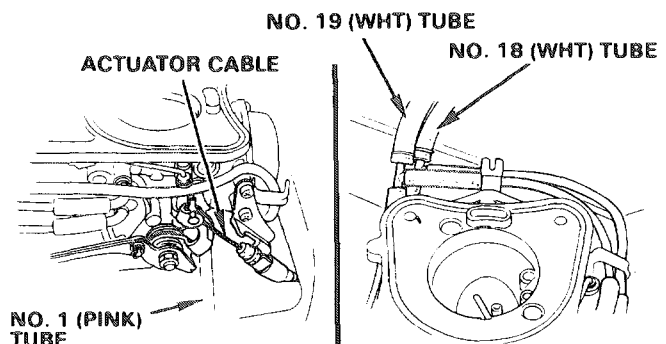
Connect the choke cable to the choke linkage. Align the end of the cable outer housing with the edge of the cable holder.

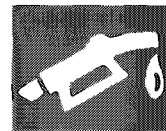
Tighten the cable holder screw securely.

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



A & SE: Connect the auto cruise actuator cable. Connect the No. 1 (PINK) tube to the carburetor. Connect the No. 18 (WHT) and No. 19 (WHT) tubes.

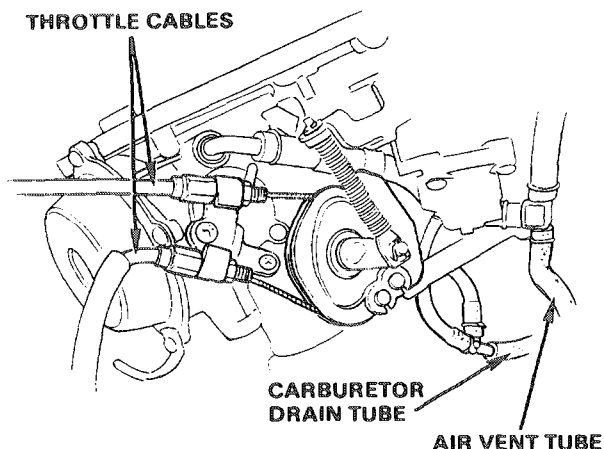




Connect the No. 5 and No. 11 tubes to the carburetor (California model only).

Connect the carburetor drain tube and air vent tube to each 3-way joint.

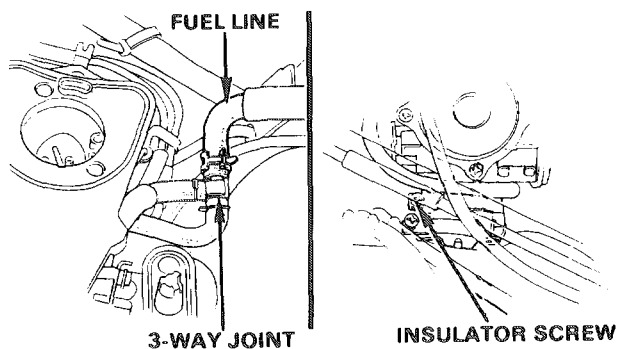
Connect the throttle cables to the throttle drum.



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

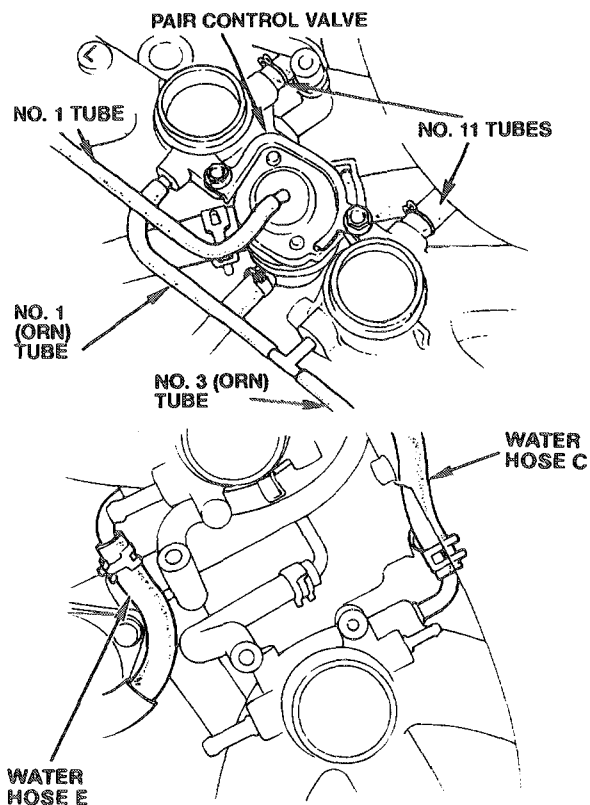
Removal

Remove the following:

- air cleaner housing (see page 4-18).
- carburetors (see page 4-19).
- heat guard.
- insulators.
- pulse secondary air injection (PAIR) control valve (see page 4-56).

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

Disconnect water hoses C and E from intake manifold riser pipes.

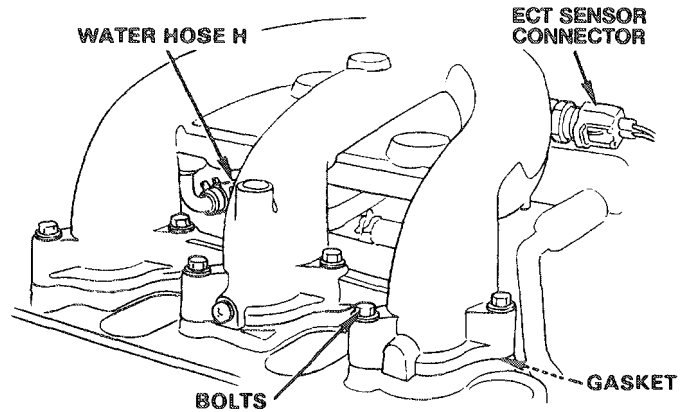


Fuel System

Intake Manifold (cont'd)

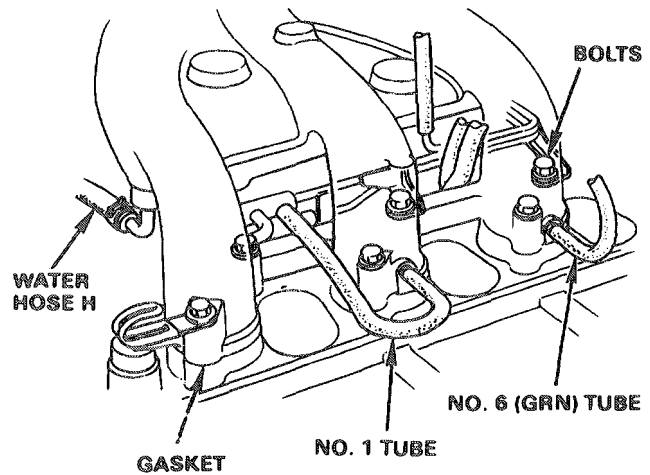
Disconnect the engine coolant temperature (ECT) sensor connector and water hose H from the right intake manifold.

Remove six bolts, the right intake manifold and gasket.



Disconnect the vacuum tube (No. 1, No. 6 GRN) and water hose H from the left intake manifold.

Remove the six bolts, left intake manifold and gasket.



Installation

Install the intake manifolds in the reverse order of removal.

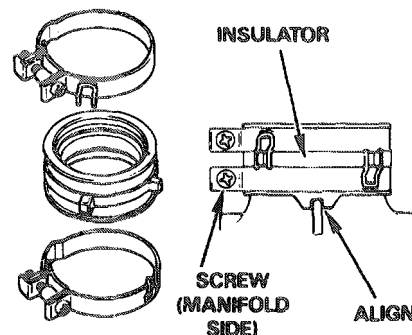
NOTE

- "L" marked manifold to the left side; "R" marked to the right.
- For all vacuum tubes connection and routing, refer to the hose and tubes routing/connection (see page 4-7).

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

Secure the screws on the manifold side.

Torque: 5 N-m (0.5 kgm, 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 rpm or smaller that will accurately indicate a 50 rpm change (E.S.I. model #320 – T/N E.S.I. No. 320).
- Use an electric fan to cool the engine.

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

CAUTION

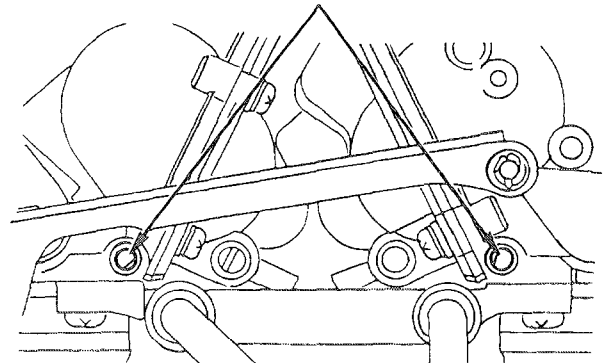
- **Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.**

Initial opening: 2 turns out

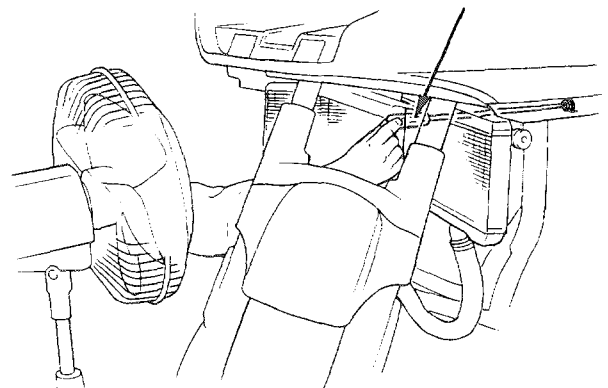
Tool:
Pilot screw wrench
07LMA-MT8010A

2. Warm the engine to operating temperature. Stop-and-go riding 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 both pilot screws 1/2 turn out from the initial setting.
6. If the engine speed increases by 50 rpm or more, continue turning both pilot screws 1/2 turn out from the previous setting until engine speed drops by 50 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 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.

PILOT SCREWS



PILOT SCREW WRENCH



Fuel System

Fuel Pump

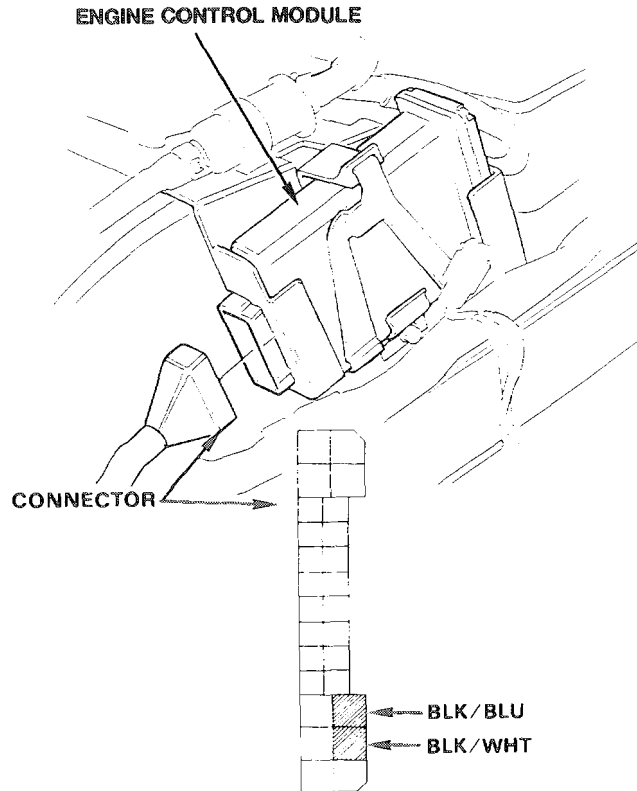
Fuel Pump Operation Test

Remove the right fairing inner cover (see page 13-12).

Turn the ignition switch OFF.

Disconnect the engine control module connector.

Short the BLK/WHT and BLK/BLU wire connector terminals with a jumper wire.



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

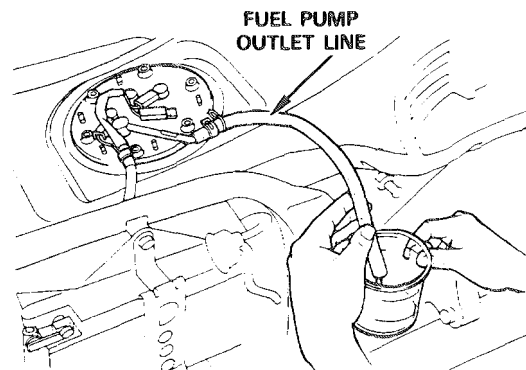
⚠ WARNING

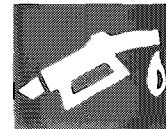
- Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.

Turn the ignition switch ON, 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 cc (21.6 oz)/minute





Fuel Pump Removal

⚠ WARNING

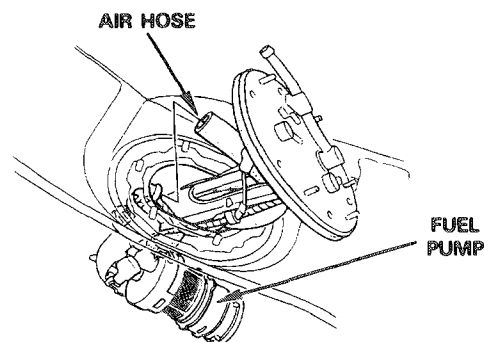
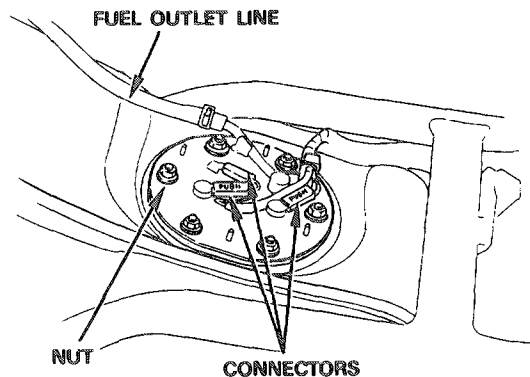
- Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.

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 from the fuel tank.

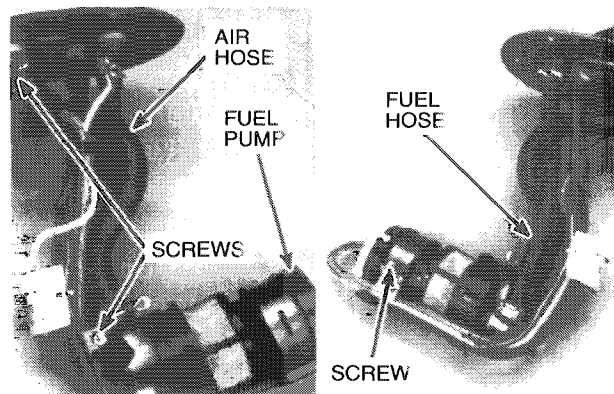


Release the terminal caps from the fuel pump wire terminals.

Remove the screws and pump wires.

Disconnect the air and fuel hoses from the pump.

Remove the pump pinch screw and fuel pump.



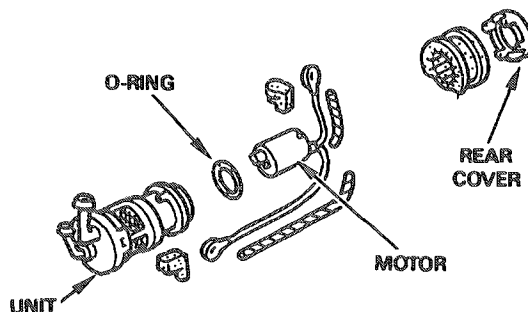
Fuel Pump Disassembly/Assembly

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 System

Fuel Pump (cont'd)

Fuel Pump Installation

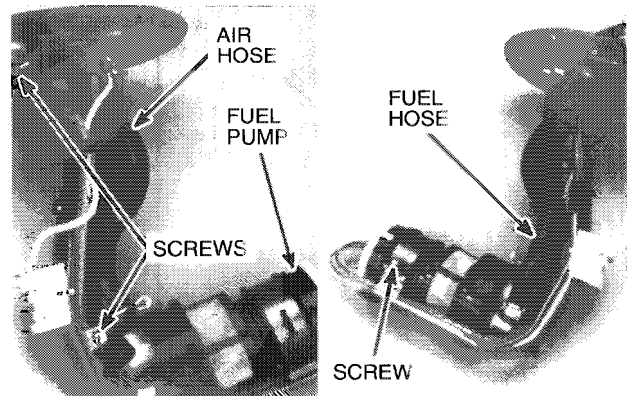
Install the fuel pump and tighten the screw securely.

Connect the air and fuel hoses to the fuel pump.

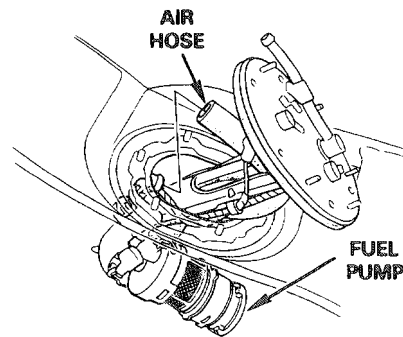
Install the clamps securely.

Route the pump wires properly. 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.

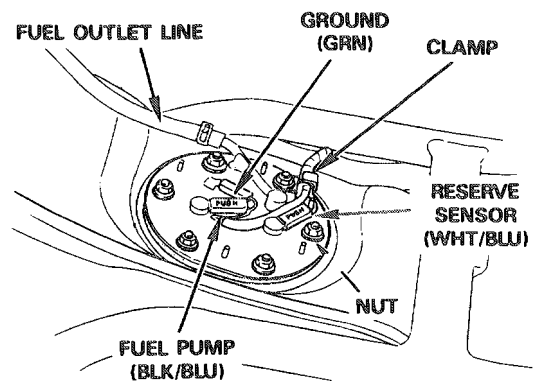
Connect the fuel pump connectors and reserve-sensor connector to the pump terminals.

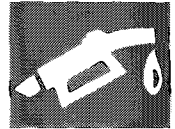
NOTE

- 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 (A & SE only)

Sensor Removal/Installation

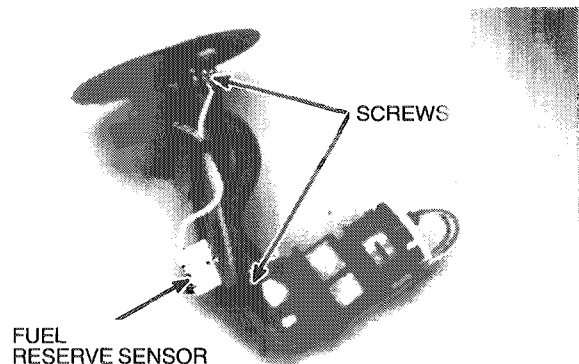
Remove the fuel pump (see page 4-41).

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

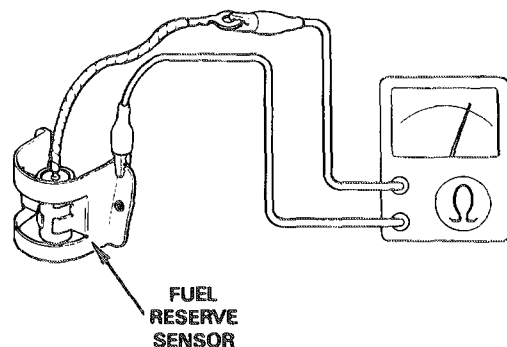
WARNING

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

Remove the fuel reserve sensor.

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

Standard: 0.9-1.3 k Ohms (250°C/ 77°F).



Indicator Inspection

Place the motorcycle on its center stand.

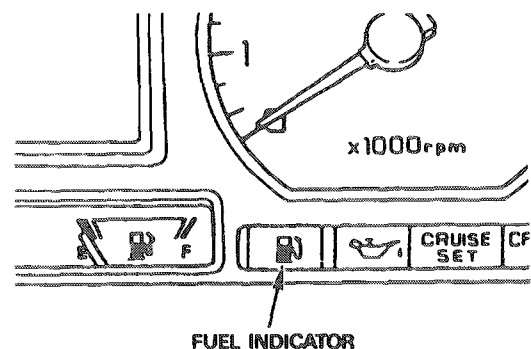
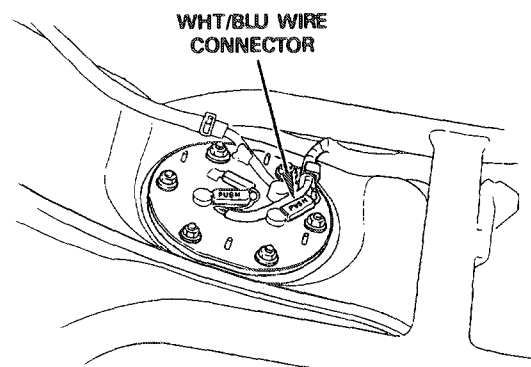
The fuel indicator light should come on within three minutes after the ignition switch has been turned ON with less than 4.0 liters (1.1 gal) of fuel in the tank. The fuel indicator light should also come on for a few seconds, then go off.

Remove the seat (see page 13-8).

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

Ground the WHT/BLU wire with a jump wire. The fuel indicator light 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 System

Fuel Level Sensor Removal

Fuel Level Sensor Removal

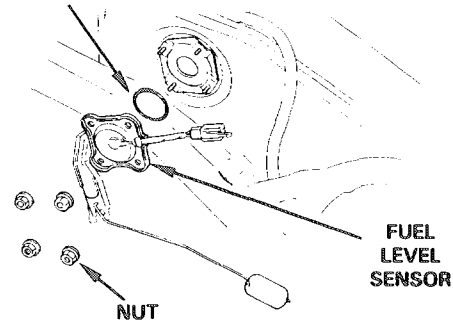
⚠ WARNING

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

A & SE: Remove the auto cruise control valve unit.

Disconnect the level sensor 2P-BLK connector from the connector holder.

Remove four nuts, the level sensor, and O-ring from the fuel tank.



Operation Test

Reconnect the sensor wires to the fuel level sensor.

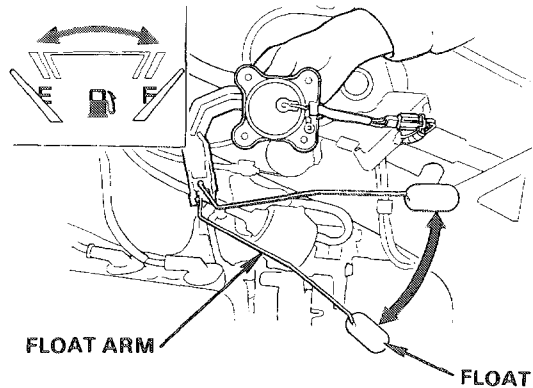
Turn the ignition on and inspect the fuel gauge operation by moving the float arm.

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

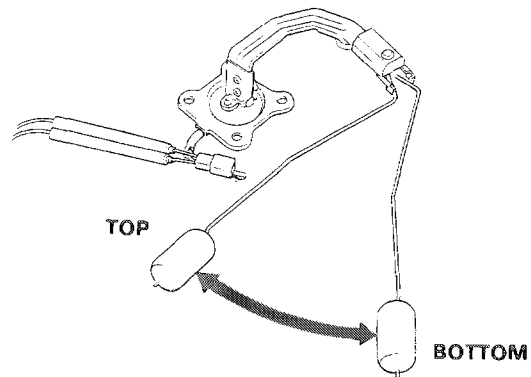
Check the resistance of the fuel level sensor with an ohmmeter.

Float at top: 4-10 Ohms (200°C/68°F)

Float at bottom: 90-100 Ohms (200°C/68°F)

NOTE

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



Fuel Level Sensor Installation

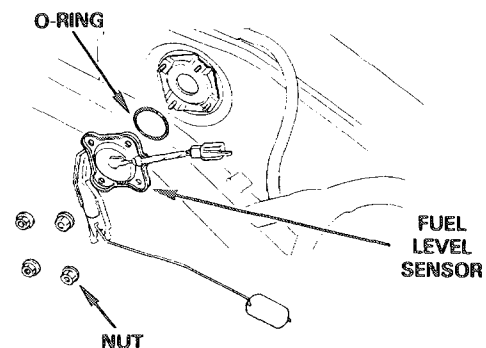
Apply oil to the O-ring.

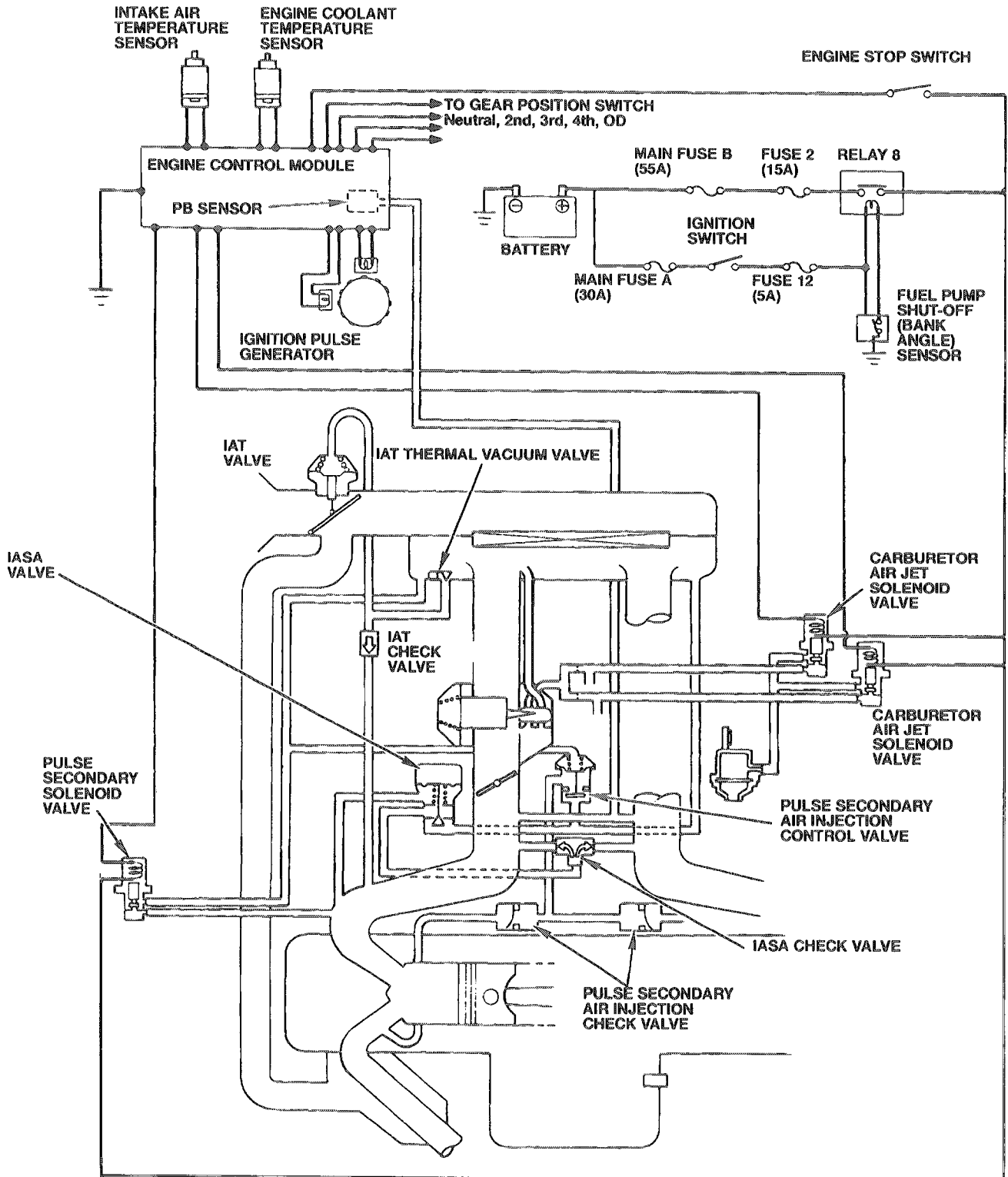
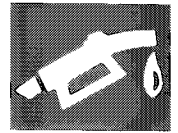
Install the fuel level sensor with O-ring in the fuel tank and secure with four nuts.

Install the remaining parts in the reverse order of removal.

NOTE

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





Fuel System

Engine Control Module

System Inspection

Remove the right fairing inner cover (see page 13-12).

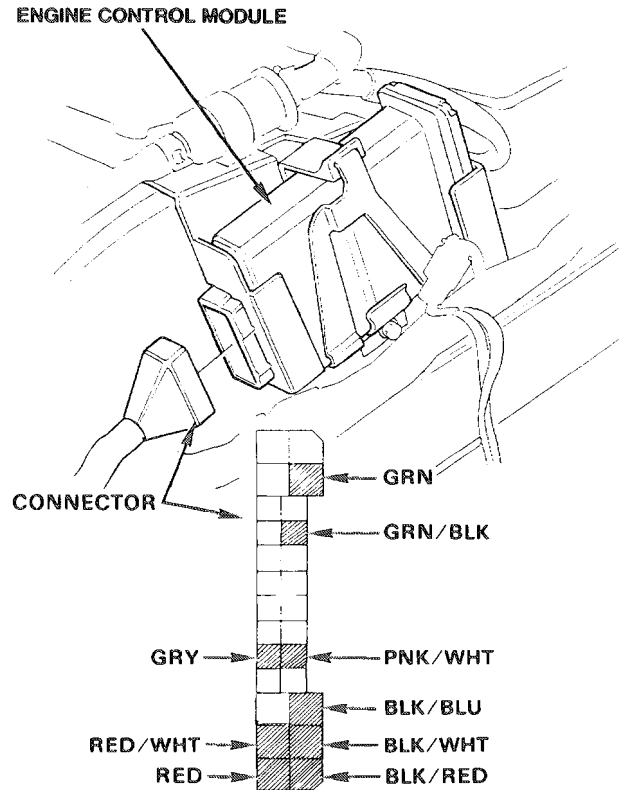
Disconnect the engine control module connector.

Check it for loose contact or corroded terminals.

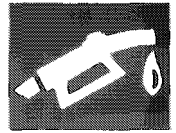
Measure the following between the connector terminals on the wire harness side:

NOTE

- Inspect according to the following conditions:
 - Condition 1: Engine stop switch on RUN
 - 2: Engine 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
Carburetor air jet solenoid valve	RED/WHT (+) and ground (-)	2	
Carburetor air jet solenoid valve	RED (+) and ground (-)	2	
PAIR solenoid valve	BLK/RED (+) and ground (-)	3	
Intake air temperature sensor	GRY and GRN/BLK	3	2.0–3.0 k ohms (20°C/68°F)
Engine coolant temperature sensor	PNK/WHT and GRN/BLK	3	2.0–3.0 k ohms (20°C/68°F)
Fuel pump	BLK/BLU and ground	3	Approx. 6 ohms
Ground	GRN and ground	3	CONTINUITY should exist



Intake Air Shot Air (IASA) System

System Inspection

Remove the left fairing inner cover (see page 13-12).

Remove the air cleaner housing (page 4-18).

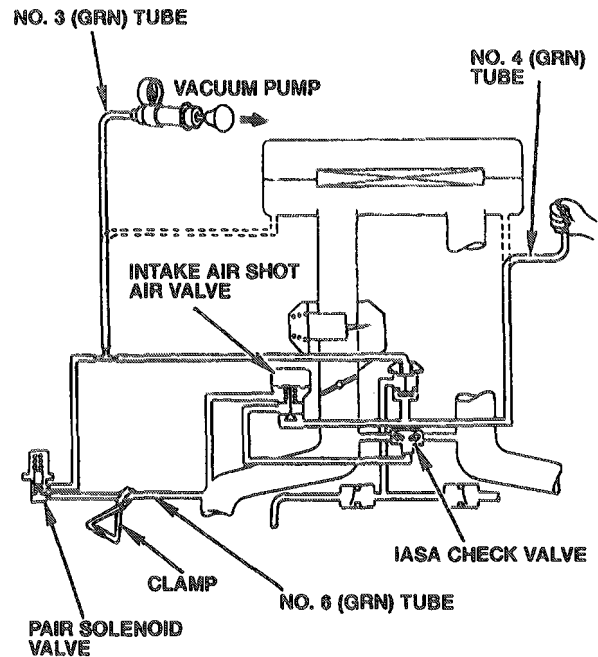
Clamp the No. 6 (GRN) tube at the PAIR solenoid valve.

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 is not drawn in through No. 4 (GRN) tube while applying the specified vacuum to the No. 3 (GRN) tube.

With the engine started and with the specified vacuum applied open the throttle above 2,000 rpm; then close the throttle quickly. Air should be sucked in through the No. 4 (GRN) tube.



Fuel System

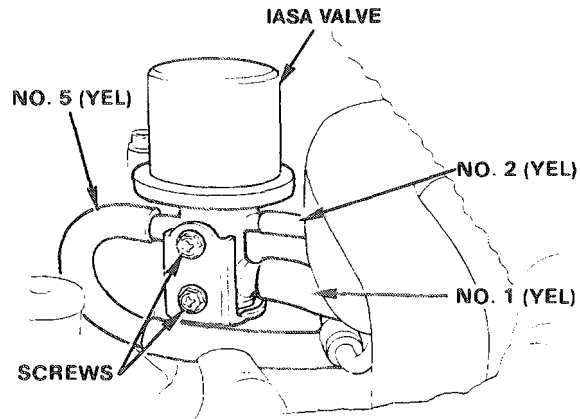
Intake Air Shot Air (IASA) System (cont'd)

Intake Air Shot Air (IASA) Valve Inspection

Remove the left cooling fan (page 5-11).

Remove the screws and disconnect the air tubes from the IASA valve.

Remove the IASA valve.



Connect a vacuum pump as shown.

Tool:

Vacuum pump
ST-AH-260-MC7

Apply the specified vacuum to the valve. 500 mmHg (19.7 inHg) vacuum should be maintained.

Do not apply more than 560 mmHg (22.0 inHg) vacuum.

Replace the valve if necessary.

Connect a vacuum pump and pressure pump as shown.

Tool:

Pressure pump
ST-AH-255-MC7

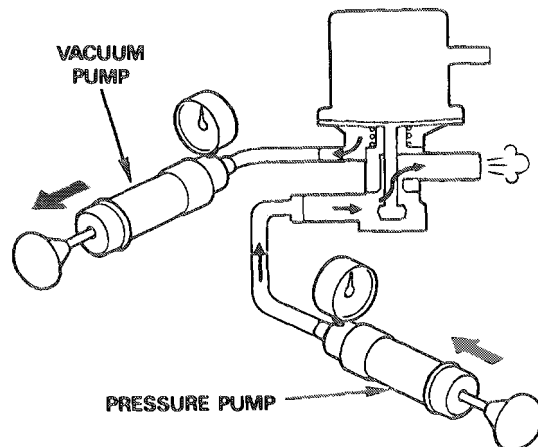
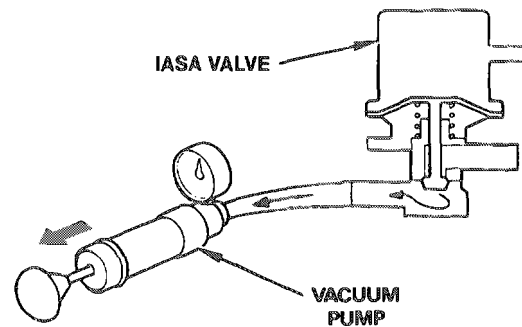
Apply light pressure (approximately 5 psi).

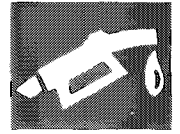
Apply the specified vacuum. The valve should open and the pressure should be released.

Specified Vacuum: 110-160 mmHg (4.3-6.3 inHg)

NOTE

- Vacuum should not hold.
- Route the tubes properly (page 4-7) and check the tubes for loose or poor connections.
- Coat the valve pipes with soapy water before connecting tubes.

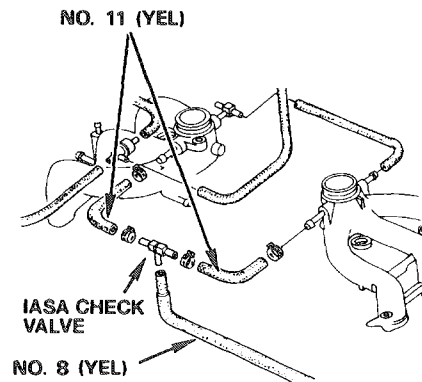




IASA Check Valve Inspection

Remove the carburetor (page 4-19).

Disconnect the air tubes and remove the IASA check valve.



Connect a vacuum pump as shown.

Tool:

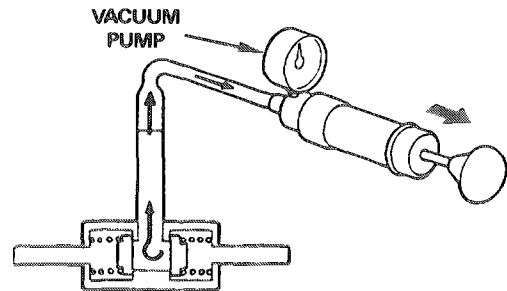
Vacuum pump
ST-AH-260-MC7

Apply the specified vacuum to the valve.

Specified Vacuum: 40 mmHg (1.6 inHg)

Vacuum should hold.

Replace the valve if vacuum does not hold.



Connect a vacuum pump as shown.

Apply vacuum. It should not hold.

NOTE

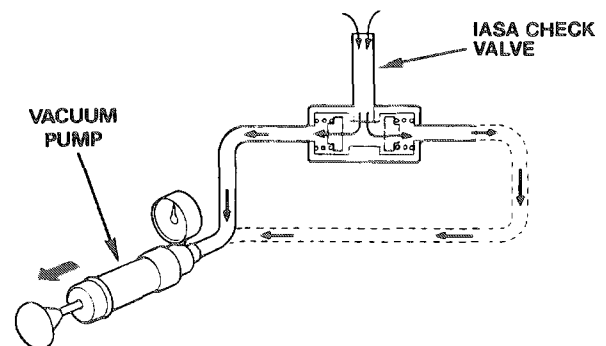
- Do this check for both valves as shown.

Replace the valve if vacuum holds.

Install the valve in the reverse order of removal.

NOTE

- Coat the valve pipes with oil when connecting the tubes.



Fuel System

Carburetor Air Jet (CAJ) Control System

System Inspection

Remove the right faring inner cover (see page 13-12).

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 both carburetor air jet (CAJ) solenoids.

Connect vacuum pumps to the CAJ solenoid valves as shown.

NOTE

- “Open” and “Closed” in the table below mean:

“Open”:

Vacuum should not be maintained when it is applied to the solenoid.

“Closed”:

Vacuum should be maintained when it is applied to the solenoid.

Specified Vacuum: 200 mmHg (7.9 inHg)

Tool:

Vacuum pump ST-AH-260-MC7 (U.S.A. only)

Disconnect the vacuum tube that goes from the engine control module 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.

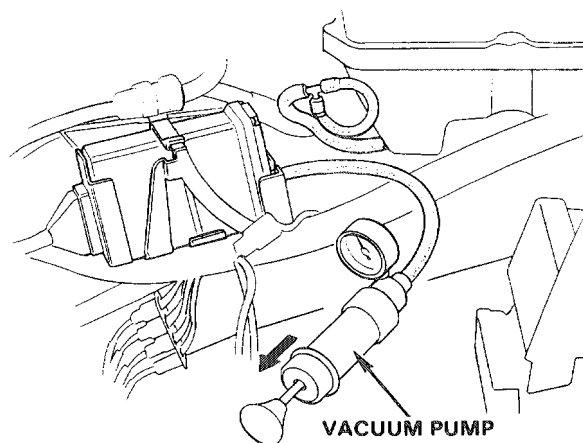
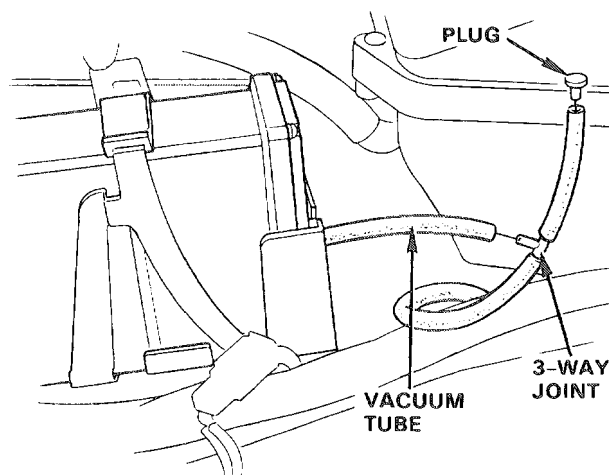
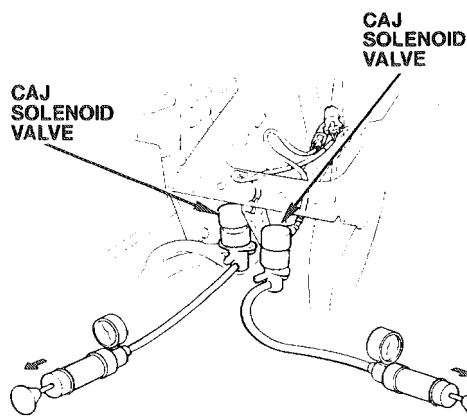
Connect a vacuum pump to the engine control module vacuum tube.

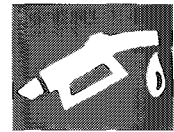
Tool:

Vacuum pump

ST-AH-260-MC7 (U.S.A. only)

Start the engine and allow it to run at specified rpm shown in the table. 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 rpm	2	Valve is "Closed"	Closed
	3	Closed	Closed
2,000 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 gear position switch 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 the 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 rpm	2	Valve is "Closed"	Closed
	3	Closed	Closed
2,000 rpm	2	Open*	Closed
	3	Closed	Closed

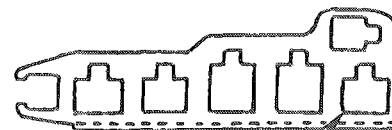
* 0 mmHg (0 inHg) in the table is for standard sea level atmospheric pressure of 760 mmHg (29.9 inHg). Therefore, the test result may be different in the area where the altitude is higher than 300 m (1,000 feet) because of the atmospheric pressure.

Carburetor Air Jet (CAJ) Solenoid Valve Inspection

Remove the fairing right pocket.

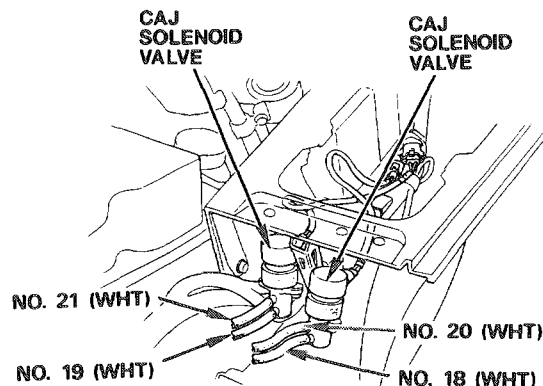
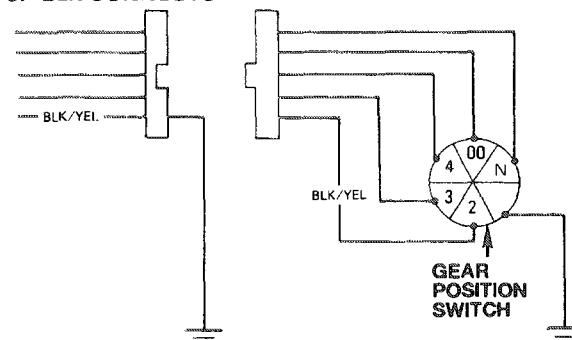
Disconnect the air tubes, 2P-GRN connector, and 2P-RED connector.

Remove the carburetor air jet solenoid valves.



6P-BLK CONNECTOR

6P-BLK CONNECTOR



Fuel System

Carburetor Air Jet (CAJ) Control System (cont'd)

Connect a vacuum pump as shown.

Tool:

Vacuum pump
ST-AH-260-MC7

Apply the specified vacuum to the CAJ valve. Vacuum should hold.

Specified Vacuum: 400 mmHg (15.7 inHg)

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)

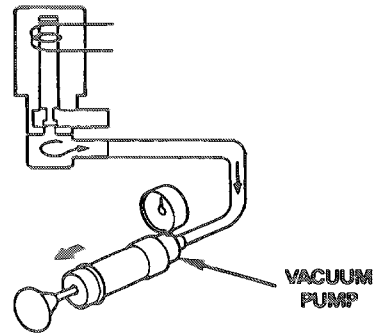
Connect a 12V battery to the valve wires. Vacuum should be released. Replace the valve if vacuum remains steady.

Install the valve in the reverse order of removal.

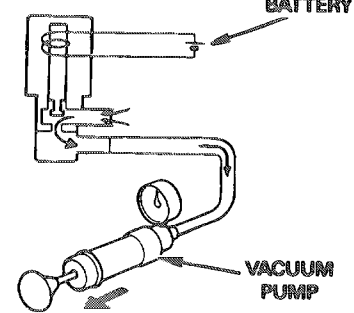
NOTE

- Route the tubes properly (page 4-7) and check the tube for loose or poor connections.

CAJ SOLENOID VALVE



CAJ SOLENOID VALVE



Intake Air Temperature (IAT) Sensor Inspection

Remove the air cleaner housing cover (see page 4-18).

Remove the IAT sensor from the air cleaner housing cover by removing the nut.

Disconnect the 2P-GRN connector from the IAT sensor.

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

Standards:

2.0-3.0 K ohms at 20°C (68°F)

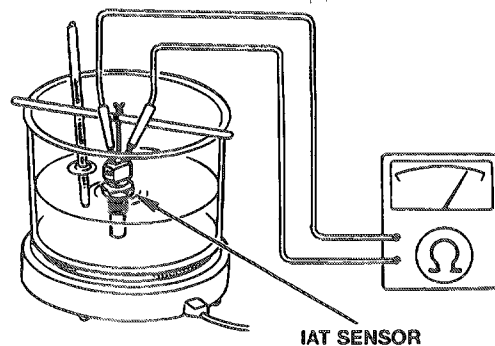
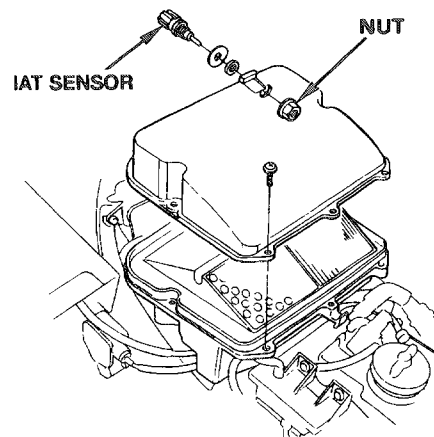
200-400 ohms at 80°C (176°F)

NOTE

- If the sensor or thermometer touches the pan, false readings will result.
- Keep water off the sensor terminals.

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

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





Intake Air Temperature (IAT) System

Intake Air Temperature (IAT) Vacuum Actuator Inspection

Remove the air duct (see page 4-18).

Connect a vacuum pump to the IAT vacuum actuator and apply the specified vacuum.

Specified Vacuum: 200 mmHg (7.9 inHg)

Tool:

Vacuum pump
ST-AH-260-MC7

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

Replace the IAT vacuum actuator if it doesn't pass this test.

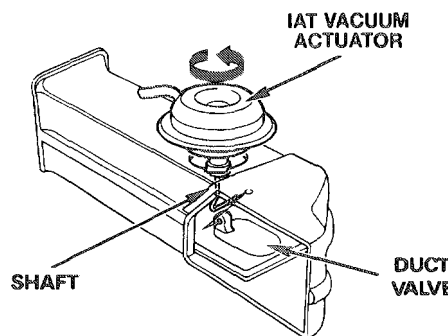
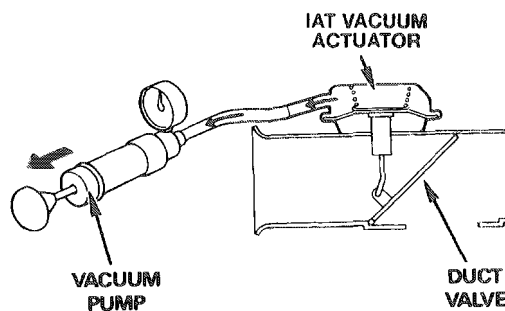
Turn the IAT vacuum actuator counterclockwise and disconnect the diaphragm shaft from the duct valve.

Remove the IAT vacuum actuator from the duct.

Install the IAT vacuum actuator in the reverse order of removal.

NOTE

- Install the IAT vacuum actuator with its vacuum pipe direction as shown.



IAT Thermal Vacuum Valve Inspection

Remove the air cleaner housing (see page 4-18).

Remove the screw and IAT thermal vacuum 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 valve.

Tool:

Vacuum pump
ST-AH-260-MC7

Specified Vacuum: 220 mmHg (8.7 inHg)

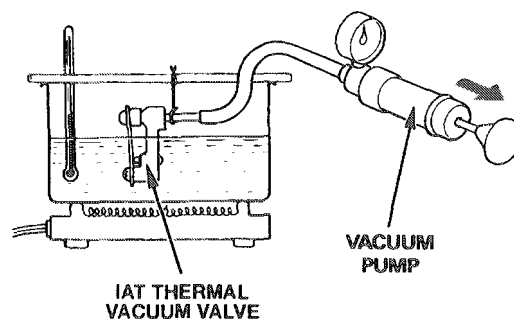
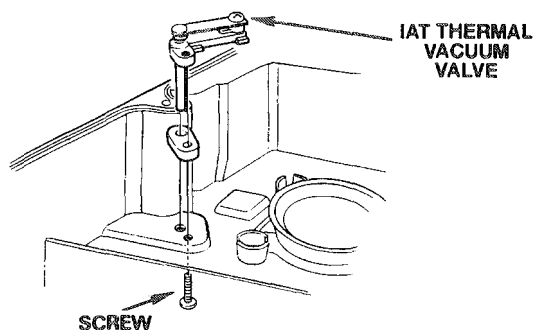
The following results are normal:

Below 11°C (52°F): The vacuum should hold.

Above 16°C (61°F): The vacuum should not hold.

NOTE

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



Install the IAT vacuum actuator valve in the reverse order of removal.

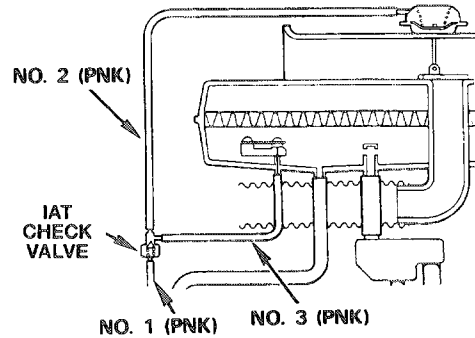
Fuel System

Intake Air Temperature (IAT) System (cont'd)

IAT Check Valve Inspection

Remove the air duct (see page 4-18).

Remove the IAT 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.

Tool:
Vacuum pump
ST-AH-260-MC7

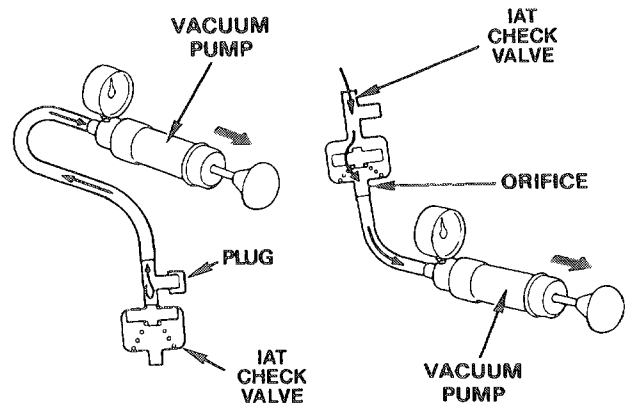
Apply the specified vacuum. Vacuum should hold.

Specified Vacuum: 40 mmHg (1.6 inHg)

Then, connect a vacuum pump to the No. 1 (PNK) port as shown. Apply vacuum.

Vacuum should not hold; the vacuum gauge should show a gradual bleed attributable to the valve orifice.

Install the valve in the reverse order of removal.



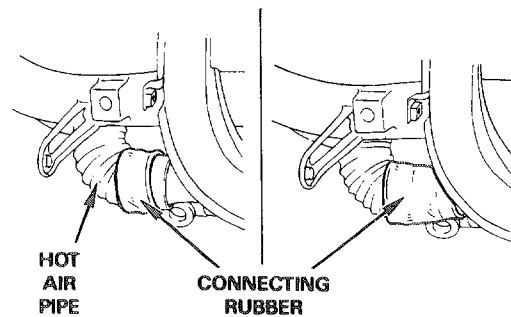
Hot Air Pipe

Remove the under cover (see page 13-11).

Remove the left cooling fan (see page 5-11).

Remove the air cleaner duct (see page 4-18).

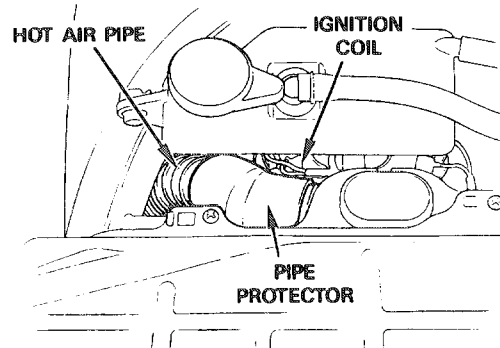
Disconnect the hot air pipe from the hot air chamber (left exhaust pipe) and remove the pipe. Check it for damage or deterioration.

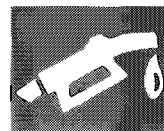


Install the pipe in the reverse order of removal, being careful to follow the instructions in the following note.

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 can be attached to the ignition coil as shown.





Pulse Secondary Air Injection (PAIR) System

System Inspection

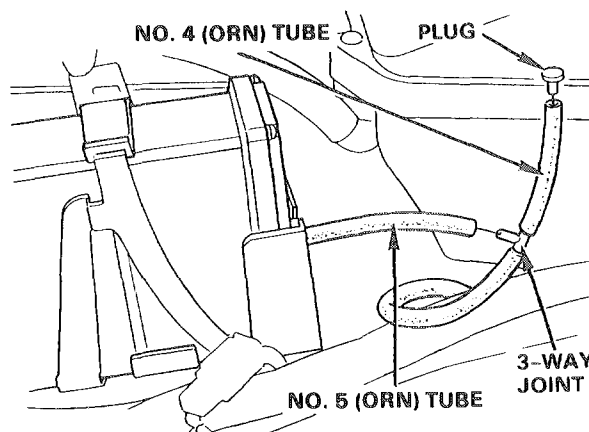
Remove both fairing inner covers (see page 13-12).

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 module No. 5 (ORN) tube.

Tool:

Vacuum pump
ST-AH-260-MC7



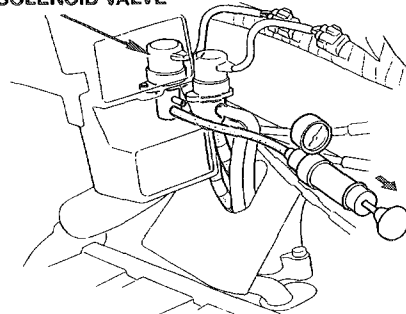
Disconnect the No. 1 and No. 6 (GRN) tubes from the PAIR solenoid valve and plug the tube ends.

Connect a vacuum pump as shown and apply the specified vacuum to the valve.

Tool:

Vacuum pump
ST-AH-260-MC7

PAIR SOLENOID VALVE



Specified Vacuum: 200 mmHg (7.9 inHg)

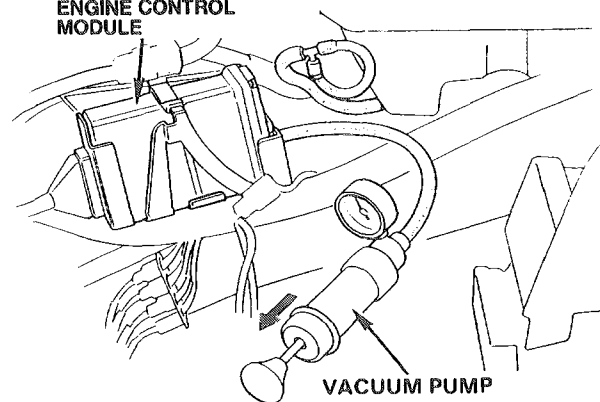
Start the engine and allow it to idle.

Vacuum should hold.

Apply the specified vacuum to the engine control module.

Specified Vacuum: 550 mmHg (21.7 inHg)

ENGINE CONTROL MODULE



Vacuum applied to the PAIR solenoid valve should release.

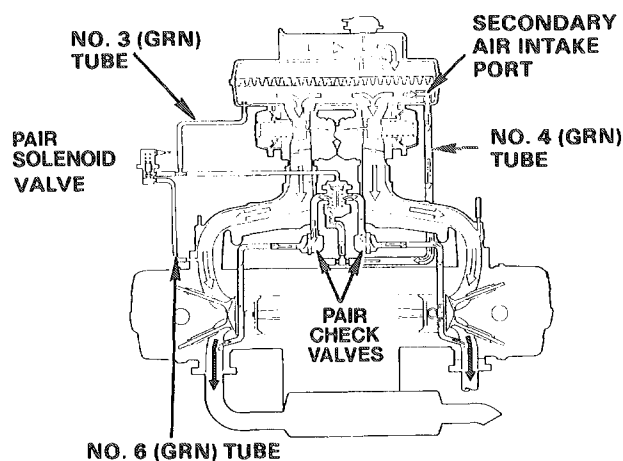
Stop the engine and remove the air cleaner element (see page 4-18).

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

Check the PAIR check valves in the secondary air passage if the ports are carbon fouled (see page 4-57).

Disconnect the air cleaner to PAIR control valve No. 4 (GRN) tube from the air cleaner housing.

Clamp No. 6 (GRN) tube at the PAIR solenoid valve.



Fuel System

Pulse Secondary Air Injection (PAIR) System (cont'd)

Connect a vacuum pump to the No. 3 (GRN) tube.

Tool:

Vacuum pump
ST-AH-260-MC7

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.

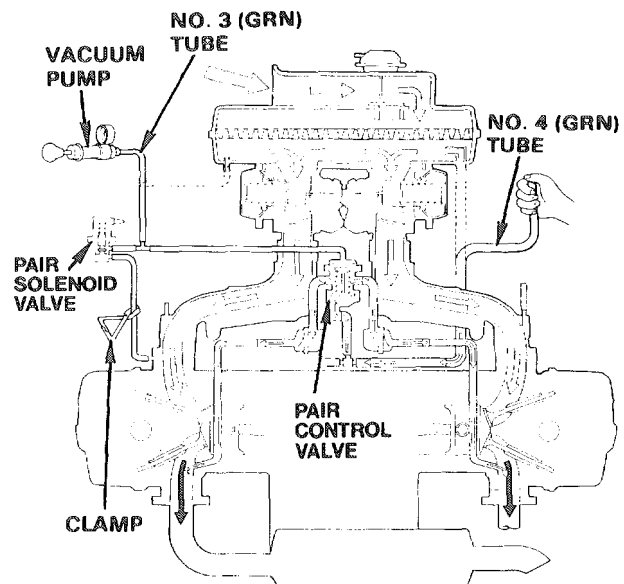
With the engine running, gradually apply vacuum to the No. 3 (GRN) tube.

Specified Vacuum: 200 mmHg (7.9 inHg)

Check that the air intake port stops drawing air, and that the vacuum holds.

If air is still drawn in, or if the specified vacuum is not maintained, check No. 1 and No. 3 (GRN) tubes for clogging. Replace the PAIR control valve, if necessary.

Check the PAIR check valve joint hoses and air supply pipes (see page 4-7).



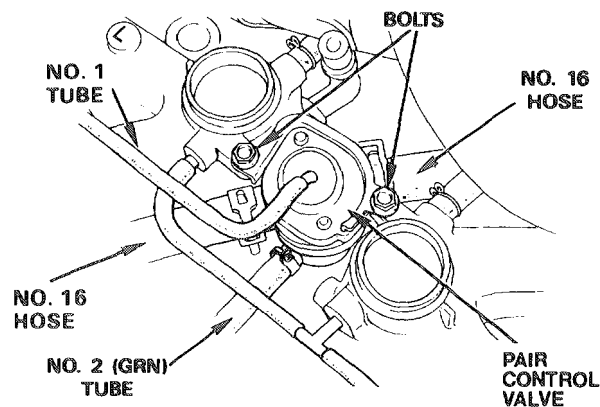
PAIR Control Valve Removal/Installation

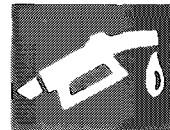
Remove the carburetor (see page 4-19).

Disconnect the No. 1, No. 2 (GRN) tubes and No. 16 hoses from the PAIR control valve.

Remove the bolts and PAIR control valve. Inspect the PAIR control valve.

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





PAIR Check Valve Inspection

Remove the PAIR control valve (see previous page).
Remove the bolts and PAIR check valve case.

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

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

Remove the pipe mounting bolts (No. 3 and No. 4).
Remove the exhaust pipes (see page 7-28).

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 (see page 7-6).
Remove the bolts, gasket, and air supply pipe of the No. 3 cylinder.

Check the pipes and O-rings for damage or fatigue.

Remove the PAIR check valve cover and PAIR check valves.

Check the reeds for damage or fatigue. Replace, if necessary.

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

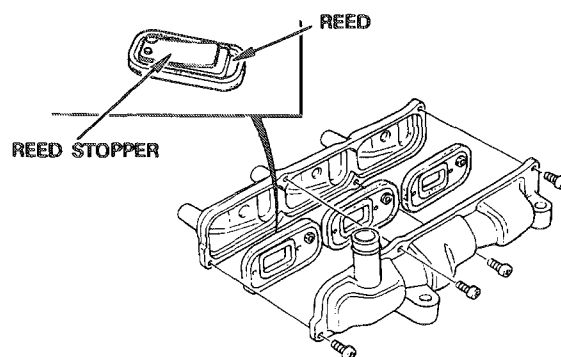
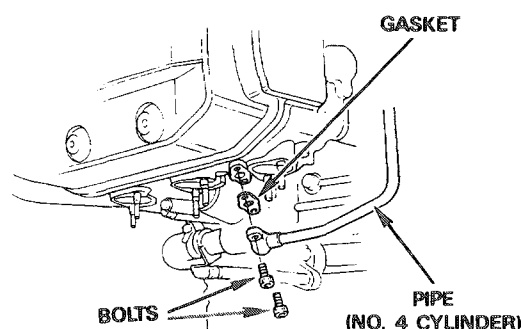
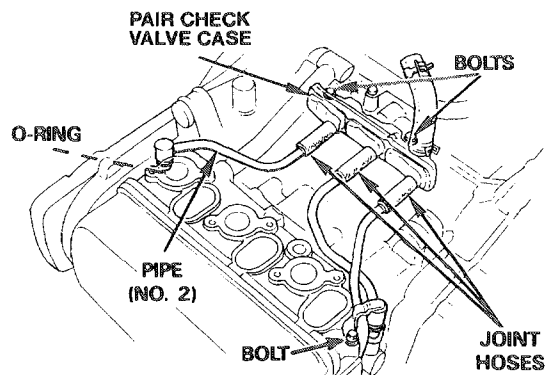
CAUTION

- 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 PAIR check 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 (see page 4-7).



Fuel System

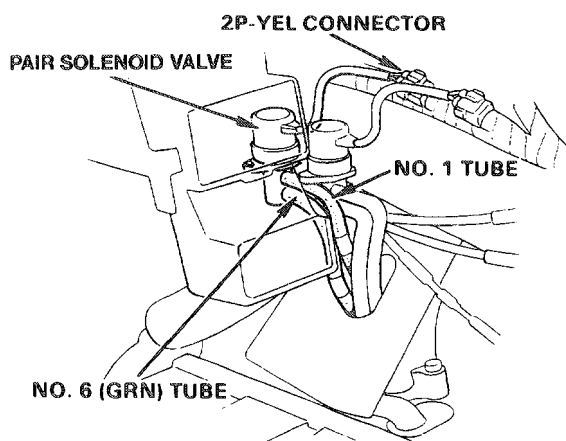
Pulse Secondary Air Injection (PAIR) System (cont'd)

PAIR Solenoid Valve Inspection

Remove the left fairing inner cover (see page 13-12).

Disconnect the No. 1 tube and No. 6 (GRN) tube from the PAIR solenoid valve.

Disconnect the 2P-YEL connector and remove the PAIR solenoid valve.



Connect a vacuum pump as shown.

Tool:

Vacuum pump
ST-AH-260-MC7

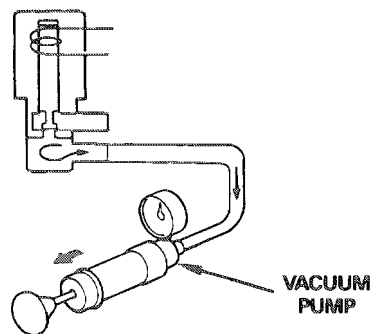
Apply the specified vacuum to the valve.

Specified Vacuum: 400 mmHg (15.7 inHg)

Vacuum should hold.

Replace the valve if vacuum does not hold.

PAIR SOLENOID VALVE



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

Specified Vacuum: 200 mmHg (7.9 inHg)

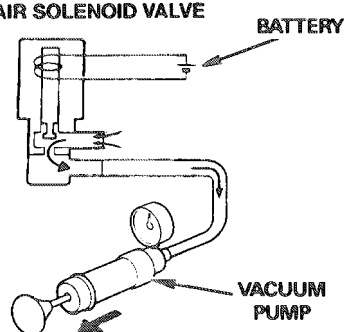
Connect a 12V battery to the valve wires. Vacuum should be released. Replace the valve if vacuum remains steady.

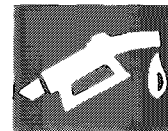
Install the valve in the reverse order of removal.

NOTE

- Route the tubes properly (page 4-7) and check the tube for loose or poor connections.

PAIR SOLENOID VALVE





Evaporative Emission (EVAP) Control System (California model only)

Remove the left fairing inner cover (see page 13-12).

Check the system hoses for deterioration, clogging, damage, loose joints and connection.

Replace any hose that shows signs of damage or deterioration.

Evaporative Emission (EVAP) Purge Control Valve Inspection

NOTE

- The EVAP purge control valve should be inspected if restarting a warm engine is difficult.

Disconnect the EVAP purge control valve hoses from their connections and remove the EVAP purge control valve from its mount. Refer to the routing label on the fuel tank below the top compartment for hose connections.

Connect a vacuum pump to the No. 11 hose fitting that goes to the right carburetor body. Apply the specified vacuum to the EVAP purge control valve.

Tool:

Vacuum pump
ST-AH-260-MC7

Specified Vacuum: 250 mmHg (9.8 inHg)

The specified vacuum should hold.

Replace the EVAP purge control valve if vacuum does not hold.

Remove the vacuum pump and connect it to the No. 4 hose fitting that goes to the left carburetor.

Apply the specified vacuum to the EVAP purge control valve.

Specified Vacuum: 40 mmHg (1.6 inHg)

The specified vacuum should hold.

Replace the EVAP purge control valve if vacuum does not hold.

Connect a pressure pump to the No. 4 hose fitting that goes to the EVAP canister. Apply the specified vacuum to the No. 11 hose fitting that goes to the right carburetor. Pump air through the canister port. Air should flow through the EVAP purge control valve and out the No. 5 hose port that goes to the carburetor. Replace the EVAP purge control valve if air does not flow out.

Tool:

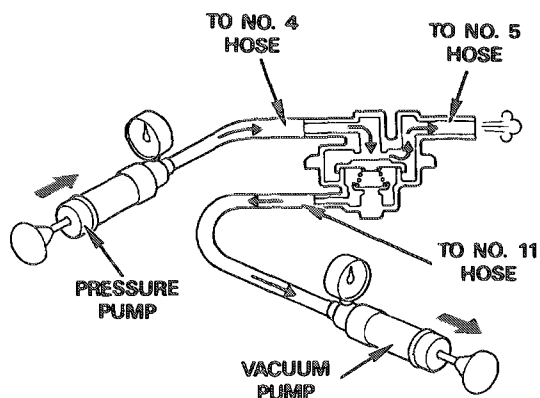
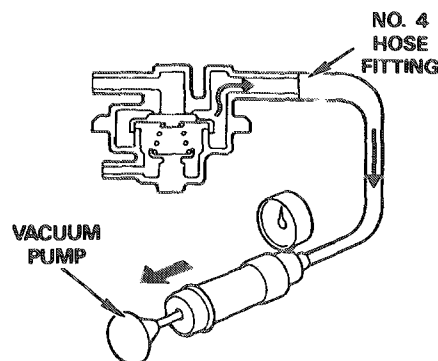
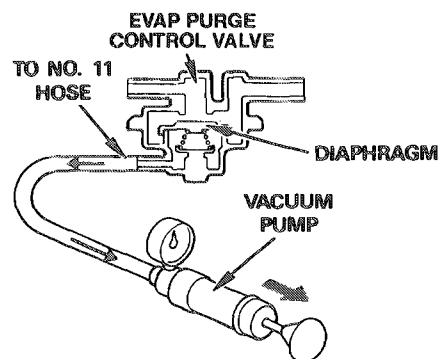
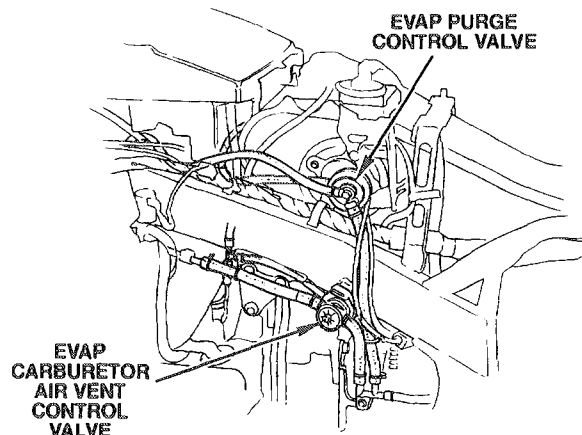
Pressure pump
ST-AH-255-MC7

Specified Vacuum: 50 mmHg (2.0 inHg)

CAUTION

- To prevent damage to the EVAP purge control valve, do not use high air pressure sources. Use a hand-operated air pump only.

Remove the pump, install the EVAP purge control valve on its mount, route and reconnect the hoses according to the vacuum hose routing diagram on the fuel tank (below the seat) or the hoses and tubes routing/connection diagram (page 4-7).



Fuel System

Evaporative Emission (EVAP) Control System (California model only) (cont'd)

Canister

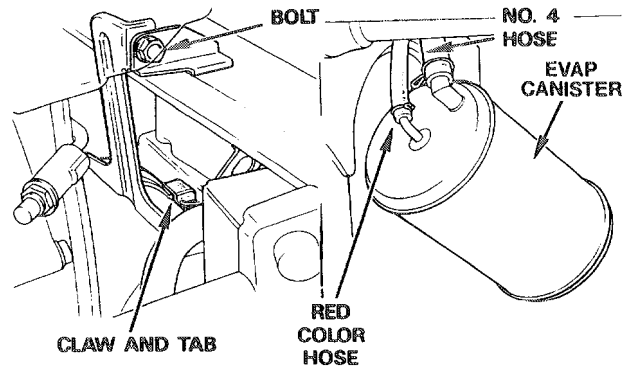
Remove the EVAP canister mounting bolt and release the claw from the frame tab.

Disconnect the No. 4 hose and red color hose from the EVAP canister.

Remove the EVAP canister.

Check the EVAP canister for any cracks, deterioration, or damage.

Install the EVAP canister in the reverse order of removal.



EVAP Carburetor Air Vent (CAV) Control Valve Inspection

NOTE

- The EVAP CAV control valve should be inspected if restarting a warm engine is difficult.

Disconnect the EVAP CAV control valve hoses from their connections and remove the EVAP CAV control valve from its mount. Refer to the routing label on the fuel tank for hose connections.

Connect a vacuum pump to the No. 10 hose that goes to the intake manifold. Apply the specified vacuum.

Specified Vacuum: 250 mmHg (9.8 inHg)

The specified vacuum should hold.

Replace the EVAP CAV control valve if vacuum does not hold.

Connect the vacuum pump to the air vent port of the EVAP CAV control valve.

Apply vacuum to the EVAP CAV control valve. The vacuum should hold steady.

Replace the EVAP CAV control valve if vacuum leaks.

Connect the vacuum pump to the No. 10 hose that goes to the intake manifold.

Connect the pressure pump to the air vent port of the EVAP CAV control valve.

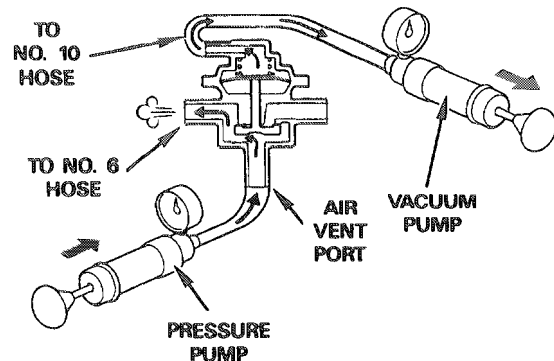
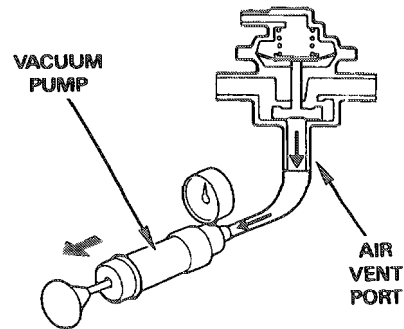
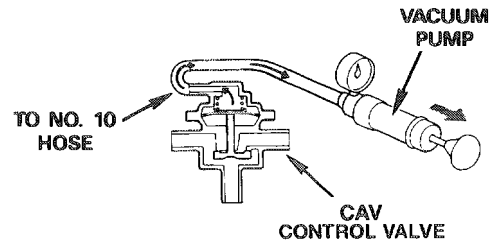
Tool:

Pressure pump
ST-AH-255-MC7

While applying the vacuum to the No. 10 hose port, pump air through the air vent port. Air should flow through the EVAP CAV control valve and out the No. 6 hose port that goes to the carburetors.

CAUTION

- To prevent damage to the EVAP CAV control valve, do not use high air pressure sources. Use a hand-operated air pump only.



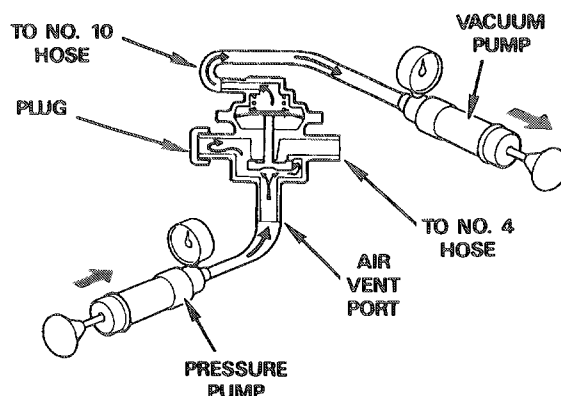


Plug the No. 6 hose port that goes to the carburetors.

While applying vacuum to the No. 10 hose port, apply air pressure from the air vent port. It should hold steady.

Replace the EVAP CAV control valve if pressure is not retained.

Remove the pumps, install the EVAP CAV control valve on its mount, route and reconnect the hoses according to the vacuum hose routing diagram on the fuel tank (below the seat) or on the hose and tubes routing/connection diagram (pages 4-7 and 4-8).



Cruise Control (A & SE only)

Service Information

Before troubleshooting the Cruise Control System (see next page), perform the following system check with a road test:

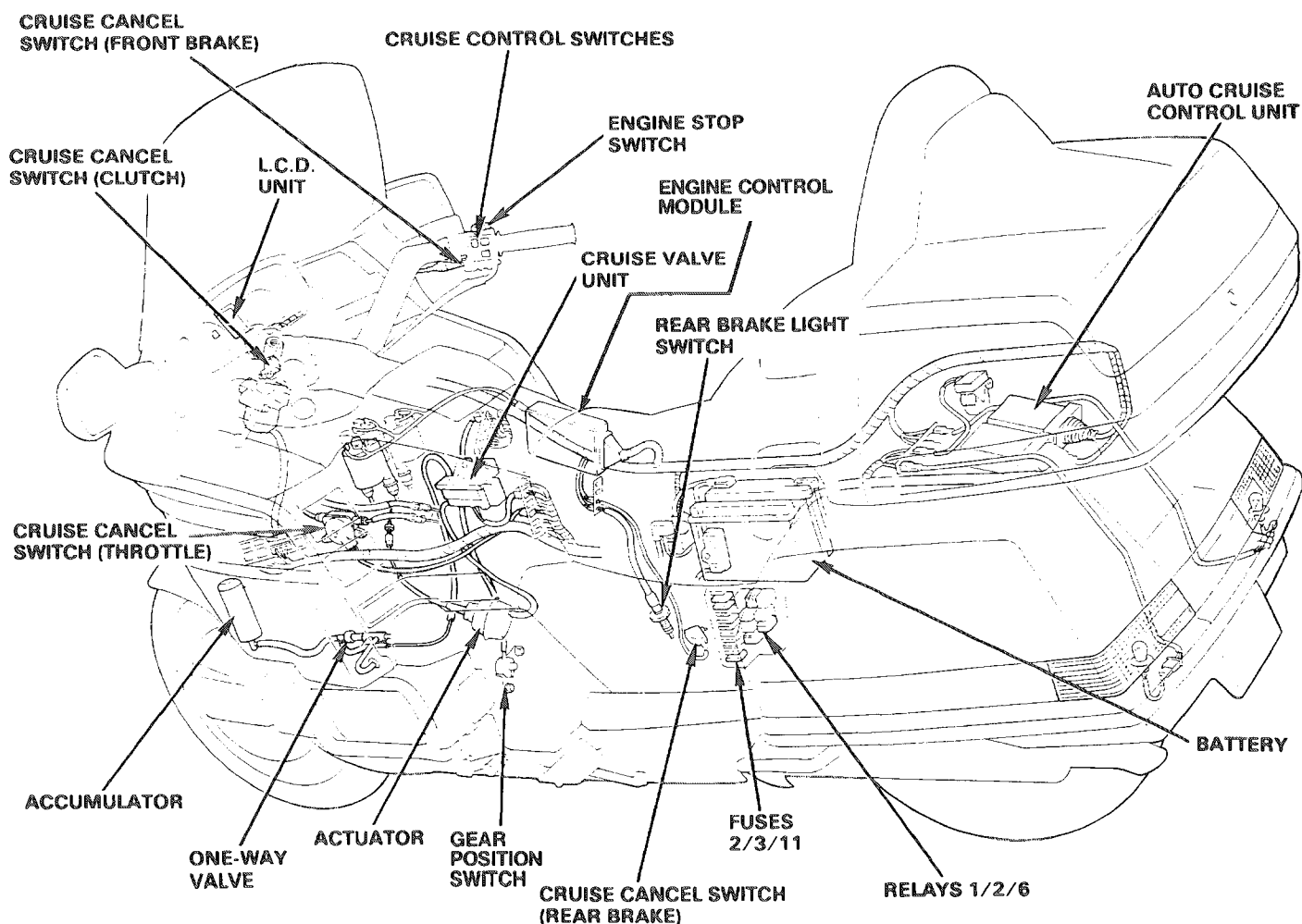
1. Make sure the battery is fully charged and its terminals and cables are clean and tight.
2. Turn the ignition switch to ON. The "Cruise Set" and "Cruise On" indicator lights should go on for a few seconds and then go out.
3. Turn the "Cruise On" switch to ON. The "Cruise On" indicator light should go on and stay on.
4. Start the motorcycle and accelerate to a speed above 30 mph (48 km/h). With the transmission in 4th or OD gear, press the Set/Decel switch and release the throttle grip. With the Set/Decel switch depressed, the motorcycle should maintain the set speed.
5. Tap the Set/Decel switch once. The motorcycle speed should decrease by one mph.
6. Tap the Resume/Accel switch once. The motorcycle speed should increase by one 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 should set and maintain the speed at the time of release.
8. Press and momentarily hold the Resume/Accel switch, then release it. The speed should increase as long as you hold the switch. Releasing the switch should set and maintain the speed at the time of release.
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 front brake, apply the rear brake). 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 30 mph (48 km/h). If the motorcycle has decelerated below 30 mph (48 km/h) you can return to the set speed by using the throttle conventionally until you are above 30 mph (48 km/h) and then pushing the Set/Resume switch.
10. Rotate the throttle grip to increase your speed, then release it. The motorcycle should slow and resume the set speed.

Fuel System

Cruise Control (cont'd)

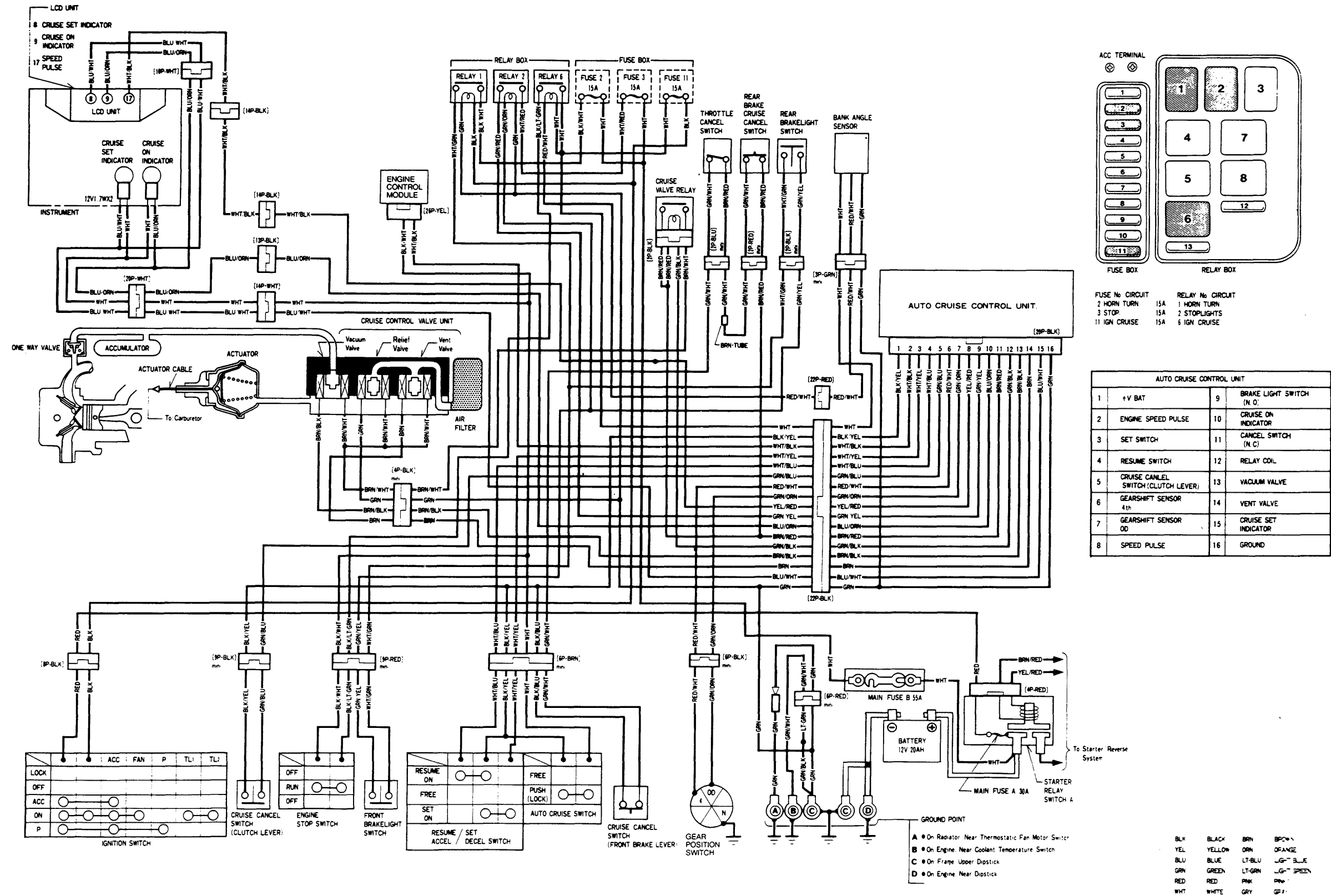
11. The system will enter any speed above 80 mph (128 km/h) as its maximum speed of 80 mph (128 km/h).
 12. With the cruise control on, your speed will still vary slightly, particularly going up or down hills.
 13. You can cancel the cruise control by turning off the cruise control switch, ignition switch, or engine stop switch. This removes power to the control unit and erases the set speed from memory.
- When inspecting the cruise control system, check the system components step-by-step according to the troubleshooting charts beginning on page 4-64.

System Location





Circuit Diagram



Fuel System

Cruise Control (cont'd)

Troubleshooting

Cruise control does not function at all.

NOTE

Cruise control is cancelled when:

- Either brake (front or rear) is applied.
- The clutch lever is operated.
- The throttle is returned.

Cruise speed memory is cancelled when:

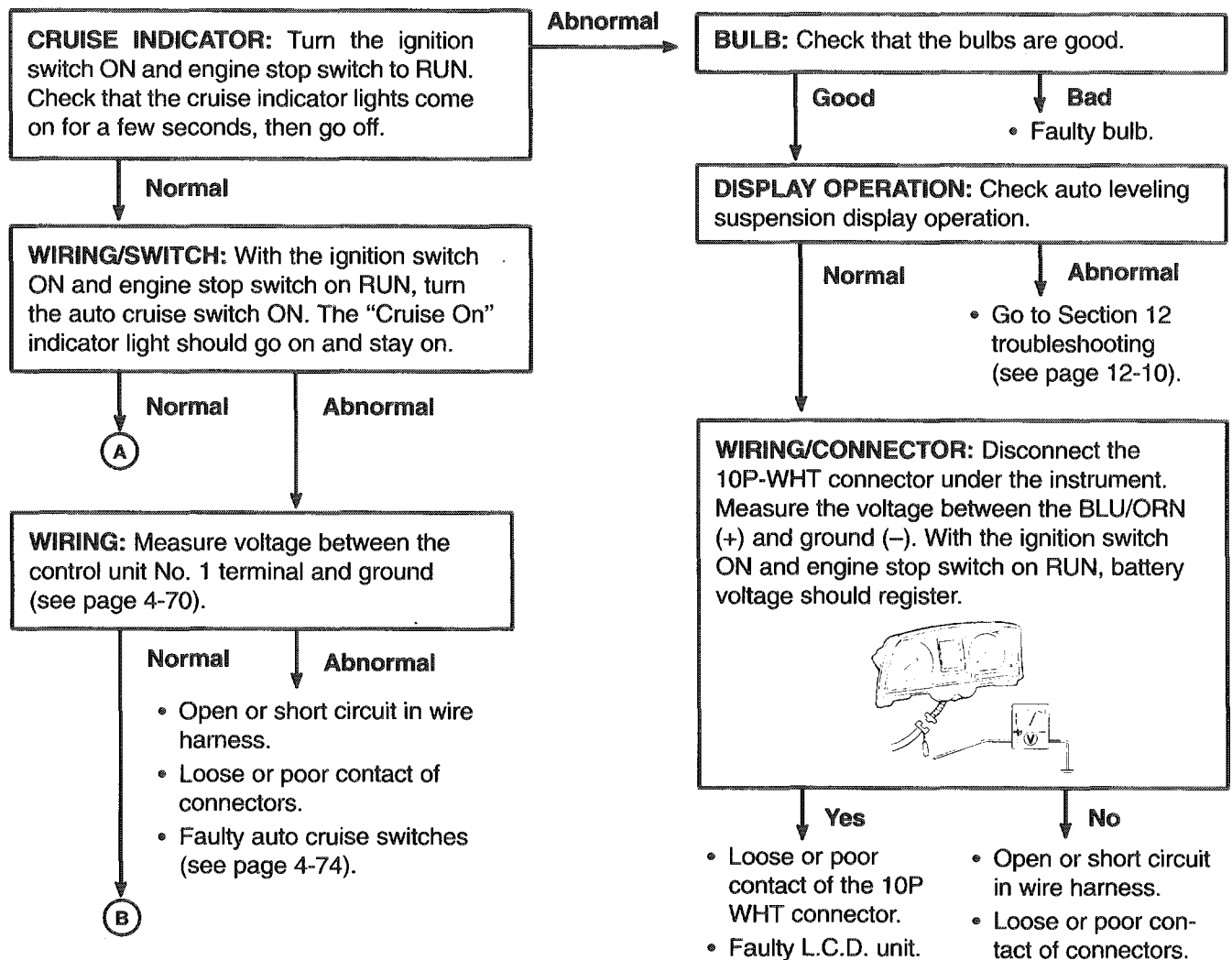
- The ignition switch, engine stop switch, or auto cruise switch is operated.

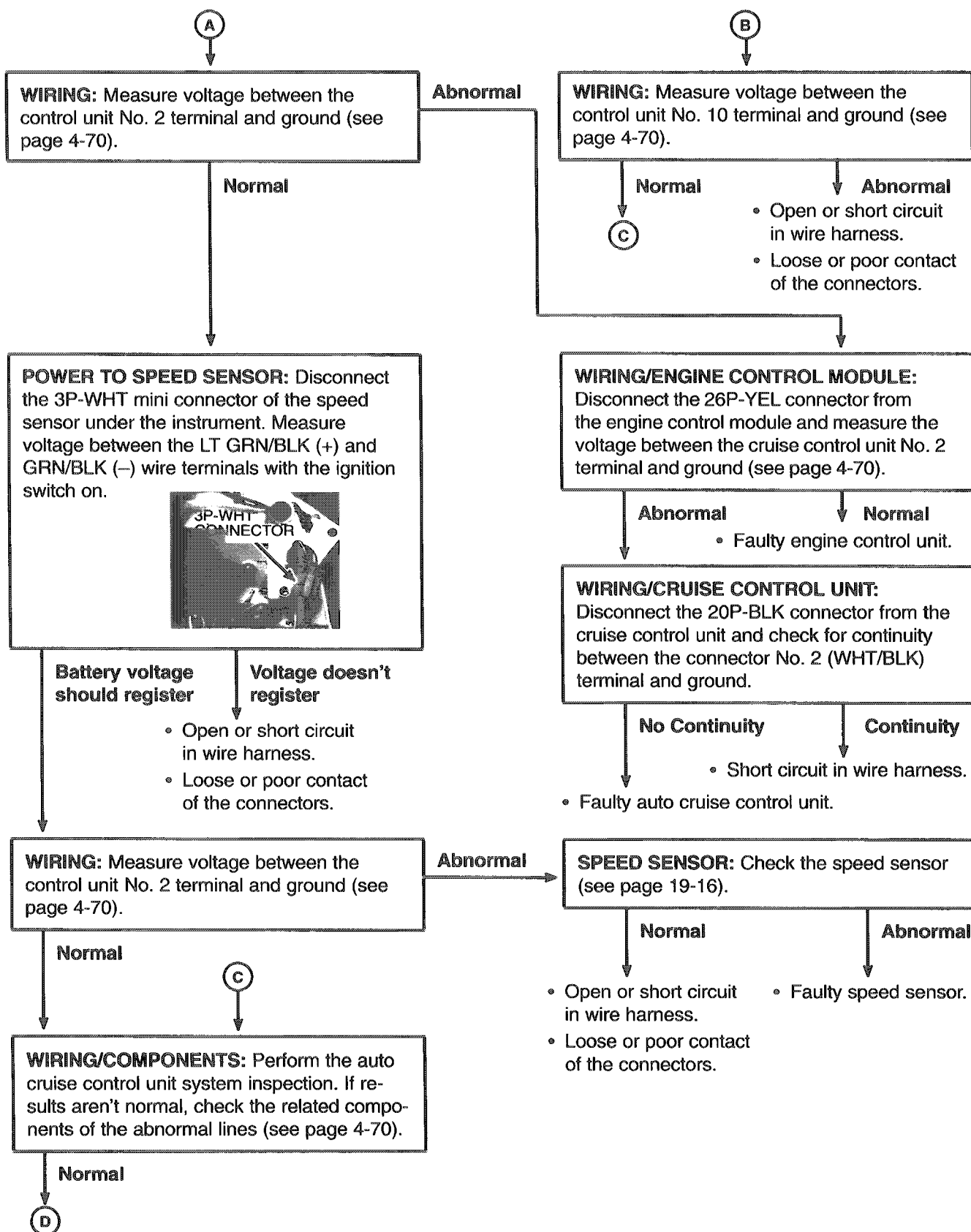
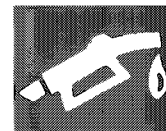
Cruise control will not function under the following conditions:

- At speeds other than 30-80 mph (48-128 km/h).
- When the transmission is in a gear other than 4th or OD.

Inspect the following before troubleshooting the cruise control system.

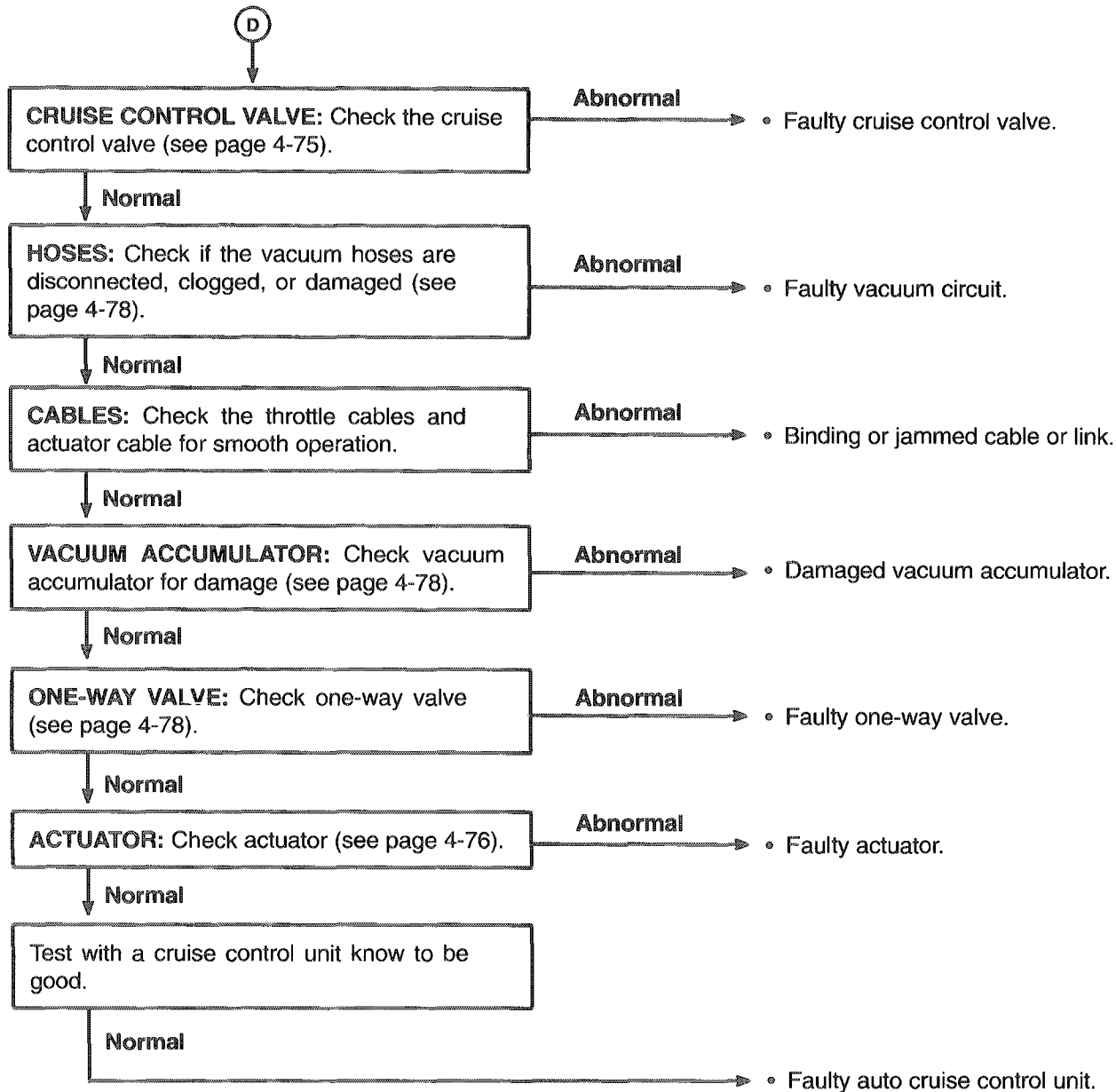
- Be sure that fuse 11 (15A), inside the fuse box, is good.
- Be sure the terminal connections of the cruise cancel switches (see page 4-72) are good.
- Be sure the cruise cancel switch of the rear brake is properly adjusted (see page 4-73).





Fuel System

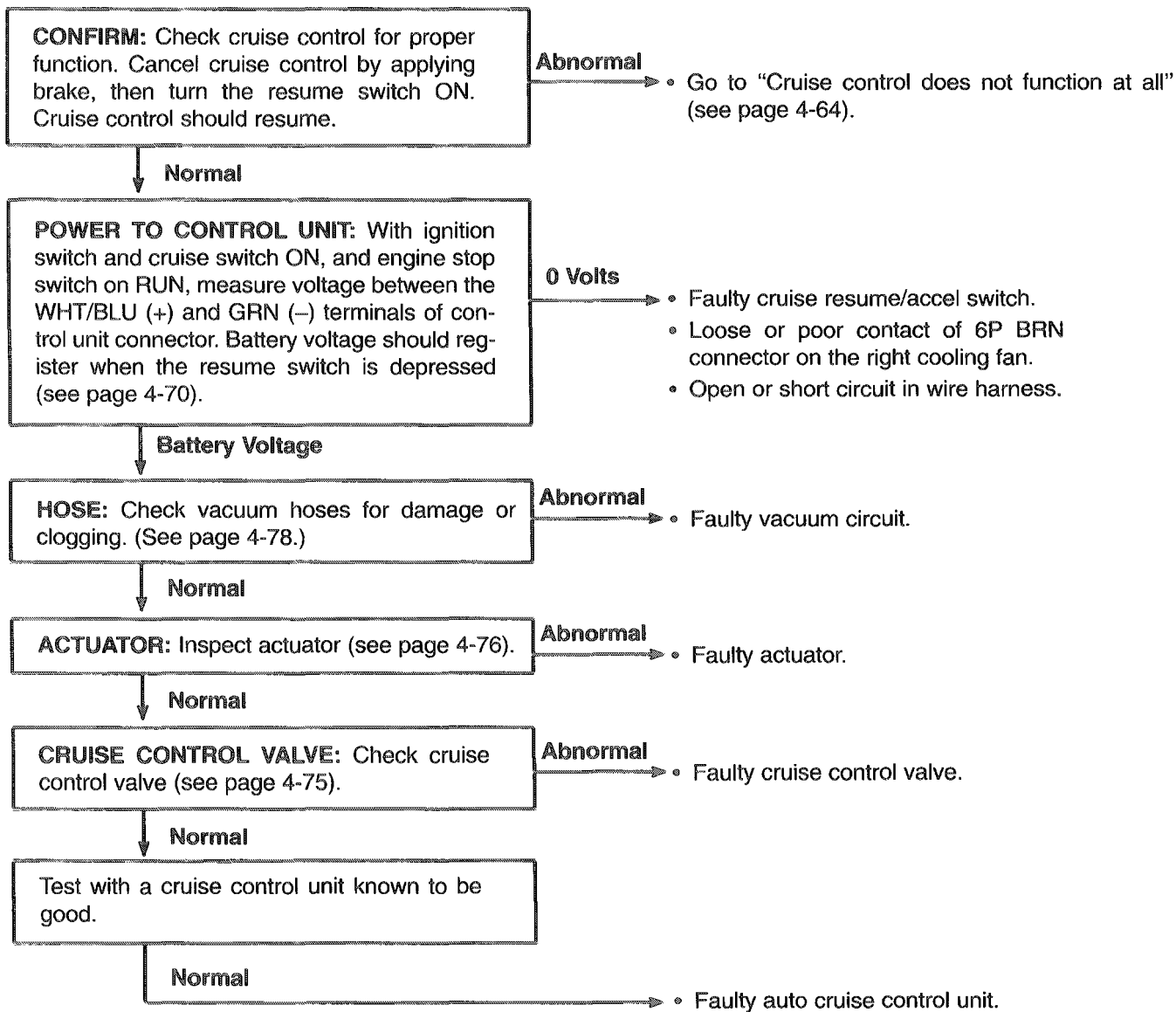
Cruise Control (cont'd)



Cruise Control Will Not Resume

NOTE

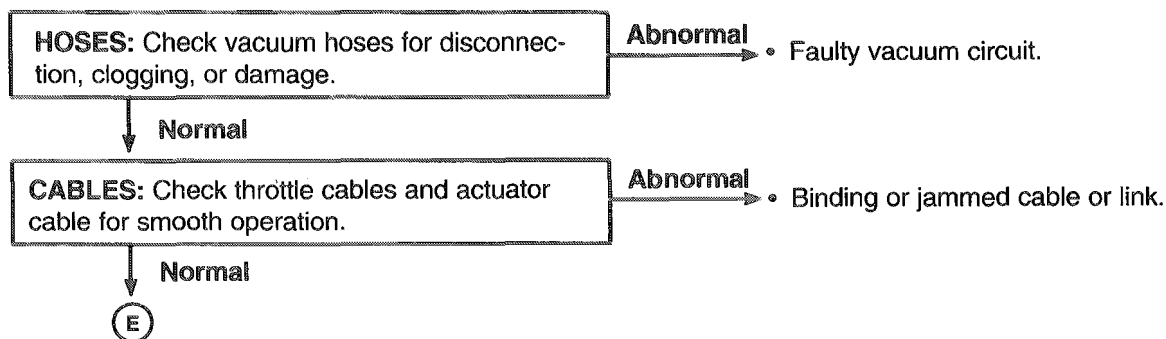
- Cruise control will not resume if speed drops below 30 mph (48 km/h).
 - Holding the resume/accel switch ON causes the motorcycle to accelerate to nearly full throttle. However, cruise control will only operate to 80 mph (128 km/h).
 - Cruise control will not resume when either the auto cruise switch, engine stop switch, or ignition switch is turned OFF, or when both the resume and set switch are operated simultaneously (memory is erased).
-



Cruise Speed Fluctuates Excessively (More than 5 mph) Immediately After Setting

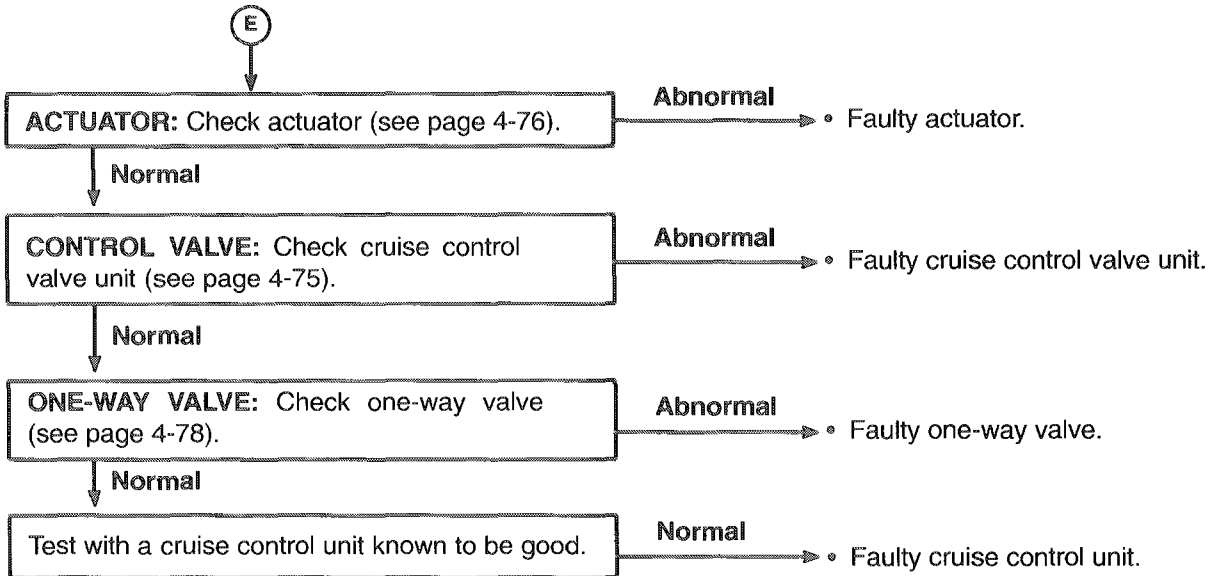
NOTE

- Before troubleshooting, check the carburetor synchronization. adjust synchronization, if necessary (see page 3-20).

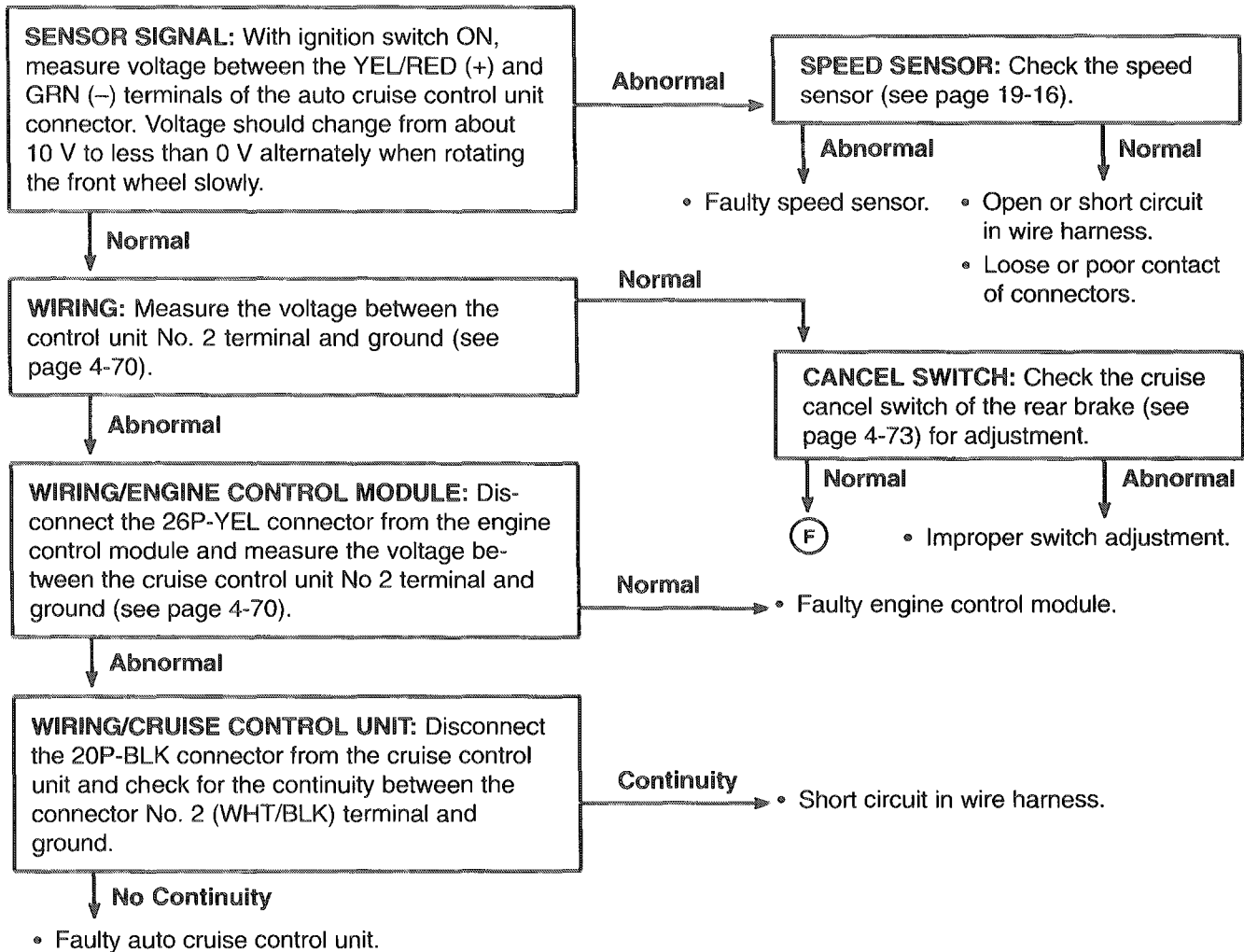


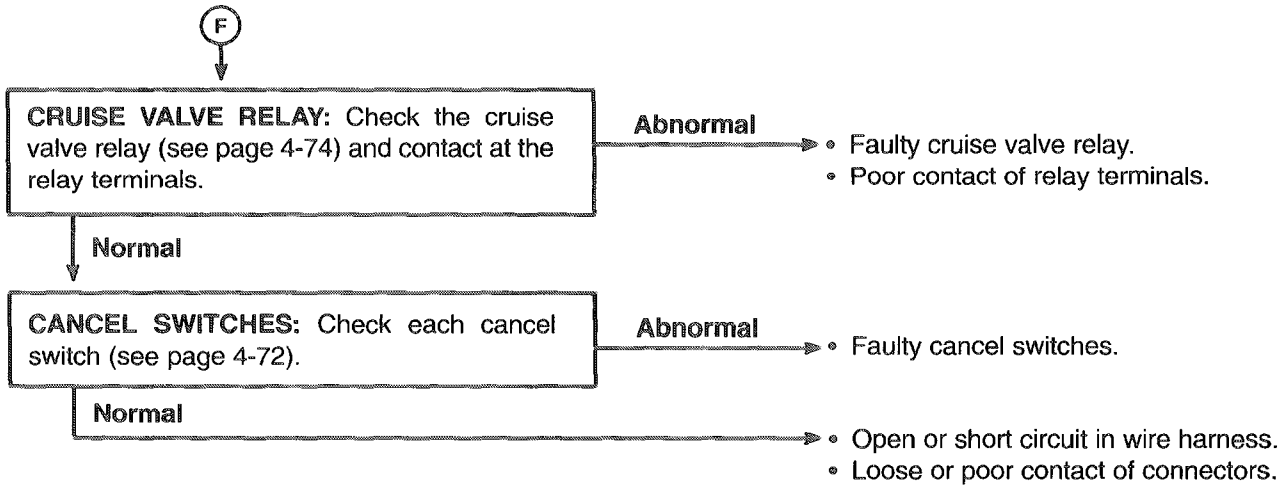
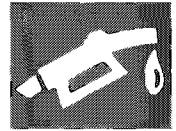
Fuel System

Cruise Control (cont'd)



Cruise Control is Cancelled Accidentally

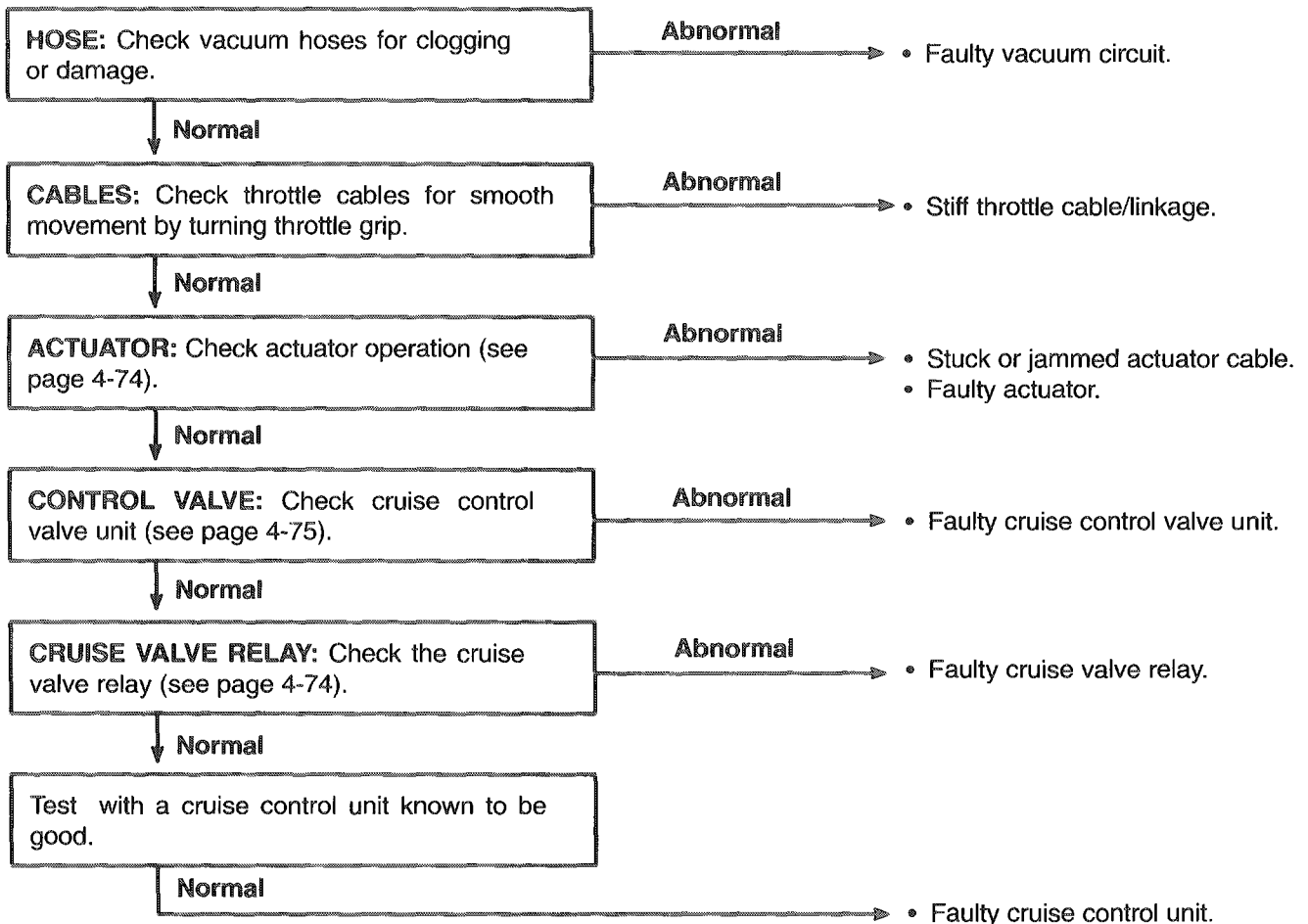




Cruise Control Cannot be Cancelled.

NOTE

- The cruise control should cancel when a brake is applied, the clutch lever is pulled in, the throttle is closed, or the transmission is shifted. Check the cancel switches, brake light switches and gear position switch for proper operation before proceeding further.



Fuel System

Cruise Control (cont'd)

Auto Cruise Control Unit

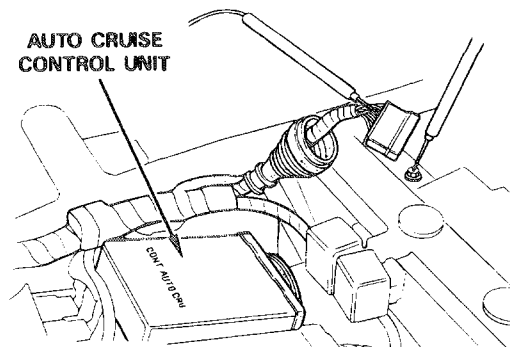
– System Inspection

Remove the trunk (see page 13-14).

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 (+) of the 20P-BLK connector.

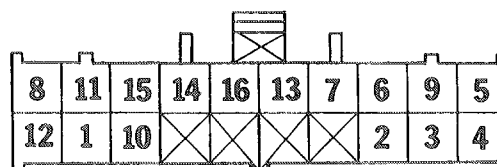
If a terminal/line check is not normal, first check the wire harness for an open or short circuit. Also check the connectors for loose or poor contact. Then, using the chart below, inspect the following related component(s), observing the conditions identified in the following note:



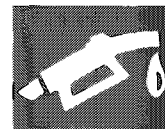
NOTE (CONDITIONS FOR CHART BELOW)

- 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

WIRE HARNESS SIDE OF CONNECTOR



TERMINAL LINE	COLOR	VOLTAGE	CONDITION(S)	RELATED COMPONENT(S)	
1	Battery voltage (+)	BLK/YEL	Battery	1, 2	Auto cruise switch (see page 4-74)
2	Engine speed pulse	WHT/BLK	Battery	1, 9	Engine control module (see page 16-7)
3	Set/decel switch	WHT/YEL	Battery	1, 2, 3	Set/decel switch (see page 4-74) Auto cruise switch (see page 4-74)
4	Resume/accel switch	WHT/BLU	Battery	1, 2, 4	Resume/accel switch (see page 4-74) Auto cruise switch (see page 4-74)
5	Cruise cancel switch (clutch)	GRN/BLU	Battery	1, 2, 5	Cruise cancel switch (clutch) (see page 4-72) Auto cruise switch (see page 4-74)
8	Speed sensor (+)	YEL/RED	0-10 Pulse	8	Speed sensor (see page 19-16)
9	Brakelight switch	GRN/YEL	Battery	6	Front brakelight switch (see page 3-28) Rear brakelight switch (see page 3-28) Relay 2 (see page 4-74)
10	CRUISE ON indicator	BLU/ORN	Battery	1	CRUISE ON indicator bulb (see page 19-16)
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) (see page 4-72) Auto cruise switch (see page 4-74)
12	Relay coil	GRN/BLK	Battery	1, 2, 7	Cruise cancel switch (front brake, rear brake and throttle) See page 4-72 Auto cruise switch (see page 4-74) Cruise valve relay (see page 4-74)
15	CRUISE SET indicator bulb	BLU/WHT	Battery	1	CRUISE SET indicator bulb (see page 19-16)



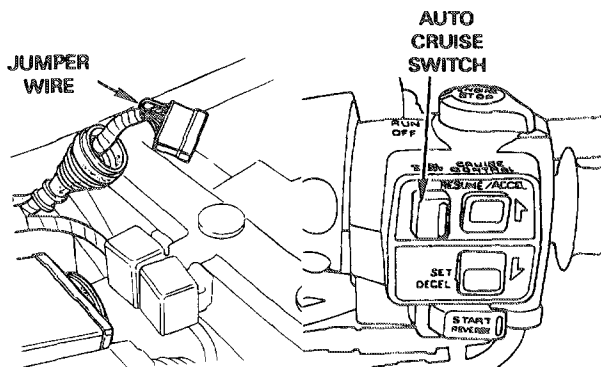
Next, inspect terminals 13 (vacuum valve) and 14 (vent valve):

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 the GRN terminal with a jumper.

Depress the auto cruise switch. The cruise control valve (relief) is normal if it clicks.

NOTE

- The cruise valve relay should also click at the same time.



Maintain all of the above conditions and ground the terminal 13 (BRN/BLK wire) with a jumper. The cruise control valve (vacuum) is normal if it clicks.

Then ground terminal 14 (BRN wire) with a jumper. The cruise control valve (vent) is normal if it clicks.

Next, maintaining all of the above conditions, measure voltage between terminal 13 (BRN/BLK wire) (+) and ground and between terminal 14 (BRN wire) (+) and ground. Battery voltage should register.

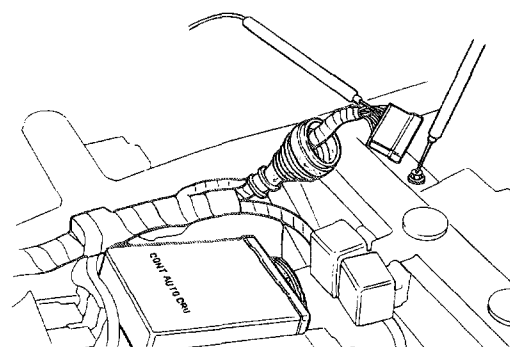
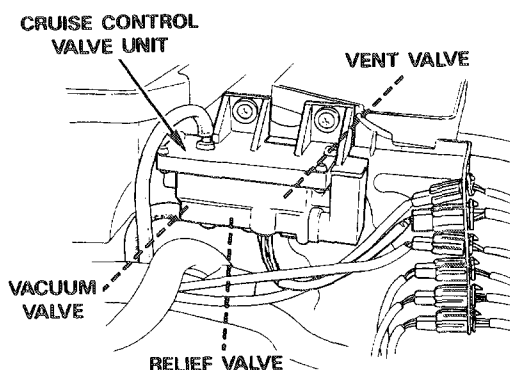
If battery voltage doesn't register, inspect the following:

- Wire harness for open or short circuit.
- Connectors for loose or poor contact.
- Cruise cancel switch (front brake, rear brake and throttle) (see page 4-72).
- Cruise valve relay (see page 4-74).
- Cruise control valve unit (see page 4-75).

Next, inspect terminals 6, 7, and 16.

Turn the ignition switch to OFF.

Check for continuity between the following wires in the 20P-BLK connector and ground.



TERMINAL LINE	COLOR	CONTINUITY	CONDITION	PROBABLE CAUSE	
6	Gear position switch: 4th	RED/WHT	Exists	Transmission in 4th	<ul style="list-style-type: none"> • Open or short circuit in wire harness • Loose or poor contact of connector • Gear position switch (see page 16-13)
7	Gear position switch: OD	GRN/ORN	Exists	Transmission in OD	
16	Ground	GRN	Exists	At all times	<ul style="list-style-type: none"> • Open or short circuit in wire harness • Loose or poor contact of ground terminal

Fuel System

Cruise Control (cont'd)

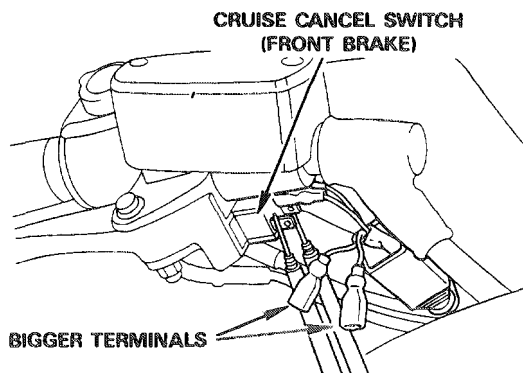
Cruise Cancel Switches

– 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

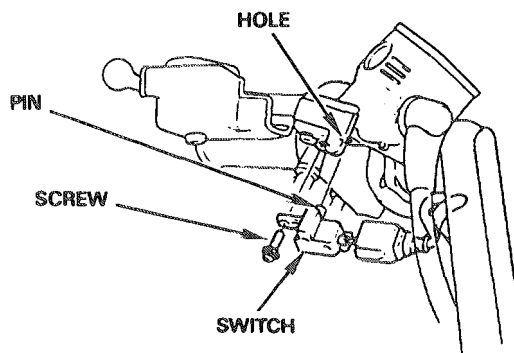


If continuity is abnormal, install a new switch.

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.

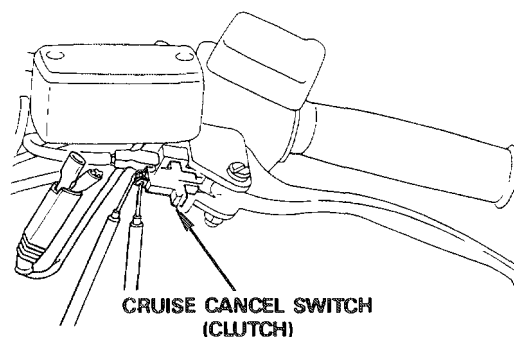


– Clutch

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



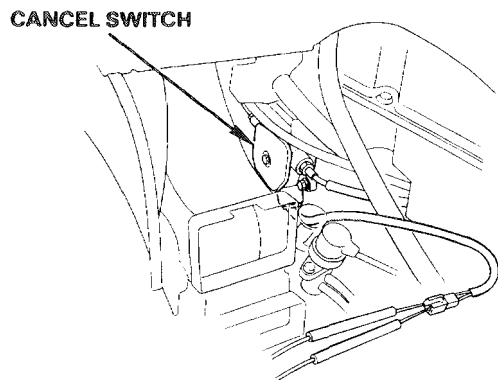
– Throttle

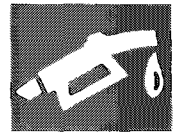
Remove the left fairing inner cover (see page 13-12).

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. There should be continuity with the throttle grip in any position.

Turn the throttle grip to open the throttle. Then turn the throttle grip beyond the fully off, idle position until it reaches its stop. There should be no continuity.





If either of the two tests fails, replace the throttle 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 throttle grip cancel switch.

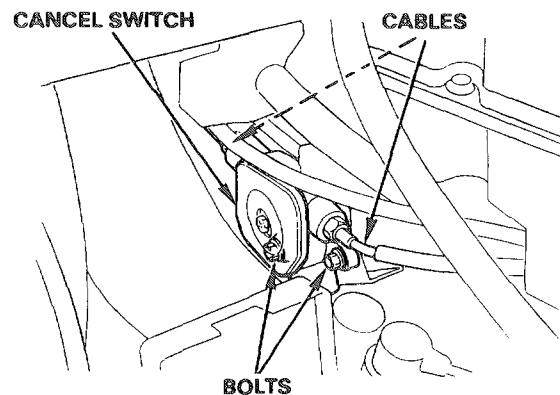
Install a new throttle grip cancel switch in the reverse order of removal.

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.



Rear Brake

Remove the right fairing inner cover (see page 13-12).

Disconnect the 2P-RED connector from the connector holder behind the ignition control module.

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).

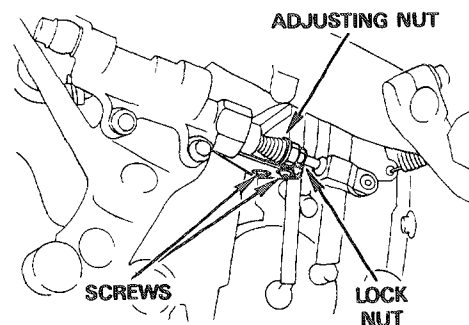
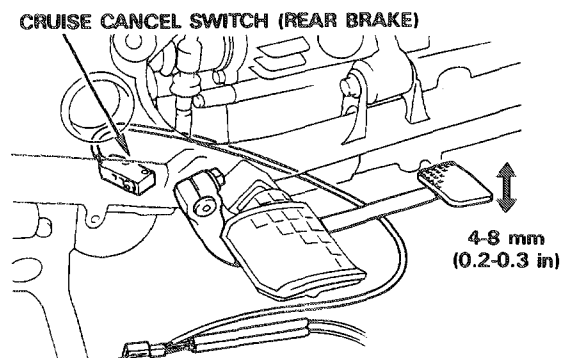
To adjust, remove the right exhaust pipe (see page 7-28). Loosen the lock nut on the master cylinder push rod. Connect an ohmmeter to the switch wire connector.

Depress 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.



Fuel System

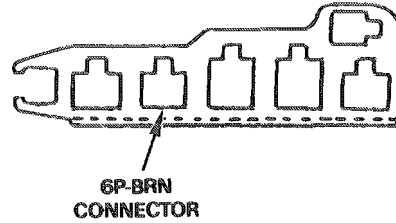
Cruise Control (cont'd)

Cruise Control Switches

– Inspection

Remove the right fairing lower cover (see page 13-12).

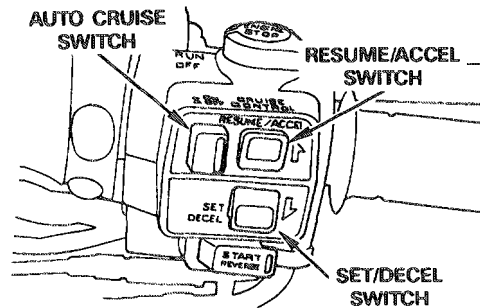
Disconnect the 6P-BRN connector of the connector holder on the right cooling fan.



Continuity checks for the cruise control switches (Auto Cruise switch), Set/Decel switch, and Resume/Accel switch) are shown in the chart.

Continuity should exist between the color coded wires.

Color	WHT/ BLU	BLK/ YEL	WHT/ YEL	Color	BLK YEL	WHT
RESUME ON	○	○		FREE		
FREE				PUSH (LOCK)	○	○
SET ON		○	○	AUTO CRUISE SWITCH		
RESUME ACCEL	/	SET DECEL	SWITCH			



Cruise Valve Relay

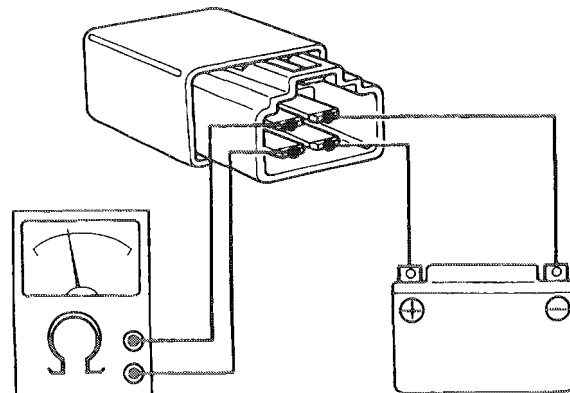
– Continuity Inspection

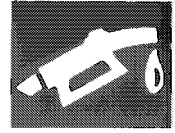
Remove the left fairing inner cover (see page 13-12).

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.





Cruise Control Valve Unit

– Inspection

Remove the left fairing inner cover (see page 13-12).

Disconnect the 4P-BLK connector from the connector holder under the cruise control valve unit.

Pry off the valve unit and actuator vacuum hoses with a small screwdriver.

CAUTION

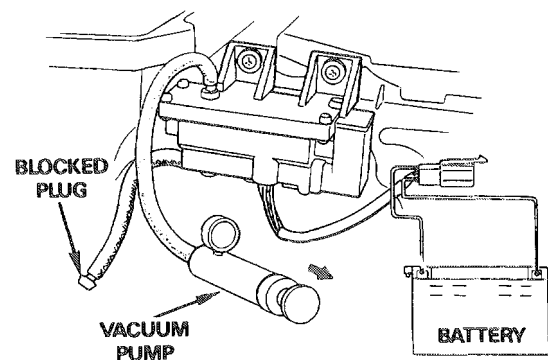
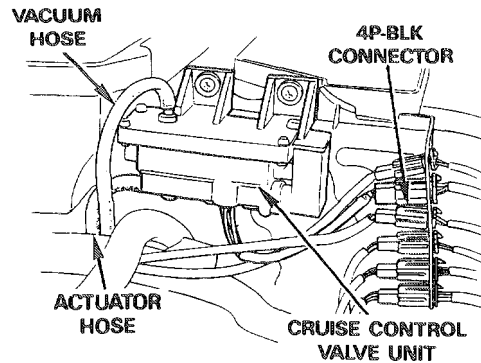
- The plastic connectors are fragile. Pull the hoses straight off; side stress may break the connectors.

Connect a vacuum pump to the valve unit hose connector and apply vacuum. If the vacuum does not remain steady, replace the valve unit with a new unit.

Connect a blocked plug to the actuator vacuum hose. While maintaining vacuum, apply battery voltage across the connector terminals as shown in the table below.

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.



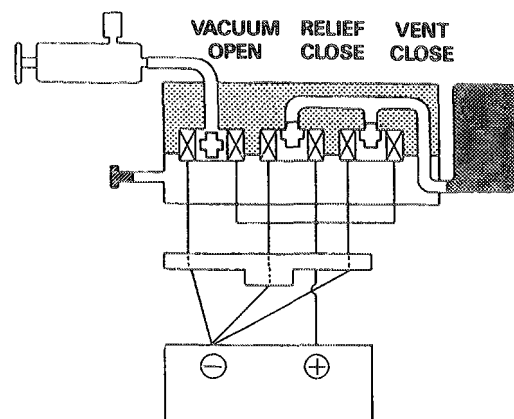
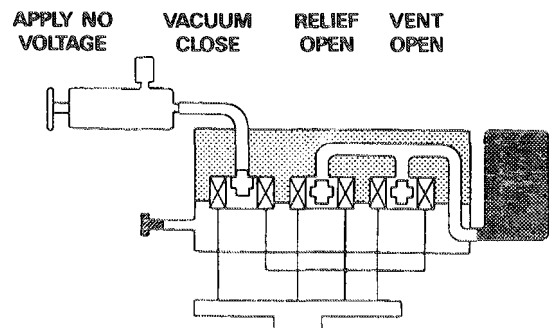
INSPECTION TABLE

Battery voltage		Vacuum
(-) battery wire	(+) battery wire	
Current 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 of vacuum should be lost each time battery voltage is applied.

If you don't obtain specified results, replace the valve unit as an assembly by removing the screws.



Fuel System

Cruise Control (cont'd)

Cruise Actuator

– Inspection

Remove the top compartment (see page 13-9).

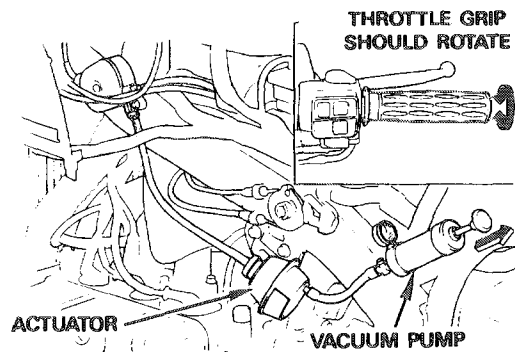
Disconnect the vacuum hose from the valve control unit.

Connect the vacuum pump to the actuator. Apply vacuum. The throttle grip should rotate.

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 (see page 3-16).



– Removal/Installation

Remove the left fairing inner cover (see page 13-12).

Disconnect the actuator cable from the throttle drum (see page 4-20).

Remove the engine bracket bolt and engine mounting nut.

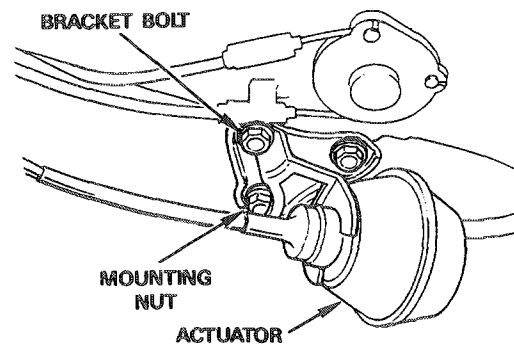
Remove the actuator.

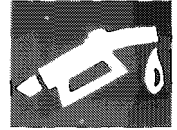
Install the actuator in the reverse order of removal.

Torque Values:

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 on the left radiator fan shroud. Use a flashlight to check that the aligning mark on the actuator cable arm aligns with the index groove.

CAUTION

- Do not move the actuator 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.

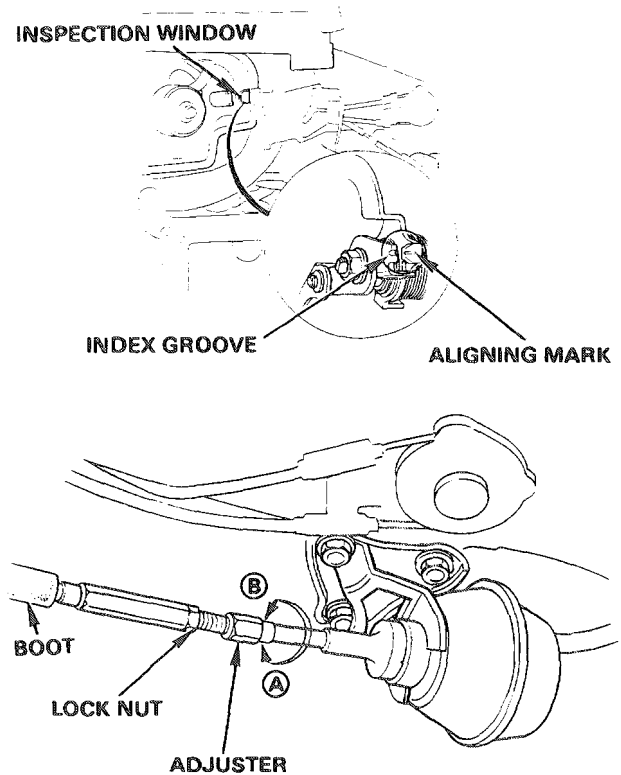
If the aligning mark does not align with the index groove adjust as follows:

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 on the adjuster properly.



Fuel System

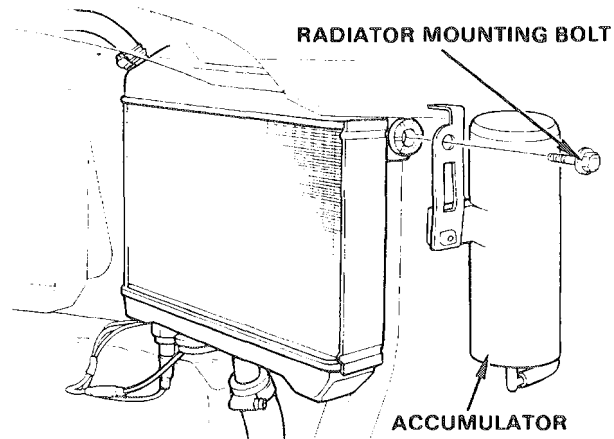
Cruise Control (cont'd)

Vacuum Accumulator

– Inspection

Remove the left fairing lower cover (see page 13-12). Inspect the vacuum accumulator for damage.

Remove the radiator mounting bolt. Remove the accumulator with the stay. Replace, if necessary.



One-Way Valve

– Inspection

Remove the left fairing lower cover (see page 13-12).

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.

Tool:

Vacuum pump
ST-AH-26O-MC7

Vacuum should not hold; the vacuum gauge should show a gradual bleed attributable to the valve orifice.

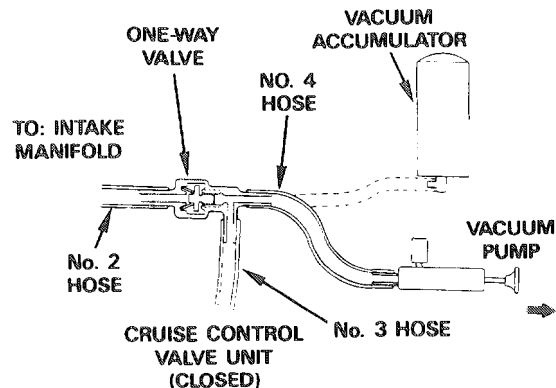
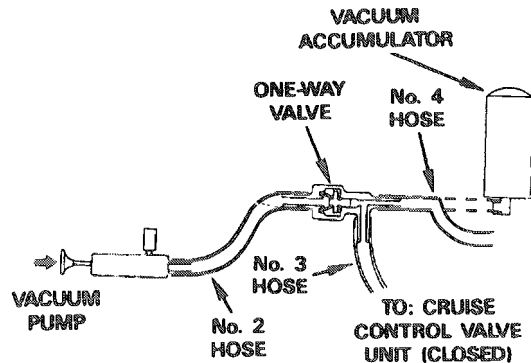
Connect a vacuum pump to the No. 4 hose. Disconnect the No. 3 hose from the valve and plug the No. 3 port.

Apply the specified vacuum and vacuum should be maintained.

Specified Vacuum: 40 mmHg (1.6 inHg)

If pressure doesn't remain steady, check the vacuum hoses (see below).

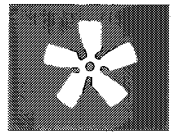
Replace the one-way valve if necessary.



Vacuum Hoses

– Inspection

Inspect the No. 2, 3 and 4 vacuum hoses (blue taping) for damage, deterioration, or loose connection.



Cooling System

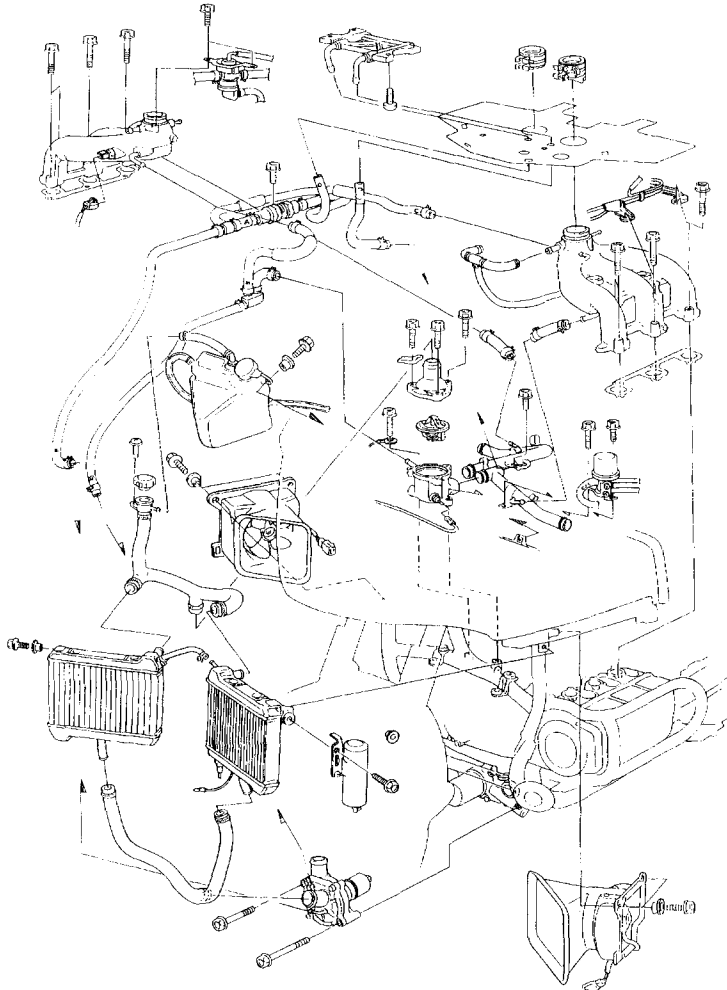
Service Information	5-2
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Radiator	5-9
Cooling Fan	5-11
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Thermostat, Carburetor	
Coolant Thermal Valve,	
Water Lines	5-13
Water Pump	5-15
Coolant Temperature	
Sensor/Gauge	5-17
Thermostatic Fan Motor	
Switch	5-18

Cooling System

Service Information

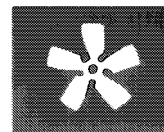
⚠ WARNING

- 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 reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system service can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For engine coolant temperature (ECT) sensor removal and inspection, see page 16-15.
- To identify water tubes, see the illustration on page 5-15.
- When inspecting the coolant temperature sensor/gauge and thermostatic fan motor switch, check the system components and lines step-by-step according to troubleshooting guidelines (see page 5-5).

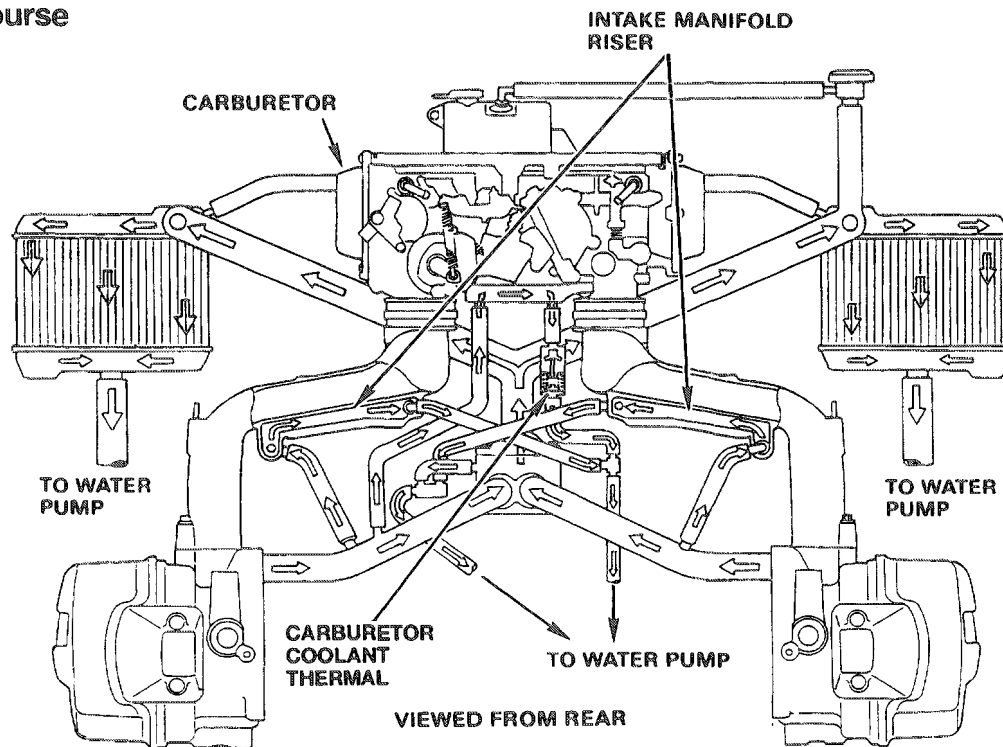


Torque Values

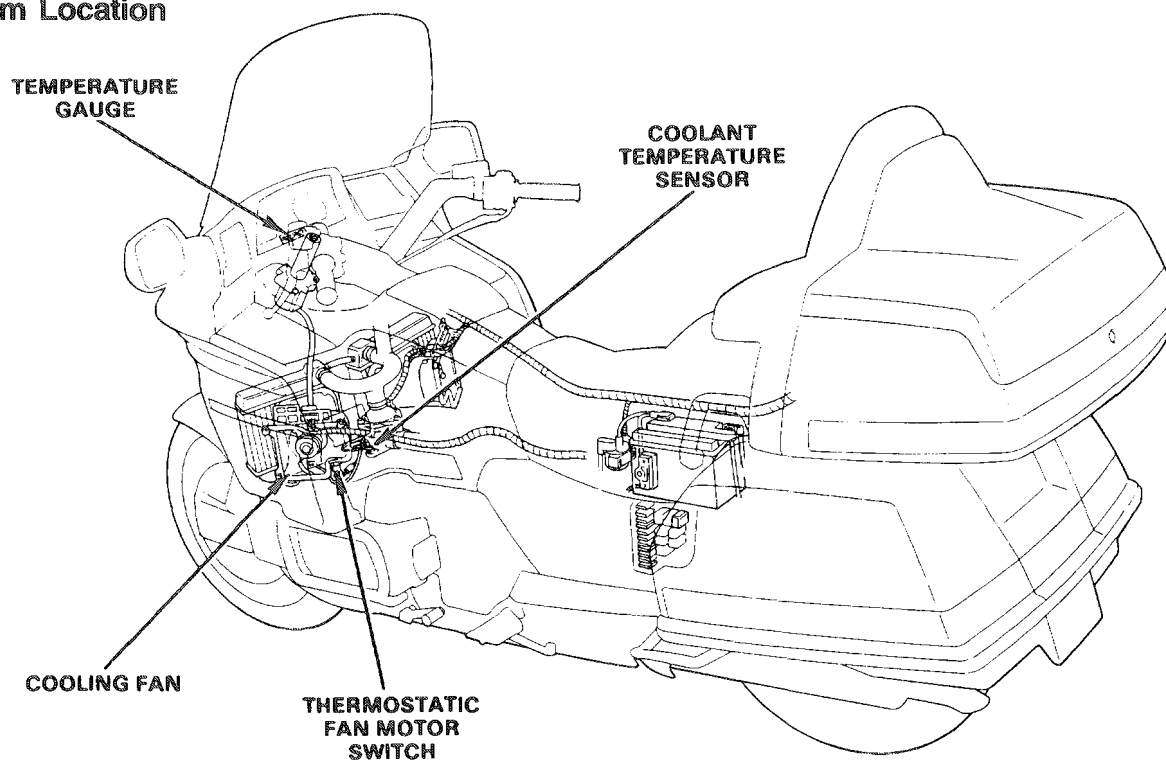
Coolant temperature sensor	12 N-m (1.2 kg-m, 9 ft-lb)	Apply sealant
Thermostatic fan motor switch	18 N-m (1.8 kg-m, 13 ft-lb)	
Engine coolant temperature (ECT) sensor	28 N-m (2.8 kg-m, 20 ft-lb)	
Water hose clamp screw	2 N-m (0.2 kg-m, 1.4 ft-lb)	



Coolant Course

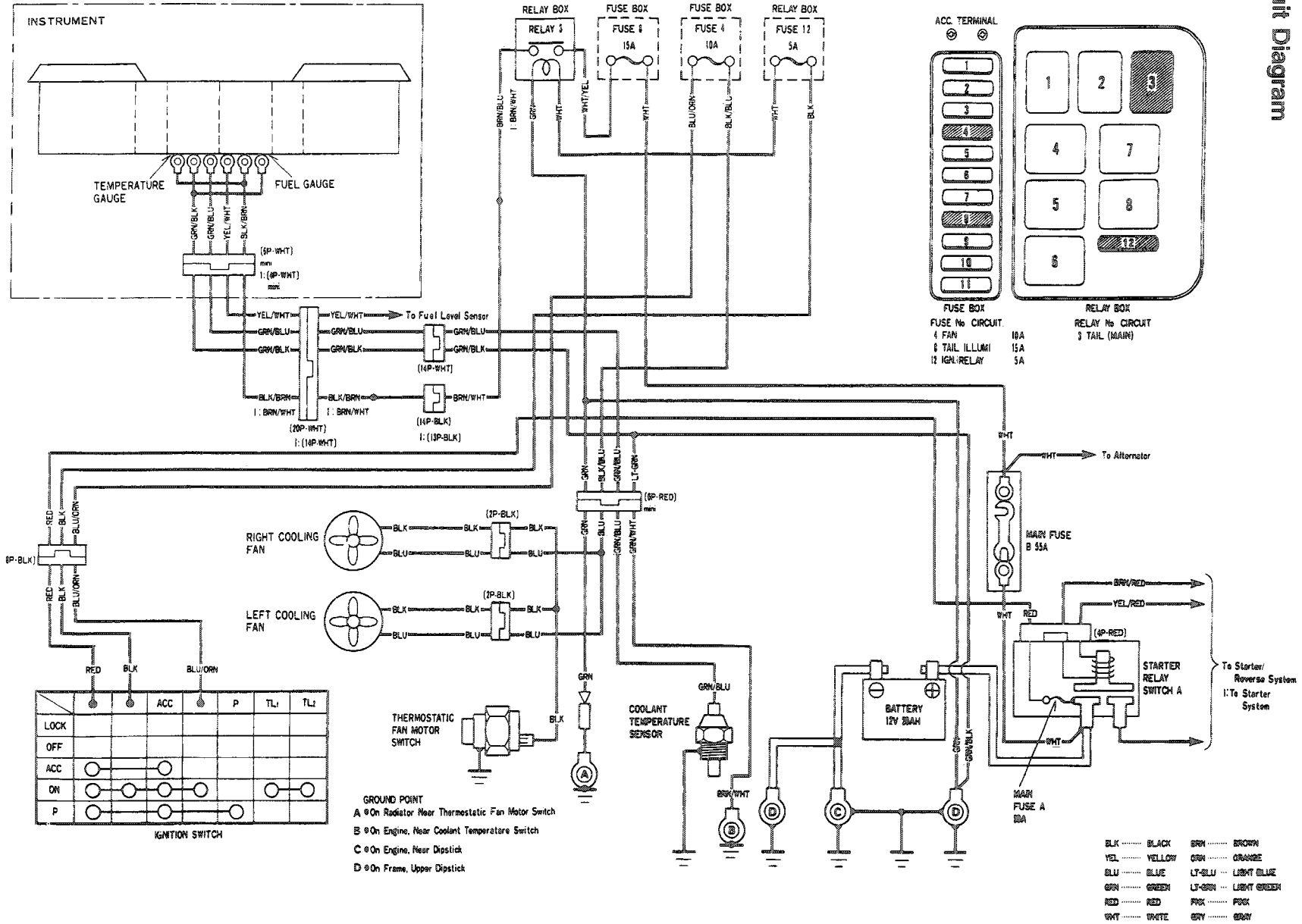


System Location



Cooling System Service Information (cont'd)

Circuit Diagram





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
- Radiator cap not holding pressure
- Fan not working (see next page)
 - Faulty thermostatic fan motor switch
 - Faulty fan motor
- Leak between the radiator and cooling fan shroud
- Water pump not rotating
- Water pump impellers damaged
- Incorrect coolant-water ratio

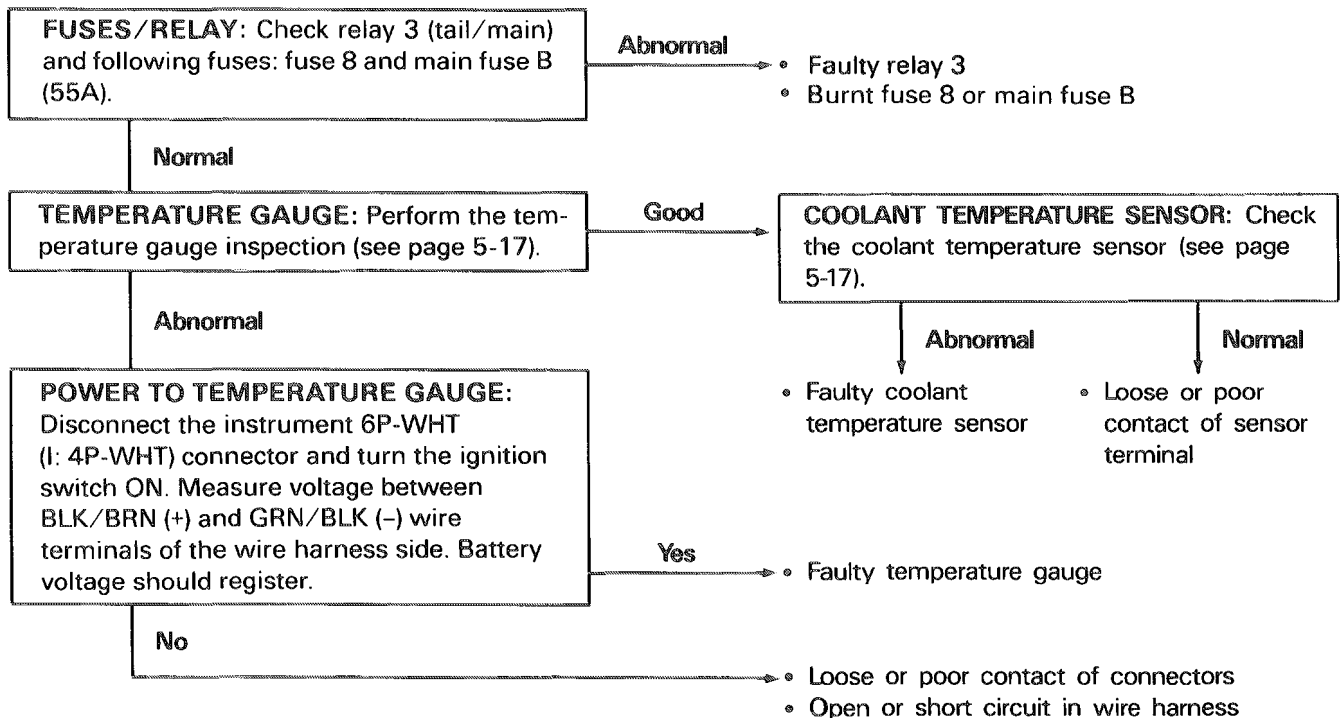
Engine temperature too low

- 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

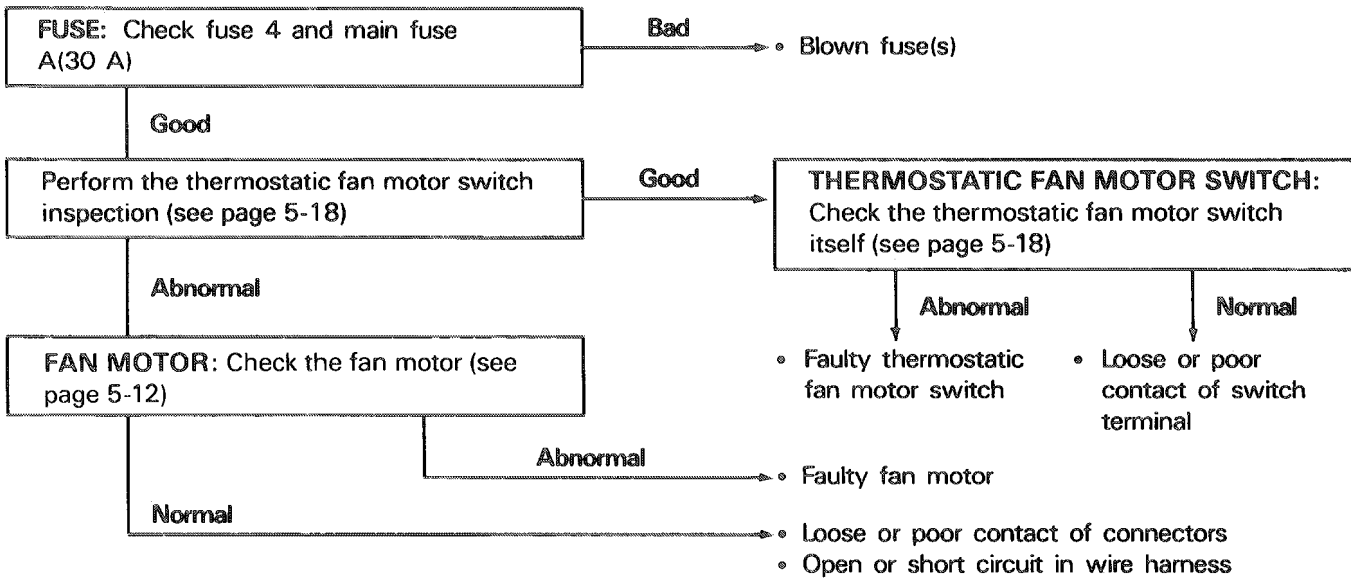
Temperature gauge not operating properly.

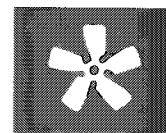


Cooling System

Troubleshooting (cont'd)

Fan motor not working.



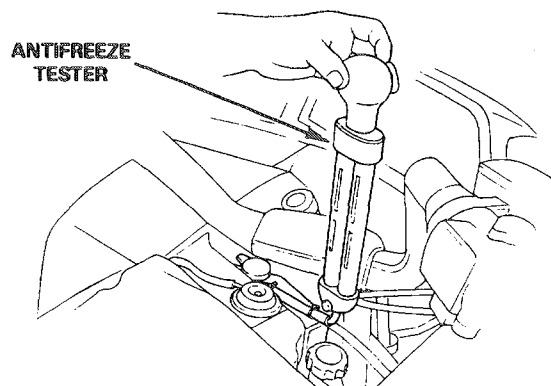


Inspection and Testing

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.

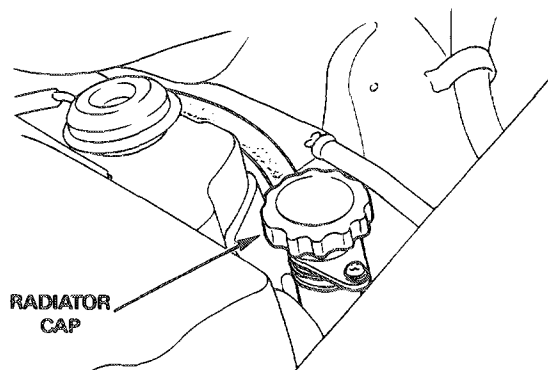


Radiator Cap

Remove the right top inner cover (page 13-9) and the radiator cap.

WARNING

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

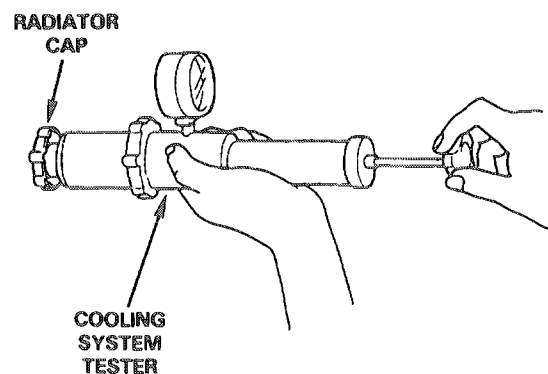


Pressure test the radiator cap. It must hold specified pressure for at least six seconds.

Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.

NOTE

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



Relief Pressure: 0.75 – 1.05 kg/cm² (11-15 psi)

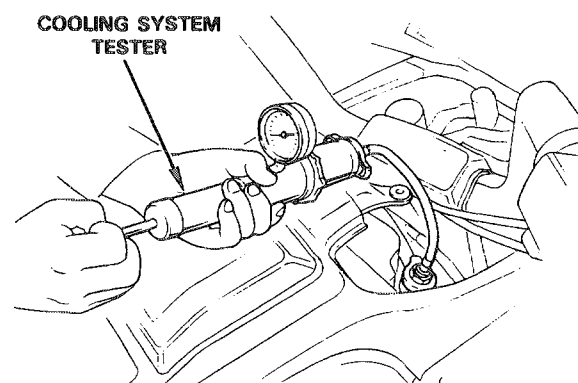
System Pressure

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

CAUTION

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

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



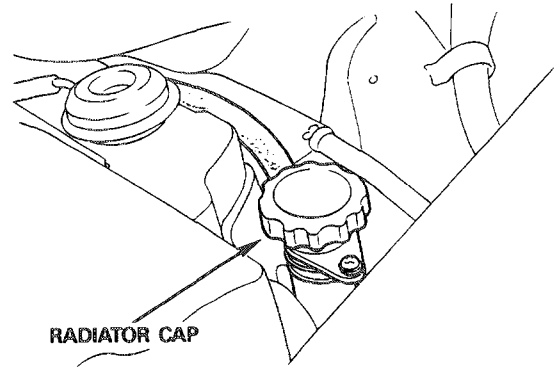
Cooling System

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.

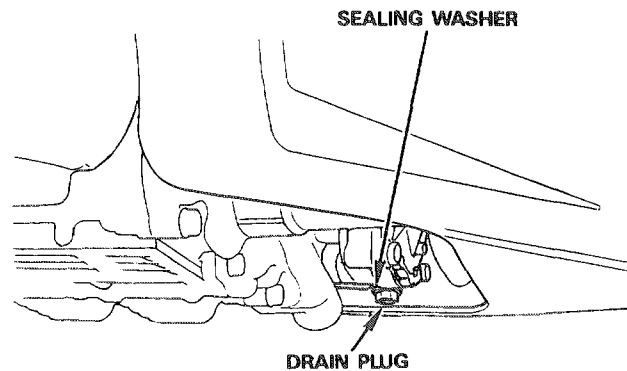
Remove the radiator cap.



Remove the drain plug. Drain the coolant.

Replace the drain plug sealing washer with a new one.

Remove the coolant reserve tank (see page 5-12). 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.

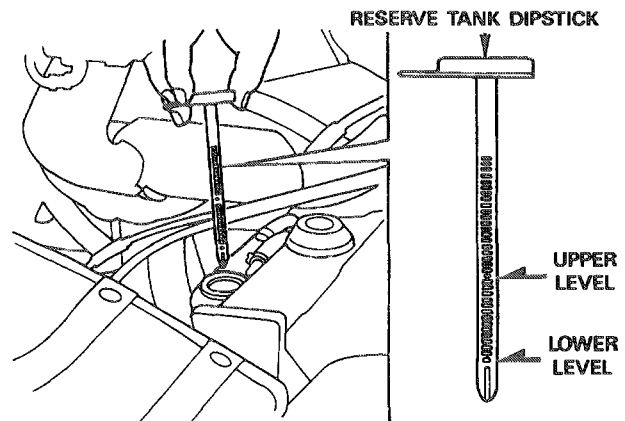
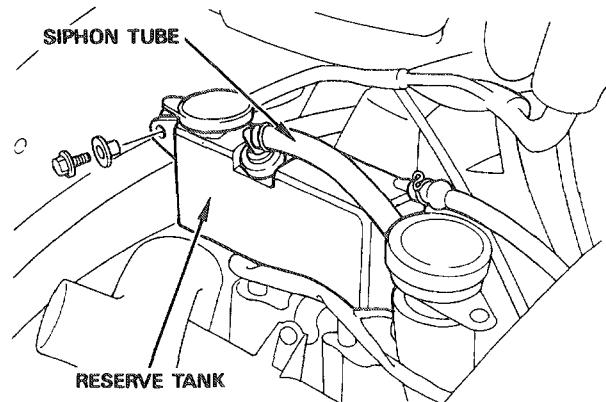
Fill the system with a 50-50 mixture of distilled water and ethylene glycol antifreeze.

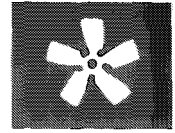
Start the engine with the radiator cap off and run until there are no air bubbles in the coolant and the coolant level stabilizes.

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 (see page 13-11).
- fairing front cover (see page 13-11).
- fairing lower covers (see page 13-12).

Drain the coolant (see previous page). Disconnect the thermostatic fan motor switch connector.

I: Remove the bolt and collar.

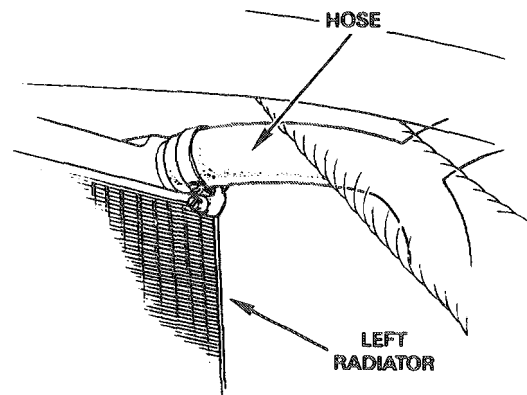
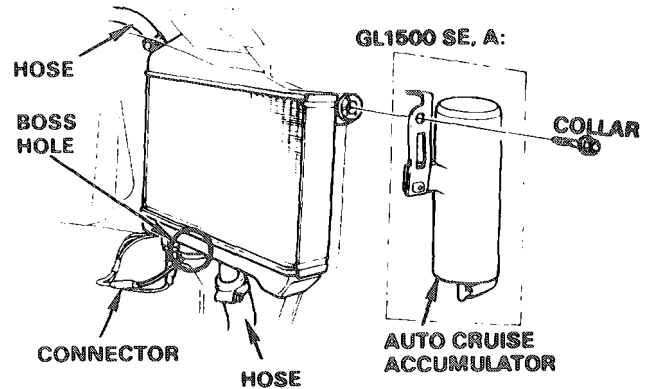
A & SE: Remove the bolt and auto cruise accumulator.

All models: 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

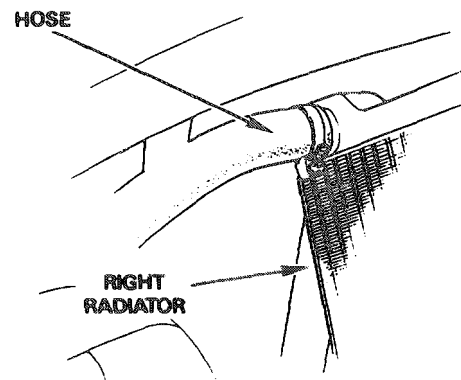
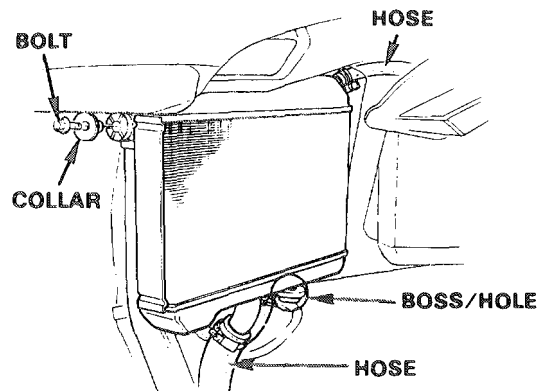
- Be careful not to damage the radiator fins.



Remove the radiator mounting bolt and collar.

Release the radiator boss from the frame rubber hole.

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

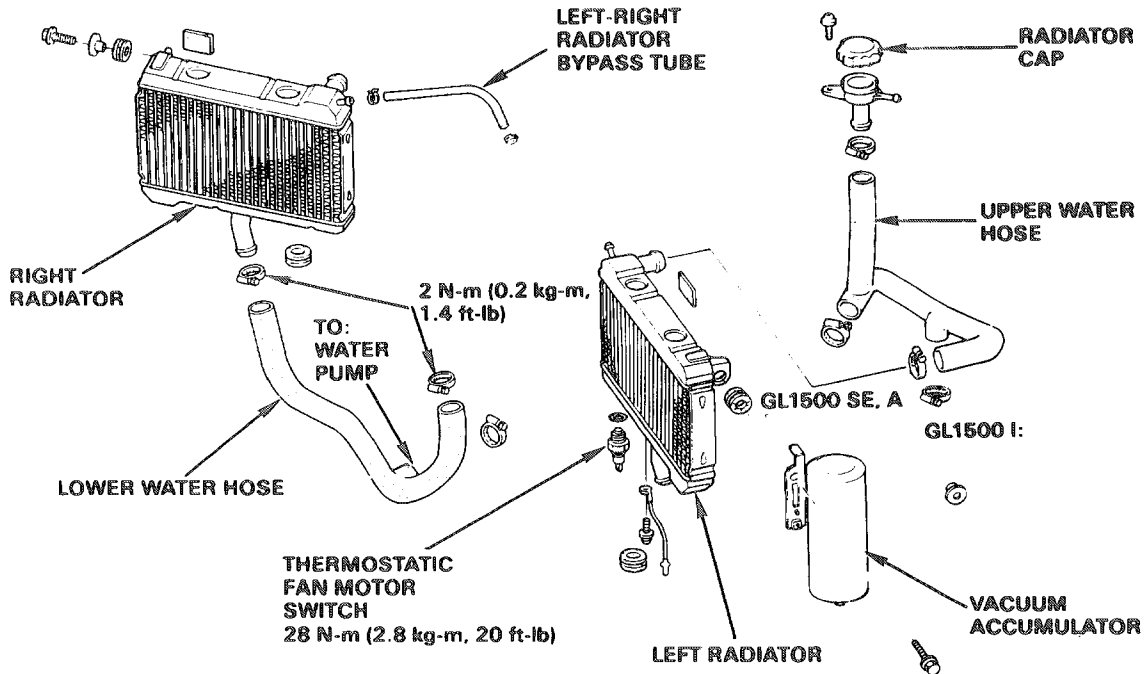


Cooling System

Radiator (cont'd)

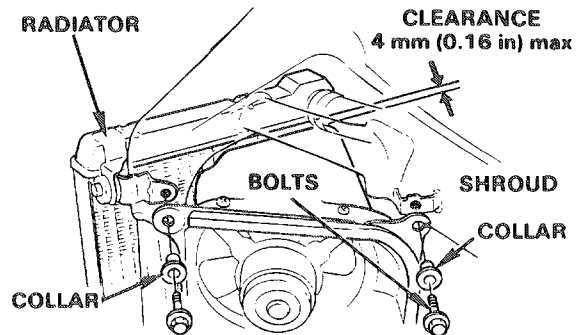
Installation

Install the radiator in the reverse order of removal.



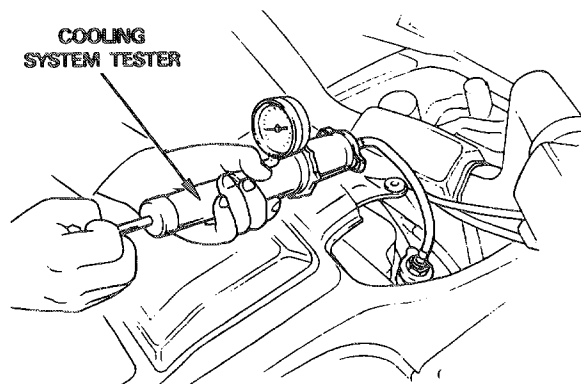
CAUTION

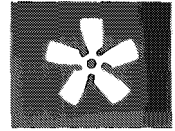
- Make sure the clearance between the radiator and cooling fan shroud is 4 mm (0.16 in) max. all the way around. An improper clearance will cause the system to lose cooling power. To get the specified clearance, loosen the cooling fan shroud bolts and reset the cooling fan properly.



After installation, perform a system pressure check (see page 5-7) to test the radiator for leakage.

Fill the system with coolant and bleed air from the radiator (page 5-8).





Cooling Fan

Removal

Remove the radiator mounting bolt. Release the radiator under boss from the frame rubber hole (see page 5-9).

NOTE

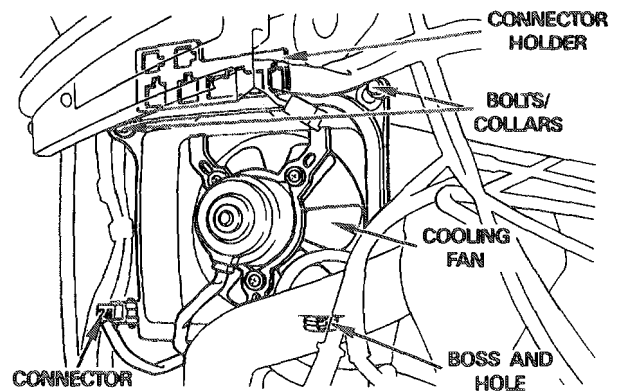
- Do not drain the coolant or disconnect the water hoses.

Disconnect the 2P-BLK connectors and remove the connector holder from the shroud.

Remove the junction box (section 4).

Remove the cooling fan mounting bolts and collars.

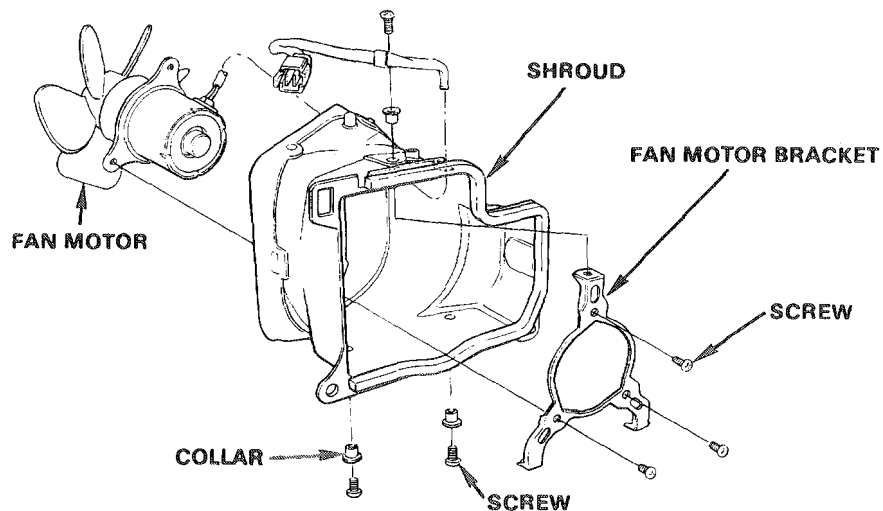
Release the shroud under boss from the frame rubber hole and remove the cooling fan.



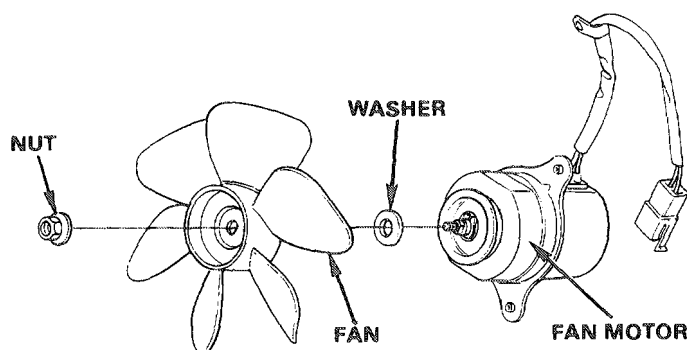
Disassembly

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

Remove three screws, collars and fan motor bracket from the shroud.



Remove the nut, fan and washer from the fan motor.



Cooling System

Cooling Fan (cont'd)

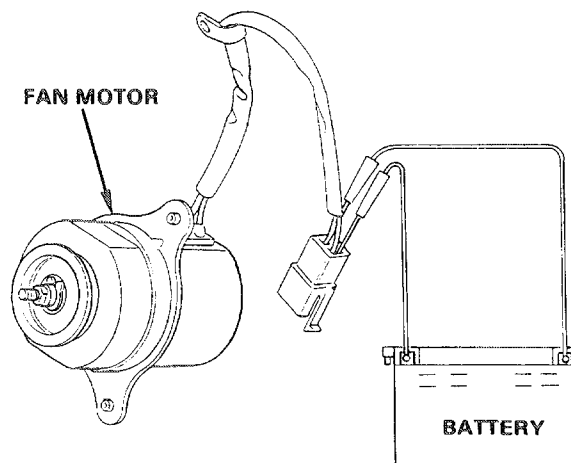
Fan Motor Inspection

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

Assembly/Installation

CAUTION

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



Reserve Tank

Removal

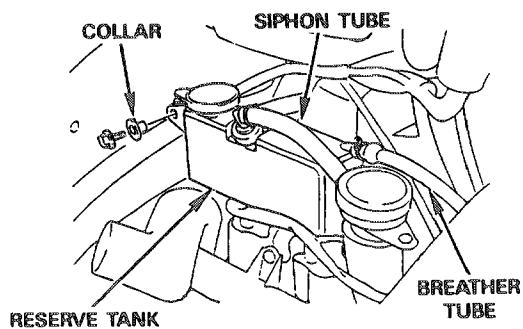
Remove the ignition coil stay mounting bolts. Move the coil down out of the way (see page 16-8, Ignition Coil Removal).

Disconnect the reserve tank breather tube and siphon tube.

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

Remove the reserve tank mounting bolt and collar.

Remove the reserve tank.

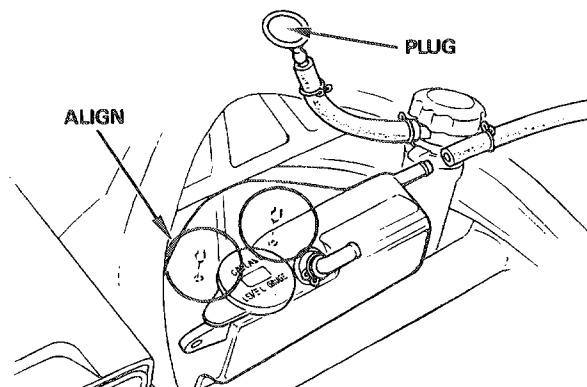


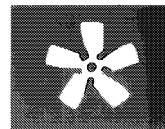
Installation

Install the reserve tank in the reverse order of removal.

NOTE

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





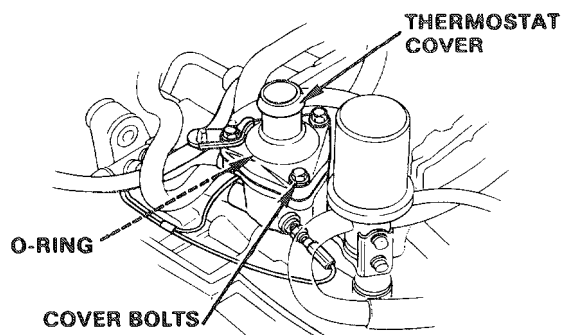
Thermostat, Carburetor Coolant Thermal Valve, Water Lines

Thermostat Removal/Inspection

Drain the coolant (see page 5-8).

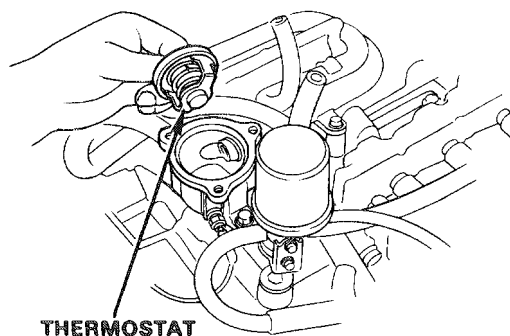
Remove the radiator (see page 5-9).

Disconnect the upper water hose from the thermostat cover. Remove the three bolts and the thermostat cover and O-ring.



Remove the thermostat from the thermostat housing.

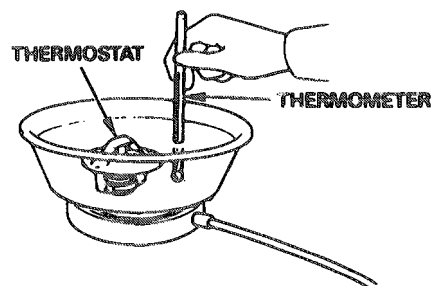
Visually inspect the thermostat for damage.



Suspend the thermostat in heated water and watch for valve opening and closing. Use an electric heating element to heat the water.

⚠ WARNING

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



Be sure the thermostat does not touch the bottom or sides of the container. Any contact can produce false readings. Apply heat for five minutes.

Starts to open: 80 - 84° C (176 - 183° F)

Full open: 93 - 97° C (199 - 206° F)

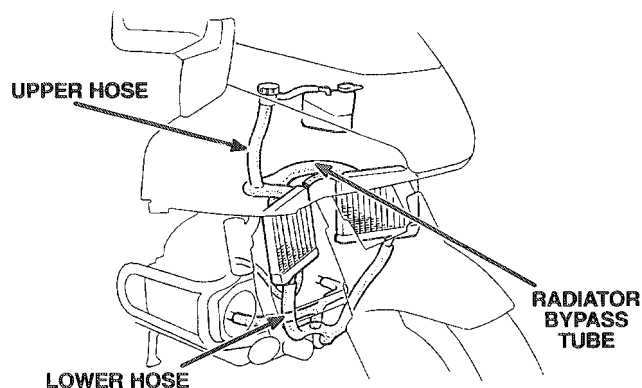
Valve lift: 8 mm (0.31 in) minimum

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 (see page 5-9).

Remove the upper water hose, lower water hose, and left- right radiator bypass tube.



Cooling System

Thermostat, Carburetor Coolant Thermal Valve, Water Lines (cont'd)

Remove the water pump hose and water pipes.

Inspect the O-rings for damage or deterioration.

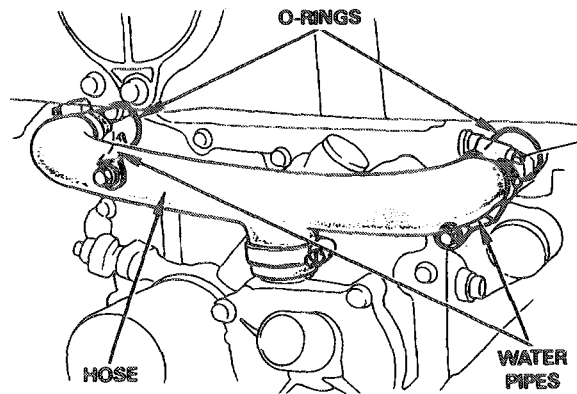
Remove the carburetor (see page 4-19) and intake manifolds (see page 4-37).

Remove five bolts, intake air shot air valve, water pipes, carburetor coolant thermal valve, and the thermostat housing from the engine.

Inspect the pipe O-rings for damage or deterioration.

Inspect the water hoses for damage or deterioration.

Inspect the carburetor coolant thermal valve (see next page).



Carburetor Coolant Thermal Valve Inspection

Visually inspect the carburetor coolant thermal valve inport (golden color side).

Connect a pressure tester to the tube as shown.

Suspend the carburetor coolant thermal valve completely in water heated by an electric heating element.

⚠ WARNING

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

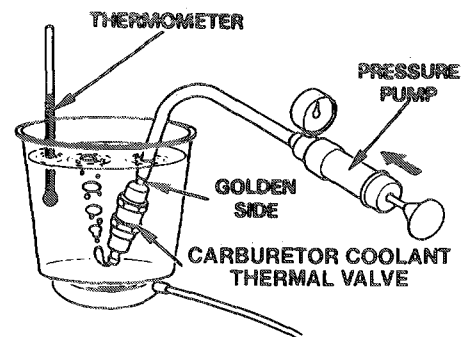
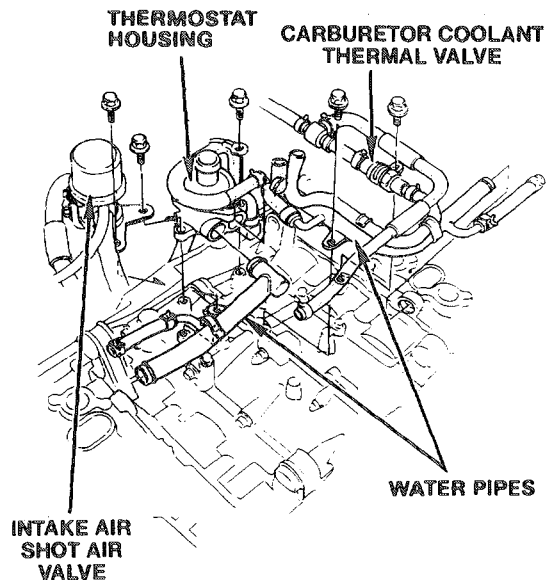
Be sure the carburetor coolant thermal valve does not touch the bottom or sides of the container. Any contact can produce false readings.

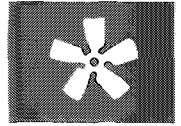
Apply a light pressure to the carburetor coolant thermal valve.

Valve Starts to Close: 78-82° C (172-180° F)

California Model: 58-62° C (136-144° F)

Replace the carburetor coolant thermal valve if the passage is blocked at a temperature lower than those listed above, or if there is no restriction at a temperature higher than those listed.



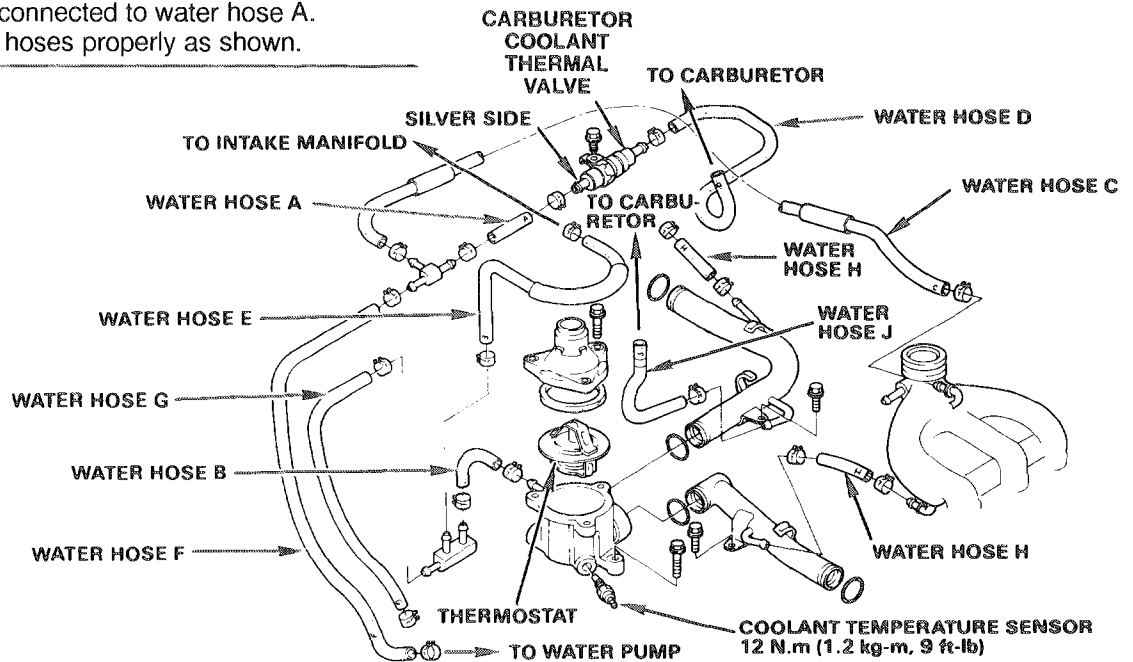


Installation

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 carburetor coolant thermal valve so that its silver side is connected to water hose A.
- Install the water hoses properly as shown.

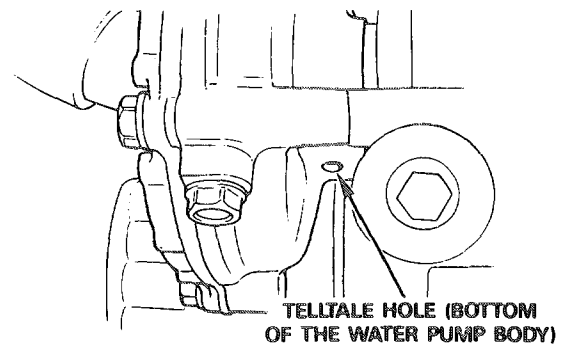


Water Pump

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.



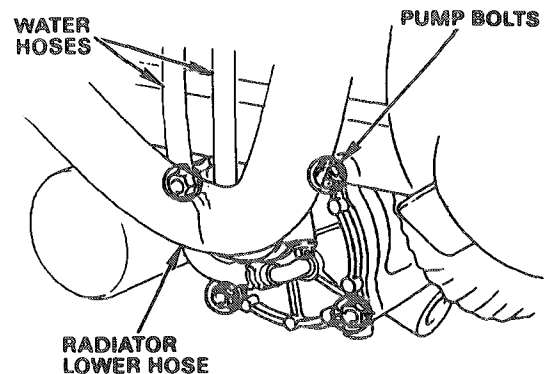
Remove the under cover (see page 13-11).

Drain the engine oil (see page 3-13).

Drain the coolant (see page 5-8).

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.



Cooling System

Water Pump (cont'd)

Disconnect the water pump hose from the water pump body.

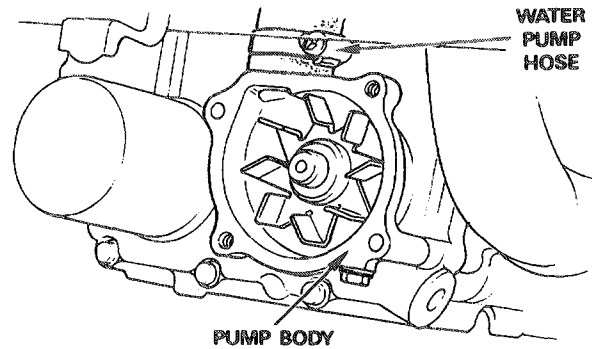
Remove the pump body from the engine.

Inspection

Check the water pump rotor for damage.

NOTE

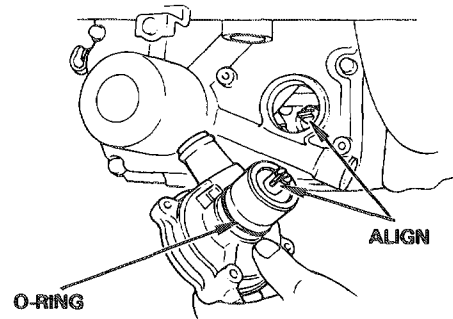
- Do not disassemble the pump rotor.



Installation

Install a new O-ring to the pump body.

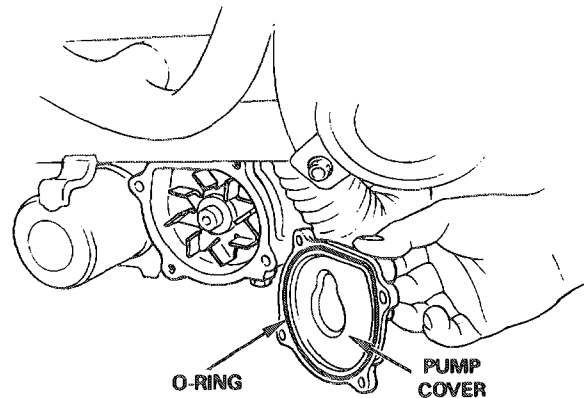
Install the pump body onto the engine, aligning the water pump rotor shaft slot with the oil pump shaft.

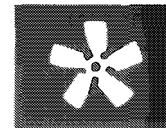


Install a new O-ring onto the pump cover.

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 (see page 5-15).





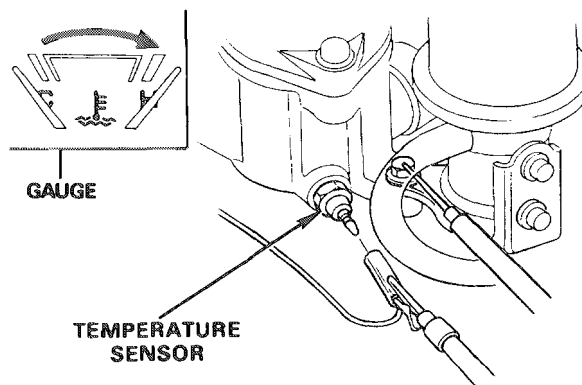
Coolant Temperature Sensor/Gauge

Temperature Gauge Inspection

Remove the left cooling fan (see page 5-11).

Disconnect the coolant temperature sensor GRN/BLU wire terminal. Short the GRN/BLU wire to ground. Turn the ignition switch to ON.

The temperature gauge should move all the way to the right (H) side. 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.

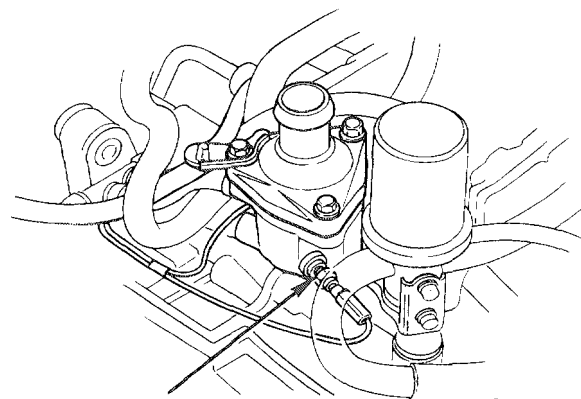
Temperature Sensor Removal

Drain the coolant (see page 5-8).

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.



COOLANT TEMPERATURE SENSOR

Temperature Sensor Inspection

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

Use an electric heating element to heat the oil.

WARNING

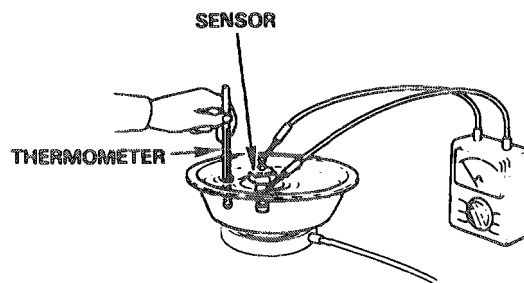
- Keep flammable materials away from the electric heating element.
- Wear insulated gloves and adequate eye protection.

	60° C	85° C	110° C	120° C
Temperature	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. Contact can cause false readings.

NOTE

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



Cooling System

Thermostatic Fan Motor Switch

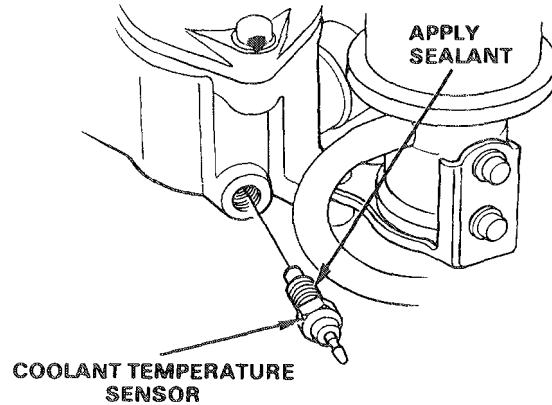
Temperature Sensor Installation

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)



Inspection

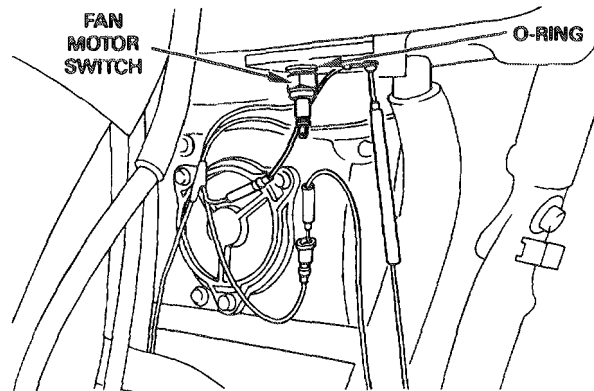
Remove the fairing front cover (see page 13-11).

Disconnect the BLK wire terminal from the thermostatic fan motor switch. Short the BLK wire to ground. Turn the ignition switch to ON. The fan motor should work.

Drain the coolant (see page 5-8).

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. Use an electric heating element to heat the coolant.



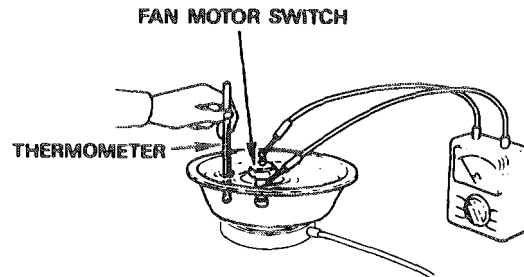
WARNING

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

Make sure that there is no switch continuity at room temperature and gradually raise the coolant temperature. The switch should have continuity (close) at 98-102° C (208-216° F).

NOTE

- Keep the temperature steady for three minutes before testing continuity. A sudden change of temperature will cause an error in 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)



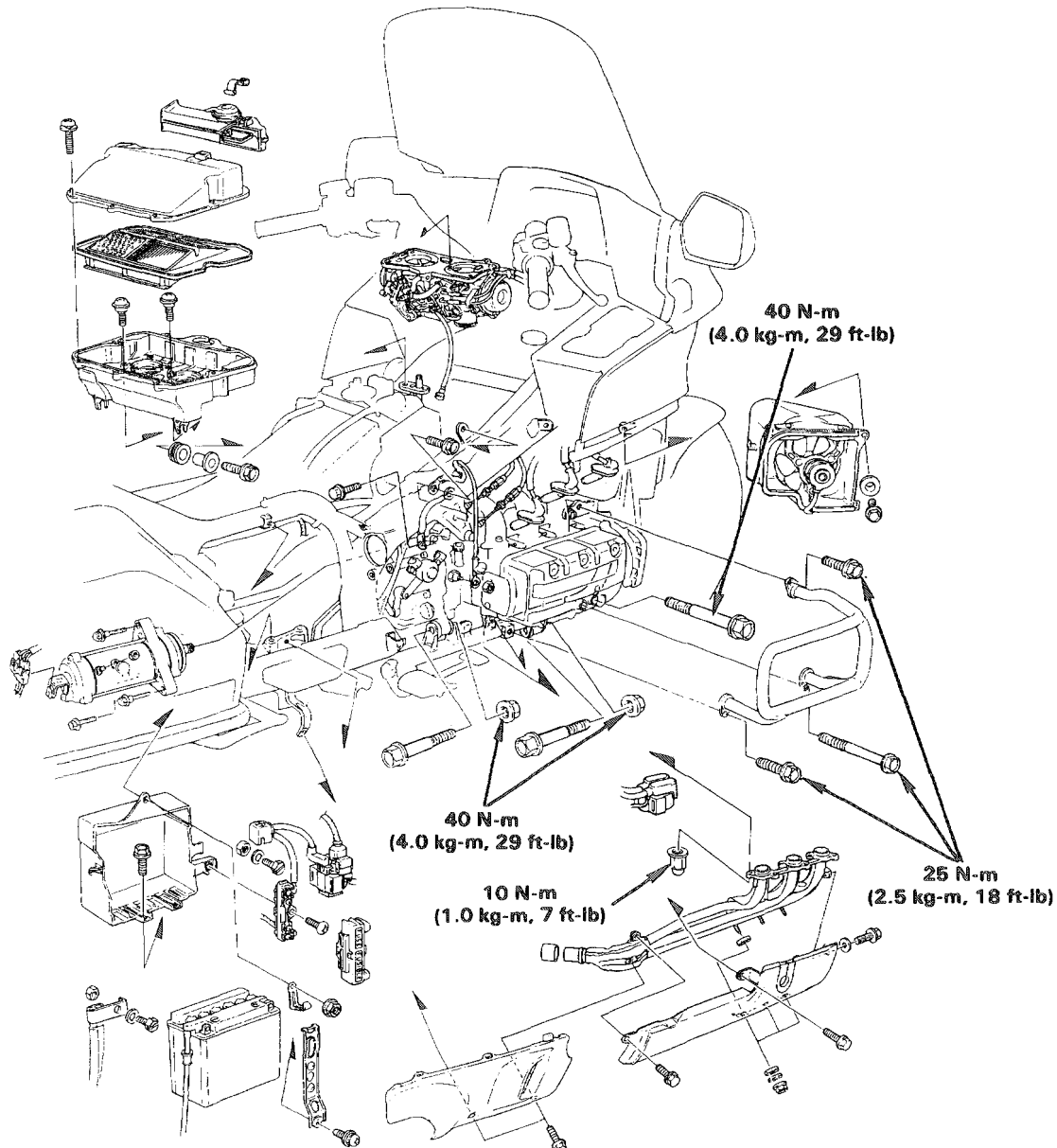
Engine Removal/Installation

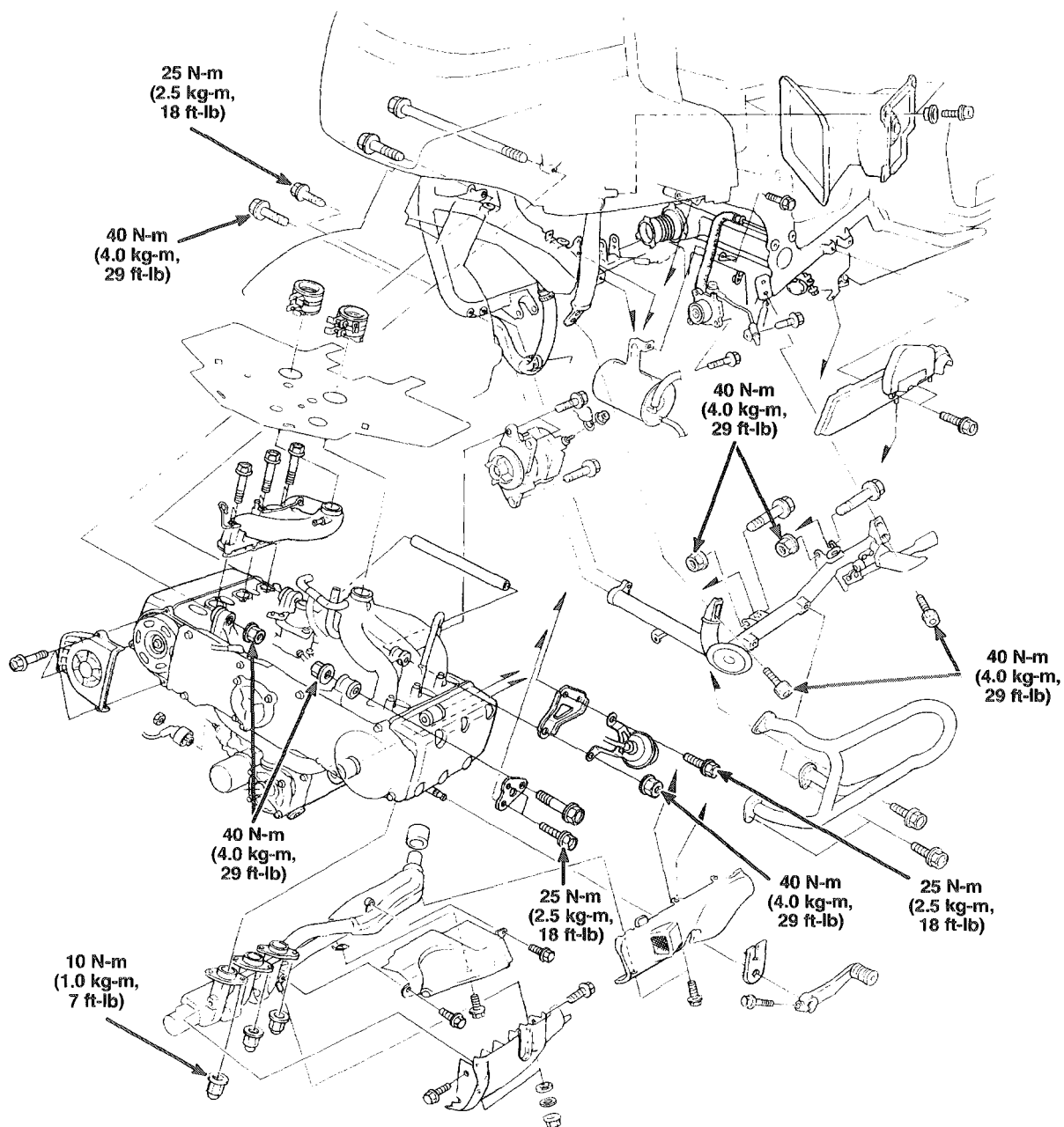
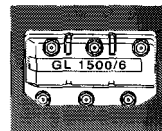
Service Information	6-2
Engine Removal	6-4
Engine Installation	6-6

Engine Removal/Installation

Service Information

- Parts requiring engine removal for servicing.
 - oil pumps (Section 8).
 - alternator drive gears, primary gears and output shaft (Section 17).
 - gearshift arm (Section 10).
 - transmission (Section 10).
 - crankshaft/piston (Section 8).
 - starter clutch and reverse shift system (Section 18).
- A floor jack or other adjustable support is required to support and maneuver the engine.
- Engine Dry Weight:
 - l: 124 kg 273 lbs
 - A&SE: 126 kg 278 lbs
- The right timing belt cover, right intake manifold, and alternator are removable to ease engine removal.





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/Installation

Engine Removal

Disconnect the battery negative cable. Drain the coolant (see page 5-8).

Drain the engine oil before removing the engine if the front, rear or clutch cover is to be removed.

Remove or disconnect the following:

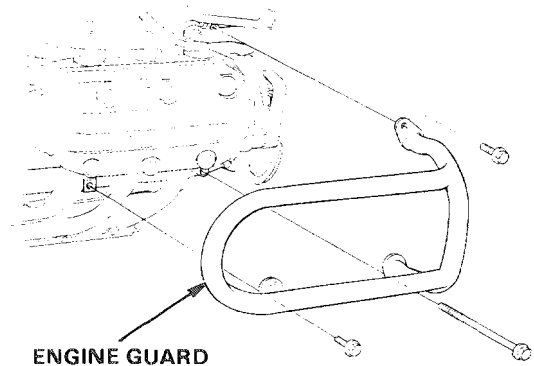
- fairing inner covers (Section 13)
- under cover (Section 13)
- 6P-BLK, 4P-WHT, 6P-RED and 2P-BLU connectors of the connector holder on the right cooling fan
- A & SE only: reverse cables from the shift arm (Section 18)
- A & SE only: reverse switch wire from the switch (Section 18)
- engine ground cable near dipstick
- starter motor (Section 18)
- cooling fans (Section 5)
- engine guards
- exhaust pipes (Section 7)
- spark plug wires
- right timing belt cover (for added clearance)
- horn wire terminals
- alternator (Section 17)
- clutch slave cylinder (Section 9)

NOTE

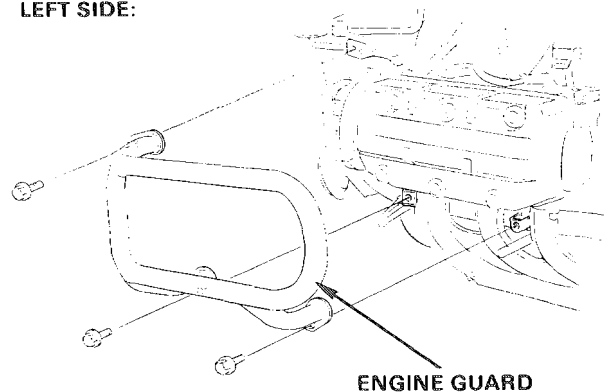
- Squeeze the clutch lever once and keep it in this position by tying it to the handlebar grip. This keeps the slave cylinder piston from overextending.

- air cleaner housing and carburetor (Section 4)
- right intake manifold (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 tubes from the solenoid valves and air jet controller (Section 4)
- crankcase breather tube from the engine
- temperature sensor wire and ground wire from thermostat case (Section 5)
- radiator lower hose from the water pump cover (Section 5)

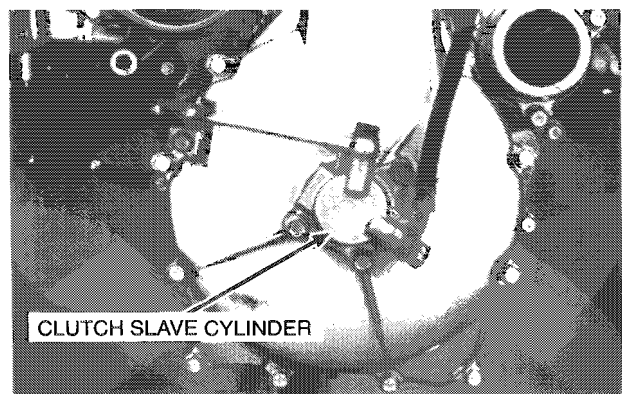
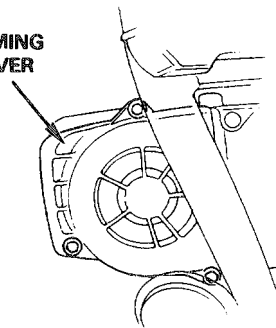
RIGHT SIDE:

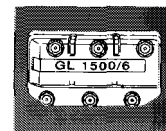


LEFT SIDE:



RIGHT TIMING BELT COVER

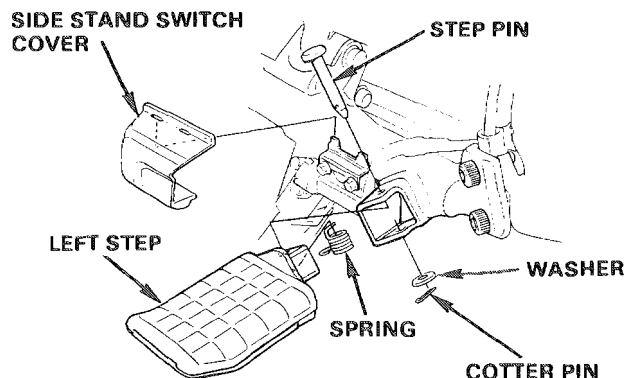




Left side:

Remove the side stand switch cover.

Remove the cotter pin, washer, step pin, spring and left step from the subframe.



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:

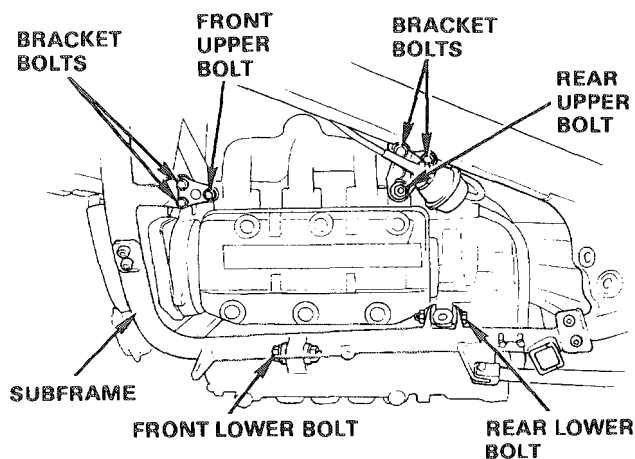
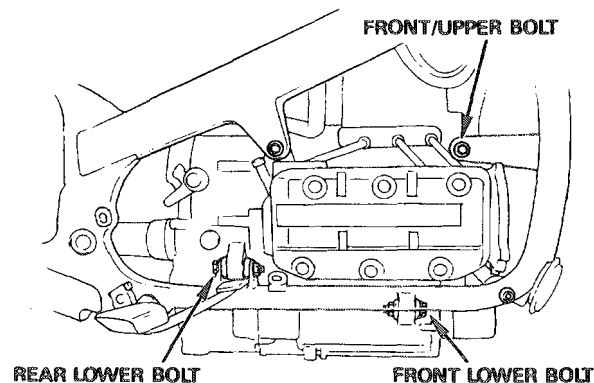
Remove the front lower and rear lower engine mounting bolts.

Remove the front upper engine mounting bolt.

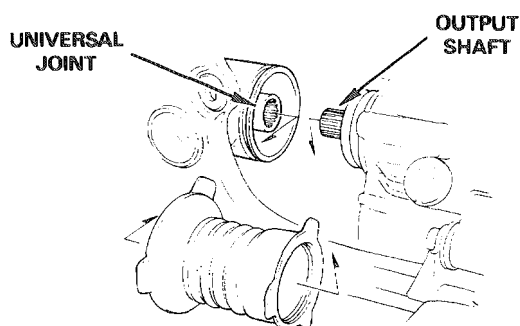
Disconnect the side stand switch 3P-GRN connector, and remove the subframe socket bolts and subframe.

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.



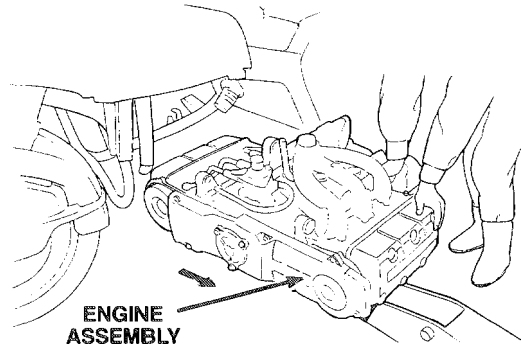
Engine Removal/Installation

Engine Removal (cont'd)

Move the engine out of the frame.

⚠ WARNING

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



Engine Installation

Installation is essentially the reverse order of removal.

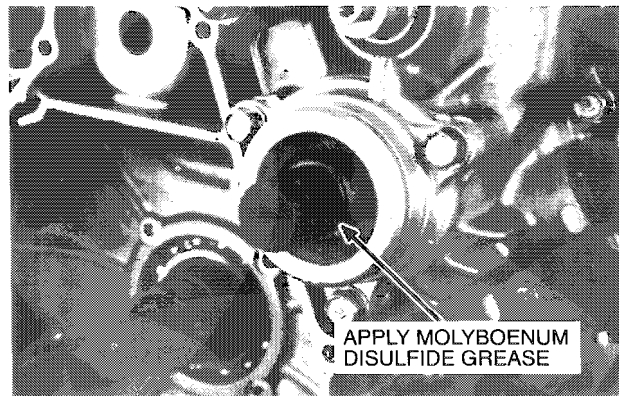
Lubricate the output shaft splines with molybdenum disulfide grease

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

⚠ WARNING

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

Slide the output shaft back into the universal joint.

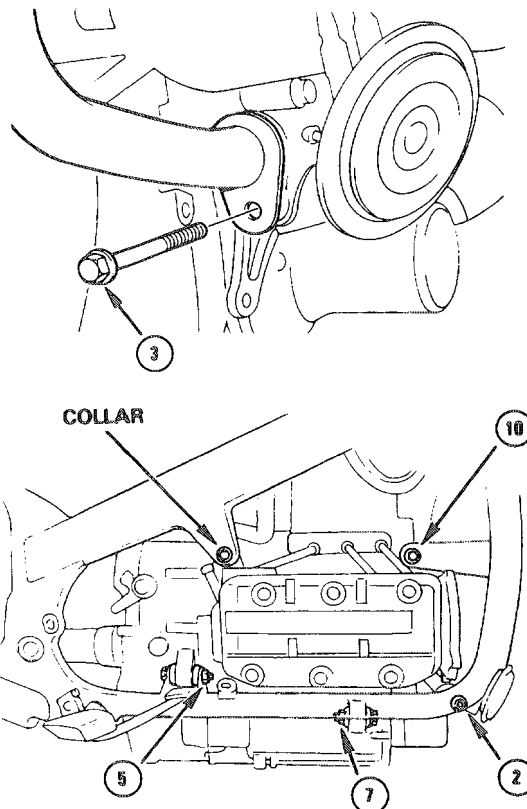


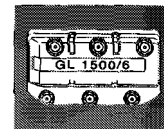
⚠ WARNING

- 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.

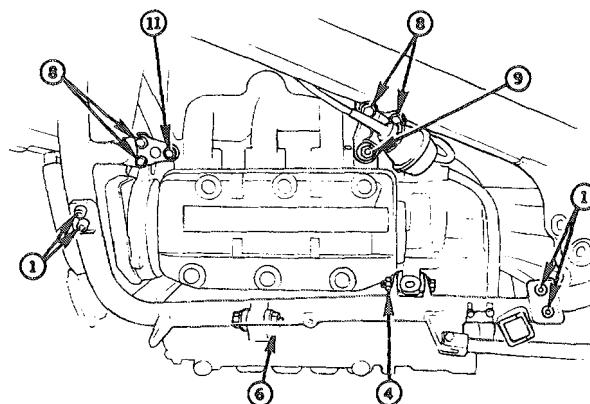
1. Right: rear lower and front lower mount bolts and nuts.
2. Right: front upper mount bolt and nut.
3. Left: front and rear bracket and bracket bolts, including the cruise actuator.
4. Right: rear upper mount bolt and nut with collar.
5. Left: front upper mount bolt and nut.
6. Left: subframe and subframe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

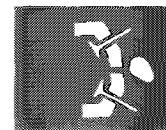




Remove the jack, and torque the bolts and nuts in the sequence as shown.

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)





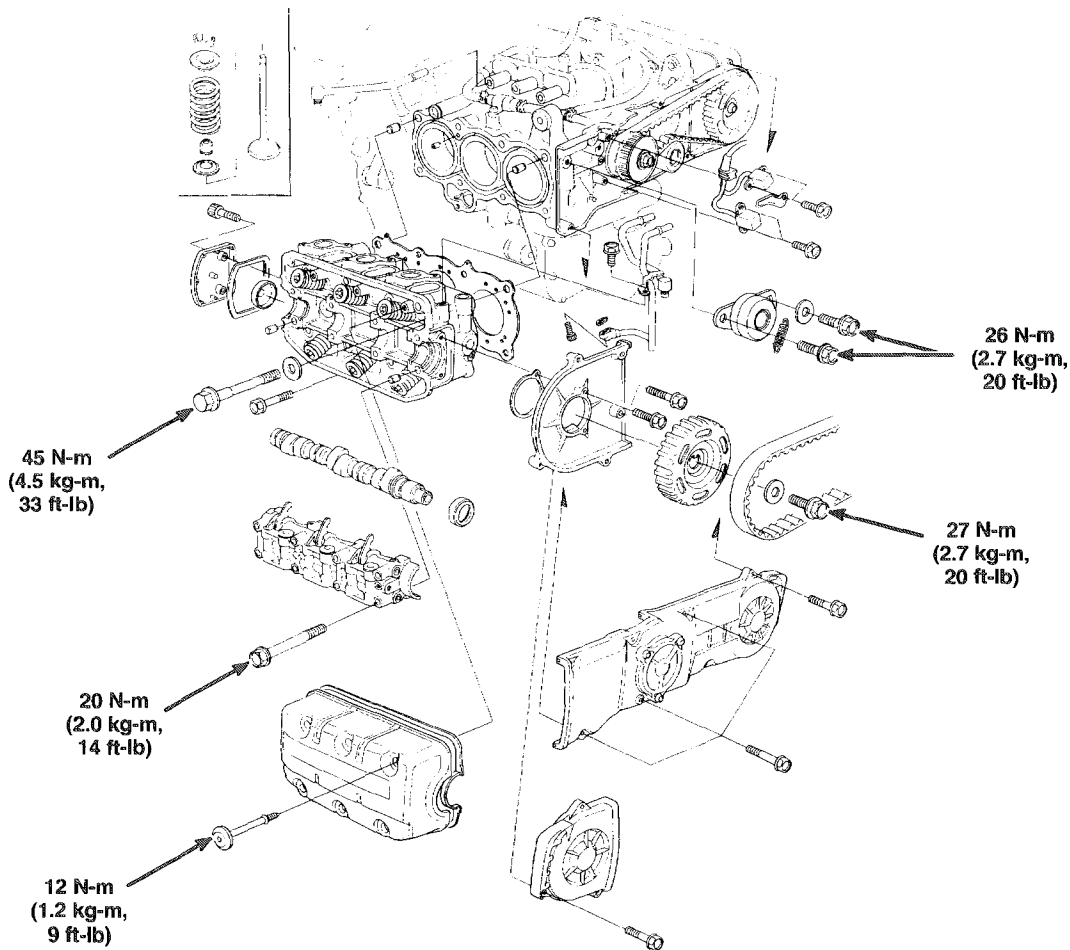
Cylinder Head/Exhaust System

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Cylinder Head/Exhaust System

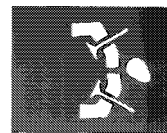
Service Information

- 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 engine case. 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. Oil 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, if necessary (see page 7-10.)
- Adjust the hydraulic adjuster holder with a shim, if any of the following parts are replaced:
 - Cylinder head/camshaft holder
 - Valve/valve seat (refacing)
 - Camshaft
 - Rocker arm/rocker arm shaft



Torque Values

Cylinder head bolt (9 mm bolt)	45 N-m (4.5 kg-m, 33 ft-lb)
Timing belt driven pulley 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)



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 8)

Compression too high:

- Excessive carbon build-up on piston 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
 - Loose adjuster stopper plug
 - Use of improper shim
- Worn valve stem
- Sticking valve or broken valve spring
- Damaged rocker arm, needle bearing, eccentric spindle, or shaft
- Loose or damaged timing belt
- Loose or damaged belt tensioners or drive pulleys
- Worn or damaged camshaft
- Damaged cylinder head gasket
- Loose spark plug

Contaminated engine oil or coolant:

- Leaking or blown head gasket
- Leaking core plugs
- Damaged or warped cylinder head

Cylinder Head/Exhaust System

Timing Belt Removal

NOTE

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

Remove the fairing front cover and under cover (see page 13-11).

Remove the timing belt covers.

Turn the crankshaft counterclockwise until the T1-2 drive pulley mark lines up with the index mark on the engine case. The "UP" marks on the driven pulleys should be facing up.

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

NOTE

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

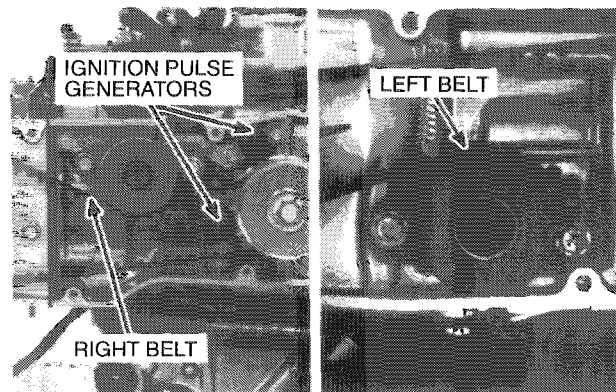
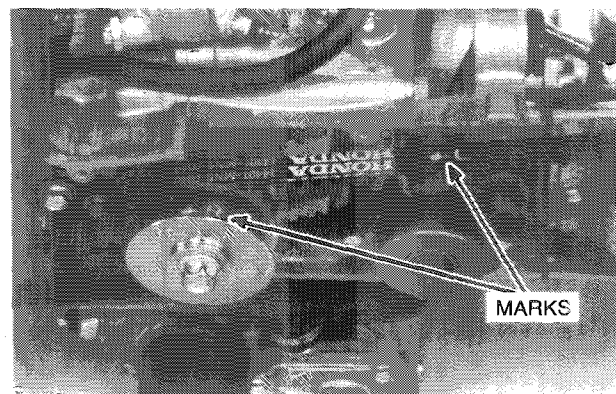
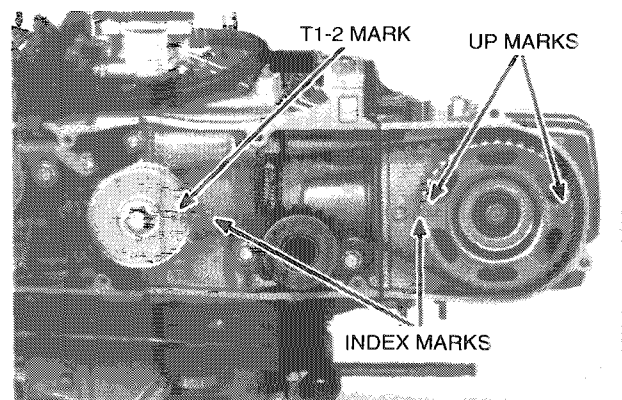
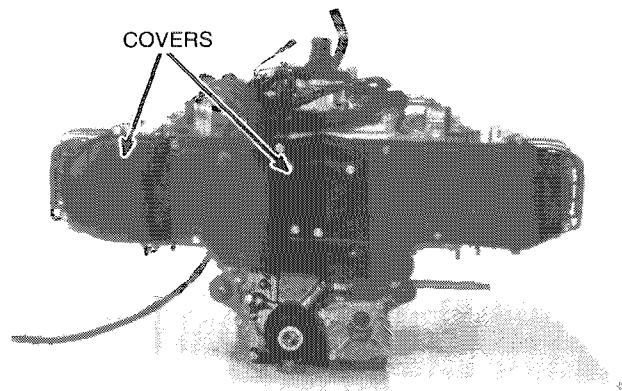
Loosen the tensioner bolts, then slip off the right belt.

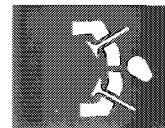
Remove the ignition pulse generators.

Slip off the left belt.

CAUTION

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



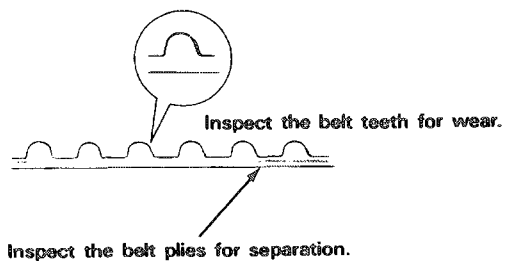


Belt Inspection

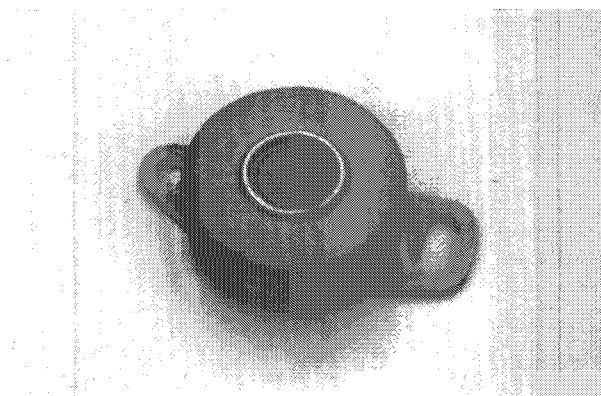
Check the belts for swelling caused by oil contamination.

Replace the belts if the material is cracked, teeth are worn, or if swelling is evident.

WORN BELT TOOTH



Inspect the belt tensioners for free movement and smooth bearings.



Check the tensioner spring for fatigue or damage.



Remove the driven pulley bolt, washer, and the pulley.

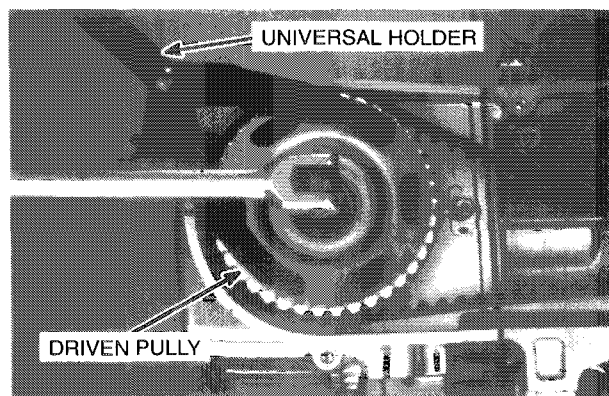
Tool:

Universal holder

07725 - 0030000

CAUTION

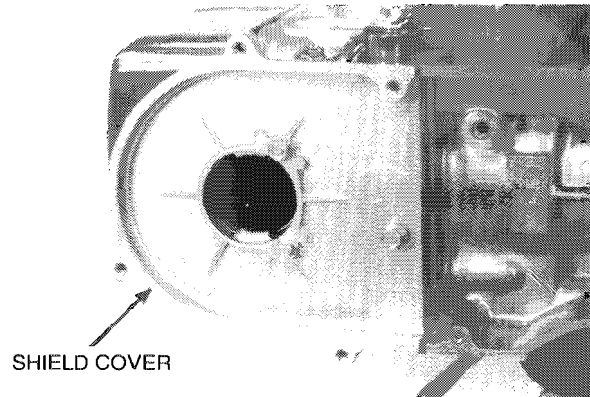
- Do not turn the camshaft when removing the driven pulley belt, or you may bend the valves.



Cylinder Head/Exhaust System

Timing Belt Removal (cont'd)

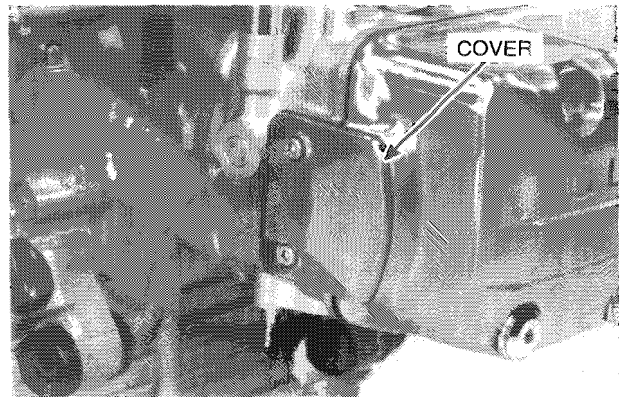
Remove the shield cover and the gasket.



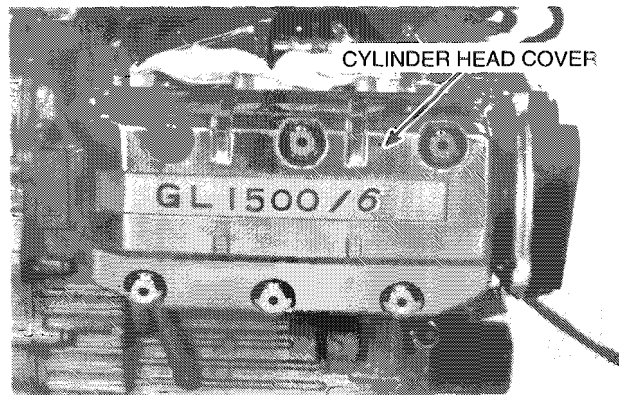
Camshaft/Rocker Arm Removal

Remove the engine guard (see page 6-4).

Remove the rear cylinder head covers and the gaskets.



Remove the cylinder head cover.





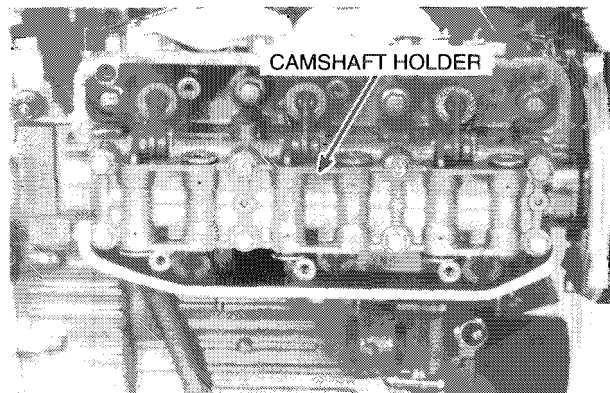
Remove the timing belt and driven pulley (see page 7-4).

Remove the eight camshaft holder bolts.

NOTE

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

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



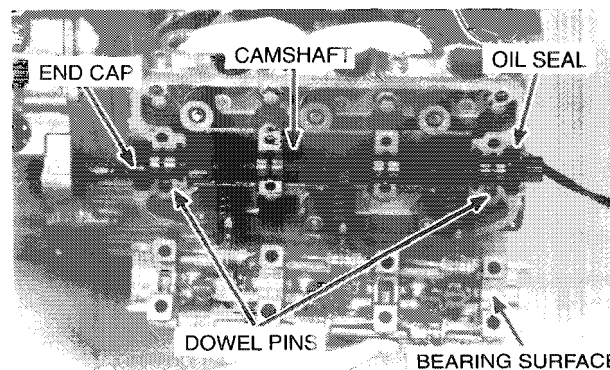
Remove the camshaft, oil seal, and end seal.

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.



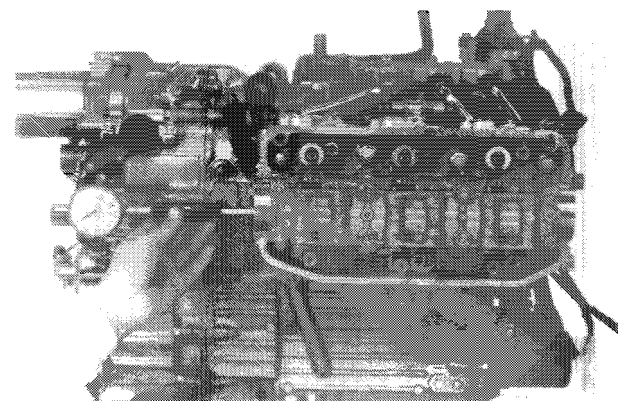
Camshaft Inspection

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.

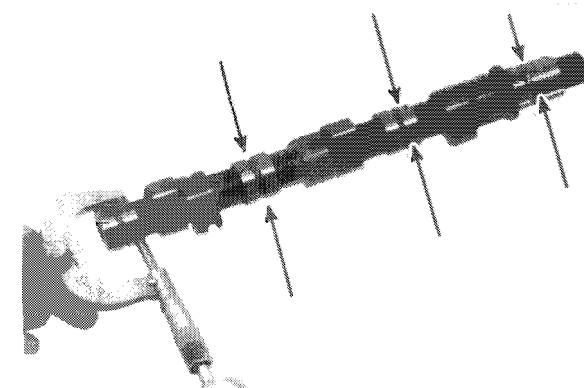
Service Limit: 26.91 mm (1.059 in)

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

Service Limit: 0.14 mm (0.006 in)

NOTE

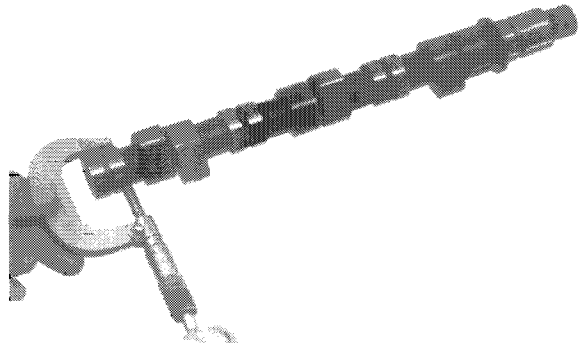
- Clearance may also be checked by using Plastigauge.



Cylinder Head/Exhaust System Camshaft/Rocker Arm Removal (cont'd)

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)

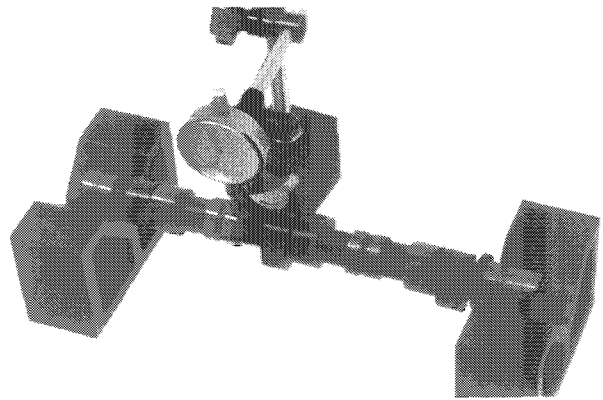


Rest each camshaft on V blocks.

Place a dial indicator on each of the inner bearing journals. 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.

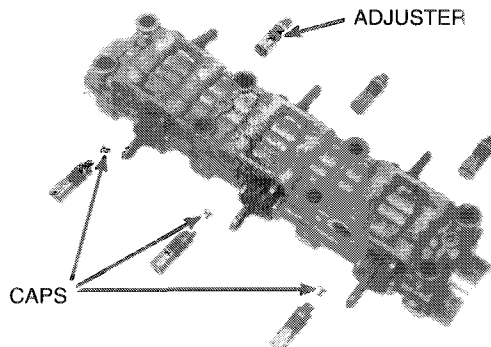
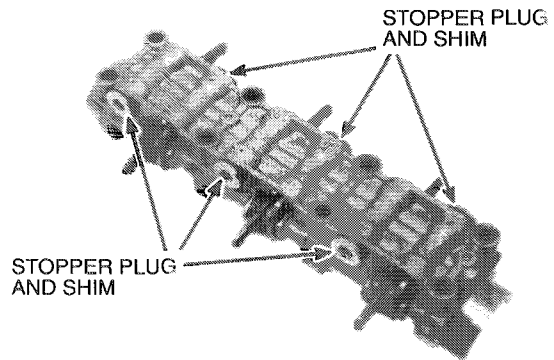
NOTE

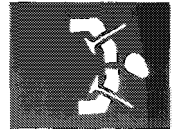
- Failure to install the shims in their original locations can cause tappet noise or sticking valves.
- Mark the hydraulic valve adjusters as they are removed, so they can be installed in their original locations.

Remove the six hydraulic valve adjusters from the camshaft holder.

NOTE

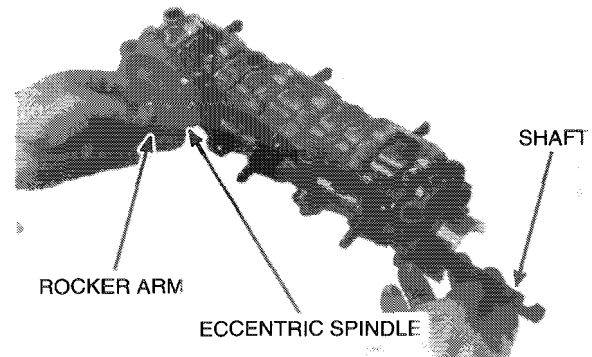
- Caps are used only on the hydraulic valve adjusters controlling the intake valve rocker arm lobes.





Remove the following:

- rocker arm shafts
- rocker arms
- rocker arm eccentric spindles (lobes)
- needle bearings

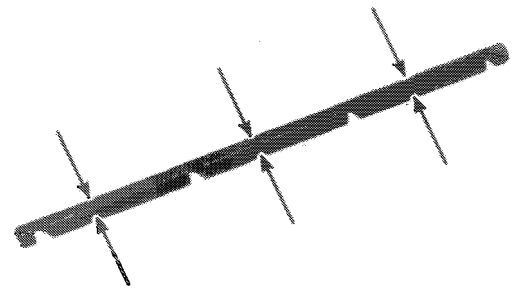


Rocker Arm Shaft Inspection

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/Eccentric Spindle 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.

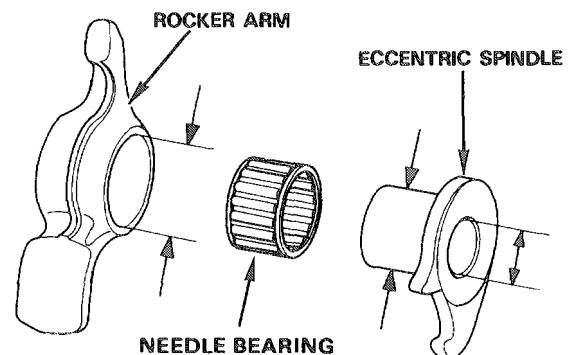
Service Limit: 25.05 mm (0.986 in)

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

Service Limits:

I.D.: 12.07 mm (0.475 in)

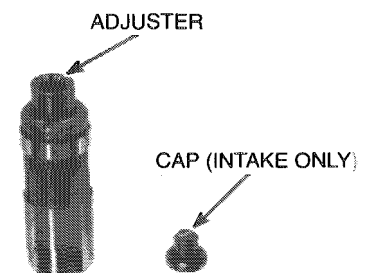
O.D.: 20.93 mm (0.824 in)



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.



Cylinder Head/Exhaust System Camshaft Holder Disassembly (cont'd)

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.

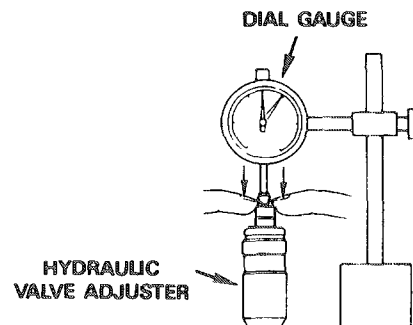
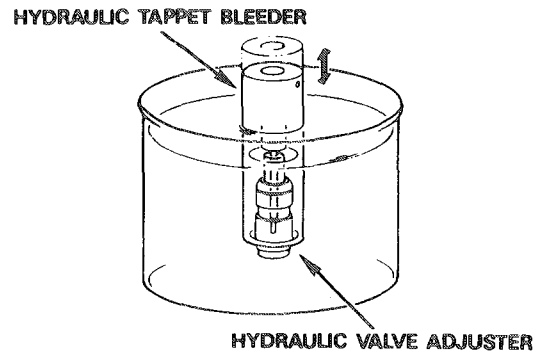
Tool:
Hydraulic tappet bleeder
07973-MJ00000

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.



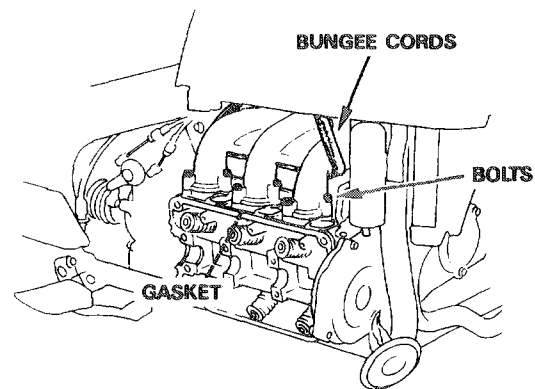
Cylinder Head Removal

Drain the coolant (see page 5-8).

Remove the following:

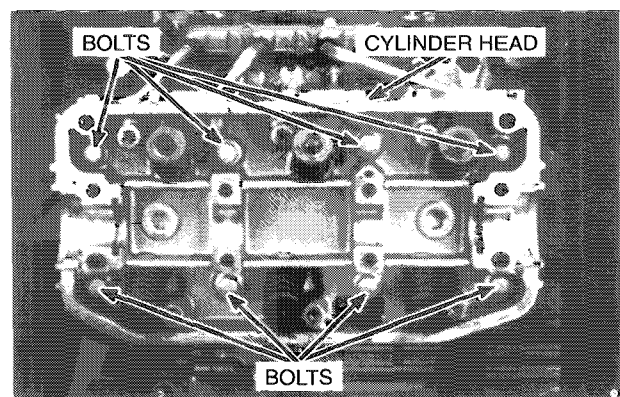
- timing belt and driven pulley (see 7-4)
- cylinder head cover, camshaft holder, and camshaft (see page 7-6)
- exhaust pipe (see page 7-28)
- spark plug wires

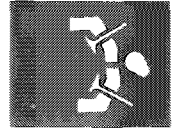
Support the intake manifold with bungee cords as shown and remove the intake manifold mounting bolts and gasket.



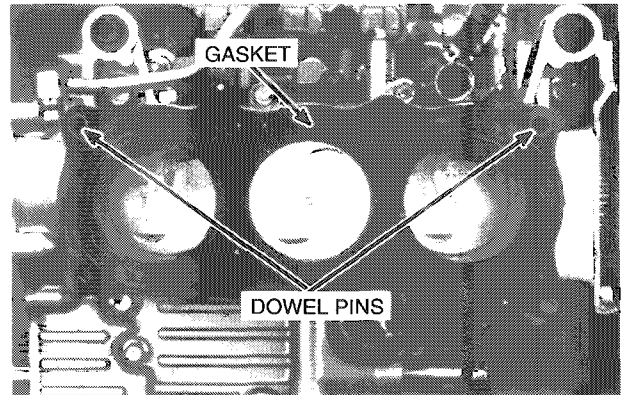
Remove the following:

- pulse secondary air injection pipes (see page 4-56)
- cylinder head bolts
- cylinder head





- 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 its keepers.
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.



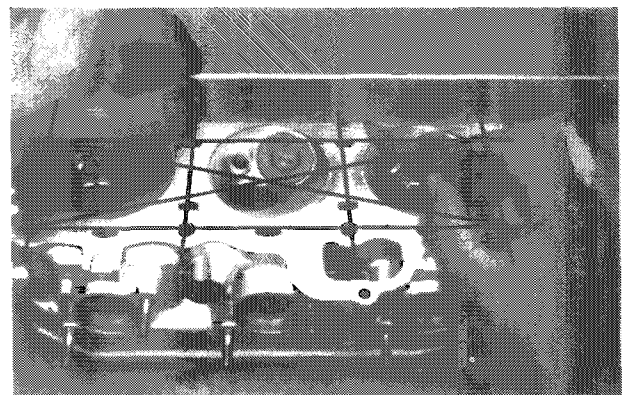
Cylinder Head Inspection

Clean carbon deposits from the combustion chamber and exhaust ports.

Check the spark plug 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)

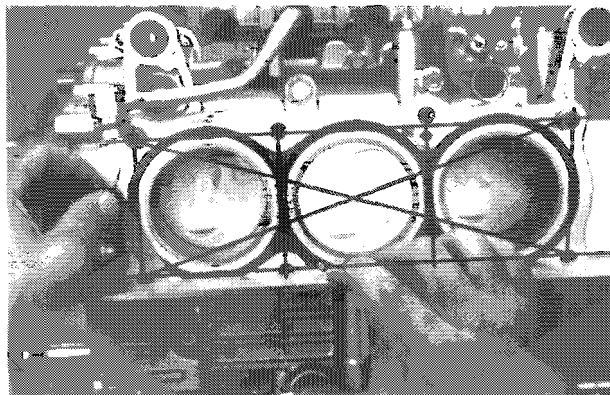


Cylinder Head/Exhaust System

Cylinder Head Disassembly (cont'd)

Check the cylinders for warpage across the head mating surface.

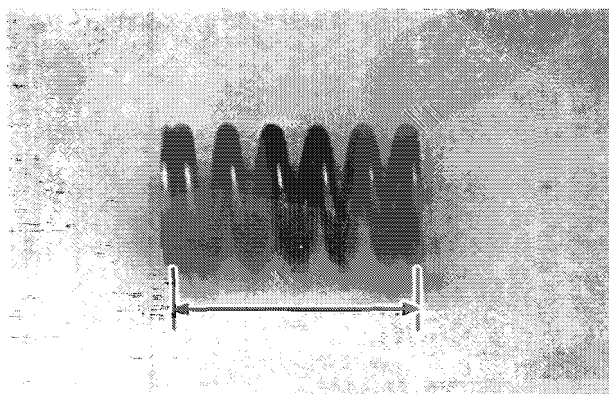
Service Limit: 0.10 mm (0.004 in)



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)

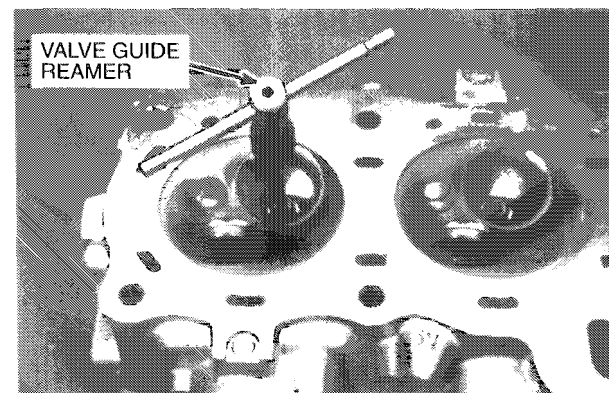


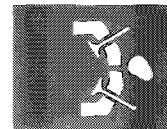
Run the proper reamer through the guides to remove carbon deposits from the combustion side of the cylinder head.

Tool:

Valve guide reamer, 5.5 mm

07984-200000C or 07984-200000D





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 275-290°F (130-140°C) with a hot plate or oven. Do not heat the cylinder head beyond 300°F (150°C). Use temperature indicator sticks available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

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 driver, 5.5 mm
07742-0010100

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

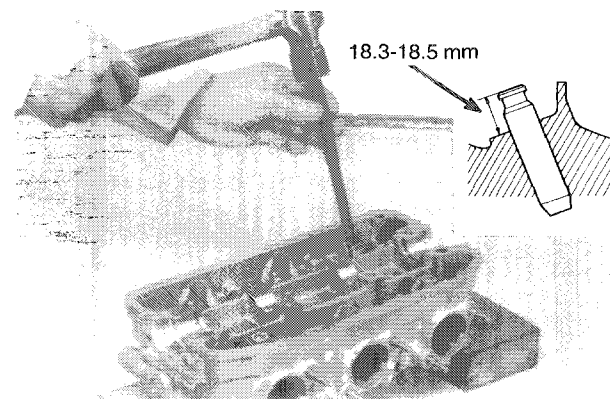
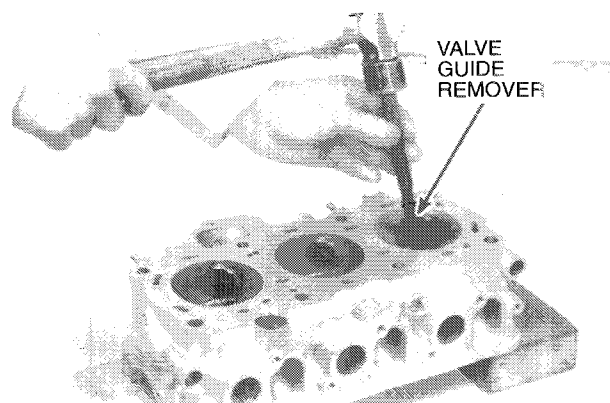
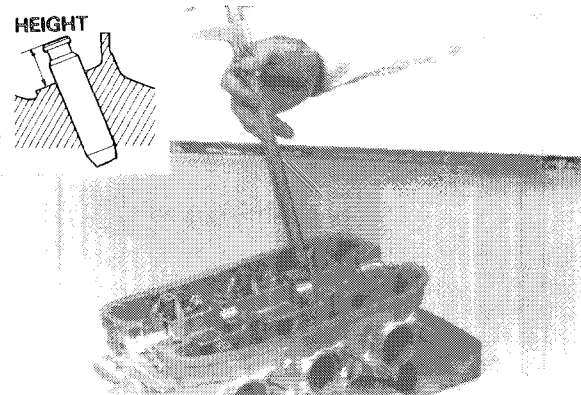
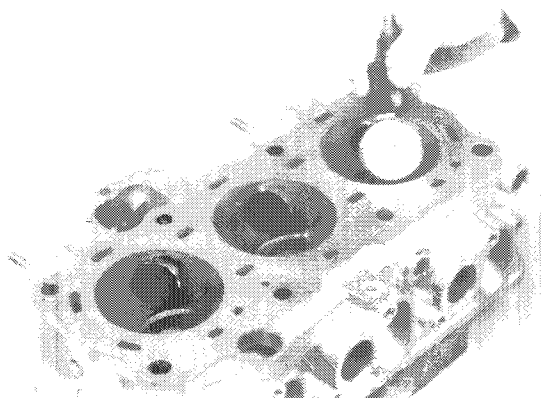
**Standard Valve Guide Height:
18.3-18.5 mm (0.72-0.73 in.)**

NOTE

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

Tool:

Valve guide driver, 5.5 mm
07742-0010100



Cylinder Head/Exhaust System

Cylinder Head Disassembly (cont'd)

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

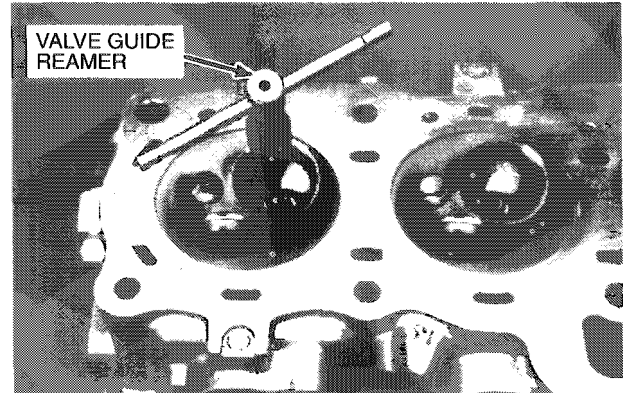
Tool:

Valve guide reamer, 5.5 mm
07984-200000B or 07984-200000C

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.

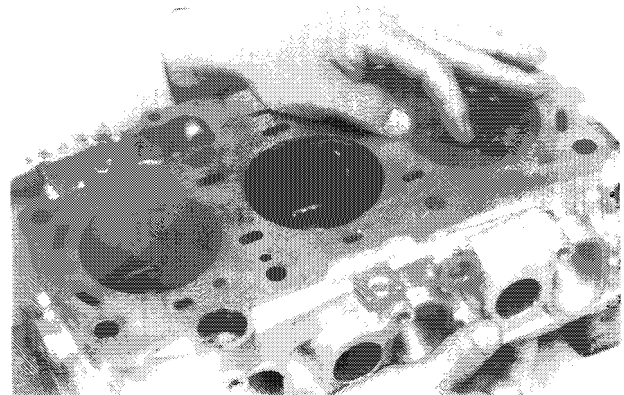


Valve Seat Inspection/Refacing

NOTE

- Check hydraulic valve adjuster shim selection whenever the valve seats are refaced.

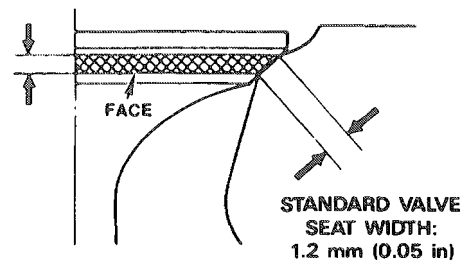
Apply a light coating of Prussian Blue to the valve face, then install the valve and lap it against its seat.

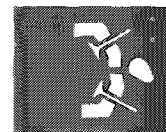


Remove the valve and inspect the face. If the seat is too wide, too rough, or has low spots, the seat must be refaced.

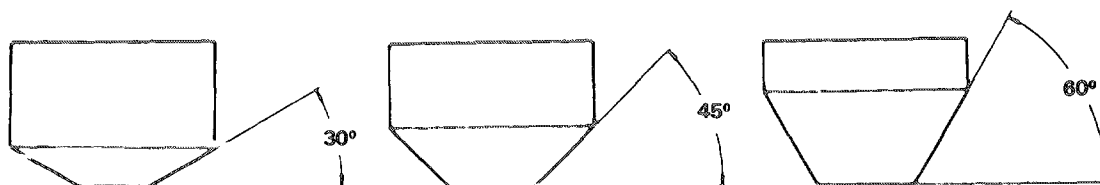
CAUTION

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





Valve Seat Cutters



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

NOTE

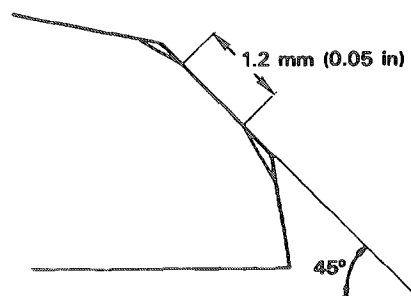
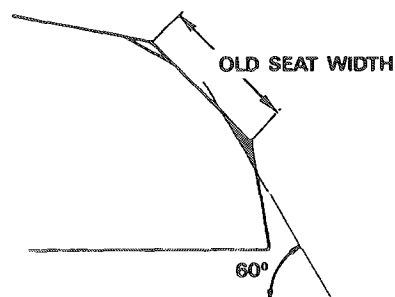
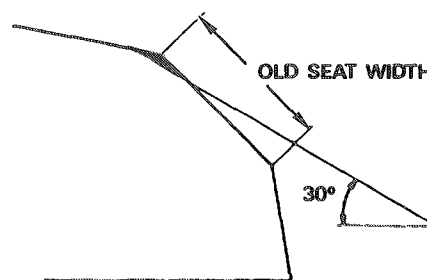
- Reface the seat with a 45 degree cutter when the valve guide is replaced.

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.

Valve Seat Width: 1.2 mm (0.05 in)



Cylinder Head/Exhaust System

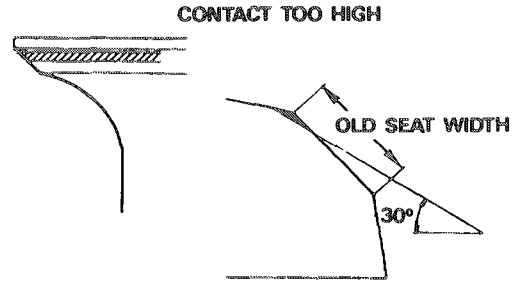
Valve Seat Inspection/Refacing (cont'd)

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.

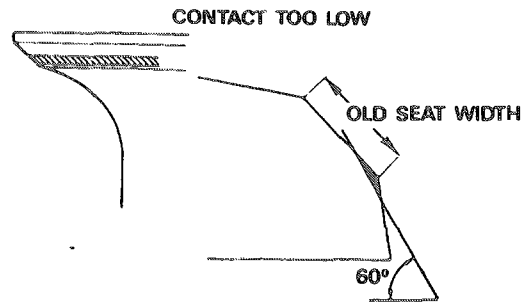
NOTE

- 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.

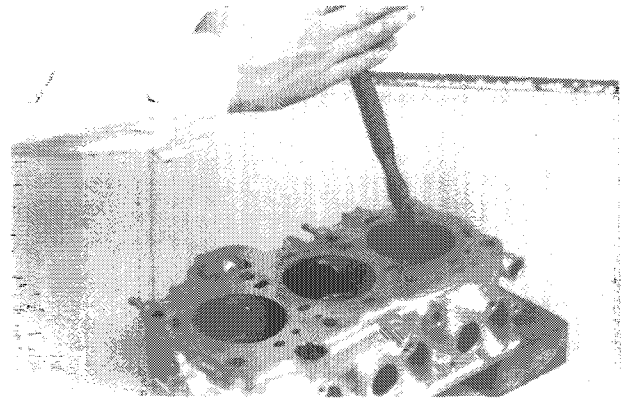


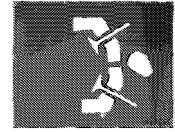
Refinish the seat to specifications, using a 45 degree finish cutter.

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 valve seal on each valve guide.

NOTE

- Replace the stem seals with new ones whenever a stem seal is removed.

Lubricate each valve stem with molybdenum disulfide oil.

CAUTION

- To avoid damage to the stem seals, turn each valve slowly when inserting.

Install the following:

- spring seats
- valves
- springs
- retainers

Compress the valve spring and install the keepers.

CAUTION

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

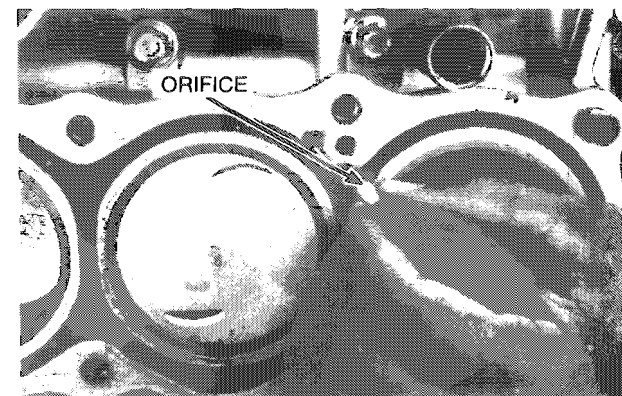
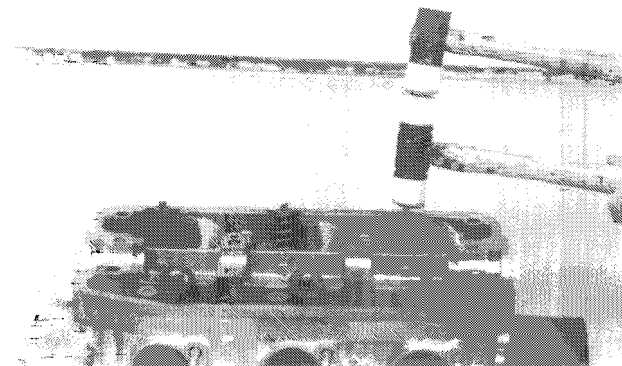
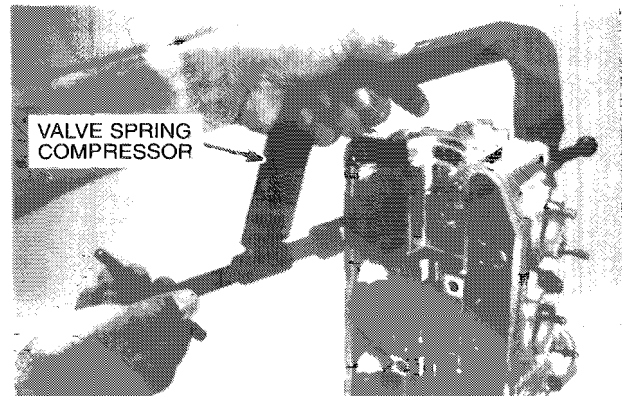
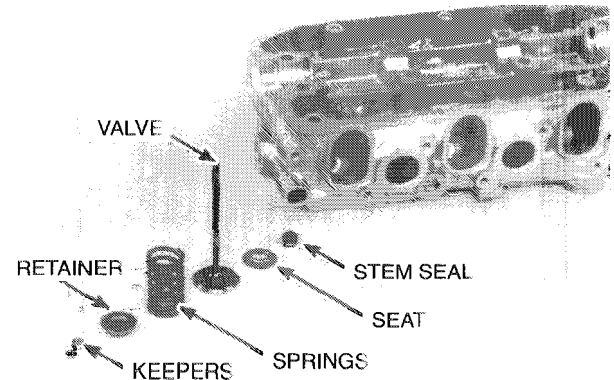
Tool:

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

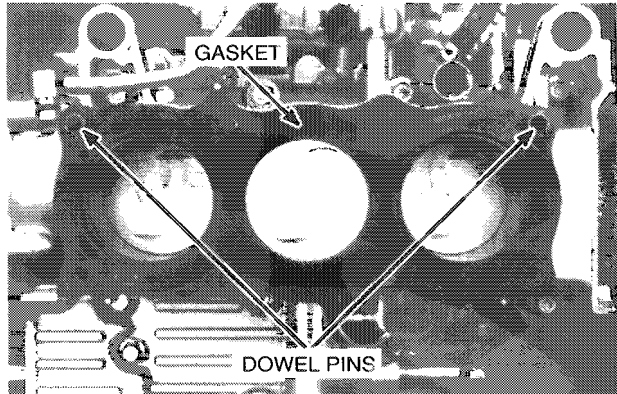
Clean any gasket material from the engine block, and check that all oil and water passages are clear.

Install the oil control orifice.

Cylinder Head/Exhaust System

Cylinder Head Assembly (cont'd)

Install dowel pins and head gasket.

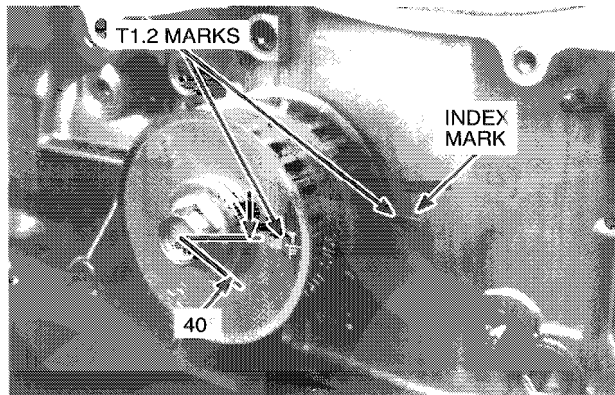


Check that the T1.2 drive pulley mark lines up with the index mark on the engine case at the No. 1 and No. 2 pistons TDC.

Turn the crankshaft 40 degrees 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 engine assembly.



Install the cylinder head and the head bolts, making sure the coolant pipe and O-ring are installed correctly (see page 5-14).

NOTE

- Coat the 9 mm bolt threads and flange surfaces with molybdenum disulfide oil.
- The 9 mm bolts have the washers.

First, gradually torque the eight 9 mm bolts in a crisscross pattern. Then torque the single 6 mm bolt.

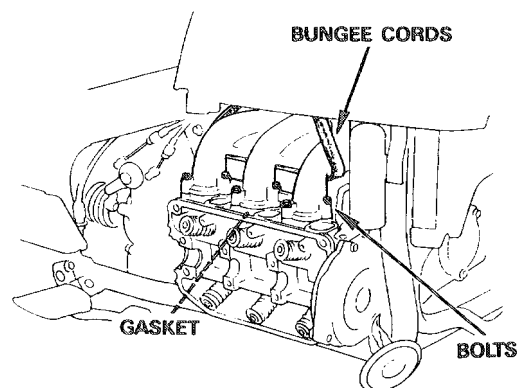
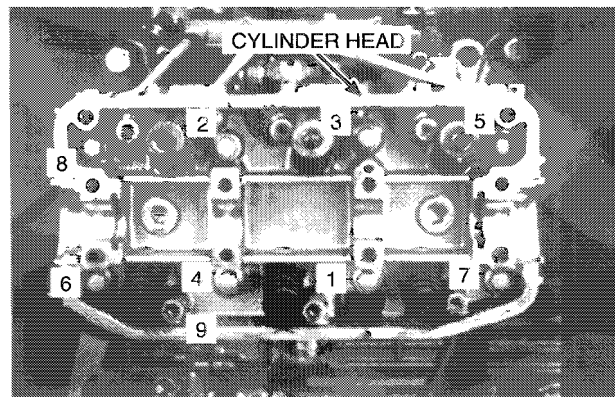
Torque: 9 mm bolts 45 N-m (4.5 kg-m, 33 ft-lb)

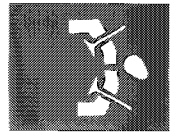
Install the pulse secondary air injection pipes (see page 4-58).

Position the gasket.

Install and tighten the intake manifold mounting bolts securely.

Release the bungee cords from the manifold.

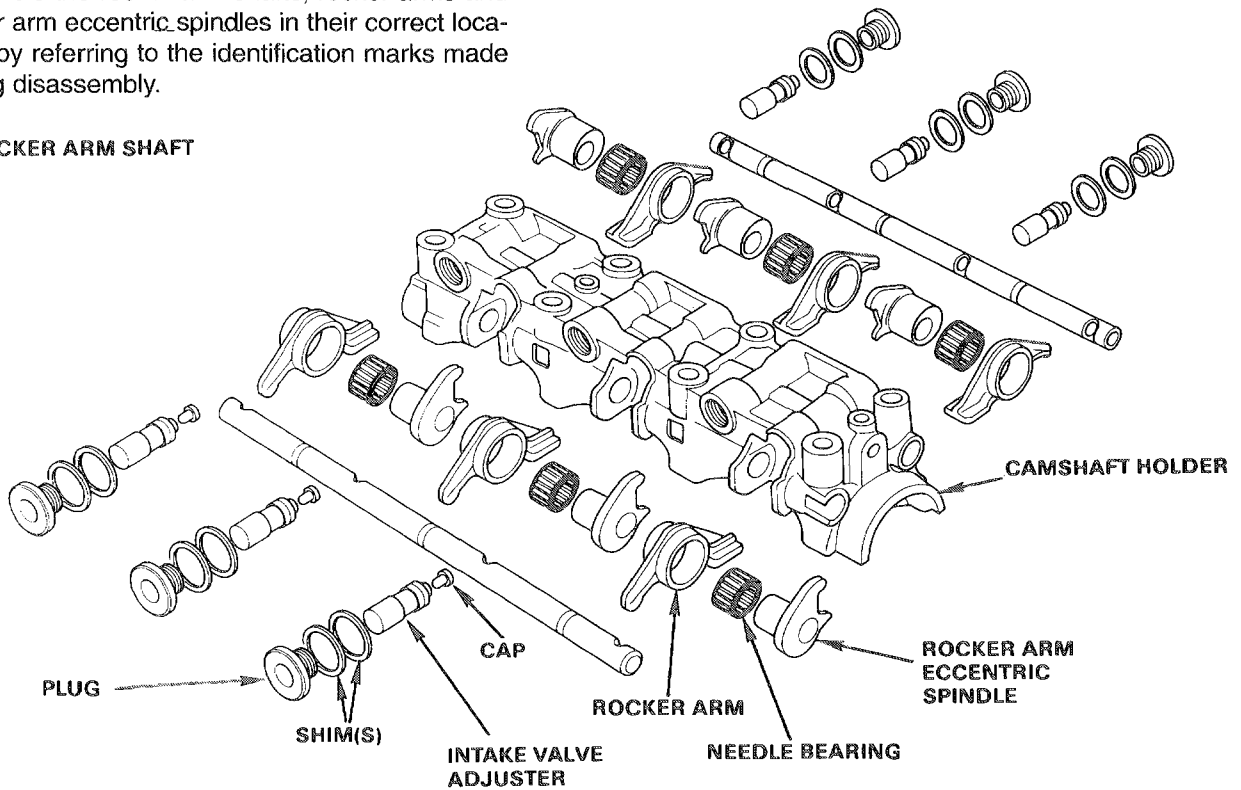




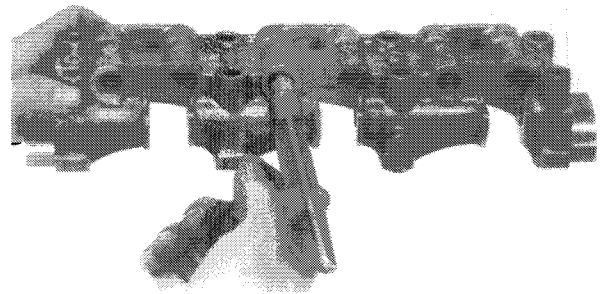
Camshaft Holder Assembly/Installation

Assemble the rocker arm shafts, rocker arms and rocker arm eccentric spindles in their correct locations by referring to the identification marks made during disassembly.

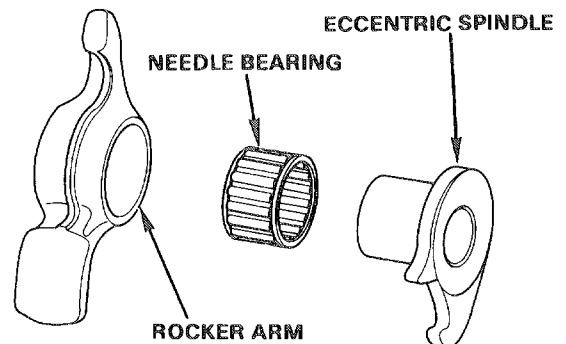
ROCKER ARM SHAFT



Clean the camshaft holder thoroughly. Blow through all holes and passages with compressed air.



Lubricate all sliding surfaces with molybdenum disulfide oil.



Cylinder Head/Exhaust System Camshaft Holder Assembly/Installation (cont'd)

Install the following:

- rocker arms
- needle bearings
- rocker arm eccentric spindles
- 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 shafts.

For shim selection, see page 7-24.

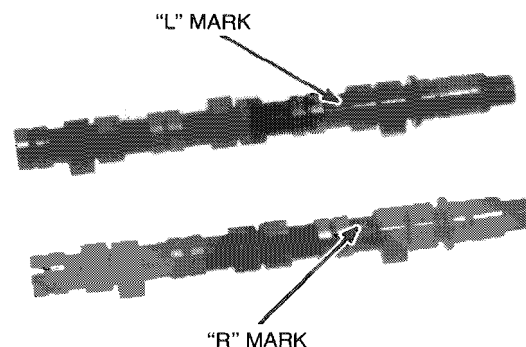
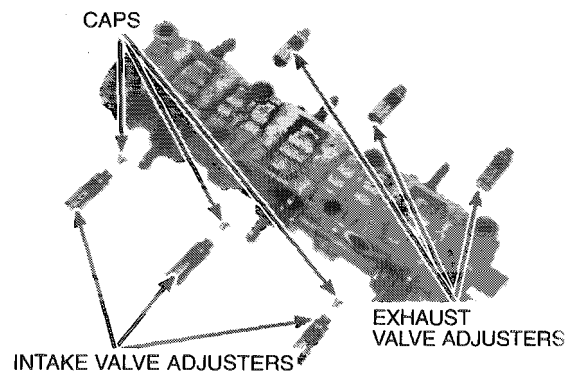
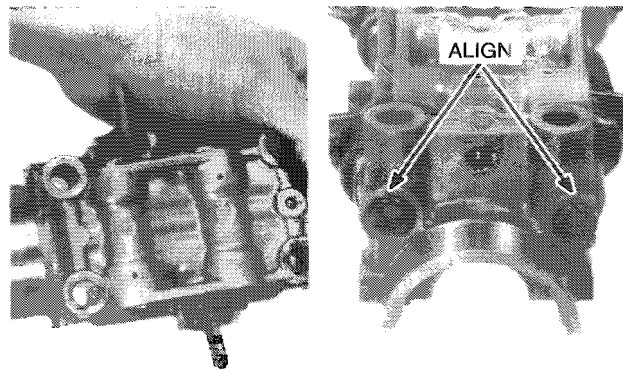
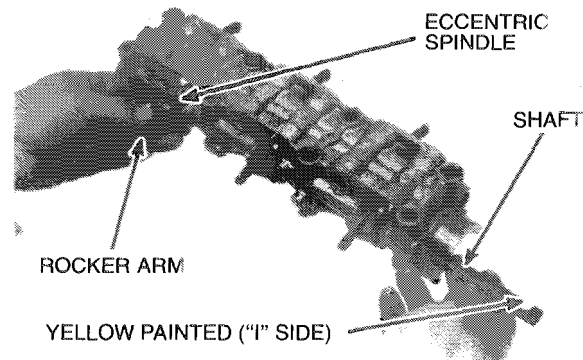
Tighten the stopper plugs.

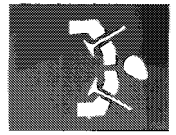
Torque: 30 N-m (3.0 kg-m, 22 ft-lb)

Lubricate the camshaft journals and cam lobes with molybdenum disulfide oil.

NOTE

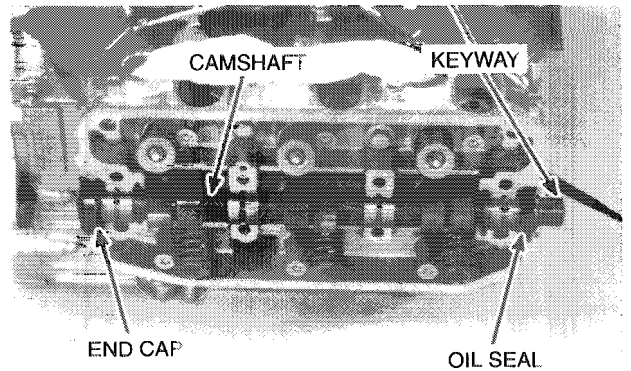
- An "R" mark appears on the right side camshaft; an "L" mark appears on the left side camshaft.



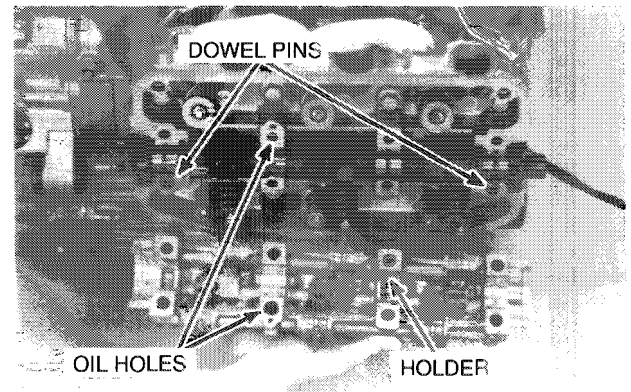


Install the oil seal and cap on the ends of the camshaft. Coat the outer edges of the oil seal and end cap with sealant.

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).



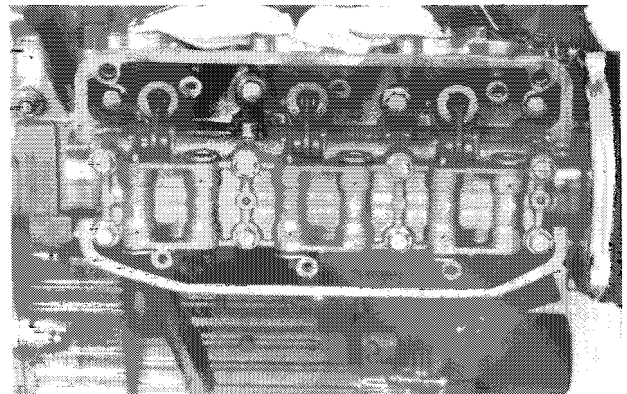
Install the two dowel pins onto the cylinder head. Install the camshaft holder in the cylinder head, aligning the oil holes on the holder and cylinder head.



Install and tighten the eight bolts in the sequence, as shown.

Torque: 20 N-m (2.0 kg-m, 14 ft-lb)

Install the timing belt (next page).



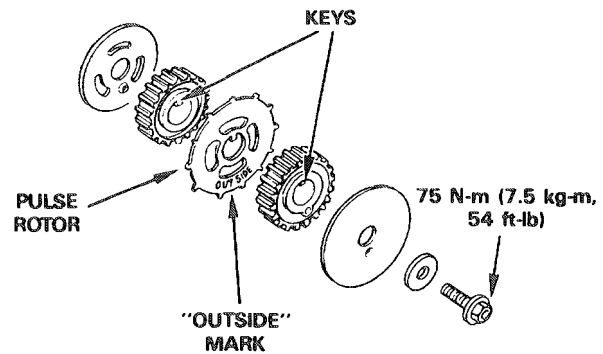
Cylinder Head/Exhaust System

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.
- The pulse rotor should be installed with its "OUT-SIDE" mark facing out.



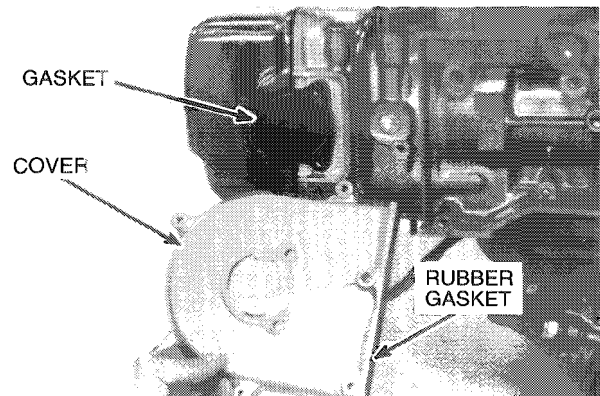
Apply locking agent to the shield cover bolt threads.

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



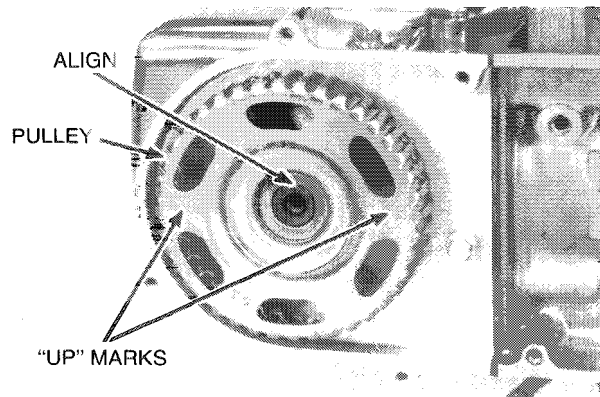
Install the driven pulley on the camshaft with the camshaft keyway aligned with the key in the driven pulley.

NOTE

- "UP" marks on the pulleys should face 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.

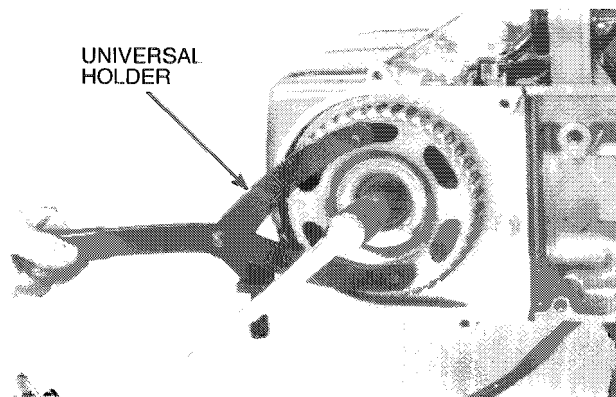
Torque: 27 N-m (2.7 kg-m, 20 ft-lb)

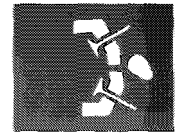
Tool:

Universal holder
07725-0030000

NOTE

- Install the washer with its chamfered side facing the bolt.





Turn the crankshaft counterclockwise until the T1.2 drive pulley mark lines up with the index mark on the engine case.

Apply locking agent to the tensioner bolt threads.

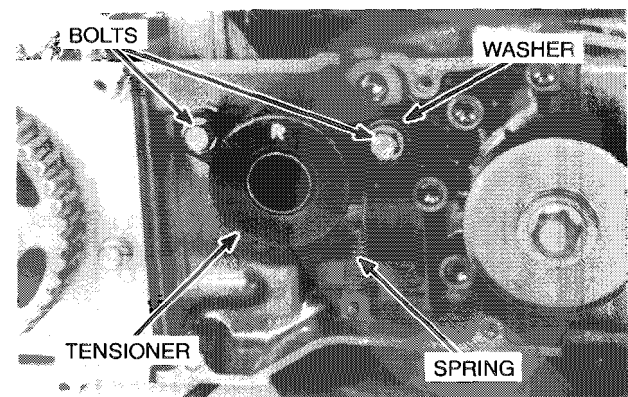
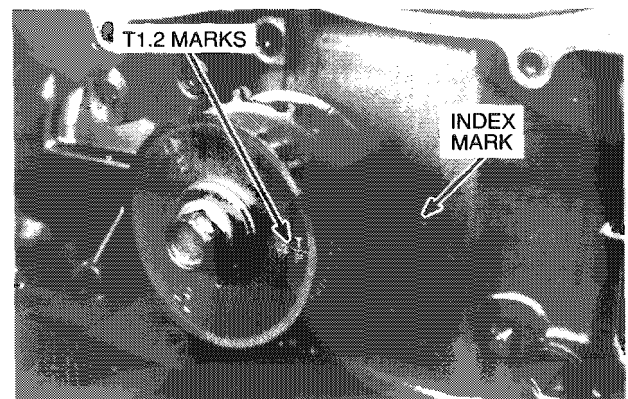
Install the timing belt tensioners on the crankcase, and tighten the bolts just enough to allow smooth movement of the tensioners.

CAUTION

- Do not lubricate the tensioners. Oil will damage the timing belts.

NOTE

- Install the tensioner springs with the open ends at the tensioner facing outward.
- Install the washer under the bolt nearest to the drive pulley (each side).

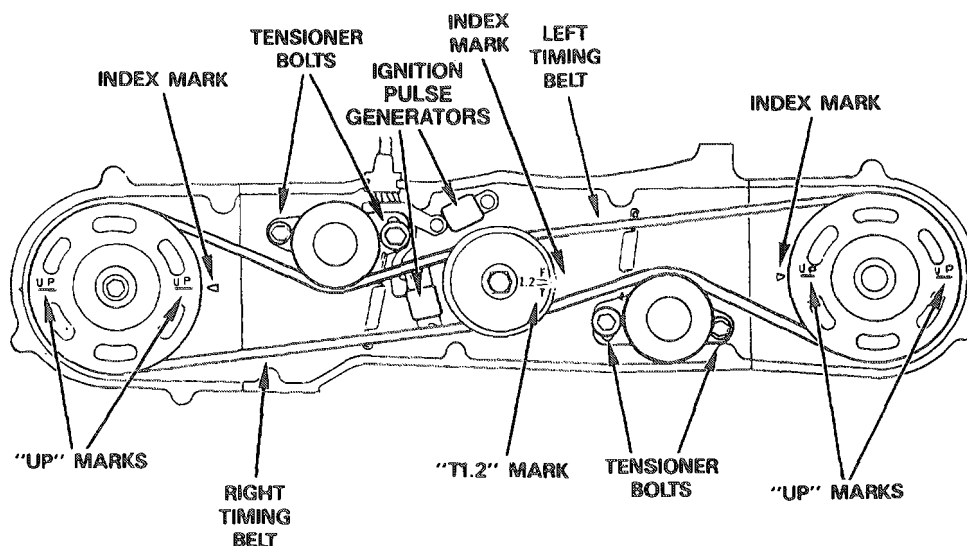


Check that the "UP" marks on the driven pulleys align with the shield cover index marks. The pulley "UP" marks should face up. Loosen the tensioner bolts and install the left timing belt.

Apply clockwise pressure on the left driven pulley so the belt will be slack at the tensioner.

Install the ignition pulse generators (see page 16-11).

Install the right timing belt using the same procedures.



Cylinder Head/Exhaust System

Timing Belt Installation (cont'd)

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 the index mark.

Tighten the tensioner driven pulley side bolt first, then tighten the drive pulley 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. The belt slack should be 5-7 mm (0.2-0.3 in).

NOTE

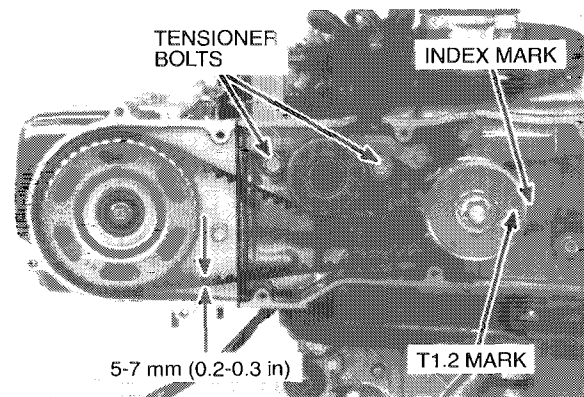
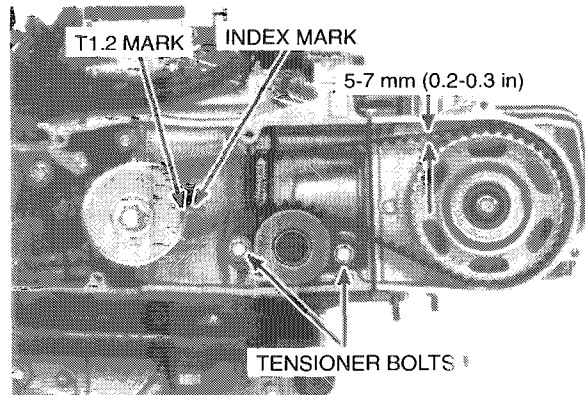
- Inspect and adjust timing belt tension while the engine is cold.

Check the timing mark alignment and tighten the tensioner bolts for the left belt in the same way.

Push the belt lower run midway between the pulleys with 2 kg (4.4 lb) force. The belt slack should be 5-7 mm (0.2-0.3 in).

CAUTION

- Do not lubricate the belt tensioners. 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:

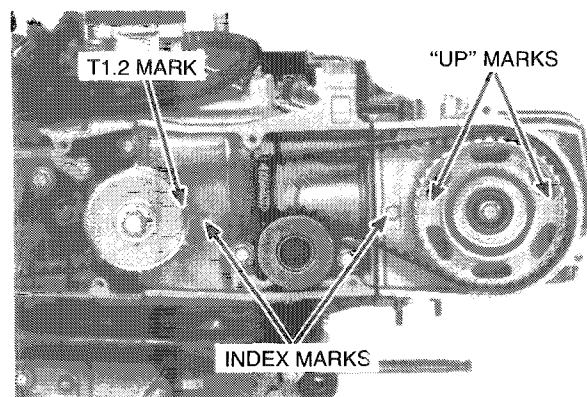
- cylinder head/camshaft holder
- camshaft
- valve/valve seat (refaced)
- rocker arm/rocker arm shaft

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 pulley mark lines up with the index mark on the engine case. The "UP" marks on the driven pulleys should be facing up (each side).



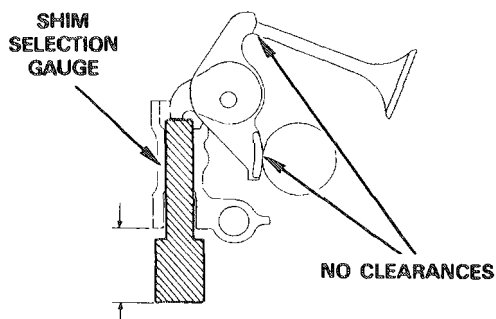


Measure the distance between the top end of the Shim Selection Gauge and shim surface of the cam holder by inserting the gauge into the valve adjuster mount hole.

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.

Firing order (cylinder number)	1	4	5	2	3	6
Drive pulley mark	T1.2	T3.4	T5.6	T1.2	T3.4	T5.6

Intake mm (in)	Exhaust mm (in)	Number of shims
10.2-10.3 (0.402-0.406)	12.2-12.3 (0.480-0.484)	0
10.3-10.4 (0.406-0.409)	12.3-12.4 (0.484-0.488)	1
10.4-10.5 (0.409-0.413)	12.4-12.5 (0.488-0.492)	2
10.5-10.66 (0.413-0.417)	12.5-12.6 (0.492-0.496)	3

NOTE

- Turn the crankshaft clockwise.

Cylinder Head/Exhaust System

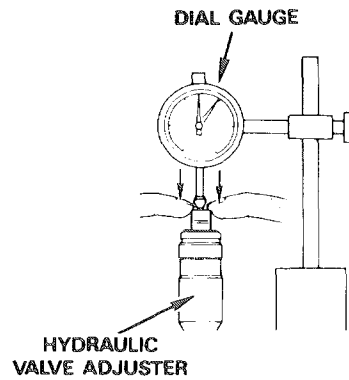
Hydraulic Valve Adjuster Shim Selection (cont'd)

Fill the hydraulic valve adjusters with oil. Check for the absence of air by compressing with your fingers.

CAUTION

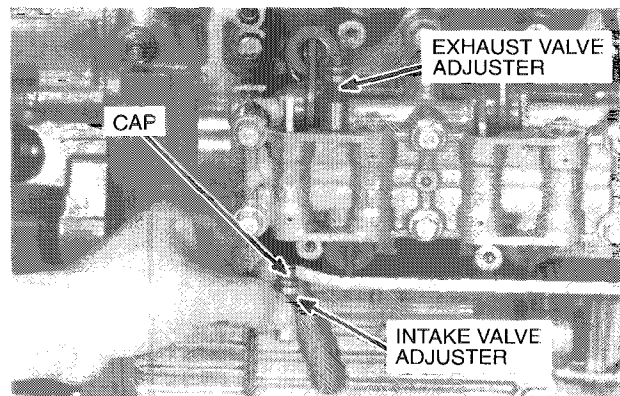
- To prevent entry of air, do not tilt the adjusters once they are filled with oil or kerosene.

Bleed air from the adjuster if it compresses by more than 0.30 mm (0.012); (see page 7-10).



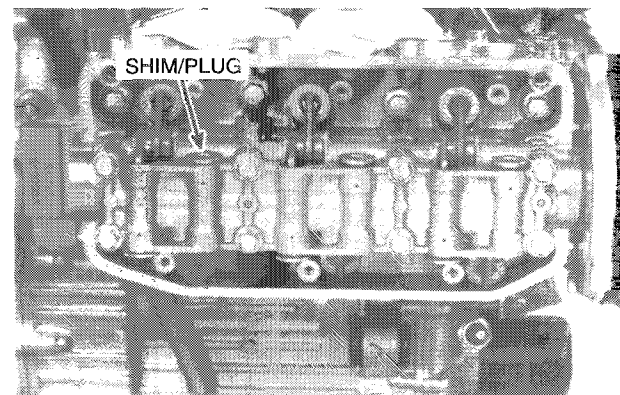
Slide the exhaust valve adjusters into the camshaft holder, with the oil holes facing up.

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)

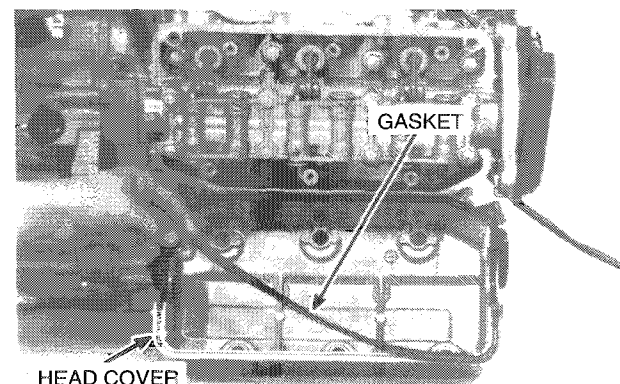


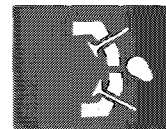
Apply Three Bond 1521 or equivalent to the cylinder head cover gasket groove if the gasket is removed.

Attach the gasket to the head cover groove correctly.

NOTE

- Clear the groove before applying adhesive.
- Do not apply adhesive to the camshaft holder contacting surfaces.



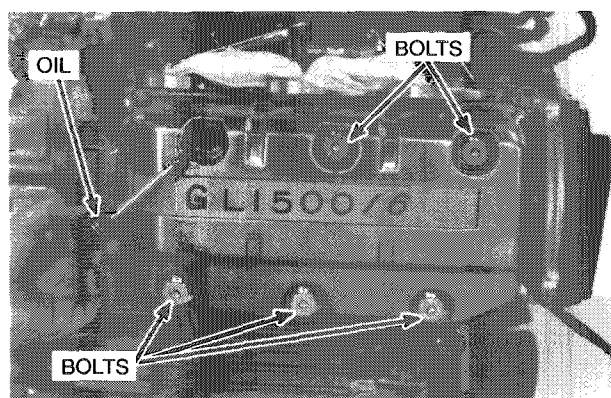


Coat the rubber areas of the cover bolts washers with oil.

Install the rubber plugs in the bolt holes.

Torque the bolts.

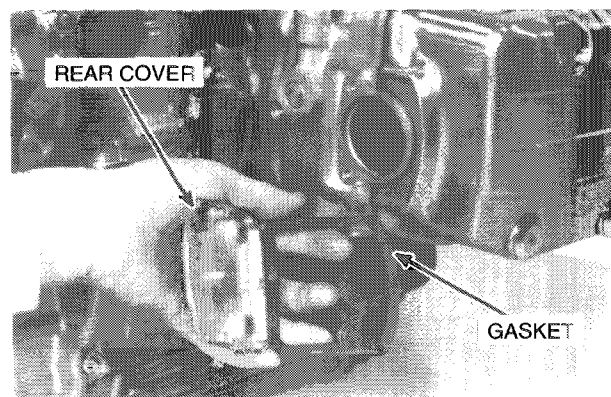
Torque: 12 N-m (1.2 kg-m, 9 ft-lb)



Install the cylinder head rear cover with a new gasket.

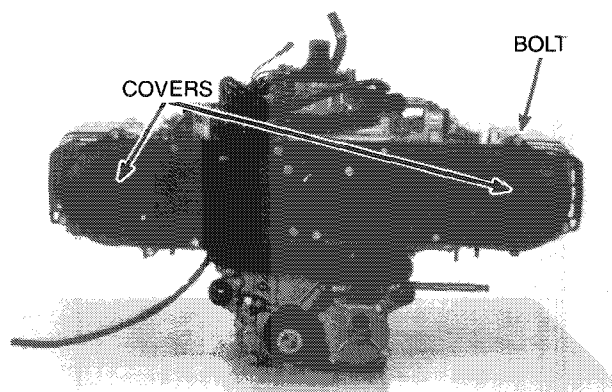
NOTE

- Align the cover holes with the gasket projections.



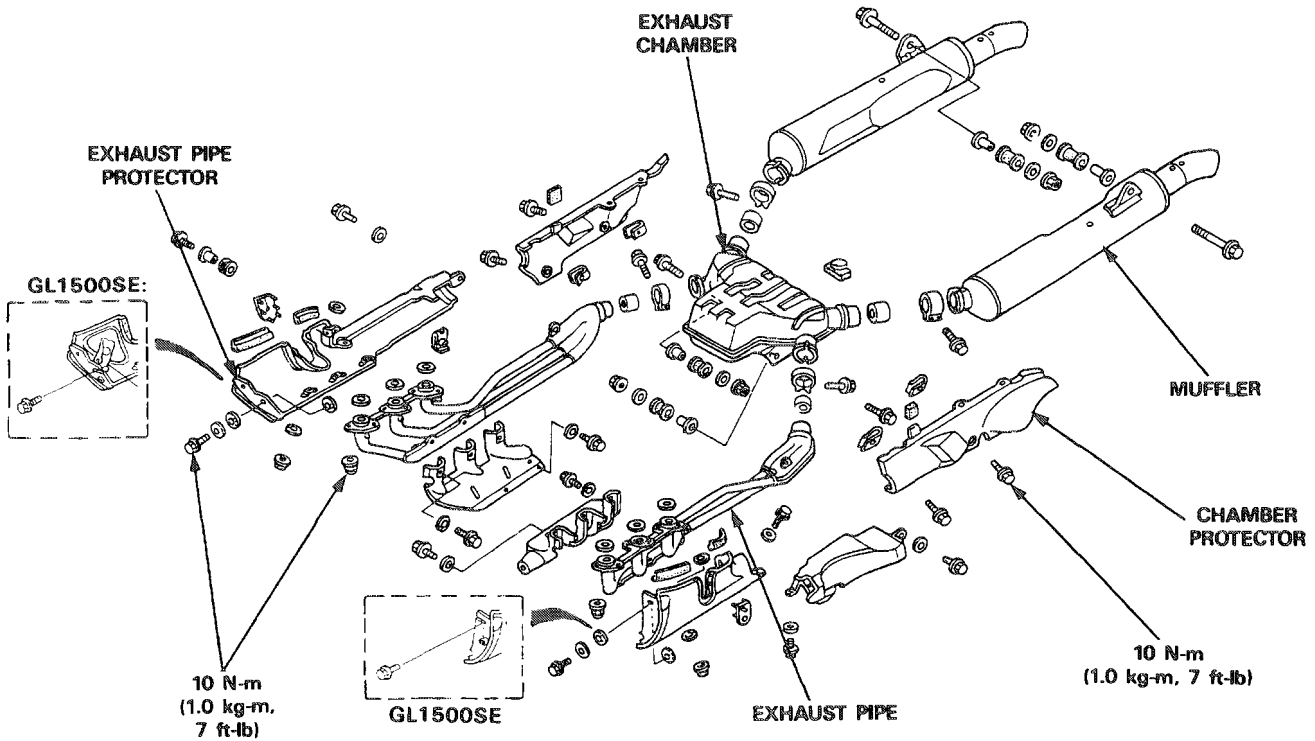
Install the timing belt covers with cover gaskets.

Install the under cover and fairing front cover (see page 13-11).



Cylinder Head/Exhaust System

Exhaust Pipe/Muffler

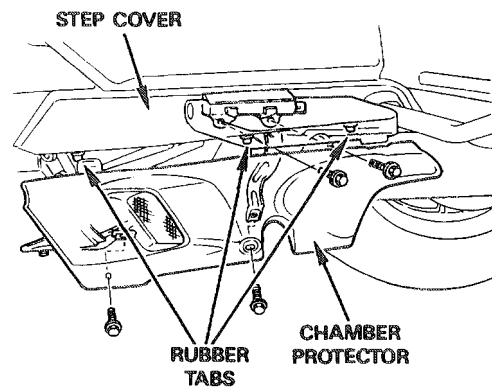


Chamber Protector

Remove the two step cover bolts.

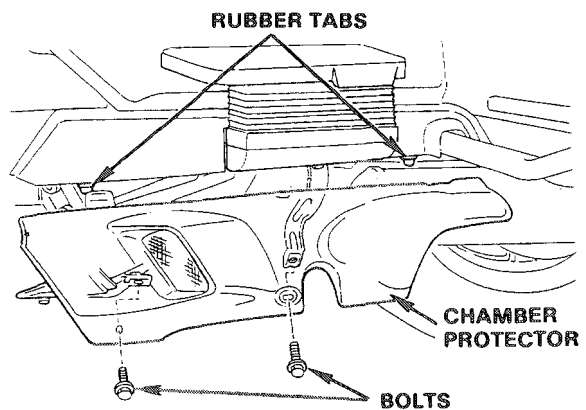
Remove the step cover by releasing its rubber tabs from the chamber protector holes.

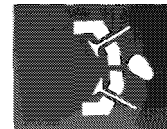
Remove two bolts and chamber protector.



GL1500SE:

Remove the two bolts, release the rubber tabs and remove the chamber protector.





Exhaust Pipe Protectors

A & I models:

Remove the fairing front cover and the under cover (see page 13-11).

Remove the chamber protector (page 7-28).

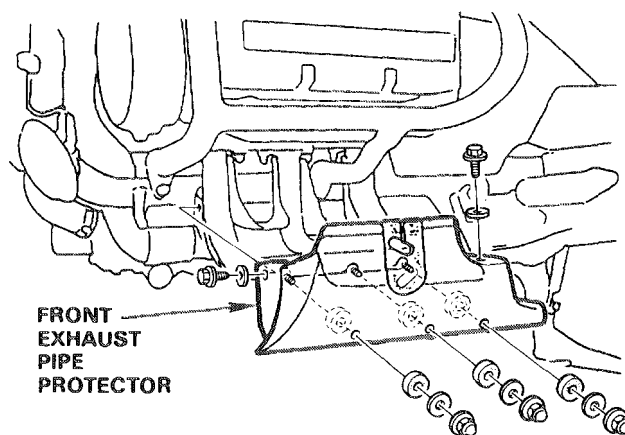
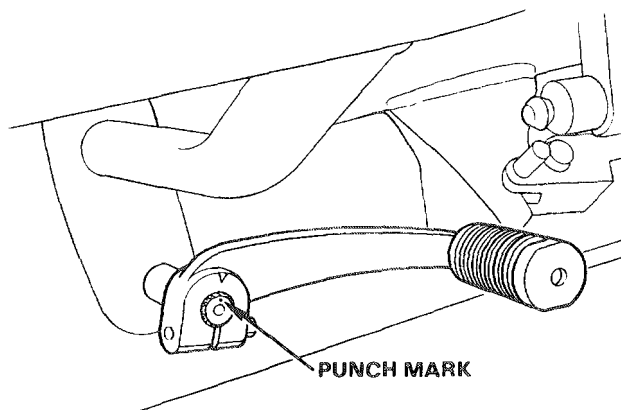
Left Side – Front:

Remove the gearshift pedal.

NOTE

- When installing the gearshift pedal, align the pedal slot with the punch mark on the gearshift shaft.

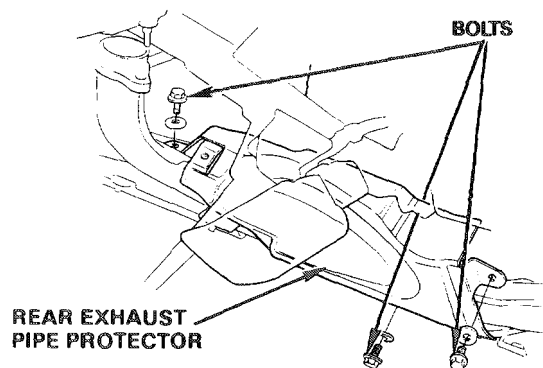
Remove two bolts and three nuts and the front exhaust pipe protector.



Left Side – Rear:

Remove the exhaust pipe (see page 7-32).

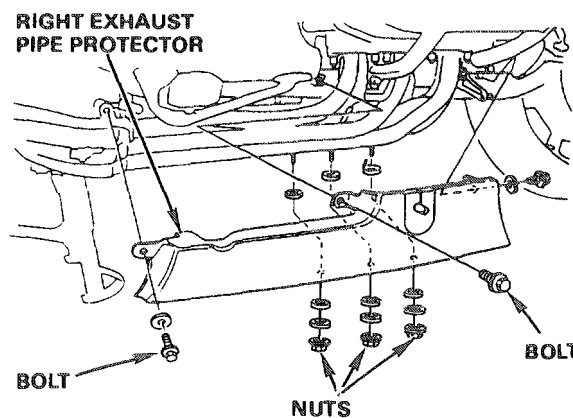
Remove three bolts and the rear exhaust pipe protector.



Right Side:

Remove the chamber protector (page 7-28).

Remove three bolts and nuts and the right exhaust pipe protector.



Cylinder Head/Exhaust System

Exhaust Pipe/Muffler (cont'd)

Exhaust Pipe Protectors

GL1500SE:

Remove the faring front cover and the under cover (see page 13-11).

Remove the chamber protector.

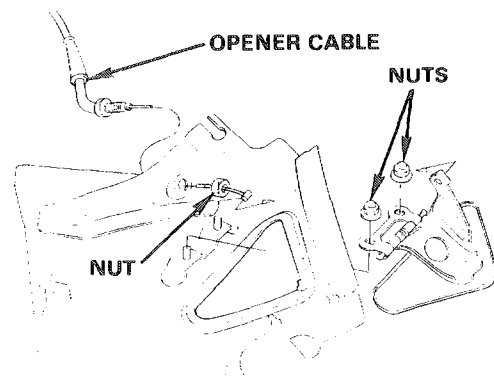
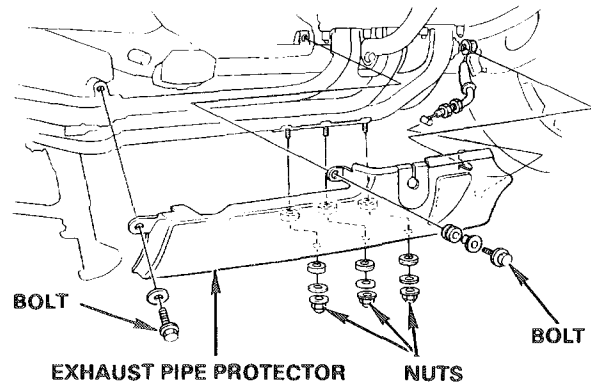
Right Side:

Remove the brake pedal.

Loosen the front bolt and remove the two bolts. Remove the three nuts and the exhaust pipe protector.

Remove the nut and disconnect the opener cable from the exhaust pipe protector lid.

Remove the two nuts and the lid from the exhaust pipe protector.

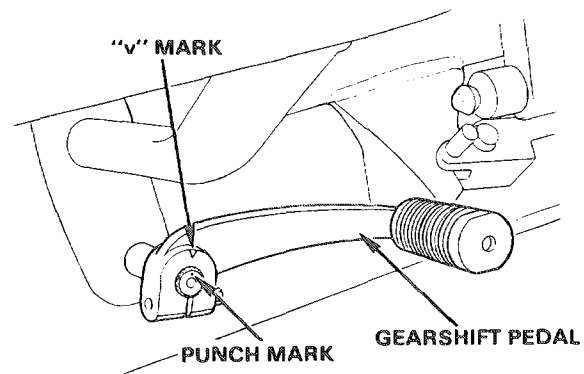


Left Side – Front:

Remove the gearshift pedal.

NOTE

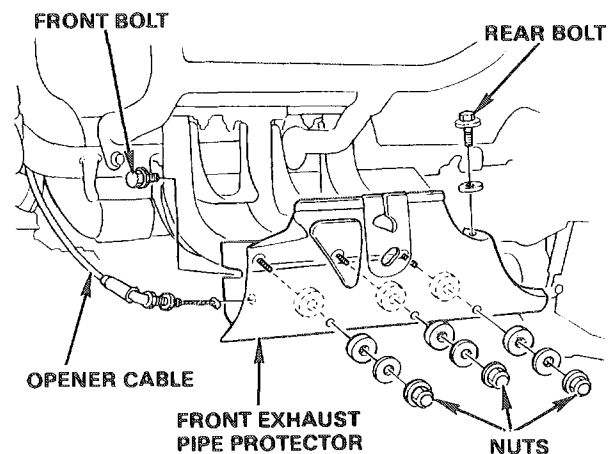
- When installing the gearshift pedal, align the "v" mark of the pedal with punch mark on the gearshift shaft.

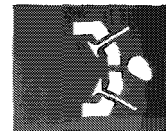


Loosen the front-bolt and remove the rear bolt.

Remove the three nuts and the front exhaust pipe protector.

Disconnect the opener cable and remove the lid in the same manner as the right side.

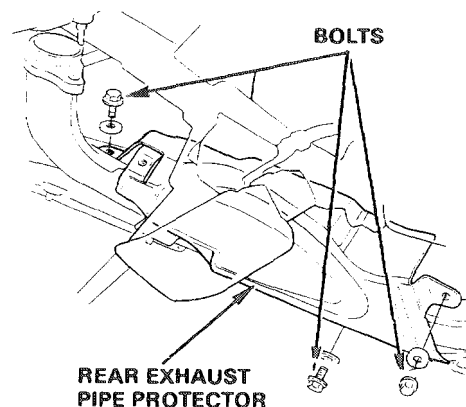




Left Side – Rear:

Remove the exhaust pipe (see page 7-32).

Remove the three bolts and the rear exhaust pipe protector.



Exhaust Pipe Protector Lid Opener

GL1500SE:

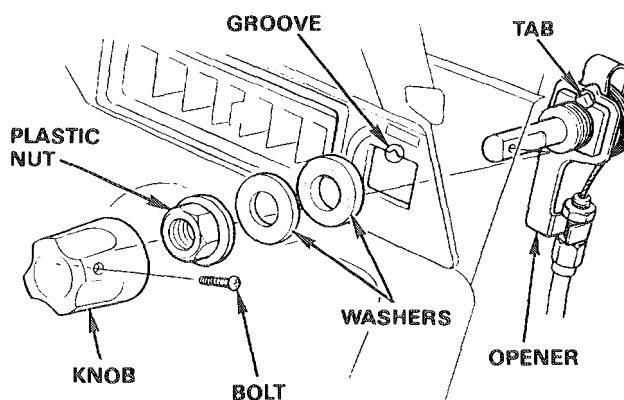
Remove the right fairing pocket (see page 13-9).

Remove the screw and the lid opener knob.

Remove the plastic nut and washers and remove the opener from the instrument panel.

NOTE

- When installing the opener, align the tab with the groove in the panel and tighten the plastic nut.

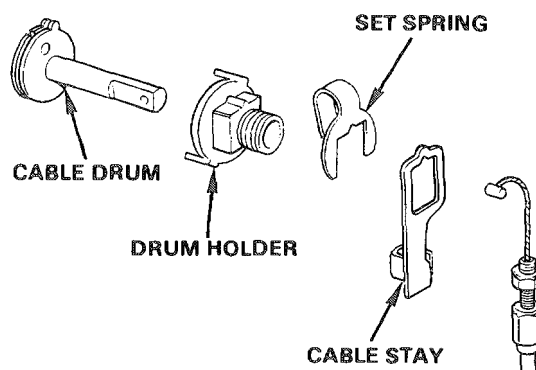


Loosen the opener cable lock nut and remove the cable from the stay.

Remove the set spring, cable stay and drum holder from the cable drum.

Install the exhaust pipe protector opener in the reverse order of removal.

After installing the opener, check the operation of the exhaust pipe protector lid by turning the opener knob.



Opener Cable Adjustment

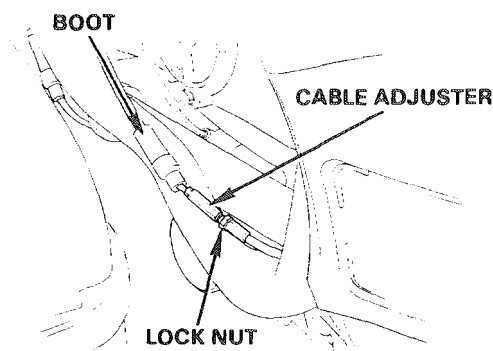
GL1500SE:

Turn the lid opener knob to the “CLOSE” position and check that the protector lid is completely closed.

Turn the opener knob to the “OPEN” position and check that the lid is fully open by moving the lid with your hand.

If adjustment is necessary, remove the under cover (see page 13-11).

Slide the boot off the cable adjuster, loosen the lock nut and turn the adjuster as required.



Cylinder Head/Exhaust System

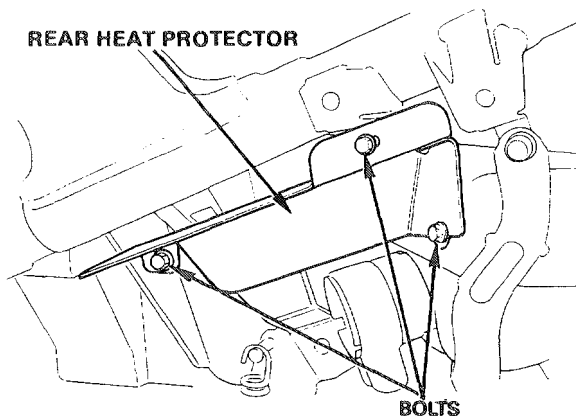
Exhaust Pipe/Muffler (cont'd)

Heat Protectors

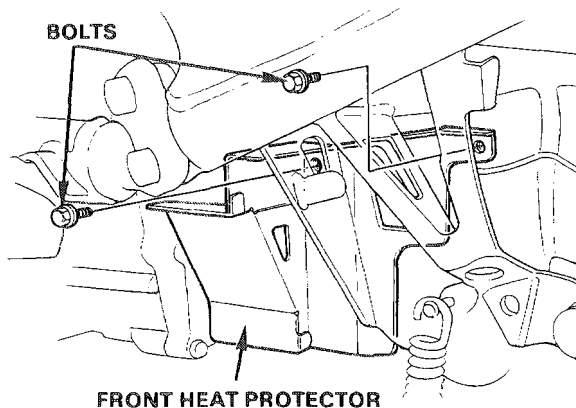
Left Side:

Remove the left exhaust pipe (see below).

Remove three bolts and the rear heat protector.



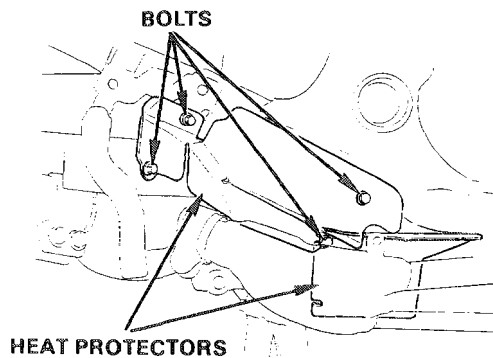
Remove two bolts and the front heat protector.



Right Side:

Remove the chamber protector and exhaust pipe protector (see previous page).

Remove four bolts and the front/rear heat protectors.



Exhaust Pipe

Left Side:

Remove the left front exhaust pipe protector (see page 7-29).

Remove the engine guard (Section 6).

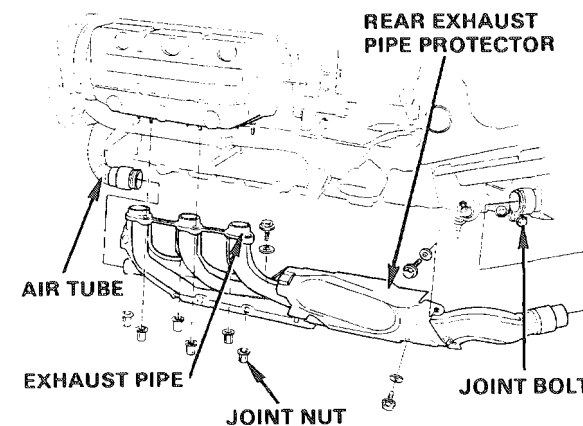
Loosen the exhaust pipe joint bolt.

Remove the exhaust pipe joint cap nuts.

Disconnect the hot air tube from the exhaust pipe hot air chamber.

Remove the exhaust pipe.

Remove the rear exhaust pipe protector.



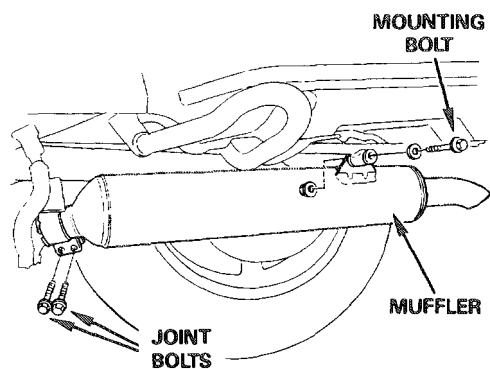


Muffler

Remove the chamber protector (see page 7-28). Loosen the muffler joint bolts.

Remove the muffler mounting bolt, washer and nut.

Remove the muffler.



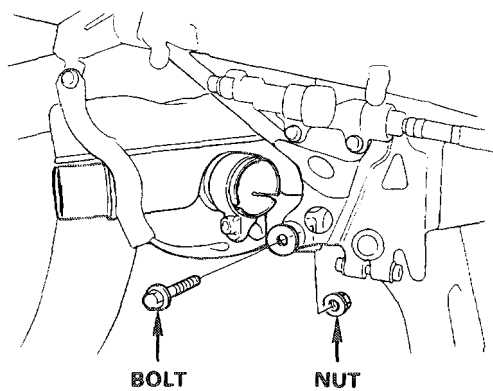
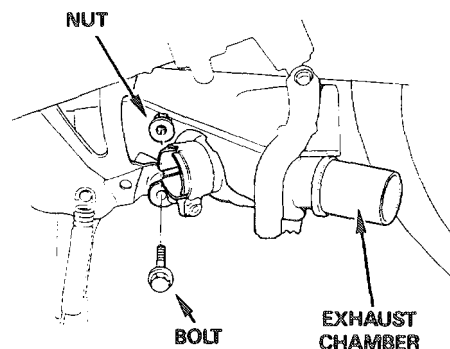
Exhaust Chamber

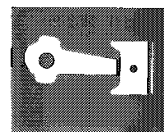
Remove the following:

- mufflers (see above).
- one exhaust pipe (see previous page).

Remove the exhaust chamber mounting bolts and nuts.

Remove the exhaust chamber.





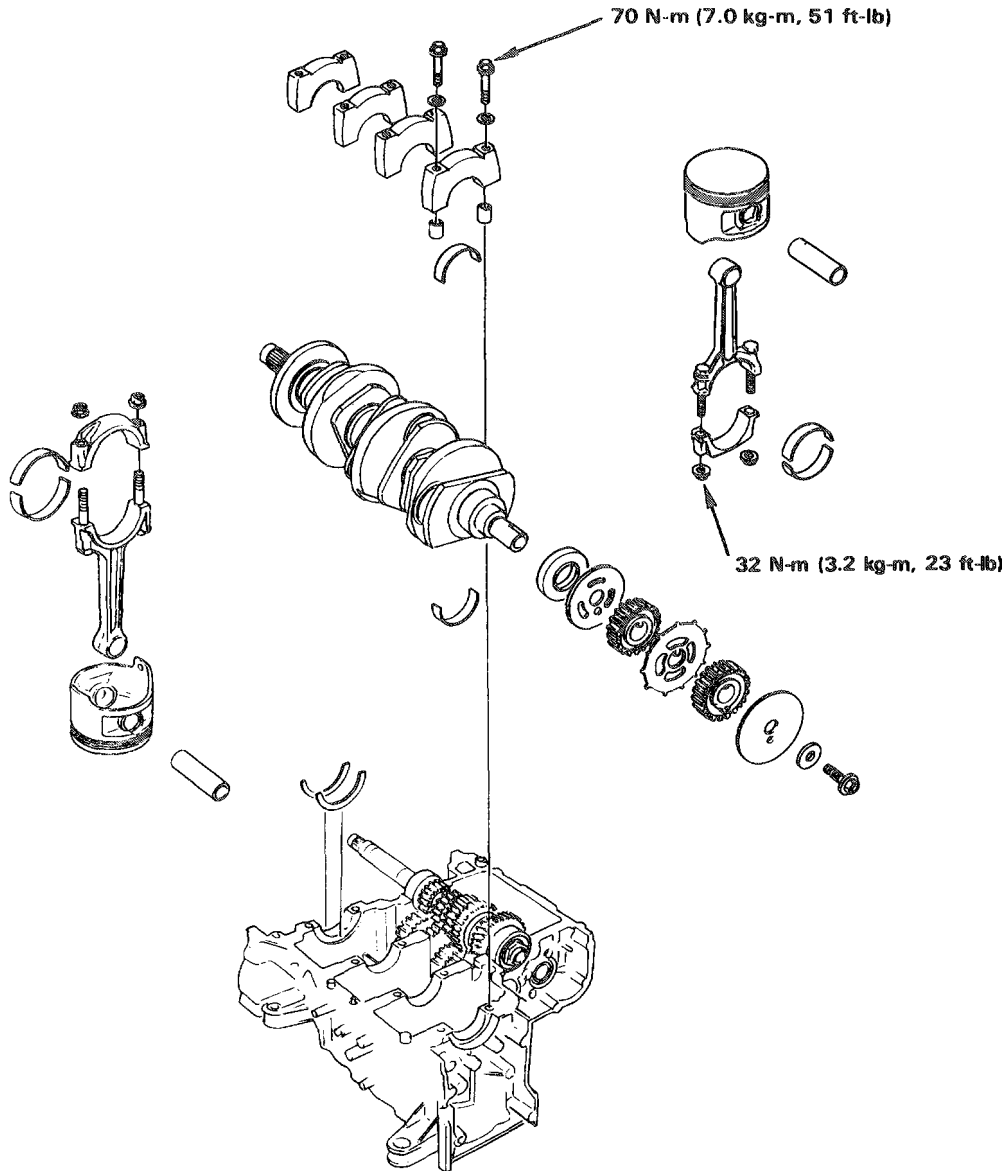
Crankshaft/Piston

Service Information	8-2
Troubleshooting	8-4
Front Engine Cover	
Removal	8-5
Rear Case Cover	
Removal	8-6
Scavenging Pump	8-10
Oil Strainer and Main	
Oil Pump	8-14
Piston/Connecting Rod	
Removal	8-17
Crankpin Bearing	8-21
Piston/Connecting Rod	
Installation	8-23
Crankshaft Removal	8-27
Main Journal Bearing ...	8-28
Crankshaft Installation ..	8-30
Front Engine Cover	
Installation	8-32
Rear Case Cover	
Installation	8-33

Crankshaft/Piston

Service Information

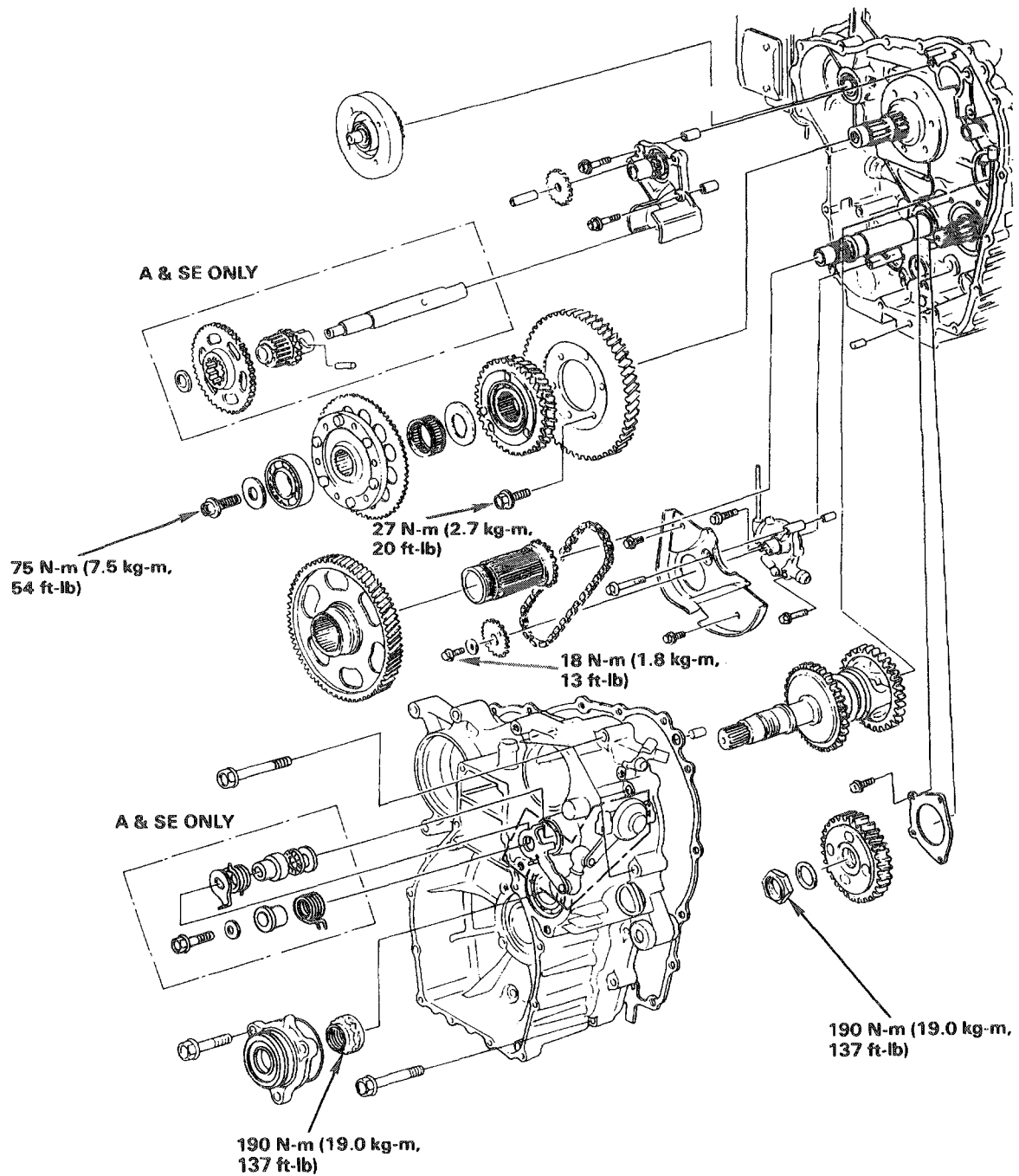
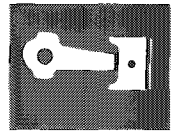
- See Section 6 for engine removal and installation.
- To separate the crankcase, refer to Section 10.
- If you aren't removing the right side pistons (cylinders No. 1, 3, and 5), it is not necessary to remove the right cylinder head. Certain steps are required to prevent valve damage when separating the engine cases without first removing the right cylinder head (Section 10).
- Whenever the case is disassembled, remove all gasket material from oil passages and water jackets.



Torque Values

Crankshaft main bearing cap bolt
Connecting rod cap nut

70 N-m (7.0 kg-m, 51 ft-lb) – Apply oil
32 N-m (3.2 kg-m, 23 ft-lb) – Apply oil



Torque Values

Starter clutch mounting bolt	75 N-m (7.5 kg-m, 54 ft-lb)
Alternator drive gear bolt	27 N-m (2.7 kg-m, 20 ft-lb)
Oil pump driven sprocket bolt	18 N-m (1.8 kg-m, 13 ft-lb)
Final drive gear lock nut	190 N-m (19.0 kg-m, 137 ft-lb)
Output shaft lock nut	190 N-m (19.0 kg-m, 137 ft-lb)

Crankshaft/Piston

Service Information (cont'd)

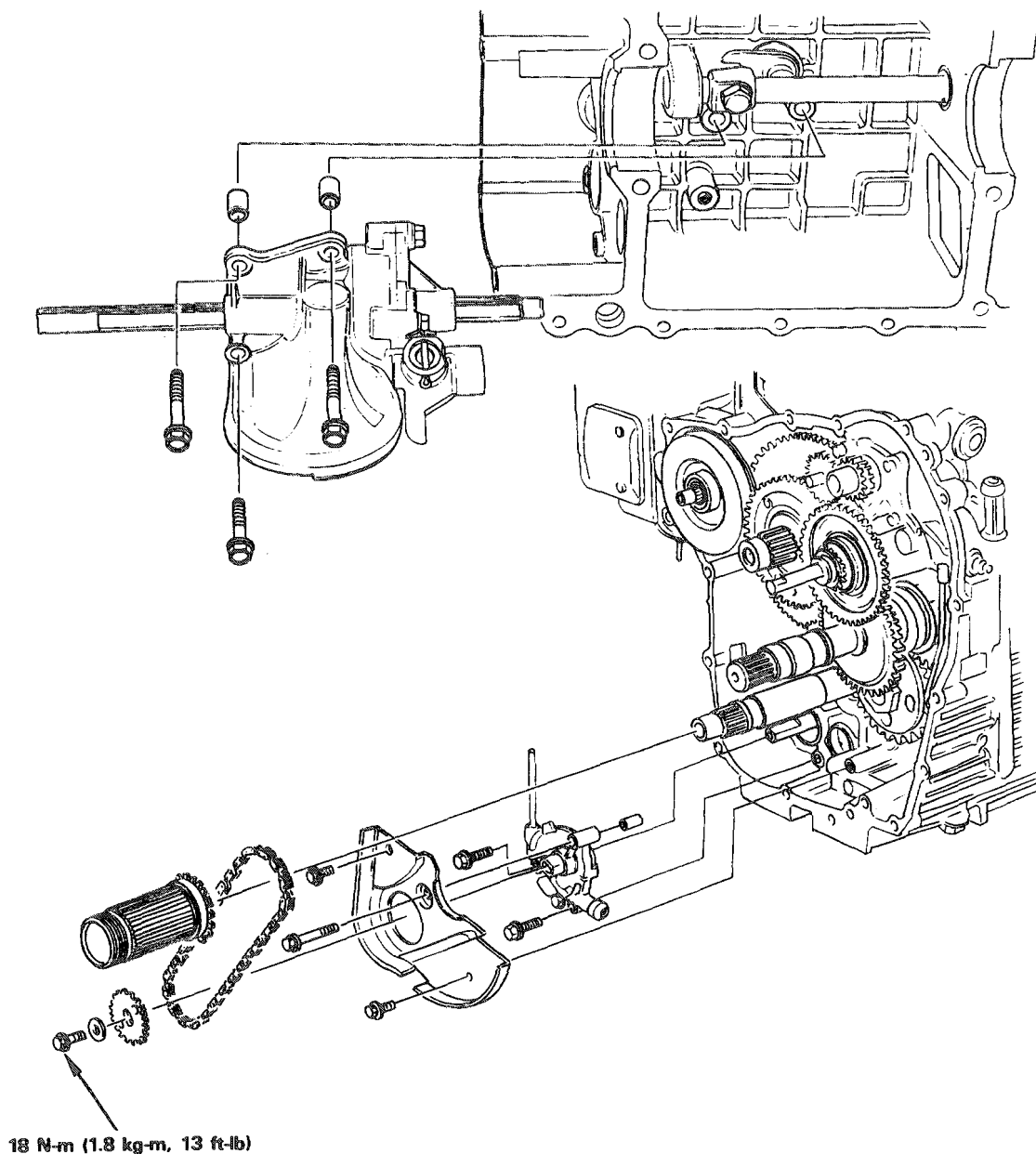
- The lubrication system uses two oil pumps; main and scavenging. The main pump picks up oil from the crankcase and delivers it under pressure to the bearings and other important parts of the engine. It is equipped with a pressure relief valve.
- The scavenging pump draws oil from the clutch housing 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 scavenging pump, perform the following:

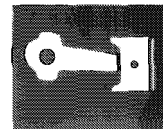
Main Oil Pump:

- Engine removal (Section 6)
- Engine case separation (Section 10)

Scavenging Pump:

- Engine removal (Section 6)
- Clutch removal (Section 9)
- Rear case cover removal (page 8-7)
- Primary driven gear removal (Section 10)





Troubleshooting

Excessive Noise

- Crankshaft
 - Worn main bearing
 - Worn rod bearing
- Piston and Connecting Rod
 - Worn piston or cylinder
 - Worn piston pin or pin hole

Low Compression or Uneven Compression

- Worn cylinder or piston ring

High Compression

- Excessive carbon build-up 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

Crankshaft/Piston

Front Engine Cover Removal

NOTE

- The front engine cover can be serviced with the engine in the frame.

Drain the coolant (see page 5-8).

Drain the engine oil (see page 3-13).

Remove the following:

- fairing front cover and under cover (see page 13-11).
- water pump (see page 5-15).
- oil pressure switch wire.
- gearshift sensor 6P-BLK connector (see page 16-13).
- bolts and front engine cover.

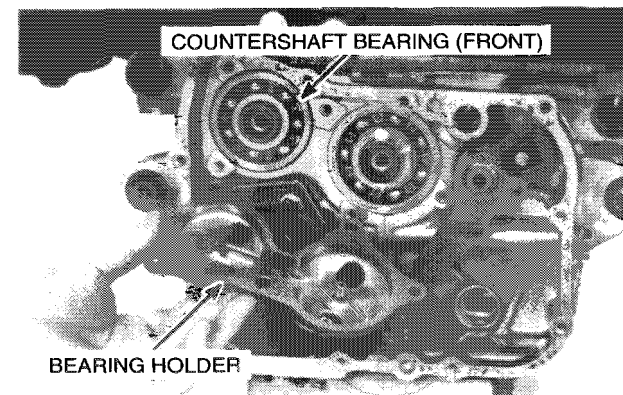
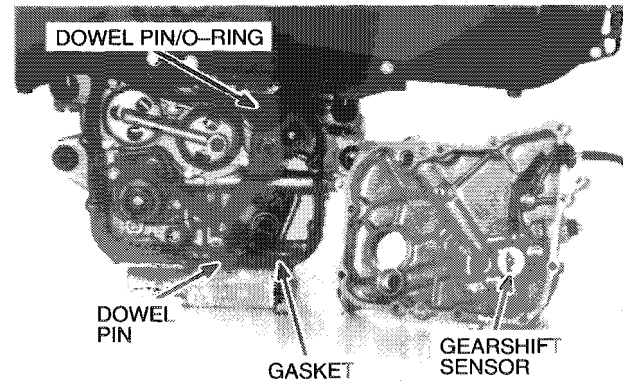
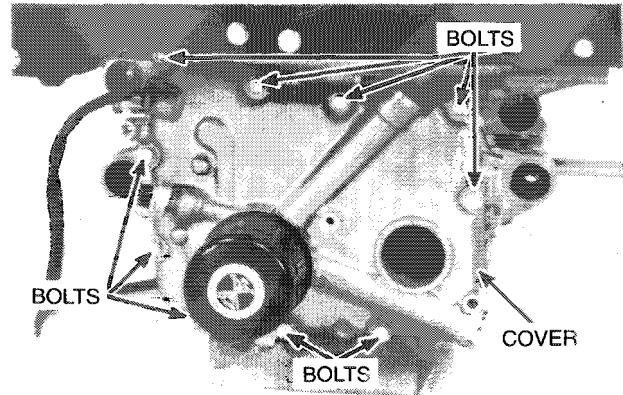
Remove the dowel pins, O-ring and gasket.

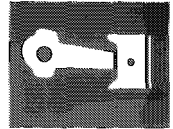
Remove the oil pipe from the oil pump.

For gearshift sensor removal, (see page 16-13).

Remove the bearing holder.

Remove the countershaft bearing, if necessary.





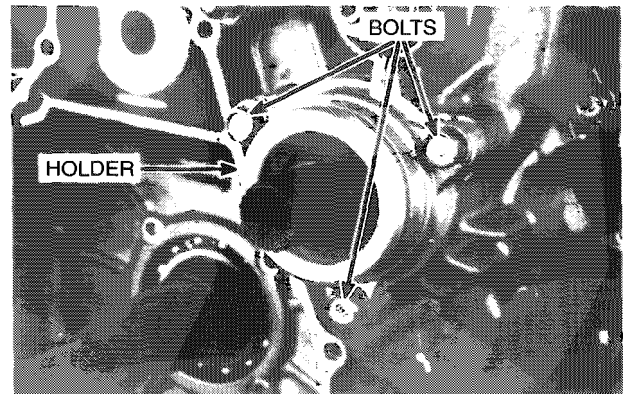
Rear Case Cover Removal

Bearing Holder (Output Shaft)

Remove the following:

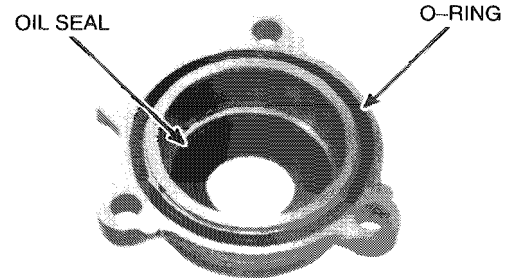
- engine (see section 6).
- A & SE: reverse shift arm (see page 18-31).
- clutch (see section 9).
- starter motor (A & SE: See page 18-13, I: see page 18-49).
- alternator (see page 17-10).

Remove the bolts and bearing holder.



Check the O-ring and oil seal for damage, fatigue, or deterioration.

Replace them if necessary.



Drive the oil seal out of the holder. Drive a new seal into the holder.

Tools:

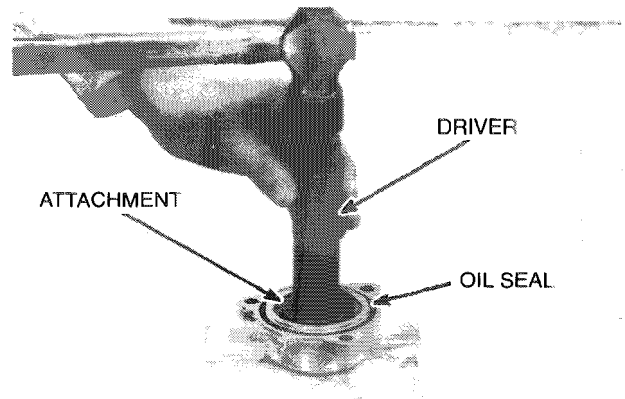
Driver

07749-0010000

Attachment, 42 x 47 mm

07746-0010300

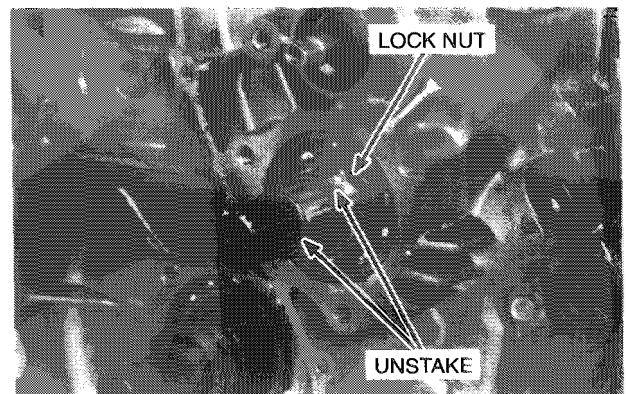
Pack the dust seal lip with grease.



Rear Case Cover

Unstake the output shaft lock nut with a drill or grinder (2 places).

Be careful that metal particles do not enter the bearing, and that the threads on the shaft are not damaged.



Crankshaft/Piston

Rear Case Cover Removal (cont'd)

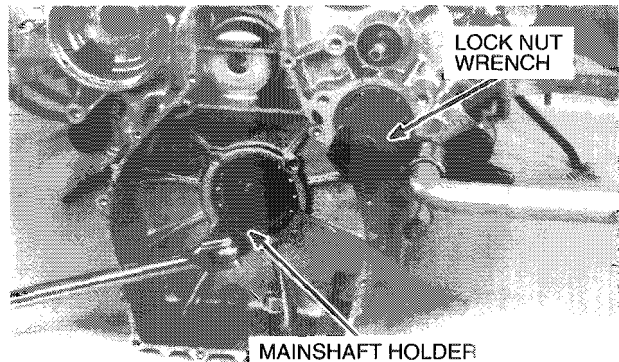
Set the transmission in any gear except neutral. Install the special tools as shown.

Remove and discard the lock nut.

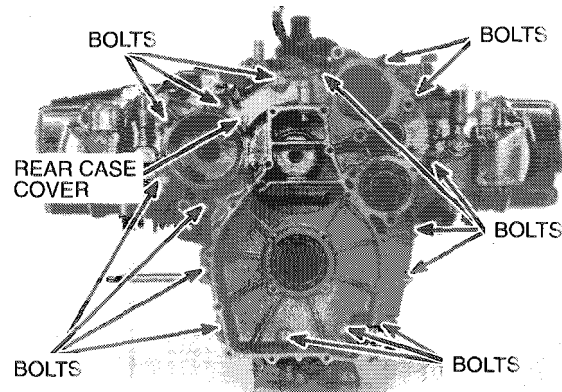
Tools:

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.

Check that the outer race of each bearing fits tightly in the rear case cover.

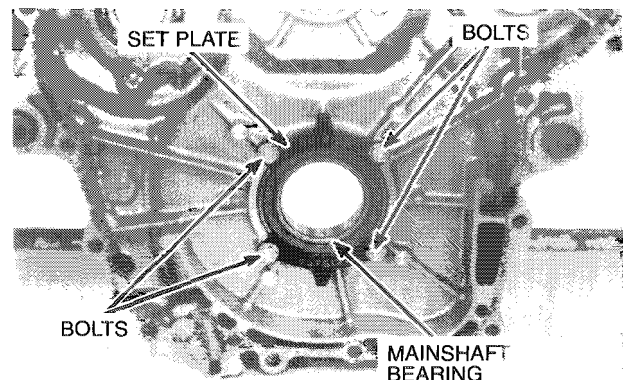
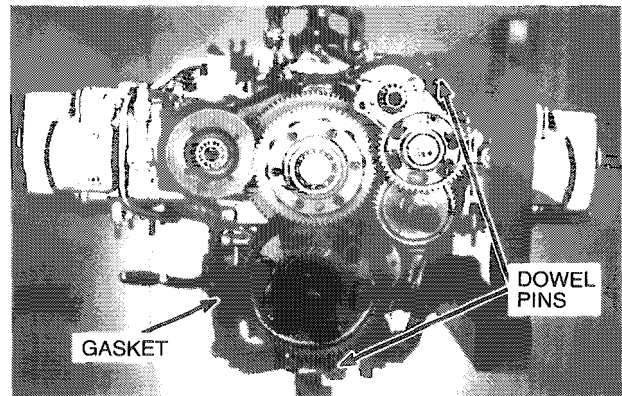
Replacement:

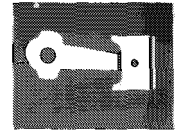
Remove the bearing set plates and mainshaft bearing. Install a new bearing with the seal facing inside.

Tools:

Driver
07749-0010000
Bearing driver attachment
07GAD-SD40101

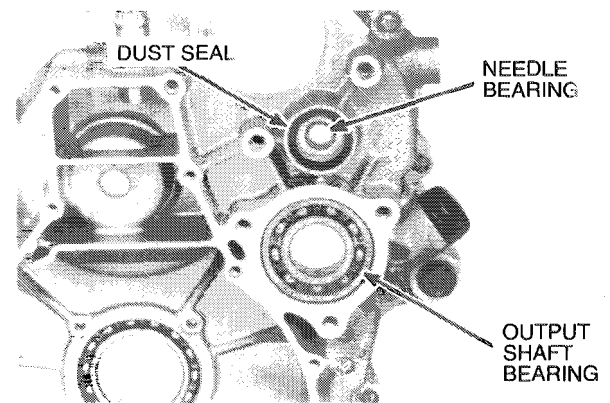
Apply a locking agent to the bolt threads. Install the bearing set plate with the "Outside" mark facing out. Tighten the bolts.





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, 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

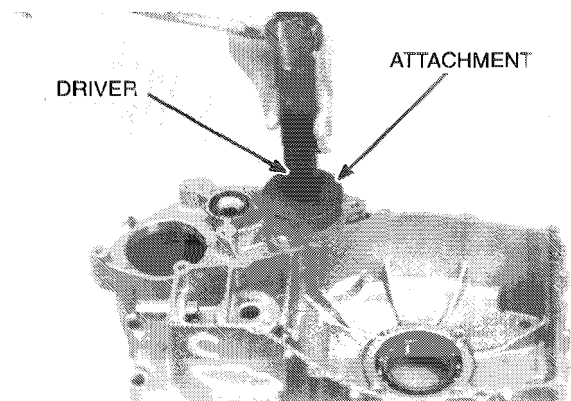
07749-0010000

Attachment, 28 x 30 mm

07946-1870100

Pilot, 12 mm

07746-0040200



Crankshaft/Piston

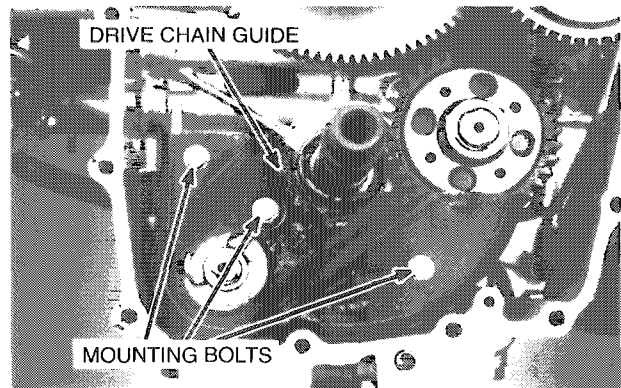
Scavenging Pump

Removal

To remove the scavenging pump, perform the following:

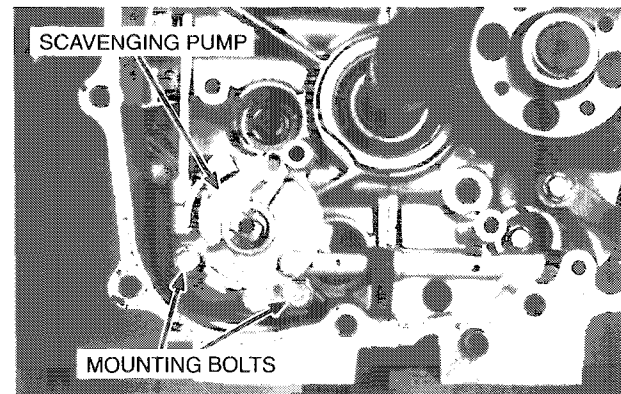
- Engine removal (see Section 6).
- Clutch removal (see Section 9).
- Rear case cover removal (see page 8-7).
- Primary driven gear removal (see Section 10).

Remove the drive chain guide after removing its three mounting bolts.



Remove the scavenging pump by removing its two mounting bolts.

Remove the dowel pin from the left crankcase.

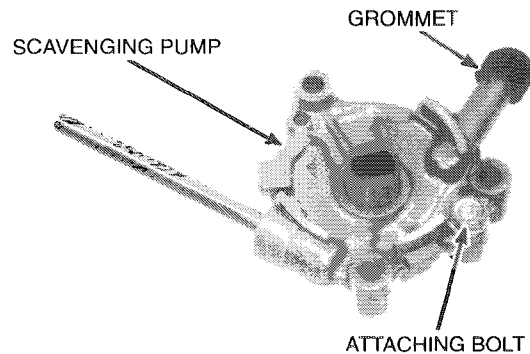


Disassembly

Remove the following:

- pump cover from the pump body by removing the attaching bolt
- grommet.
- dowel pins from the pump body.
- oil seals from the pump body and cover.

Clean all parts thoroughly with clean engine oil.

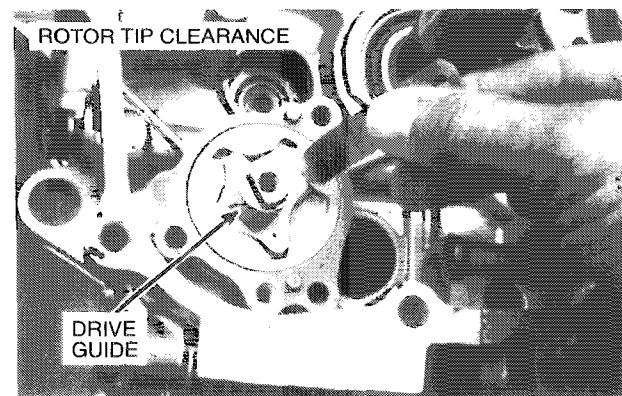


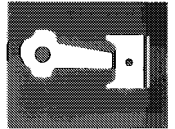
Inspection

Temporarily reinstall the scavenging pump as shown.

Measure the rotor tip clearance.

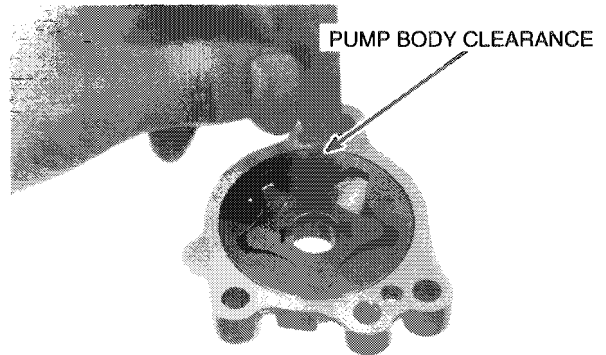
Service Limit: 0.35 mm (0.014 in.)





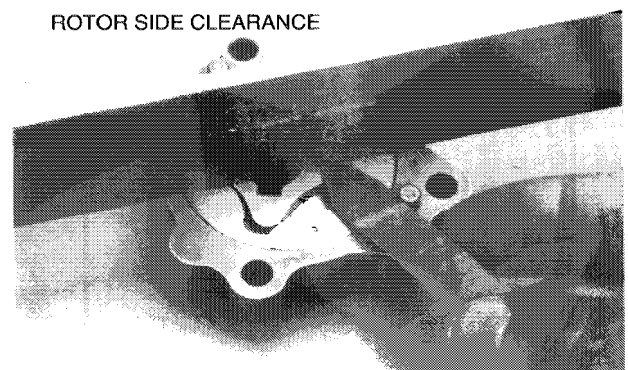
Measure the pump body clearance.

Service Limit: 0.42 mm (0.017 in)

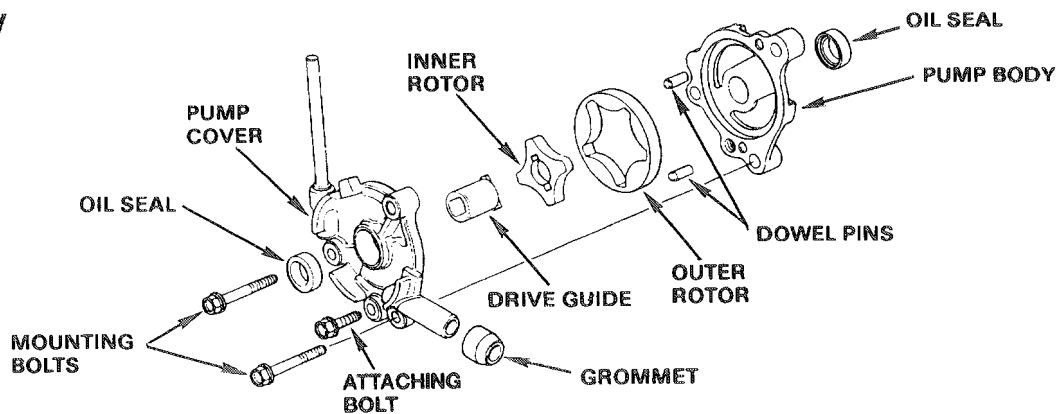


Measure the side clearance.

Service Limit: 0.12 mm (0.005 in)



Assembly



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

Install a new oil seal into the pump body.

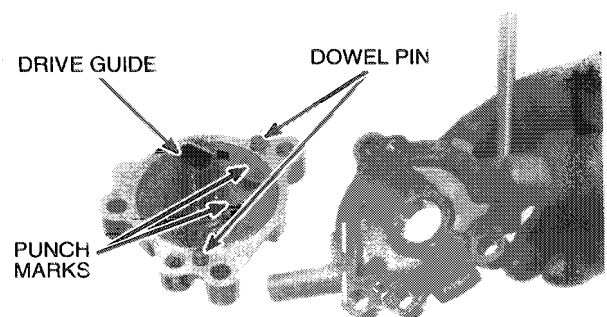
Install the dowel pins on the pump body.

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 a new oil seal into the pump cover.

Install the pump cover onto the body.



Crankshaft/Piston Scavenging Pump (cont'd)

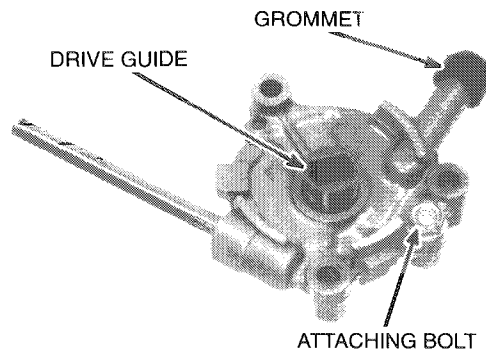
Install and tighten the attaching bolt.

Install the grommet securely.

NOTE

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

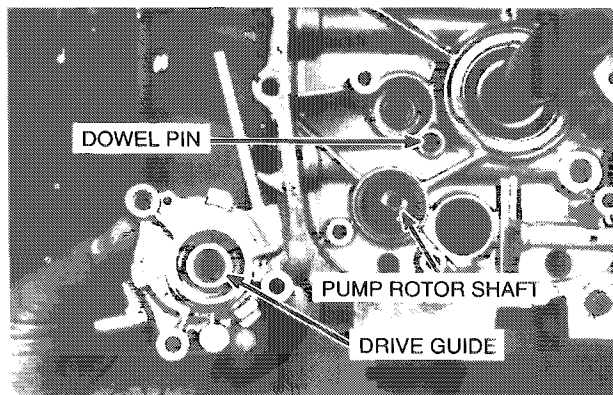
Make sure the drive guide is rotating smoothly.



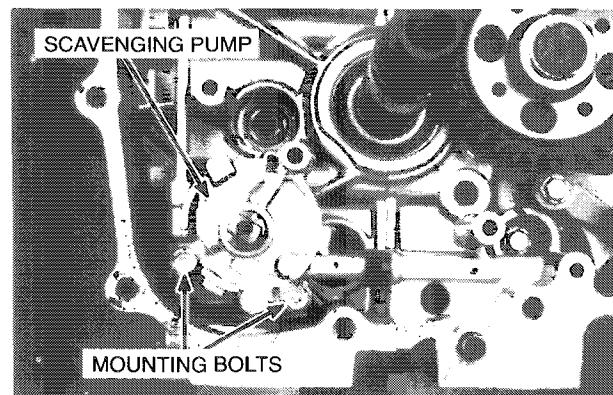
Installation

Install the dowel pin.

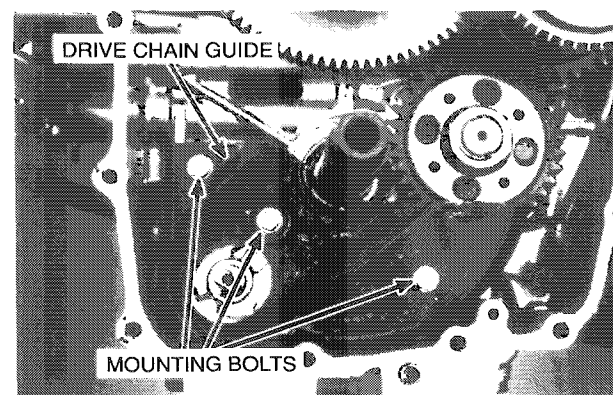
Install the pump on the left crankcase, aligning the flat on the pump rotor shaft with the flat on the drive guide.

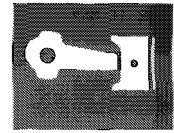


Install and tighten the two mounting bolts.



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 cannot be rotated.

Tool:

Clutch outer holder
07JMB-MN50100

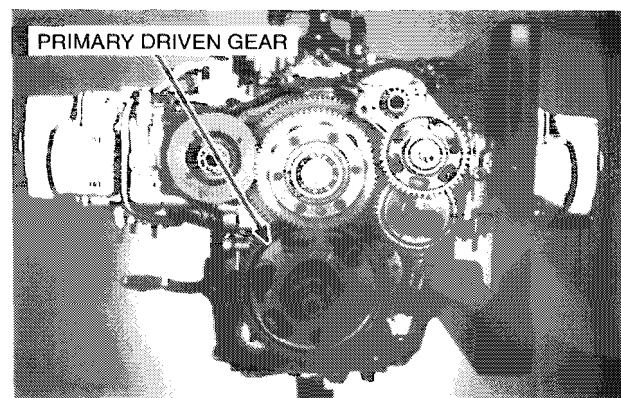
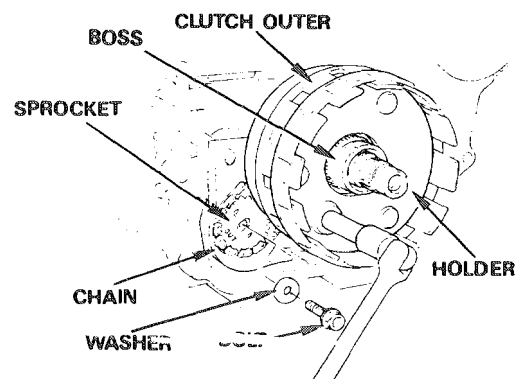
Apply a locking agent to the sprocket bolt threads.

Install and tighten the washer and bolt, holding the clutch outer.

Torque: 18 N-m (1.8 kg-m, 13 ft-lb)

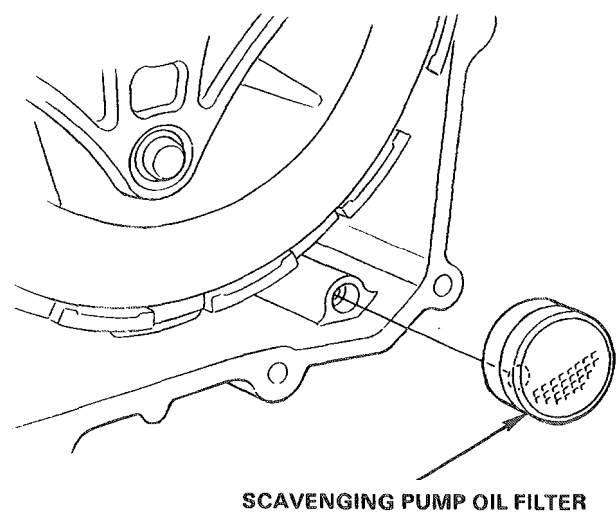
Install the primary driven gear (see Section 10).

Install the starter clutch (see Section 18).



Install the scavenging pump oil filter to the rear case cover.

Install the rear case cover (page 8-33).



Crankshaft/Piston

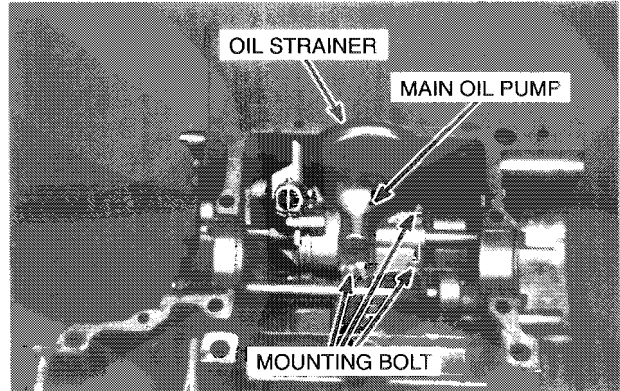
Oil Strainer and Main Oil Pump

Removal

To remove the main oil pump perform the following:

- Engine removal (see Section 6).
- Engine case separation (see Section 10).

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

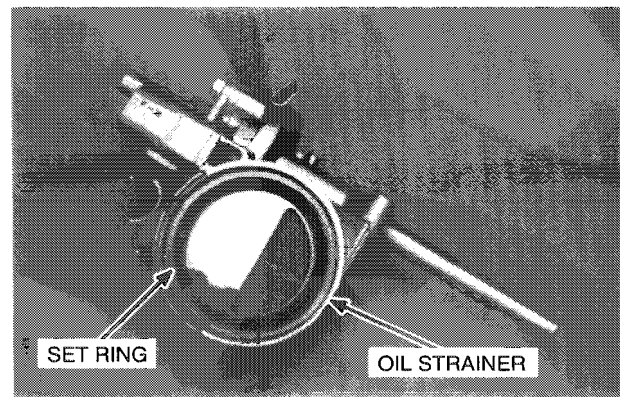


Oil Strainer Cleaning

Remove the set ring and oil strainer.

Clean the oil strainer with a non-flammable solvent.

Install the oil strainer and set ring 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.

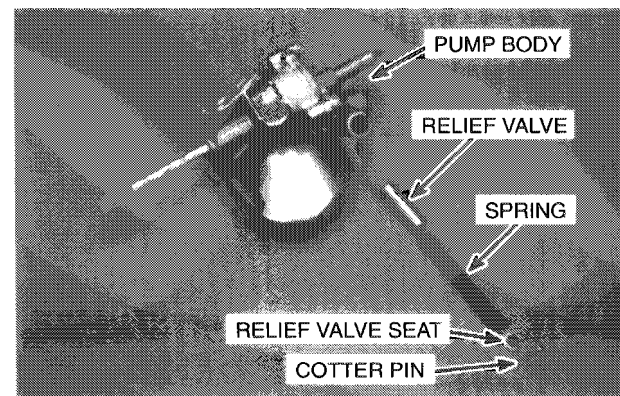
Measure the relief valve spring free length.

Service Limit: 84.0 mm (3.31 in)

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

NOTE

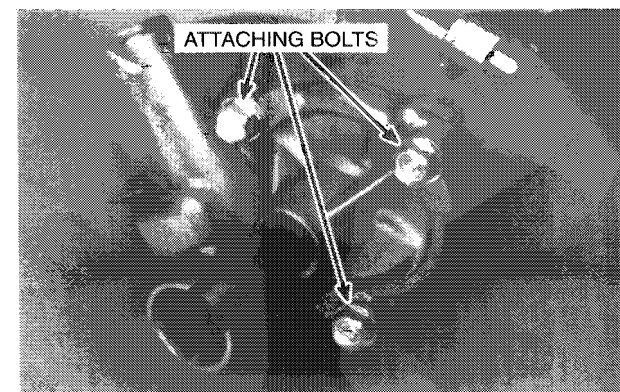
- Position the cotter pin as shown.

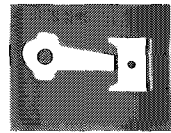


Main Oil Pump Disassembly

Remove the pump cover from the body by removing the attaching bolts.

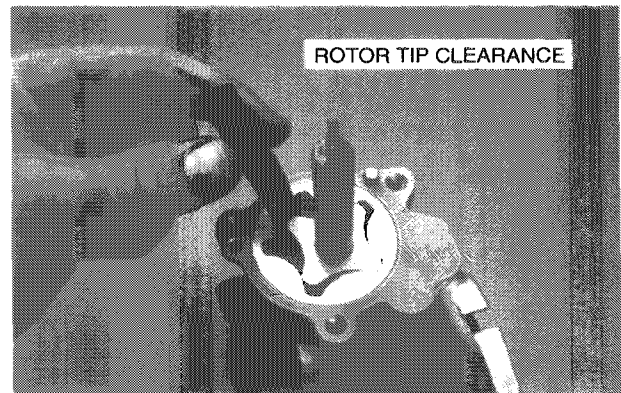
Disassemble and clean all parts thoroughly with clean engine oil.





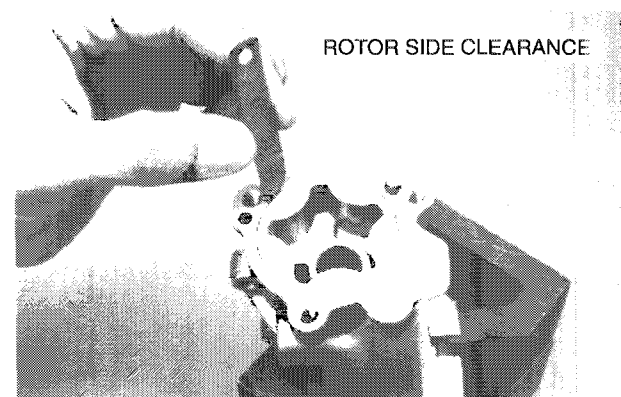
Measure the rotor tip clearance as shown.

Service Limit: 0.35 mm (0.014 in)



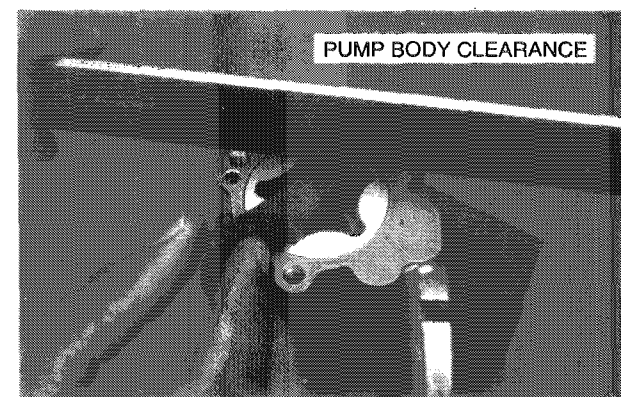
Remove the rotor shaft, spacer and drive pin. Measure the side clearance.

Service Limit: 0.12 mm (0.005 in)

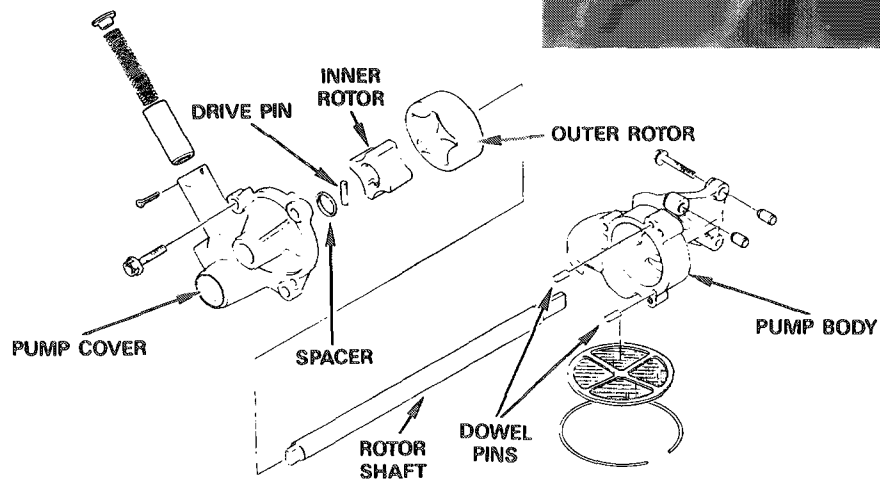


Measure the pump body clearance.

Service Limit: 0.43 mm (0.017 in)



Assembly



Crankshaft/Piston

Oil Strainer and Main Oil Pump (cont'd)

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.

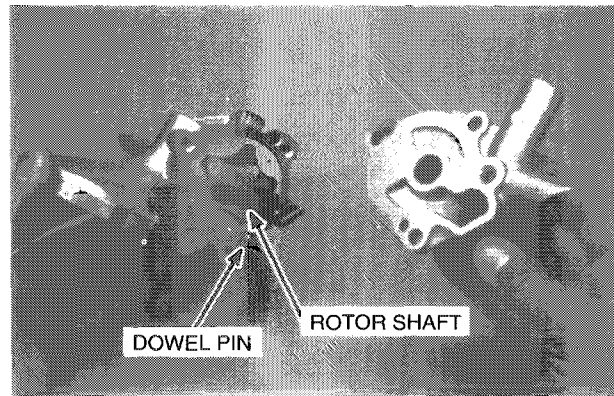
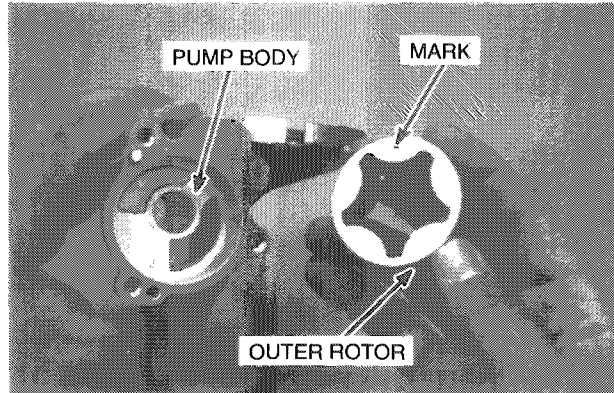
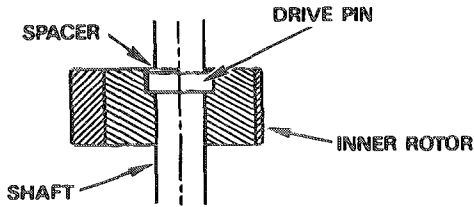
Align the slots in the inner rotor with the drive pin.

Place the spacer into the inner rotor groove.

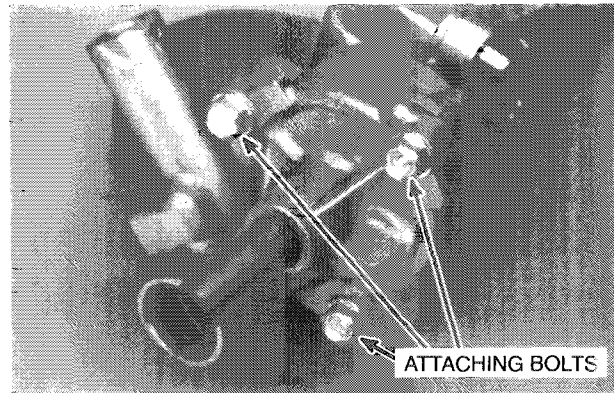
Install the dowel pins and pump body.

NOTE

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

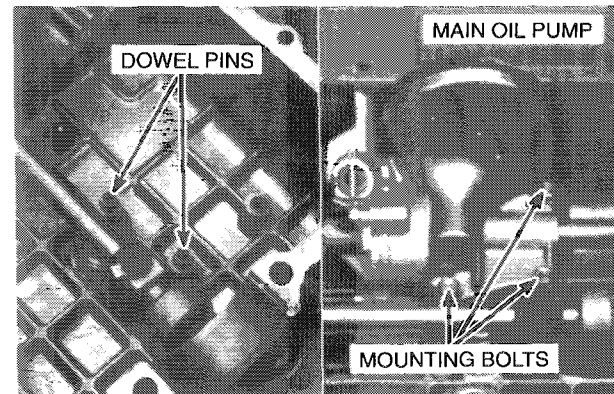


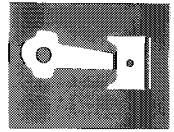
Tighten the pump cover attaching bolts.
Make sure the rotor shaft rotates smoothly.



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 (see Section 10).
Install the engine in the frame (see Section 6).





Piston/Connecting Rod Removal

Separate the crankcase (see page 10-9).

Side Clearance Inspections

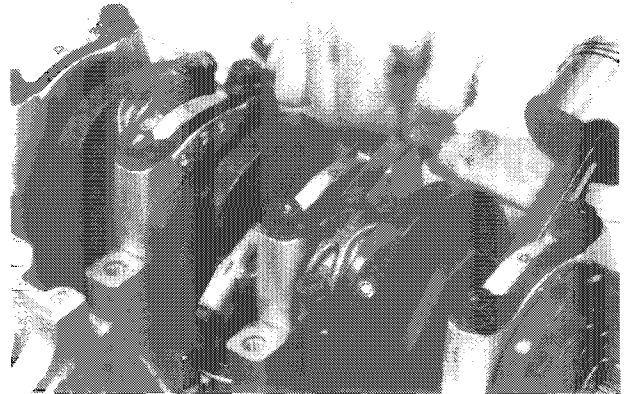
Measure the connecting rod side clearances.

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.

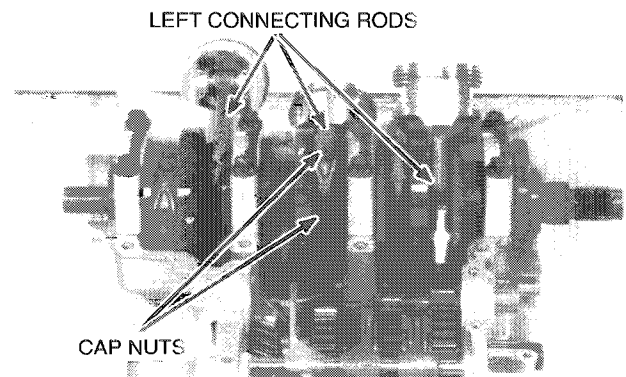


Remove the left connecting rods by removing the bearing caps. Mark them to indicate the correct cylinder (No. 2, 4 and 6) and piston on the crankpins.

Remove the right connecting rod bearing caps.

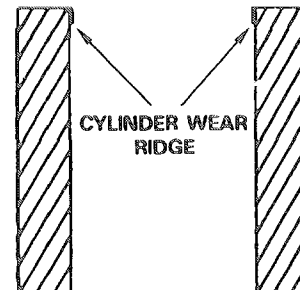
Push the connecting rod and piston out through the top of the right cylinder bore.

Mark them to indicate the correct cylinder (No. 1, 3 and 5) and piston on the crankpins.



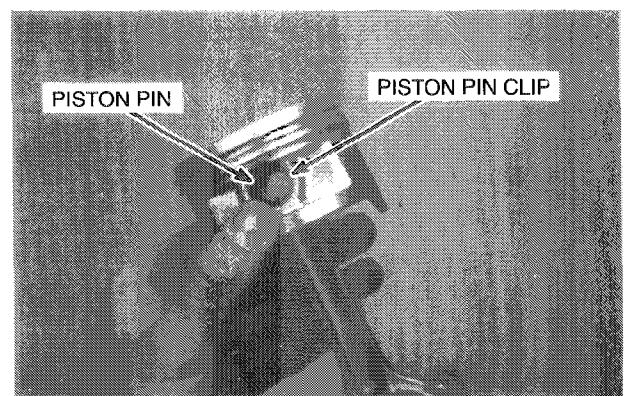
CAUTION

- 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. Press the piston pin out of the piston.



Crankshaft/Piston

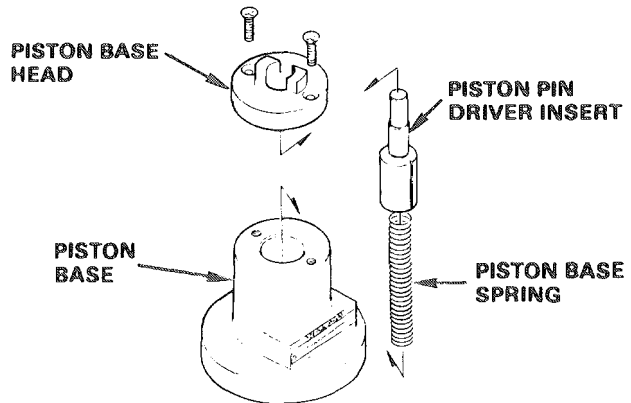
Piston/Connecting Rod Removal (cont'd)

Piston/Ring/Rod Inspection

Install the piston pin driver pilot and piston base head on the piston base as shown.

Tools:

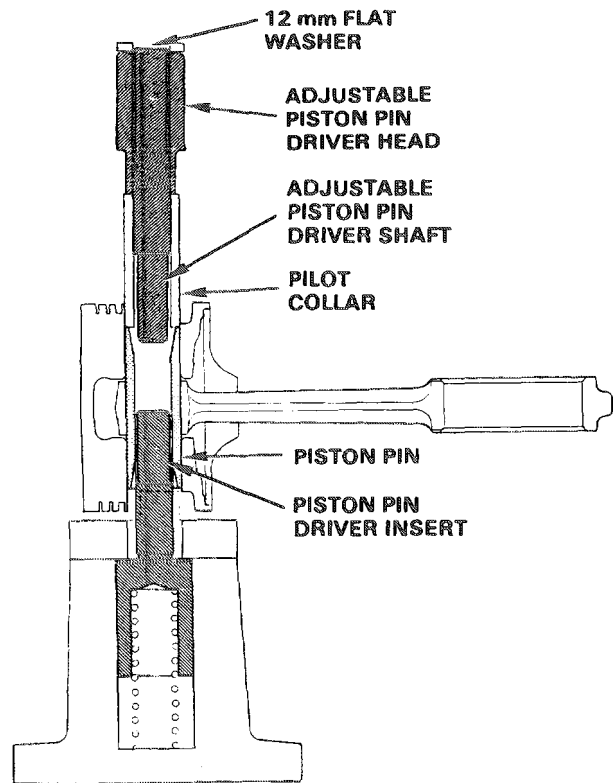
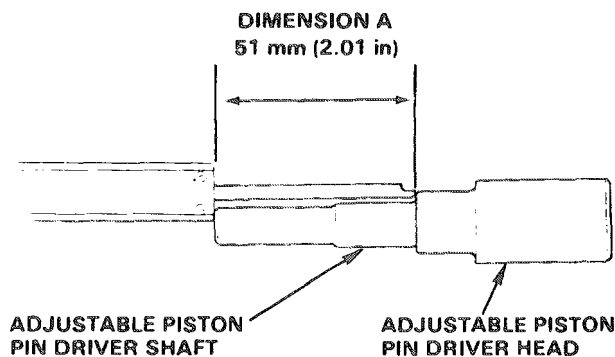
Piston base head	07JGF-001010A
Piston base	07973-6570500
Piston pin driver insert	07973-6570400
Piston base spring	07973-6570600



Turn the handle of the piston pin driver so that dimension A is 51 mm (2.01 in).

Tools:

Adjustable piston pin driver head	07973-6570210
Adjustable pin driver shaft	07973-6570300



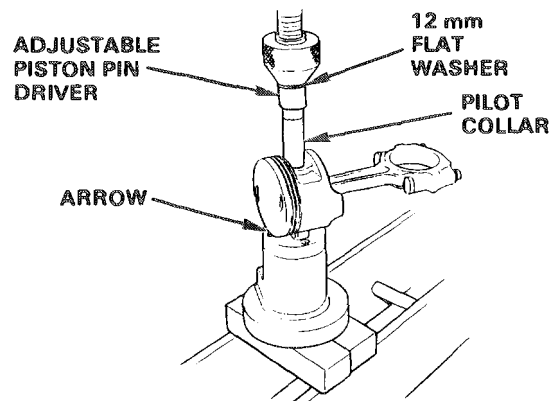
NOTE

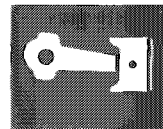
- After adjusting the piston pin driver length, the driver shaft will protrude past the adjustable piston pin driver head. Place a suitable 12 mm plain washer over the driver head to prevent direct pressure on the shaft threads when putting the piston driver in the hydraulic press.

Place the piston on the piston base with the piston head toward the arrow on the base. Press the piston pin out of the connecting rod with the position pin driver collar and driver, using a hydraulic press.

Tool:

Pilot collar	07KMF-MT20200
--------------	---------------





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.

Piston/Ring/Rod Inspection

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.

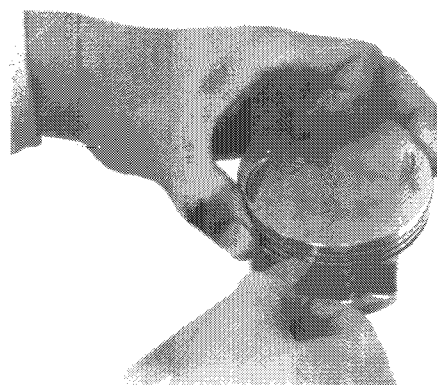
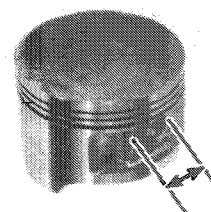
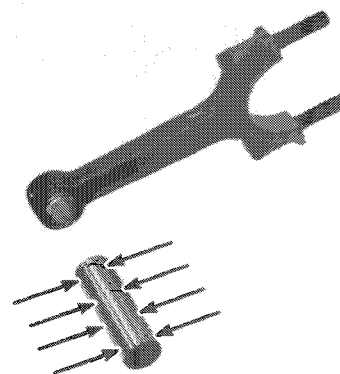
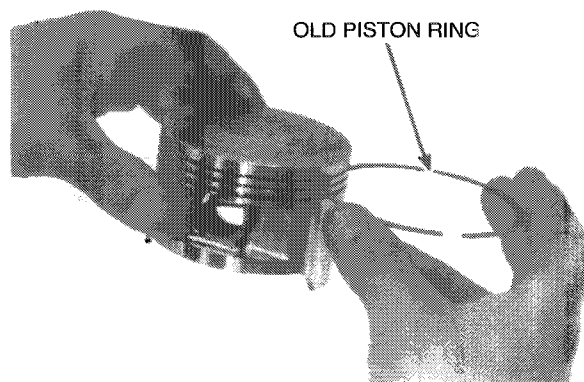
Service Limit: 0.04 mm (0.002 in)

Inspect the ring lands for abnormal wear. Inspect the 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: 0.10mm (0.004 in)

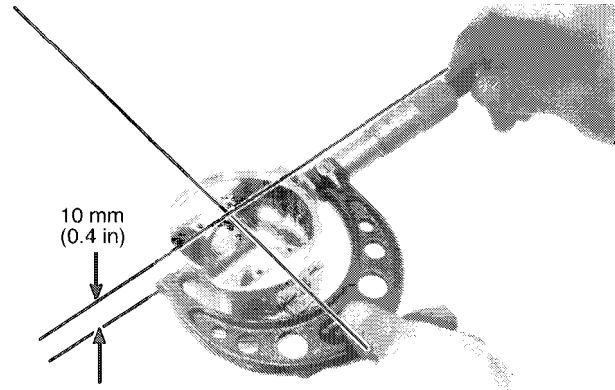


Crankshaft/Piston

Piston/Connecting Rod Removal (cont'd)

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 a new piston ring squarely into the cylinder and measure the end gap at the position in the cylinder bottom shown.

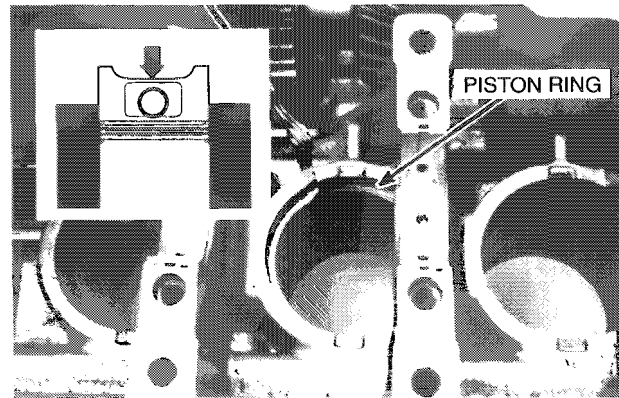
Service Limits:

Top/second: 0.5 mm (0.02 in)

Oil: 0.9 mm (0.04 in)

If the gap exceeds the service limit, measure the cylinder I.D.

Inspect the cylinder walls for scratches and wear.



Measure the cylinder I.D. at three levels in an X and Y axis. Take the maximum reading to determine the cylinder wear.

Service Limit: 71.1 mm (2.80 in)

Measure each piston O.D. at three levels in an 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)

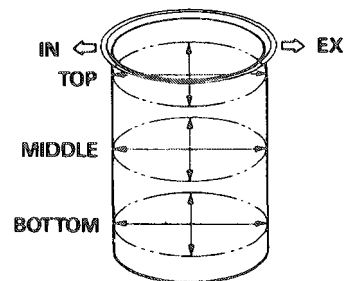
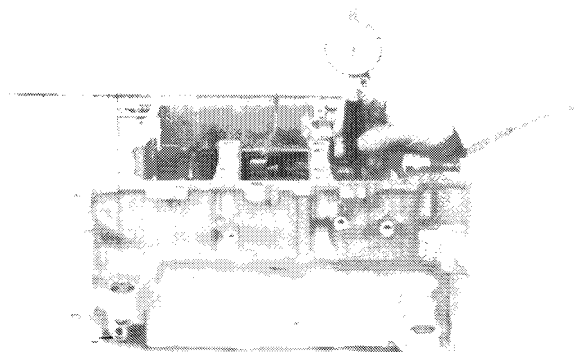
Calculate the cylinder out-of-round at three levels in an X and Y axis. Take the maximum reading to determine the out-of-round.

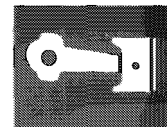
Service Limit: 0.15 mm (0.006 in)

The cylinder must be rebored and an 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 for an oversize piston is 0.015-0.065 mm (0.0006 – 0.0026 in).



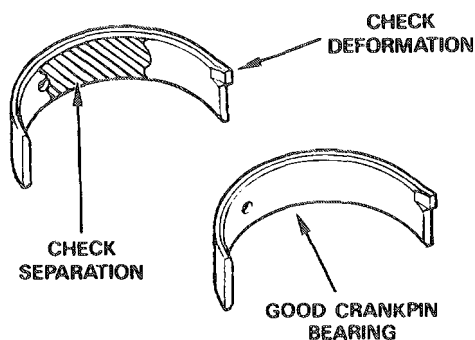


Crankpin Bearing

Oil Clearance Inspection

Inspect the bearings for scars, separation, and damage on the bearing surfaces.

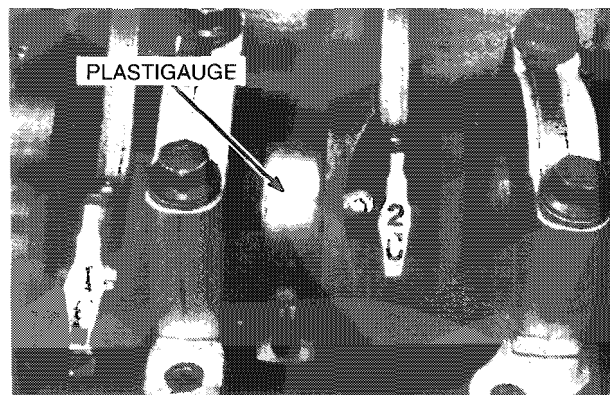
Inspect the bearing tab for deformation.



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.

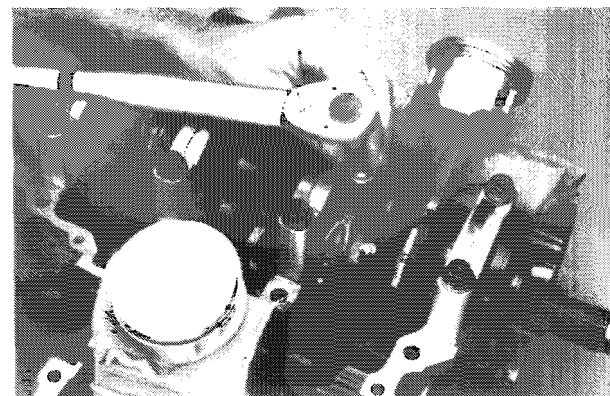


On the crankpin bearings, install the bearing caps and rods on the correct crankpins, and tighten them evenly.

Torque: 32 N-m (3.2 kg-m, 23 ft-lb)

NOTE

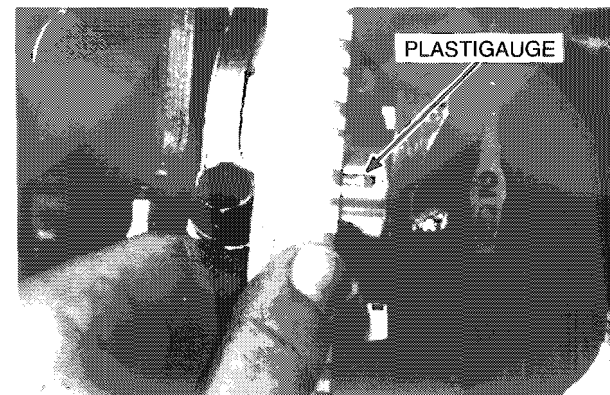
- Apply oil to the nut flange and threads.

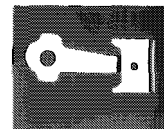


Remove the caps and measure the compressed Plastigauge on each crankpin.

If the bearing clearance is beyond the service limit, select the correct replacement bearings.

Service Limit: 0.06 mm (0.002 in)





Bearing Installation

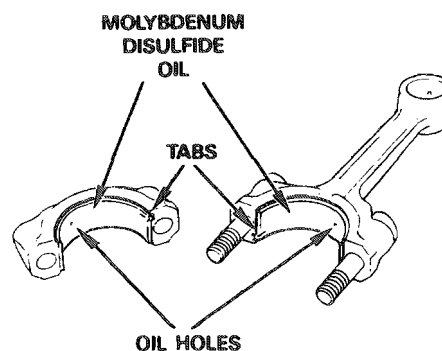
Clean oil off the bearing outer surfaces, bearing caps, and connecting rods.

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 are aligned with the grooves on the rods and caps.

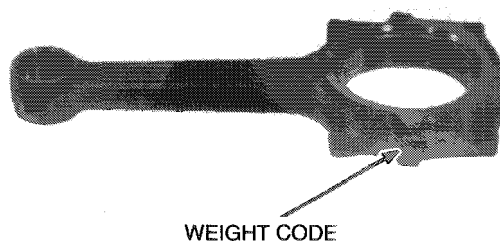


Piston/Connecting Rod Installation

Connecting Rod Selection

If a connecting rod requires replacement, you should select a rod with the same weight code as the original.

Old Rod Weight Code	New Rod Weight Code
A	A
B	B
C	C
D	D
E	E



Crankshaft/Piston

Piston/Connecting Rod Installation (cont'd)

Installation

Before installing the pistons, apply a coat of oil to the ring grooves, cylinder bores, and rod bearings.

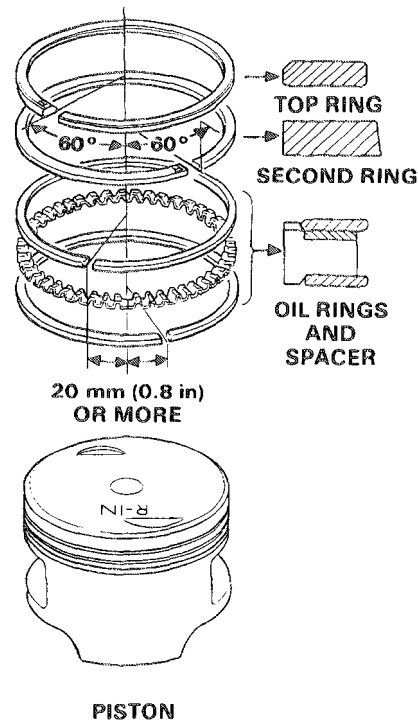
Carefully install the piston rings on the piston.

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" marks, as shown.

Stagger the oil ring and side rail end gaps as shown.



Turn the handle of the piston pin driver so that dimension A is 51 mm (2.01 in).

Adjustable piston pin driver head 07973-6570210
Adjustable piston pin driver shaft 07973-6570300

Install the piston pin driver collar onto the driver pilot.

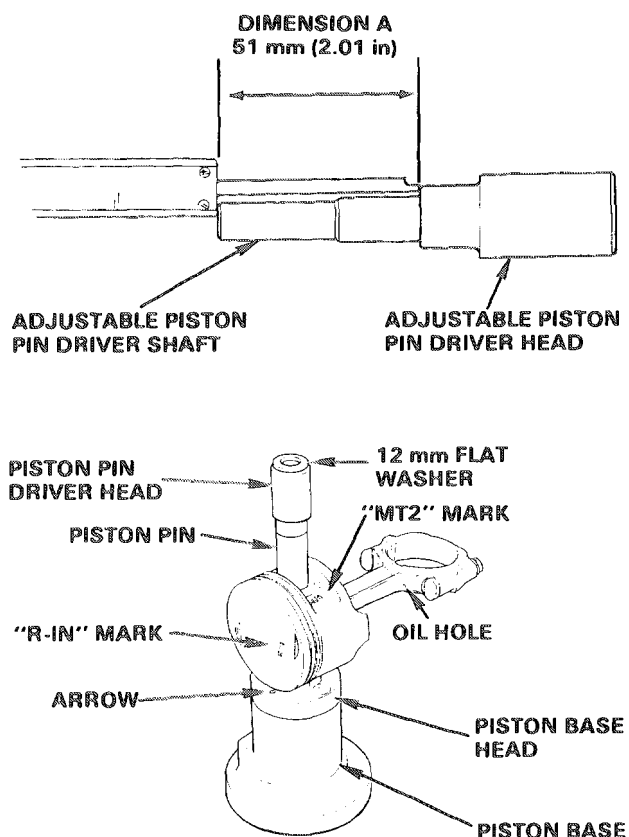
NOTE

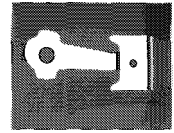
- After adjusting the piston pin driver length, the driver shaft will protrude past the adjustable piston pin driver head. Place a suitable 12 mm plain washer over the driver head to prevent direct pressure on the shaft threads when putting the piston pin driver in the hydraulic press.

Install the piston and connecting rod onto the piston base as follows:

No. 1, No. 3 and No. 6 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 insert	07973-6570400
Pilot collar	07KMF-MT20200

NOTE

- After adjusting the piston pin driver length, the driver shaft will protrude past the adjustable piston pin driver head. Place a suitable 12 mm plain washer over the driver head to prevent direct pressure on the shaft threads when putting the piston pin driver in the hydraulic press.

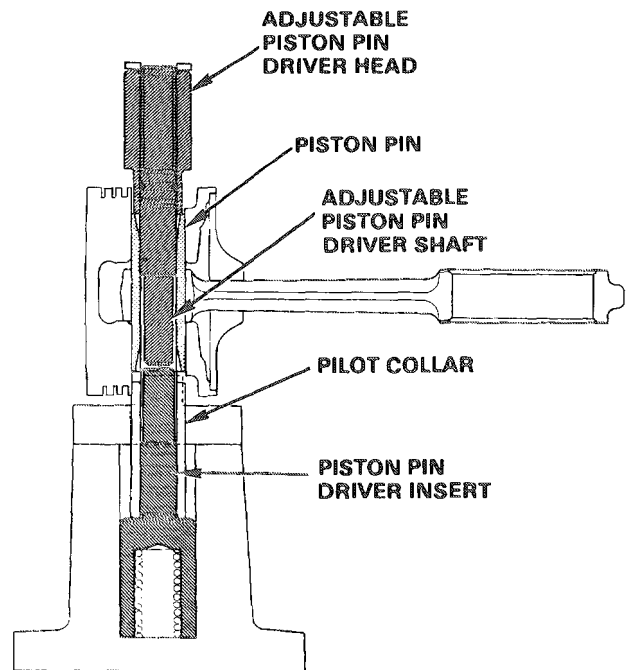
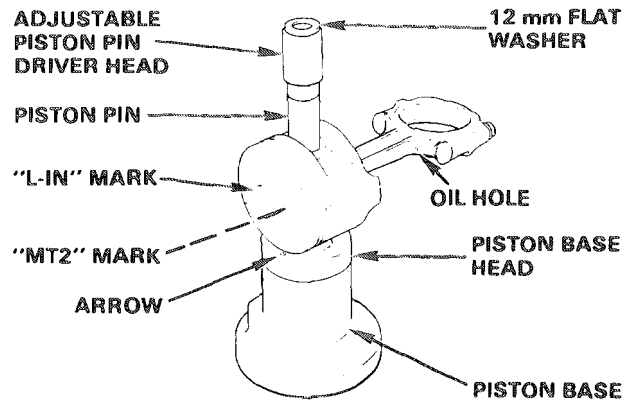
Using a hydraulic press, press the piston pin into the connecting rod until the driver pilot bottoms against the base (hydraulic pressure rises slightly).

Remove the piston assembly from the tools.

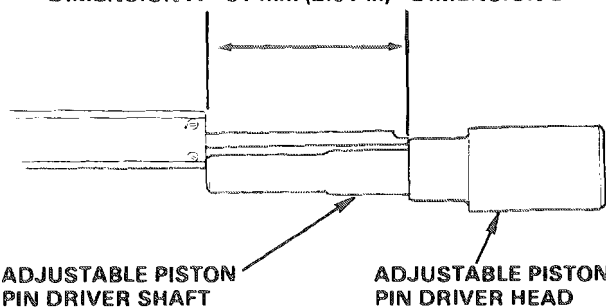
Measure dimension B between the piston pin and piston ends with the connecting rod small end of the marking side contacted with the piston.

Determine dimension A by subtracting dimension B from 51 mm (2.01 in).

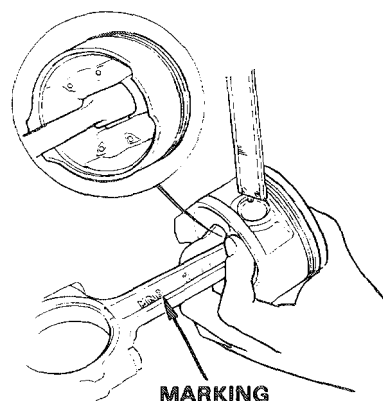
Adjust dimension A of the piston pin driver.



DIMENSION A = 51 mm (2.01 in) - DIMENSION B



Press in the piston pin again in the same manner until the driver pilot bottoms.



Crankshaft/Piston

Piston/Connecting Rod Installation (cont'd)

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 toward the top of the engine.

Tool:
Piston Ring Compressor
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 gradual, crisscross pattern.

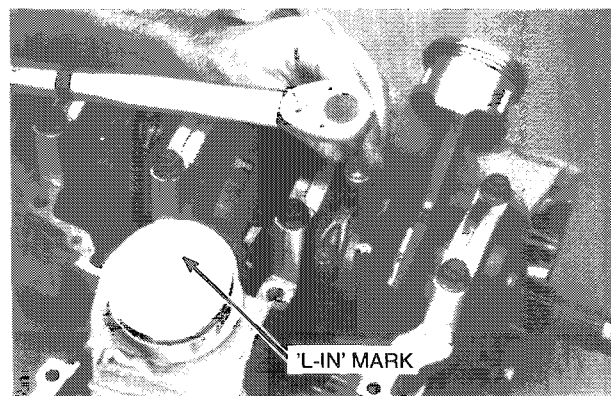
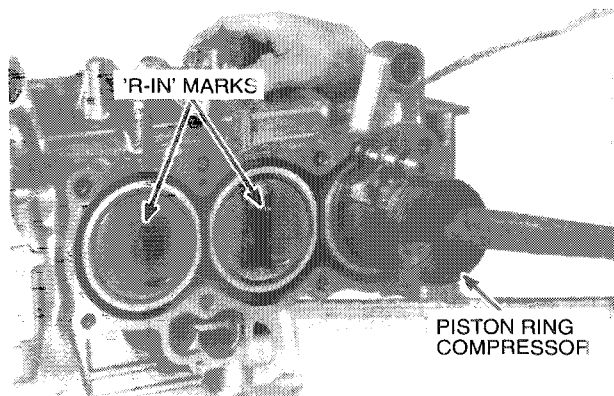
Torque: 32 N-m (3.2 kg-m, 23 ft-lb)

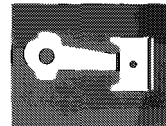
Install the left side rod assemblies in cylinders No. 2, 4, and 6 in their original positions with the "L-IN" marks toward the top of the engine.

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 gradual, crisscross pattern.

Torque: 32 N-m (3.2 kg-m, 23 ft-lb)



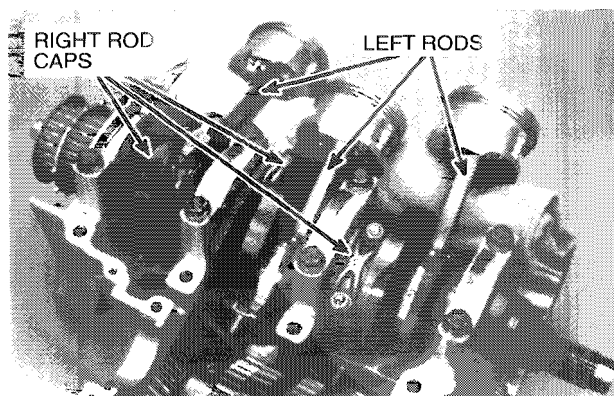


Crankshaft Removal

Separate the crankcase (see page 10-9).

Remove the left side rod assemblies from the crankshaft (see page 8-17).

Remove the right side rod bearing cap (see page 8-17).

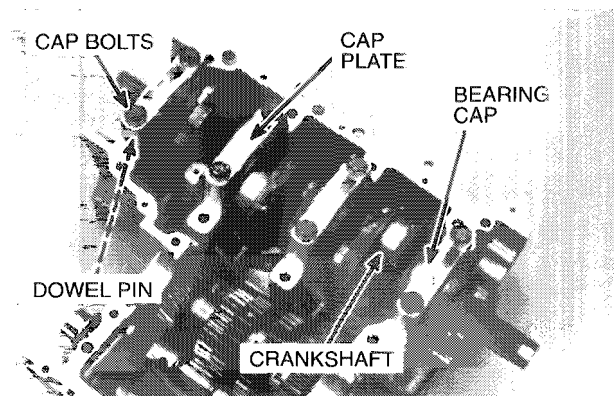


Remove the following:

- main bearing cap bolts.
- bearing cap plates.
- bearing caps.
- dowel pins.
- crankshaft.

NOTE

- Do not forcibly remove dowel pins from the bearing caps.



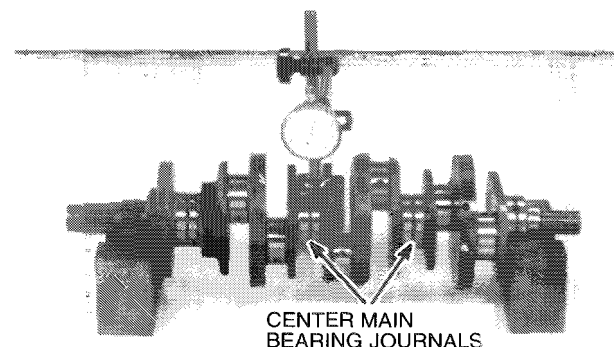
Crankshaft Inspection

Rest the crankshaft on V blocks.

Set a dial indicator on a 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.

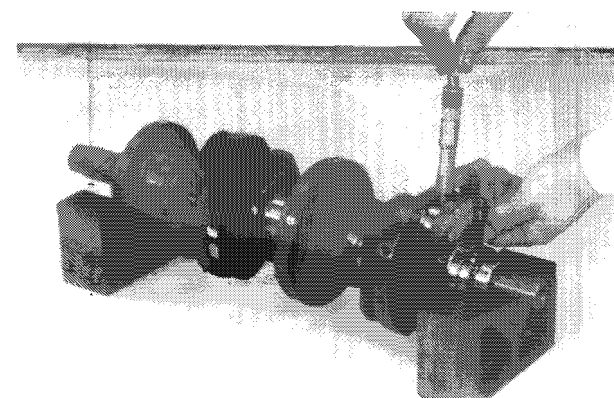
Service Limit:

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.



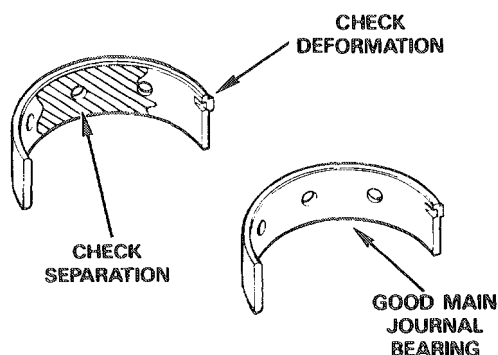
Crankshaft/Piston

Main Journal Bearing

Oil Clearance Inspection

Inspect the bearings for scars, separation, and damage on the bearing surfaces.

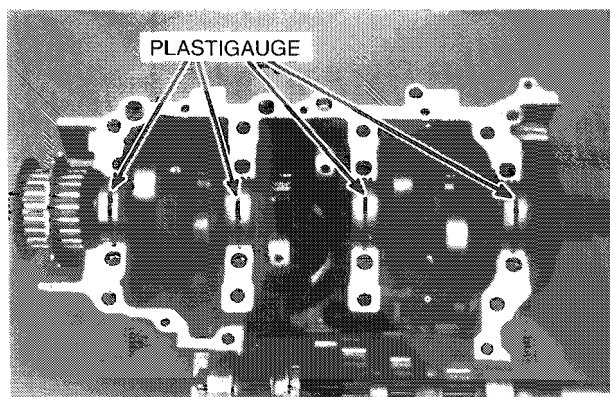
Inspect the bearing tab for deformation.



Put a piece of Plastigauge on each main journal.

NOTE

- Do not place Plastigauge over any oil holes.
- Do not rotate the crankshaft during the inspection.

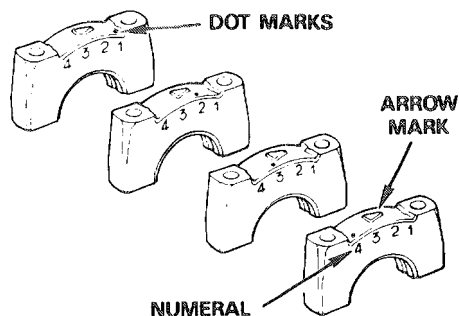


On the main journal bearings, install the main bearing caps and dowel pins on the correct journals.

NOTE

- The installation positions of the main bearing caps are identified with dot marks aligned with the numerals 1, 2, 3, and 4, viewed from the front of the engine.

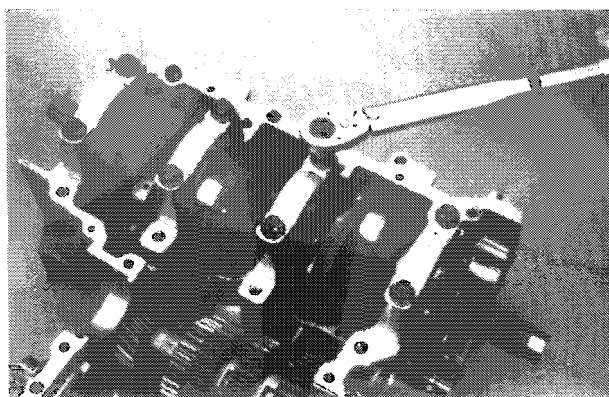
The arrows on the caps should face toward the engine top.

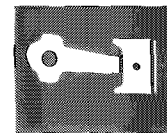


Apply oil to the cap bolt threads and flange surfaces.

Tighten the cap bolts in a gradual, crisscross pattern.

Torque: 70 N-m (7.0 kg-m, 51 ft-lb)

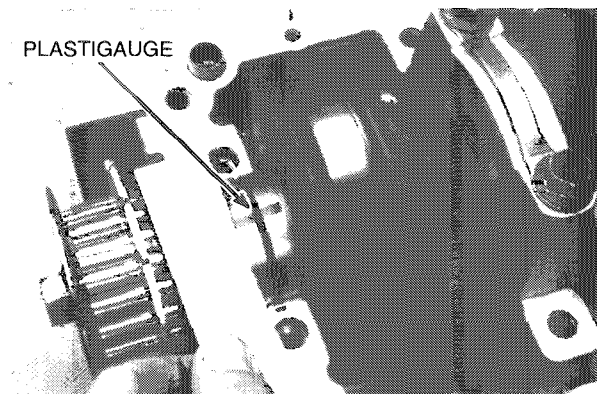




Remove the caps and measure the compressed Plastigauge on each main journal.

If the bearing clearance is beyond the service limit, select the correct replacement bearings.

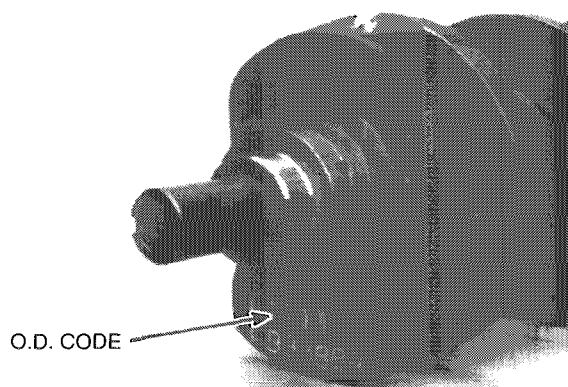
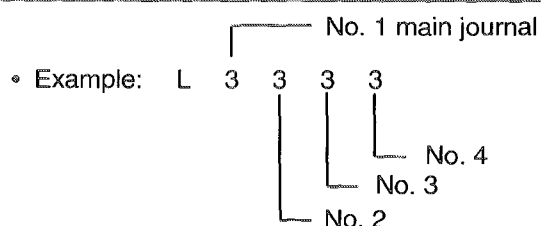
Service Limit: 0.06 mm (0.002 in)



Bearing Selection

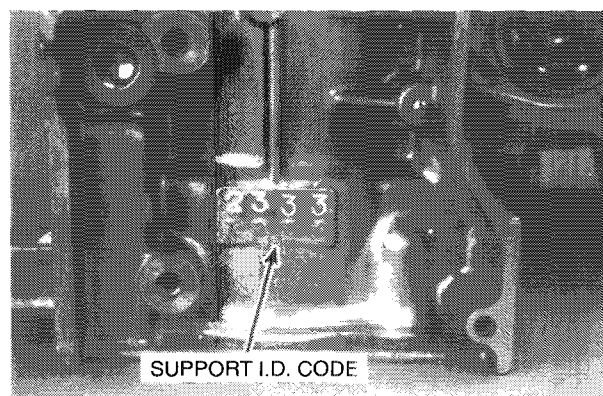
Record the crankshaft main journal O.D. code numbers. The code may be 1, 2, or 3.

NOTE



Record the corresponding engine crankcase bearing support I.D. codes from the pad on the right side engine case. The codes may be I, II, or III.

The numerals 1, 2, 3, and 4 stand for the crankshaft main journals, as viewed from the front.



Cross reference the bearing support and main journal codes to determine the correct replacement bearing color.

ROD BEARING SELECTION TABLE

Crankcase Bearing Support I.D. Codes	III	Brown	Black	Blue
	II	Green	Brown	Black
	I	Yellow	Green	Brown
		1	2	3
Crankshaft Main Journal O.D. Codes				

Crankshaft/Piston

Main Journal Bearing (cont'd)

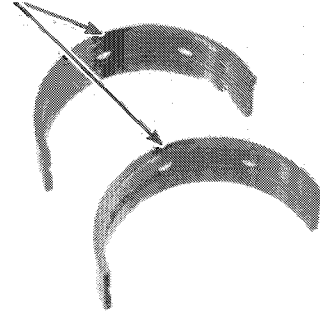
Bearing insert thickness, mm (in)

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.

COLOR CODE



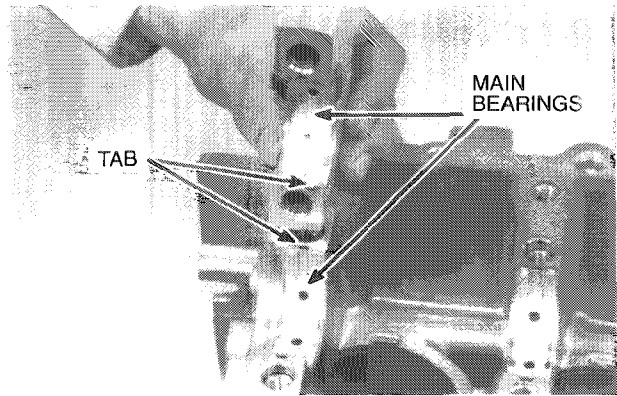
Bearing Installation

Clean oil off the bearing outer surfaces, bearing caps, and right case.

Install the main bearings onto the right engine case and bearing caps. Apply molybdenum disulfide oil to the main bearing surfaces.

CAUTION

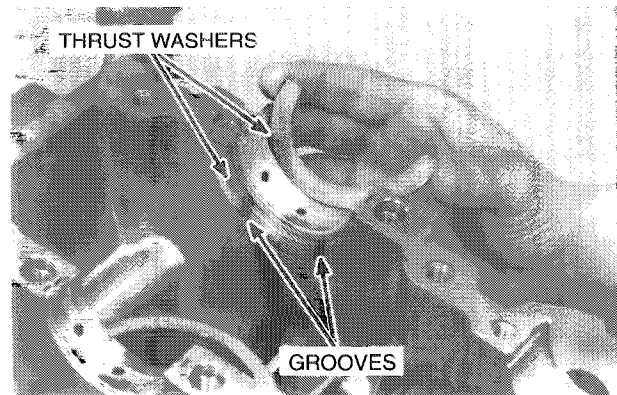
- Make sure the bearing tabs are aligned with the grooves on the case and caps.



Crankshaft Installation

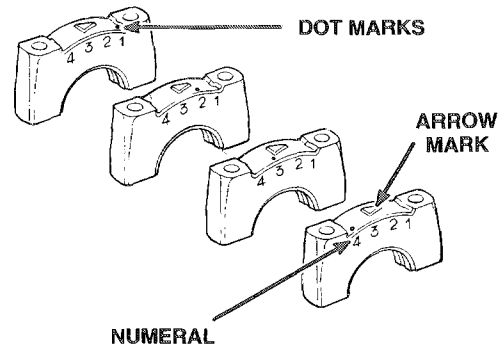
Inspect the thrust washers for scoring or discoloration. Replace, if necessary.

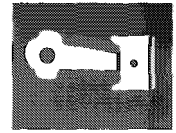
Install the thrust washers with groove sides facing out.



The installation position of each main bearing cap is identified with a dot mark that is aligned with the proper numeral, as viewed from the front side of the engine.

Each cap should be installed with its arrow mark pointing toward the engine top.

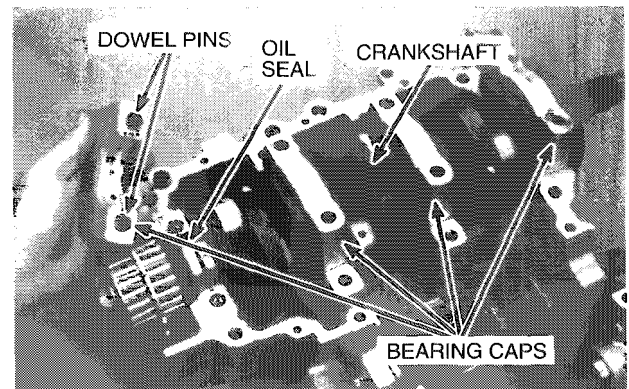




Install the crankshaft.

Install the oil seal with the lip side facing inside.

Install the dowel pins and main bearing caps, noting cap installation procedure mentioned in the previous step.

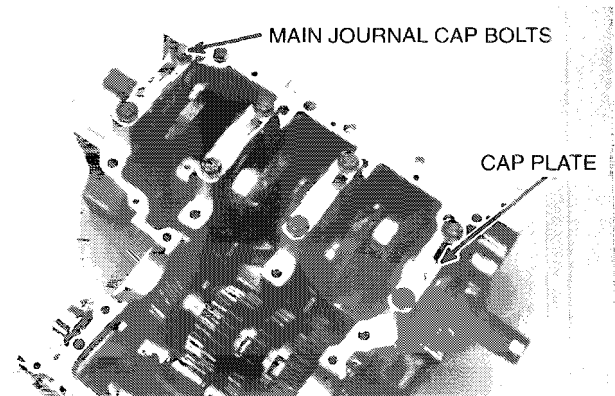


Apply oil to the main journal cap bolt threads and flange surfaces.

Install the bearing cap plates and cap bolts.

Tighten the bolts in a gradual, crisscross pattern.

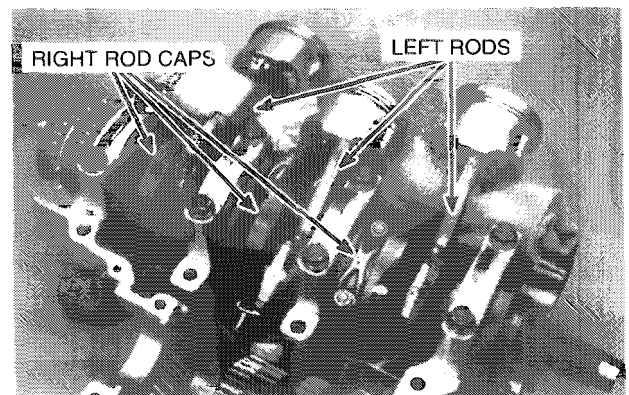
Torque: 70 N-m (7.0 kg-m, 51 ft-lb)



Install the following:

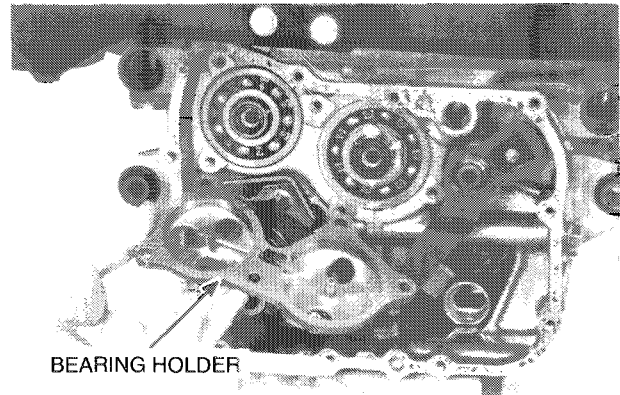
- right side rod bearing caps (see page 8-26).
- left side rod assemblies (see page 8-26).

Assemble the crankcase (see page 10-18).

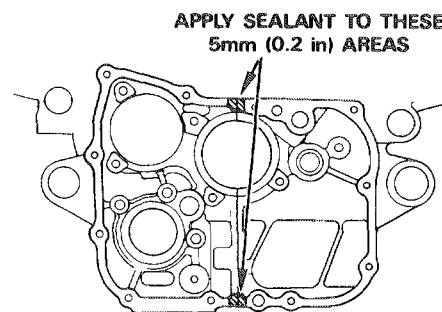


Crankshaft/Piston Front Engine Cover Installation

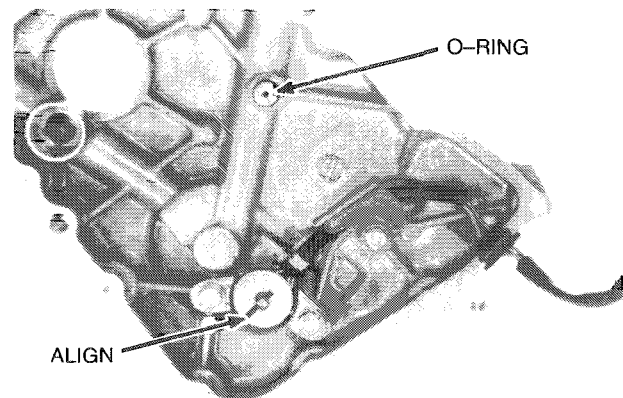
If removed install the bearing holder.



Apply sealant to the engine case surfaces as shown.



Align the gearshift sensor pin with the tab as shown.
Install the O-ring onto the oil orifice.

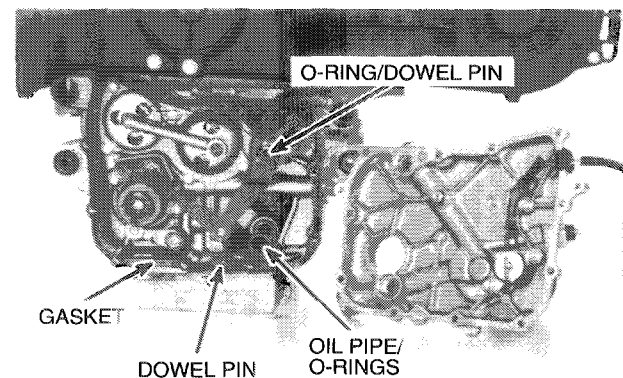


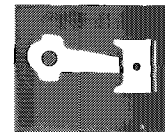
Install the following:

- 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.



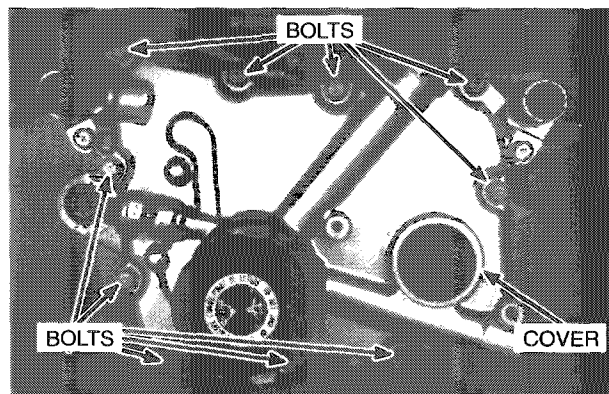


Tighten the front engine cover bolts in a gradual, criss-cross pattern.

Install the removed parts in the reverse order of removal.

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

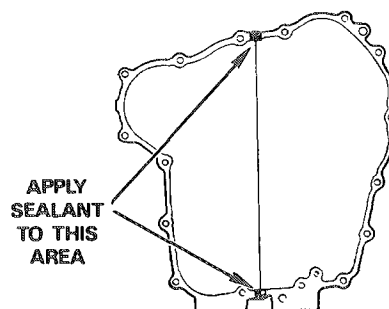
Fill the engine with coolant (see page 5-8).



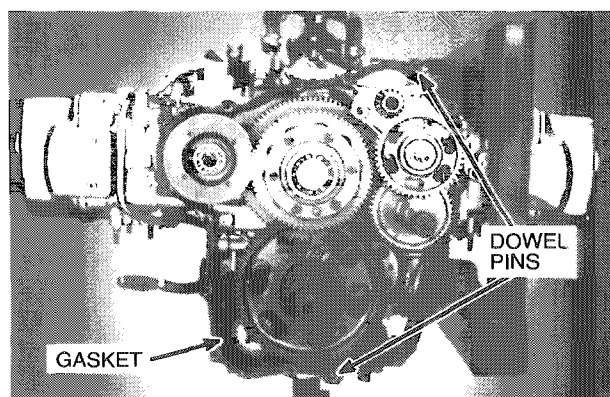
Rear Case Cover Installation

Rear Case Cover

Apply sealant to the crankcase surface, as shown.



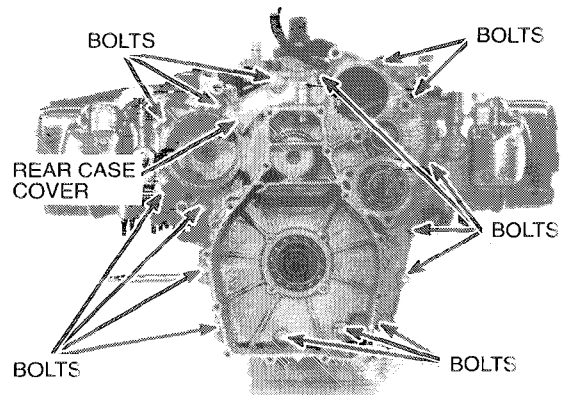
Install a new gasket and dowel pins.



Crankshaft/Piston

Rear Case Cover Installation (cont'd)

Install the rear engine cover and tighten the bolts in a gradual, crisscross pattern.



Set 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)

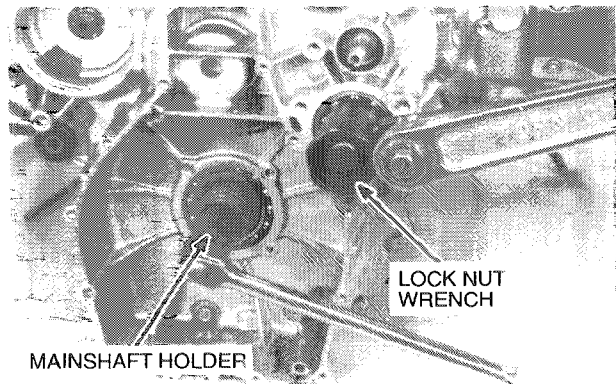
Tools:

Mainshaft holder

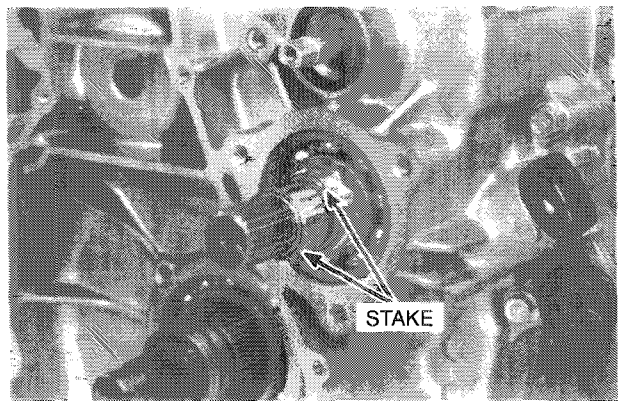
07JMB-MN50200

Lock nut wrench, 30 x 64 mm

07916-MB00001



Stake the output shaft lock nut (2 places).

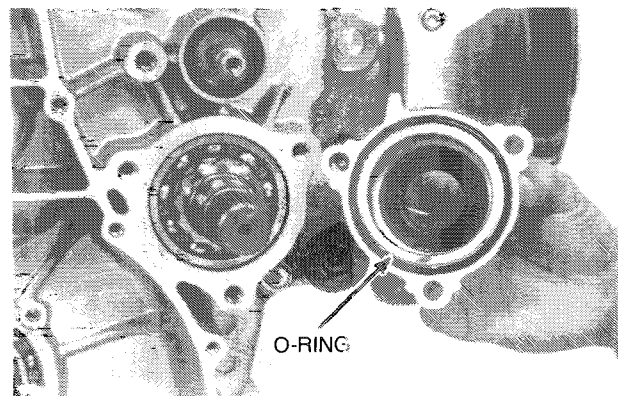


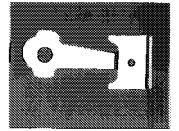
Bearing Holder (Output Shaft)

Apply oil to the rear case cover surface as shown.

Install an O-ring into the bearing holder groove.

Install the holder over the output shaft.

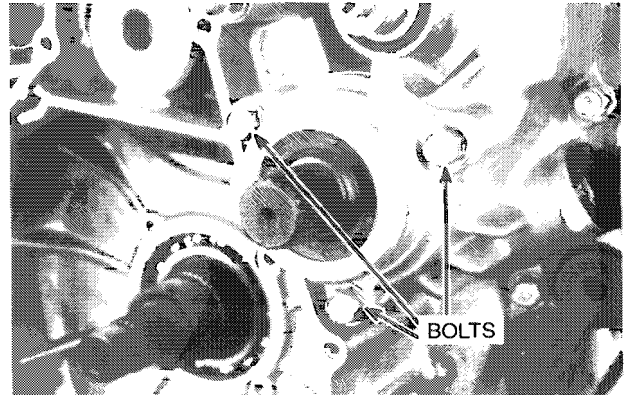


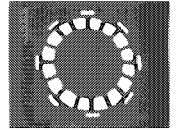


Install and tighten the bearing holder bolts securely.

Install the following:

- alternator (see page 17-17)
- starter motor (A & SE: see page 18-21, I: see page 18-51)
- clutch (see Section 9)
- A & SE: reverse shift arm (see page 18-38)
- engine (see Section 6)





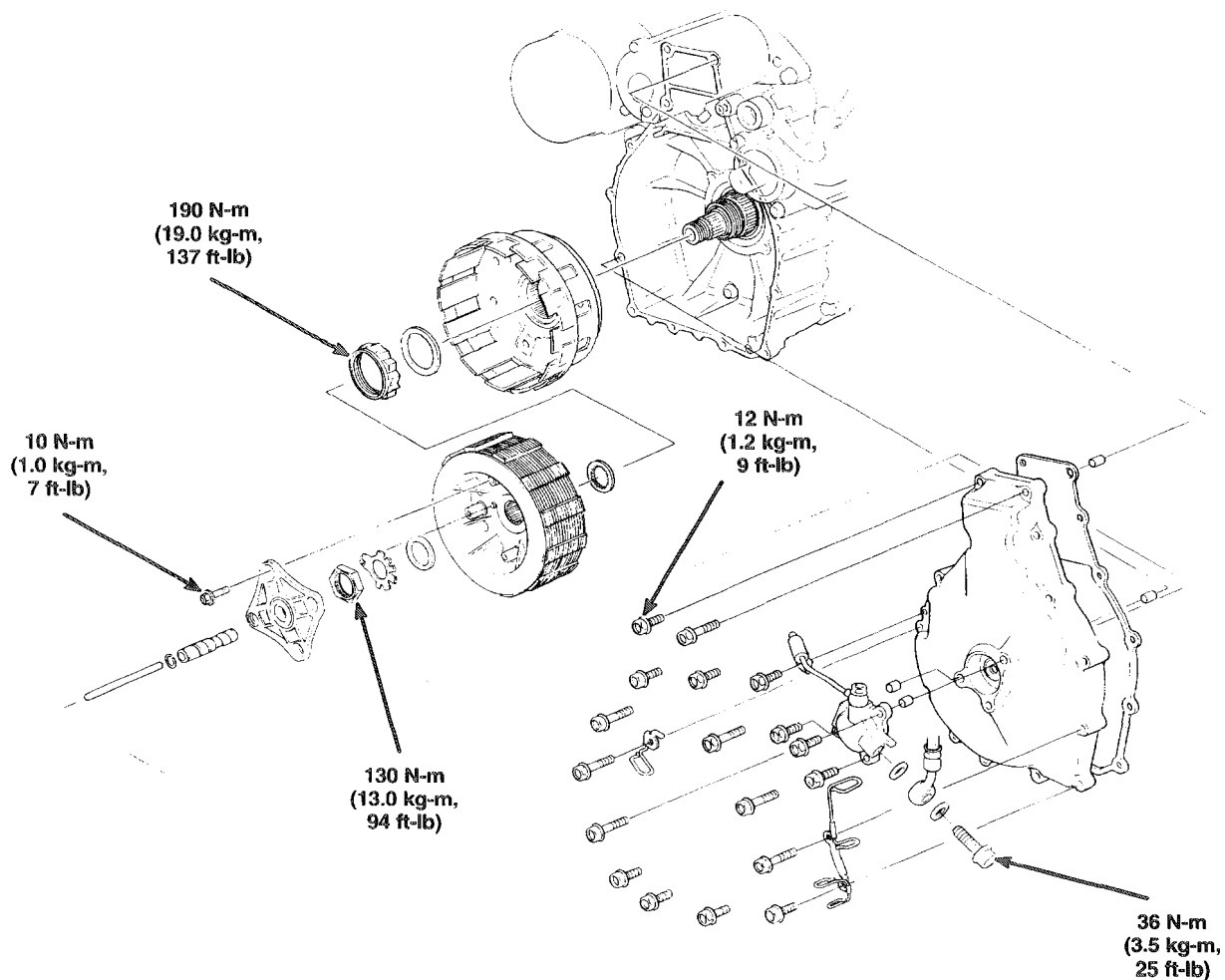
Clutch

Service Information	9-2
Troubleshooting	9-4
Clutch Fluid Replacement/ Air Bleeding	9-5
Clutch Master Cylinder ...	9-6
Clutch Slave Cylinder	9-9
Clutch	9-10

Clutch

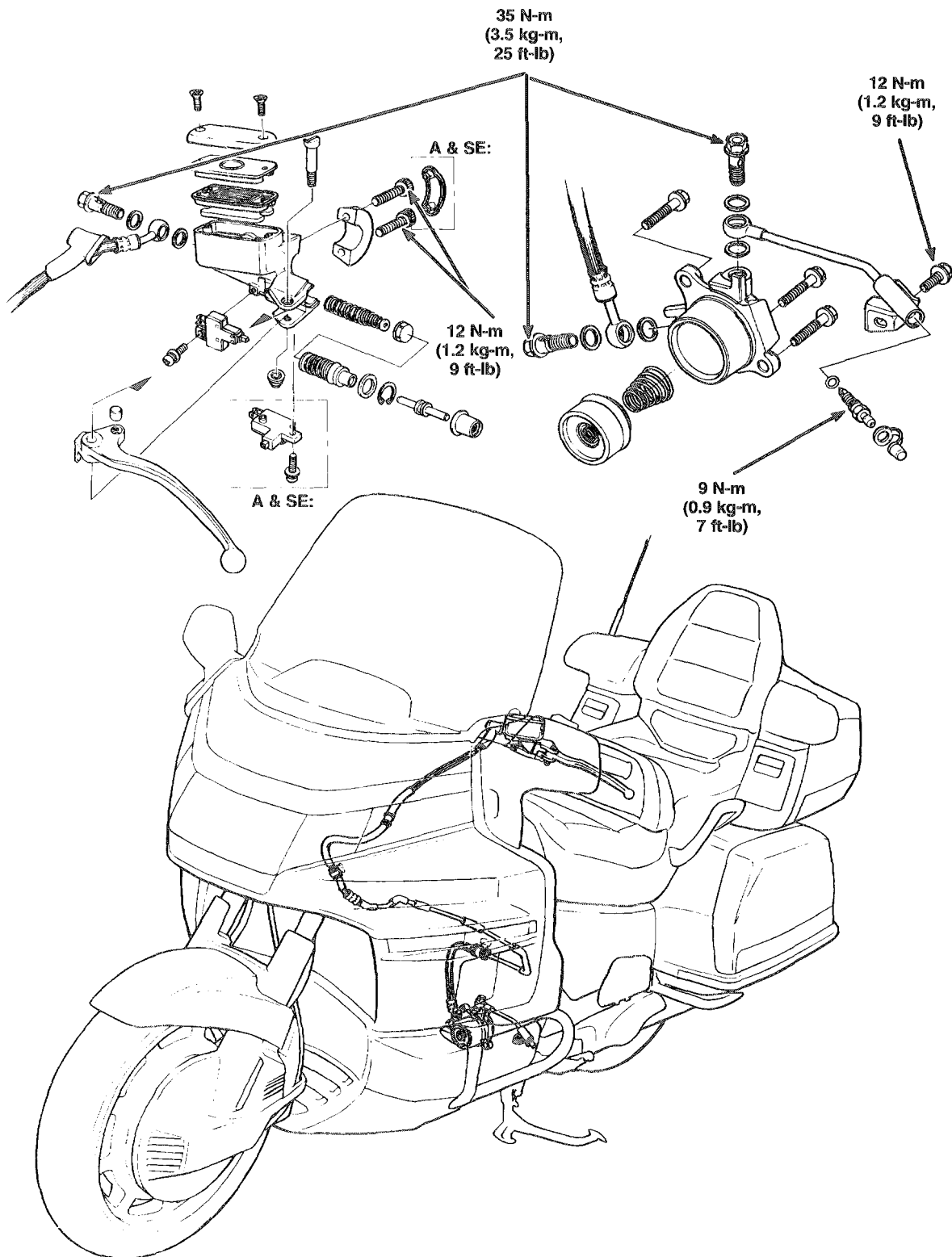
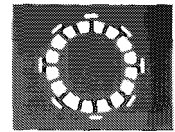
Service Information

- This section covers removal and installation of the clutch hydraulic system and the clutch.
- DOT 4 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 the slave cylinder piston from being forced out of the cylinder, squeeze the clutch lever and tie it to the handlebar grip.



Torque Values

Clutch hose bolt	35 N-m (3.5 kg-m, 25 ft-lb)
Clutch master cylinder socket 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 to the threads



Clutch

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

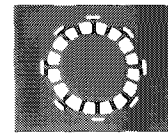
- Air bubbles in hydraulic system
- Low fluid level
- Hydraulic system leaking
- Hydraulic system sticking
- Plates warped
- Engine oil level too high (too much engine oil)
- Engine oil viscosity too thick

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) out of the reservoir 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 appears out of the bleed valve and air bubbles do not appear in the plastic hose.

NOTE

- Add fluid when the fluid level in the 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 (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)

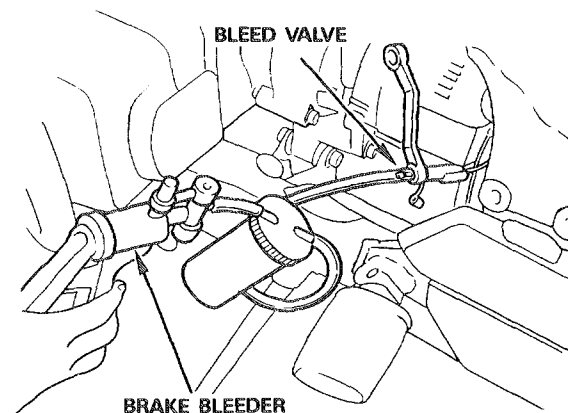
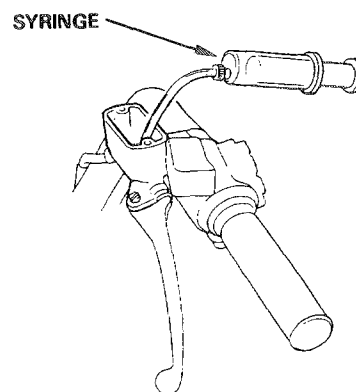
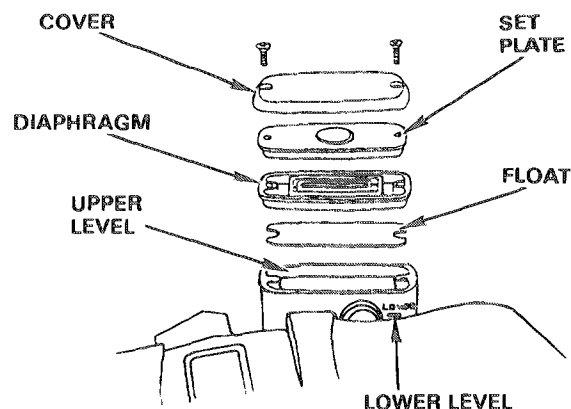
Fill the reservoir with fresh DOT 4 brake fluid to the upper level mark.

Operate the clutch lever. If it feels spongy, bleed the air from the system.

Air Bleeding

If a brake bleeder is available, open the bleed valve and pump the bleeder until air bubbles do not appear in the plastic hose while adding fresh DOT 4 fluid to reservoir upper level (same procedure as clutch fluid replacement above).

If a bleeder is not available, follow the instructions for air bleeding on the next page.



Clutch

Clutch Fluid Replacement/Air Bleeding (cont'd)

Connect a plastic hose to the bleed valve.

1. Pump up the system pressure with the clutch lever until there are no air bubbles in the fluid flowing out of the reservoir bleed holes. Squeeze the lever, open the bleed valve 1/2 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.

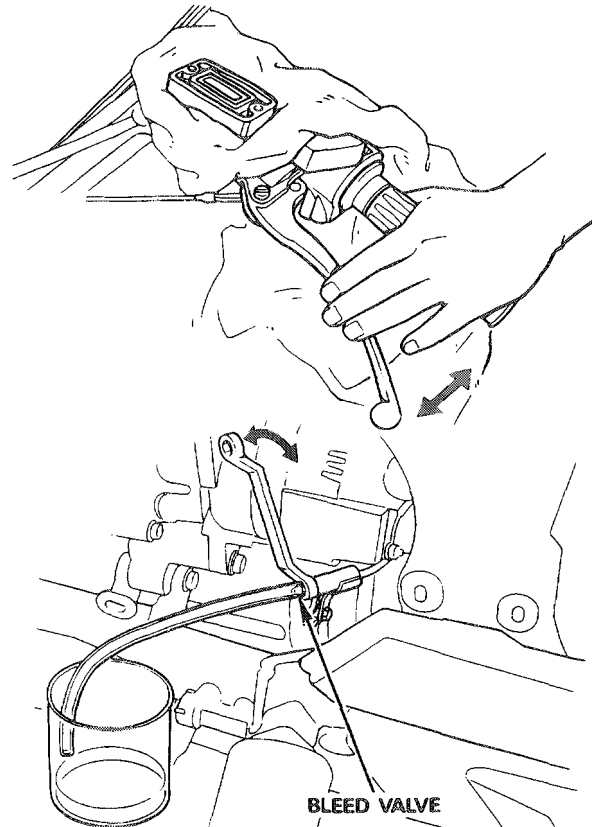
Repeat steps 1 and 2 until air bubbles cease to appear in the fluid coming out of the bleed valve.

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 diaphragm, set plate and reservoir cover.



Clutch Master Cylinder

Disassembly

Draw the brake fluid from the reservoir completely using a commercial syringe (previous page).

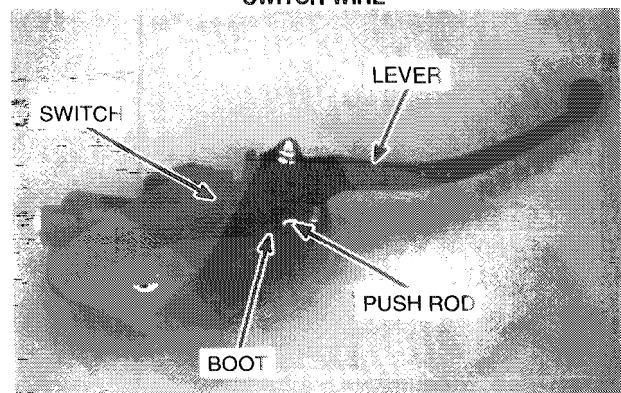
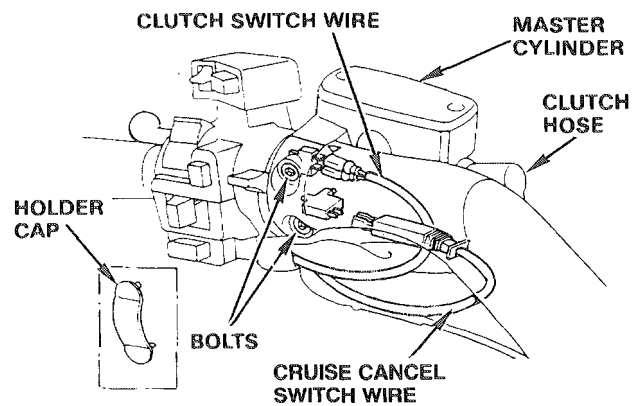
Remove the following:

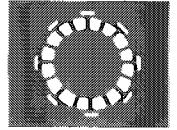
- clutch switch wires.
- clutch hose.

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.**

- A & SE: cruise cancel switch wire.
- A & SE: holder cap.
- master cylinder holder and master cylinder
- clutch lever.
- switch.
- push rod.
- boot.

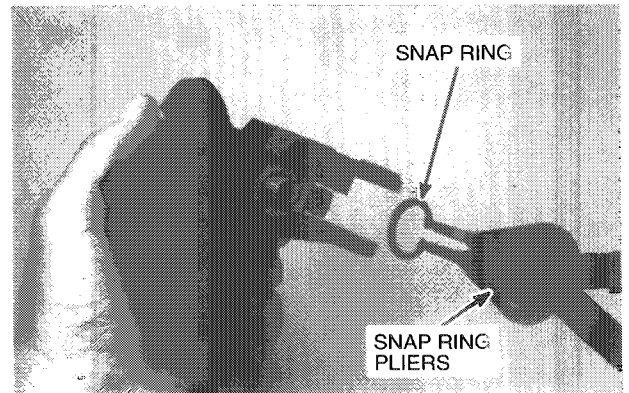




- snap ring

Tool:

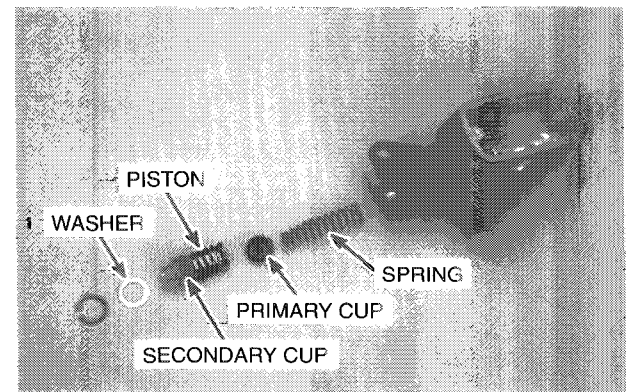
Snap ring pliers
07914-3230001 or commercial equivalent



- washer
- master piston
- primary cup
- spring

Clean the master cylinder, reservoir, and master piston in clean brake fluid.

Check the primary and secondary cups for damage or deterioration.

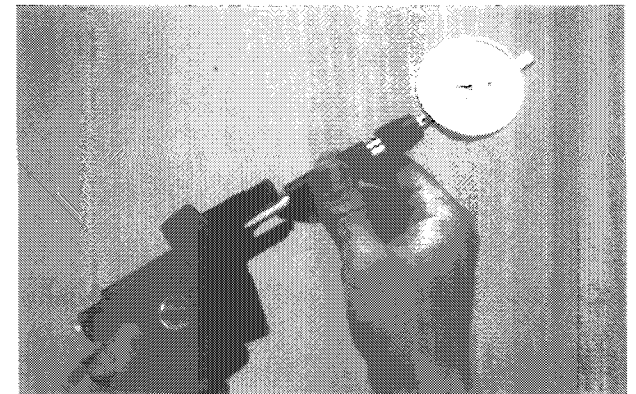


Inspection

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)

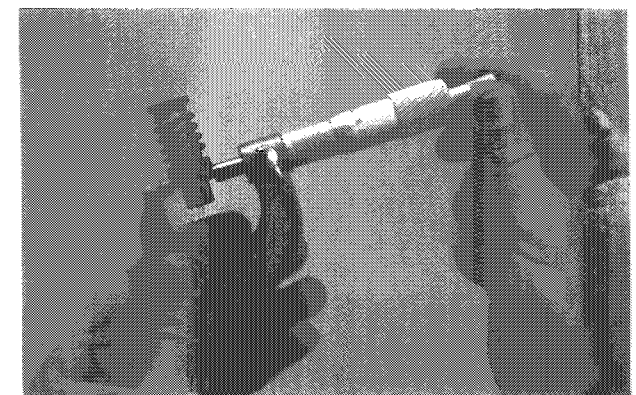


Measure the master piston outside diameter.

Service Limit: 15.82 mm (0.623 in)

NOTE

- The master piston, piston cups, and spring must be replaced as a set.



Clutch

Clutch Master Cylinder (cont'd)

Assembly

CAUTION

- Handle the master piston, spring, primary cup and secondary cup as a set.

Coat the master piston and the 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 out.

- washer
- snap ring

Tool:

Snap ring pliers

07916-3230001 or commercial equivalent

CAUTION

- Be certain the snap ring is firmly seated in the groove.

- boot
- switch
- push rod
- 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. 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 two new sealing washers.

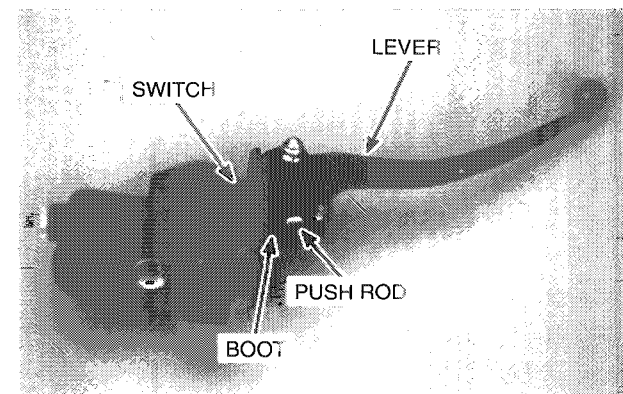
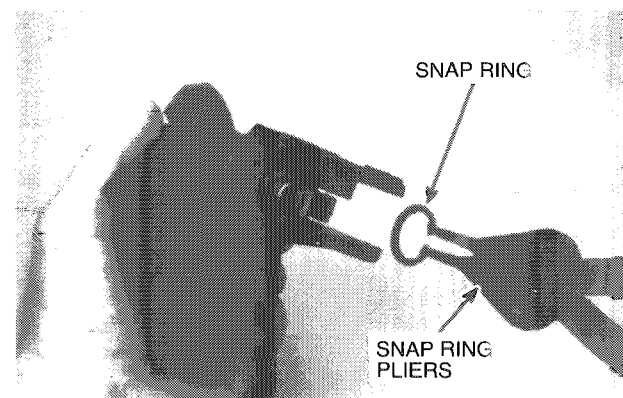
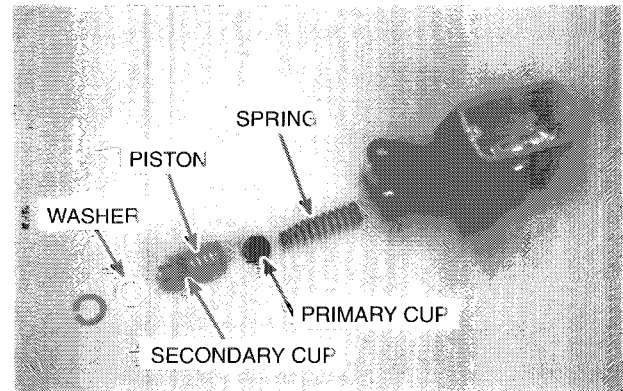
NOTE

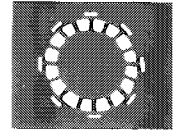
- Set the hose as shown.

Tighten the oil bolt.

Torque: 35 N-m (3.5 kg-m, 25 ft-lb)

Connect the switch wires to the switch. Fill and bleed the clutch hydraulic system (see page 9-5).





Clutch Slave Cylinder

Disassembly

NOTE

- The clutch slave cylinder can be removed with the engine in the frame.

Remove the following:

- both front side covers (see page 13-8).
- canister (California model only; see page 4-60).
- bleed pipe mounting bolt and slave cylinder bolts.
- slave cylinder.

Check the piston sliding area for fluid leak.

Get the slave piston out from the slave cylinder by squeezing the clutch lever several times.

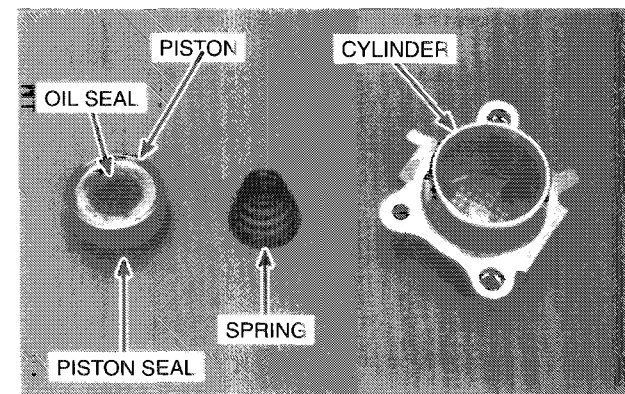
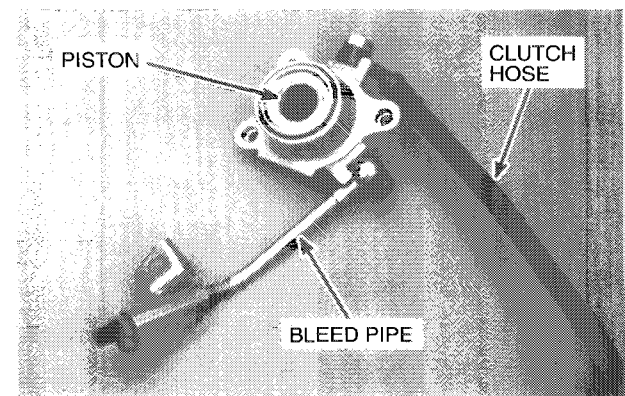
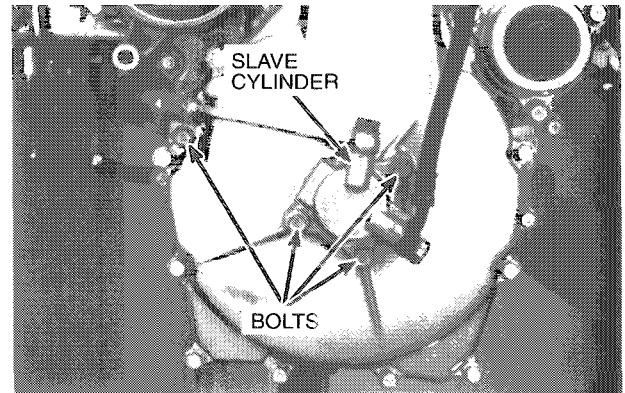
CAUTION

- **Avoid spilling clutch 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

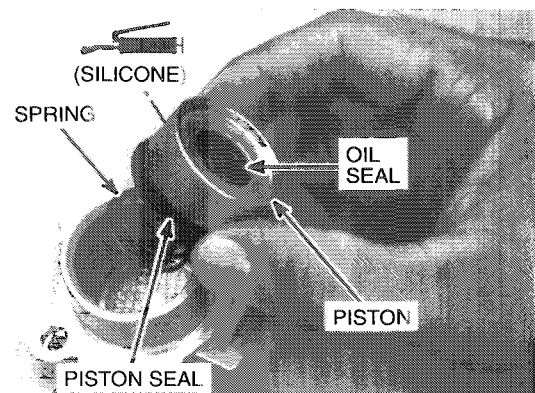
Apply a small amount of silicone grease (0.2 grams) to the lifter rod attaching area of the piston.

Apply clean brake fluid to the piston and a new piston seal. Apply grease to new oil seal lips.

Install the following to the piston:

- seals
- spring

Install the piston into the slave cylinder.



Clutch

Clutch Slave Cylinder (cont'd)

Install the dowel pins to the clutch cover.

Install the slave cylinder and tighten the bolts securely.

Install the clutch hose and bleed pipe to the slave cylinder, using new sealing washers if the old washers were removed.

Tighten the oil bolts to the specified torque.

Torque: 35 N-m (3.5 kg-m, 25 ft-lb)

Apply locking agent to the bleed pipe mounting bolt threads.

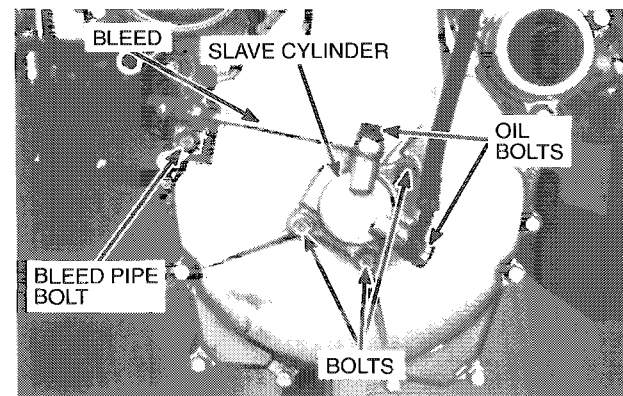
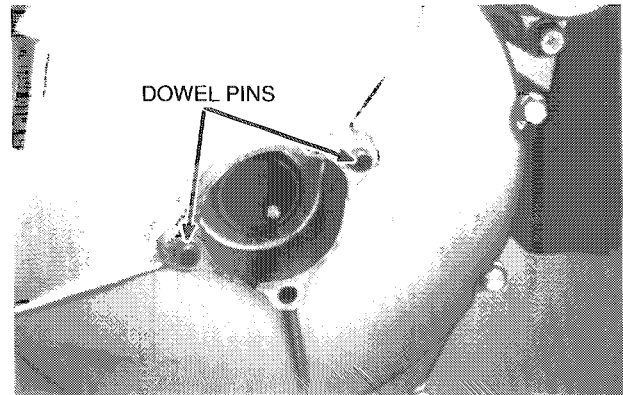
Tighten the bleed pipe mounting bolt.

Torque: 12 N-m (1.2 kg-m, 9 ft-lb)

Install the following:

- canister (California model only; see page 4-60).
- front side covers (see page 13-8).

Fill and bleed the clutch hydraulic system (see page 9-5).



Clutch

Disassembly/Inspection

Drain the engine oil (see page 3-13).

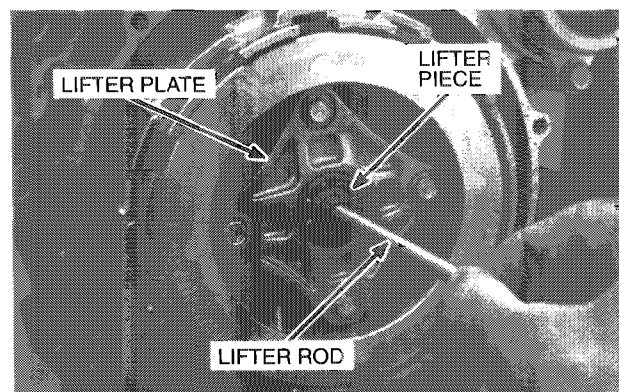
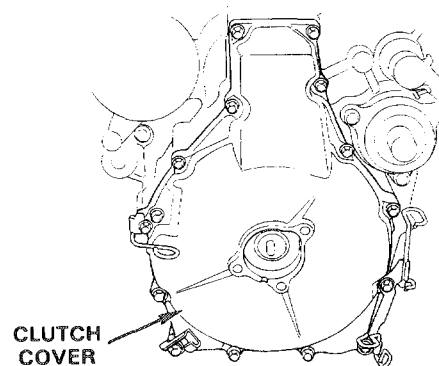
Remove the following:

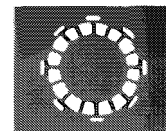
- front side covers (see page 13-8).
- left exhaust pipe protector (page 7-29) and heat protector (page 7-32).
- canister (California model only; see page 4-60).
- clutch slave cylinder (see page 9-9).

NOTE

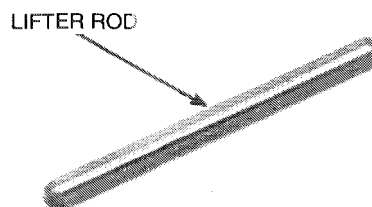
- Do not disconnect the clutch hose.
- To keep slave cylinder piston from being forced out of the cylinder, squeeze the clutch lever and tie it to the handlebar.

- clutch cover.
- dowel pins and gasket.
- clutch lifter rod and clutch lifter piece.
- clutch lifter plate.

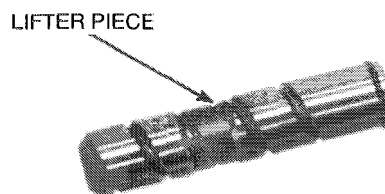




Inspect the lifter rod for wear, damage, or bending.



Check the lifter piece for wear or damage.

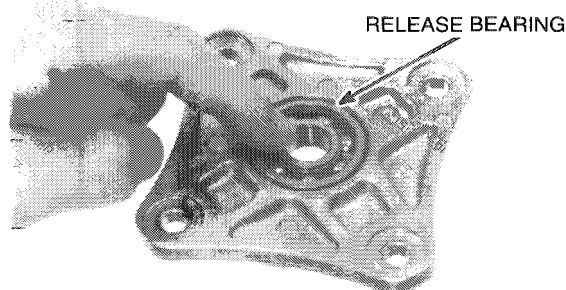


Turn the inner race of the release bearing with your finger. The bearing should turn smoothly and quietly.

Also check that the outer race of the release bearing fits tightly in the lifter plate.

Remove and discard the bearing if the inner race does not turn smoothly and quietly. Replace the clutch lifter plate if the outer race does not fit securely.

Drive the bearing out from the lifter plate.



Install the bearing with its mark side facing out.

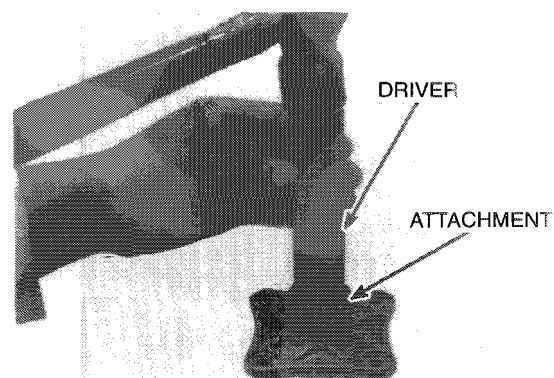
Tools:

Driver

07749-0010000

Attachment, 32 x 35 mm

07746-0010100



Clutch

Clutch (cont'd)

Straighten the lock washer tab and discard the lock washer.

Set the special tool's collars to the 4" hole mark and loosely install the nuts.

Tool:
Clutch center holder
07HGB-001000A
(U.S.A. only)

Install the clutch center holder onto the clutch pressure plate and tighten the tool's holder nuts securely. Use four 6 mm bolts to secure the tool to the clutch.

Remove the lock nut with a commercial reversible ratchet as shown.

Remove the following:

- lock washer.
- washer.
- clutch center, pressure plate, discs, and plates as an assembly from the clutch outer.

NOTE

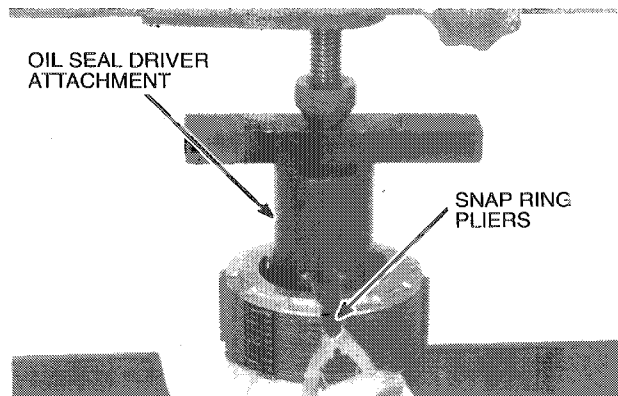
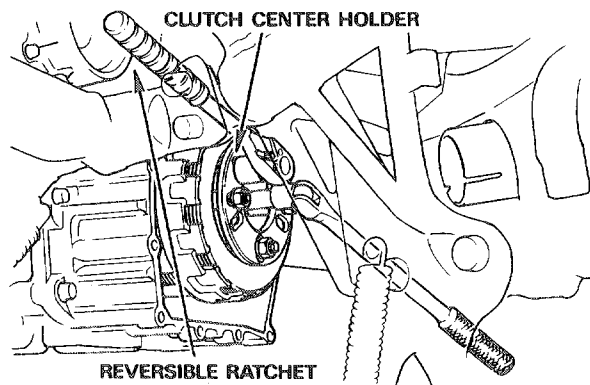
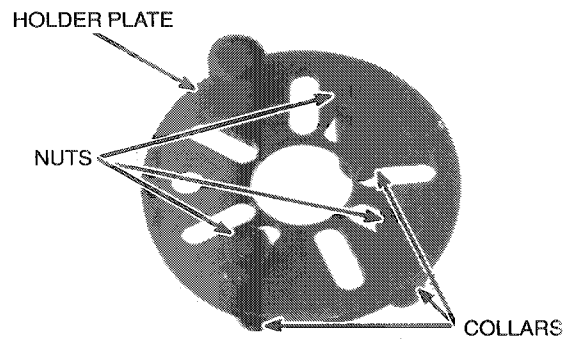
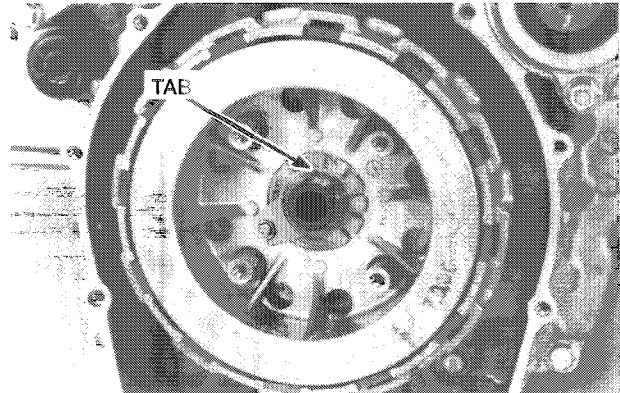
- To prevent damage to the clutch, four 6 mm bolts must be used to secure the tool to the clutch.

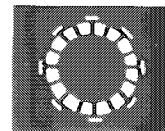
Compress the diaphragm spring in a bench press just enough to remove the stopper ring; remove the stopper ring and disassemble the clutch.

CAUTION

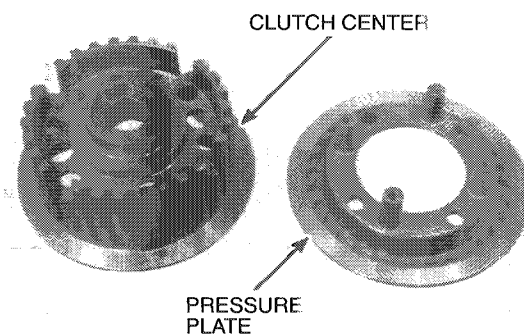
- To prevent a loss of tension, do not compress the diaphragm spring more than necessary to remove the stopper ring.

Tools:
Oil seal driver attachment
07965-MA10200
Snap ring pliers
07914-3230001 or
commercial equivalent



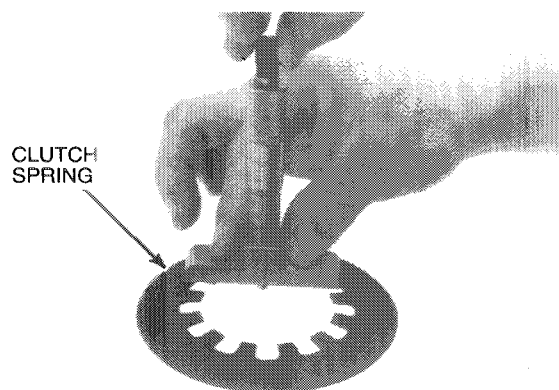


Check the clutch center and pressure plate for nicks, cuts and indentations made by the plates.



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

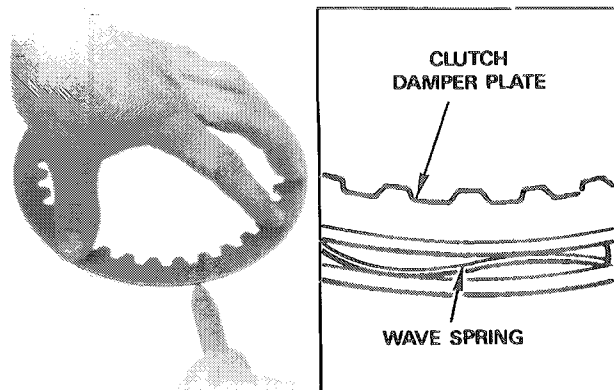
- Replace the discs and plates as a set.



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

Service Limit: 0.30 mm (0.012 in)

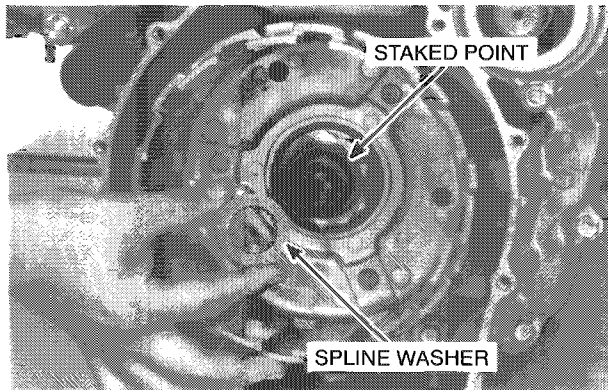
Check the clutch damper plate wave spring for damage.



Clutch

Clutch (cont'd)

Remove the spline washer from the mainshaft. Unstake the clutch outer lock nut, using a drill or grinder.



Hold the clutch outer with the special tool. Remove the clutch outer lock nut and discard it. Remove the lock washer and clutch outer.

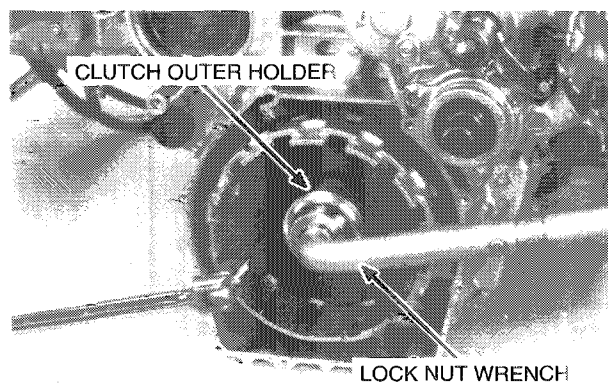
Tool:

Clutch outer holder

07JMB-MN50100

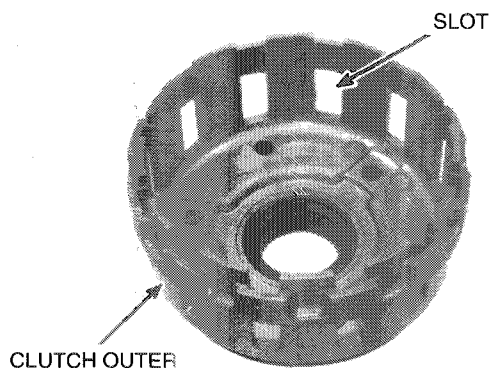
Lock nut wrench, 46 mm

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.



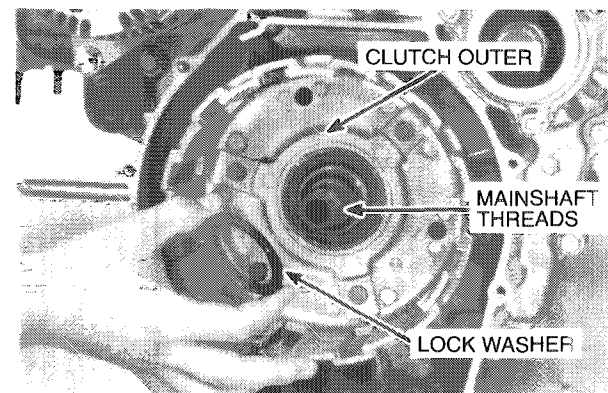
Assembly

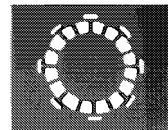
Clean the mainshaft and absorb the oil from the outer lock nut threads thoroughly.

Install the clutch outer and lock washer.

NOTE

- Install the lock washer with the "OUTSIDE" mark facing outward.





Apply locking agent to the threads of a new lock nut.

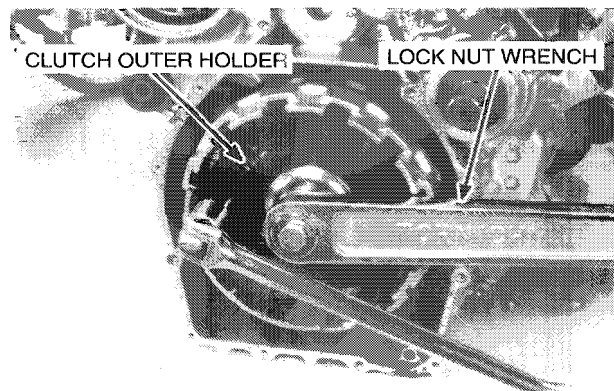
Tighten the lock nut to the specified torque.

Torque: 190 N-m (19.0 kg-m, 137 ft-lb)

Tool:

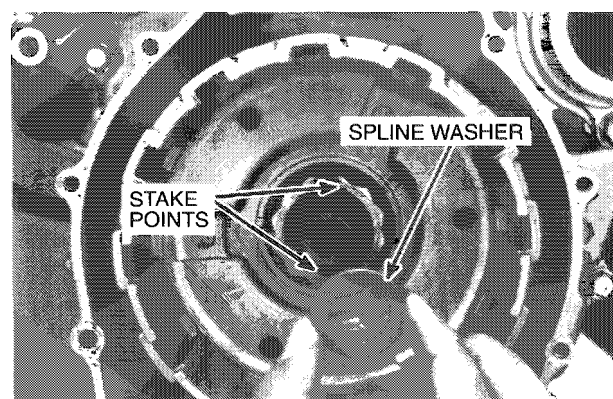
Clutch outer holder
07JMB-MN50100

Lock nut wrench, 46 mm
07JMA-MN50100



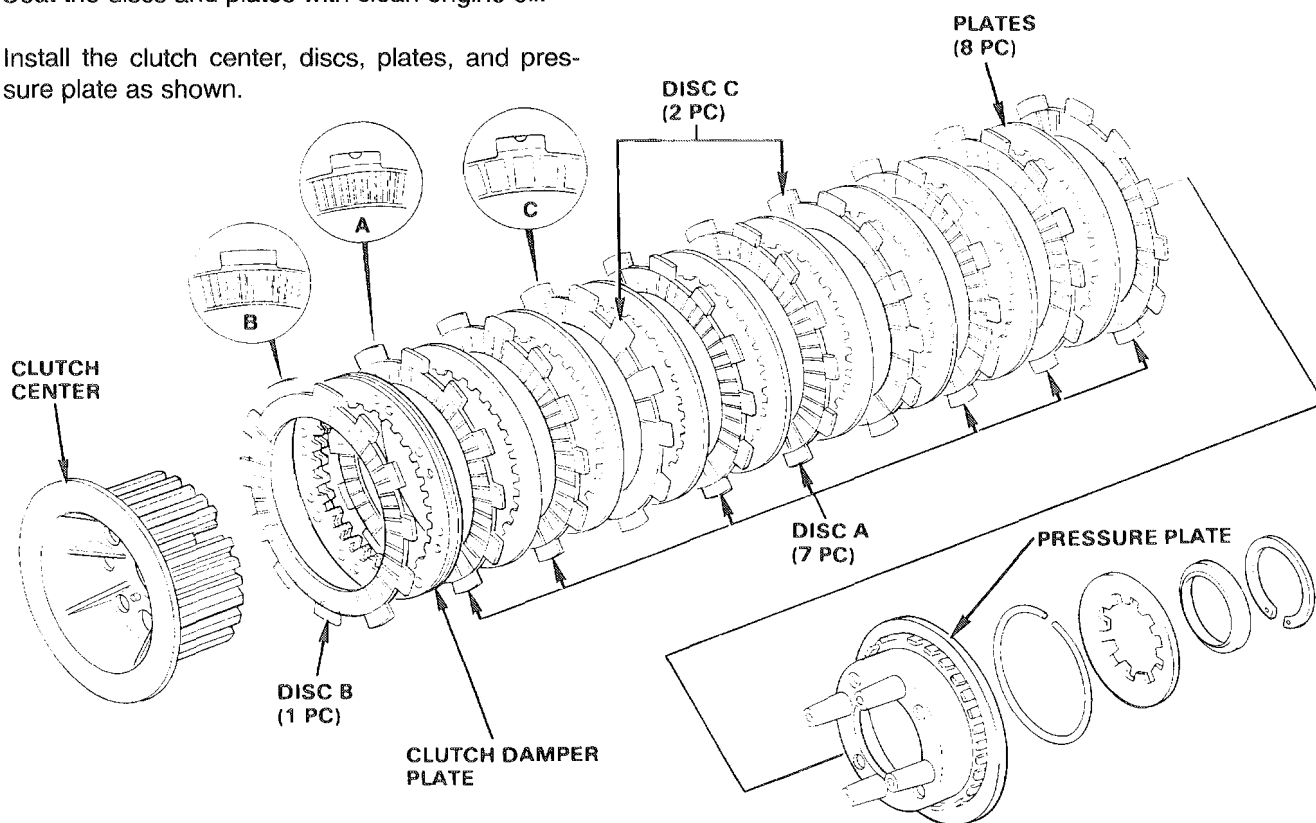
Stake the lock nut in two places.

Install the spline washer.



Coat the discs and plates with clean engine oil. ^A

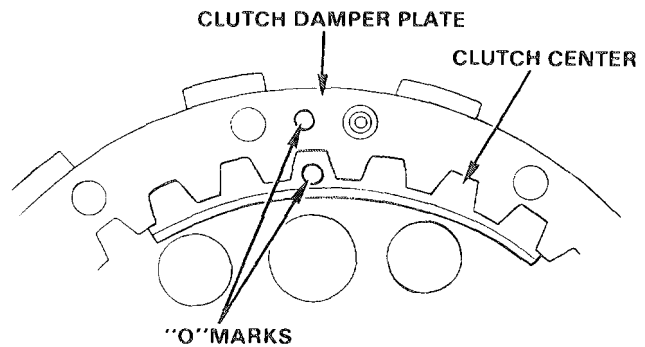
Install the clutch center, discs, plates, and pressure plate as shown.



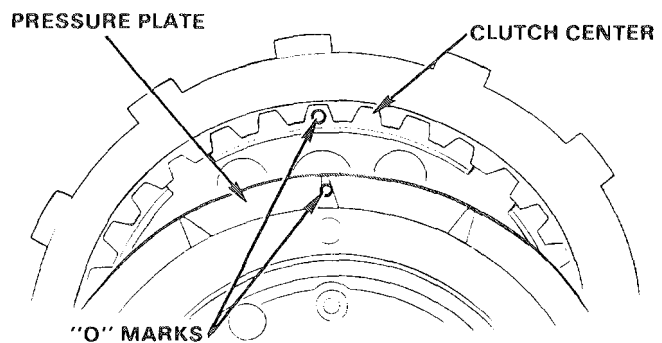
Clutch

Clutch (cont'd)

Install the clutch damper plate, aligning the "O" marks on the clutch damper plate and clutch center.

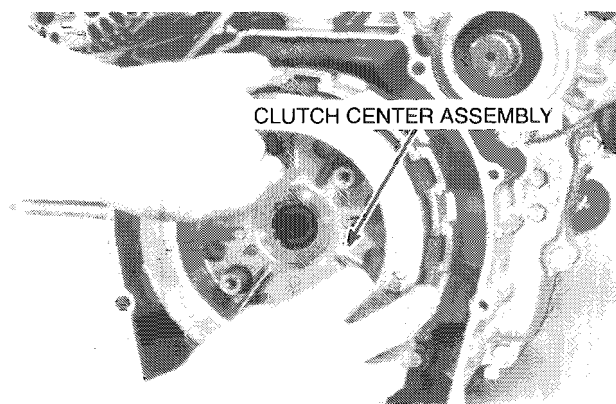


Install the pressure plate, aligning the "O" marks on the pressure plate and clutch center.



Slide the clutch center assembly into the clutch outer to align the discs and plates.

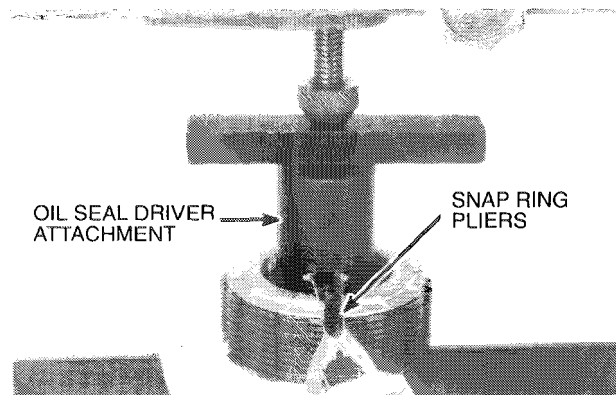
Remove the clutch center assembly from the clutch outer without disturbing the alignment.

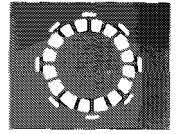


Place spring seat A, the clutch spring, and spring seat B on the clutch center and compress the spring in a press just enough to install the circlip.

CAUTION

- To prevent a loss of tension, do not compress the diaphragm spring more than necessary to install the stopper ring.

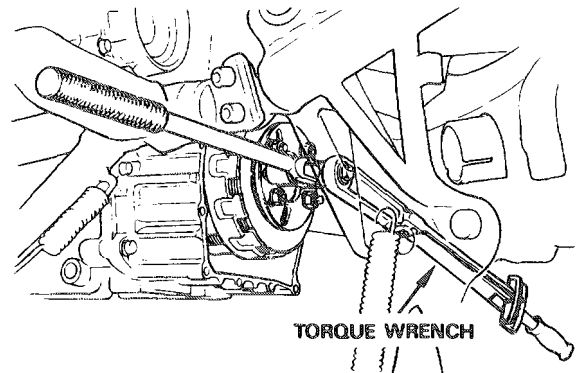




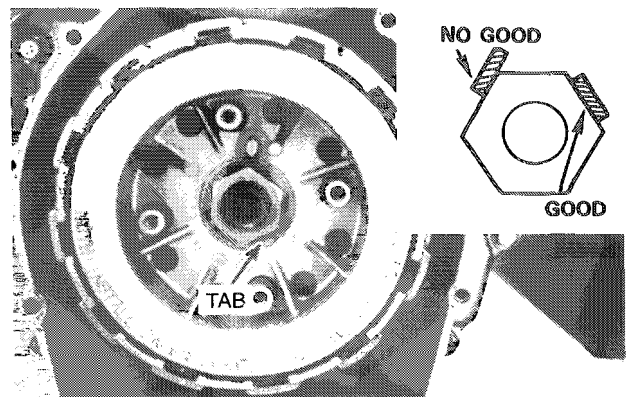
Remove the reversible ratchet and install a torque wrench.

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.

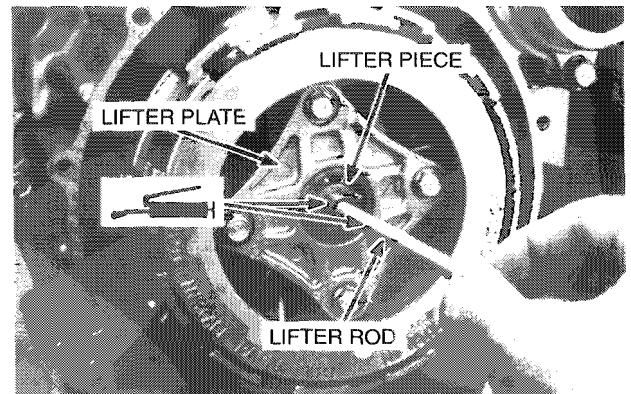


Install the lifter plate and tighten the bolts.

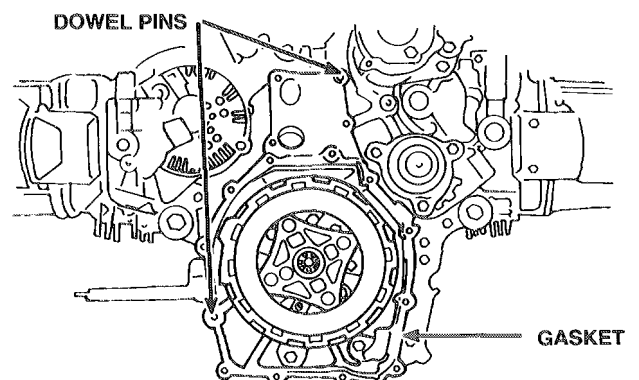
Torque: 10 N-m (1.0 kg-m, 7 ft-lb)

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.



Clutch

Clutch (cont'd)

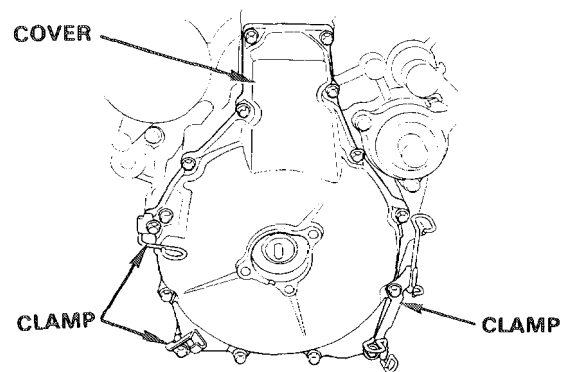
Install the following:

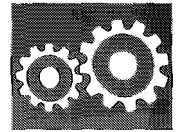
- clutch cover.
- clutch slave cylinder (see page 9-10).

NOTE

- Release the clutch lever from the handlebar grip and push the slave cylinder piston in all the way.
-
- canister (California model only: page 4-60).
 - left exhaust pipe protector (page 7-29) and heat protector (page 7-32).
 - front side covers (see page 13-8).

Fill the engine with the recommended engine oil (see page 3-13).





Transmission

Service Information	10-2
Troubleshooting	10-5
Gearshift Linkage	10-6
Crankcase Separation .	10-9
Transmission	
Disassembly	10-10
Transmission Inspection	10-12
Transmission Assembly	10-14
Crankcase Assembly ..	10-18
Primary Drive/	
Driven Gears	10-22
Output Shaft	10-25

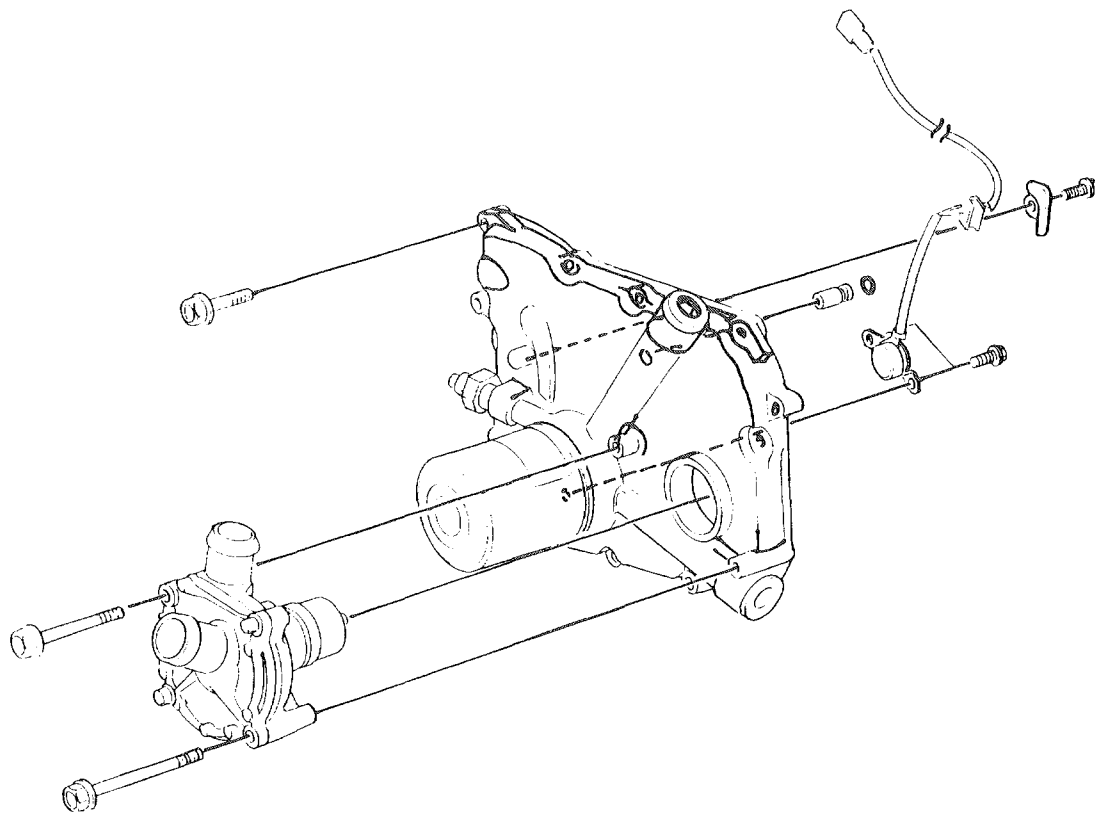
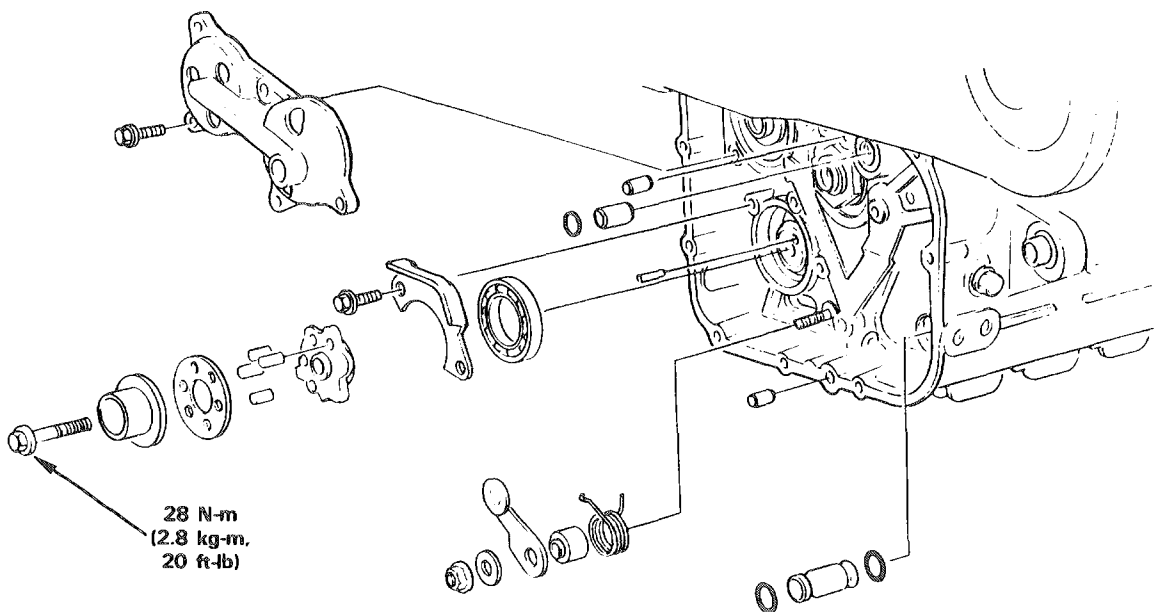
Transmission

Service Information

- The gearshift linkage, with the exception of the shift spindle and shift arm, can be serviced with the engine in the frame.
- The crankcases must be separated to inspect the transmission gears.
- Avoid damaging the pistons against the transmission gears or engine case when separating the crankcase halves. 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.
- Maintenance services and repairs of the primary gears and output shaft described in this section must be performed with the engine removed from the frame.
- For starter clutch removal/installation, see Section 18.

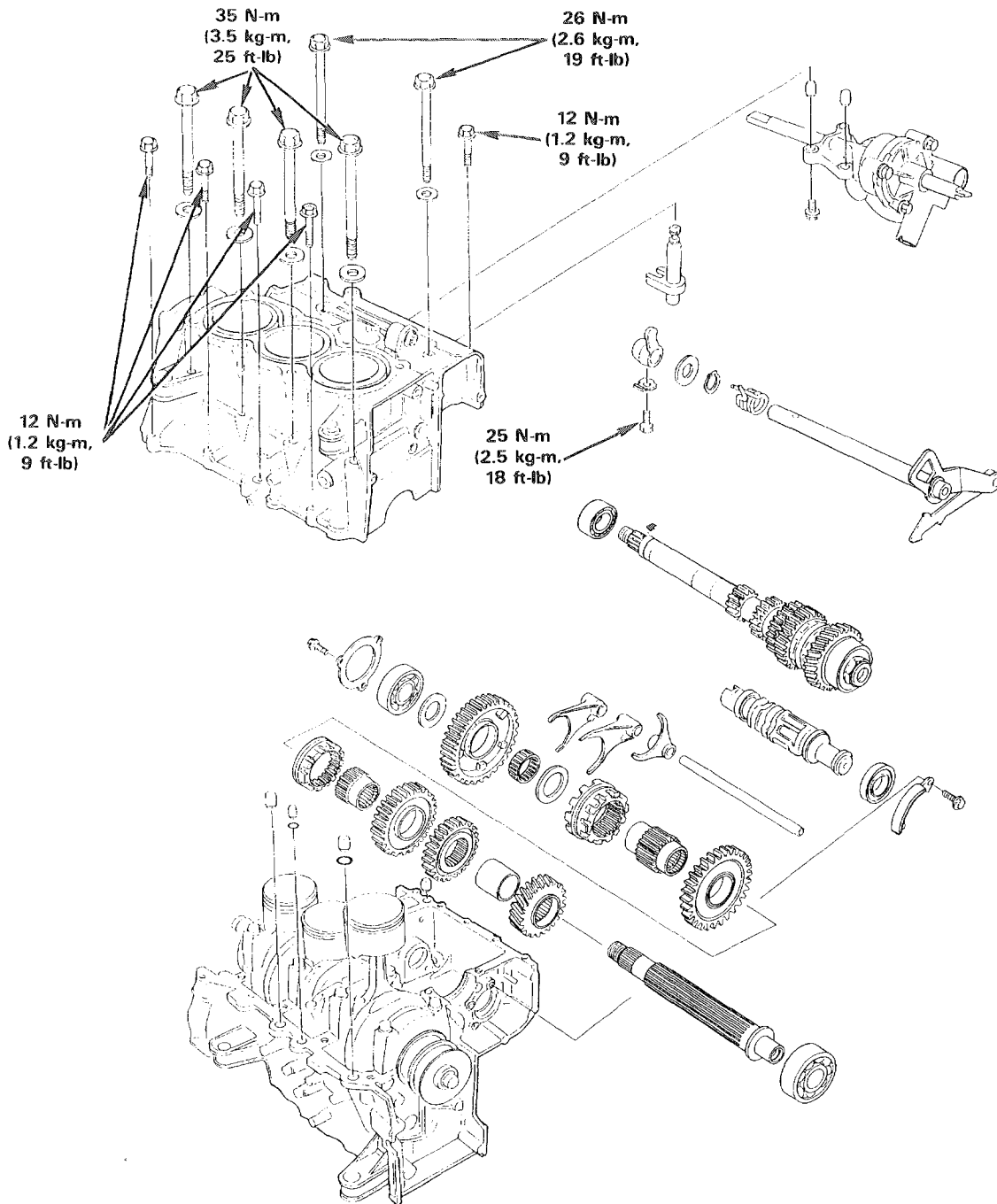
Service Points

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) Water pipe (Section 5) Timing belts (Section 7) Left cylinder head (Section 9) Clutch (Section 9) Rear case cover (Section 8) Scavenging pump (Section 8) Front engine cover and bearing holder (Section 8)
Transmission	Countershaft bearing (front)	Front engine cover and bearing holder (Section 8)
	Countershaft bearing (rear)	Engine (Section 6) Rear case cover (Section 8) and final drive gear (this section)
	Mainshaft, shift drum, and forks	Crankcase separation (above)
	Shift drum bearing (front)	Front engine cover and cam plate (Section 8)
	Countershaft	Engine case separation (above) Final drive gear (this section)



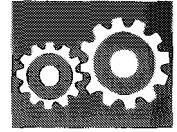
Transmission

Service Information (cont'd)



Torque Values

Engine case bolt (10 mm)	35 N-m (3.5 kg-m, 25 ft-lb)
(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 (left hand threads)	190 N-m (19.0 kg-m, 137 ft-lb)
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)



Troubleshooting

Hard to shift into gear

- Air in clutch system
- Shift forks bent
- Shift shaft bent
- Shift claw bent
- Shift spindle bolt loose
- Shift drum stopper bent
- Shift drum cam grooves damaged
- A & SE: Damaged reverse drum lock system (Section 18)

Transmission jumps out of gear

- Gear dogs worn
- Shift shaft bent
- Shift drum stopper broken
- Shift forks bent

Excessive output shaft noise

- Final drive and driven gears worn or damaged
- Output shaft bearing worn or damaged
- Excessive backlash between final drive and driven gears

Transmission

Gearshift Linkage

Removal

NOTE

- The gearshift linkage, with the exception of the shift arm and spindle, can be serviced with the engine in the frame.

Remove the following:

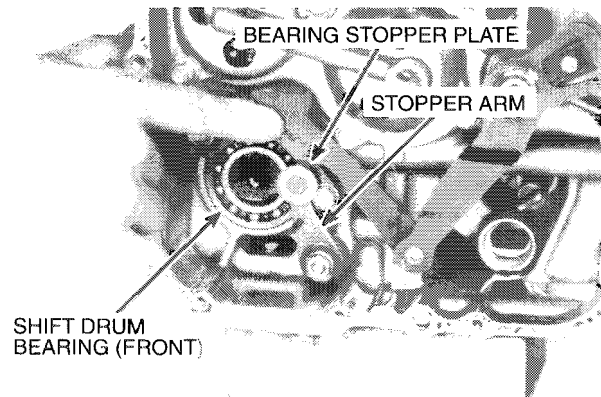
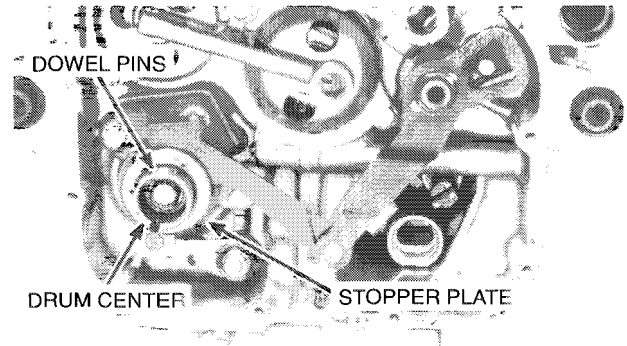
- front engine cover (see page 8-6).
- drum center, stopper plate, dowel pins, cam plate, and dowel pin.

NOTE

- Do not drop dowel pins into the engine case.

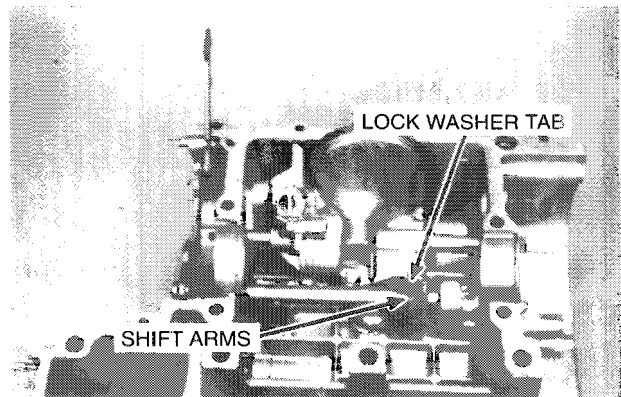
Remove the stopper arm.

If necessary, remove the bearing stopper plate and the shift drum bearing out of the engine case.



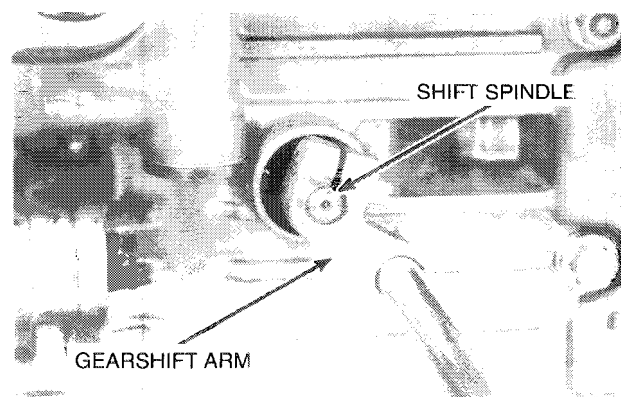
Separate the crankcase (see page 10-9).

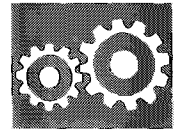
Straighten the lock washer tab. Remove the lock bolt. Then remove the shift arms.



Remove the bolt and gearshift arm.

Remove the shift spindle from the left engine case.

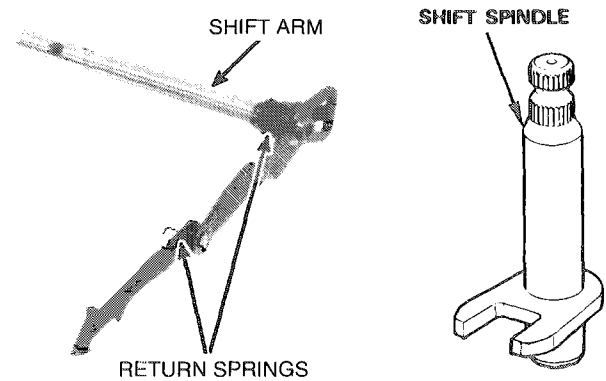




Inspection

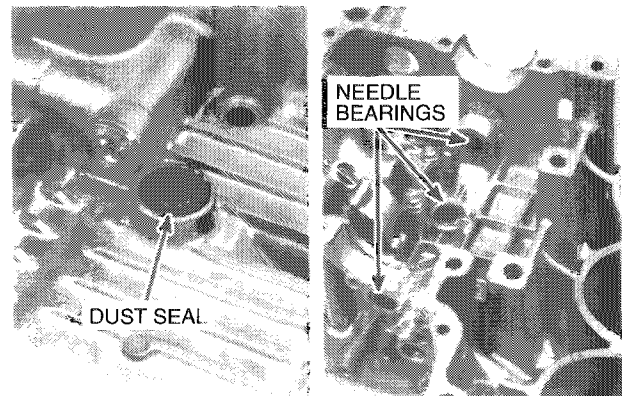
Inspect the shift spindle and shift arm for wear, damage or bending.

Inspect the shift arm and return springs for weakness or damage.



Check the shift spindle dust seal for damage, fatigue, or deterioration.

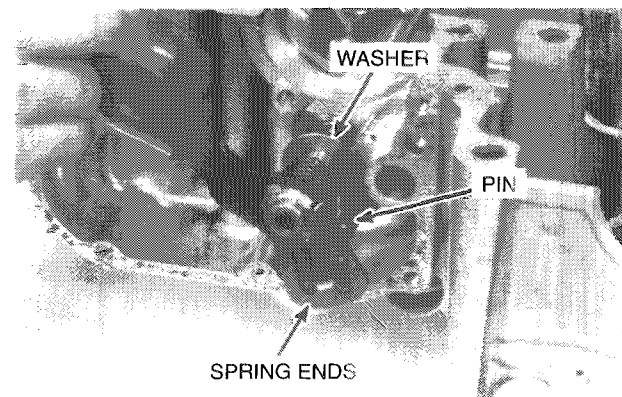
Check the needle bearings for damage or excessive play.



Installation

Install the washer onto the shift arm.

Install the shift arm, aligning the return spring ends with the pin.

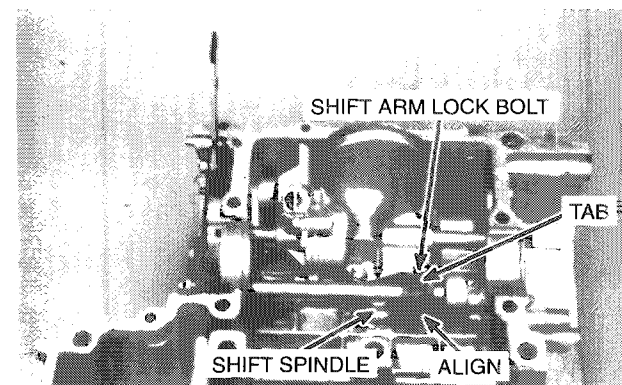


Install the shift spindle onto the left engine case and install the shift arm (smaller), aligning the arm with the spindle groove as shown.

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)

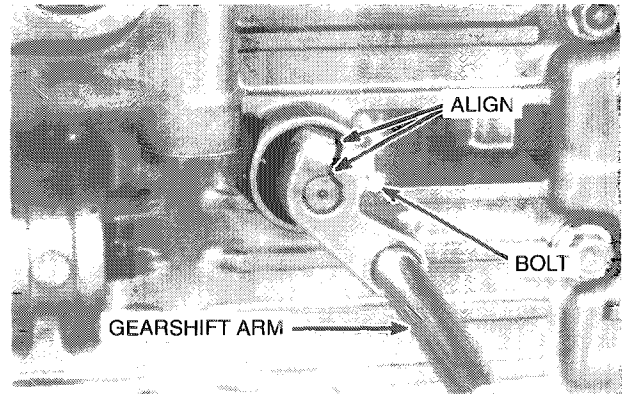


Transmission

Gearshift Linkage (cont'd)

Install the gearshift arm onto the shift spindle, aligning the punch mark on the spindle with the slot of the arm.

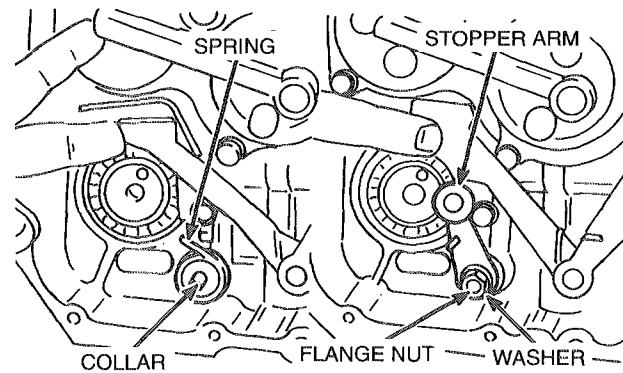
Tighten the bolt securely.



Install the collar and spring as shown.

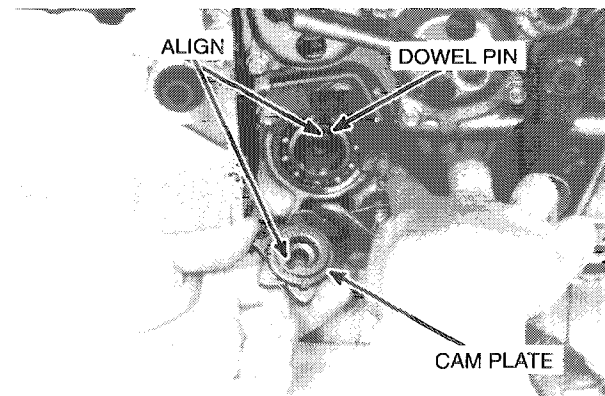
Install the stopper arm, washer, and flange nut.

Tighten the bolt securely.



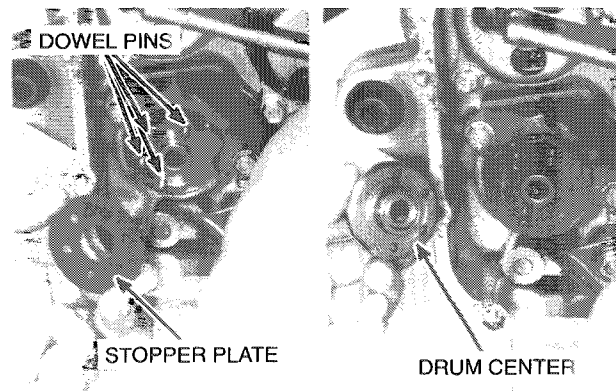
Install the dowel pin in the shift drum.

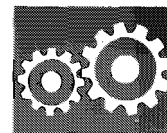
Install the cam plate in the shift drum by holding the shift arm and stopper arm as shown, aligning the dowel pin with the slot in the cam plate.



Install the following:

- four dowel pins to the cam plate
- stopper plate
- drum center



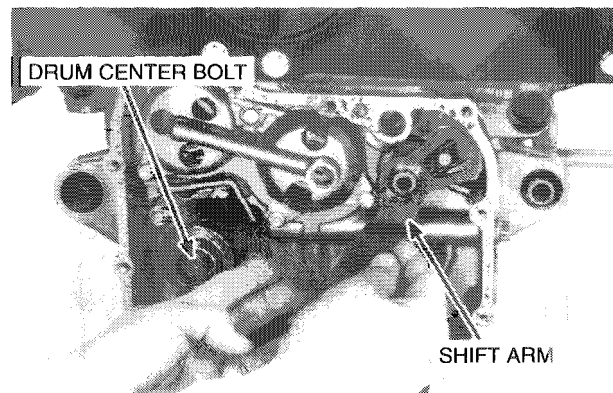


Tighten the drum center bolt to the specified torque.

Torque: 28 N-m (2.8 kg-m, 20 ft-lb)

Check that the stopper arm is engaged to the cam plate and the shift arm is engaged to the dowel pins.

Check the operation of the gearshift linkage.



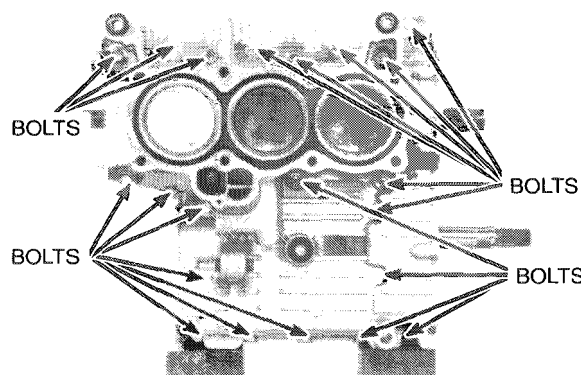
Crankcase Separation

Remove the necessary components for separation before separating the crankcases (see 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.

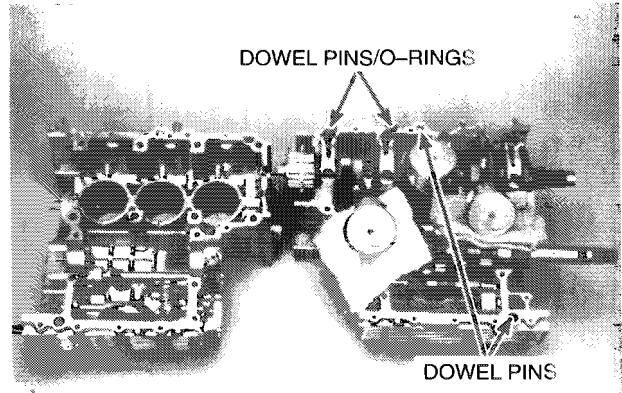


Transmission

Crankcase Separation (cont'd)

Remove the dowel pins and O-rings.

Clean any liquid sealant off the crankcase mating surface.



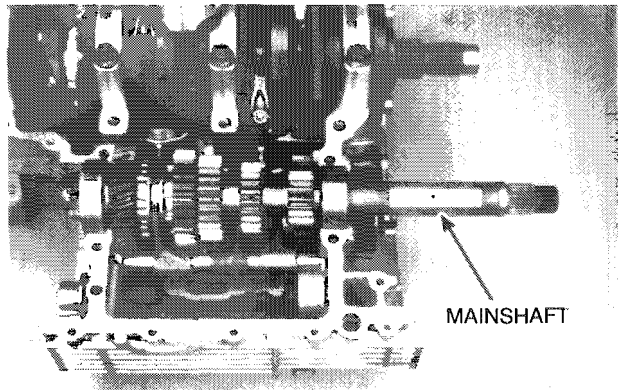
Transmission Disassembly

Separate the crankcases (see page 10-9).

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.

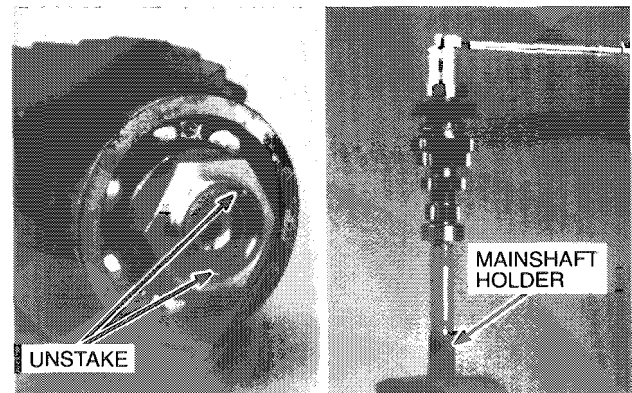
NOTE

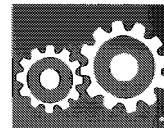
- The mainshaft lock nut has left hand threads.

Tool:

Mainshaft holder
07JMB-MN50200

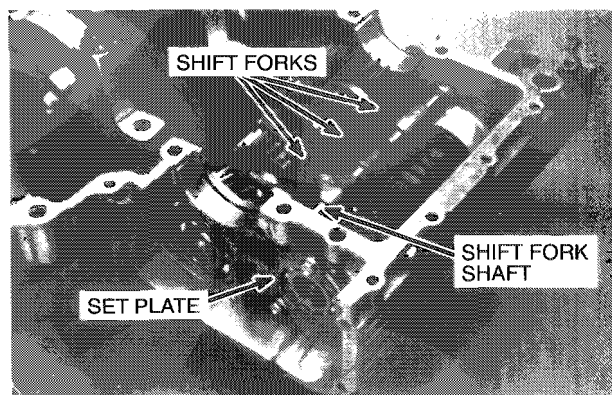
Disassemble the mainshaft.



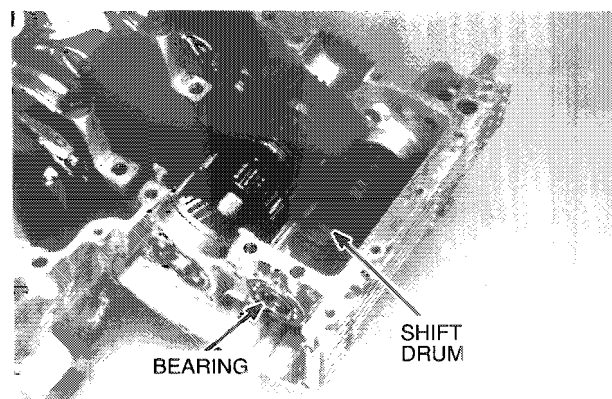


Remove the following:

- gearshift linkage (see page 10-6).
- shift drum bearing set plate.
- shift fork shaft.
- shift forks.



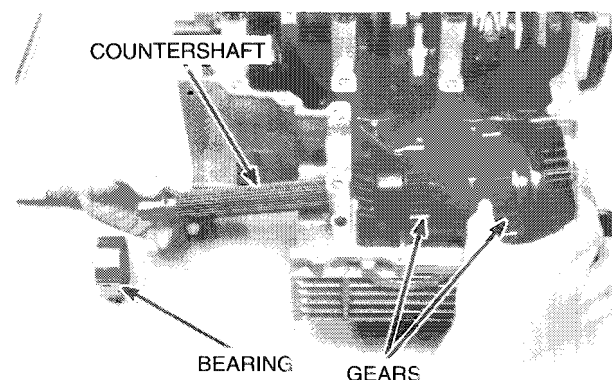
Remove the shift drum front bearing and remove the shift drum.



Remove the final drive gear (see page 10-25).

Remove the countershaft front bearing and pull the countershaft out of the gears.

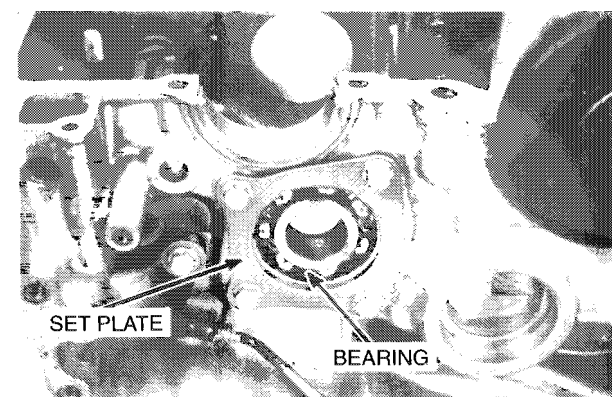
Disassemble the countershaft gears.



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.



Transmission

Transmission Inspection

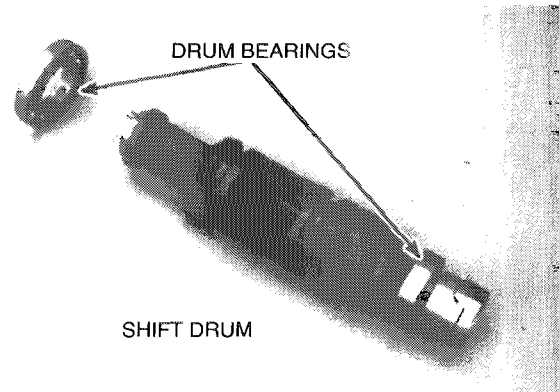
Shift Drum Inspection

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.



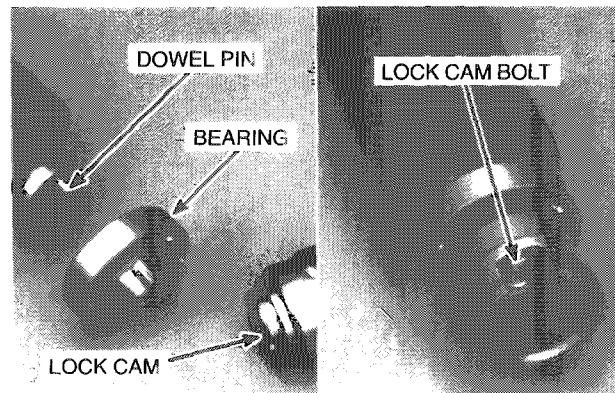
A & SE models:

If necessary, remove the shift drum lock cam bolt and remove the lock cam, dowel pin, and bearing.

Assemble in the reverse order of disassembly.

Apply a locking agent to the shift drum lock cam bolt threads and tighten to the specified torque.

Torque: 12 N-m (1.2 kg-m, 9 ft-lb)

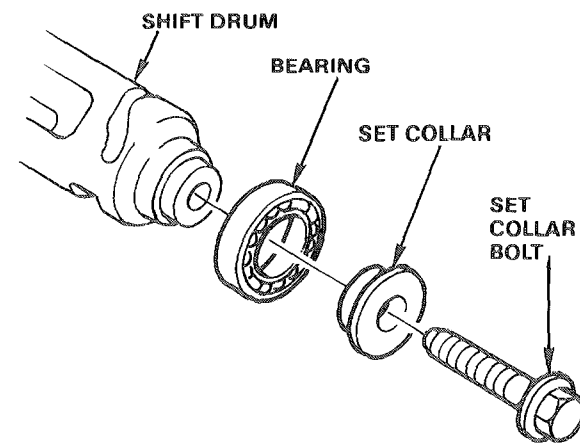


GL1500 I:

If necessary, remove the shift drum bearing set collar bolt and remove the shift drum bearing set collar and bearing.

Assemble in the reverse order of disassembly. Apply a locking agent to the shift drum bearing set collar bolt threads and tighten 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.

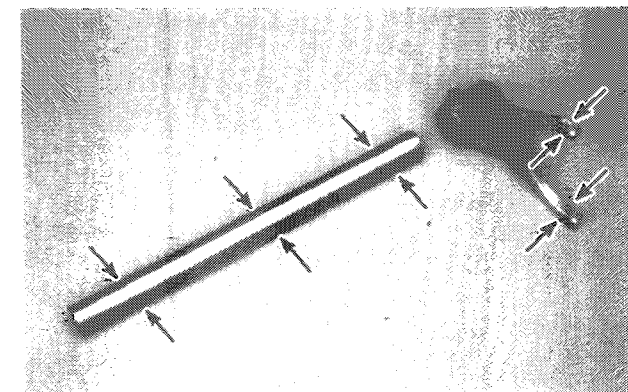
Service Limit: 5.6 mm (0.22 in)

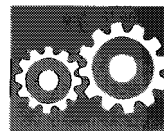
Measure the shift fork I.D.

Service Limit: 14.04 mm (0.553 in)

Measure the shift fork shaft O.D. at shift fork surfaces, as shown.

Service Limit: 13.90 (0.547 in)





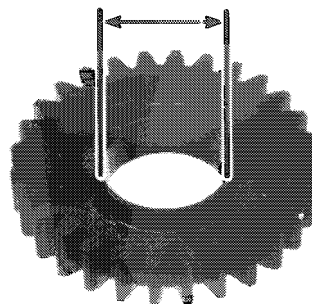
Transmission Gear Inspection

Check the 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, MS, C2, C3: 34.04 mm (1.340 in)



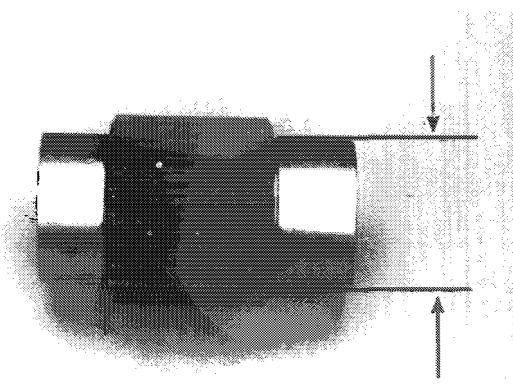
Measure the O.D. of these gear bushings.

Service Limits:

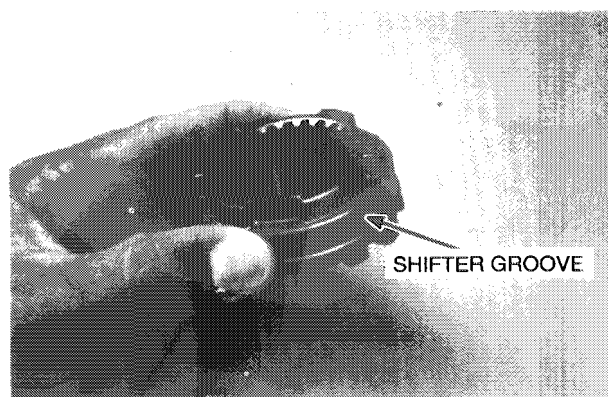
M4, MS, C2, C3: 33.92 mm (1.335 in)

Calculate the clearance between the gears and bushings.

Service Limit: 0.10 mm (0.004 in)



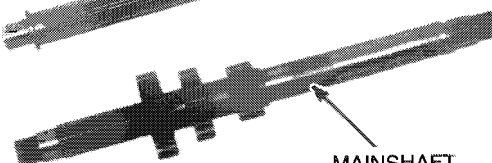
Check the shifter groove for excessive or abnormal wear.



Shaft Inspection

Inspect the mainshaft and countershaft for excessive or abnormal wear.

COUNTERSHAFT



MAINSHAFT

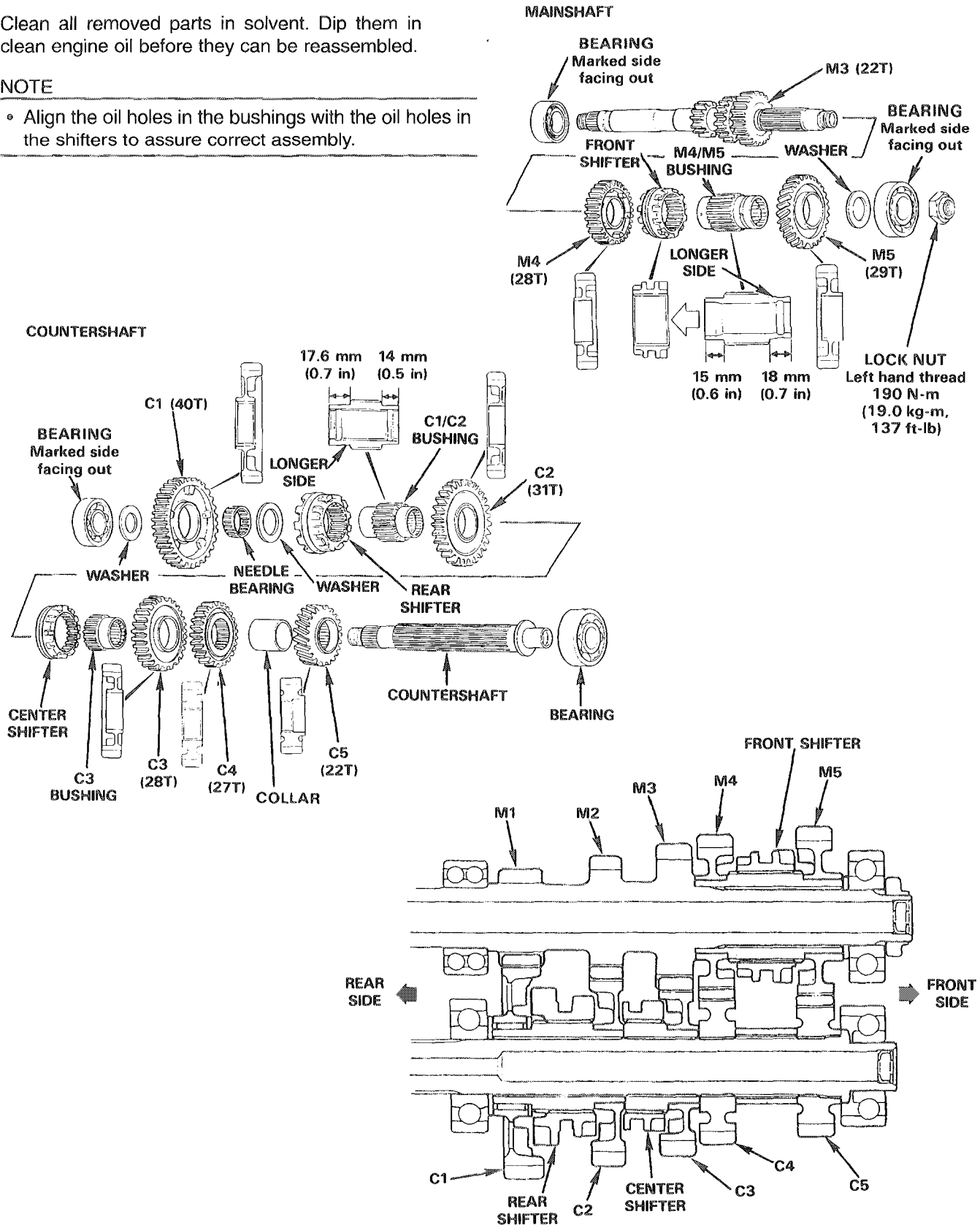
Transmission

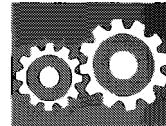
Transmission Assembly

Clean all removed parts in solvent. Dip them in clean engine oil before they can be reassembled.

NOTE

- Align the oil holes in the bushings with the oil holes in the shifters to assure correct assembly.

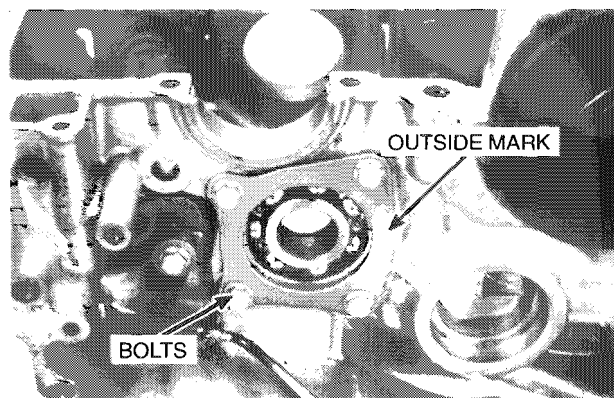




If removed, install the bearing with the marked side facing out.

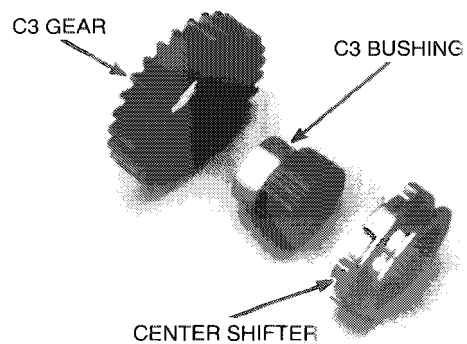
Install the bearing holder with the "OUTSIDE" mark facing out.

Apply 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.



Transmission

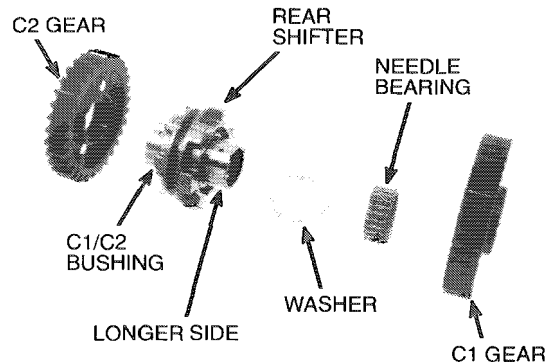
Transmission Assembly (cont'd)

Assemble the C2 gear, C1/C2 bushing, rear shifter, washer, needle bearing, and C1 gear as shown.

NOTE

- Install with the longer side of the bushing sliding surfaces facing toward the C1 gear.

Apply molybdenum disulfide oil to the shifter groove.



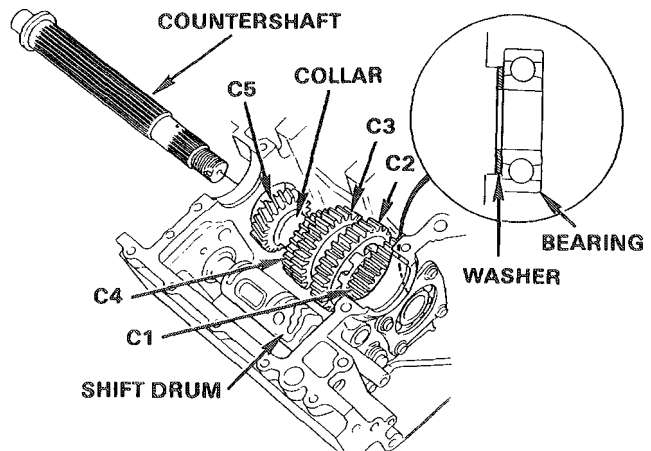
Install the shift drum.

Apply oil to the washer and temporarily install it next to the inner race of the bearing as shown.

Install the C5 gear, collar, C4 gear, C3 assembled gear and assembled gears (above step) to the countershaft as shown.

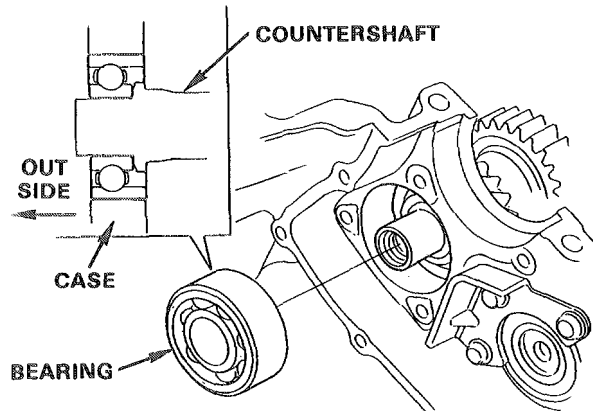
NOTE

- Do not drop the washer into the engine case.



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 (see page 10-29).

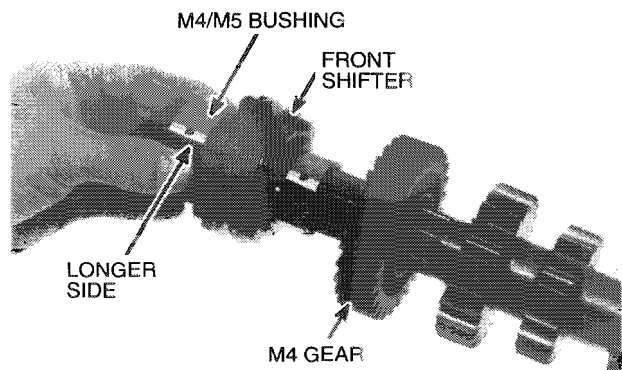


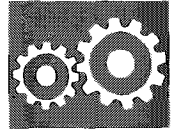
Install the M4 gear, M4/M5 bushing, and front shifter onto the mainshaft.

NOTE

- Install with the longer side of the bushing sliding surfaces facing toward the M5 gear.

Apply molybdenum disulfide oil to the shifter groove.

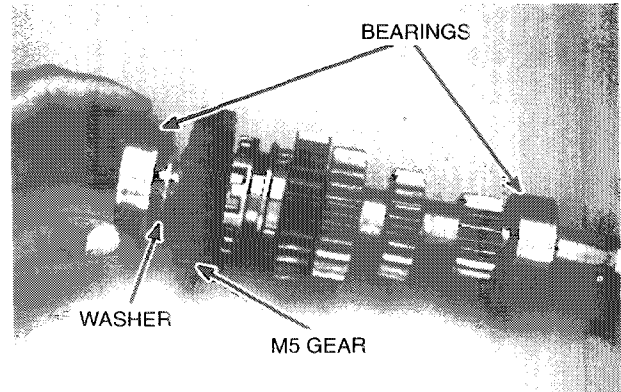




Install the M5 gear, washer, and bearings onto the mainshaft.

NOTE

- Install the 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.

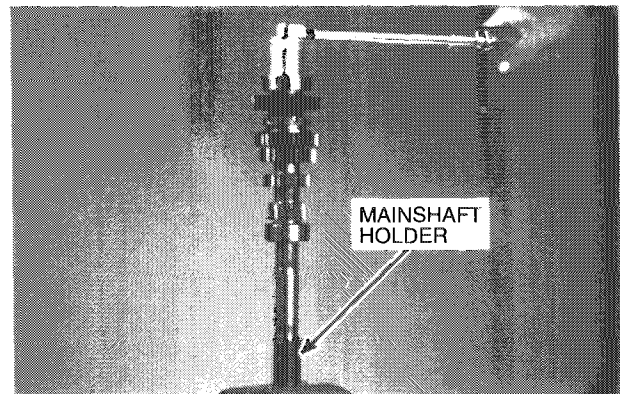
NOTE

- The mainshaft lock nut has left hand threads.

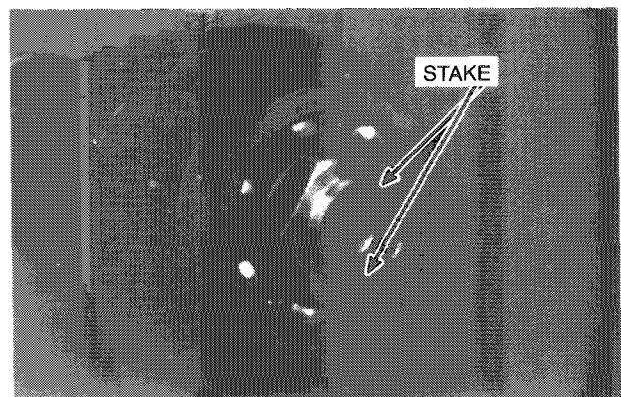
Torque: 190 N-m (19.0 kg-m, 137 ft-lb)

Tool:

Mainshaft holder
07JMB-MN50200

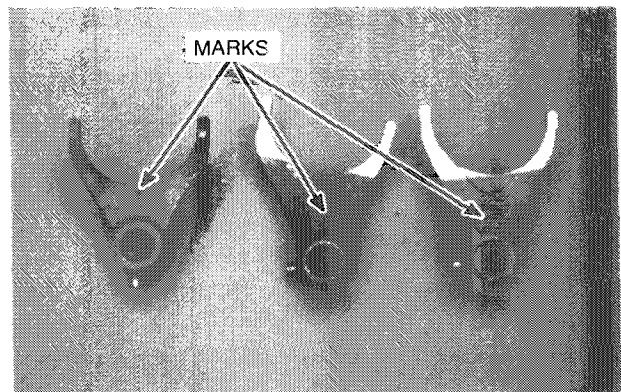


Stake the lock nut to the grooves in the mainshaft end (2 places).



The shift forks have the following identification marks:

- F: front fork
- C: center fork
- R: rear fork



Transmission

Transmission Assembly (cont'd)

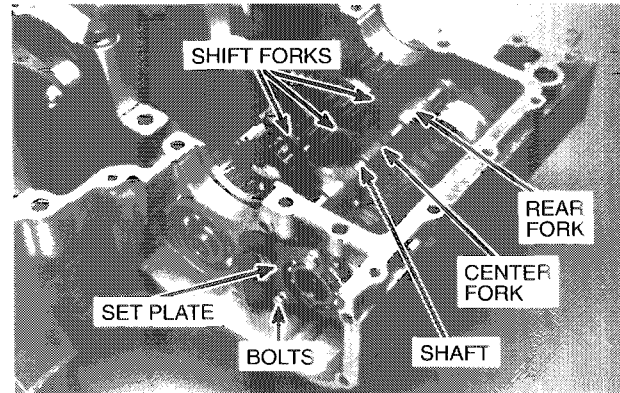
Install the center and rear shift forks into their shifters and shift drum grooves, with the marked side (C or R) facing toward the front.

Apply oil to the shift fork shaft.

Slide the shaft into the crankcase and push through all forks.

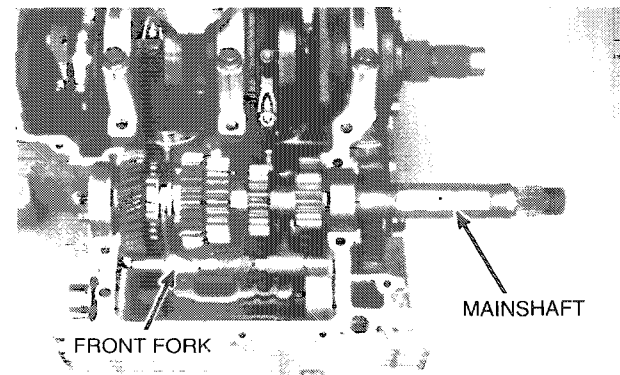
Apply a locking agent to the set plate bolt threads.

Install the set plate and tighten the bolts securely.



Install the mainshaft, aligning the front fork with the front shifter groove and shift drum grooves, with the marked side (F) facing toward the front.

After assembling, check for smooth movement.



Crankcase Assembly

Coat the cylinders, pistons, and piston ring/grooves with oil. Make sure that the piston ring end gaps are staggered as shown on page 8-24.

Turn the crankshaft counterclockwise until the T1.2 drive pulley mark is facing up.

Tools:

(3) Piston Ring Compressors

07JMG-MN5000A

Piston Base "A"

07JMG-MN5012A

Piston Base "B"

07JMG-MN50111

Crankcase Support Blocks

(suitable wooden blocks:

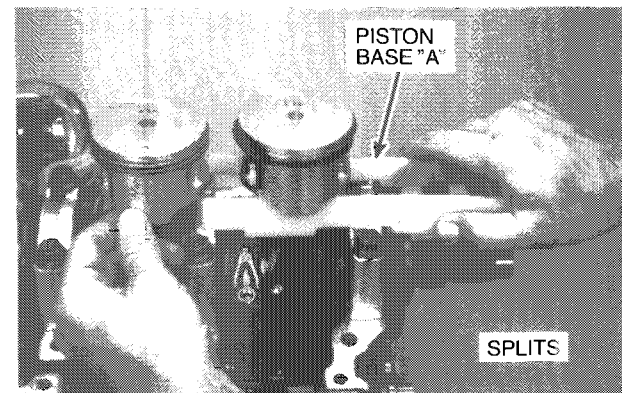
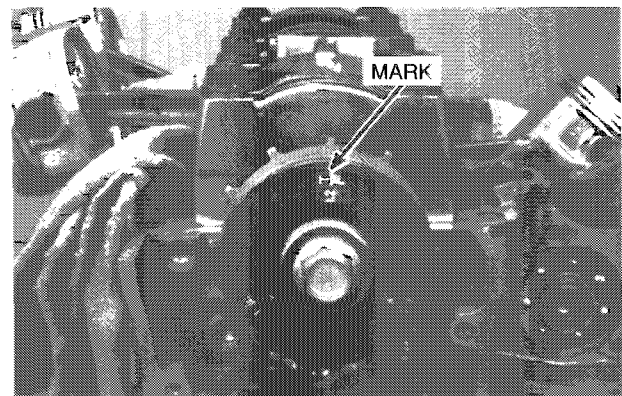
$1\frac{1}{2} \times 1\frac{1}{2} \times 3\frac{3}{8}$ in., 40 x 40 x 86 mm)

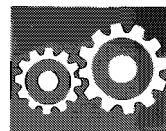
Place shop towels over the transmission.

Install piston base "A" (plastic) by bending the spring so that the two outside surfaces are parallel to each other, with their notches to the outside.

Guide piston base "A" under the No. 4 and No. 6 pistons (clutch side).

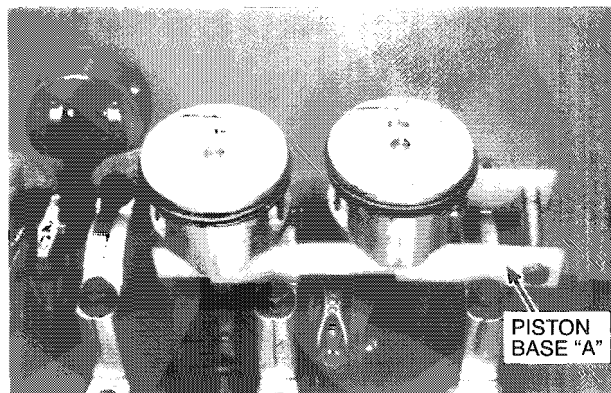
After piston base "A" stops, let the sides of the tool straighten until it supports the two pistons.



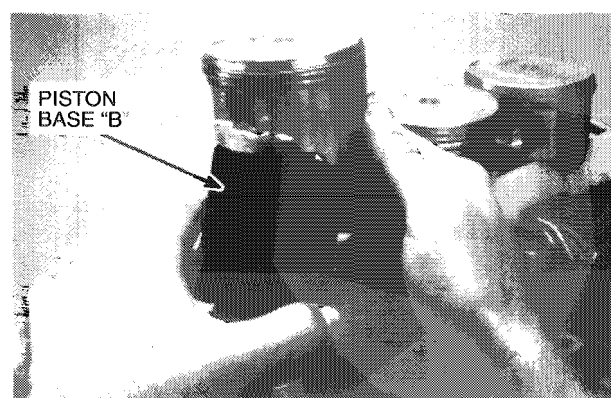


The installed piston base "A" will support the pistons as shown.

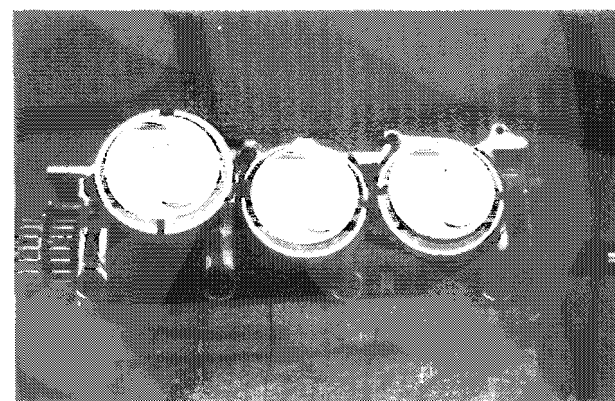
Be sure that the sides of the piston base are straight up and down.



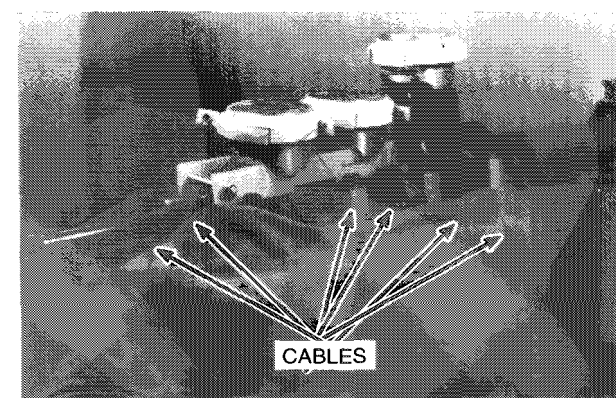
Install piston base "B" (rubber), with its notch toward the connecting rod, under the No. 2 piston (timing belt side).



Install the ring compressors on the pistons so that their tapered sides are facing up and the splits are positioned as shown.



Align the cables from the piston ring compressor as shown. This will make it easier to remove them.



Transmission

Crankcase Assembly (cont'd)

Remove the dowel pin and O-ring on the timing belt side of the engine to make more room for the crankcase assembly guide.

Use suitable wooden blocks ($1\frac{1}{2} \times 1\frac{1}{2} \times 3\frac{3}{8}$ in., 40 x 40 x 86 mm) as crankcase support blocks, place them as shown.

Use wire to position the shift arm out of the way.

Hold the crankcase over the No. 2 piston, align the cylinder with the piston, and set the crankcase straight onto the piston. The crankcase will rest on the crankcase support blocks.

Remove piston base "B" (rubber).

Slide the ring compressor down on the piston about one-half inch.

NOTE

- If a compressor is knocked off a piston, start over.

Pull both cables on the No. 2 piston ring compressor at the same time to separate the halves. Then remove the piston ring compressor.

Have an assistant turn the crankcase support blocks on their sides as shown. Hold the crankcase so that it doesn't hit the piston ring compressors. Set the crankcase straight onto both pistons and let it rest on the support blocks.

Remove piston base "A" (plastic) by turning the top edge of the tool inward as shown.

Slide the ring compressor on the No. 6 piston down.

Pull both cables on the piston ring compressor at the same time to separate the two halves. Then remove the piston ring compressor.

To remove the No. 4 (center) piston ring compressor, shift the crankcase away from the transmission as much as possible to gain maximum clearance.

Then pull both compressor cables back-and-forth until the halves separate.

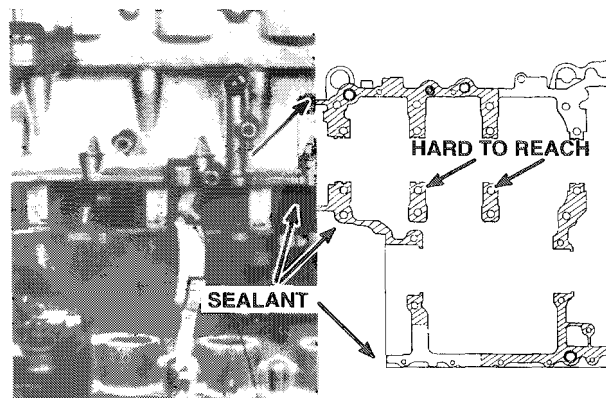
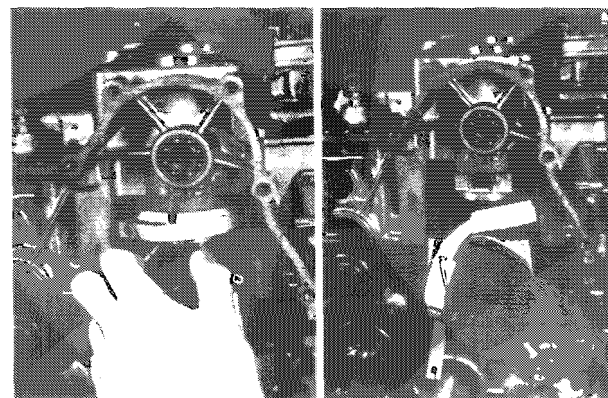
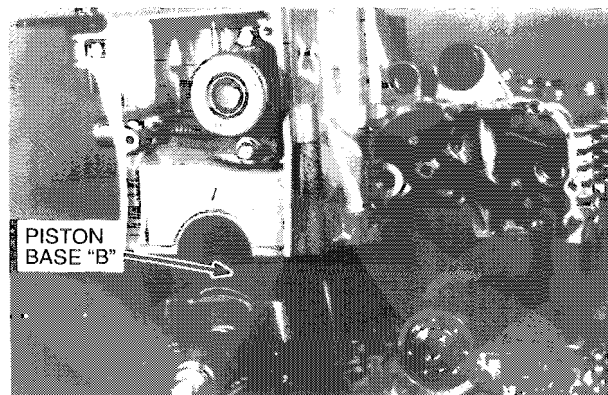
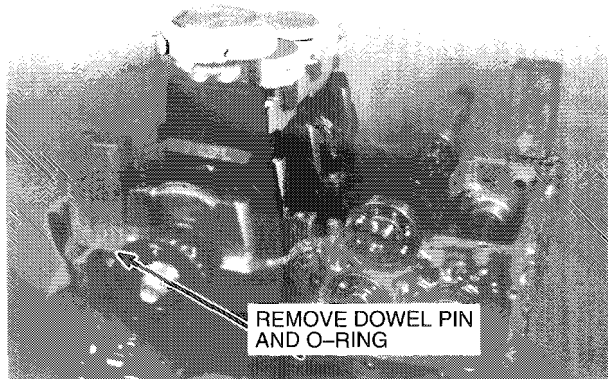
Apply sealant to the crankcase.

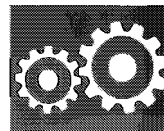
NOTE

- Be sure to apply sealant to the hard-to-reach spots as indicated.

Have an assistant hold the case while you remove the crankcase support blocks and install the dowel pin and O-ring. Apply sealant to the areas where the crankcase support blocks were.

Assemble the case.





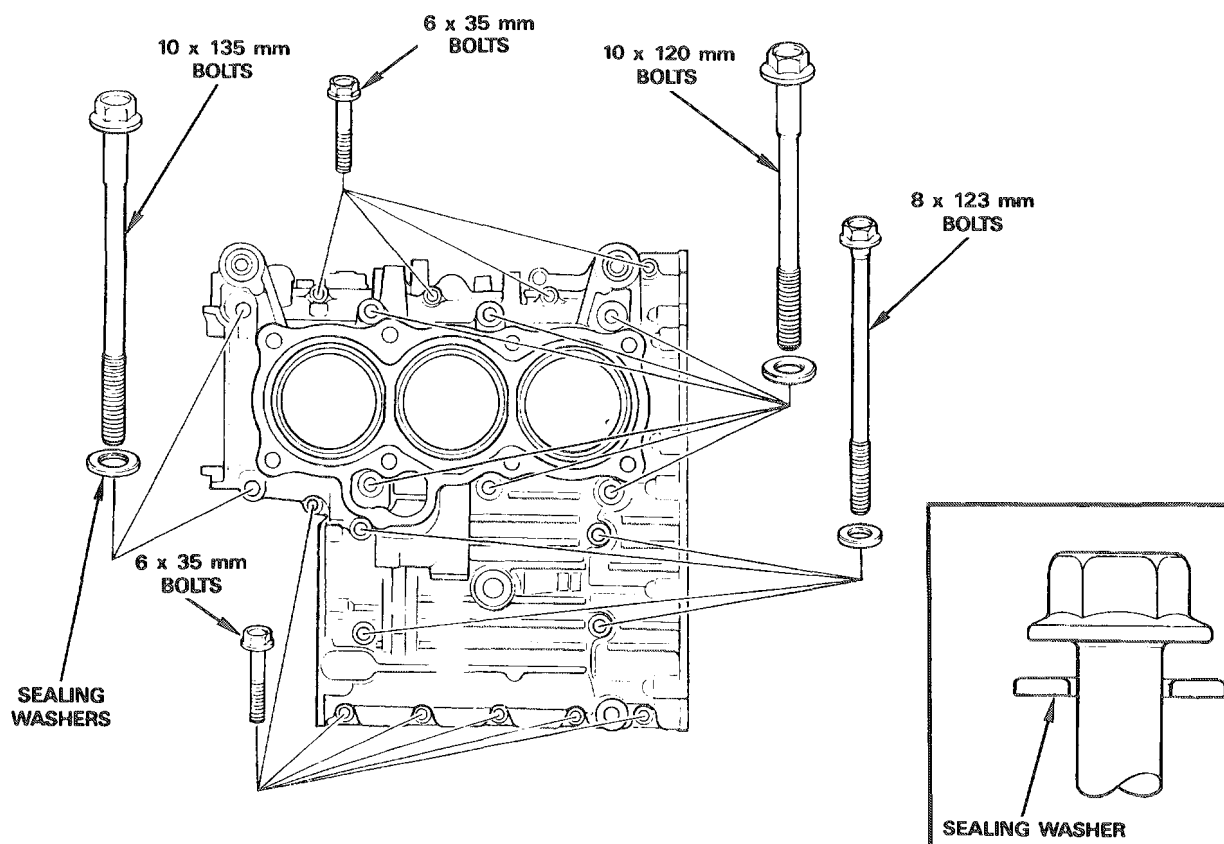
Coat the threads of all 10 mm bolts with oil.

NOTE

- Tighten all case bolts in a gradual, crisscross pattern.
- Eight 10 mm bolts have sealing washers.
- Begin with larger diameter bolts first.

Torque Values

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)



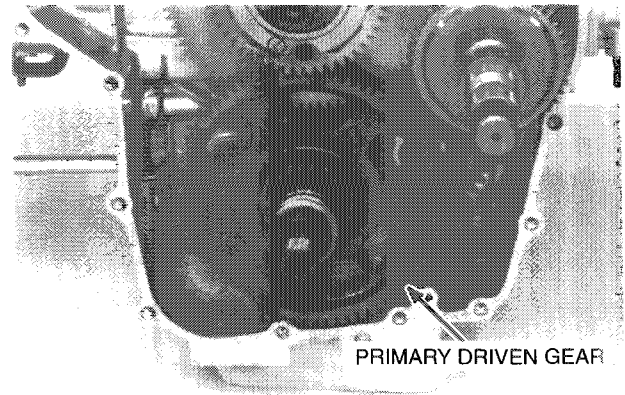
Install the removed parts (see page 10-2).

Transmission

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 cannot be rotated.

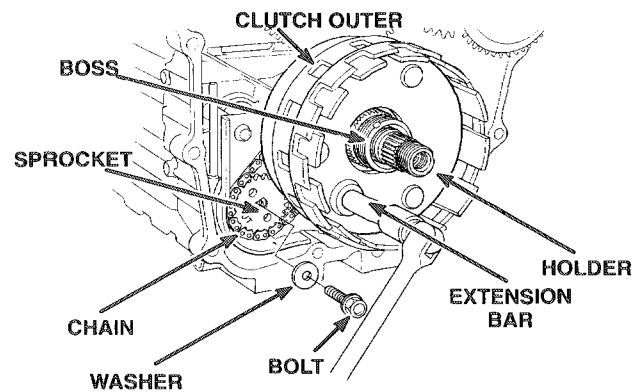
Tool:

Clutch outer holder
07JMB-MN5010A

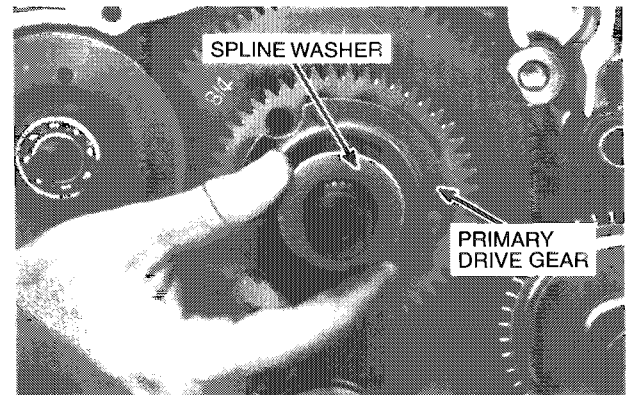
Remove the oil pump driven sprocket bolt and washer, holder, and clutch outer.

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.

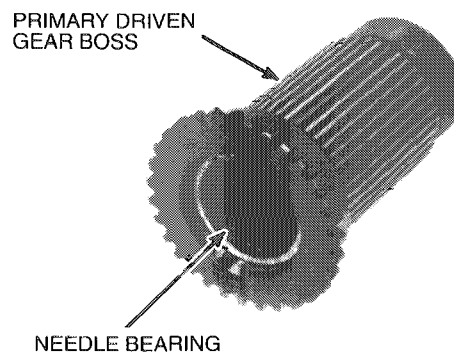


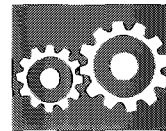
Boss Bearing Replacement

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

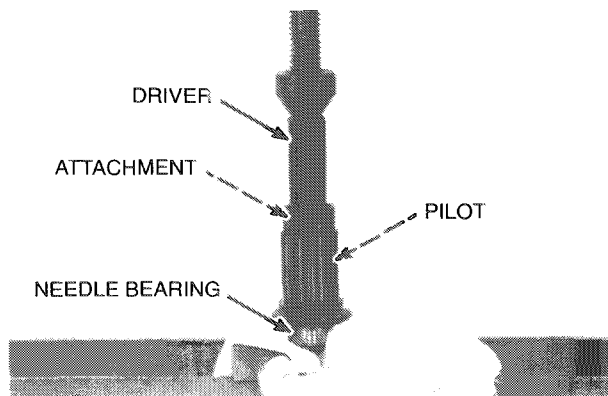
07749-0010000

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

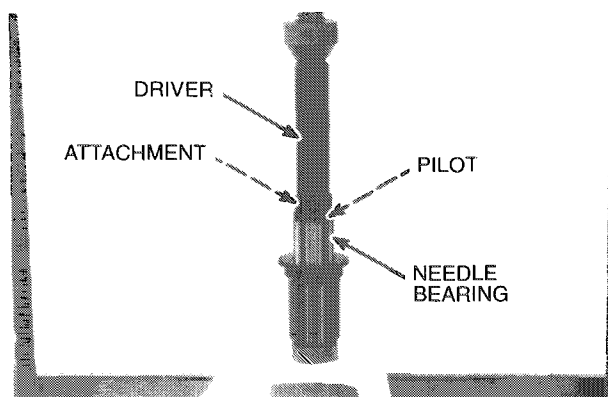
07749-0010000

Attachment, 32 x 35 mm

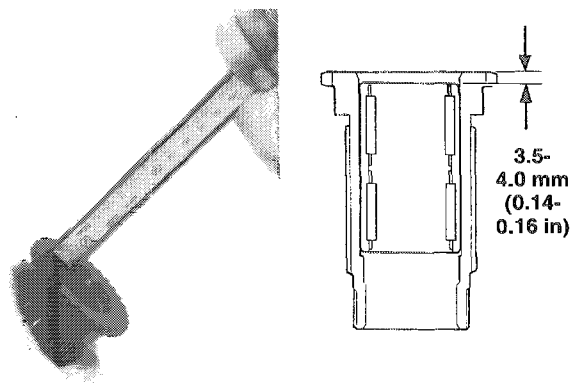
07746-0010100

Pilot, 28 mm

07746-0041100

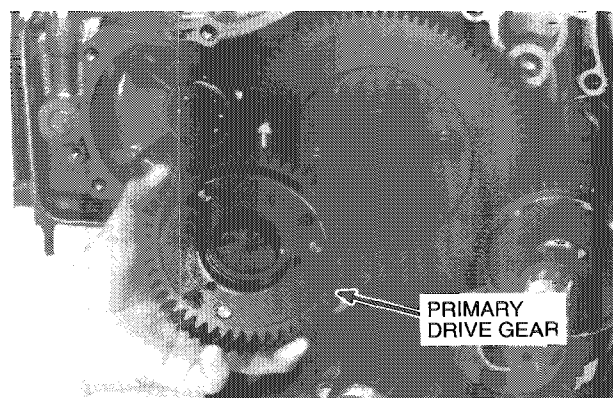


Installed Height: 3.5 - 4.0 mm (0.14 - 0.16 in)



Installation

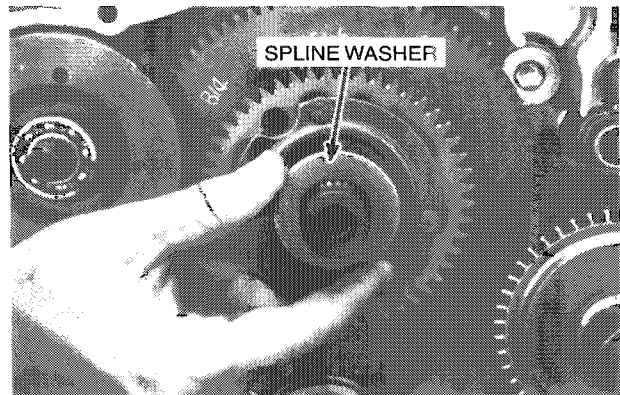
Install the primary drive gear onto the crankshaft.



Transmission

Primary Drive/Driven Gears (cont'd)

Install the spline washer onto the crankshaft.



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

NOTE

- Install the sprocket with the sprocket OUT mark facing out.

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

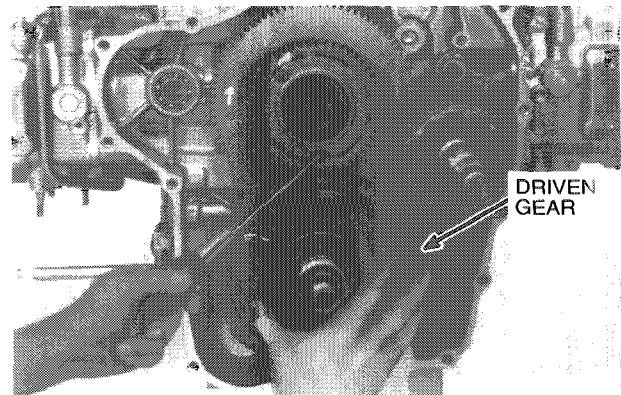
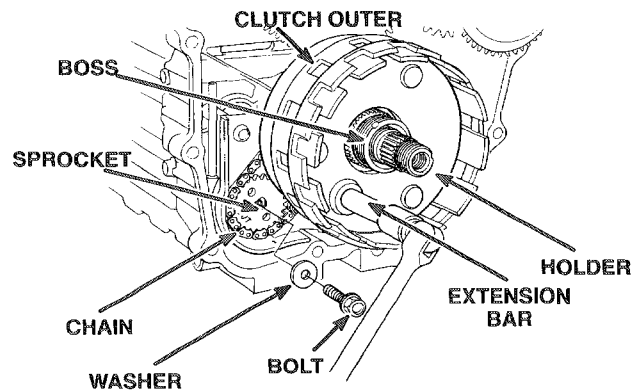
Tool:

Clutch outer holder
07JMB-MN50100

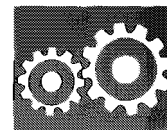
Apply a locking agent to the sprocket bolt threads.

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.

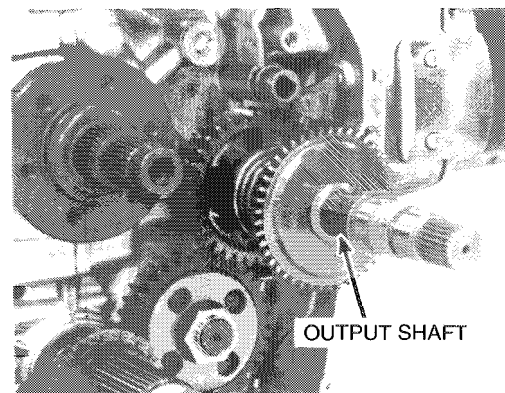


Output Shaft

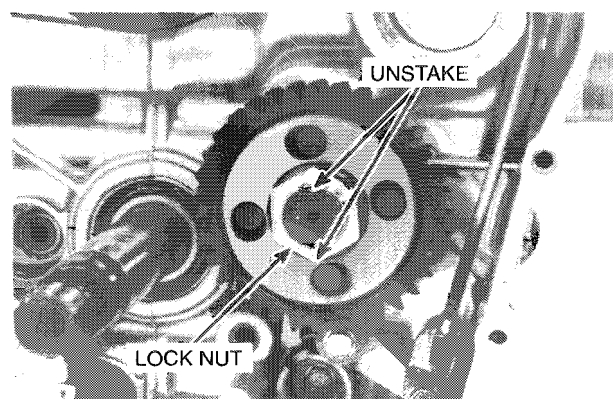
Removal

Remove the primary drive and driven gear (see page 10-22).

Remove the output shaft as an assembly from the engine.



Unstake the final drive gear lock nut with a drill or grinder (2 places). Be careful that the threads on the countershaft are not damaged.



Set the transmission in any gear. Remove the lock nut by turning it clockwise.

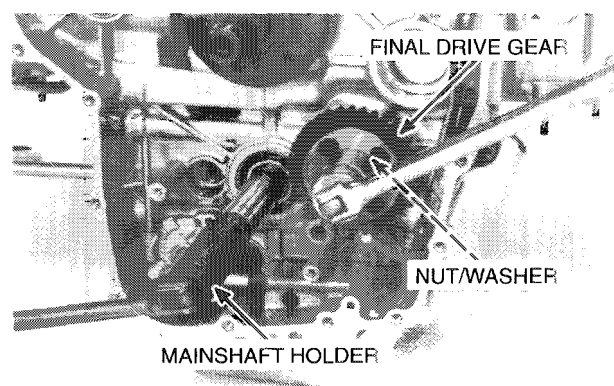
NOTE

- The lock nut has a left-hand thread.

Tool:

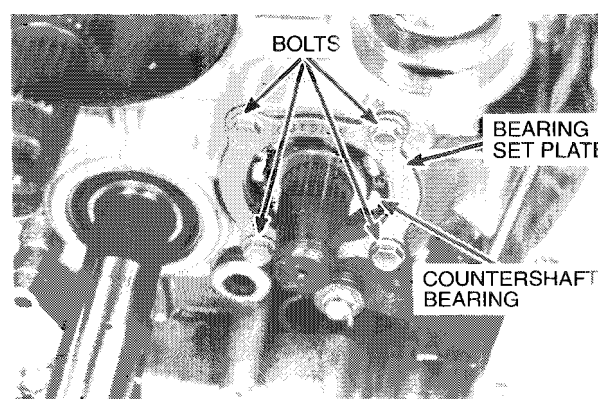
Mainshaft holder
07JMB-MN50200

Remove the spring washer and final drive gear from the countershaft.



Remove the bolts and bearing set plate.

If necessary the countershaft bearing should be removed from the engine and be replaced.

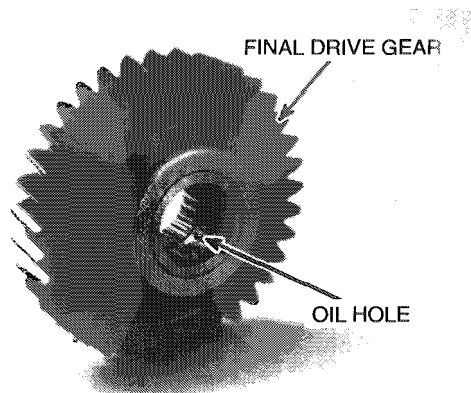


Transmission

Output Shaft (cont'd)

Check the final drive gear for damage.

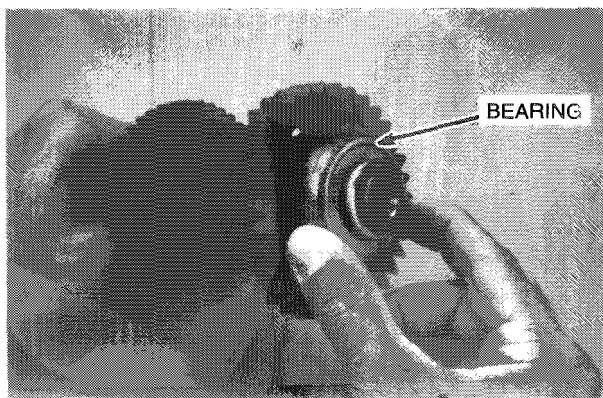
Check if the gear's oil hole is clogged.



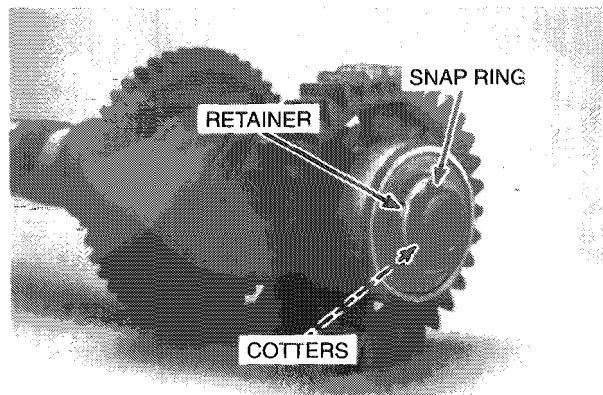
Output Shaft Disassembly/Inspection

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.

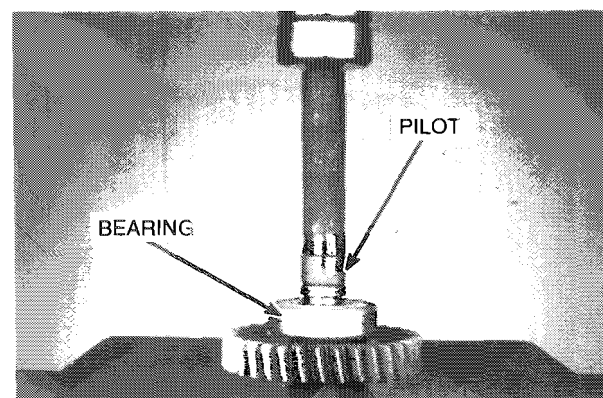


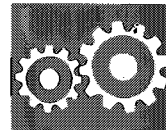
Press the output shaft out of the bearing.

Discard the bearing.

Tool:
Pilot, 22 mm
07746-0041000

Disassemble the output shaft.



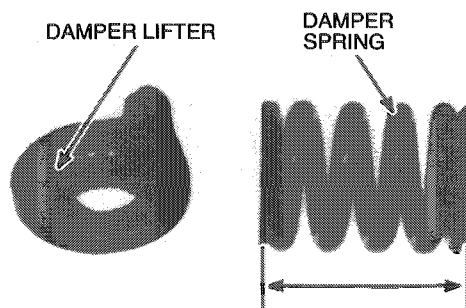


Check the damper lifter for wear or damage.

Measure the damper spring free length.

Service Limit: 57.0 mm (2.24 in)

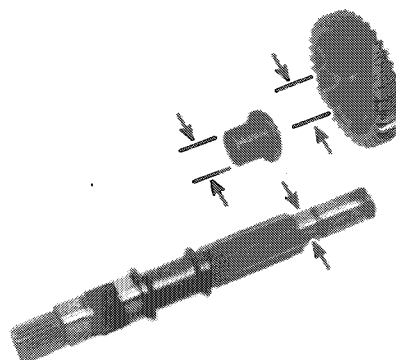
Check the output shaft, collar, and final driven gear for wear or damage.



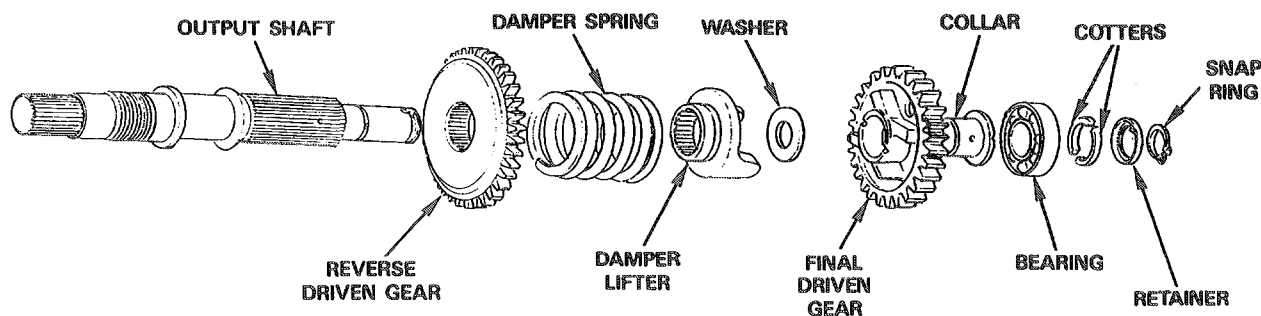
Measure the following:

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)



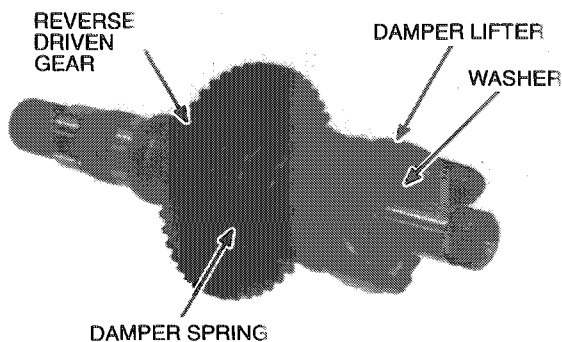
Assembly



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.

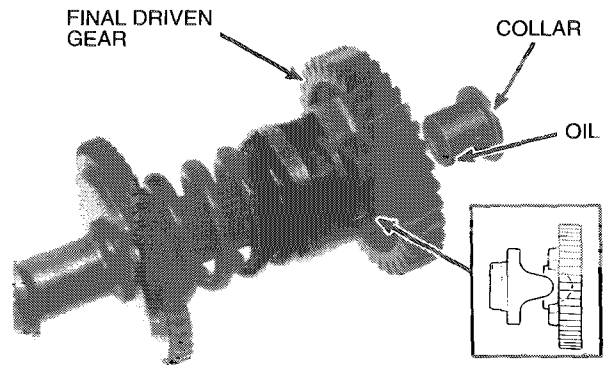


Transmission

Output Shaft (cont'd)

Apply oil to the collar.

Install the final driven gear and collar, as shown.

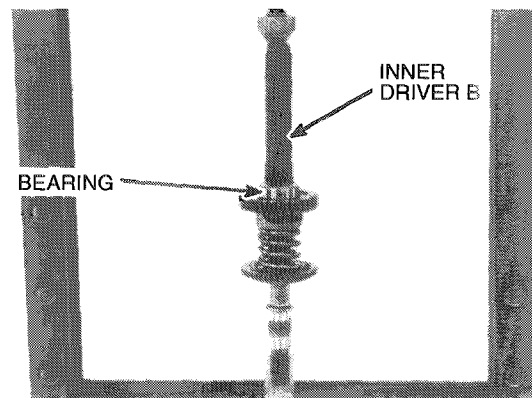


Press a new bearing with the sealed side facing up into the output shaft.

Tool:

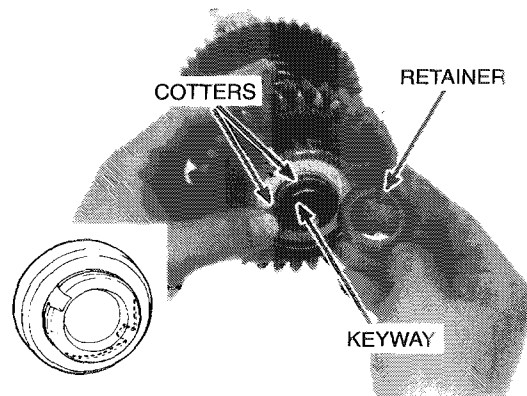
Inner driver B

07746-0020100



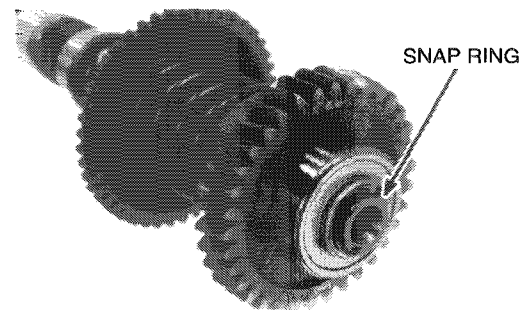
Install the cotters and retainer.

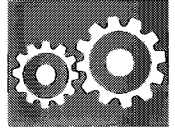
Rotate the retainer 180 degrees and set the retainer tab in the opposite position of the shaft key way.



Install the snap ring with the chamfered surface facing the retainer.

Check the bearing for smooth rotation.

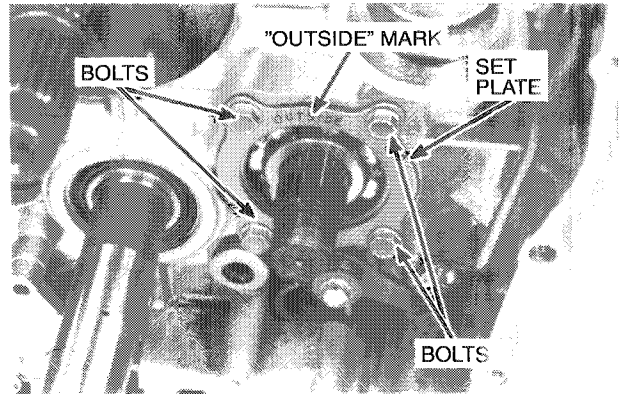




Apply a locking agent to the bearing set plate bolt threads.

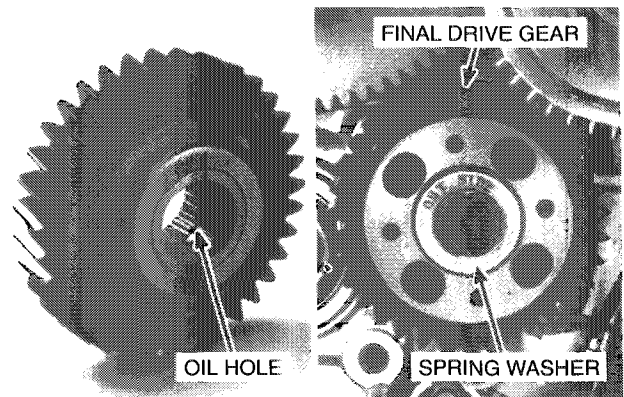
Install the bearing set plate with the OUTSIDE mark facing out.

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 final drive gear.



Set the transmission in any gear except neutral.

Apply a locking agent to the threads of a new lock nut and install it on the countershaft.

Tighten the nut, turning it counterclockwise, to the specified torque.

NOTE

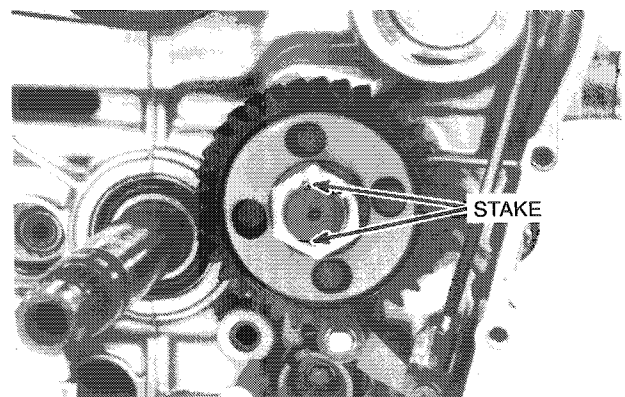
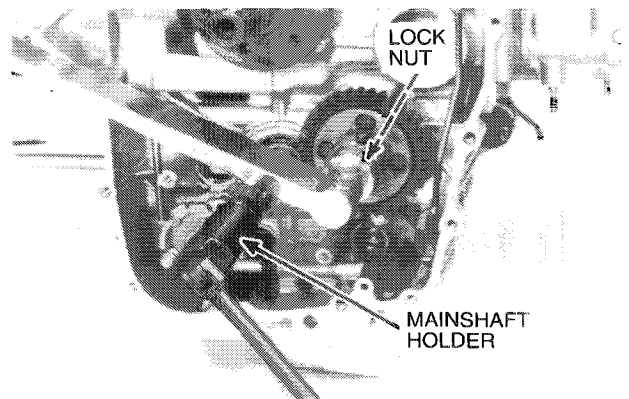
- The lock nut has left-hand threads.

Torque: 190 N-m (19.0 kg-m, 137 ft-lb)

Tool:

Mainshaft holder
07JMB-MN50200

Stake the lock nut (2 places).

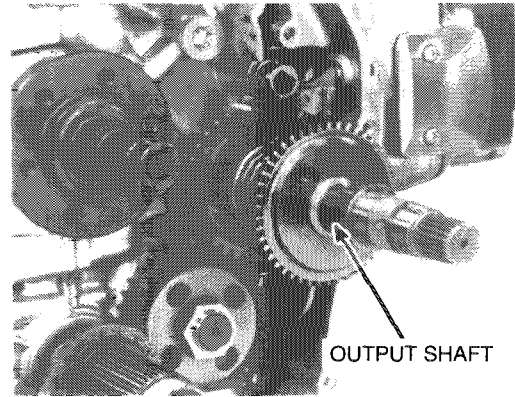


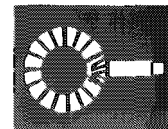
Transmission

Output Shaft (cont'd)

Install the output shaft as an assembly.

Install the primary drive and driven gear (see page 10-23).





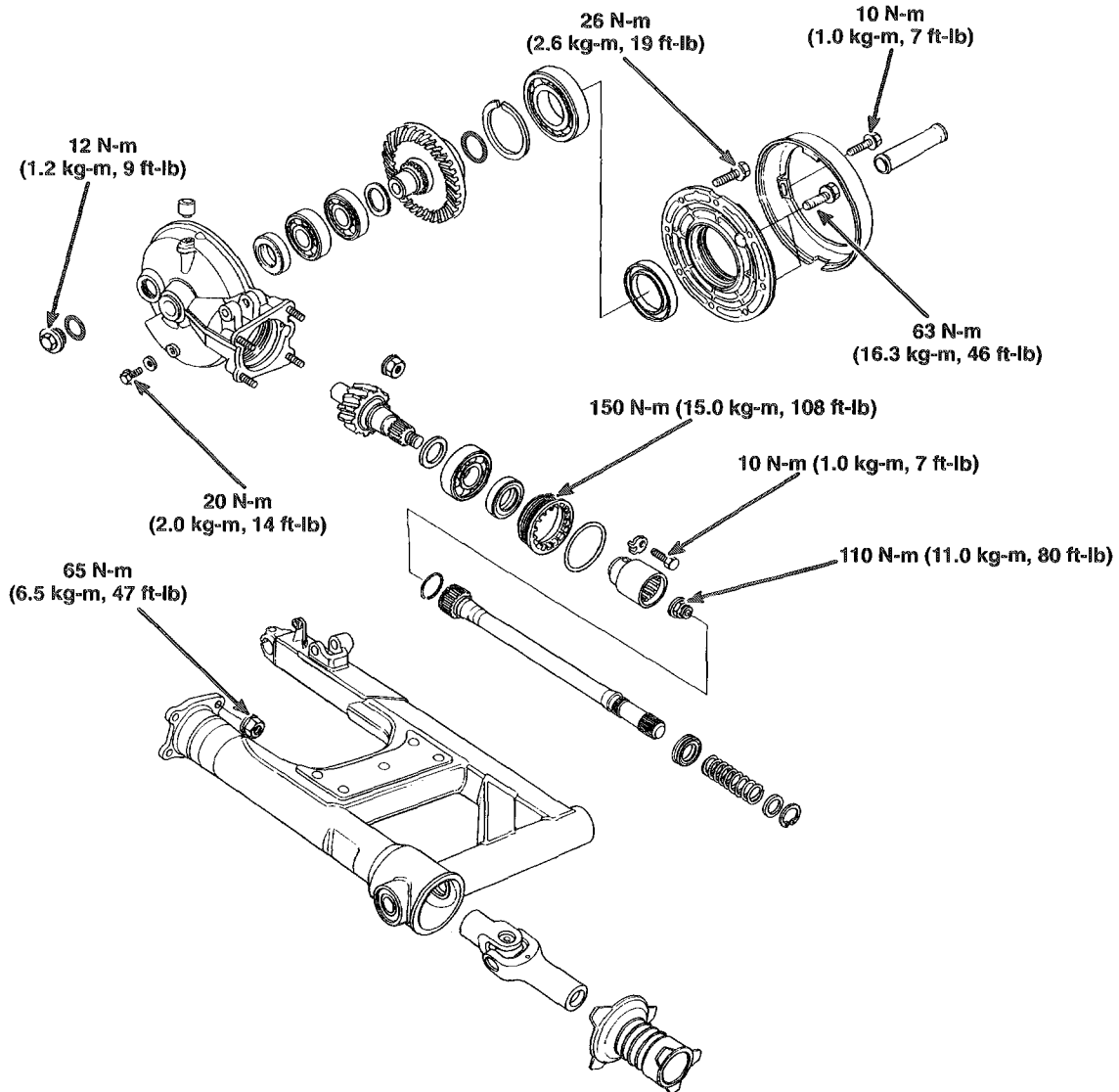
Final Drive

Service Information	11-2
Troubleshooting	11-3
Gear Case Removal	11-4
Drive Shaft	11-4
Universal Joint	11-5
Gear Case	
Disassembly	11-6
Gear Case Assembly ..	11-14
Gear Case	
Installation	11-17

Final Drive

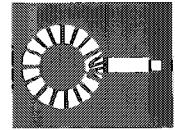
Service Information

- Refer to Section 3 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.



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)
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)



Troubleshooting

Excessive noise

- Worn or scored ring gear shaft and driven flange
- Scored driven flange and wheel hub
- Worn or scored 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
- Loose cover bolt

Rear wheel will not rotate freely

- Damaged pinion and ring gear bearing
- Stuck pinion and ring gear
- Bent drive shaft

Final Drive

Gear Case Removal

Gear Case Removal

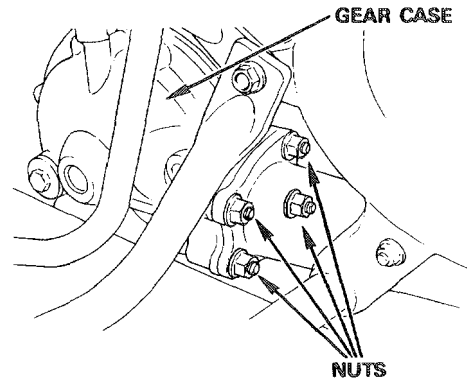
Place the motorcycle on its center stand.

Remove the rear wheel (see page 15-10).

Drain the final gear case oil if disassembling the gear case (see page 3-15).

Remove the four gear case mounting nuts.

Remove the final gear case from the swing arm.

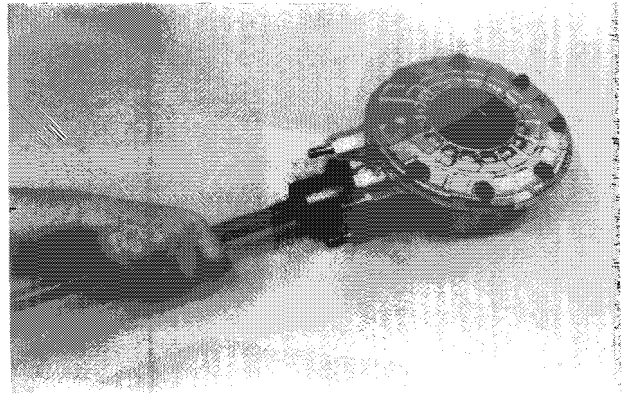


Turn the drive shaft. The drive pinion and ring gear should turn smoothly and quietly.

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 11-6 for gear case disassembly.



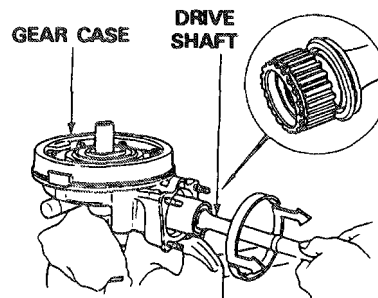
Drive Shaft

Removal

Insert the axle and distance collar through the gear case.

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.



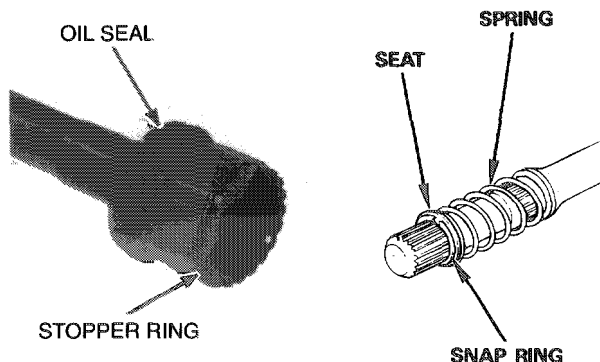
Disassembly

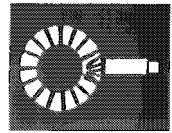
Remove the following:

- 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:

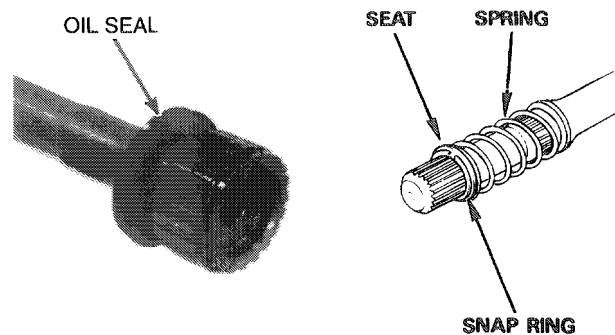
- a new oil seal

NOTE

- The stopper ring removed during disassembly does not have to be reinstalled. It is used for production line purposes.

- spring
- spring seat
- snap ring

See page 11-17 for gear case installation.

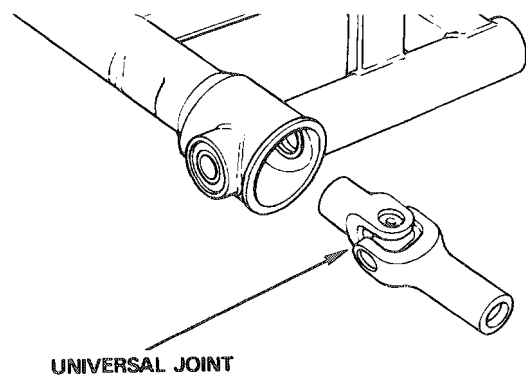


Universal Joint

Removal/Installation

Remove the swing arm (see page 12-26).

Remove the universal joint from the swing arm.



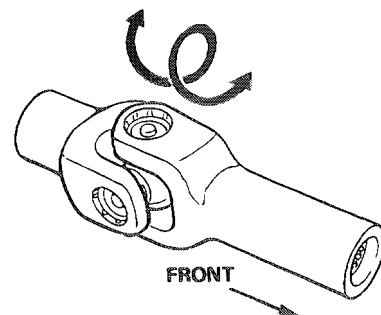
Inspect the universal joint. There should be no play in the bearings.

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.



Final Drive

Gear Case Disassembly

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 case studs.

Install the pinion joint holder onto the attachment.

Position the gear case in a soft jaws vise to prevent damage to the case.

Tools:

Pinion joint holder attachment

07924-9690101

(Must be modified: 4 holes increased 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. 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 degrees 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 each bearing and case (as below).

If the backlash is too small, install a thinner ring gear spacer. If too large, install a thicker spacer (page 11-9).

Backlash is changed by about 0.06-0.07 mm (0.002-0.003 in) when the spacer thickness is changed by 0.10 mm (0.004 in).

Ring Gear Spacer:

A: 1.82 mm (0.072 in)

E: 2.06 mm (0.081 in)

B: 1.88 mm (0.074 in)

F: 2.12 mm (0.083 in)

C: 1.94 mm (0.076 in)

G: 2.18 mm (0.086 in)

D: 2.00 mm (0.079 in)*

H: 2.24 mm (0.088 in)

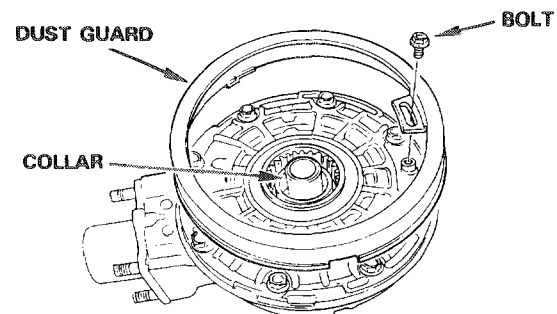
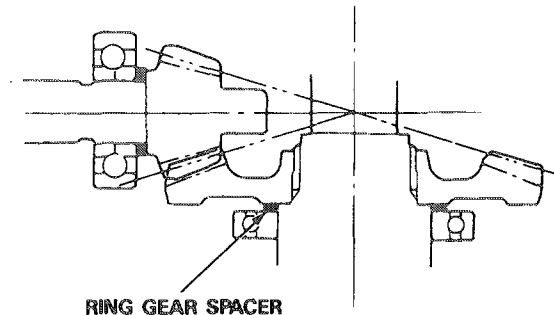
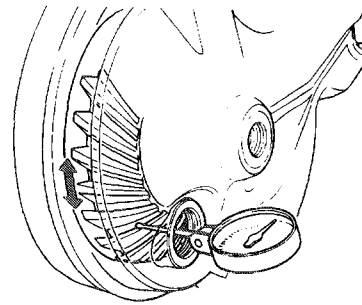
*Standard

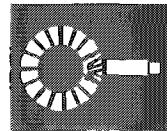
I: 2.30 mm (0.091 in)

Ring Gear Removal

Remove the following:

- dust guard
- distance collar

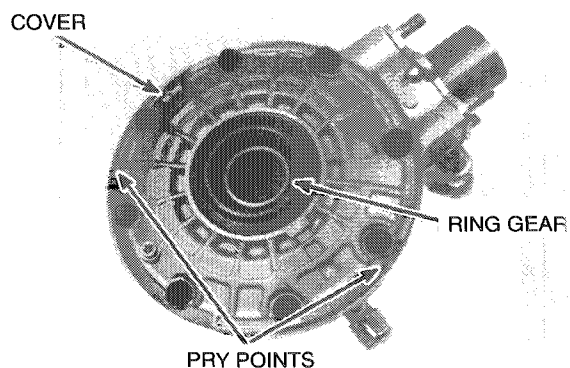




- case cover bolt

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:

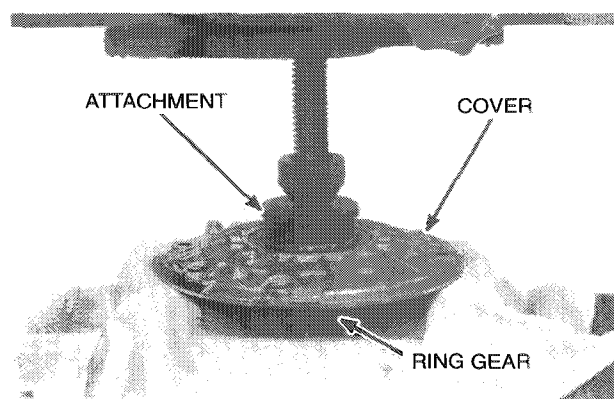
Place the cover in a press with the ring gear down.

Make sure the cover is securely supported.

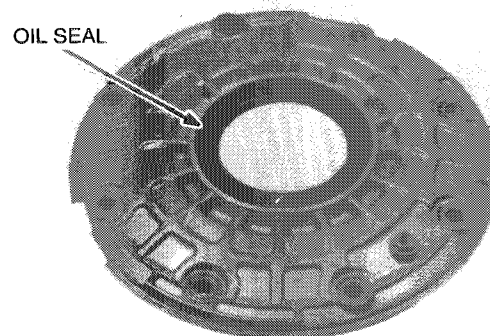
Press the ring gear out of the cover.

Tool:

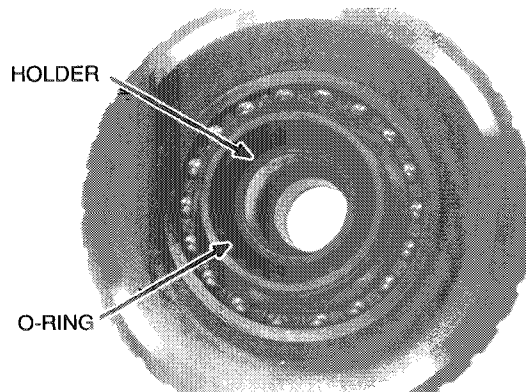
Attachment, 62 x 68 mm
07746-0010500



Remove the oil seal from the case cover.



Replace the O-ring and O-ring holder with a new one, if necessary.



Final Drive

Gear Case Disassembly (cont'd)

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 inner 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 the ring gear bearing/spacer replacement, see page 11-9.

For drive pinion removal and disassembly, see page 11-10.

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 and its spacer into the cover (see page 11-16).

Tighten the cover bolts gradually in a crisscross pattern 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.

Torque:

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

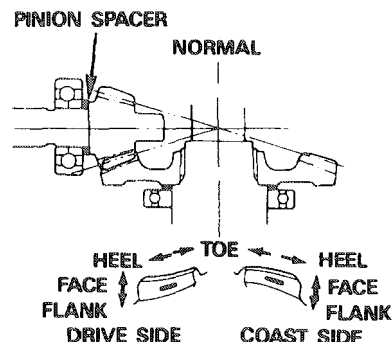
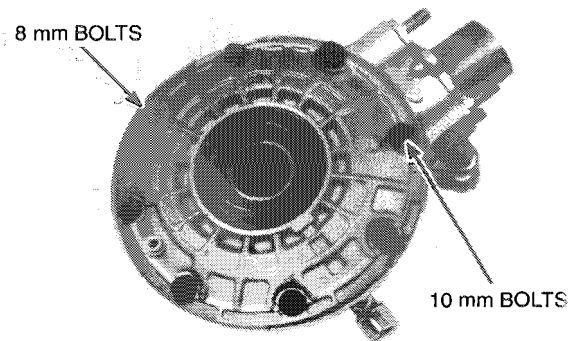
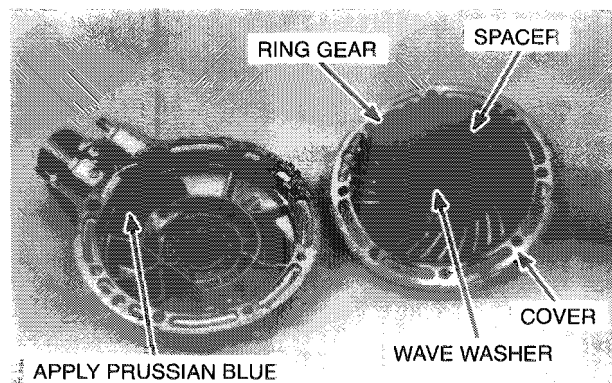
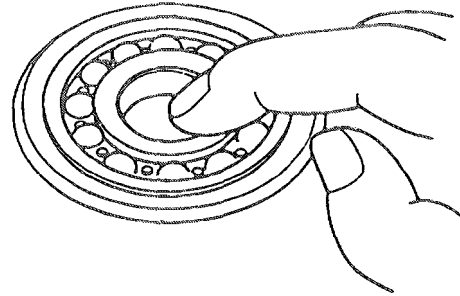
- It is important to turn the pinion while tightening the bolts. If the ring gear spacer is too thick, the gears will lock after only light tightening.

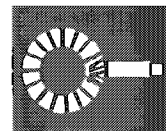
Remove the oil filler cap from the final drive case.

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 transferred 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 spacer thickness is changed by 0.10 mm (0.004 in).

Pinion Spacers:

A: 1.32 mm (0.052 in) E: 1.56 mm (0.061 in)
B: 1.38 mm (0.054 in) F: 1.62 mm (0.064 in)
C: 1.44 mm (0.057 in) G: 1.68 mm (0.066 in)
D: 1.50 mm (0.059 in)*

*Standard

Ring Gear Bearing/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 (see page 11-6) on the ring gear.

NOTE

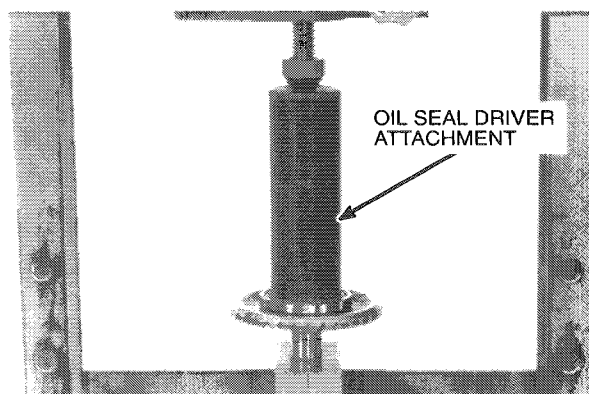
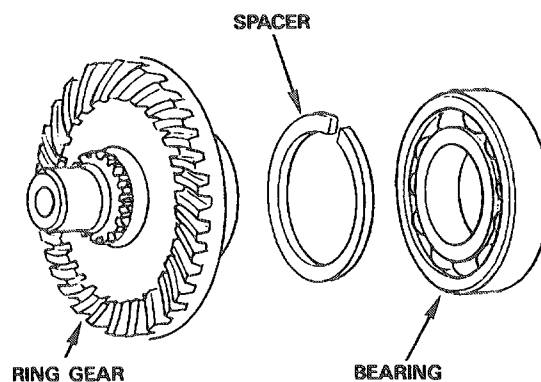
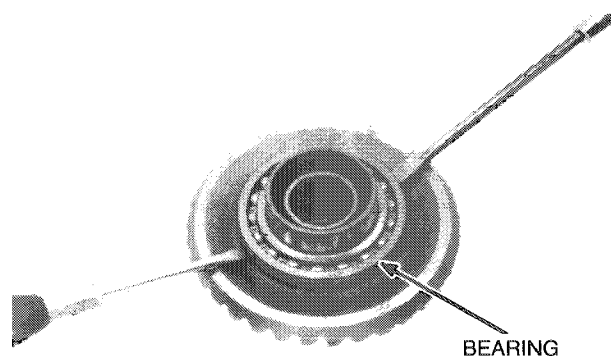
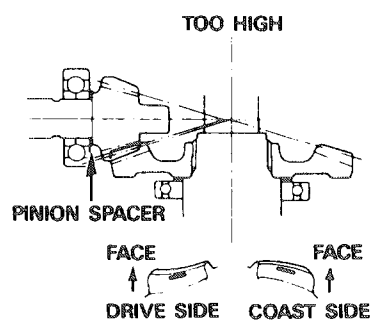
- If the gear set, pinion bearing, ring gear bearing, and/or gear case is replaced, install a 2.00 mm (0.079 in) thick spacer (standard).

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



Final Drive

Gear Case Disassembly (cont'd)

If the ring gear remained in the cover: Press the ring gear bearing into the case.

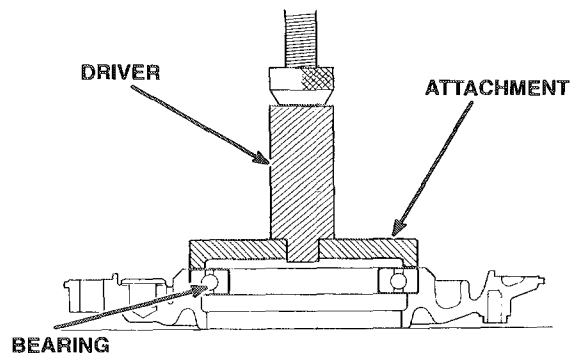
Tools:

Driver

07749-0010000

Attachment (ring gear bearing)

07947-6340100



Install the suitable spacer (see page 11-6) on the ring gear.

NOTE

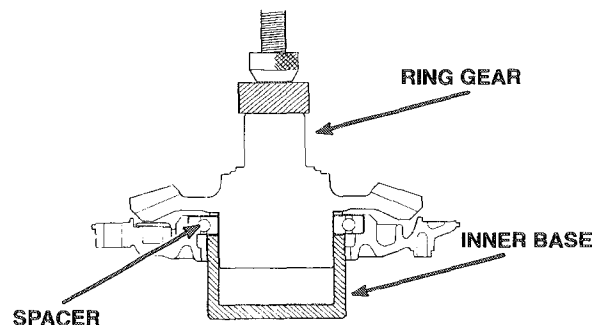
- If the gear set, pinion bearing, ring gear bearing, and/or gear case is replaced, install a 2.00 mm (0.079 in) thick spacer (standard).

Support the bearing inner race with the inner base, and press the ring gear into the bearing with a suitable tool.

Tool:

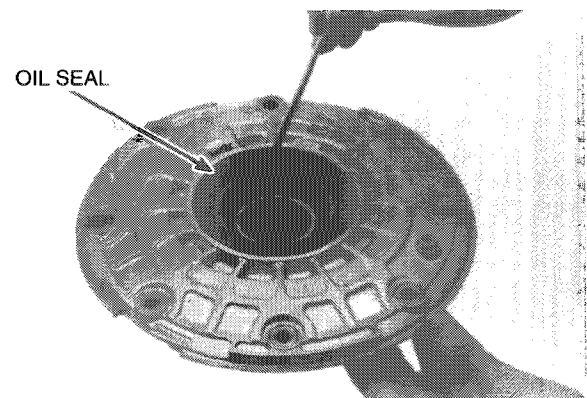
Inner base

07965-3710300



Apply gear oil to the case cover oil seal lip.

Install the ring gear into the case cover. Gently seat the oil seal lip to the ring gear shaft if the oil seal lip turns inside out.



Pinion Spacer Replacement

Remove the pinion joint nut.

Tools:

Pinion joint holder attachment

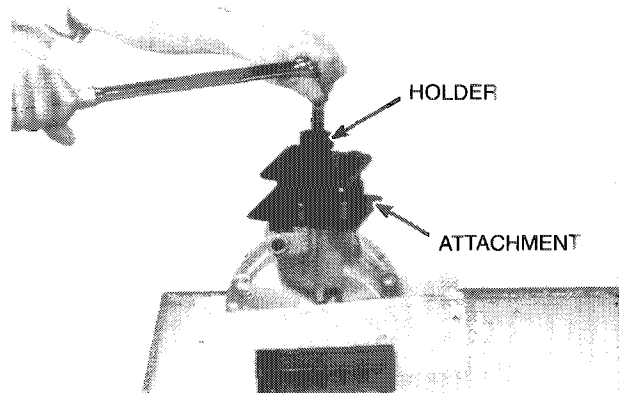
07924-9690101

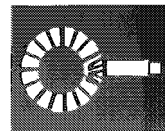
(Must be modified: 4 holes increased to 10.5 mm)

or 07924-9690102

Pinion joint holder

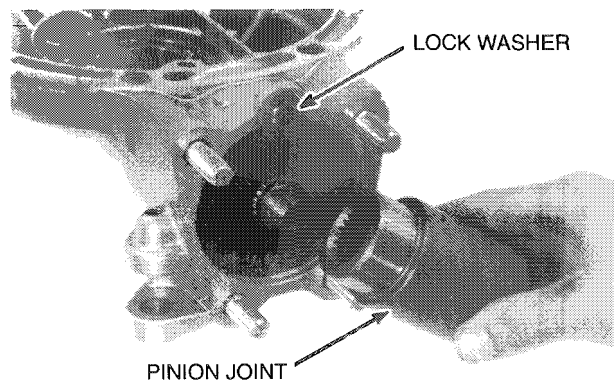
07924-ME40000





Remove the following:

- pinion joint
- retainer lock washer

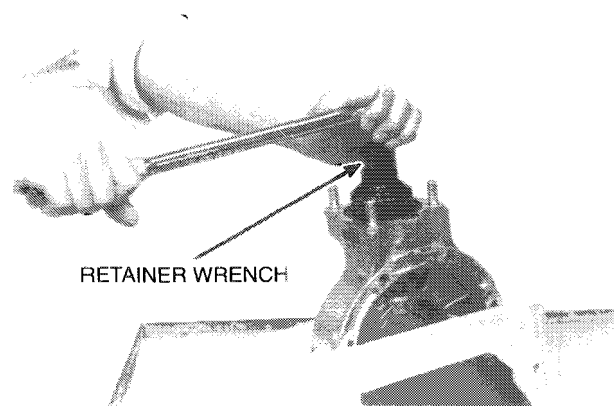


Remove the following:

- retainer

Tool:

Retainer wrench
07910-4630100



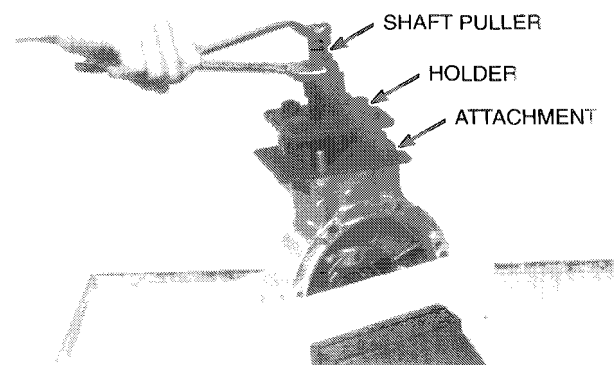
- pinion assembly

Tools:

Pinion joint holder attachment
07924-9690101
(must be modified: 4 holes increased to 10.5 mm)
or 07924-9690102

Pinion joint holder
07924-ME40000

Shaft puller
07931 -ME40000
or 07931-ME4000A (U.S.A. only)



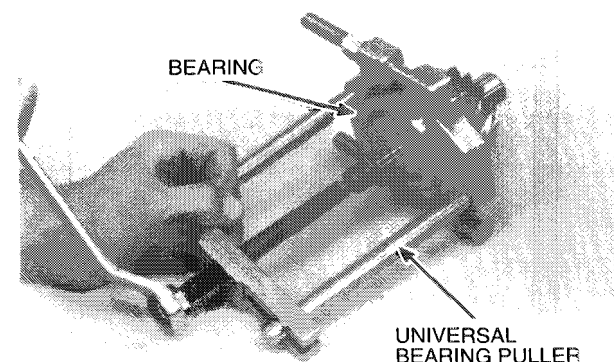
Pull the bearing outer and inner races off the shaft with the universal bearing puller.

Pull the other inner race off with the same tool.

Tool:

Universal bearing puller
commercially available in U.S.A.

Remove the pinion spacer.



Final Drive

Gear Case Disassembly (cont'd)

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:

Driver, 40 mm I.D.
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, 40 mm
07749-0010000
Attachment, 52 x 55 mm
07746-0010400

Case Bearing Replacement

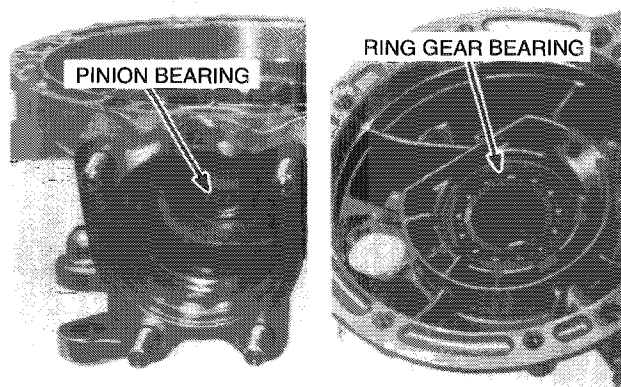
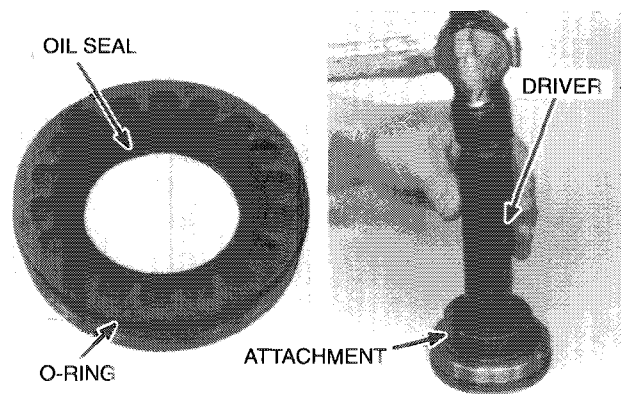
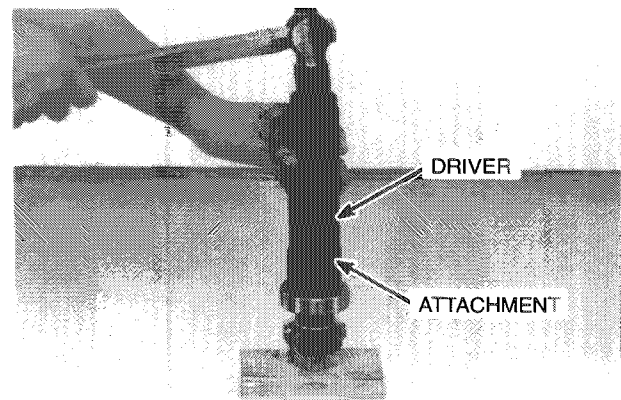
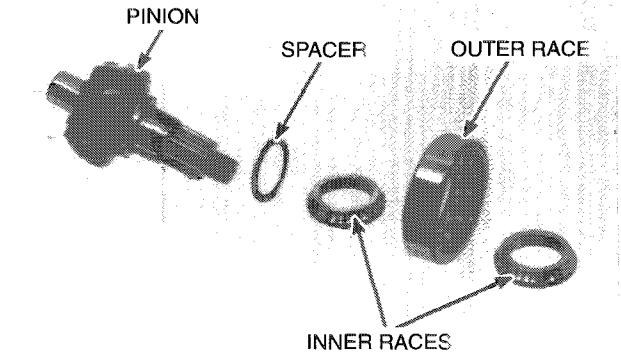
NOTE

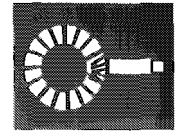
- The drive pinion bearing cannot be removed. Replace the final drive case if the bearing is damaged.

Heat the gear case to approximately 80°C (175°F).

WARNING

- Always wear gloves when handling hot parts.





Install the special tool into the ring gear bearing.

Tools:

Adjustable bearing puller, 25-40 mm

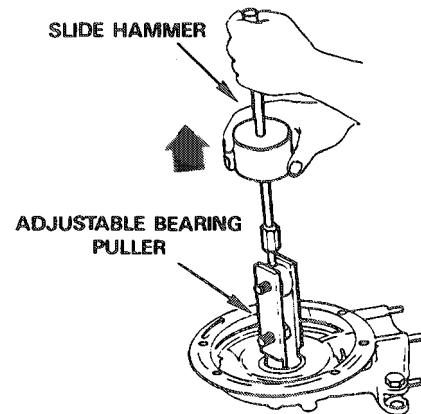
07736-A01000A (USA only)

Slide hammer, 3/8 x 16

Commercially available

Using the special tools, pull out the bearing.

Remove the oil seal using the same tools.



Apply grease to the oil seal lips.

Drive a new oil seal into the case.

Drive a new bearing into the case.

Tools:

Driver

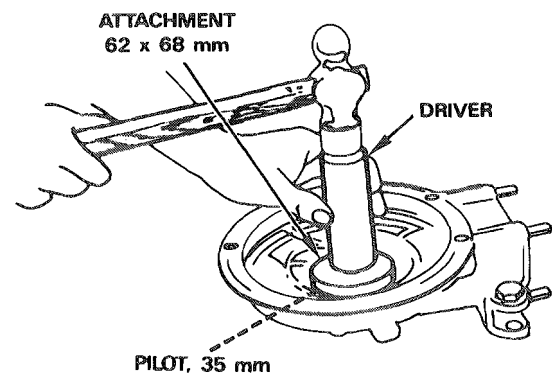
07749-0010000

Attachment, 62 x 68 mm

07746-0010500

Pilot, 35 mm

07746-0040800



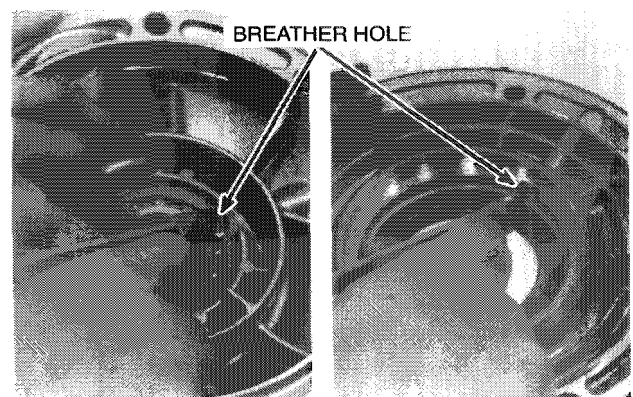
NOTE

- Drive the first bearing in, stopping before the attachment hits the case.

Blow compressed air through the breather holes in the case and the cover.

CAUTION

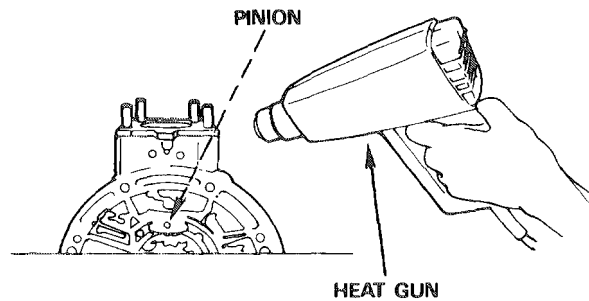
- **Hold the bearing to prevent it from rotating when using compressed air.**



Final Drive Gear Case Assembly

Heat the final gear case to approximately 80°C (176°F).

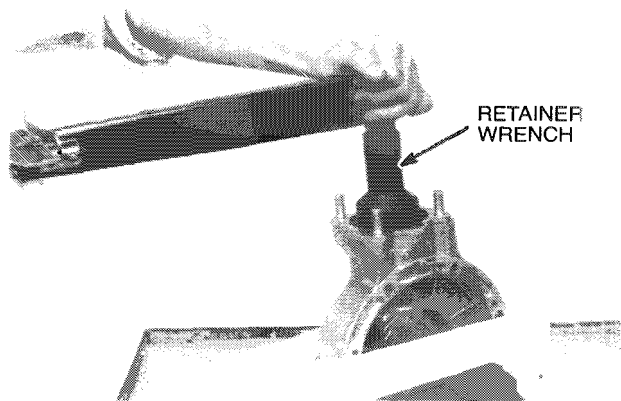
Then place the drive pinion assembly into its housing and tap it into the final gear case with a plastic hammer until the pinion retainer threads can engage the case threads.



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
07910-4630100



Install a pinion retainer lock tab and tighten the bolt.

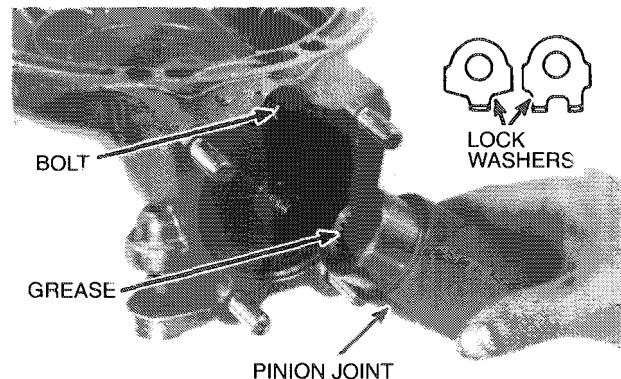
Torque: 10 N-m (1.0 kg-m, 7 ft-lb)

NOTE

- There are two types of lock washers, as shown.

Apply grease to the pinion joint spline.

Install the pinion joint to the pinion.



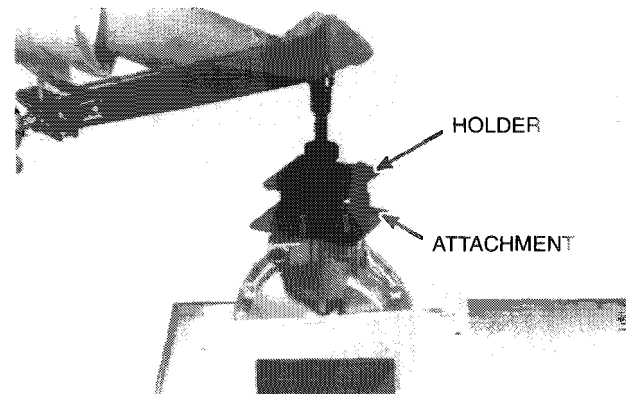
Apply a locking agent to the pinion joint nut threads. Set the attachment and holder onto the gear case.

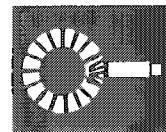
Tools:
Pinion joint holder attachment
07924-9690101
(must be modified: 4 holes increased to 10.5 mm)
or 07924-9690102
Pinion joint holder
07924-ME40000

Tighten the nut to the specified torque.

Torque: 110 N-m (11.0 kg-m, 80 ft-lb)

Remove the tools.



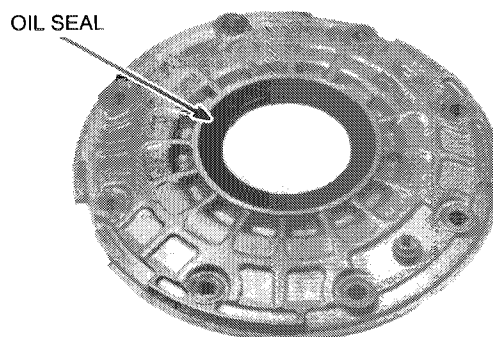


If the ring gear assembly was loose against the cover:

Install the oil seal into the cover.

NOTE

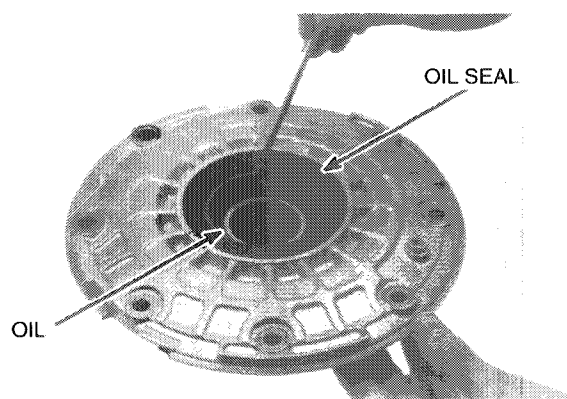
- The seal surface should be aligned with the cover surface.



Apply gear oil to the case cover oil seal lip.

Install the ring gear assembly into the case cover.

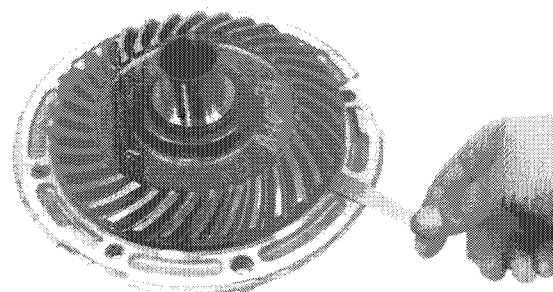
Gently seat the oil seal lip to the ring gear shaft if the oil seal lip turns inside out.



If the ring gear stayed in the cover:

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.**

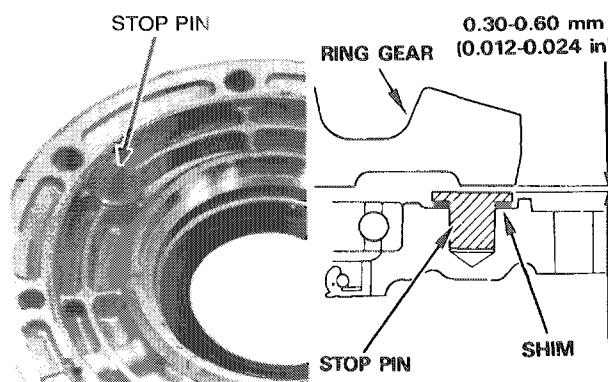
Install a stop pin shim to obtain the correct clearance.

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.



Final Drive

Gear Case Assembly (cont'd)

NOTE

- When the bearing, gear set and/or case has been replaced, check the tooth contact pattern (see page 11-8) and gear backlash (see page 11-6).

Install a wave washer on the ring gear assembly.

Apply liquid sealant to the mating surface of the cover and install the cover on the final gear case.

NOTE

- Do not apply liquid sealant to the dowel pins holes.

Apply locking agent to the threads of the 10 mm bolts.

Tighten the cover bolts in a gradual, crisscross pattern until the cover evenly touches the final drive case. Then, while rotating the pinion, tighten the bolts to the specified torque in a gradual, crisscross pattern.

Torque:

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)

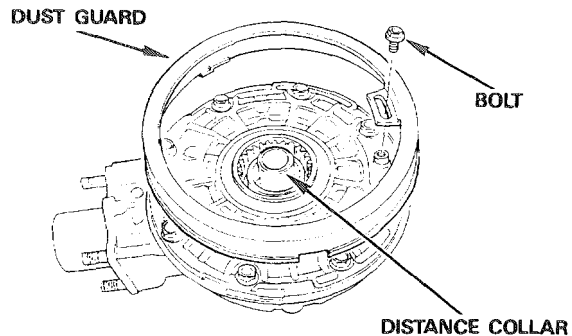
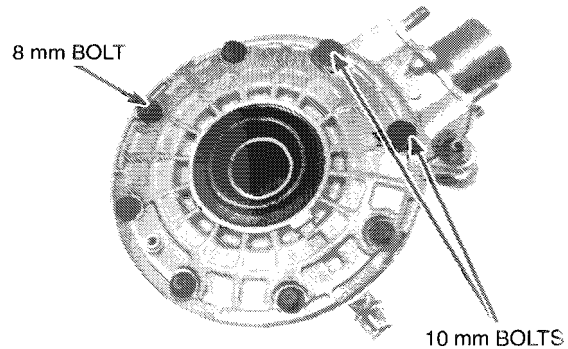
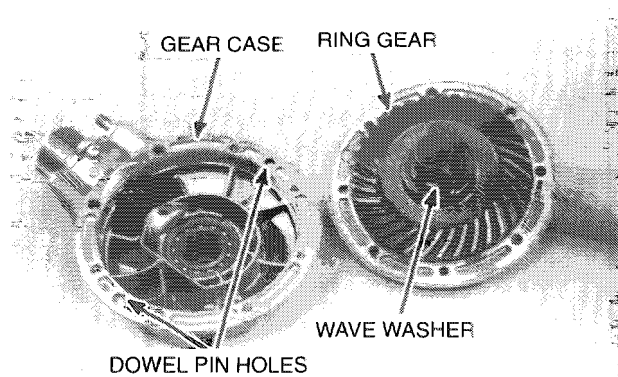
CAUTION

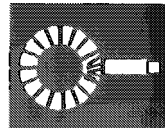
- It is important to turn the pinion while tightening the bolts. If the ring gear spacer is too thick, the gears will lock after only a light tightening.
- Be careful not to damage the case oil seal lips.

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.



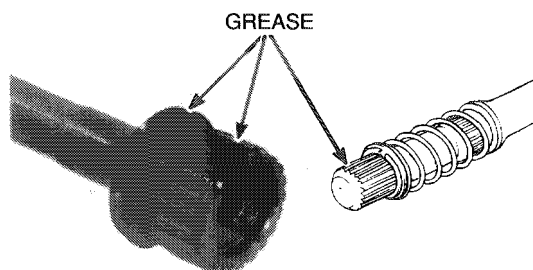


Gear Case Installation

Apply grease to the drive shaft spline.

NOTE

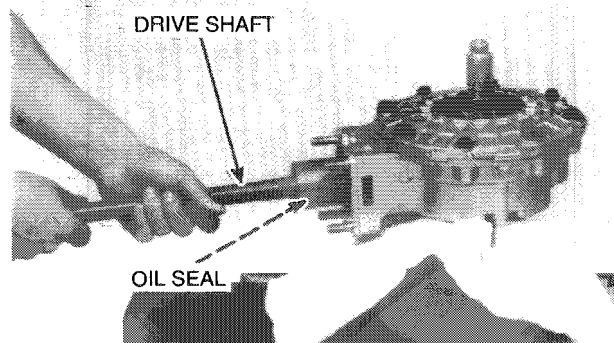
- Do not install a stopper ring on the drive shaft, even if one was present during disassembly. It is not necessary.



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

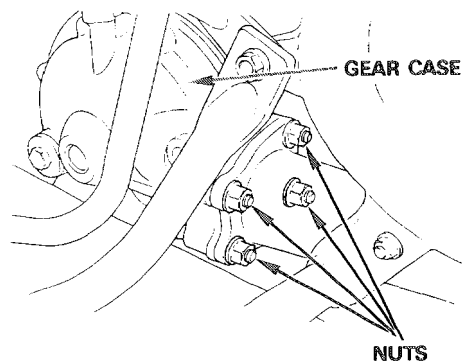
- To ease axle installation, do not tighten the gear case mounting nuts until after the axle is installed.

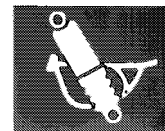
Make sure the distance collar is in the final gear case.

Install the rear wheel and torque the bolts and nut (see page 15-16). 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 (see page 3-15).





Frame/Suspension

Service Information	12-2
Troubleshooting	12-6
Fork Legs	12-11
Shock Absorbers	12-20
Swing Arm	12-16
On-Board Air Compressor	
System	12-31
Handlebar Stem	12-41
Steering Stem	12-41

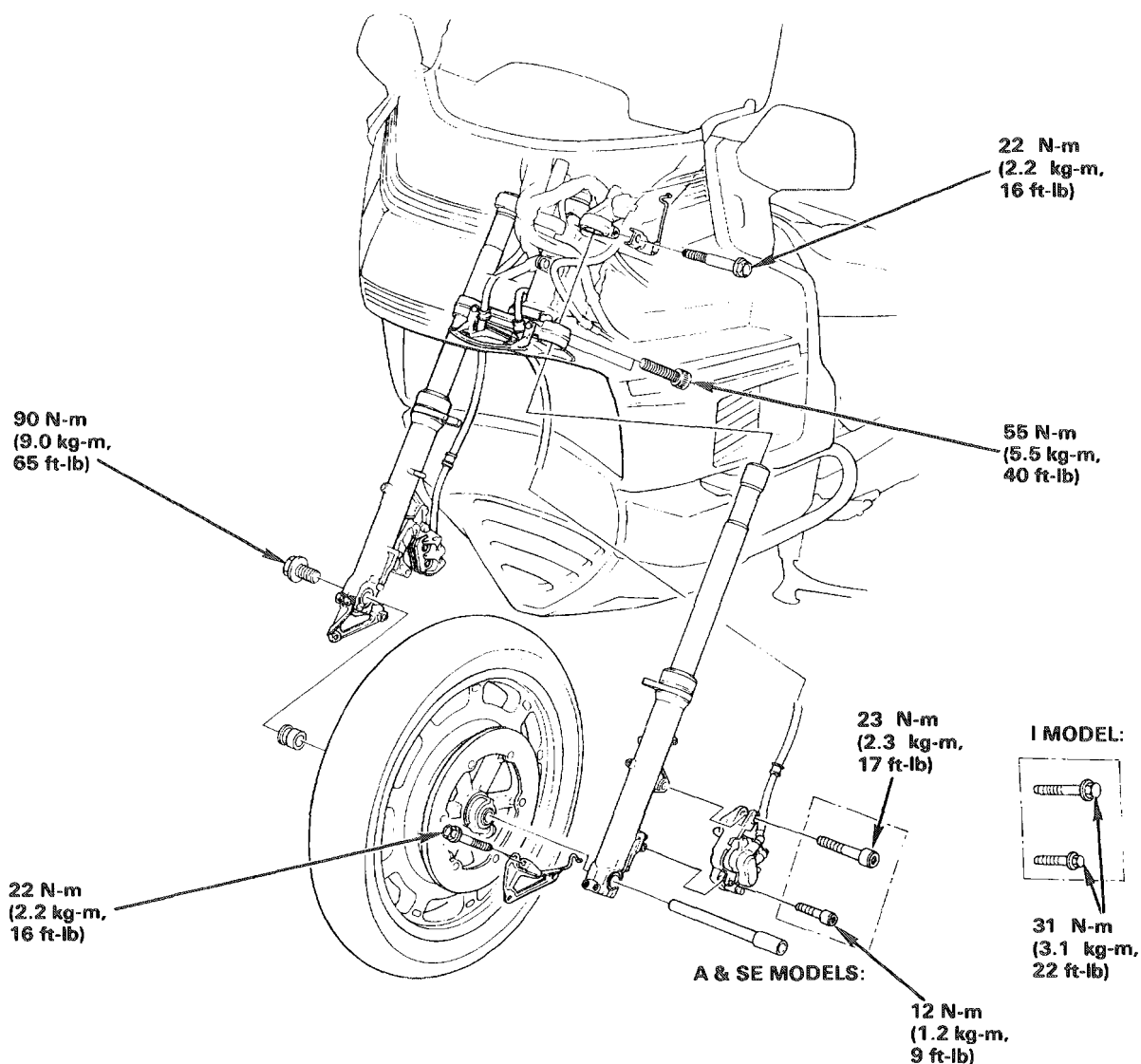
Frame/Suspension

Service Information

- Apply clean suspension fluid to the O-rings when installing the air hoses.
- Always replace bent forks; straightening them will weaken the material.
- A & SE: When inspecting the On-Board Air Compressor System, check the system components and lines step-by-step according to the troubleshooting chart.

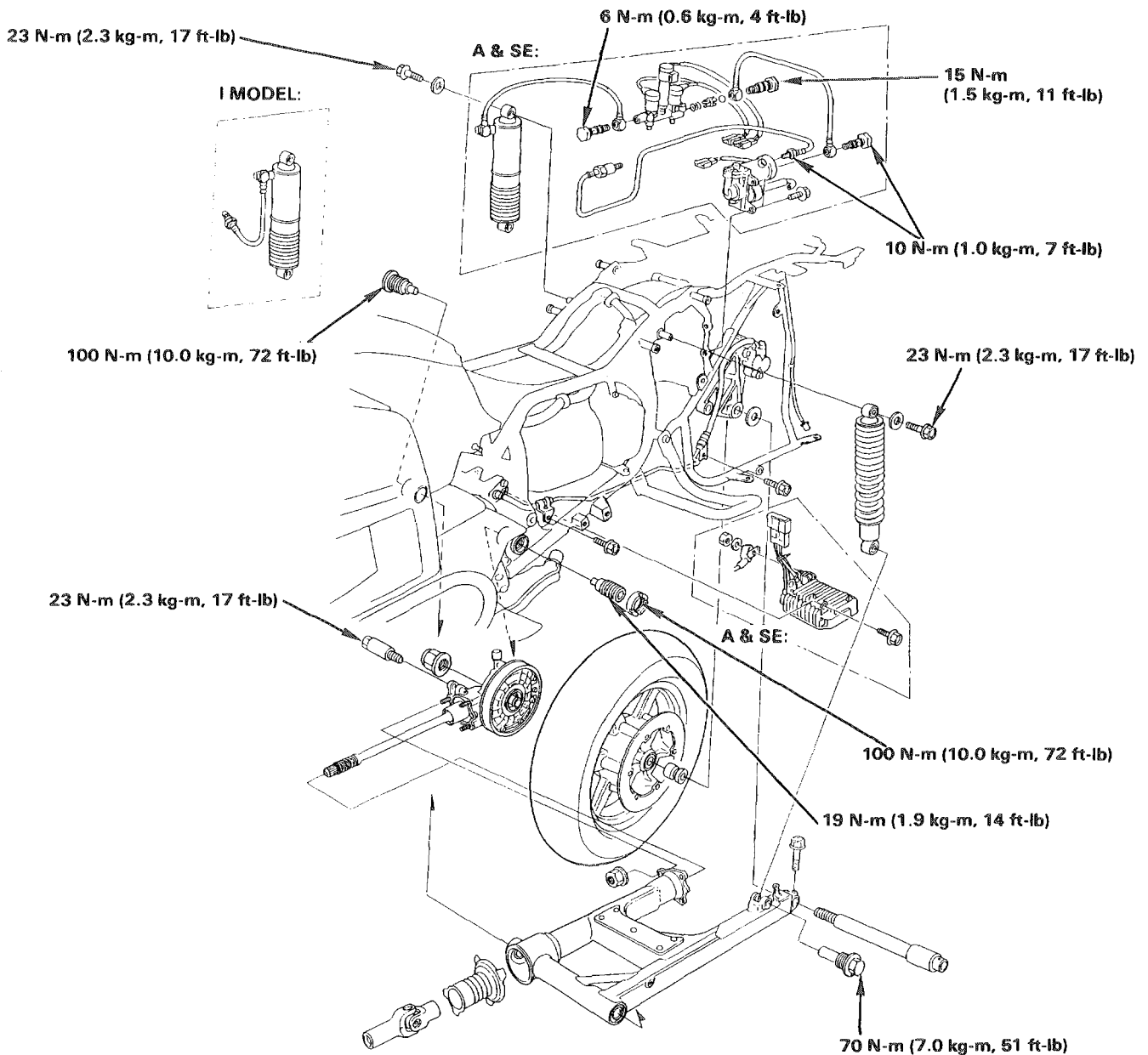
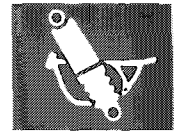
CAUTION

- 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.



Torque Values

Anti-dive case socket bolt	8 N-m (0.8 kg-m, 6 ft-lb)
Fork bottom socket bolt	20 N-m (2.0 kg-m, 14 ft-lb)
Fork bolt	23 N-m (2.3 kg-m, 17 ft-lb)
Fork leg upper pinch bolt	22 N-m (2.2 kg-m, 16 ft-lb)
Fork leg lower pinch bolt	55 N-m (5.5 kg-m, 40 ft-lb)
Steering adjustment nut	19 N-m (1.9 kg-m, 14 ft-lb)
Steering stem nut	100 N-m (10.0 kg-m, 72 ft-lb)



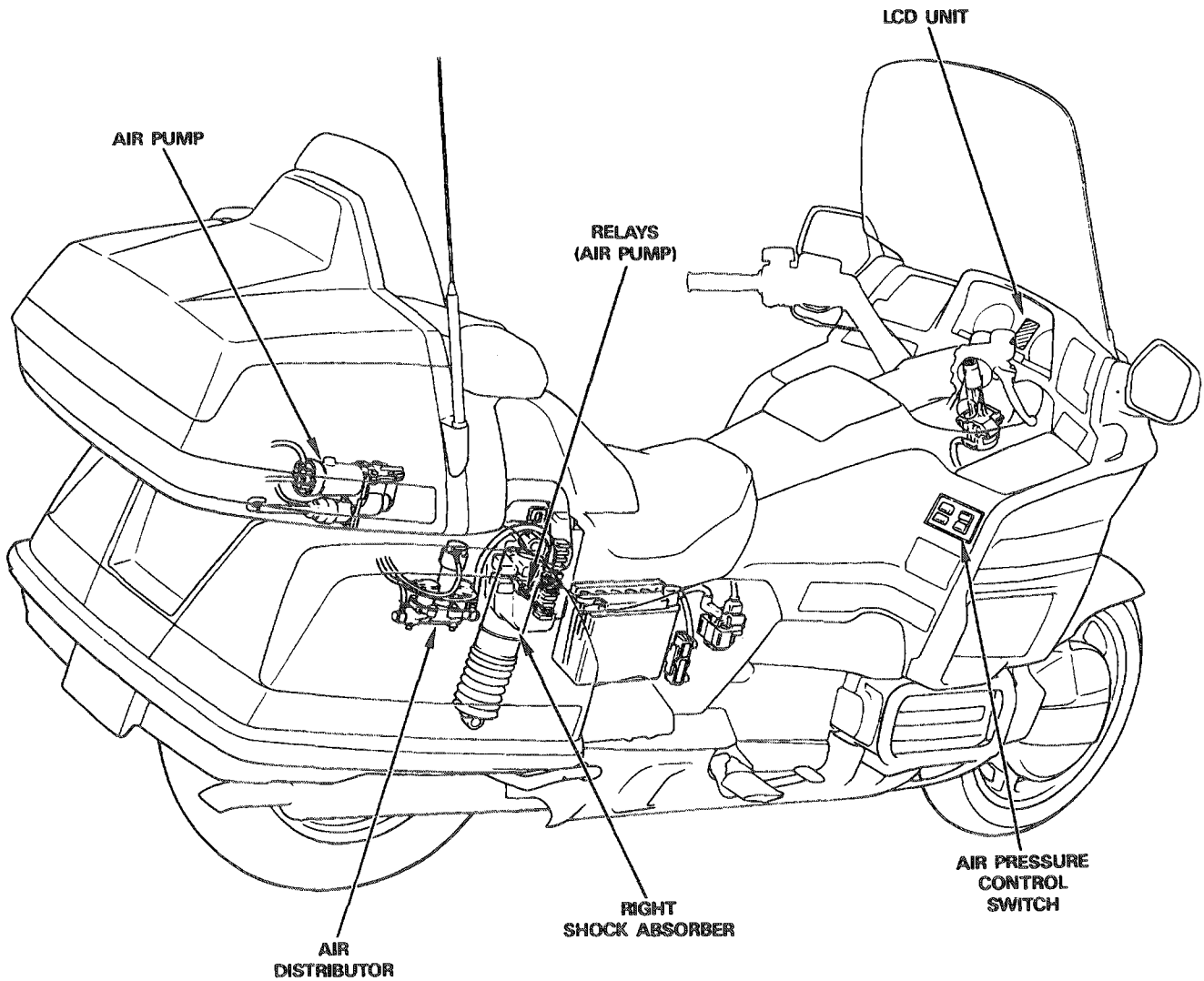
Torque Values

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		100 N-m (10.0 kg-m, 72 ft-lb)
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		10 N-m (1.0 kg-m, 7 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)

Frame/Suspension

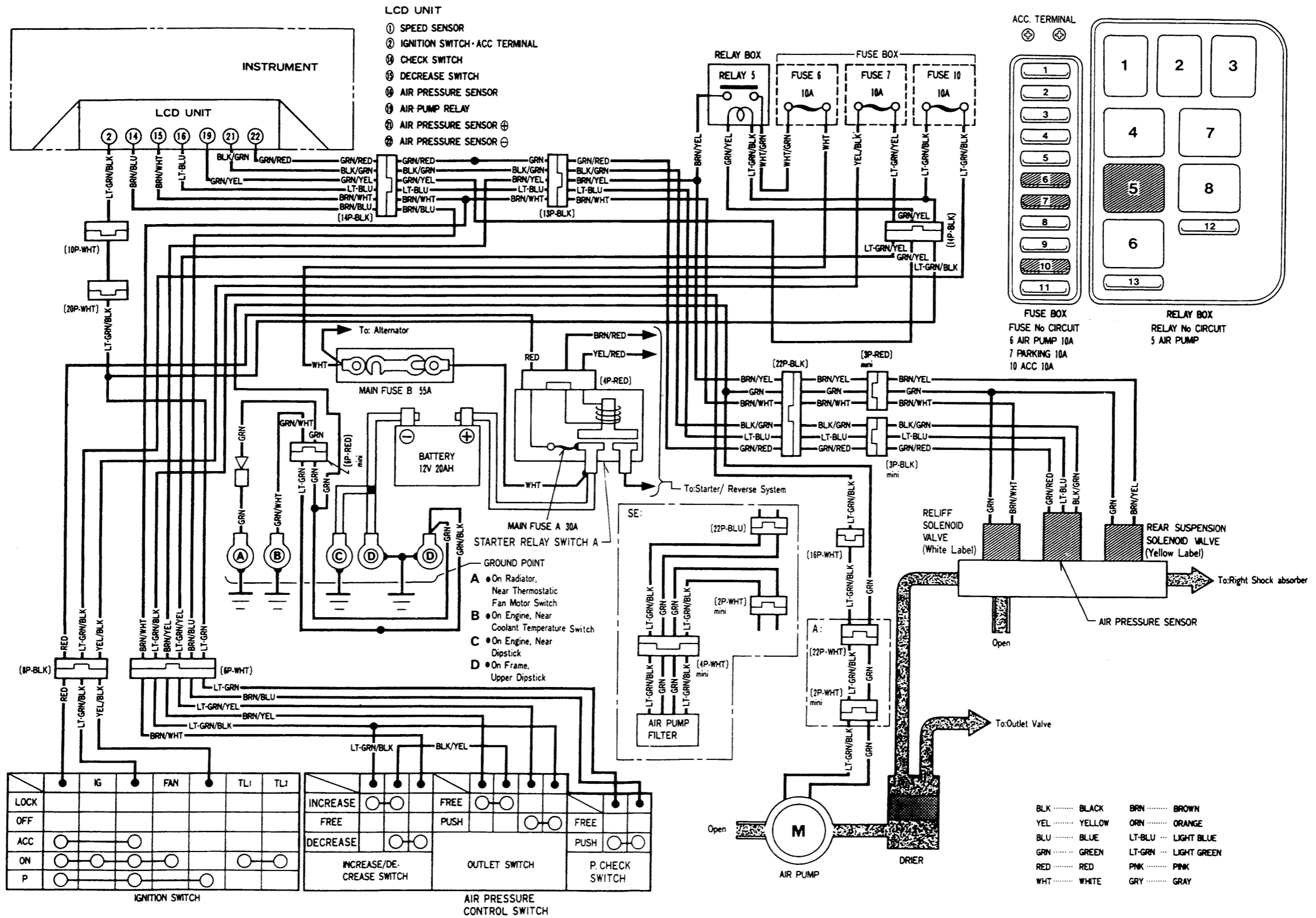
Service Information (cont'd)

System Location (A & SE only)





Circuit Diagram (A & SE only)



Frame/Suspension

Troubleshooting

Wobble or Vibration

- Distorted rim.
- Loose wheel bearing.
- Faulty tire.
- Loose axle.
- Loose swing arm pivot bolt.

Soft Suspension

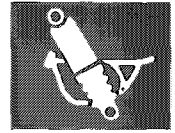
- Weak spring.
- Insufficient air pressure (rear/right).
- Weak rear damper.
- Insufficient fluid weight (low viscosity).

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).

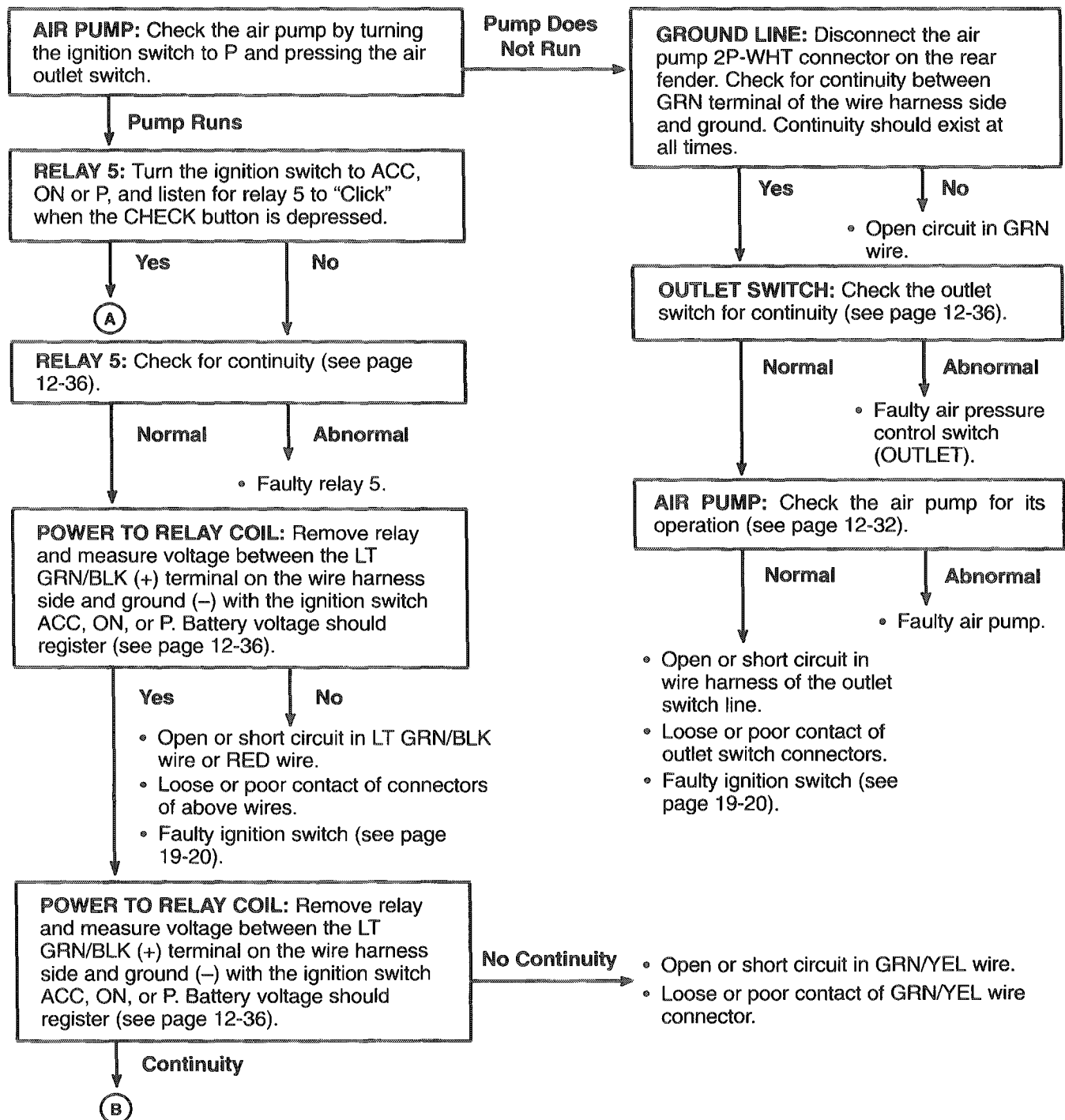


A & SE only

NOTE

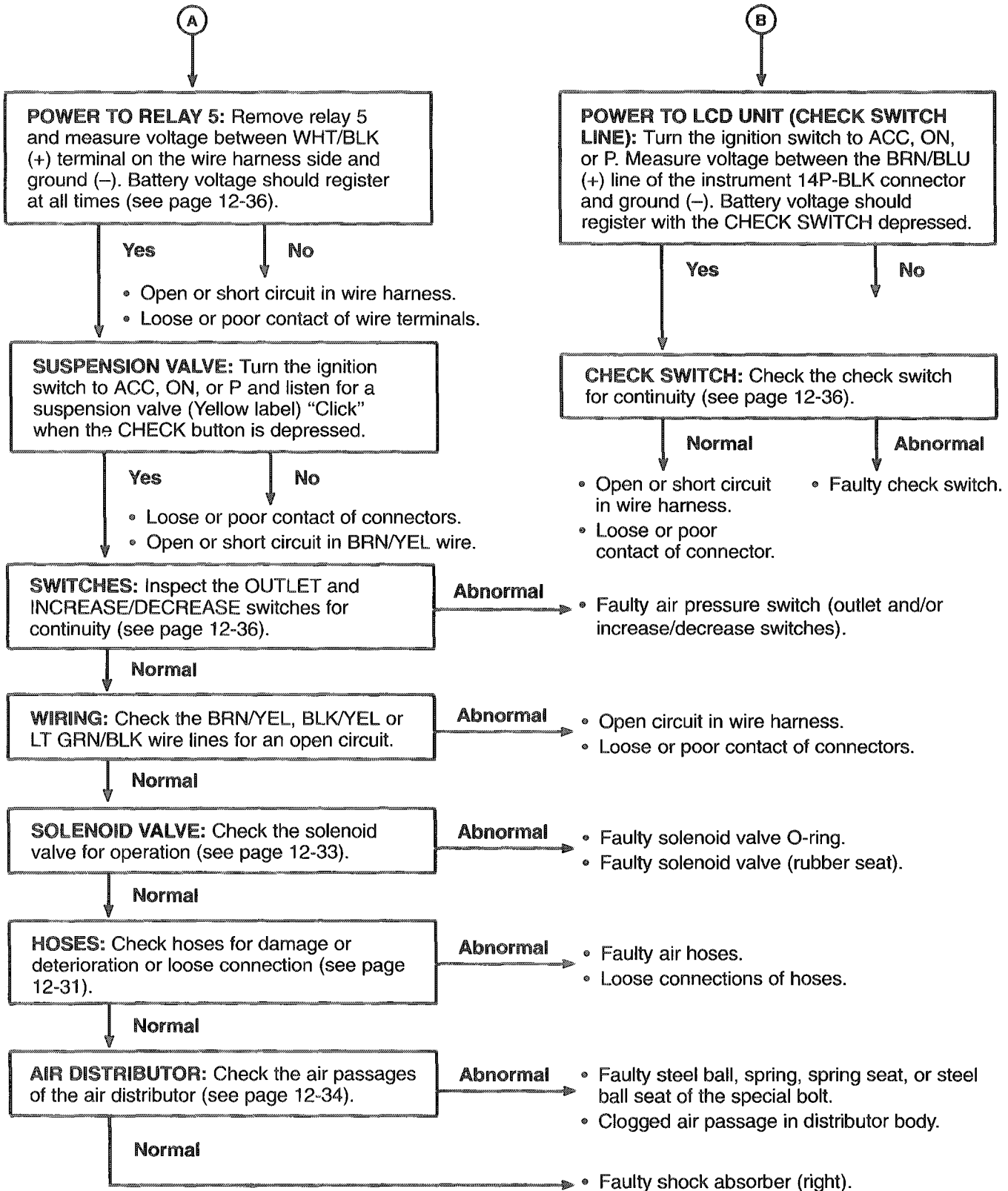
- Before troubleshooting the On-Board Air Compressor System, check the following fuses:
 - Fuse 6 (10 A), 7 (10 A) or 10 (10 A) – inside the fuse box.
 - Main fuse A (30 A) – inside the starter relay switch A.
 - Main fuse B (55 A) – on the battery case.

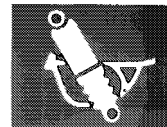
Ride and level control pressure will not increase



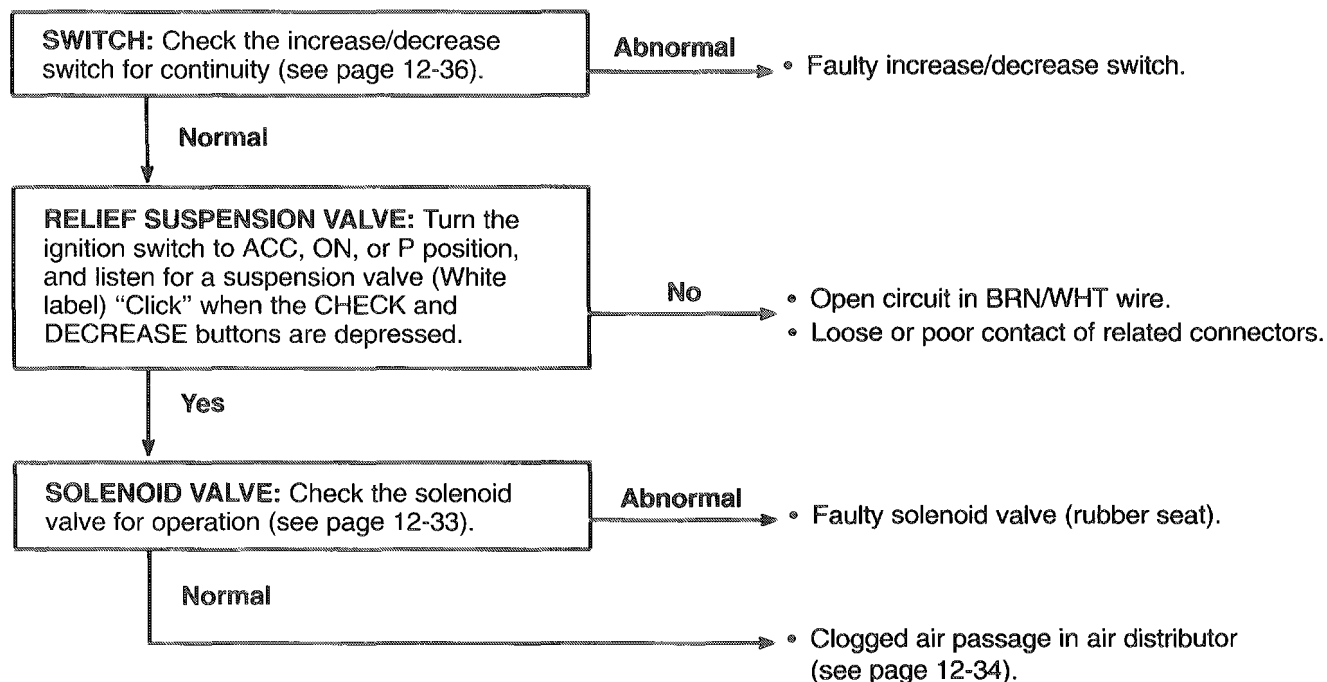
Frame/Suspension

Troubleshooting (cont'd)

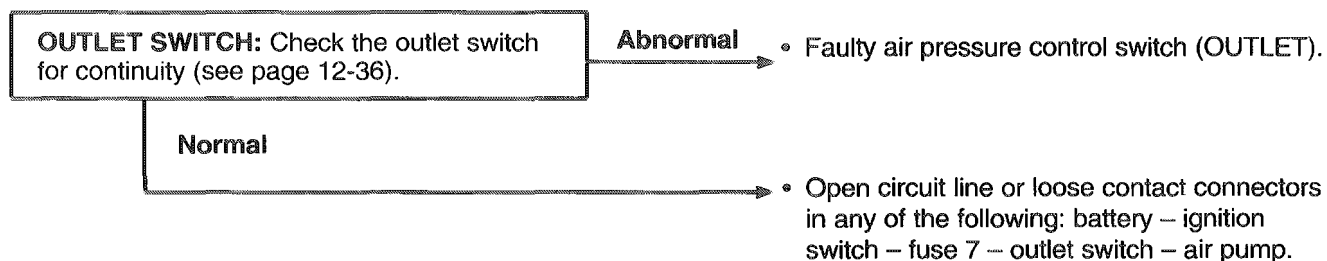




Suspension system will not decrease pressure, but will increase pressure.



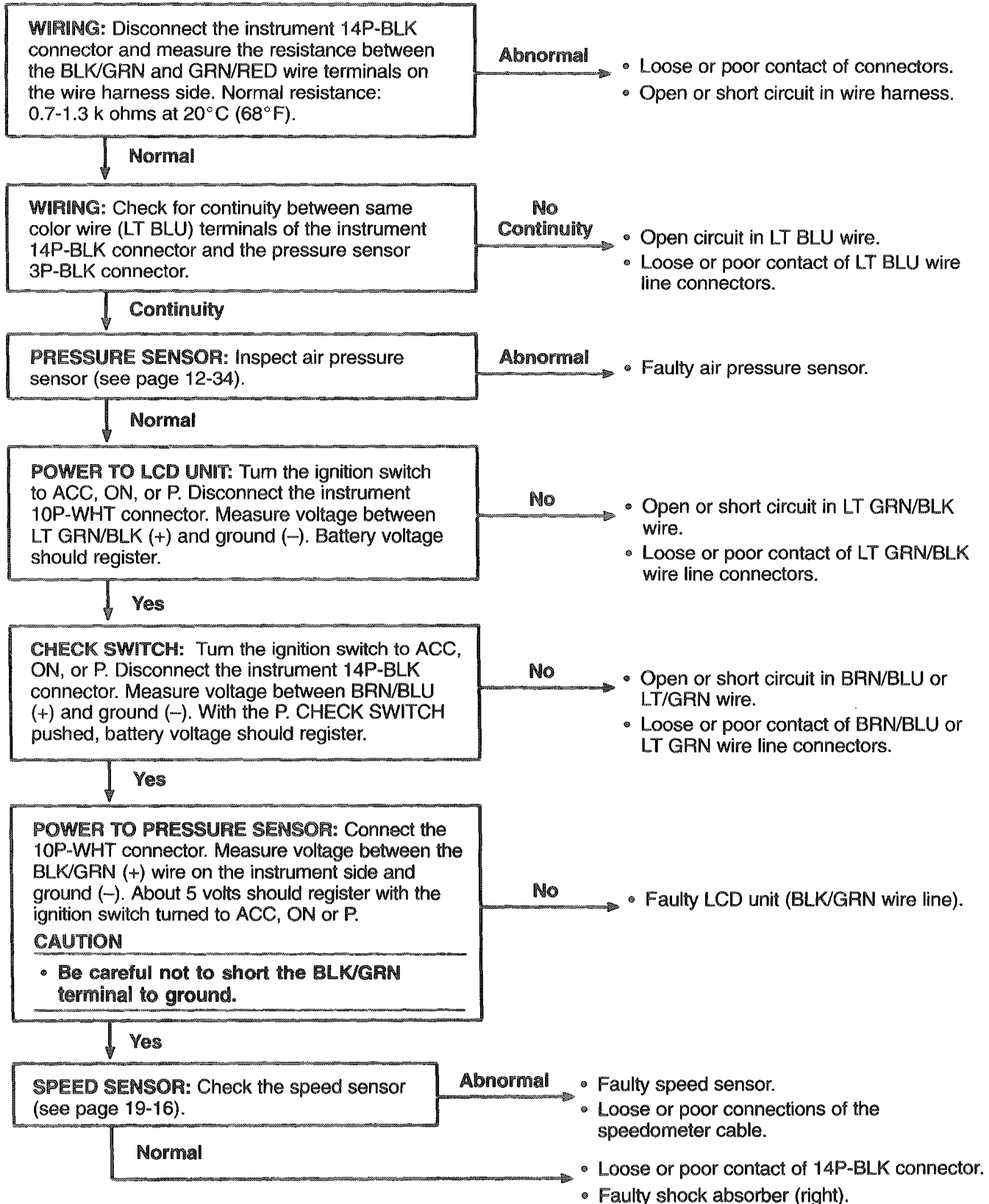
The auxiliary air pressure does not work, but the ride and level control works.

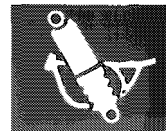


Frame/Suspension

Troubleshooting (cont'd)

Air compressor system works, but LCD unit display does not work properly.





Fork Legs

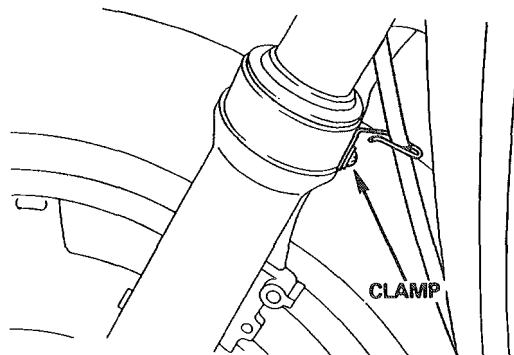
Removal

Remove the following:

- speedometer cable clamp.
- front fender (see page 13-18).
- brake caliper (see page 14-19).
- front wheel (see page 15-5).

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.**



A & SE models: Remove the air valve caps.

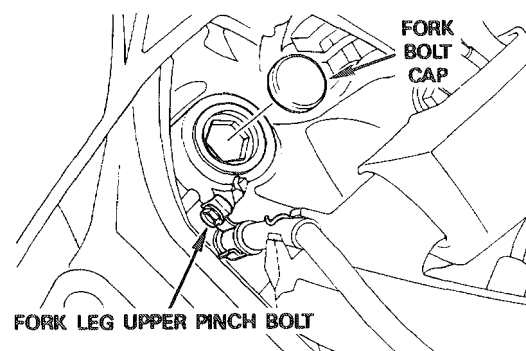
I model: Remove the fork bolt cap.

Loosen (but don't remove) the fork bolt.

WARNING

- **The fork bolt is under high spring pressure. Use care when loosening the bolt.**

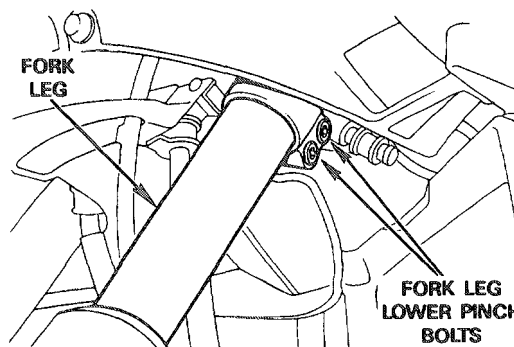
Loosen the fork leg upper pinch bolt.



Loosen the fork leg lower pinch bolts and remove the fork leg.

NOTE

- Be careful not to drop the fork legs when loosening the bolts.



Fork Slider Needle Bearing Replacement

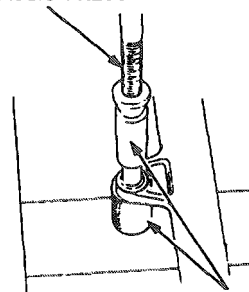
Remove the pivot collar.

Check the needle bearing for wear or damage. Replace, 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.

(1) HYDRAULIC PRESS



(2) SUITABLE TOOLS

Frame/Suspension

Fork Legs (cont'd)

Disassembly

SE models: Remove the air valve from the fork bolt.

Install the special tool "Fork Bolt Assembly Tool" on the front fork.

NOTE

- Align the top of the fork tube with the lower edge of the window in the tool as shown.

Tool:

Fork bolt assembly tool
07KMF-MT20300

SE: Install the attachment with the protrusion facing upward.

A & I: Install the attachment with the protrusion facing downward.

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 front fork, then remove the tool and fork bolt from the front fork.

Remove the spacer, spring joint plate, and spring.

Remove any remaining fork fluid by pumping the fork up and down several times.

Remove the dust seal and stopper ring.

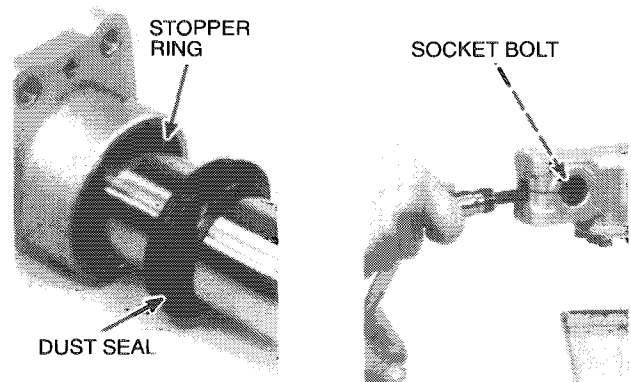
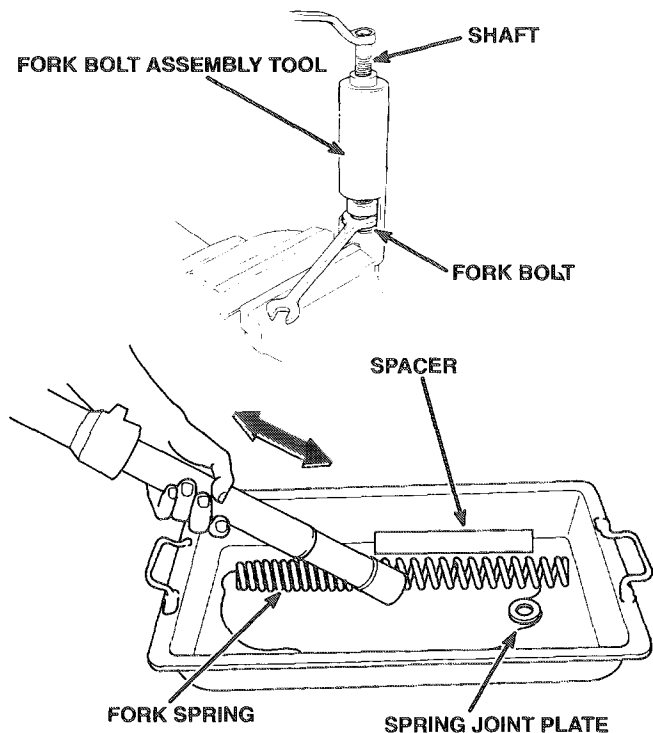
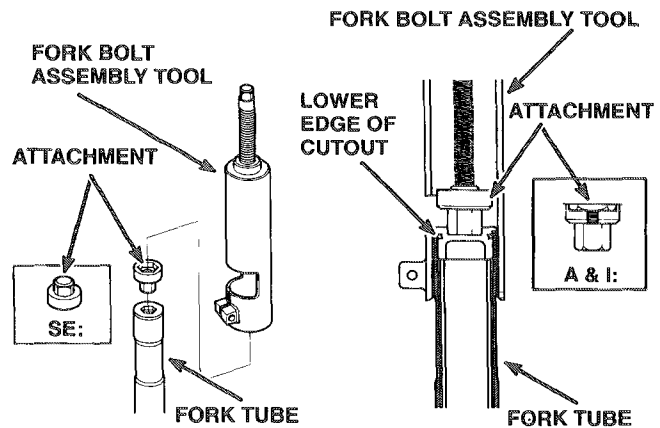
NOTE

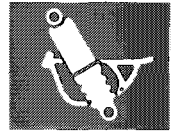
- Take care to avoid damaging the fork tube while removing the stopper ring.

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 the socket bolt is difficult to remove.





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

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

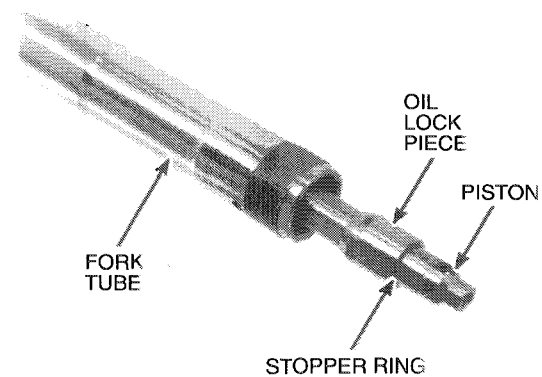
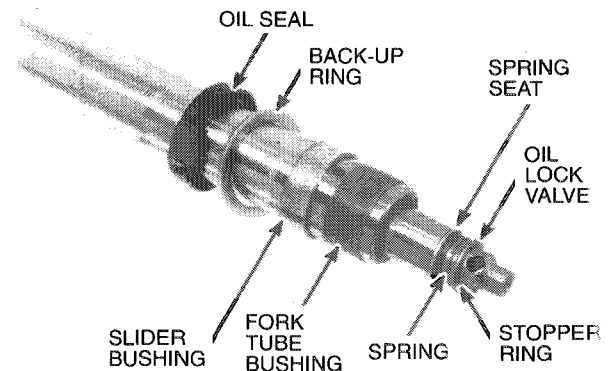
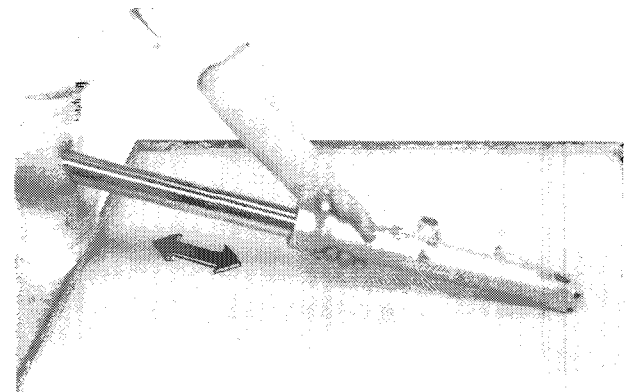
- Do not remove the fork tube bushing unless it requires replacement.

Remove the stopper ring, oil lock valve, oil lock spring, and spring seat from the fork piston.

Remove the stopper ring from the fork piston.

Remove the oil lock piece from the fork piston. (A & SE: right side only)

Remove the piston from the fork tube.



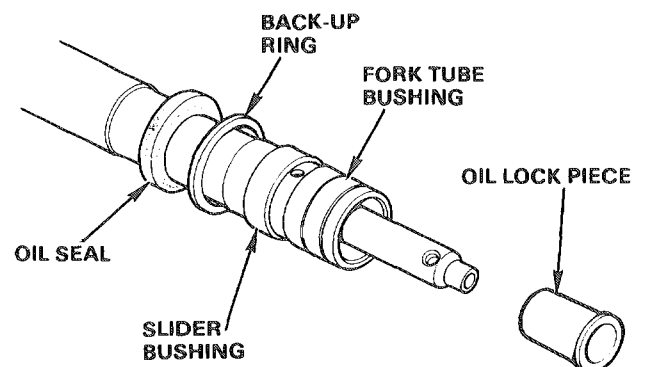
I model, left side:

Remove the oil lock piece from the piston.

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

NOTE

- Do not remove the fork tube bushing unless it requires replacement.

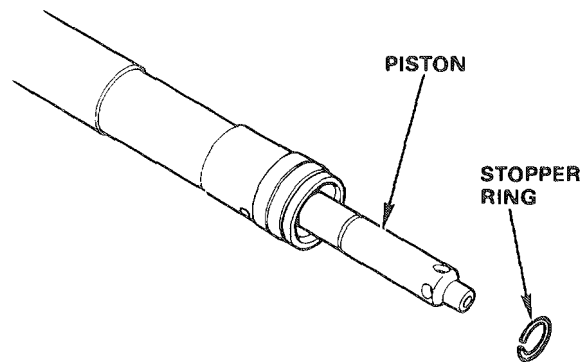


Frame/Suspension

Fork Legs (cont'd)

Remove the stopper ring from the piston.

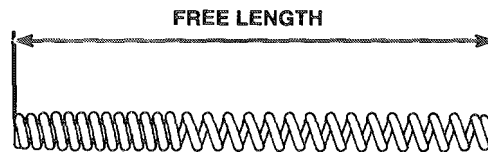
Remove the piston and rebound spring from the fork tube.



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)

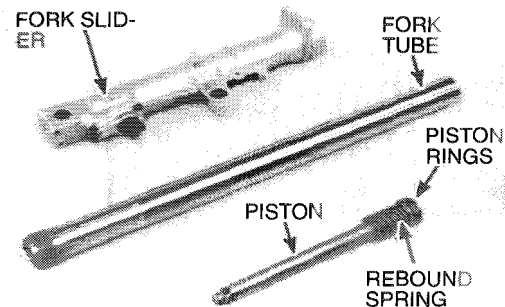


Check the fork tubes, fork sliders, and pistons for score marks, scratches, or abnormal wear.

Check the fork piston rings for wear or damage.

Check the rebound spring for damage.

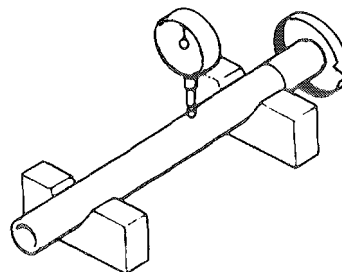
Replace any worn or damaged parts.

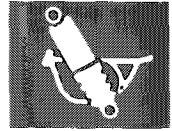


Set the fork in V blocks and read the runout.

Actual runout is 1/2 the total indicator reading.

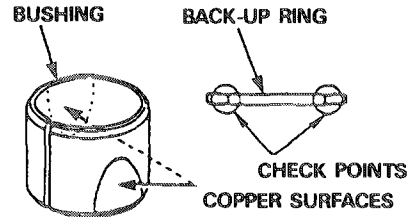
Service Limit: 0.2 mm (0.01 in)





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

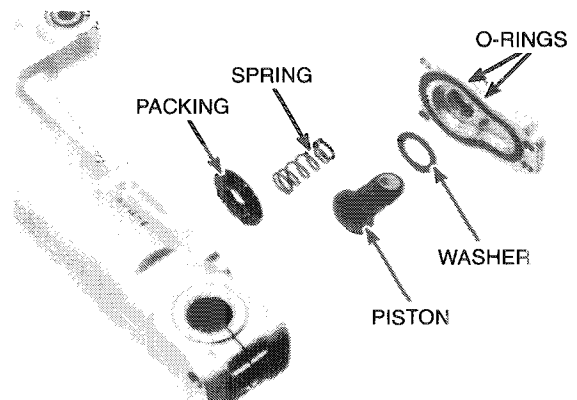
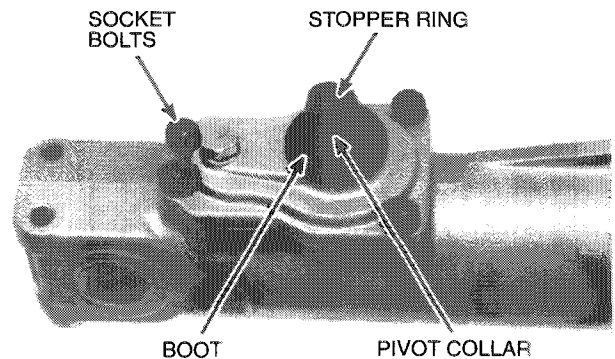
- The anti-dive case is under spring pressure. Use care when removing the case to keep it from becoming a projectile.

Check the packing, spring, piston, washer, and O-rings for damage, wear, or deterioration. Replace, if necessary.

Assemble in the reverse order of removal.

NOTE

- Install the packing with its uneven side facing the fork slider.
- Apply suspension fluid to the O-rings and piston.

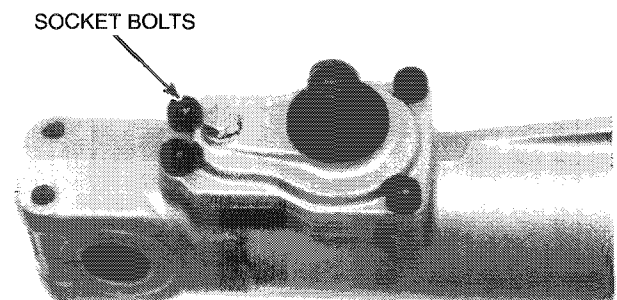


Apply a locking agent to the socket bolt threads.

Install the bolts and tighten to the specified torque.

Torque: 8 N-m (0.8 kg-m, 6 ft-lb)

Check the operation of the piston.

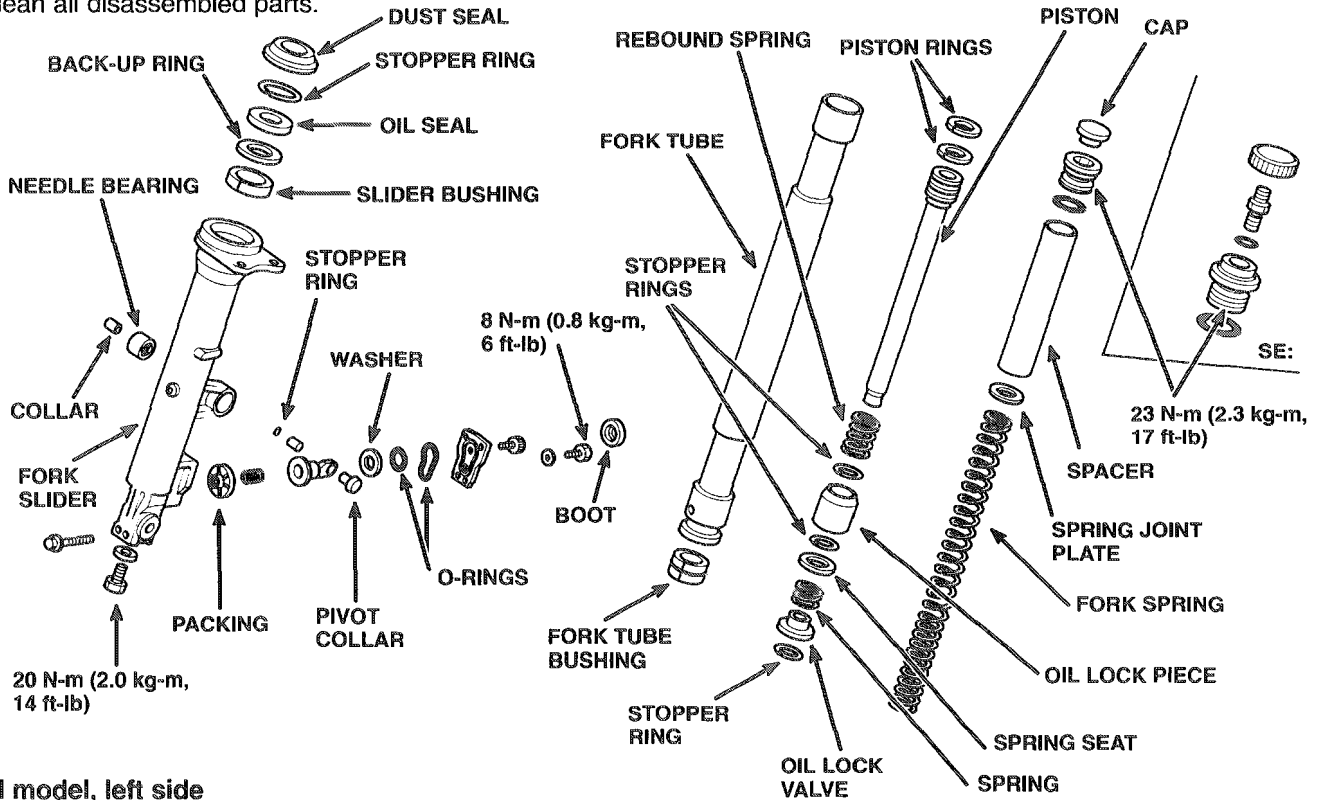


Frame/Suspension

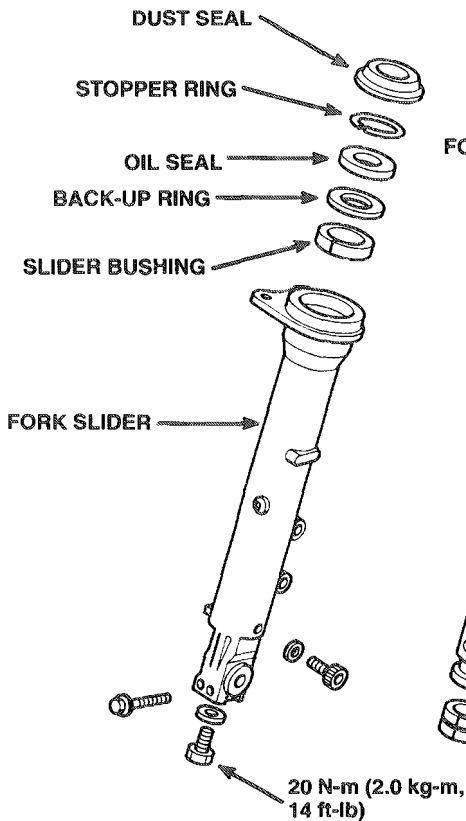
Fork Legs (cont'd)

Assembly

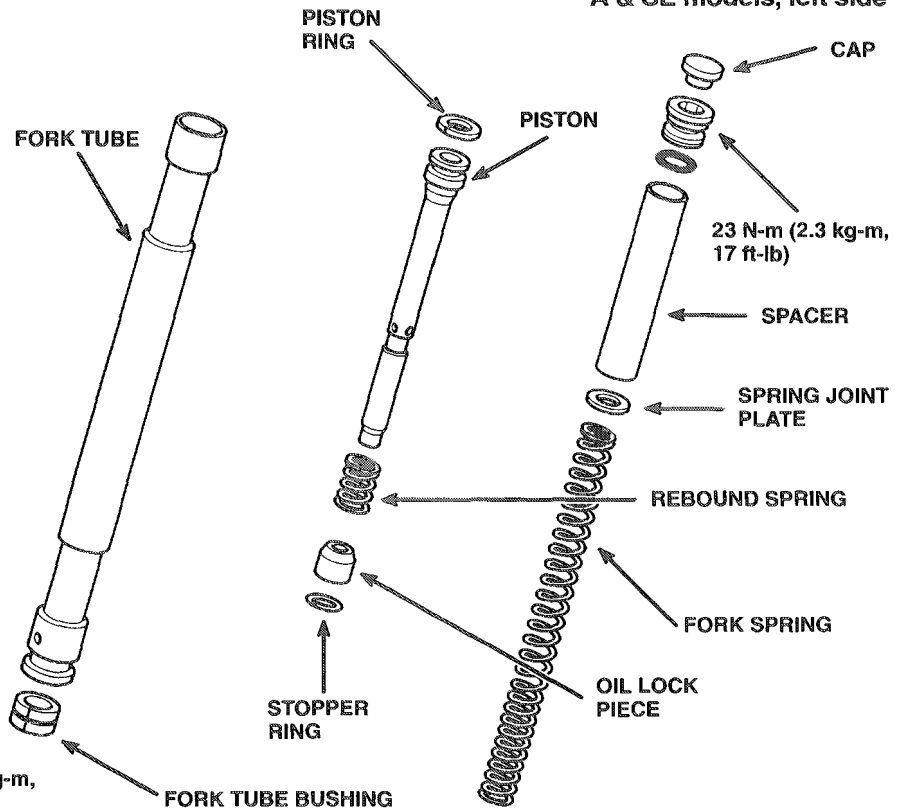
Clean all disassembled parts.

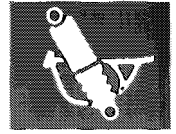


I model, left side



*A & SE models, left side



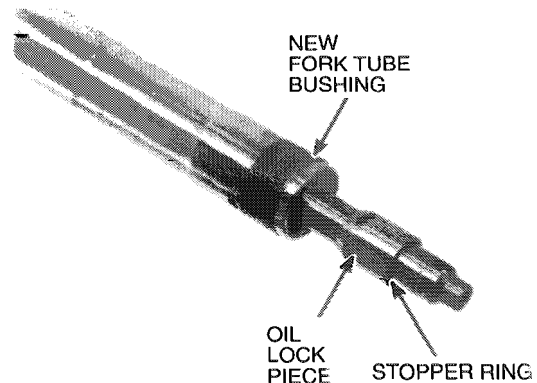


Install a new bushing on the fork tube if necessary.

Place the piston with rebound spring into the fork tube

Install the oil lock piece onto the fork piston. (A & SE: rights side only.)

Install the stopper ring onto the fork piston.

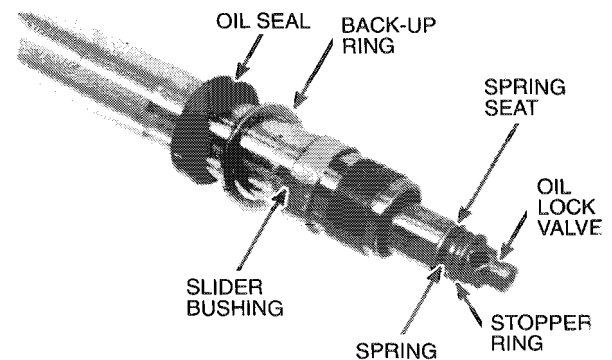


Install the spring seat, spring, and oil lock valve on the piston. Secure them with the stopper ring.

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 suspension fluid and install it with the seal mark facing up.



I model, left side:

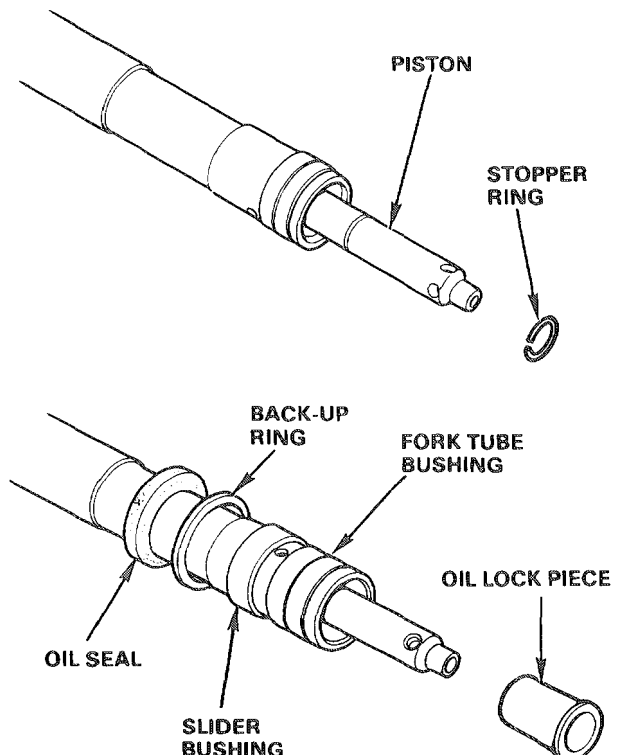
Install new bushing on the fork tube if necessary. Place the piston with rebound spring into the fork tube. Install the stopper ring on the piston.

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 Pro Honda Suspension Fluid SS-8 or equivalent and install it with the seal mark facing up.

Install the oil seal lock piece on the piston.



Frame/Suspension

Fork Legs (cont'd)

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. 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.

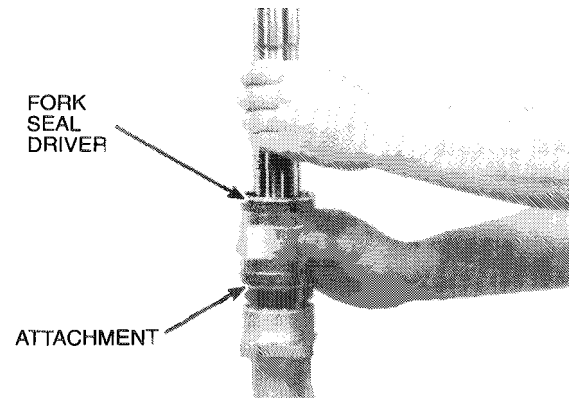
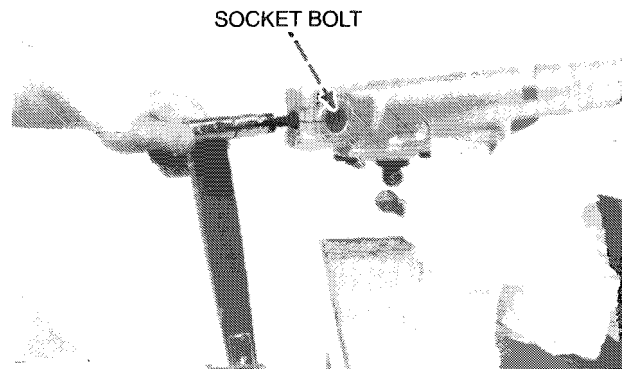
Tools:

Fork seal driver

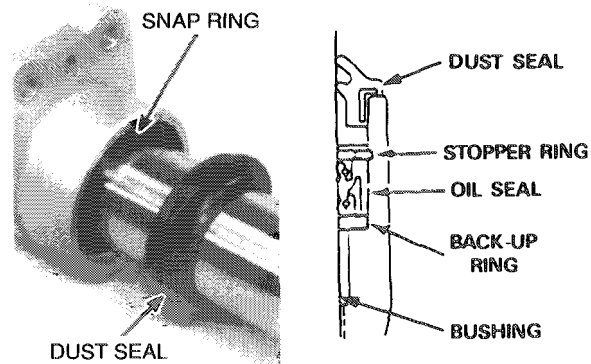
07947-KA50100

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 fork spring (see page 12-12).

Fill the fork with Pro-Honda Suspension Fluid SS-8 or equivalent.

Capacity (A & SE):

Right Fork: 377 cc (12.7 US oz, 13.2 Imp oz)

Left Fork: 372 cc (12.6 US oz, 13.1 Imp oz)

Capacity (I only):

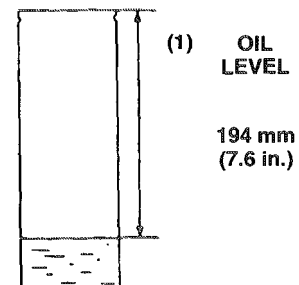
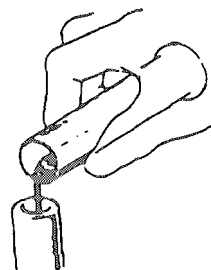
Right Fork: 377 cc (12.7 US oz, 13.2 Imp oz)

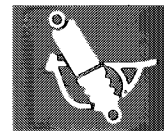
Left Fork: 361 cc (12.2 US oz, 12.7 Imp oz)

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 oil off the spring and spacer thoroughly using a clean cloth.

Install the spring with its tightly wound coil end facing down.

Install the spring joint plate and spacer.

Coat the O-ring with Pro-Honda Suspension Fluid SS-8 or equivalent.

Install the fork bolt with an O-ring.

Install the fork bolt and the attachment of the special tool.

Install the Fork Bolt Assembly Tool on the fork tube and align the lower edge of 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.

Install the fork into the steering stem, and tighten the fork bolt to the specified torque (page 12-20).

A & SE models: Install the air valve into the fork bolt.

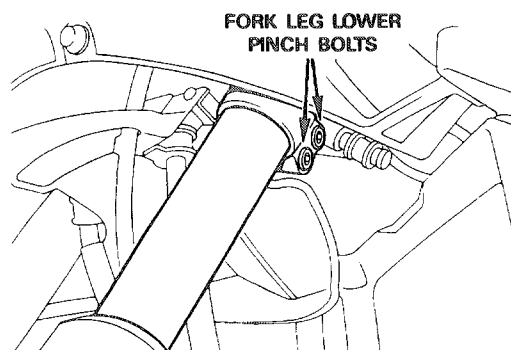
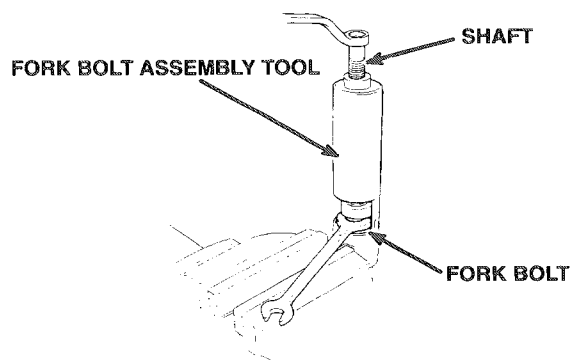
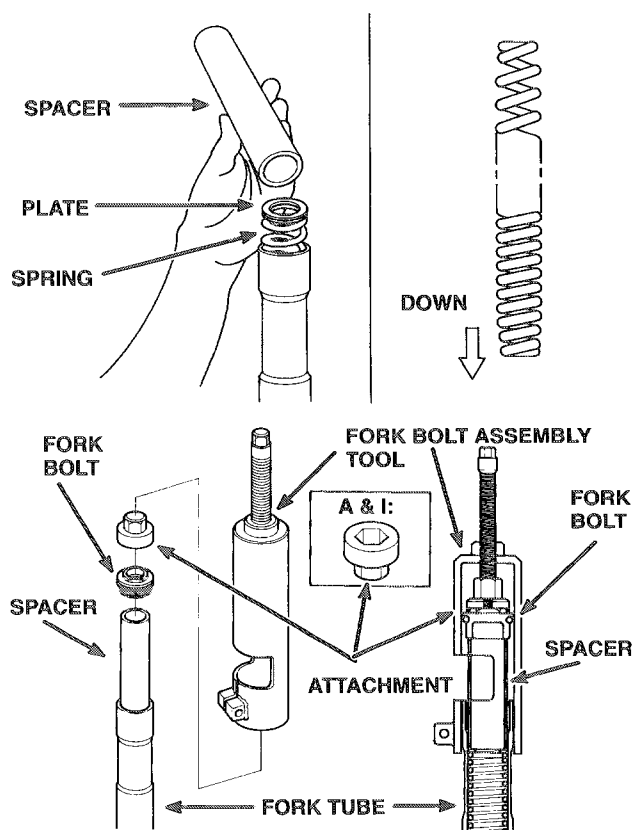
Installation

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.



Frame/Suspension

Fork Legs (cont'd)

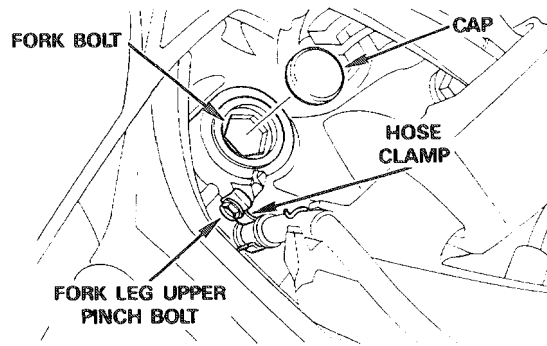
Tighten the fork leg upper pinch bolt (hose clamp) to the specified torque.

Torque: 11 N-m (1.1 kg-m, 8 ft-lb)

Tighten the fork bolt to the specified torque.

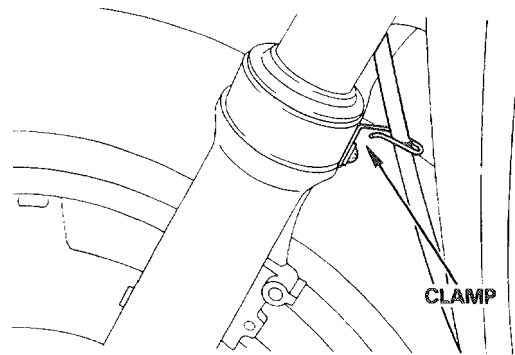
Torque: 23 N-m (2.3 kg-m, 17 ft-lb)

Install the fork bolt cap.



Install the following in the reverse order of removal:

- speedometer clamp.
- front wheel (see page 15-8).
- brake caliper (see page 14-20).
- front fender (see page 13-18).



Shock Absorbers

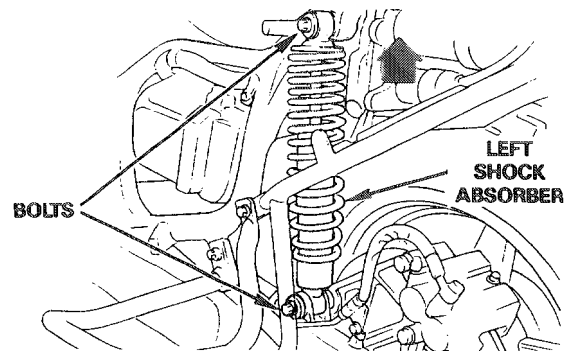
Removal (Left)

Place the motorcycle on its center stand.

Remove the left saddlebag (see page 13-17).

Remove the shock absorber lower mount bolt and upper mount bolt.

Remove the left shock absorber upward from the frame.



Removal (Right)

Place the motorcycle on its center stand.

Remove the right saddlebag.

A & SE Only:

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 display registers 0 psi (0 kg/cm²).

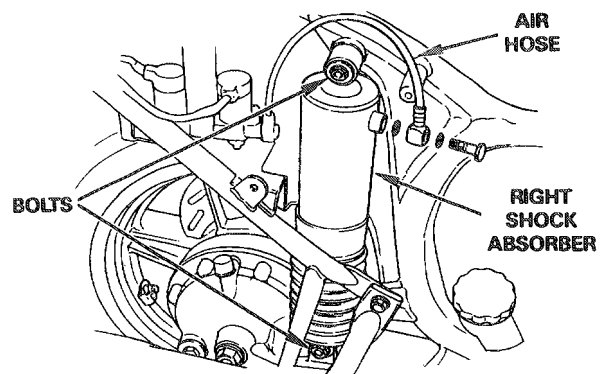
Turn the ignition switch OFF.

Disconnect the air hose from the right shock absorber.

All Models:

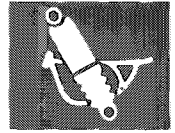
Remove the shock absorber lower mount bolt and upper mount bolt.

Remove the right shock absorber from the frame.



NOTE

- Do not lay the shock absorber on its side. The fluid will run out.



Rubber Bushing Inspection

Check the rubber bushings of left and right shock absorber mounts for wear, damage, or deterioration.

Disassembly/Assembly (Left)

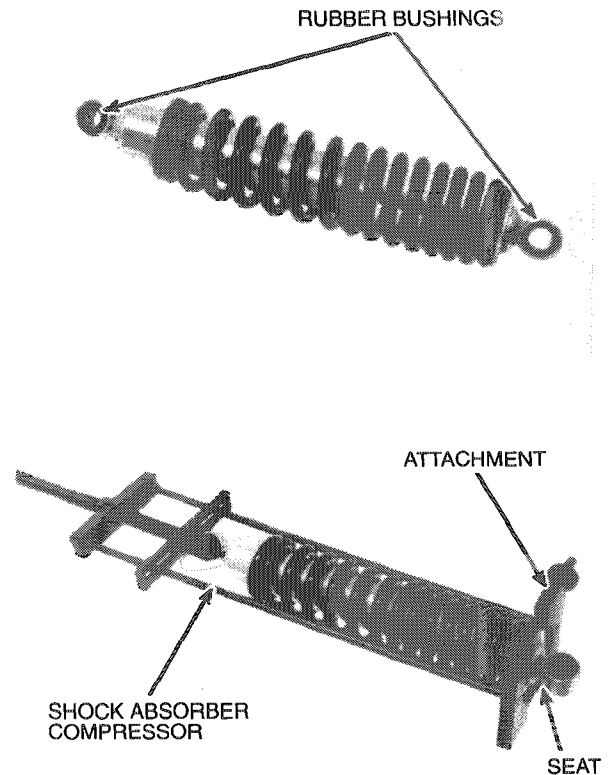
Set the shock absorber in the shock absorber compressor.

Tools:
Shock absorber compressor
07GME-0010000 or 07959-3290001
Attachment
07959-MB10000

Compress the spring until the spring stopper seat can be removed. Remove the stopper seat. Disassemble the shock absorber.

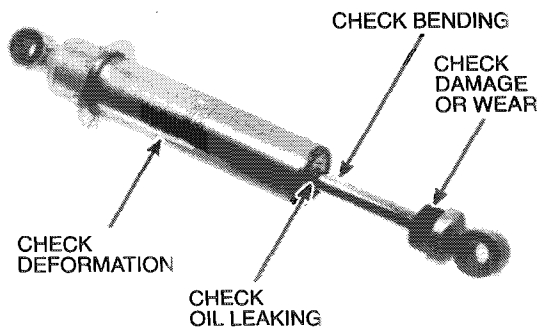
NOTE

- Compress the spring while tightening the attachments to keep the shock absorber secure in the compressor.



Check the damper for deformation, oil leaking, bending of the rod, or smooth operation.

Check the damper rubber for wear or damage.



Frame/Suspension

Shock Absorbers (cont'd)

Install the spring with its tightly wound coil end toward the upper mount. Set the shock absorber in the compressor tool.

Tools:

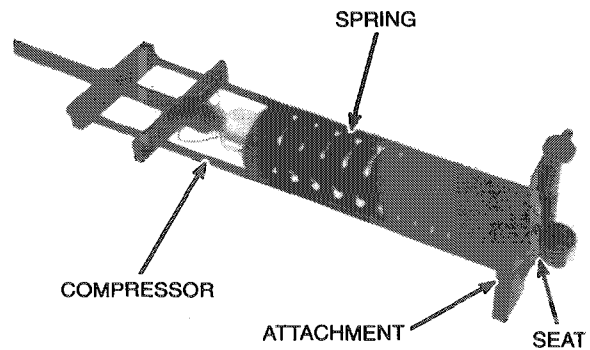
Shock absorber compressor

07GME-0010000 or 07959-3290001

Attachment

07959-MB10000

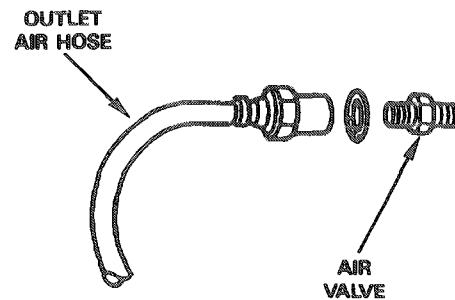
Compress the spring until the spring stopper seat can be installed. Remove the compressor.



Oil Seal Replacement (Right)

A & SE models:

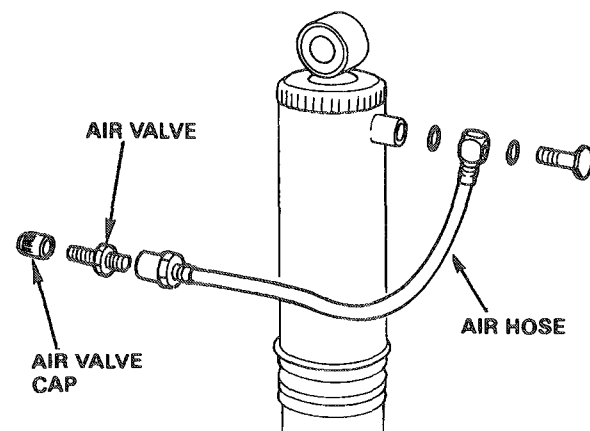
Remove the air valve from the outlet air hose.



I model:

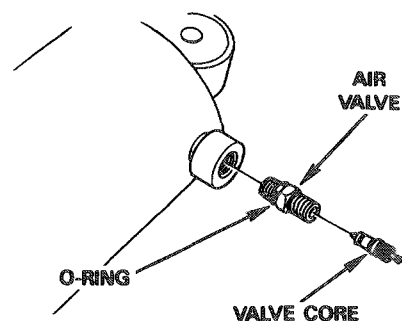
Remove the air hose from the shock absorber.

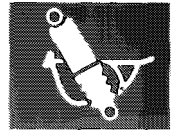
Remove the air valve cap and air valve from the air hose.



All models:

Install the air valve in the shock absorber. Remove the core from the valve.





Remove the rubber boot.

Remove the stopper ring. To do this, the inner backup ring must be pushed down below the stopper ring.

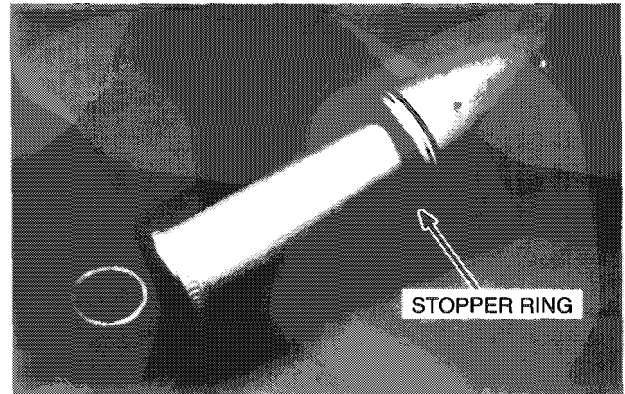
CAUTION

- Do not press the backup ring in too far or the guide bushing will jam into the shock case, making guide bushing removal difficult.

Then remove the stopper ring from the shock absorber.

Clean the shock outer case.

Securely tape a thick plastic bag to the shock's outer case. The bag will catch the suspension fluid when the seal comes out.



WARNING

- The seal will come out under hydraulic pressure which can be very high. Wear protective clothing and a face guard to protect yourself from the suspension fluid.

Clamp the shock upright in a vise with soft jaws.

NOTE

- The shock must be kept upright to keep suspension fluid from leaking out of the damper and into the outer case.

Fill the seal remover pump with Honda Suspension Fluid SS-7 or equivalent. Connect the attachment hose to the shock's air valve stem.

Tool:

Seal Remover Pump
07971-M01000A

Equivalent commercially available in U.S.A.

Pump suspension fluid into the shock absorber to force out the back-up ring, oil seal, and guide bushing.

NOTE

- It takes an average of 2 to 3 minutes of pumping to force out the seal.

Leave the shock absorber standing vertically for another 10 minutes to let any remaining suspension fluid drain. **Do not tilt the shock absorber.**

NOTE

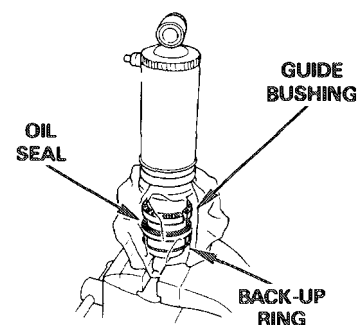
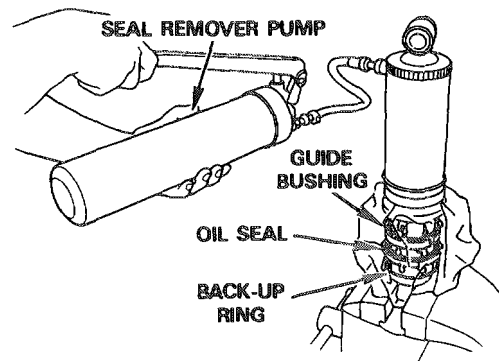
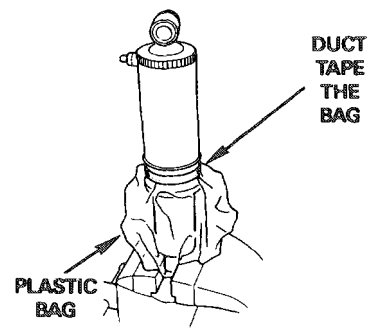
- Tilting the shock absorber will allow suspension fluid to flow out of the damper. It is very difficult to replace.

Keeping the shock upright, remove it from the vise.

Remove the plastic bag, back-up ring, the oil seal, and the guide bushing.

Install the valve core into the air valve.

In one smooth motion, turn the shock absorber upside down and clamp it in the vise.

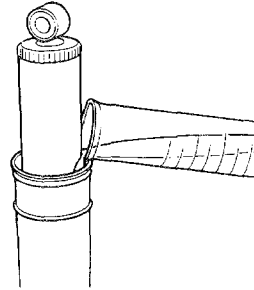


Frame/Suspension

Shock Absorbers (cont'd)

Fill the shock body with the specified amount of Pro-Honda Suspension Fluid SS-7 or equivalent.

Oil Capacity: 140cc (4.7 U.S. oz, 4.9 Imp oz)



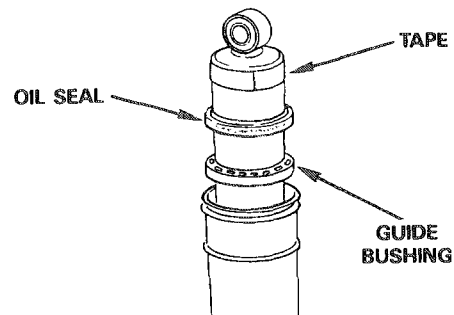
Install the guide bushing in the damper case.

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 suspension fluid 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, keeping it upright.

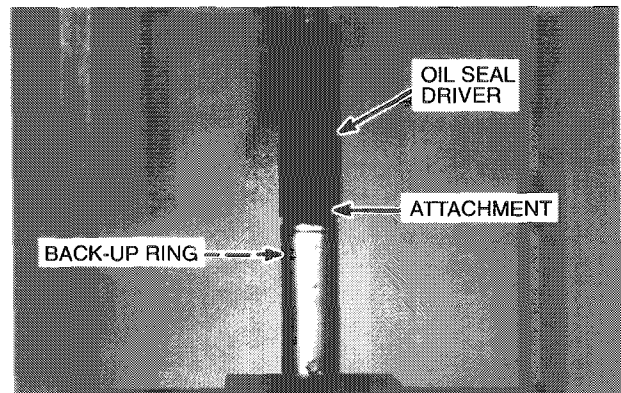
Install the back-up ring.

Press the oil seal into the damper case.

Tools:

Oil seal driver attachment
07965-KE80100

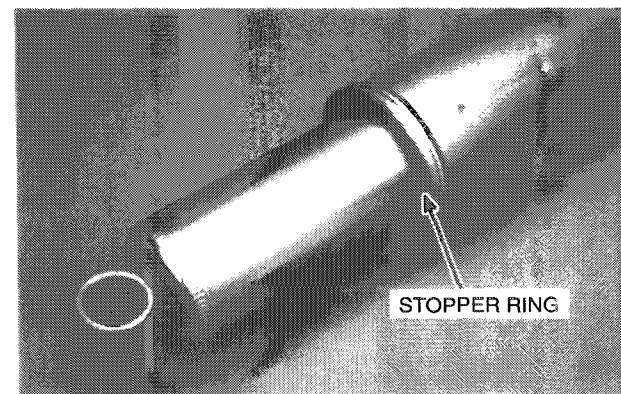
Oil seal driver
07965-MB00100

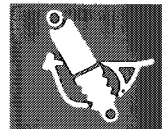


Install the stopper ring.

CAUTION

- Be sure the stopper ring is seated all the way round the stopper ring groove.



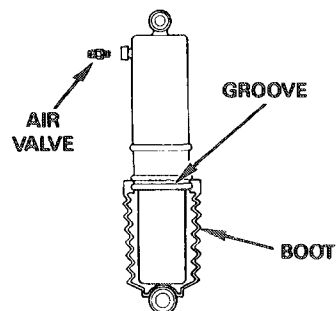


Install the boot onto the damper case and remove the air valve from the shock absorber.

NOTE

- Be sure the boot is installed properly onto the damper case groove.

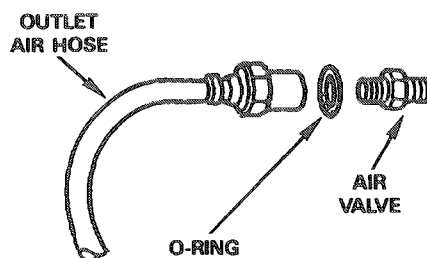
Keep the shock absorber upright to prevent loss of fluid.



A & SE models:

Apply suspension fluid to the O-ring and install the air valve to the outlet air hose.

Torque: 6 N-m, (0.6 kg-m, 4 ft-lb)



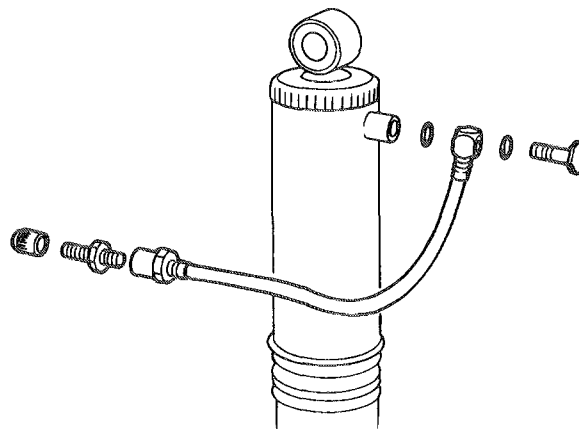
I model:

Install the air valve with O-ring to the air hose.

Apply suspension fluid to new O-rings and 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)



Installation (Left)

Install the shock absorber onto the frame.

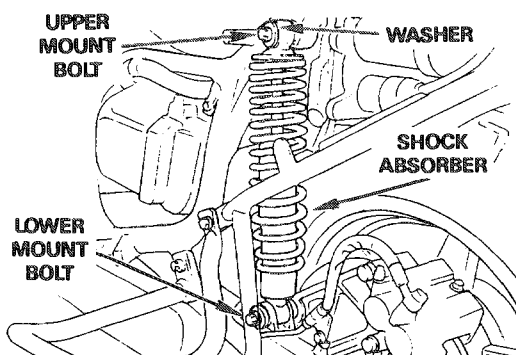
Tighten the upper and lower mount bolts to the specified torque.

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 (see page 13-17).



Frame/Suspension

Shock Absorbers (cont'd)

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)

A & SE models:

Apply suspension fluid to new O-rings and connect the airhose to the shock absorber.

Tighten the air hose bolt to the specified torque.

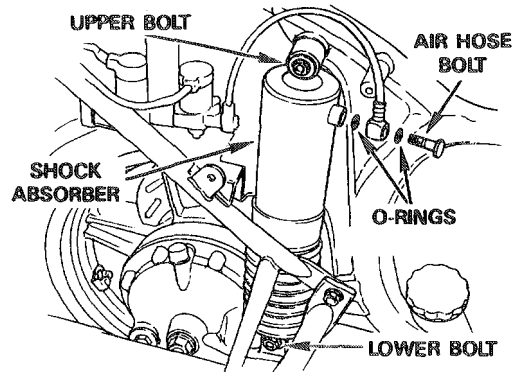
Torque: 6 N-m (0.6 kg-m, 4 ft-lb)

NOTE

- Install the hose vertically as shown.

All models:

Install the right saddlebag (see page 13-17).



Swing Arm

Removal

Place the motorcycle on its center stand on a level surface.

Remove the following:

- rear wheel (see page 15-10).
- shock absorbers (see page 12-20).

NOTE

- Keep the right shock upright with the air hose connected.

- final gear case (see page 11-4).
- battery and battery box (see page 17-7).
- brake hose and brake pipe clamps.
- exhaust chamber and heat protector (see page 7-28).

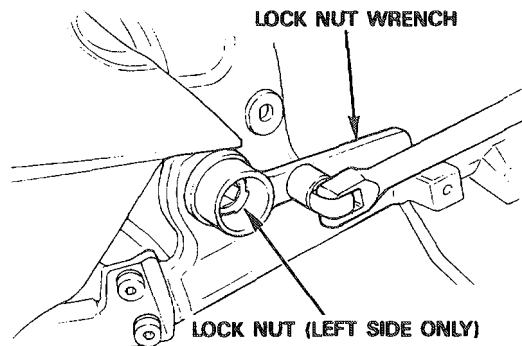
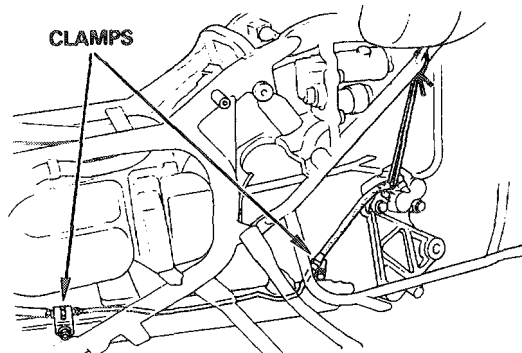
CAUTION

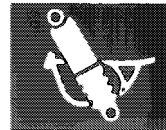
- Do not let the caliper hang by the brake hose. Hang it with a wire.

Remove the lock nut on the left side.

Tool:

Lock nut wrench
KS-HBA-08-469





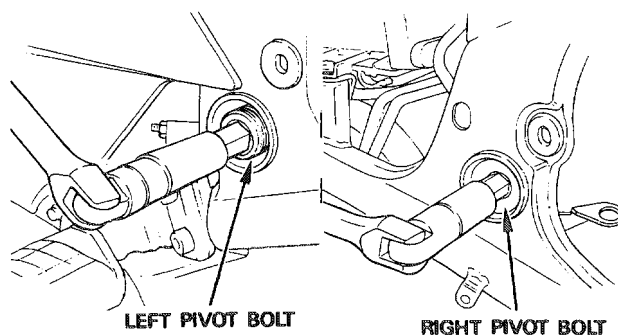
Remove the right and left pivot bolts.

Tool:

Hex socket, 17 mm

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.

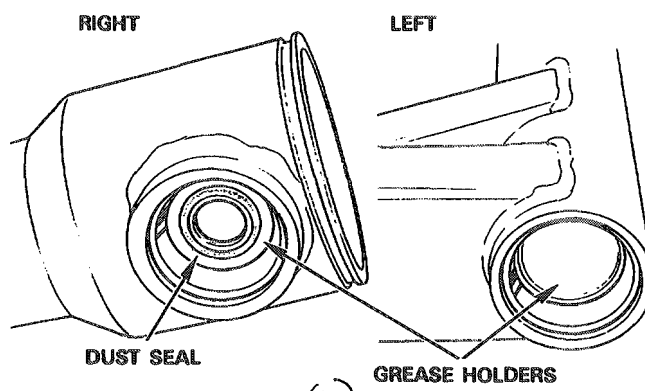
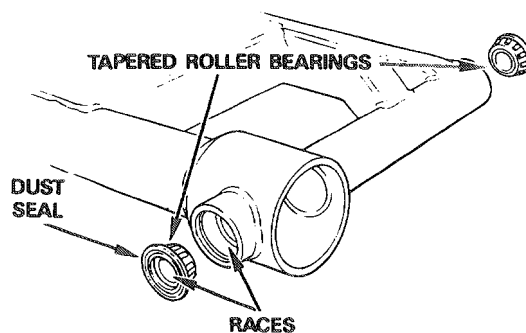
Inspect the tapered roller bearings and races for damage or wear.

Check the bearing dust seals for damage or wear. Replace, if necessary.

NOTE

- Always replace pivot bearings, races, and grease holders in pairs.

Check the grease holders for damage or deformation. Check the grease holder dust seal (right side only) for damage or fatigue.



Remove the right outer race with the grease holder.

Tools:

Bearing outer race remover

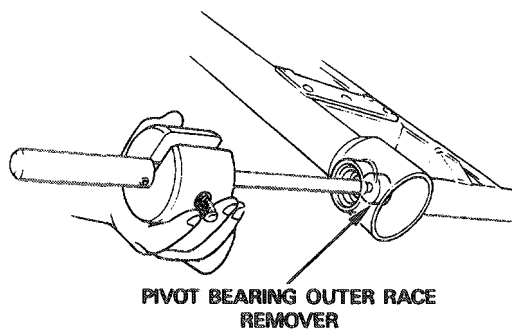
07936-8890300

Handle

07936-3710100

Weight

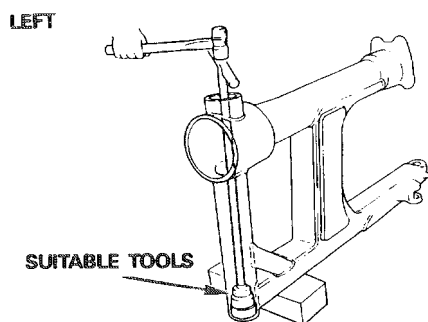
07936-3710200



Frame/Suspension

Swing Arm (cont'd)

Remove the left outer race with the grease holder with 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:

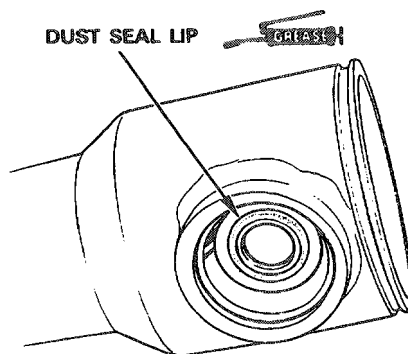
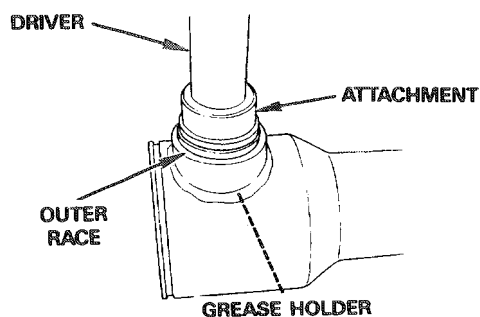
Driver

07749-0010000

Attachment, 37 x 40 mm

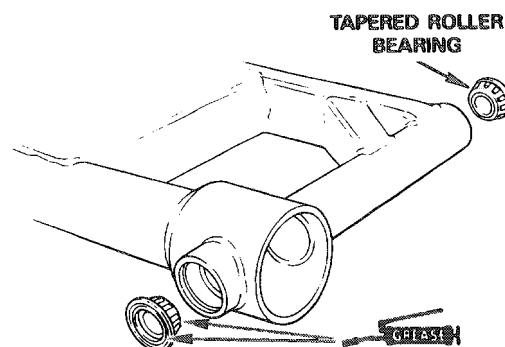
07746-0010200

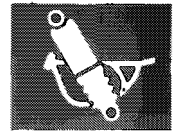
Apply grease to the right grease holder dust seal lip.



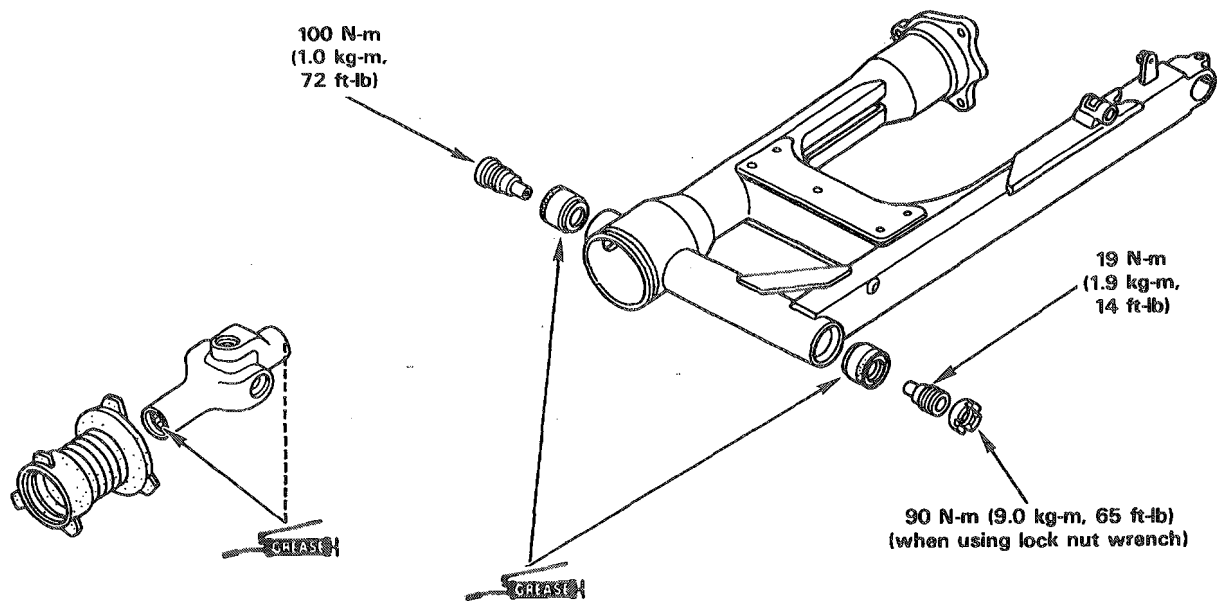
Pack the tapered roller bearings with grease. Apply grease to the bearing dust seal lips.

Install the bearings into the swing arm pivots.



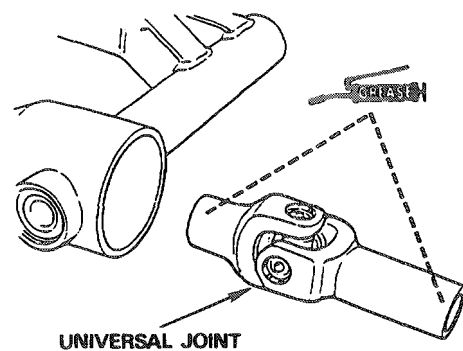


Installation



Lubricate the universal joint splines with grease.

Place the universal joint in the swing arm, with the long splines to the front.

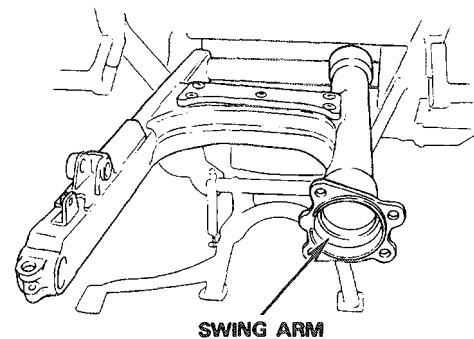


Position the swing arm in the frame

Grease the tips of the pivot bolts and loosely install them.

NOTE

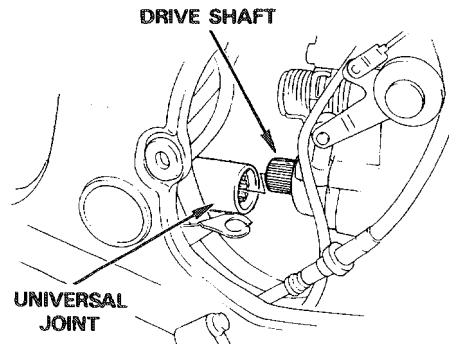
- Make sure that the ends of the pivot bolts are inside the bearing inner races.



Frame/Suspension

Swing Arm (cont'd)

Slide the universal joint onto the final drive shaft.

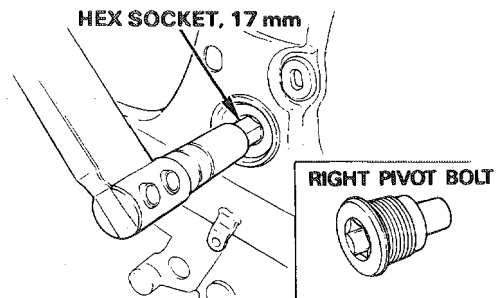


Tighten the right pivot bolt.

Torque: 100 N-m (10.0 kg-m, 72 ft-lb)

Tool:

Hex socket, 17 mm



Tighten the left pivot bolt.

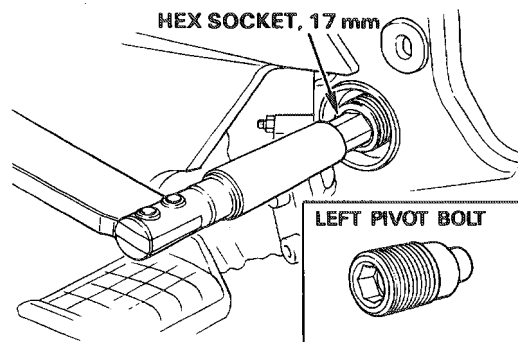
Torque: 19 N-m (1.9 kg-m, 14 ft-lb)

Move the swing arm up and down several times to seat the bearings.

Then retorque the pivot bolt.

Tool:

Hex socket, 17 mm



Install the pivot lock nut on the pivot bolt.

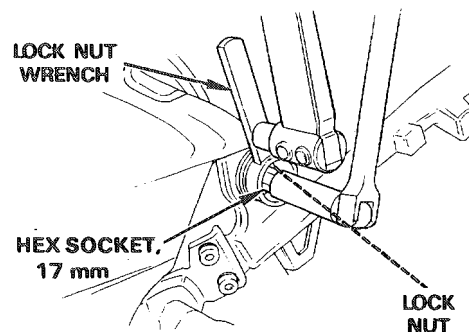
Hold the pivot bolt and tighten the pivot lock nut to a torque wrench reading of 90 N-m (9.0 kg-m, 65 ft-lb).

Tool:

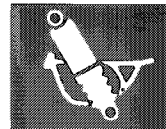
Lock nut wrench
KS-HBA-08-469

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 (A & SE only)

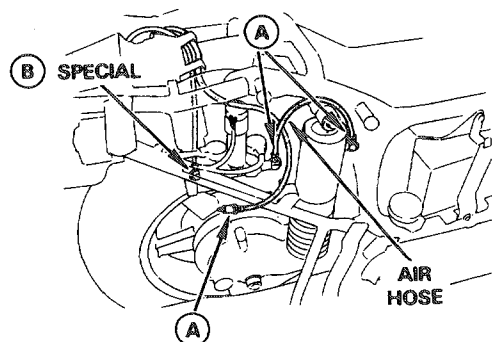
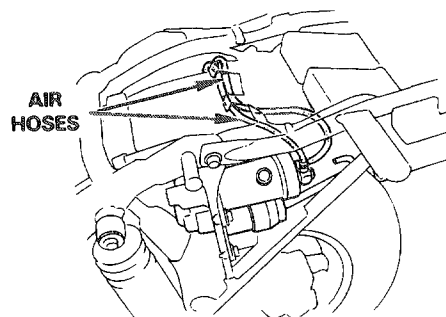
Check the air hoses for loose connections, damage, or deterioration.

If the air hose connection is loose, tighten 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 (see page 13-14).

Remove the rear fender (rear) mounting bolt.

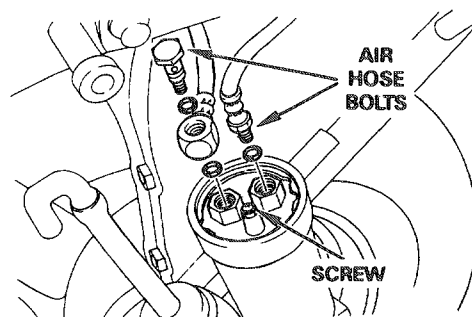
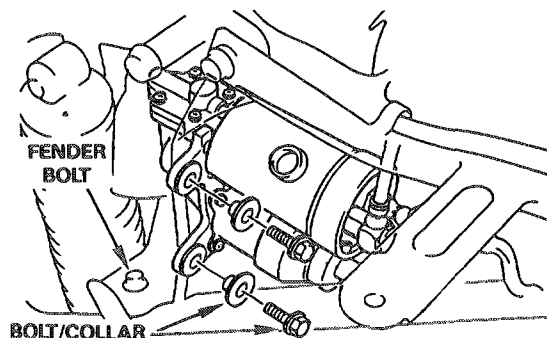
Disconnect the 2P-WHT connector at the connector holder on the rear fender.

Remove the air pump mounting bolts and collars and the air pump from the frame.

Disconnect the air hose bolts. Remove the air pump from the air hoses.

NOTE

- Do not remove the screw.



Frame/Suspension

On-Board Air Compressor System (cont'd)

— Drier Disassembly/Assembly

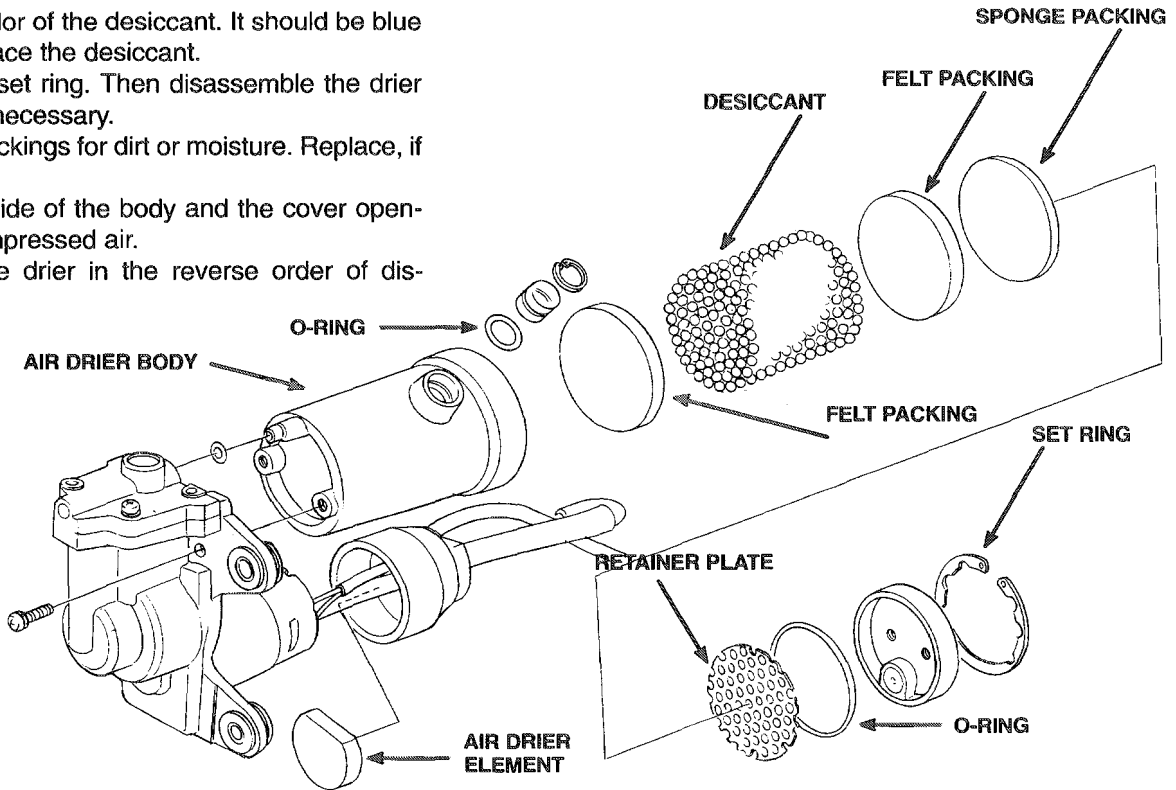
Check the color of the desiccant. It should be blue. If it isn't, replace the desiccant.

Remove the set ring. Then disassemble the drier as shown, if necessary.

Check the packings for dirt or moisture. 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.

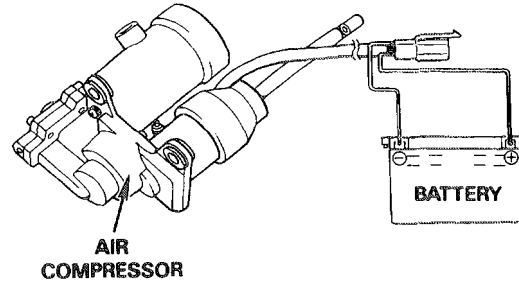


— Air Pump Inspection

Use a 12V battery to energize the pump motor and check its operation.

NOTE

- Do not disassemble the air compressor.



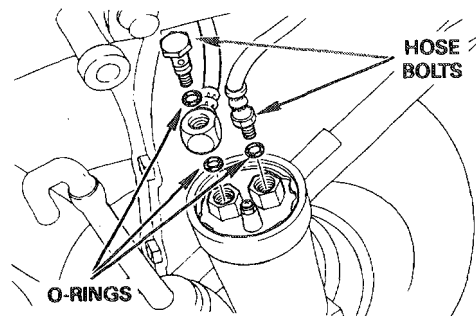
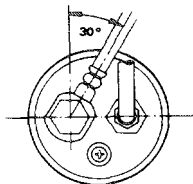
— Installation

Apply suspension fluid to new O-rings and connect the air hose bolts. Tighten the bolts to the specified torque.

Torque: 6 N-m (0.6 kg-m, 4 ft-lb)

NOTE

- Install each hose as shown.

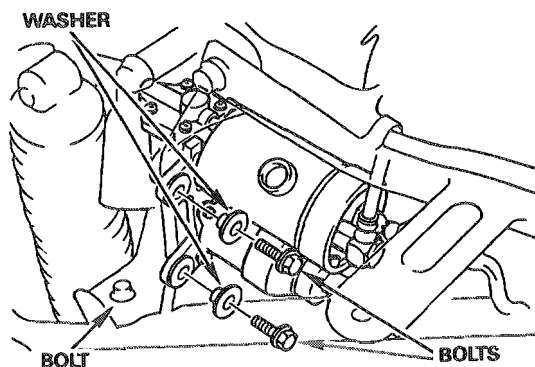




Install the air pump onto the frame.

Install the following:

- rear fender (rear) mounting bolt.
- 2P-WHT connector.
- saddlebag (see page 13-17) and trunk (see page 13-15).



Air Distributor

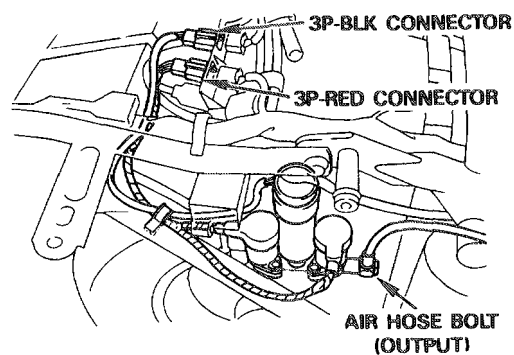
— Removal

Remove the trunk (see page 13-15) and right saddlebag (see page 13-17). Disconnect the 3P-BLK and 3P-RED connectors at 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.

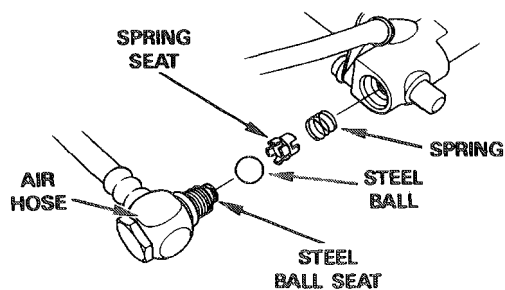
Remove the air hose bolt (input side) and disconnect the air hose from the distributor body.



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.

Disconnect the relief valve drain tube and remove the air distributor as an assembly.



— Solenoid Valve Inspection

Connect a pressure pump to the suspension valve (yellow label) output port and apply pressure.

Tool:

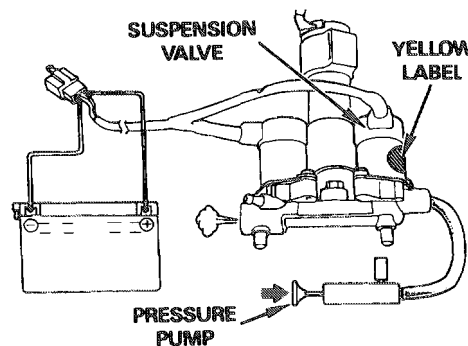
Pressure pump
ST-AH-255-MC7

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 (see page 12-34).



Frame/Suspension

On Board Air Compressor System (cont'd)

Connect a vacuum pump to the relief valve (White Label) relief port and apply vacuum.

Tool:
Vacuum pump
ST-AH-260-MC7

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.

— 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: 0.7-1.3K 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).

Tool:
Pressure pump
ST-AH-255-MC7

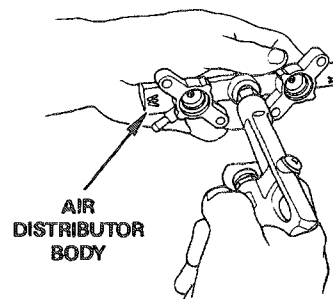
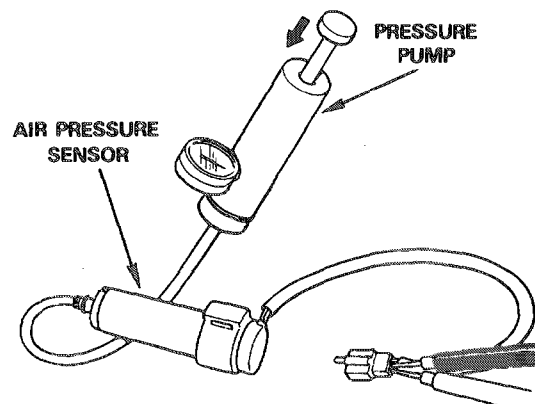
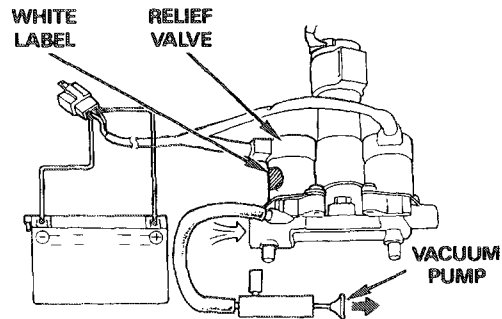
The resistances between the BLK/GRN and LT BLU terminals should decrease proportionally as the pressure increases.

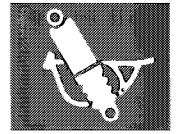
The resistances between the LT BLU and GRN/RED terminals should increase proportionally as the pressure increases.

— 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.



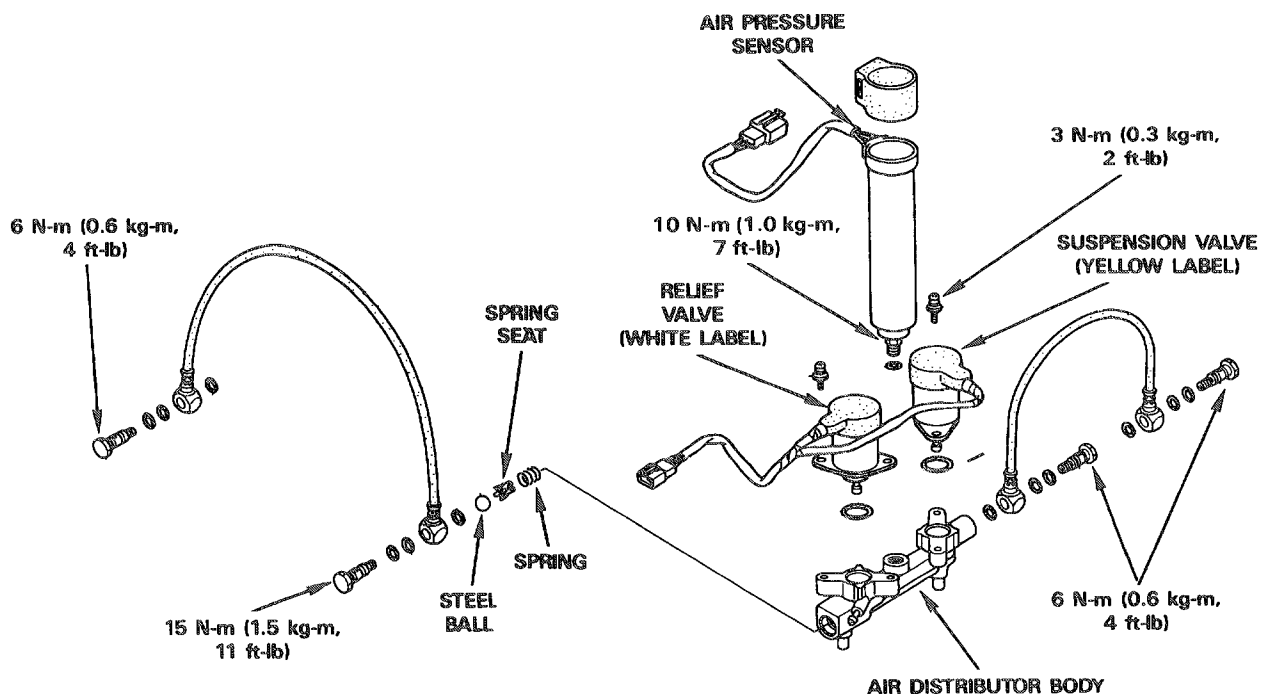


— Assembly/Installation

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

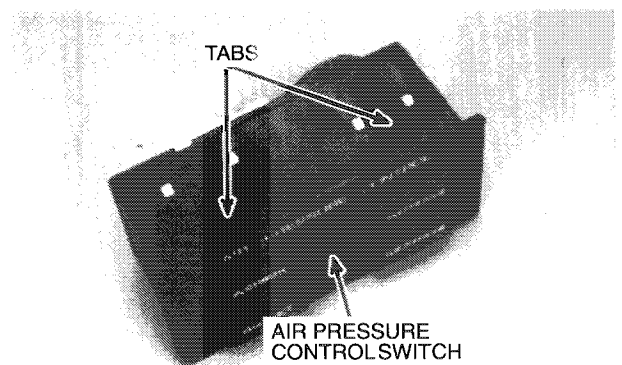
— Inspection

Remove the right fairing inner cover (see page 13-12).

Disconnect the 6P-WHT connector of the air pressure control switch.

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 the next page.



Frame/Suspension

On-Board Air Compressor System (cont'd)

Continuity should exist between the color coded wires in the charts as shown.

Increase/Decrease Switch

Color \ Switch Position	LT GRN/BLK	BRN/YEL	BRN/WHT
Increase	○ — ○	○ — ○	
Free			
Decrease		○ — ○	○ — ○

Outlet Switch

Color \ Switch Position	BRN/YEL	BRN/WHT	LT GRN/YEL	LT GRN/BLK
Free	○ — ○			
Push			○ — ○	

P. Check Switch

Color \ Switch Position	LT GRN	BRN/BLUE
Free		
Push	○ — ○	○ — ○

Air Pump Relay (Relay 5 in the relay box)

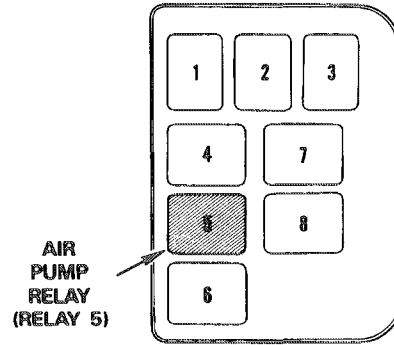
— Operation Inspection

Open the relay box cover under the left rear side cover.

Turn the ignition switch to ACC, ON, or P position.

Depress the P. CHECK button.

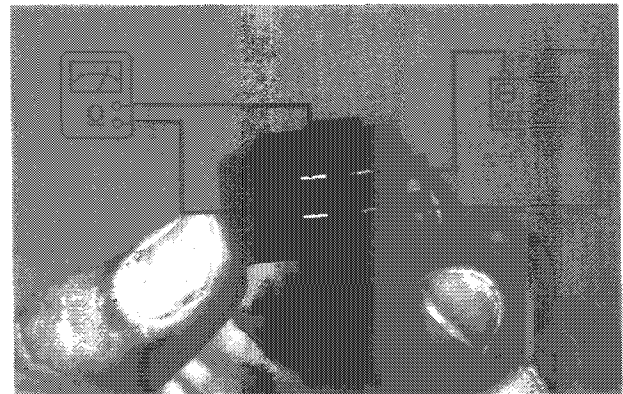
The relay primary coil is normal if it clicks.



— 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.



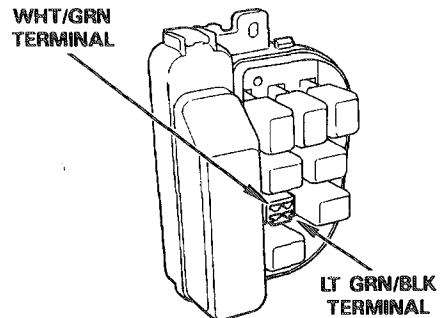
— Wiring Inspection

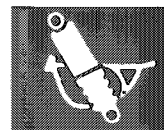
Measure voltage between the LT GRN/BLK (+) terminal on the wire harness side and ground (-) with the ignition switch ACC, ON, or P.

Battery voltage should register.

Measure voltage between the WHT/GRN (+) terminal on the wire harness side and ground (-).

Battery voltage should register at all times.



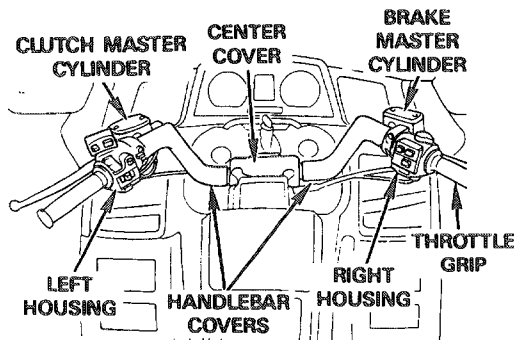


Handlebar

Removal

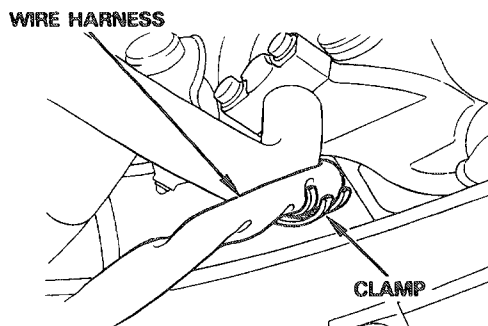
Remove the following:

- Clutch master cylinder
- Left switch housing
- Front brake master cylinder
- Right switch housing
- Throttle grip
- Handlebar cover set plates
- Handlebar covers
- A & SE: Handlebar center cover



NOTE

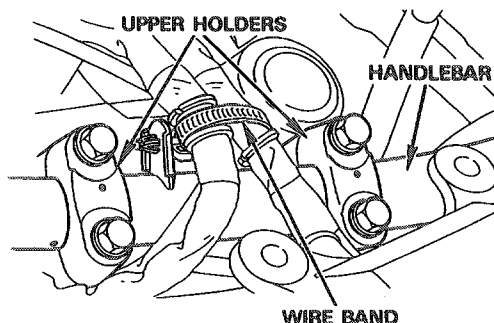
- Using wires, hang the clutch and front brake master cylinder at least as high as the position originally installed to prevent air getting into the master cylinder.
- Do not twist the brake or clutch hoses.



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

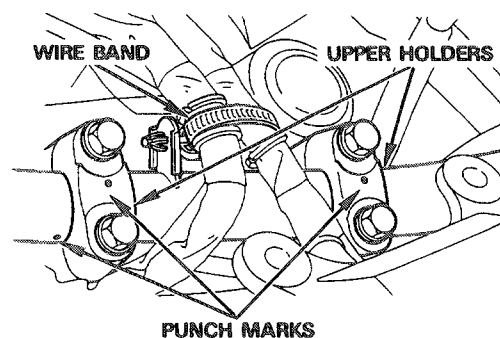
Install the handlebar onto the steering top bridge, aligning the punch marks on the handlebar with the top bridge upper edge.

Install the handlebar upper holders with the punch marks on them facing forward. Tighten the holder bolts.

Torque: 25 N-m (2.5 kg-m, 18 ft-lb)

NOTE

- Tighten the holder bolts front side first, then tighten the rear side.

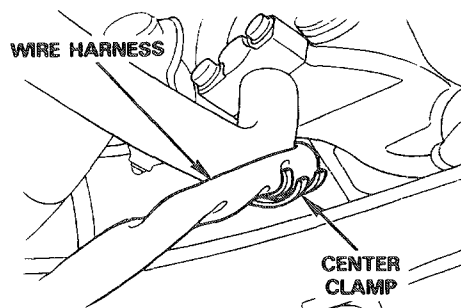


Frame/Suspension

Handlebar (cont'd)

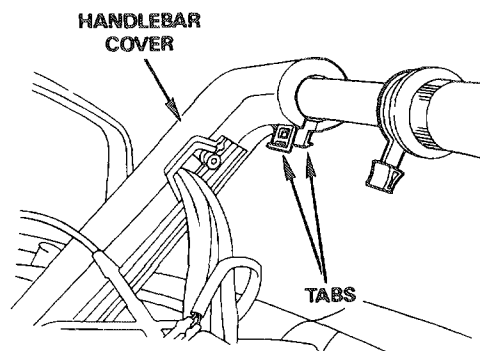
Install the wire band onto the handlebar.

Clamp the right handlebar switch wire harness securely with the center clamp.



Install the handlebar cover (each side).

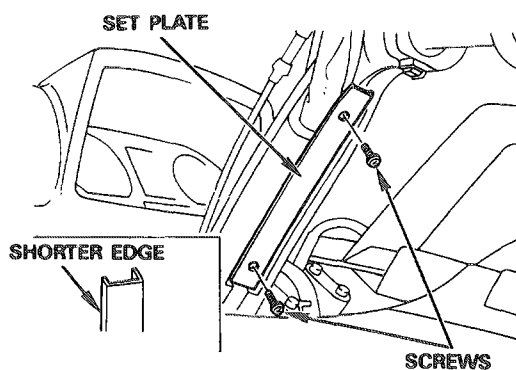
Secure the upper end of the handlebar covers by fastening the tab at the upper end.



Install and secure the handlebar cover set plates with the screws.

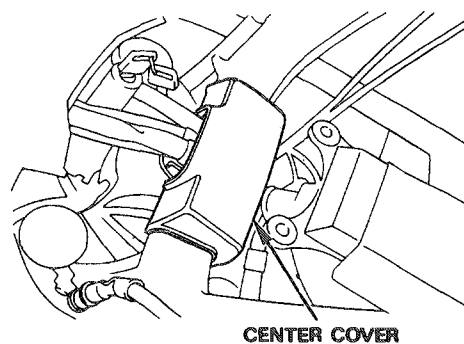
NOTE

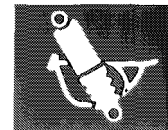
- Install the set plate with its shorter edge forward.



A & SE models:

Install the handlebar center cover securely.

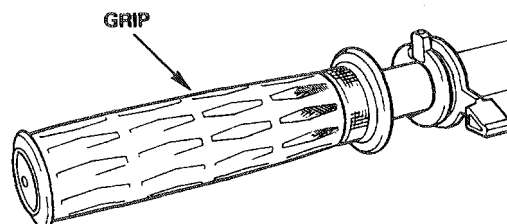




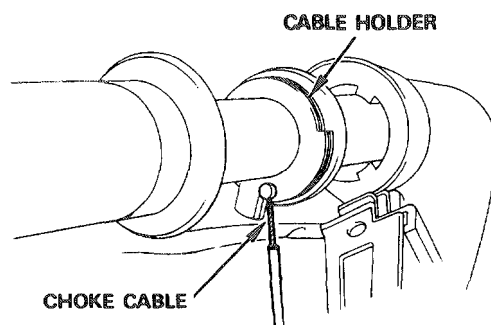
If the hand grips were removed, apply Honda Bond A or Honda Grip Cement (U.S.A. only) to the inside surfaces of the grips and to the clean surfaces of the left handlebar and throttle grip. Wait 3-5 minutes and install the grips. Rotate the grips for even application of the adhesive.

NOTE

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



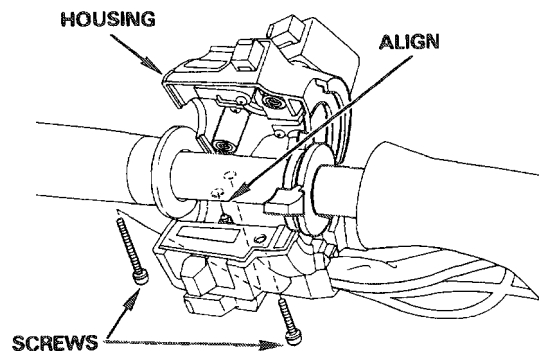
Install the choke cable onto the cable holder.



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.

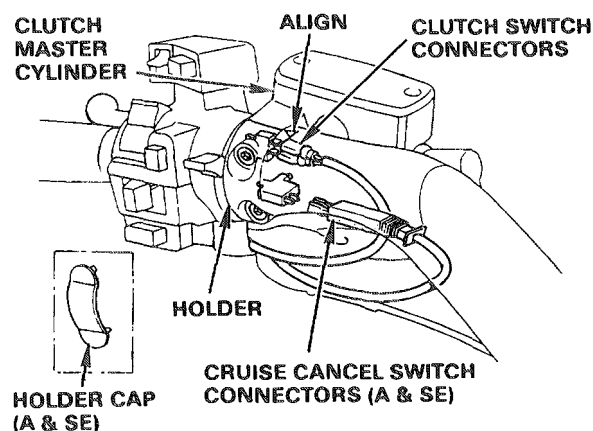
Install and tighten the holder bolts.

Torque: 12 N-m (1.2 kg-m, 9 ft-lb)

Connect the clutch switch connectors.

A & SE: Connect the cruise control cancel switch connectors.

A & SE: Install the holder cap.



Frame/Suspension

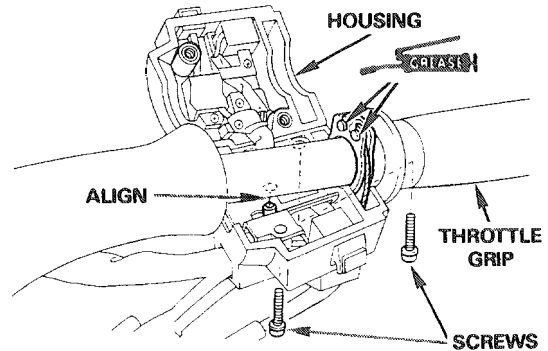
Handlebar (cont'd)

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. Connect the throttle cables to the grip.

Secure the housing with the screws; 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.

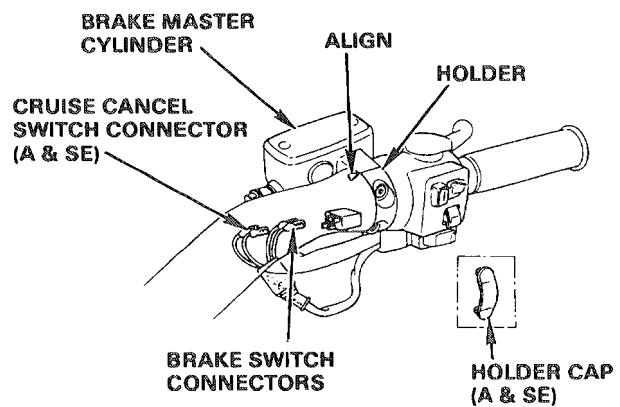
Install and tighten the holder bolts.

Torque: 12 N-m (1.2 kg-m, 9 ft-lb)

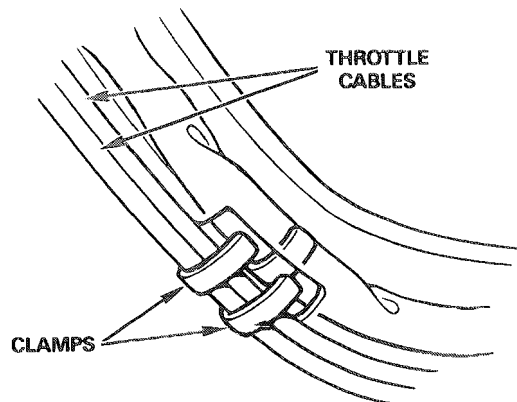
Connect the brake switch connectors.

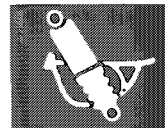
A & SE: Connect the cruise cancel switch connectors.

A & SE: Install the holder cap.



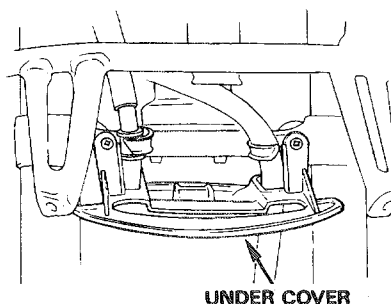
Securely clamp the throttle cables with the right handlebar clamps.





Removal

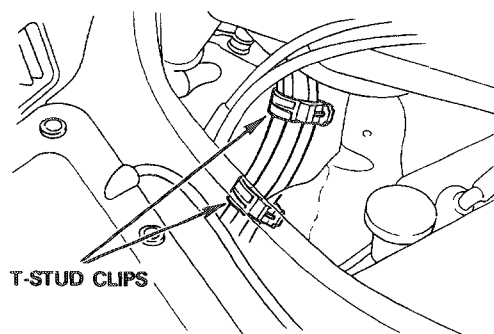
Remove the stem under cover from the steering stem. (It isn't necessary to remove the fairing to remove the stem under cover.)



Unfasten the T-stud clips at the lower side of the ignition switch.

NOTE

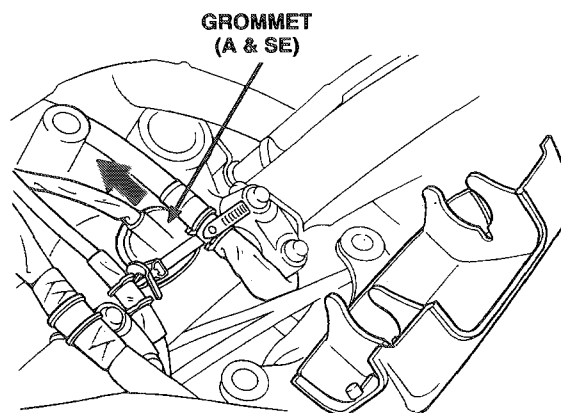
- Do not remove the T-stud clips from the frame. The T-stud clips cannot be reused if removed.



A & SE only:
Remove the steering stem grommet and slide it all the way to the wire harness.

CAUTION

- Apply a soapy water solution to the wire harness surface to allow the grommet to slide smoothly.



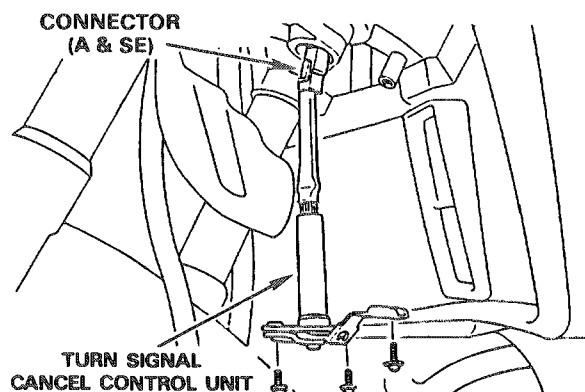
Remove the retaining screws and move the turn signal cancel control unit enough to disconnect the unit connector.

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.



Frame/Suspension

Steering Stem (cont'd)

Remove the following parts.

- Handlebar (see page 12-37).
- Front wheel (see page 15-5).
- Front fender (see page 13-18).

NOTE

- The steering stem can be removed without removing the fairing.
-

Remove the steering stem nut.

Tool:

Socket, 30 mm

Remove the fork legs (see page 12-11) and top bridge.

Straighten the lock washer tabs. 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

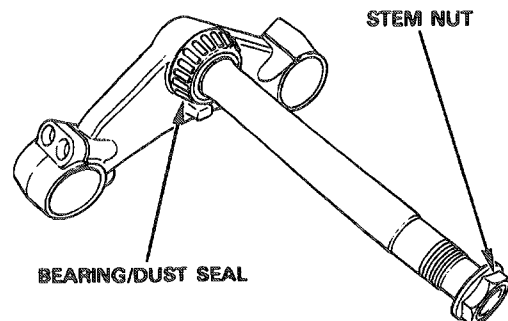
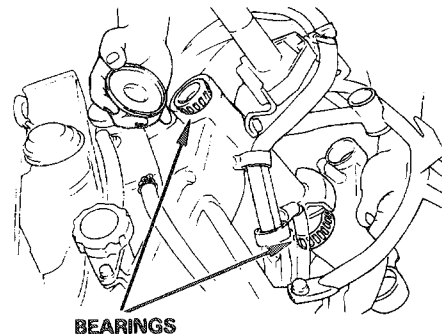
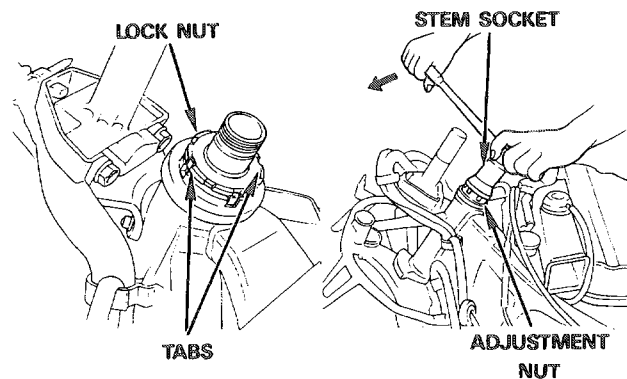
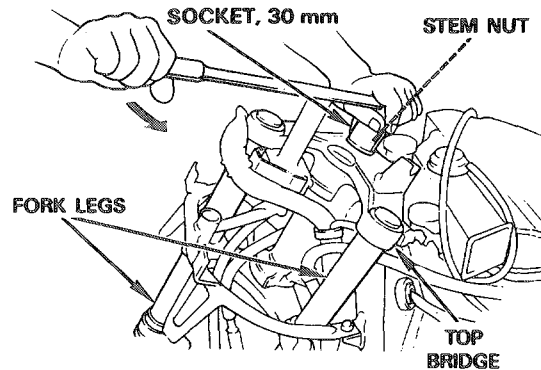
- **Steering head bearings and races are supplied in matched sets to ensure a precision fit. Remove and install complete sets. Do not mix replacement bearings or races with original parts.**
 - **If there has been collision damage, inspect the steering head for cracks, deformation, and misalignment before you install new races.**
-

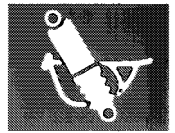
Bottom Bearing Replacement

Remove the bottom bearing with a hammer and a drift.

NOTE

- Install the stem nut on the top end of the steering stem to prevent damage to the threads.
 - The bearing and dust seal will 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 or 07736-A01000A
Bottom race: Ball race remover
07953-4250002
Bearing race remover
07946-3710500

NOTE

- Always remove the top race before driving out the bottom race.

Install a new bottom race.

Tools:
Driver
07749-0010000
Attachment, 52 x 55 mm
07746-0010400

NOTE

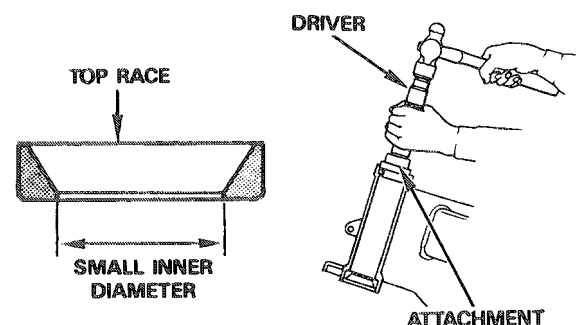
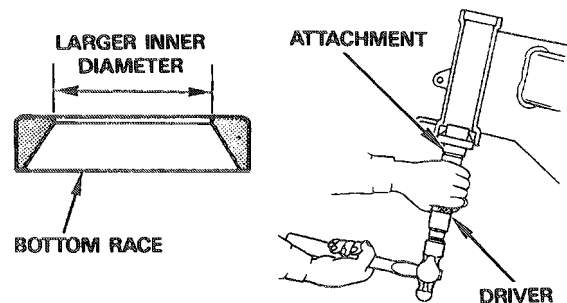
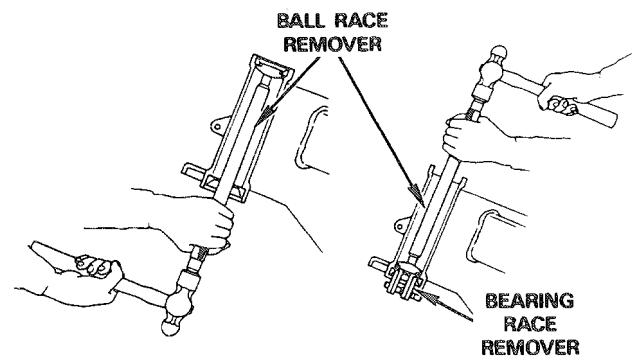
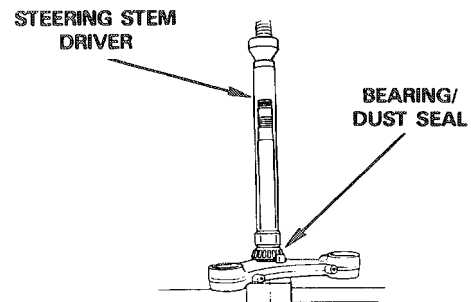
- The bottom race has a larger I.D. than the top race. Be sure to install the races properly.
- Drive the races in squarely until they seat fully.

Install a new top race.

Tools:
Driver
07749-0010000
Attachment, 42 x 47 mm
07746-0010300

NOTE

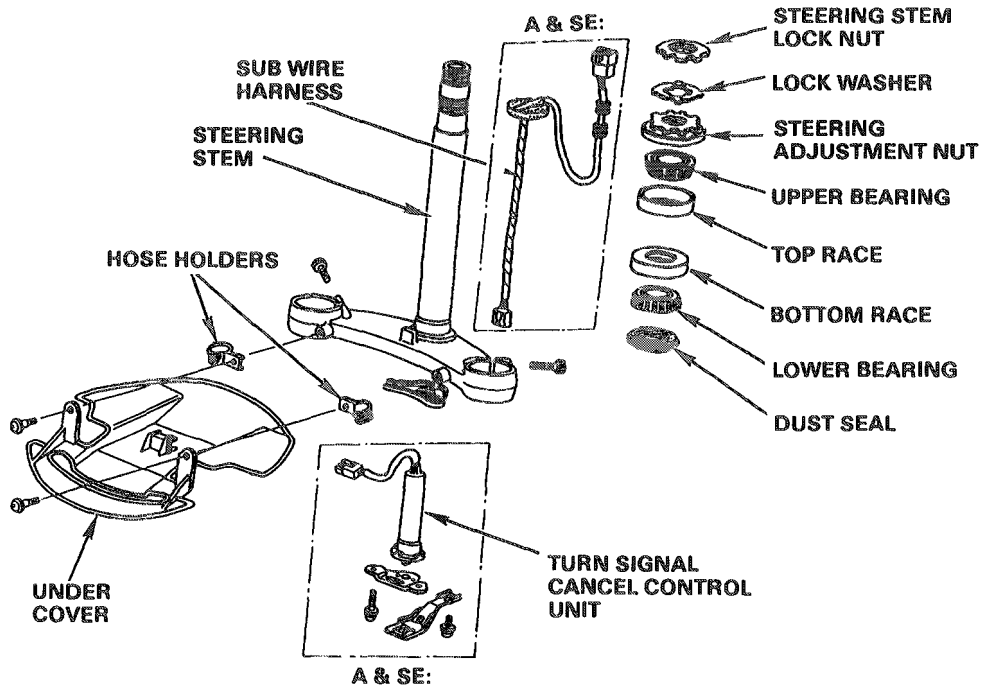
- Drive the races in squarely until they are fully seated.



Frame/Suspension

Steering Stem (cont'd)

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 is hand-tight.
4. Then retighten to the specified torque.

Tool:

Steering stem socket
07916-3710100

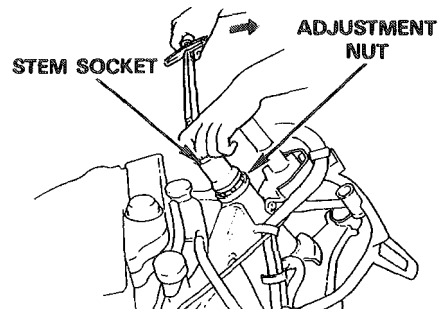
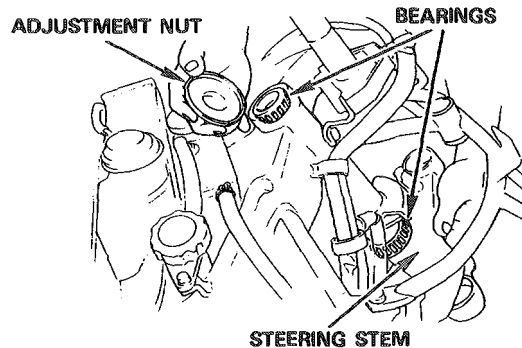
Torque: 19 N-m (1.9 kg-m, 14 ft-lb)

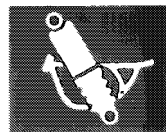
Repeat steps 2, 3, and 4 above.

Then repeat steps 2 and 4 a third time, (do not loosen the adjustment nut).

⚠ WARNING

- Improper adjustment of the steering stem adjustment nut (too loose or too tight) may cause handlebar oscillation, cornering instability, or excessive noise during braking.





Install a new lock washer, aligning the tabs with the nut grooves.

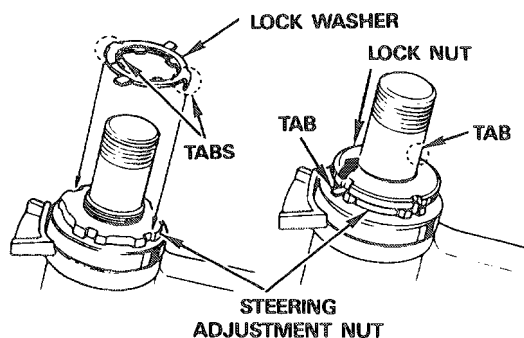
NOTE

- Always use a new lock washer.

Hold the adjustment nut and hand tighten the lock nut 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 top nut.

Tool:

Socket, 30 mm

Torque: 100 N-m (10.0 kg-m, 72 ft-lb)

Loosen the lower fork pinch and install the fork legs (see page 12-19).

Install the following:

- Front fender (see page 13-18).
- Front wheel (see page 15-8).

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

Position the steering stem to the straight-ahead position.

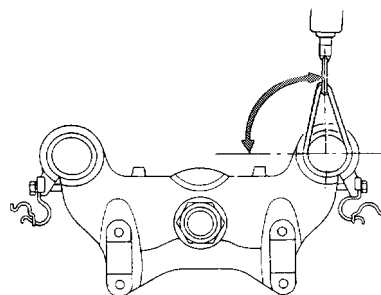
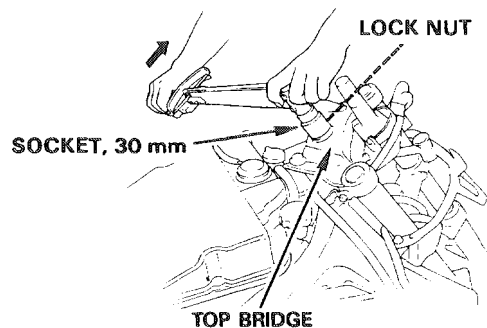
Hook a spring scale to the fork tube and measure the steering head bearing preload.

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 to the ground and adjust the steering stem adjustment nut (see previous page).



⚠ WARNING

- **Incorrect steering head bearing preload may cause handlebar oscillation, cornering instability, or excessive noise during braking.**

Frame/Suspension

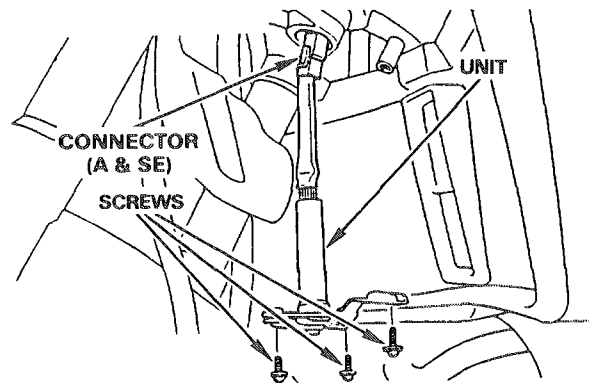
Steering Stem (cont'd)

A & SE models:

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 soapy water solution to the wire harness surface to allow sliding the grommet smoothly.

All models:

Install the handlebar (see page 12-37).

A & SE models:

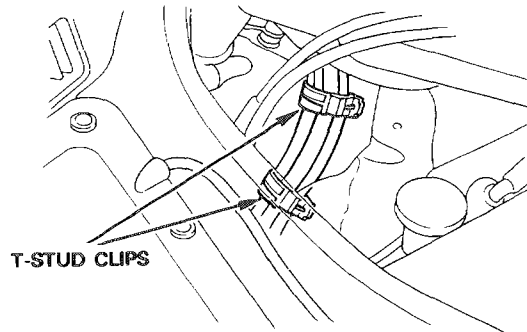
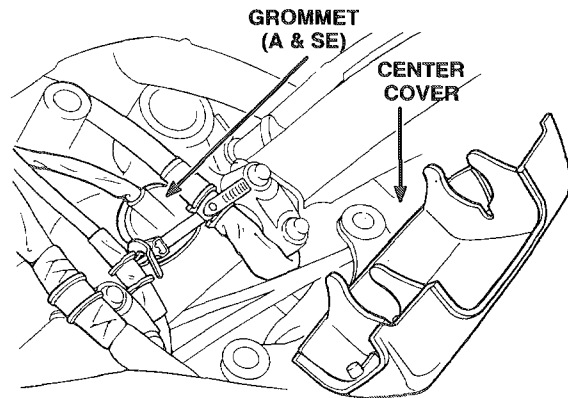
Install the handlebar center cover securely.

All models:

Fasten T-stud clips at lower side of the ignition switch.

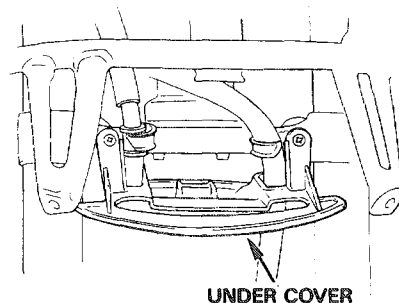
NOTE

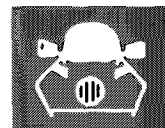
- Do not remove the T-stud clips from the frame. The T-stud clips cannot be reused if removed.



Install the stem under cover, inserting its tab between the turn signal cancel control unit plates.

Tighten the brake hose holder screws.





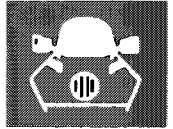
Fairing/Body Components

Service Information	13-2
Windshield	13-3
Fairing	13-6
Trunk/Saddlebags	13-14
Front Fender	13-18
Rear Fender	13-19
Adjustable Passenger	
Footrests (SE)	13-20
Footrests	13-22

Fairing/Body Components

Service Information

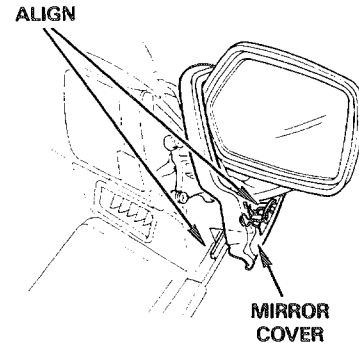
- When removing a cover, be careful not to damage any tab or groove.
- Installation is reverse of removal, unless noted otherwise



Windshield

Replacement

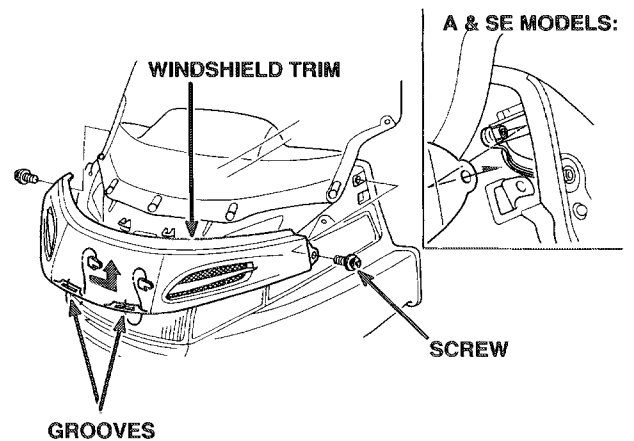
Release the spring clamp from the fairing groove and free the mirror covers.



Remove two screws.

A & SE: Remove the windshield trim from the windshield height adjustment level tension plate.

Free the trim grooves from the fairing tabs and remove the trim from the fairing.



Remove the screws and windshield.

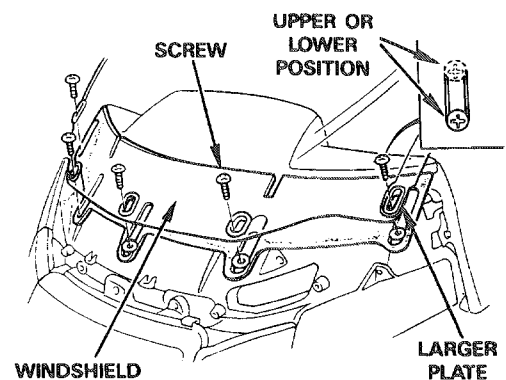
Install a new windshield. Align the setting plates with the holes of the windshield and tighten the screws securely.

NOTE

- Position the two larger setting plates on both ends.
- Make sure the windshield can 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.



Fairing/Body Components

Windshield (cont'd)

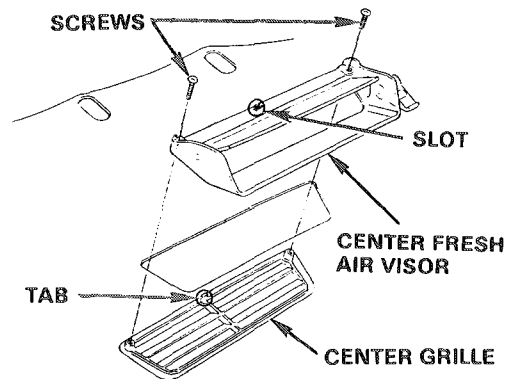
Center Fresh Air Visor (SE only)

Removal

Remove the windshield.

Remove the two screws, center fresh air visor and grille.

Remove the screw, lever cover, lever, spring, steel ball and plate from the visor.



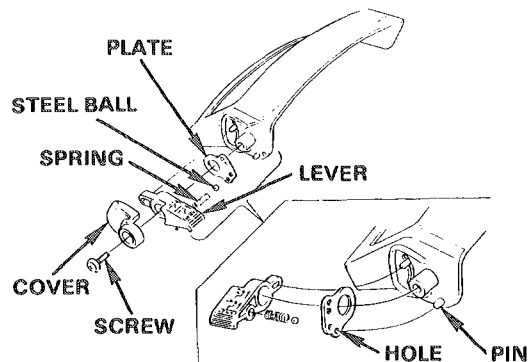
Installation

Install the plate onto the visor, aligning the hole in the plate with the pin on the visor.

Install the spring and steel ball into the lever, then install the lever, cover and screw securely.

Install the grille and visor on the windshield, aligning the tab on the grille with the slot in the visor.

Install, then tighten the screws securely.



Windshield Lever Replacement (A & SE only)

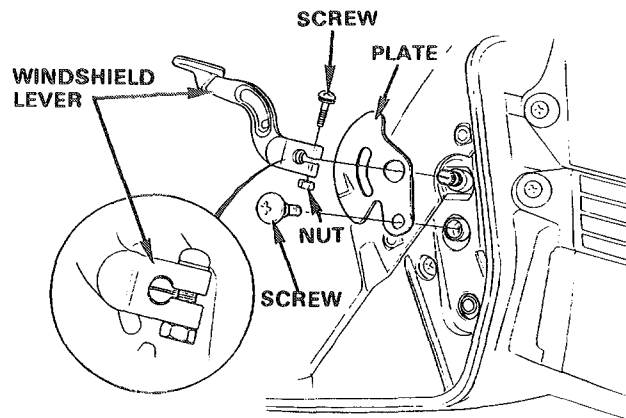
Remove the nut, screw and windshield lever.

Remove the screw and plate.

Install the windshield lever (as shown) in the reverse order of removal.

NOTE

- Align the slit of the lever with the index line on the lever shaft as shown.



Windshield Lever Adjustment (A & SE only)

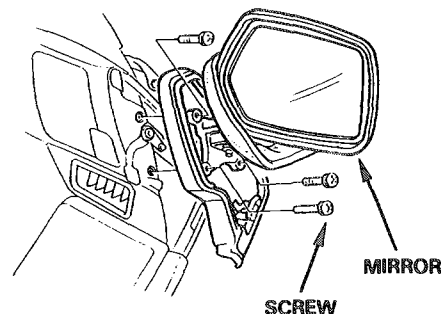
NOTE

- If the lever is removed, adjust the lever as follows:

Step 1:

Install the windshield.

Remove three screws and the mirror (each side).

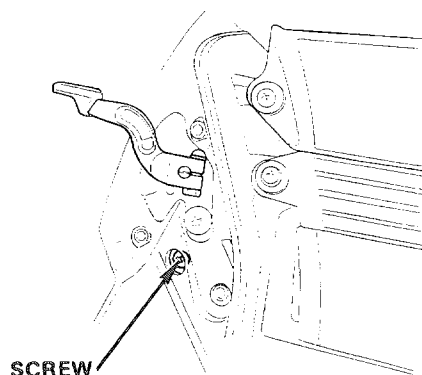




Step 2:

Loosen the screw as shown (each side).

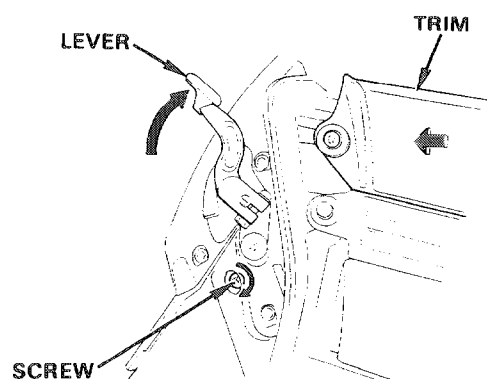
Temporarily tighten the screw on the other side. (Do not tighten the screw on the side being adjusted.)



Step 3:

Set the lever at the upper position.

Push the windshield trim and, at the same time, tighten the screw as shown.



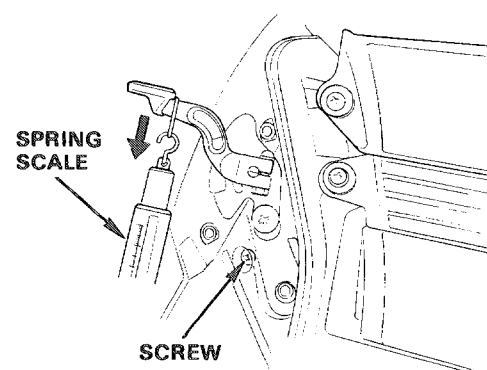
Step 4:

Set the other side lever at the lower position.

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 the above specification, loosen the screw and return to Step 3.

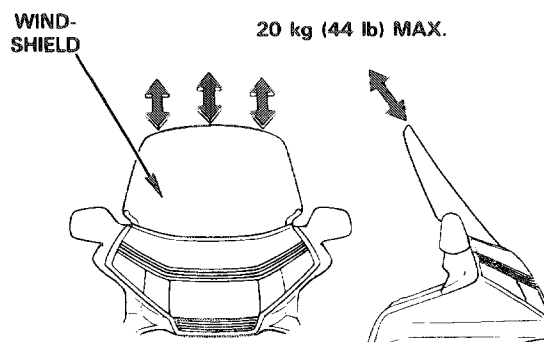
For the other windshield lever, perform Steps 3 and 4.



Step 5:

Make sure the lever can be operated smoothly.

With both levers at the lower position, check that the windshield does not move up and down by applying a force which does not exceed 20 kg (44 lb).



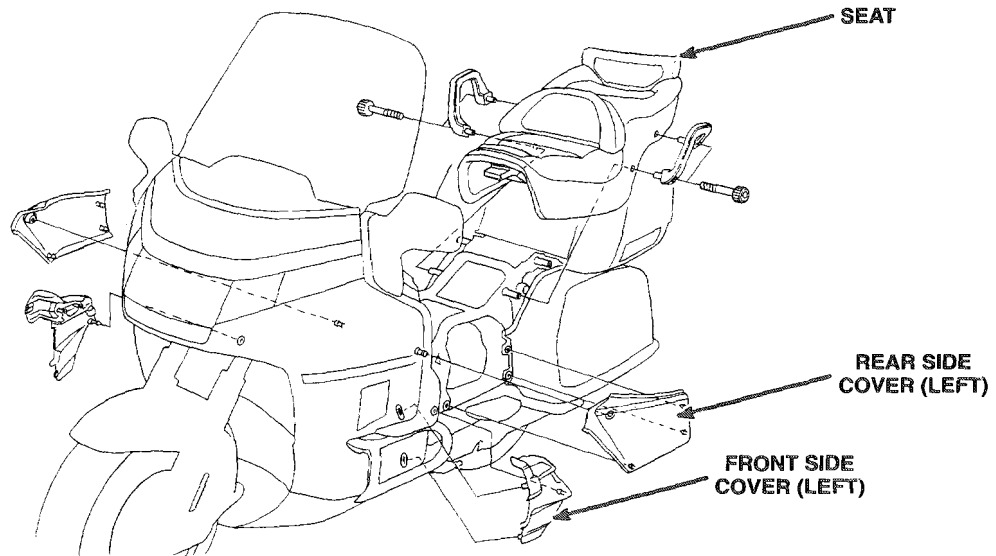
Fairing/Body Components

Fairing

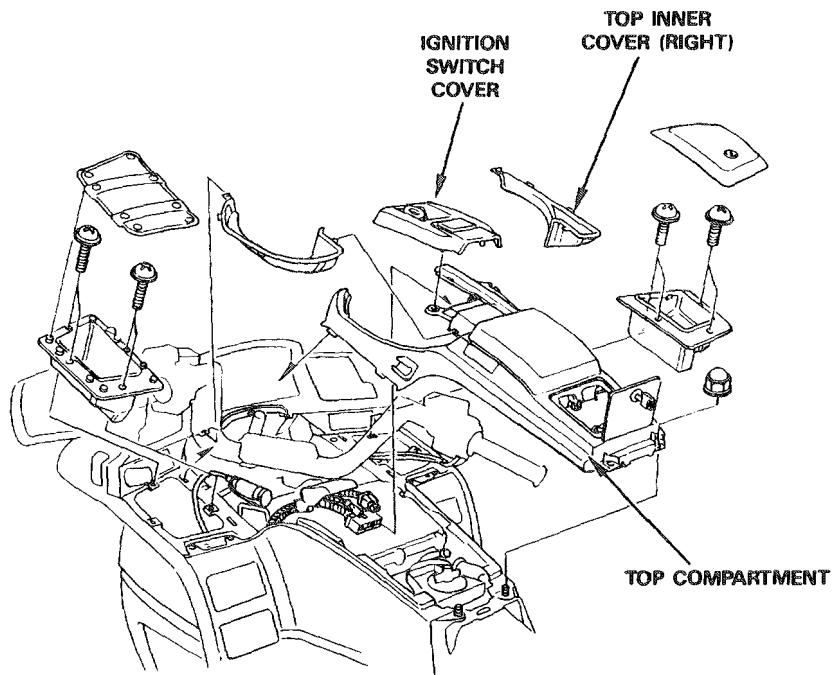
NOTE

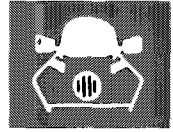
- Remove the fairing following steps 1 through 4. For detailed instructions, see pages 13-8 through 13-12.

Step 1:

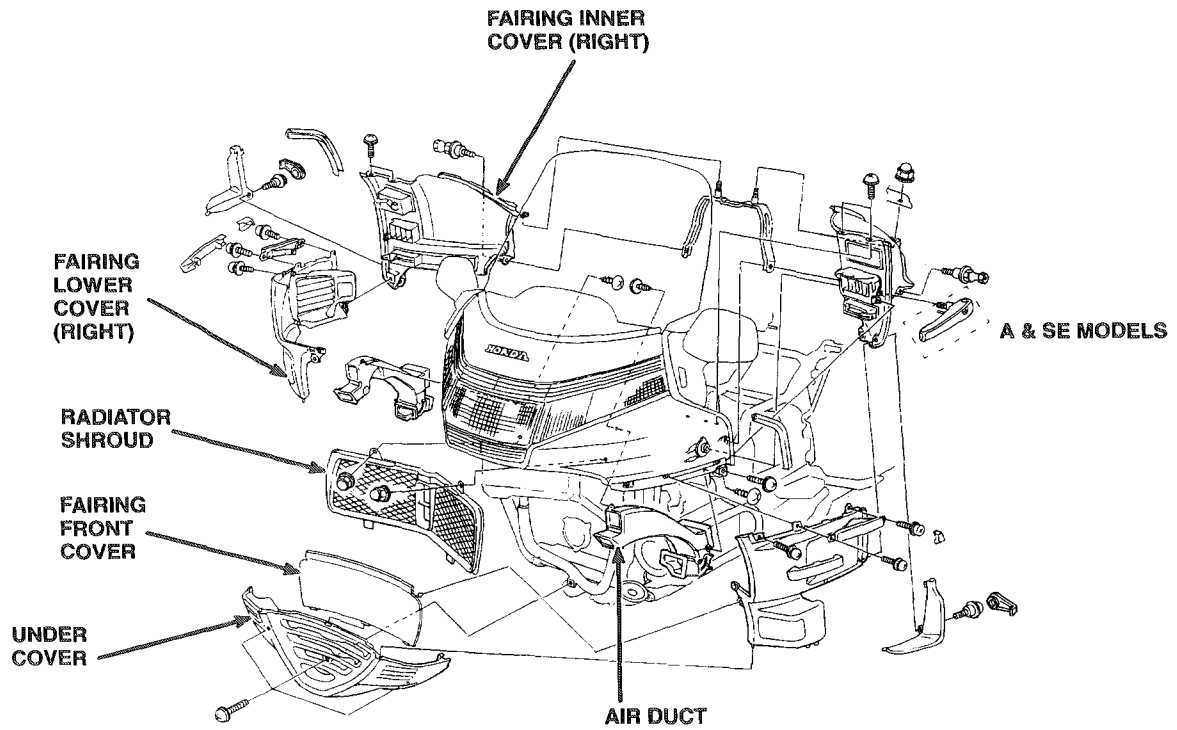


Step 2:

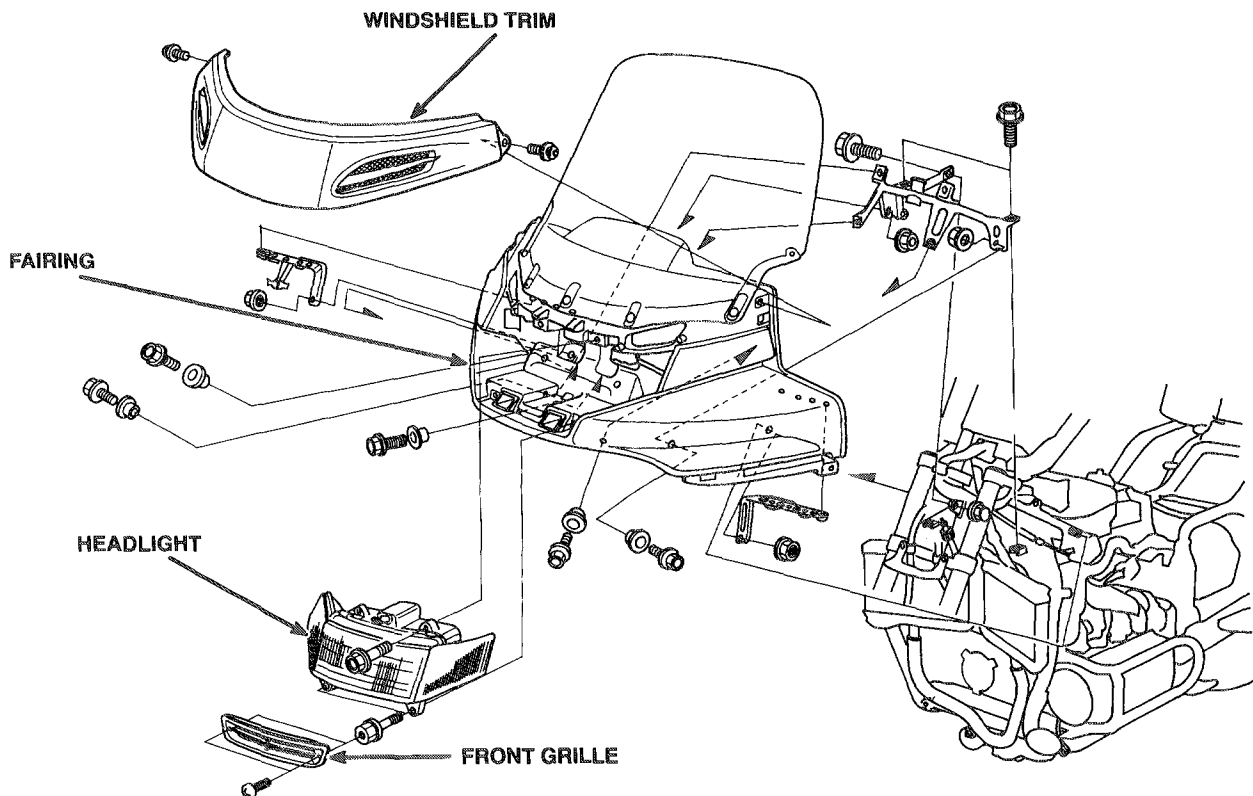




Step 3:



Step 4:



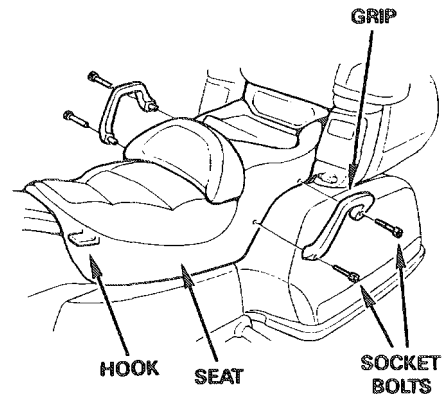
Fairing/Body Components

Fairing (cont'd)

Seat

Remove the four bolt caps, socket bolts, and grips.

Lift up on the rear of the seat to release the hook from under the top compartment bracket. Remove the seat.

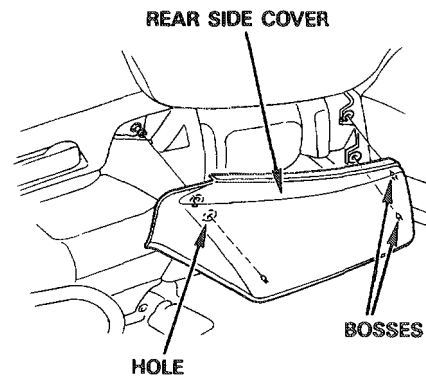


Rear Side Cover

Release the cover's three bosses from the three rubber holes on the frame.

Free the rubber hole from the top compartment bracket bolt.

Remove the rear side cover.

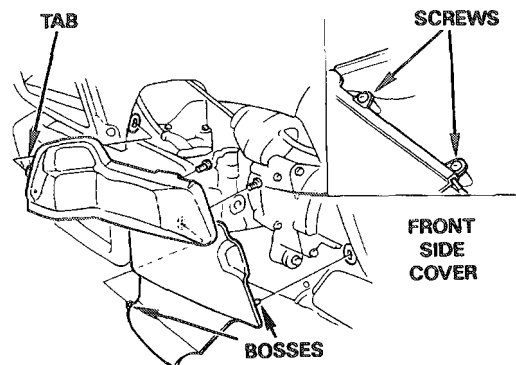


Front Side Cover

Release the cover's two bosses from the frame rubber holes. Release the cover front tab from the fairing inner cover groove.

Remove the front side cover.

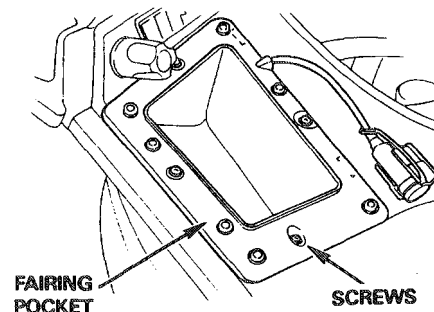
Remove two screws and separate the cover.



Left Fairing Pocket

Remove four screws.

Remove the left fairing pocket.



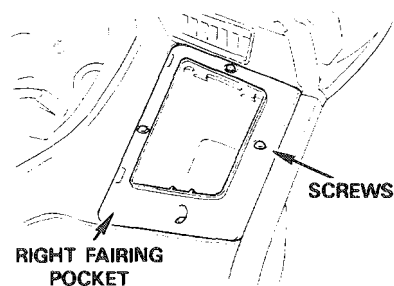


Right Fairing Pocket

Remove the pocket cover with the ignition switch key.

Remove the four screws.

Remove the right fairing pocket.

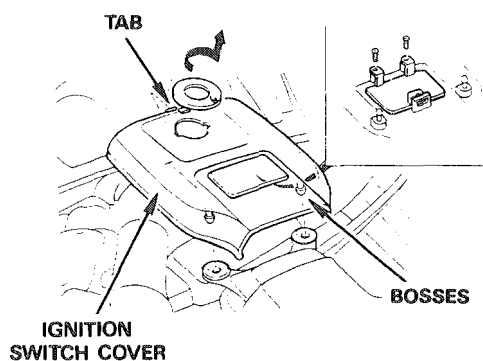


Ignition Switch Cover

Release the cover's two bosses from the top compartment rubber holes.

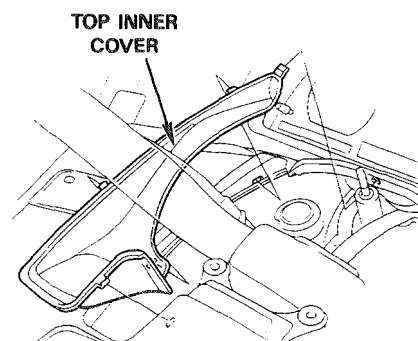
Release the cover front tab from the instrument panel.

Remove the ignition switch cover.



Top Inner Cover

Remove the top inner cover by releasing its tabs from the fairing.



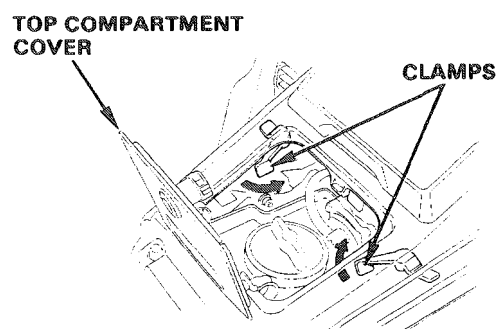
Top Compartment

Remove the following:

- fairing pockets (see above).
- ignition switch cover (see above).
- top inner covers (see above).
- seat (see previous page).

Open the top compartment cover.

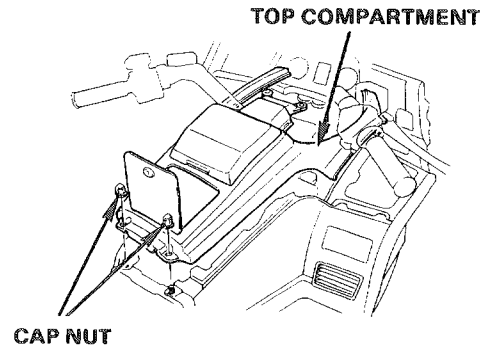
Turn the clamps as shown.



Fairing/Body Components

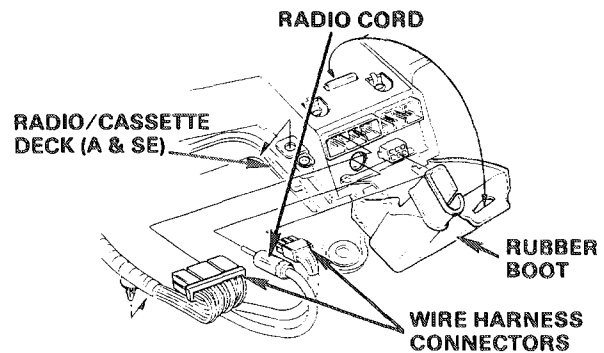
Fairing (cont'd)

Remove the cap nuts and top compartment.



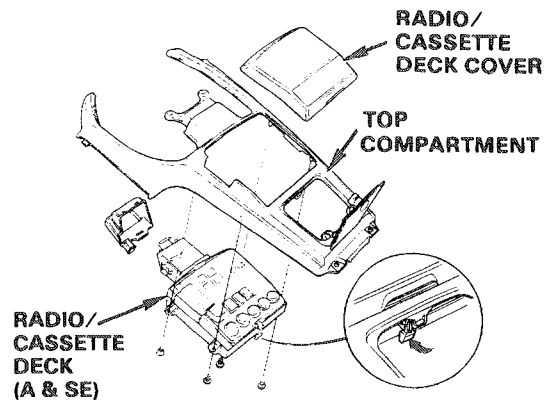
A & SE models:

Pull the rubber boot back enough to allow disconnecting the radio/cassette deck wire harness connectors and radio cord from the radio/cassette deck.



Push the lever and remove the radio/cassette deck cover from the top compartment.

Remove the four screws and radio/cassette deck from the top compartment.

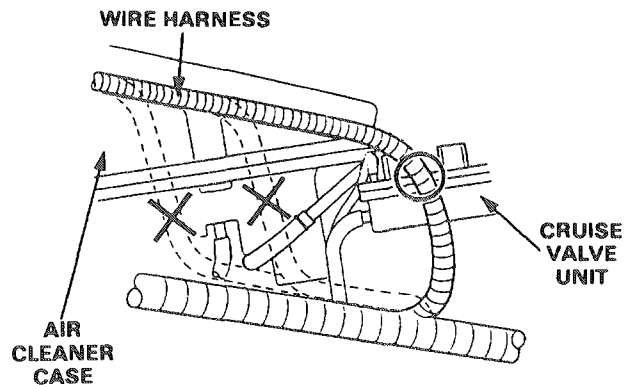


CAUTION

- Route the radio/cassette deck wire harness properly as shown.

WARNING

- Do not block the air inlet hole during installation, or the cruise control will not disengage.





Instrument Panel

Remove the following:

- top compartment (see page 13-9).
- rear view mirror (see page 13-3 and Windshield Lever Adjustment, page 13-4).

Remove the screw and headlight vertically adjusting knob.

Remove the plastic nut and washers.

Remove the fresh air outers from the instrument panel.

GL1500SE:

- Remove the exhaust pipe protector lid opener from the instrument panel (see page 7-31).

A & SE: Set the windshield lever at the upper position. Release the windshield trim from the windshield. Remove the instrument panel from the fairing.

Fairing Front Cover

Release the cover's two bosses from the rubber holes of the fairing lower covers by pressing in on 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 (see above).

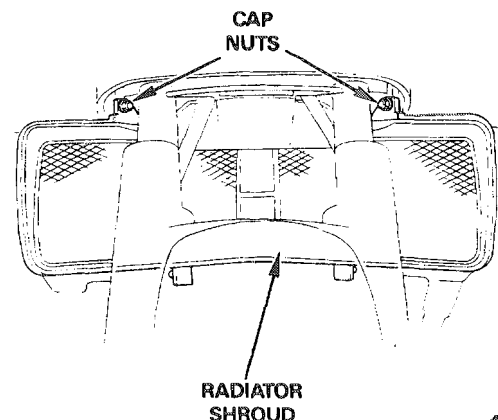
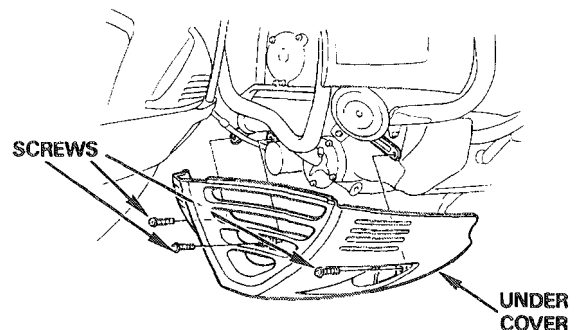
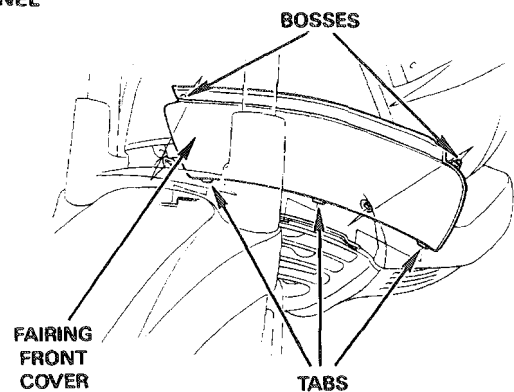
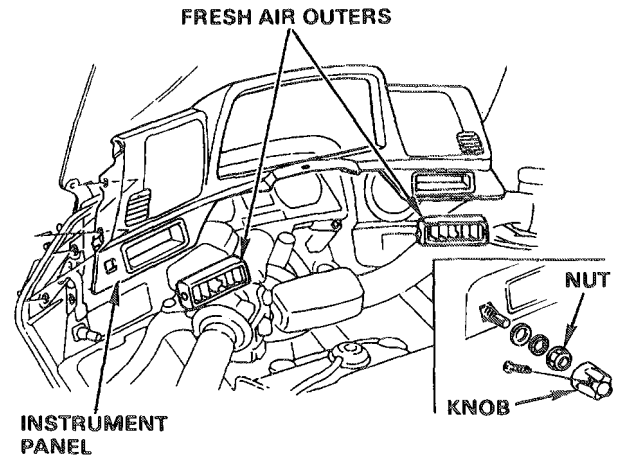
Remove three screws and the under cover.

Radiator Shroud

Remove the fairing front cover (see above).

Remove the two cap nuts.

Remove the radiator shroud.



Fairing/Body Components

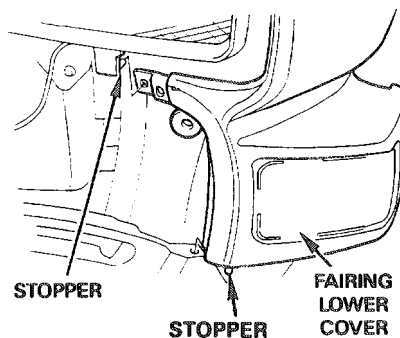
Fairing (cont'd)

Fairing Lower Cover

Remove the fairing front cover (see page 13-11).

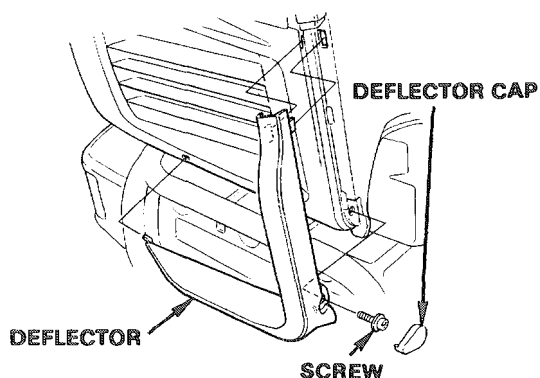
Release the stopper of the cover from the under cover hole.

Release the stopper of the radiator shroud from the cover hole.



Remove the deflector cap.

Remove the screw and deflector.

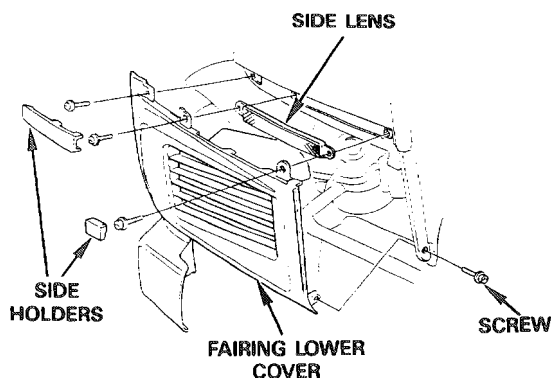


Remove the side holders.

Remove three screws, the fairing lower cover, and the side lens.

SE:

- Disconnect the cornering light wire connector.



Fairing Inner Covers

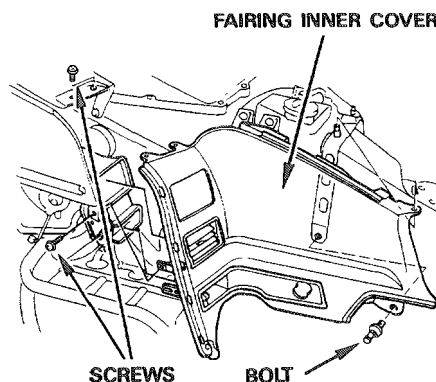
Remove the following:

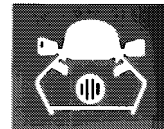
- seat (see page 13-8).
- fairing pockets (see pages 13-8, 9).
- ignition switch cover (see page 13-9).
- top inner covers (see page 13-9).
- top compartment (see page 13-9).
- fairing lower cover (see above).
- A & SE: reverse lever, to allow removal of left fairing inner cover (see page 18-30).

SE only: Disconnect the CB transceiver connector and ground wire connector to allow removal of the left fairing inner cover.

Remove three screws and one bolt. Remove the fairing inner cover.

Torque: Special bolt 10 N-m (1.0 kg-rm, 7 ft-lb)



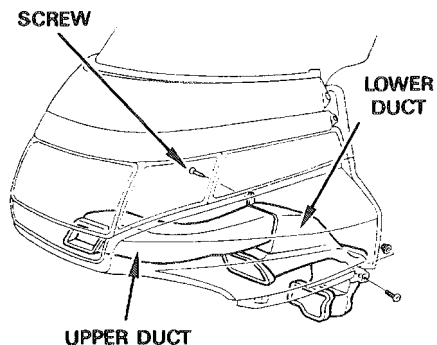


Air Ducts

Remove the fairing inner cover (see previous page).

Remove two screws and the lower air duct from the fairing.

Remove the upper air duct from the fairing.



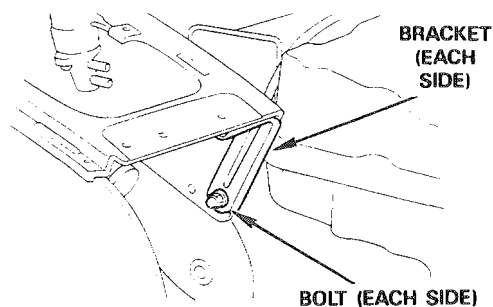
Fairing

Remove the fairing inner covers (see previous page) and air ducts (see above).

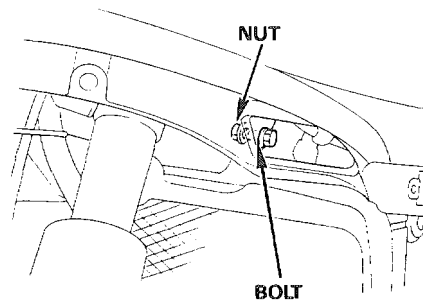
Remove the headlight (see page 19-12).

Remove the bolt on both sides and solenoid valve bracket.

Disconnect the instrument wire harness connectors.

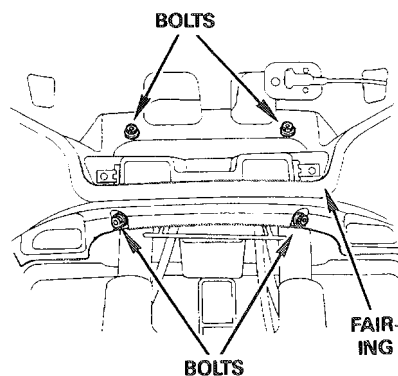


Remove the fairing inner bolt and nut (each side).



Remove four bolts.

Remove the fairing from the frame.

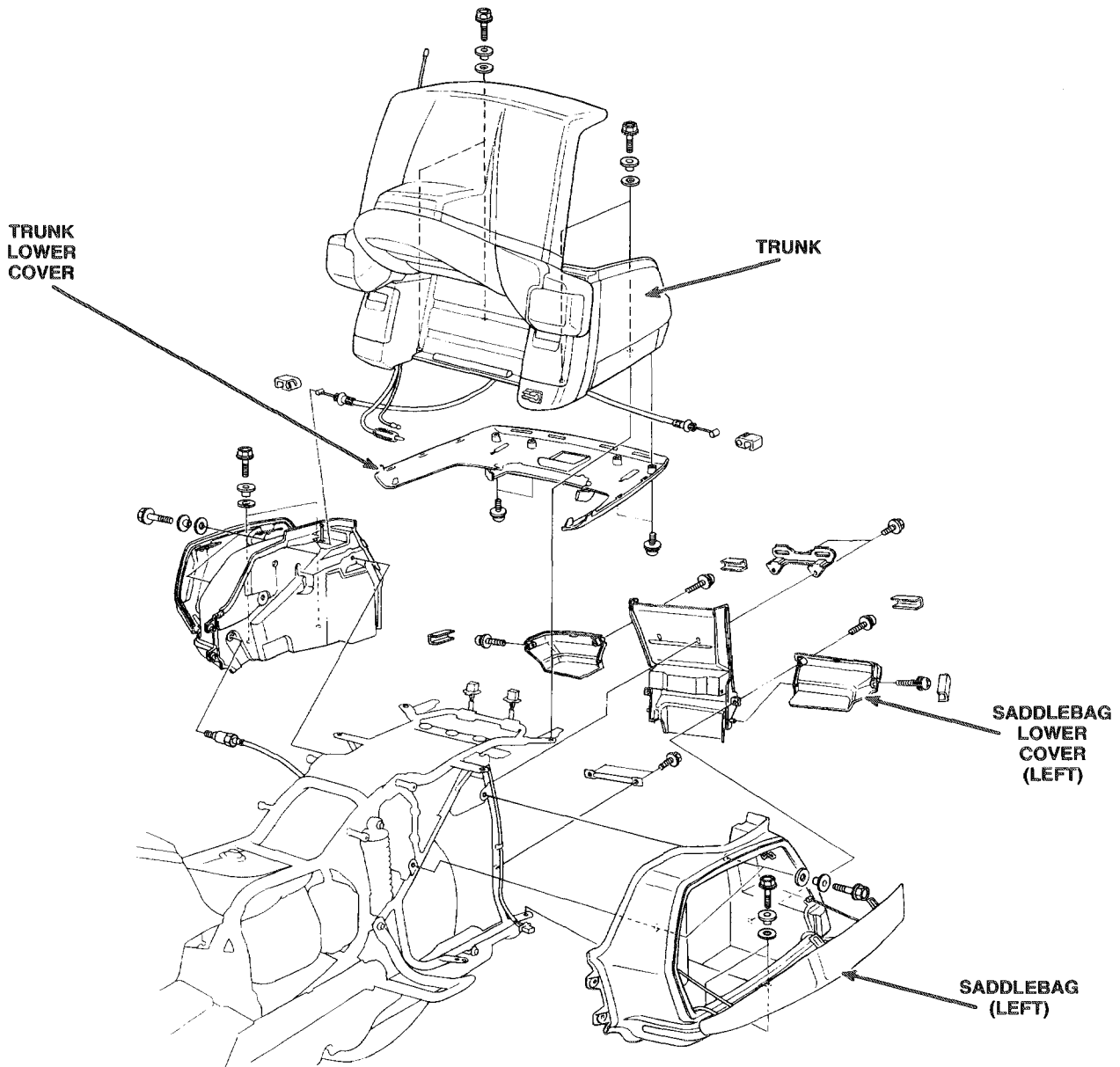


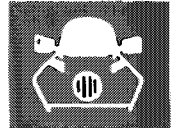
Fairing/Body Components

Trunk/Saddlebags

NOTE

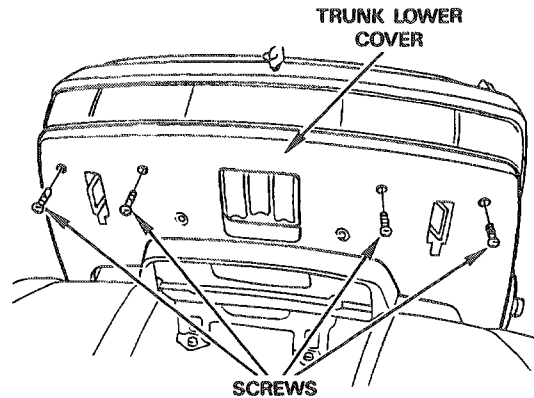
- For detailed removal instructions, see the next two pages.
 - See Section 15, Rear Wheel Removal, for instructions to remove the trunk and saddlebags as an assembly.
-





Trunk Lower Cover

Remove four screws as shown.

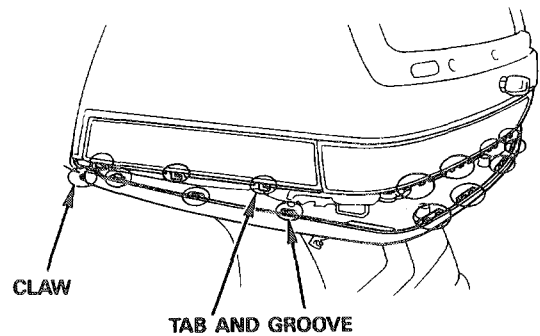


Release the cover grooves from the trunk tabs.

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.

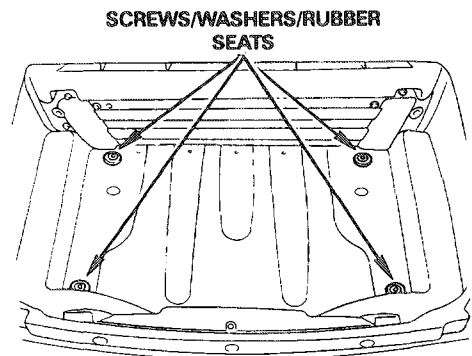


Trunk

A & I models:

Remove the trunk lower cover (above).

Open the saddlebags and disconnect the opener cables from the cable stoppers (see page 13-16).



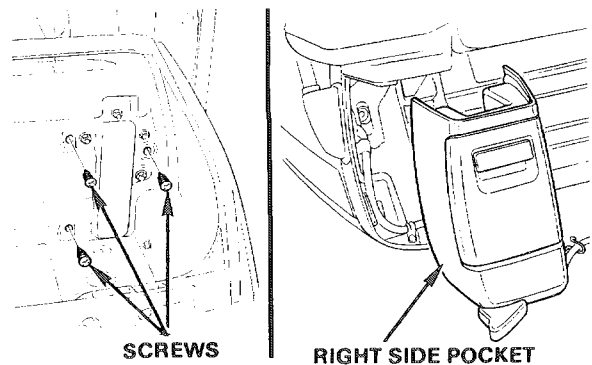
SE model:

Remove the trunk lower cover (see above).

Remove the seat (see page 13-8).

Open the trunk lid.

Remove the three screws and the right side pocket from the trunk.



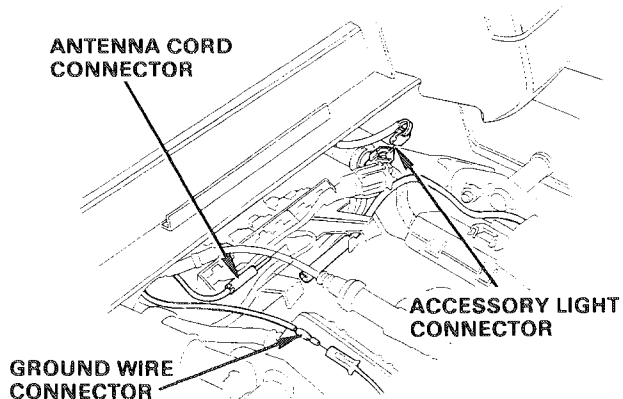
Fairing/Body Components

Trunk/Saddlebags (cont'd)

Disconnect the antenna cord connector and ground wire connector.

SE only:

Disconnect the high mount accessory light (2P-BLK) connector, CB antenna wire connector, and rear speaker (4P-BLK) connector.

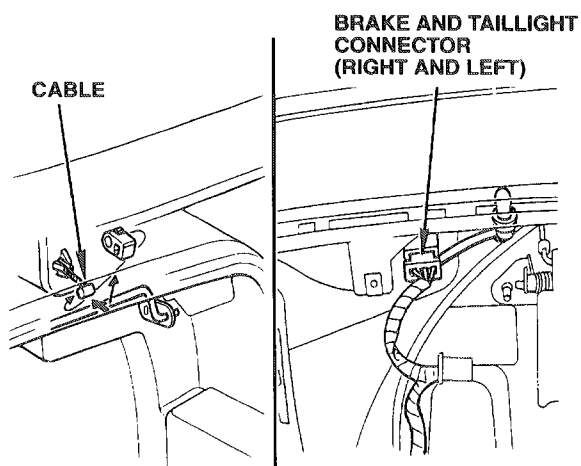


Disconnect the brake and taillight wire connectors.

Open the saddlebags and disconnect the opener cables from the cable stoppers.

Disconnect the antenna connector and antenna ground wire (see page 20-16).

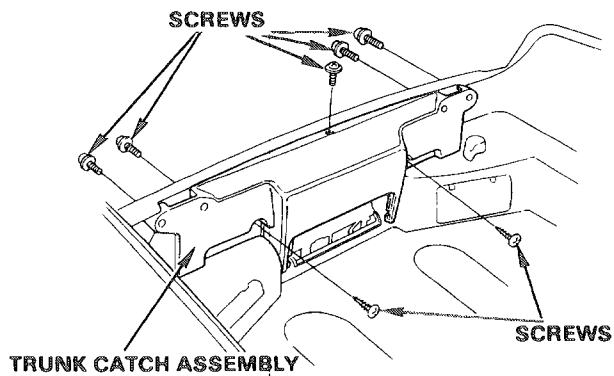
Remove the trunk.



Trunk Opener

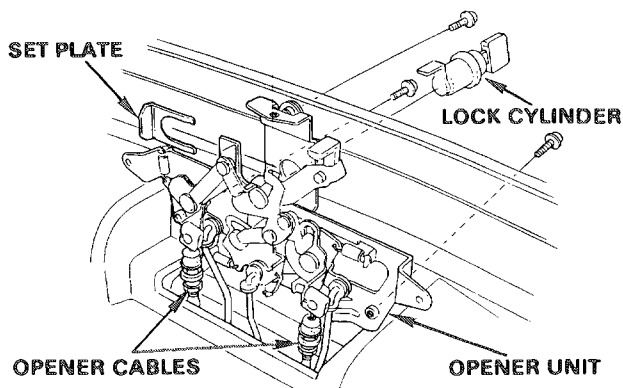
Open the trunk lid.

Remove the seven screws and the trunk catch assembly.



Remove the set plate and the lock cylinder. Remove the three screws and the trunk/saddlebag opener unit from the trunk.

Disconnect the saddlebag opener cables from the opener unit.





Installation is essentially the reverse order of removal.

Position the tab of the trunk opener unit perfectly upright when the trunk opener rod is installed.

CAUTION

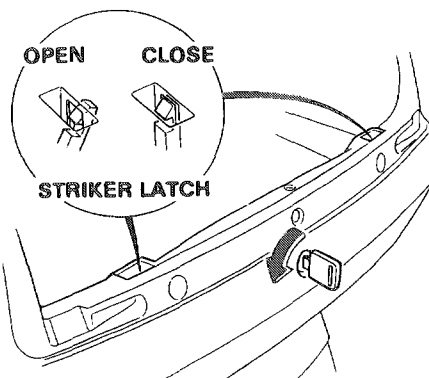
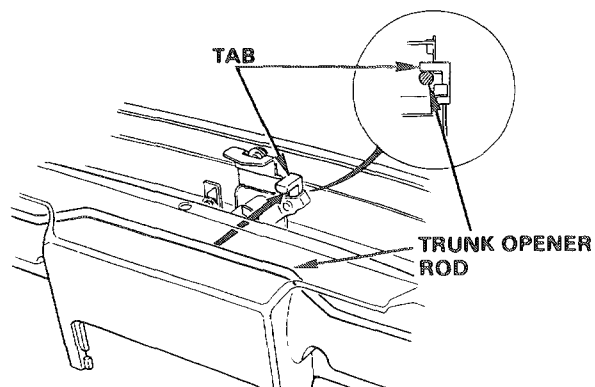
- If the tab of the trunk opener unit is not positioned properly, the trunk lid can not be opened.

Install the trunk catch assembly so that the trunk opener rod is positioned under the tab.

After installing the catch assembly, check that the striker latch operates properly by turning the key.

CAUTION

- If the striker latch is not released completely, the trunk lid cannot be opened.



Saddlebag Lower Cover

Remove the screw holders.

Remove two screws and the saddlebag lower cover from the saddlebag.

Saddlebag

Remove the following:

- trunk lower cover (see page 13-15).
- saddlebag lower cover (see above).
- brake and taillight connector.

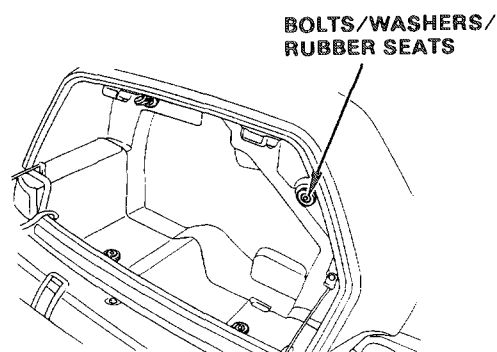
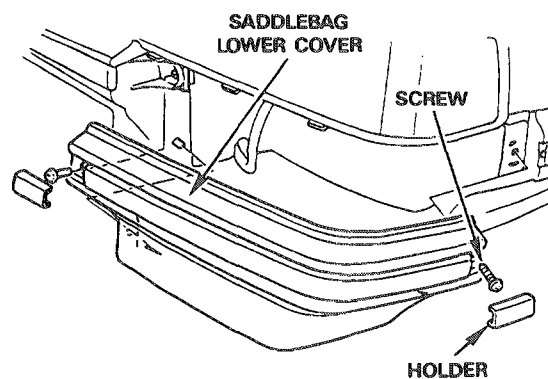
Disconnect the opener cables from the cable stopper (see previous page).

Remove the bolts, washers and, rubber seats.

Remove the saddlebag.

NOTE

- For right saddlebag removal, remove the outlet valve (On-board Air Compressor System).



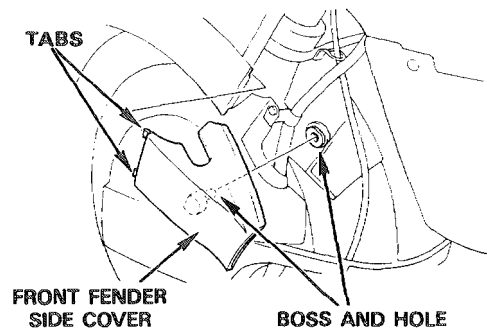
Fairing/Body Components

Front Fender

Release the boss from the fender rubber hole.

Release two tabs from the fender grooves.

Remove the front fender side cover (each side).

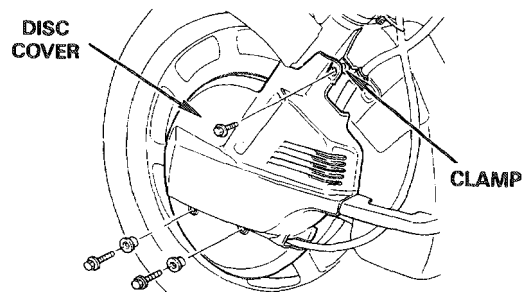


Remove three bolts, two collars, and clamp.

Remove the disc cover (each side).

NOTE

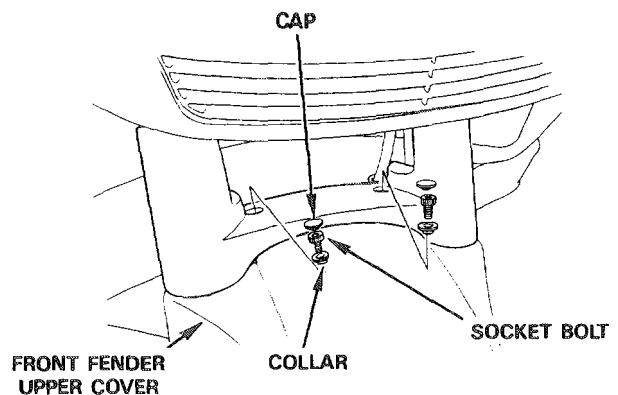
- The upper bolt does not have a collar. See the illustration.



Remove the bolt caps.

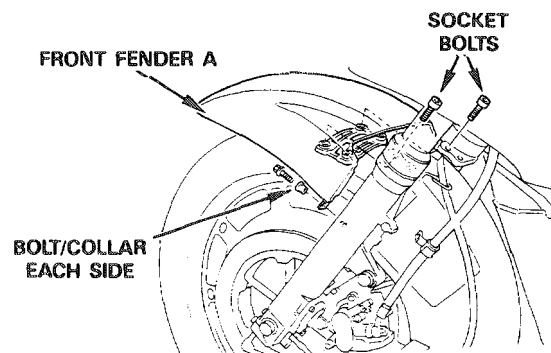
Remove the socket bolts and collars.

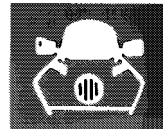
Remove the front fender upper cover.



Remove two socket bolts, two flange bolts, and the collars.

Remove front fender A.

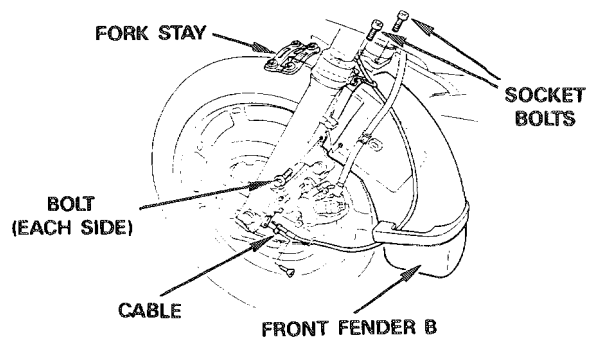




Disconnect the speedometer cable.

Remove two socket bolts and flange bolts.

Remove front fender B and the fork stay.

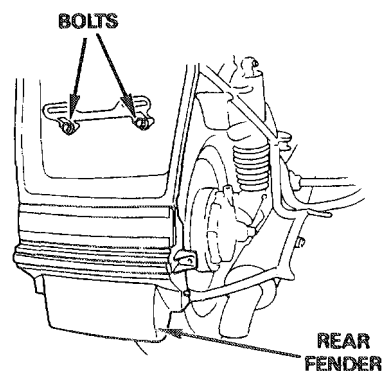


Rear Fender

Remove the following:

- trunk (see page 13-15).
- saddlebags (see page 13-17).

Remove the bolts and rear fender A.



A & SE models:

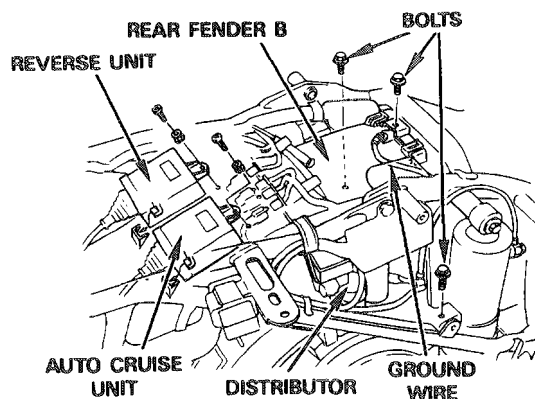
Remove the screws. Remove the reverse control unit and auto cruise control unit from rear fender B by releasing the unit tabs from the fender grooves.

Release the air distributor from rear fender B without disconnecting the air hose (see page 12-33).

Remove the upper bolt and disconnect the ground wire from the frame.

All models:

Remove two bolts and rear fender B.



Fairing/Body Components

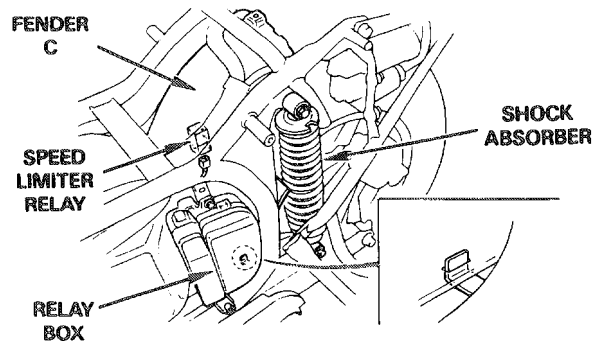
Rear Fender (cont'd)

Remove the following:

- left shock absorber (see page 12-20).
- relay and fuse box (by removing two bolts).
- A & SE: speed limiter relay.

Release the frame tab from the rear fender C groove.

Remove rear fender C.



Adjustable Passenger Footrests (SE only)

Footrest

Remove the front side cover (see page 13-8).

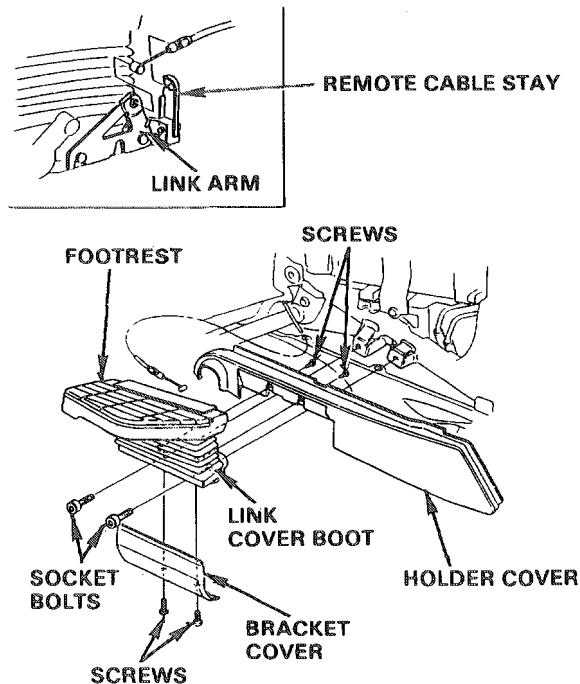
Remove the two screws and the footrest bracket cover.

Slide the link cover boot upward, and remove the two socket bolts, footrest and step holder cover assembly.

Remove the screws and holder cover.

Remove the footrest remote cable from the stay and disconnect the cable from the link arm.

Install the removed parts in the reverse order of removal and check the operation of the adjustable footrests.





Footrest Remote Lever

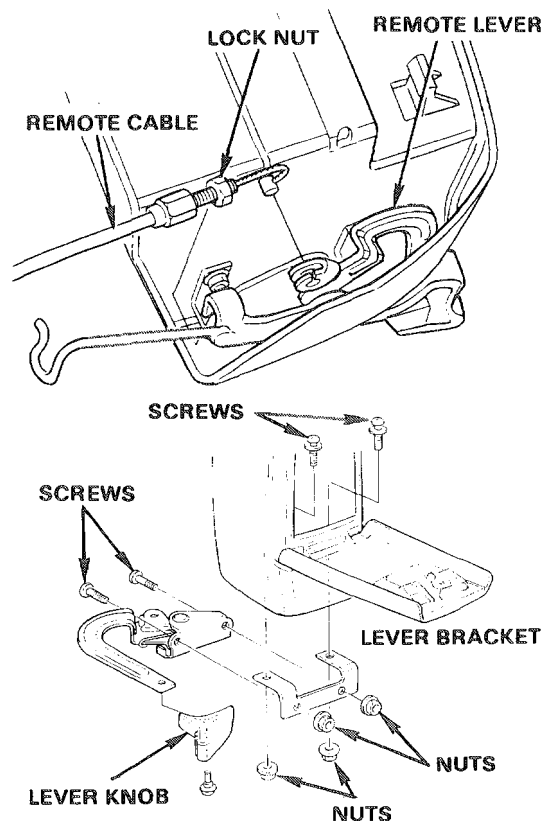
Remove the right side pocket (see page 13-15).

Loosen the cable lock nut and disconnect the remote cable from the remote lever.

Remove the screw and the lever knob.

Open the pocket lid, and remove the two screws, nuts and the lever assembly from the pocket.

Remove the two nuts, screws and the lever bracket from the lever.



Remote Cable Adjustment

Pull the footrest remote lever to release the link arm from the link and check that both left and right footrests move up and down without binding.

Also check that both footrests are locked securely at the desired position when you release the remote lever.

Measure footrest remote lever free play at the tip of the lever.

FREE PLAY: 3.0-5.0 mm (0.12-0.20 in)

If adjustment is necessary, remove the seat (see page 13-8).

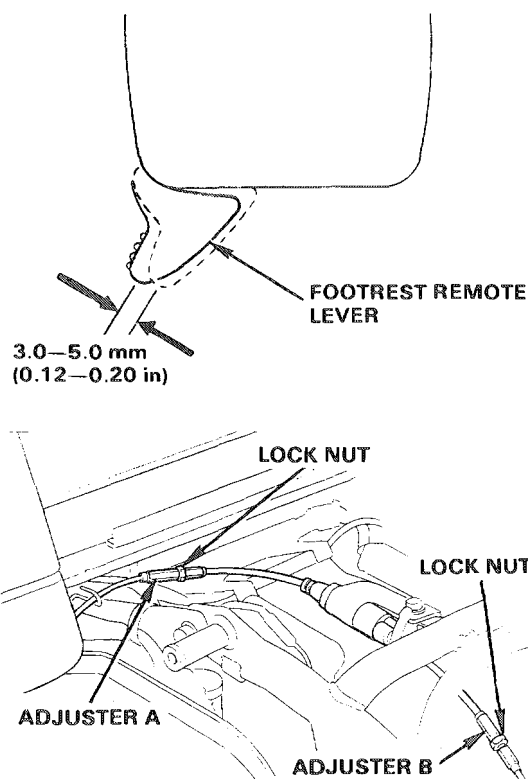
Loosen the lock and adjust the free play by turning adjuster A.

Tighten the lock nut after adjustment.

Check that the left and right steps are locked and released equally.

If they are not equalized, loosen the lock nut and adjust the synchronization by turning adjuster B.

Tighten the lock nut after adjustment.



Fairing/Body Components

Footrests (A & 1 only)

Remove the cotter pin, washer and pin.

Remove the footrest.

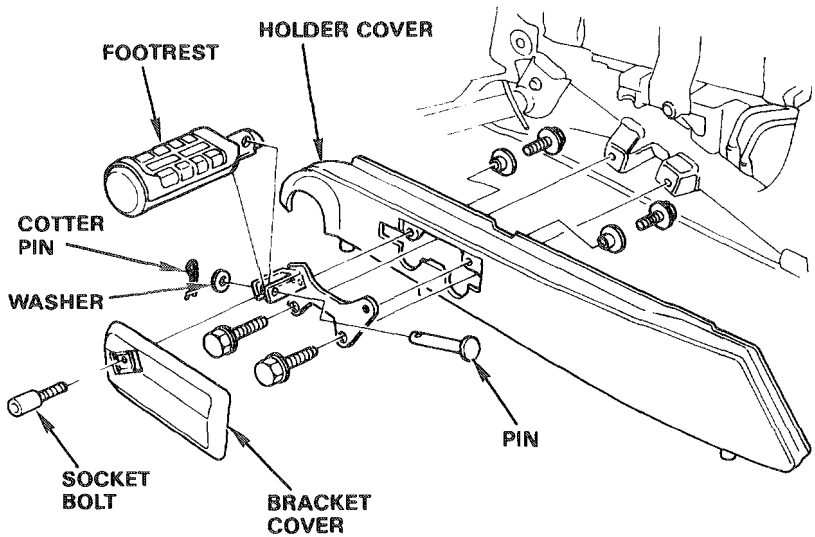
Remove the socket bolt and bracket cover.

Remove the two bolts and holder cover.

Remove the two bolts and collars.

Remove the holder cover bracket.

Installation is the reverse order of removal.





Brakes

Service Information	14-2
Troubleshooting	14-4
Brake Fluid Replacement/ Air Bleeding	14-5
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Rear Master Cylinder	14-14
Front Brake Caliper	14-19
Rear Brake Caliper	14-21
Brake Pedal	14-23
Metal Brake Line	14-24

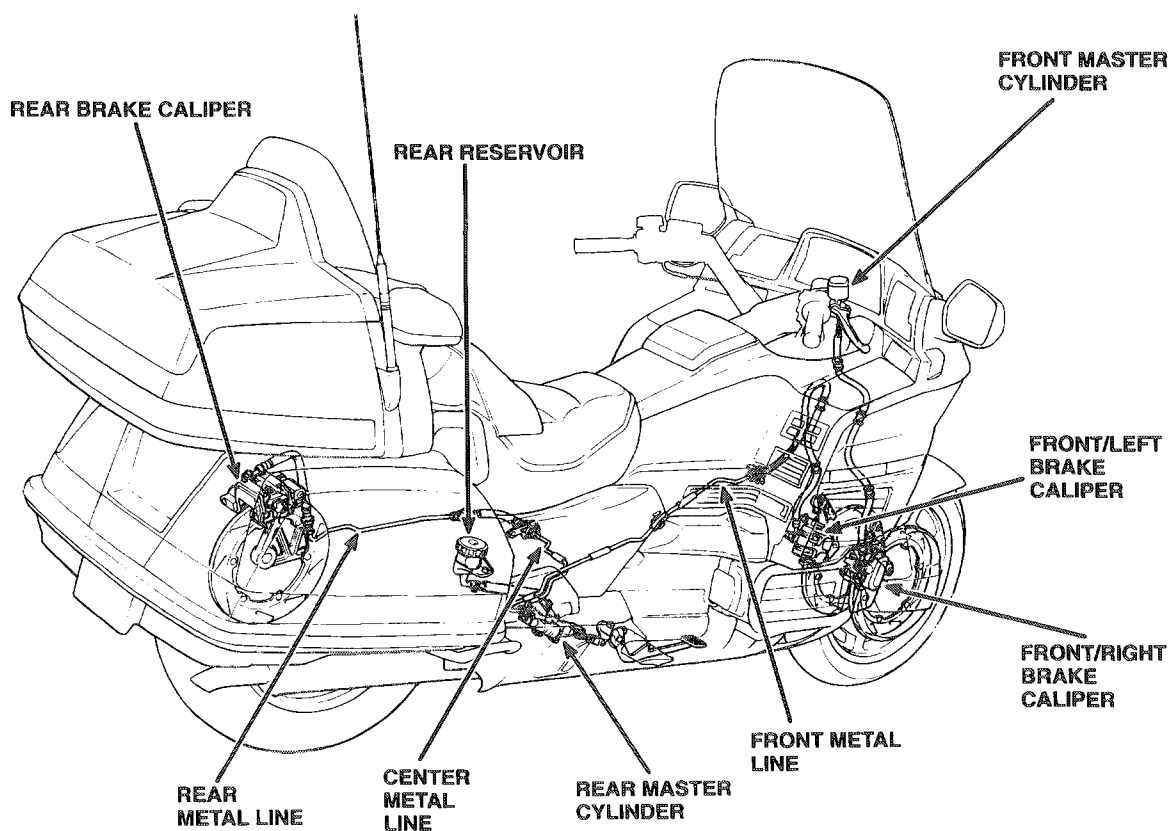
Brakes

Service Information

WARNING

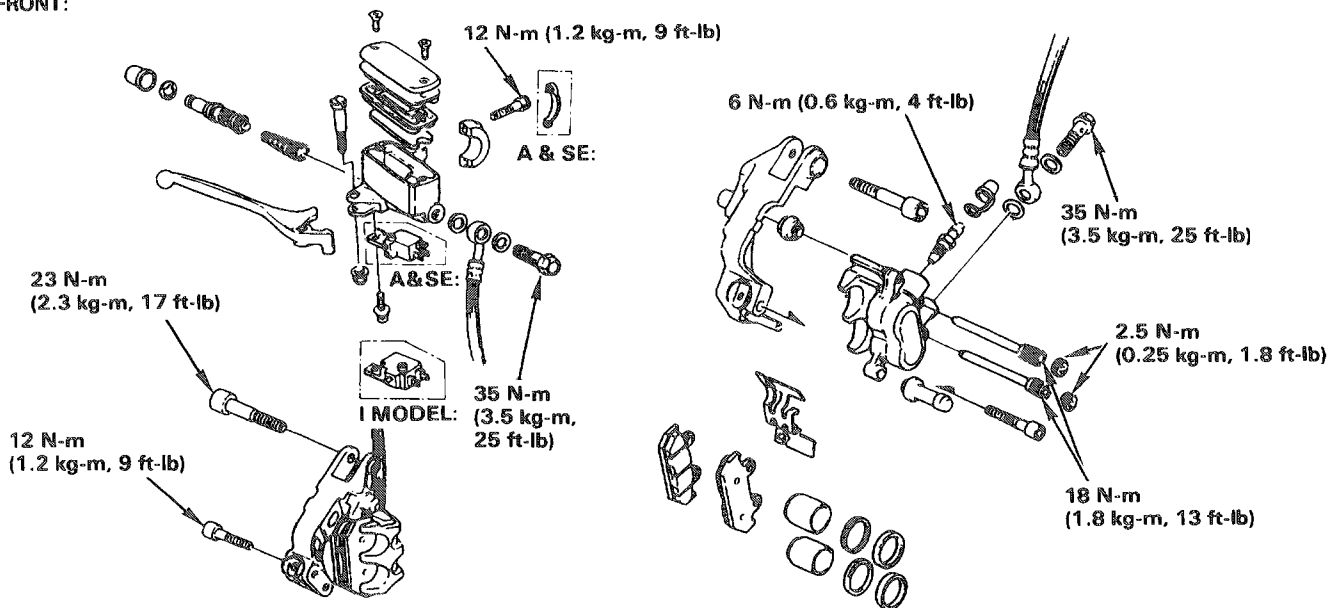
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
 - Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or an alternate OSHA-approved method designed to minimize the hazard caused by airborne asbestos fibers.
-
- 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.

System Location





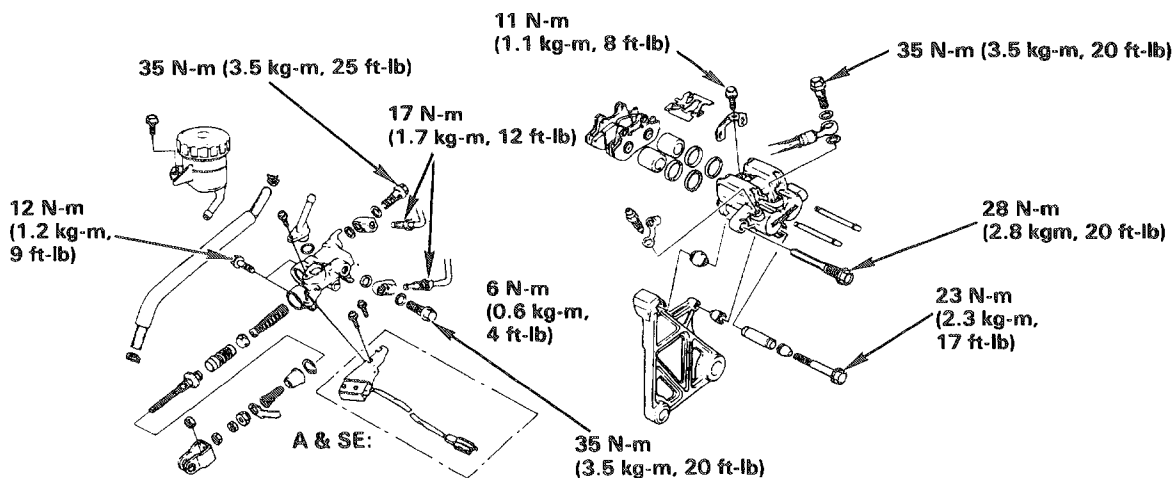
FRONT:



Torque

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)
Right front caliper bracket bolt (I model)	31 N-m (3.1 kg-m, 22 ft-lb)

REAR:



Torque

Brake hose bolt	35 N-m (3.5 kg-m, 20 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 caper 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)

Brakes

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 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 Lever System Fluid Replacement (Front/Right)

Remove the reservoir cover, set plate, diaphragm, and float with the fluid reservoir parallel to the ground.

Draw all the brake fluid from the reservoir 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 appears coming out of the bleed valve and air bubbles do not appear in the plastic hose.

NOTE

- Add fluid when the fluid level in the 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. Operate the brake lever. If it feels spongy, bleed the air from the system (see next page).

Brake Pedal System Fluid Replacement (Front/Left and Rear)

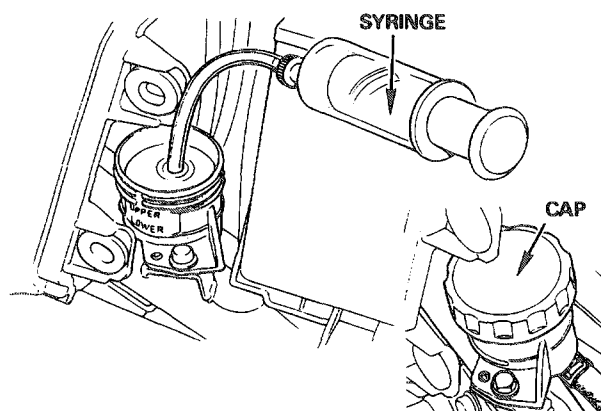
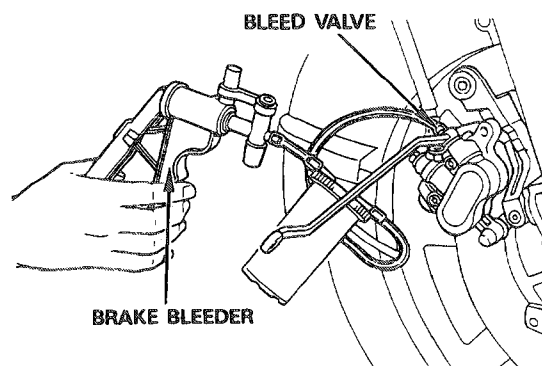
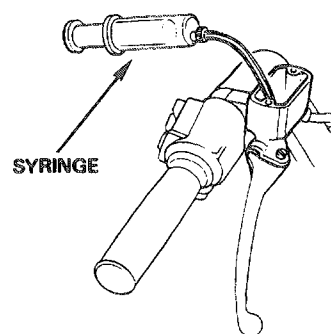
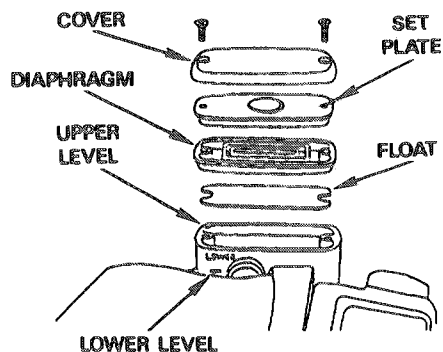
Place the motorcycle on its center stand.

Remove the right rear side cover (see page 13-8).

Remove the reservoir cap, set plate, and diaphragm.

Draw all the brake fluid from the reservoir using a commercial syringe.

Fill the reservoir with fresh DOT 4 brake fluid to the upper level mark.



Brakes

Brake Fluid Replacement/Air Bleeding

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.

Connect a commercial brake bleeder, such as the Mityvac NQ 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 the 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.

Operate the brake pedal. If it feels spongy, bleed the air from the system.

Air Bleeding (Brake Lever System)

If a brake bleeder is available, open the bleed valve and pump the bleeder until air bubbles do not appear in the plastic hose while adding fresh DOT 4 fluid to reservoir upper level. (This is the same procedure used for fluid replacement.)

If a bleeder is not available, perform the air bleeding as follows:

Connect the plastic hose to the bleed valve.

1. Pump up the system pressure with the brake lever until there are no 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 the reservoir is low; do not mix different types of fluid.

2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

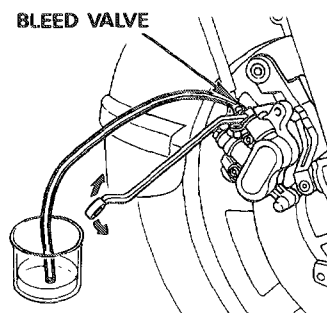
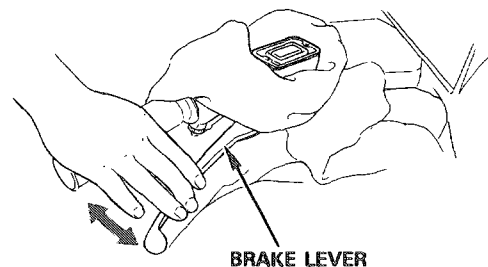
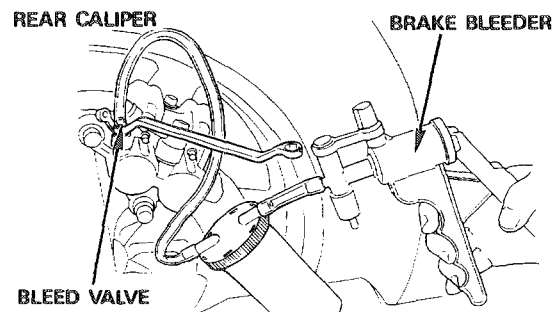
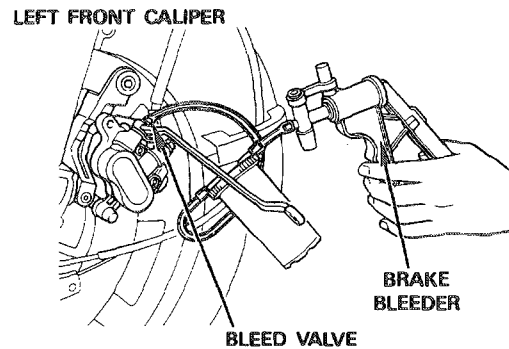
Repeat steps 1 and 2 until air bubbles cease to appear in the fluid coming out of the bleed valve.

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.

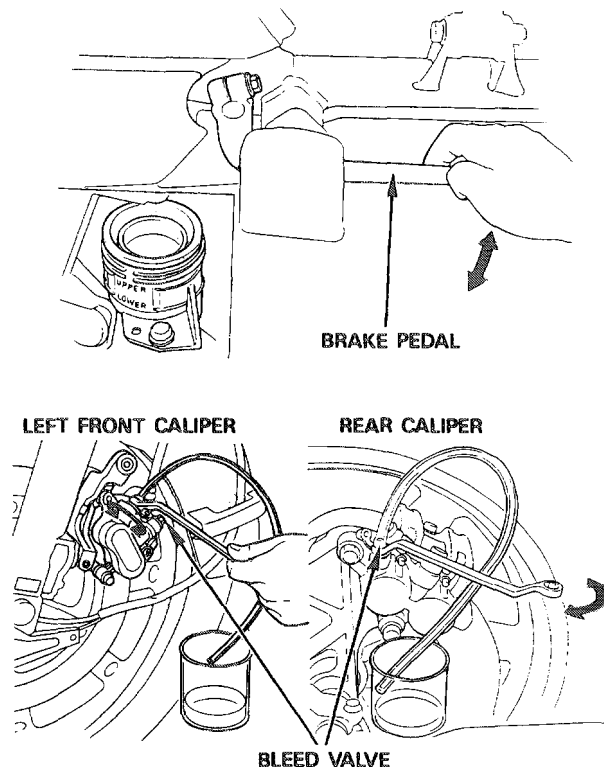




Air Bleeding (Brake Pedal System)

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 brake lever system air bleeding on the previous page.



Brake Pad Replacement

WARNING

- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or an OSHA-approved alternate method designed to minimize the hazard caused by airborne asbestos fibers.

NOTE

- Always replace the brake pads in pairs to assure even disc pressure.
- Do not disturb the brake hose.

Front

Remove the disc covers (see page 13-18).

Remove the pad pin plugs and loosen the pad pins.

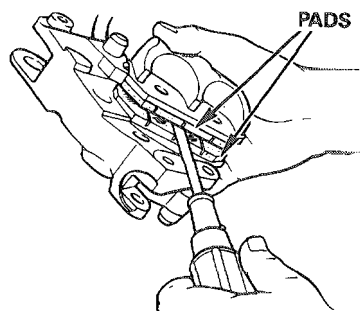
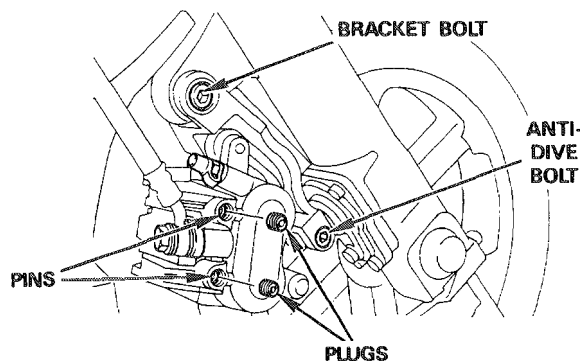
Remove the caliper bracket bolt and anti-dive piston bolt, then remove the caliper.

I model, left side:

Remove the caliper bracket bolts and remove the caliper. Push the pistons 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.

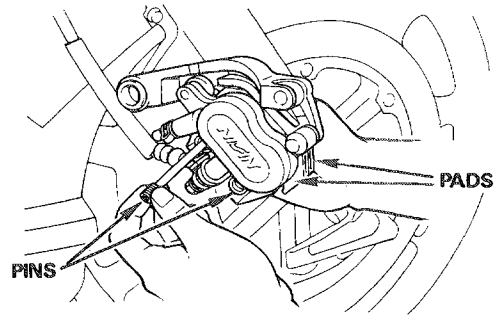


Brakes

Brake Pad Replacement (cont'd)

Pull the pad pins out of the caliper.

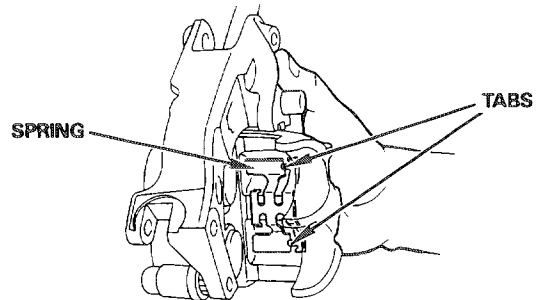
Remove the brake pads.



Position the pad spring in the caliper as shown.

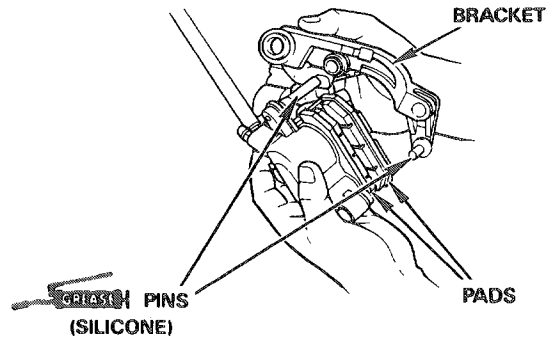
NOTE

- Make sure that tabs of the pad spring face the wheel side.

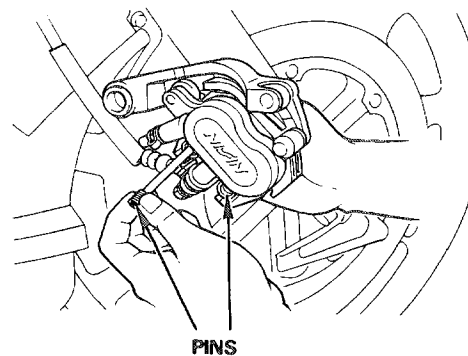


Install the new pads in the caliper.

If you removed the caliper bracket, install it, applying silicone grease to the 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-drive piston bolt and install it.

Tighten the caliper bracket bolt and anti-drive bolt.

Torque:

Caliper bracket bolt: 23 N-m (2.3 kg-m, 17 ft-lb)

Anti drive piston bolt: 12 N-m (1.2 kg-m, 9 ft-lb)

Right front caliper bracket bolt (I model):

31 N-m (3.1 kg-m, 22 ft-lb)

Install the pad pins and pad pin plugs.

Torque:

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 the brake lever to seat the caliper pistons against the pads.

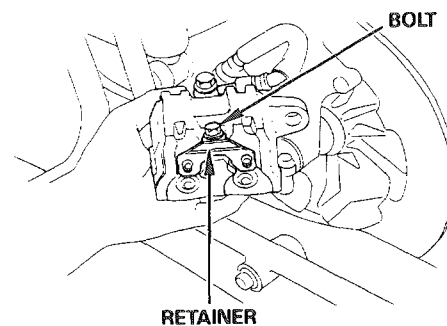
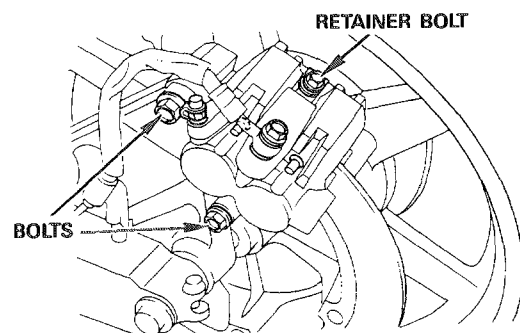
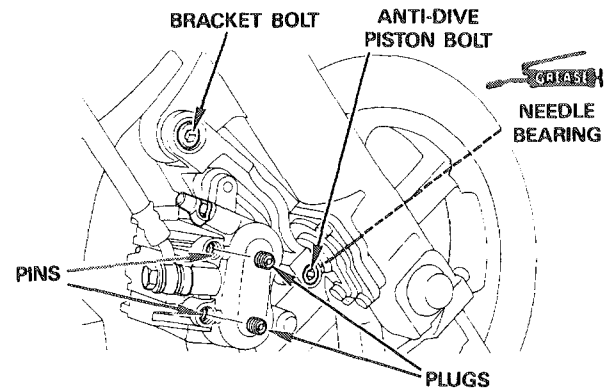
Install the disc covers (see page 13-18).

Remove the left saddlebag (see page 13-17).

Loosen the pad pin retainer bolt.

Remove the caliper bolt and pin bolt.

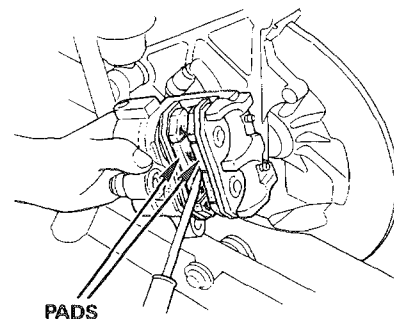
Remove the pad pin retainer bolt and retainer.



Push the piston all the way in to provide clearance for the new brake pads.

NOTE

- Check the brake fluid level in the reservoir. This operation causes the level to rise.

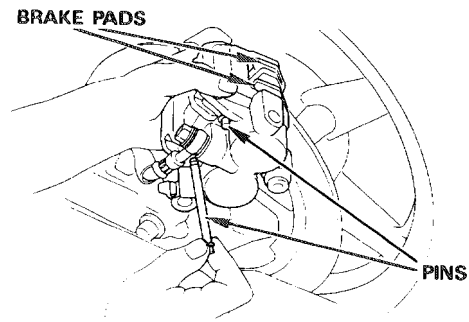


Brakes

Brake Pad Replacement (cont'd)

Pull the pad pins out of the caliper.

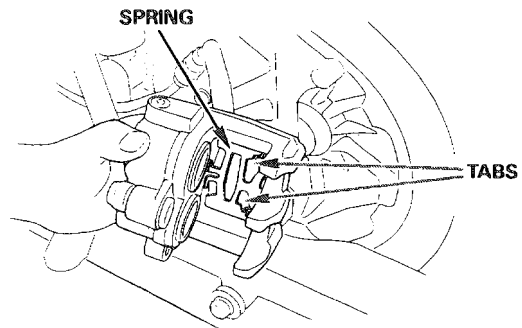
Remove the brake pads.



Position the pad spring in the caliper as shown.

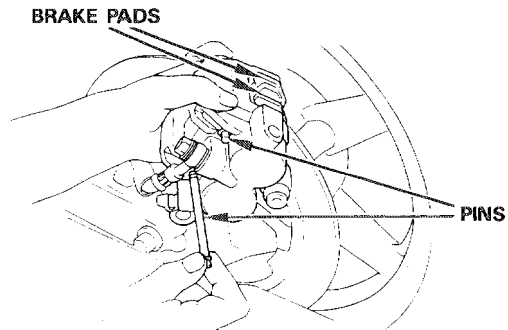
NOTE

- Make sure that the tabs of the pad spring face the wheel.



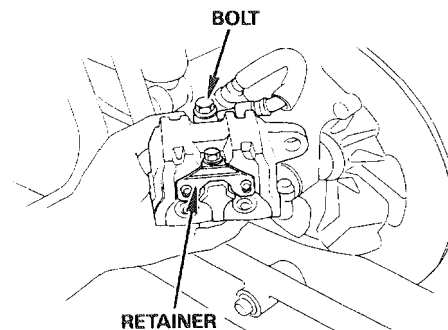
Install the new pads in the caliper.

Install one pad pin. Then push the pads to compress the pad spring while you install the other pin.



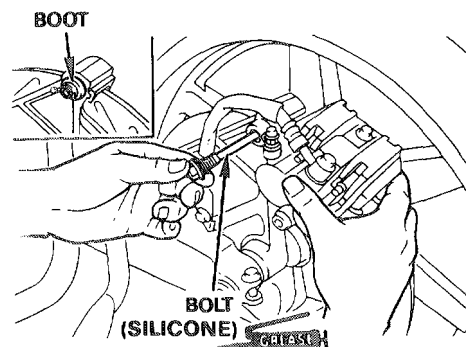
Place the pad pin retainer over the pad pins. Push the retainer down to secure the pins.

Install (but do not tighten) the pad pin retainer bolt.





Align the caliper pin bolt hole with caliper bracket boot. Apply silicone grease to the caliper pin bolt. Insert the caliper pin bolt into the hole.



Tighten the caliper bolt, pin bolt, and retainer bolt.

Torque:

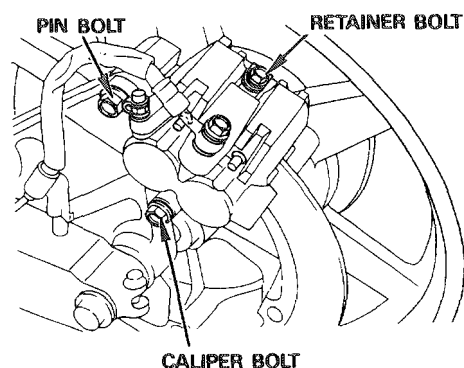
Caliper bolt: 23 N-m (2.3 kg-m, 17 ft-lb)

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 the brake pedal to seat the caliper pistons against the pads.



Install the left saddlebag (see page 13-17).

Brake Disc Inspection

Front:

Remove the disc cover (see page 13-18).

Rear:

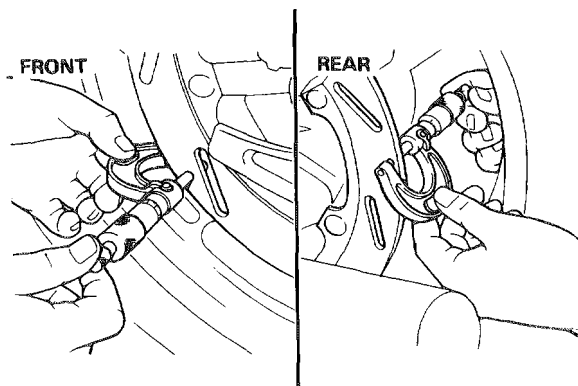
Remove the left saddlebag (see page 13-17).

Measure the thickness of each brake disc.

Service Limits:

Front: 5.0 mm (0.20 in)

Rear: 6.0 mm (0.24 in)

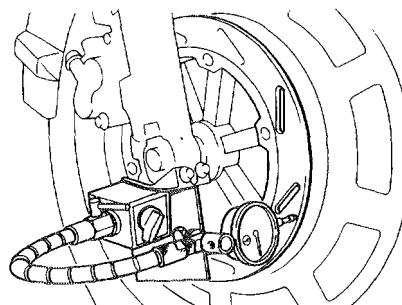


Measure the brake disc for warpage with a dial indicator as shown.

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 indicator mount.



Brakes

Front Master Cylinder

Removal

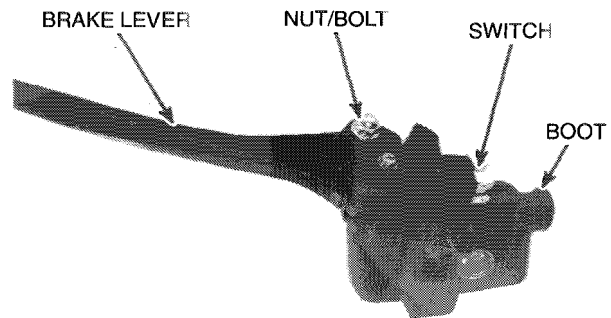
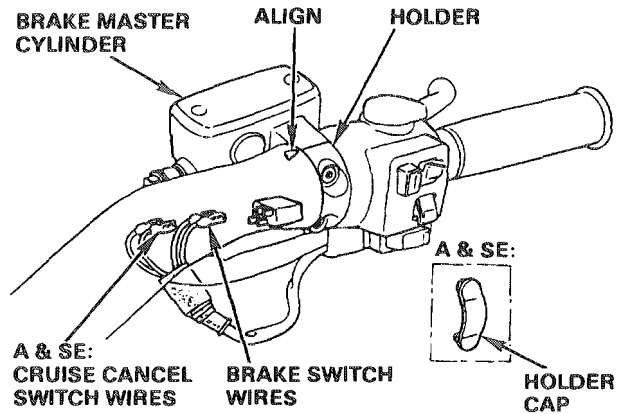
CAUTION

- 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 using a commercial syringe (see page 14-5).

Remove the following:

- brake light switch wires.
- A & SE: cruise cancel switch wires.
- A & SE: holder cap.
- brake hose.
- master cylinder holder and master cylinder.
- brake lever.
- switch.
- piston boot.



Disassembly

Remove the snap ring from the master cylinder body.

Tool:

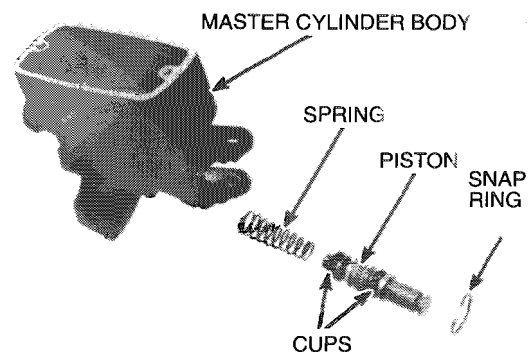
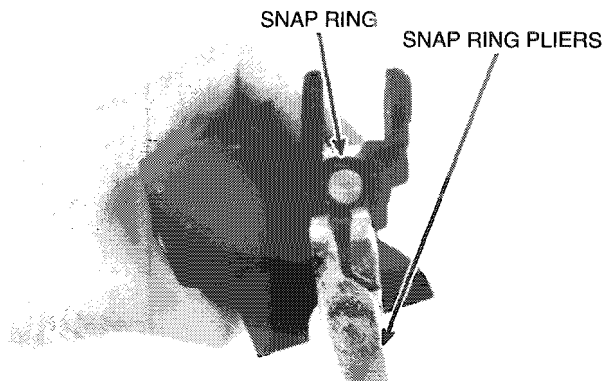
Snap ring pliers
07914-3230001

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.
- Use compressed air to check that air can pass through the master cylinder port.



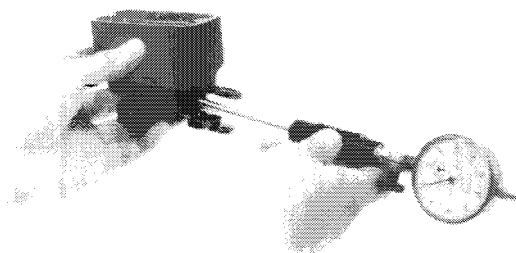


Inspection

Check the master cylinder for scores, scratches, or nicks.

Measure the master cylinder I.D.

Service Limit: 12.755 mm (0.5022 in)

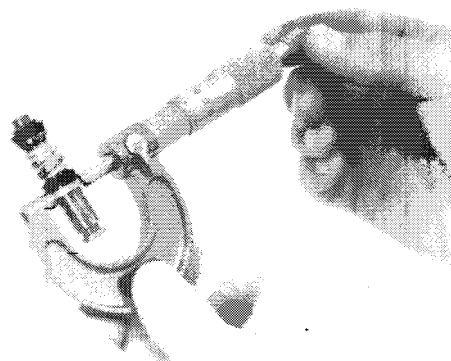


Check the piston for scores, scratches, nicks, or other damage.

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

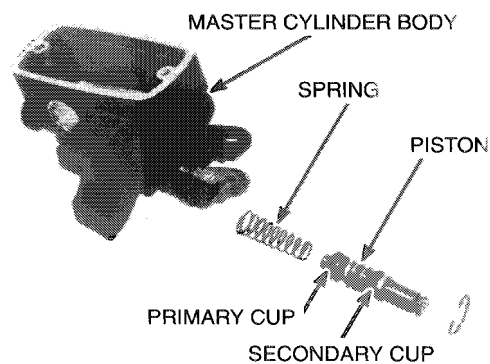
- The master cylinder piston, cups, and spring must be installed as a set.

Coat all the parts with clean DOT 4 brake fluid before assembly.

Install the 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.

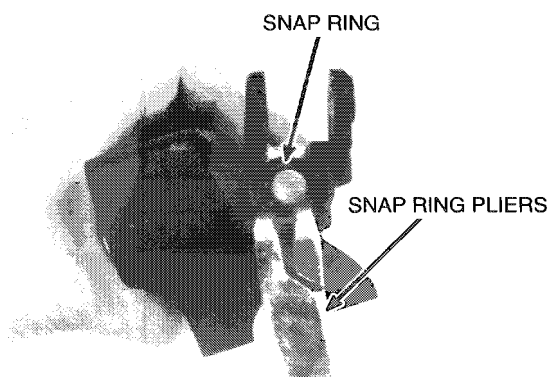
Install the snap ring to the master cylinder body.

Tool:

Snap ring pliers
07914-3230001

CAUTION

- Be certain the snap ring is firmly seated in the groove.



Brakes

Front Master Cylinder (cont'd)

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. 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.

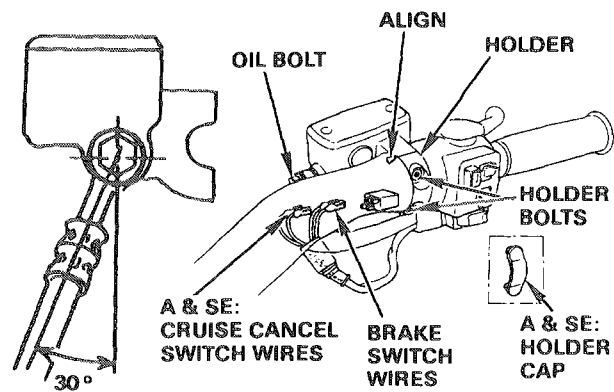
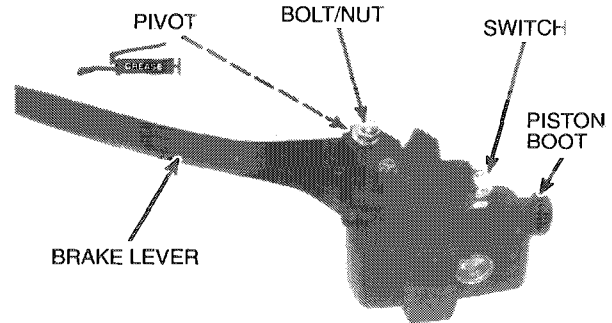
Torque: 35 N-m (3.5 kg-m, 25 ft-lb)

Connect the switch wires to the switch.

A & SE: Connect the cruise cancel switch wires to the switch.

A & SE: Install the holder cap.

Fill and bleed the brake lever hydraulic system (see page 14-6).



Rear Master Cylinder

Removal

Remove the following:

- Left exhaust pipe, mufflers and exhaust chamber (see page 7-32).
- Right heat protector (see page 7-32).
- Battery and battery holder (see page 17-7).

Remove the cotter pin, washer, and clevis pin. Then disconnect the brake rod clevis from the brake arm.

A & SE models:

Disconnect the 2P-RED connector of the connector holder behind the ignition control module.

Place a drip pan under the brake line.

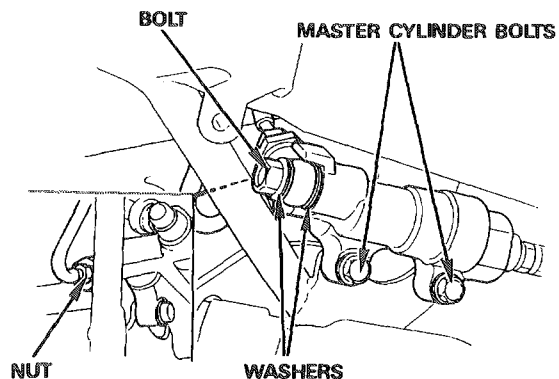
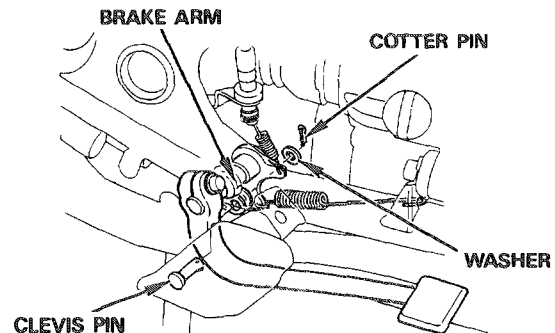
Disconnect the metal brake line for the rear caliper by removing the bolt and sealing washers.

Disconnect the metal brake line from the front caliper by loosening the nut.

CAUTION

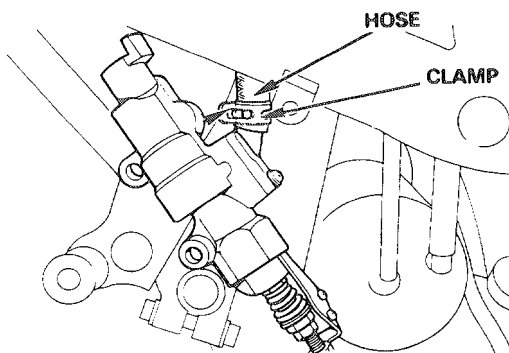
- Avoid spilling brake fluid on painted surfaces.

Remove the master cylinder by removing two bolts.



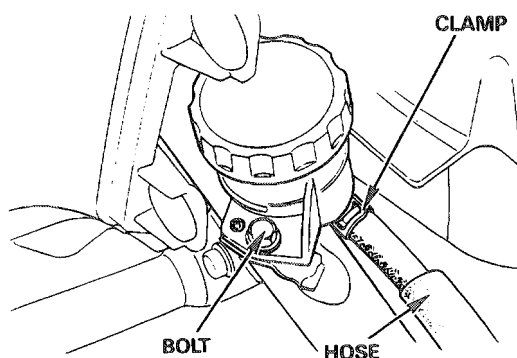


Disconnect the reservoir hose from the rear master cylinder by removing the clamp.



Remove the reservoir bolt, open the reservoir cap, and drain the brake fluid from the master cylinder.

Remove the reservoir hose from the reservoir by removing the clamp.



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 its screw.

Move the dust cover from the master cylinder and remove the snap ring and pull the rod out of the master cylinder.

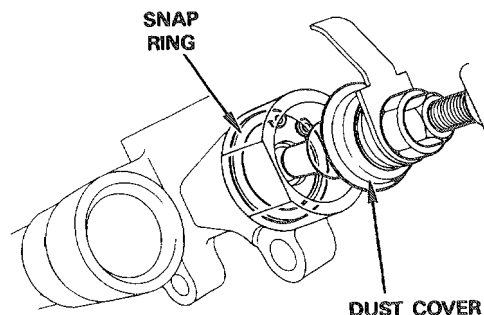
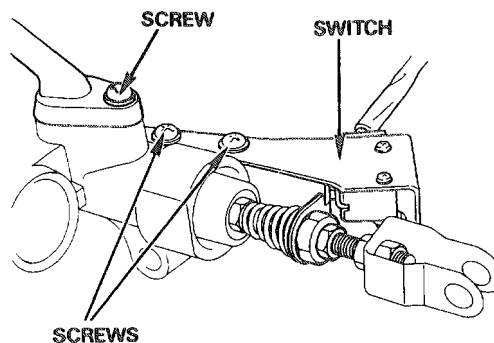
Tool:

Snap ring pliers
07914-3230001

CAUTION

- The push rod may pop out when removing the snap ring.

Check that the push rod is not bent or damaged.



Brakes

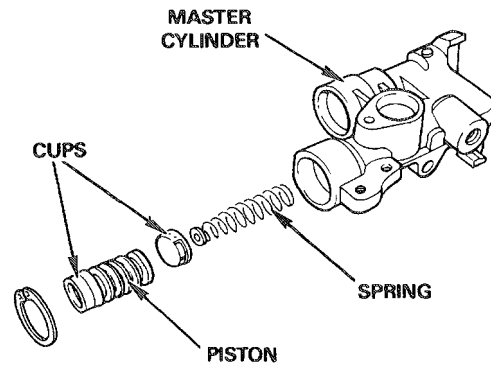
Rear Master Cylinder (cont'd)

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. Use compressed air to check that air can pass through the master cylinder port.

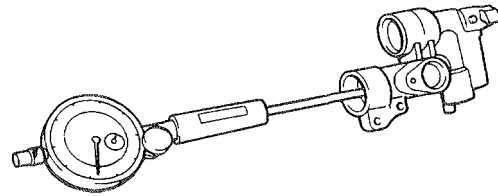


Inspection

Check the master cylinder for scores, scratches or nicks.

Measure the master cylinder I.D.

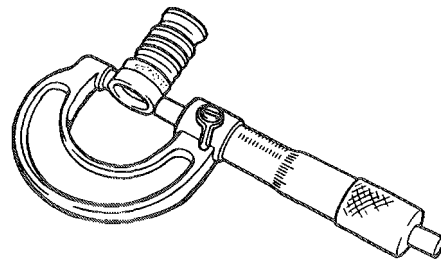
Service Limit: 15.925 mm (0.6270 in)



Check the primary and secondary cups for damage or deterioration. Replace, if worn or damaged.

Measure the master piston O.D. as shown.

Service Limit: 15.815 mm (0.6226 in)



Assembly

Coat all the parts with clean DOT 4 brake fluid before assembly.

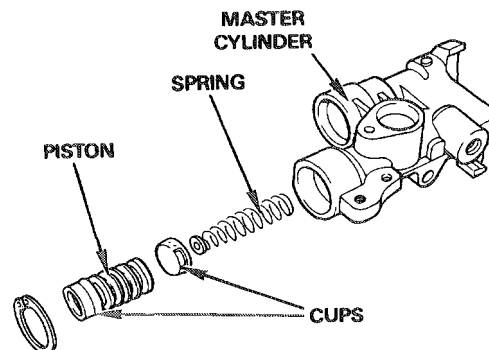
CAUTION

- When installing the cups, do not allow the lips to turn inside out.

Install the spring, primary cup, and piston together, with the small coil end of the spring towards the piston.

NOTE

- The master cylinder piston, cups, and spring must be installed as a set.





Apply grease to the push rod.

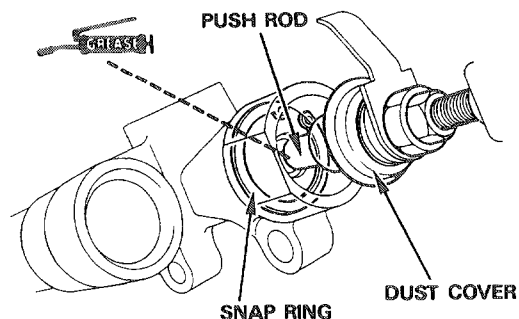
Install the push rod into the master cylinder. Install the snap ring.

Tool:

Snap ring pliers
07914-3230001

CAUTION

- Be certain the snap ring is seated firmly in the groove.



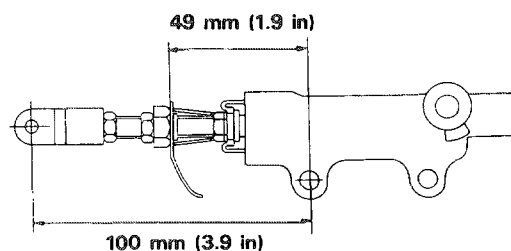
Install the dust cover.

Adjust the installed length of the cruise cancel switch plate and brake rod clevis as shown.

Standard Install Length:

Brake rod clevis: 100 mm (3.9 in)

A & SE: Cancel switch plate: 49 mm (1.9 in)



Check the O-ring for fatigue.

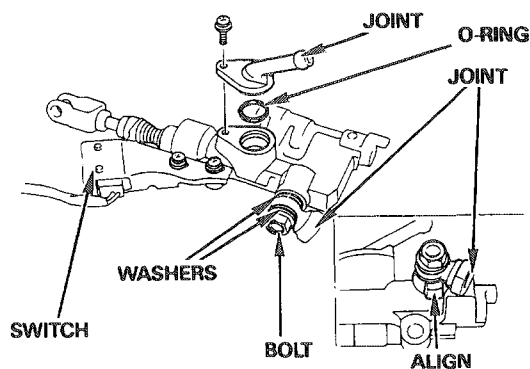
Install the O-ring and reservoir joint with its screw.

A & SE: 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.

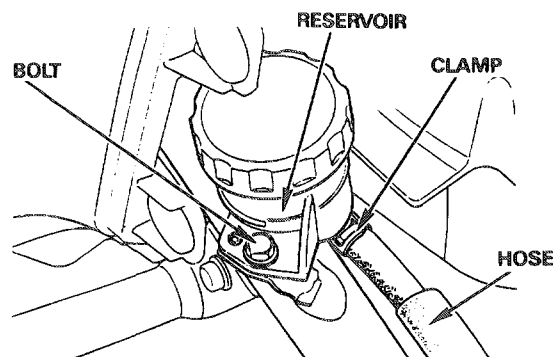
Torque: 35 N-m (3.5 kg-m, 25 ft-lb)



Installation

Connect the reservoir hose with its clamp.

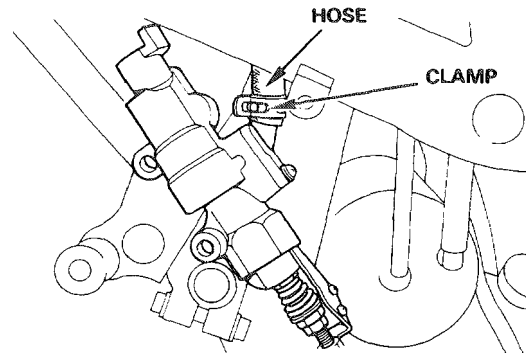
Install the reservoir with its bolt.



Brakes

Rear Master Cylinder (cont'd)

Connect the reservoir hose to the master cylinder joint with its clamp.



Connect the metal brake line for the front caliper at the rear master cylinder with its nut.

Tighten the nut to the specified torque.

Torque: 17 N-m (1.7 kg-m, 12 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 metal brake line for the rear caliper at the control valve with its bolt and new sealing washers.

Tighten the bolt to the specified torque.

Torque: 35 N-m (3.5 kg-m, 25 ft-lb)

Connect the brake rod clevis to the brake arm with the clevis pin.

Install the washer and new cotter pin.

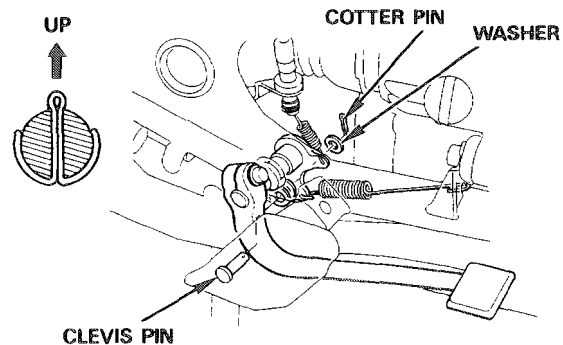
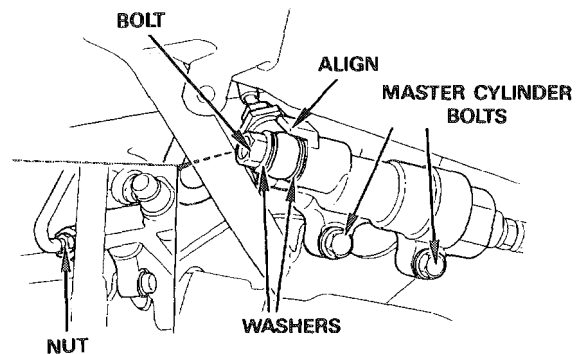
Bend the cotter pin as shown.

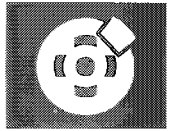
A & SE: Connect the 2P-RED connector to the connector holder behind the ignition control unit.

Install the following:

- Battery and battery holder (see page 17-8).
- Exhaust system components (see page 7-28).

Fill and bleed the brake pedal hydraulic system (see page 14-7).





Front Brake Caliper

Removal

Remove the disc cover (see page 13-18).

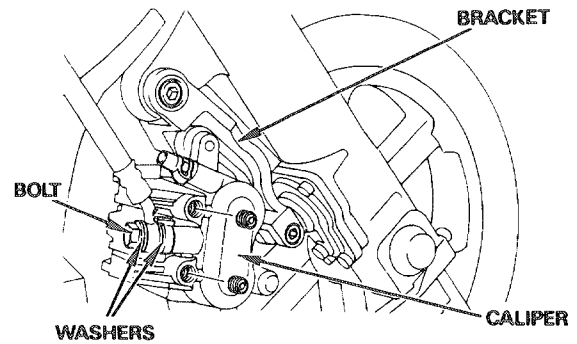
Place a clean container under the caliper.

Disconnect the brake hose from the caliper by removing one bolt and two sealing washers.

CAUTION

- **Avoid spilling brake fluid on painted surfaces.**

Remove the caliper, brake pads, caliper bracket, and pad spring (see page 14-7).



Disassembly

Position the caliper with the pistons facing 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.**

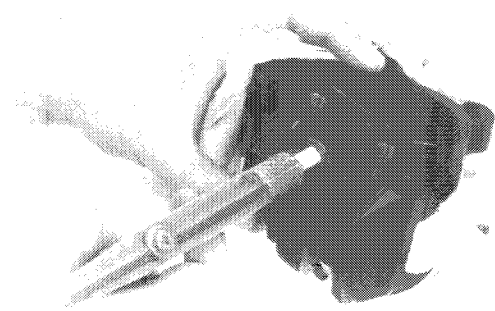
Examine the pistons and cylinders for scoring, scratches, or other damage. Replace, if necessary.

Push the piston and dust seals in, lift them out, and discard them.

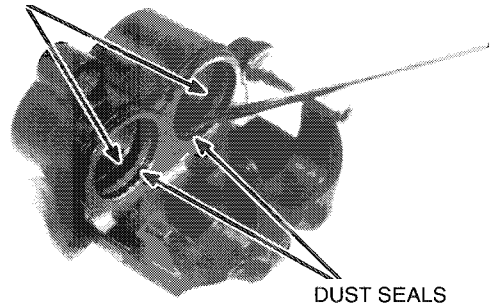
CAUTION

- **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.



PISTON SEALS



Inspection

Measure the piston diameter with a micrometer.

Service Limits:

Left: 25.310 mm (0.9965 in)

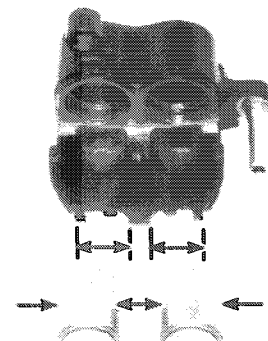
Right: 30.140 mm (1.1866 in)

Measure the caliper cylinder bore.

Service Limits:

Left: 25.460 mm (1.0024 in)

Right: 30.290 mm (1.1925 in)



Brakes

Front Brake Caliper (cont'd)

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.

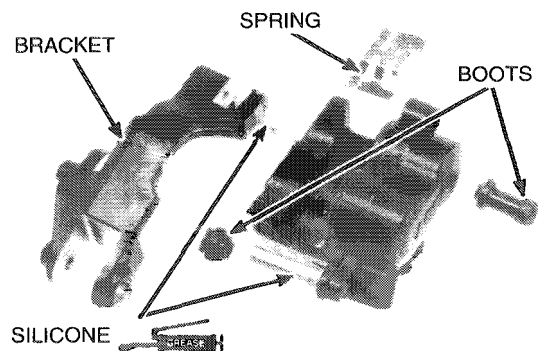
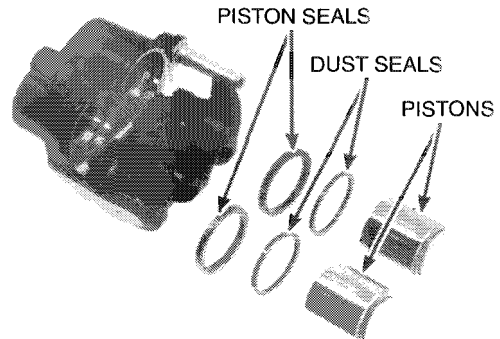
Install the boots.

Apply silicone grease to the caliper pin and caliper bracket pin.

Install the caliper bracket, pad spring, pads, and pad pins (see page 14-8).

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)

Right front caliper bracket bolt (1 model):

31 N-m (3.1 kg-m, 22 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.

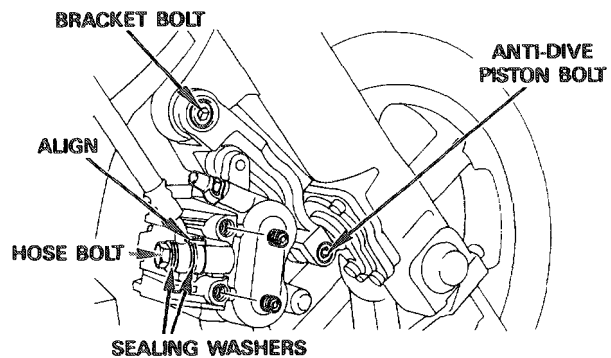
Torque: 35 N-m (3.5 kg-m, 25 ft-lb)

NOTE

- Align the hose joint with caliper boss.

Fill and bleed the hydraulic system (see page 14-5).

Install the disc cover (see page 13-18).





Rear Brake Caliper

Removal

Remove the left saddlebag (see page 13-17).

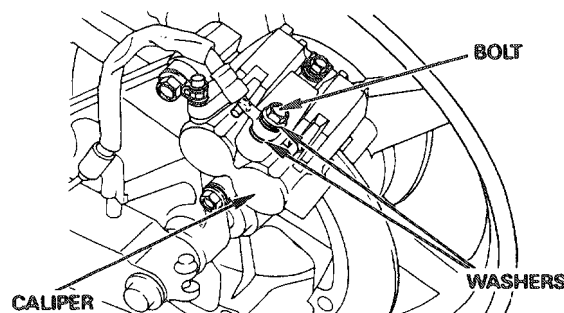
Place a clean container under the caliper and disconnect the brake hose from the caliper.

CAUTION

- Avoid spilling brake fluid on painted surfaces.

Disconnect the brake hose from the caliper by removing its bolt and two sealing washers.

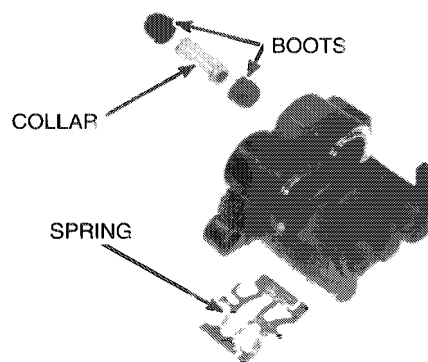
Remove the caliper and pads (see page 14-9).



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 facing 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.

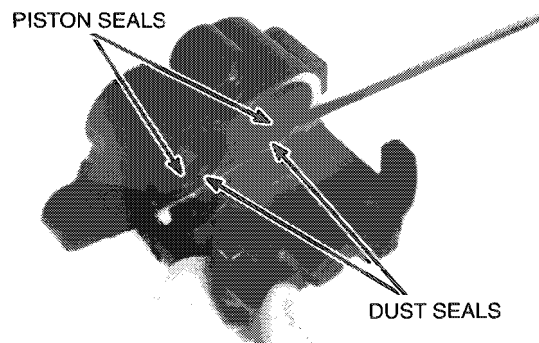


Push the dust and piston seals in, lift them out, and discard them.

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.



Brakes

Rear Brake Caliper (cont'd)

Inspection

Check the caliper cylinder for scratches, scoring, or other damage.

Measure the caliper cylinder bore.

Service Limit: 32.090 mm (1.2634 in)

Examine the pistons and cylinders for scoring, scratches, or other damage. Replace if necessary.

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 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 pins (see page 14-10).

CAUTION

- **Be careful not to damage the 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.

Torque:

Caliper bolt: 23 N-m (2.3 kg-m, 12 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.

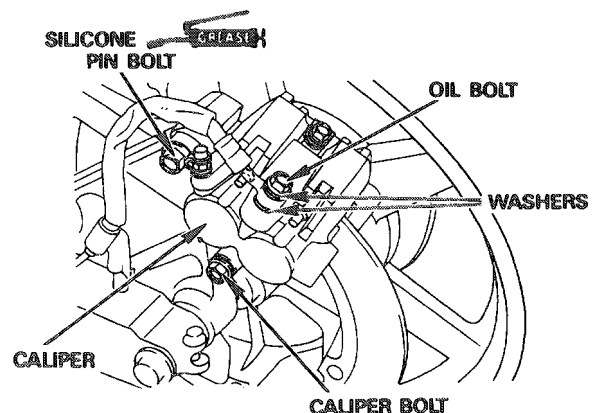
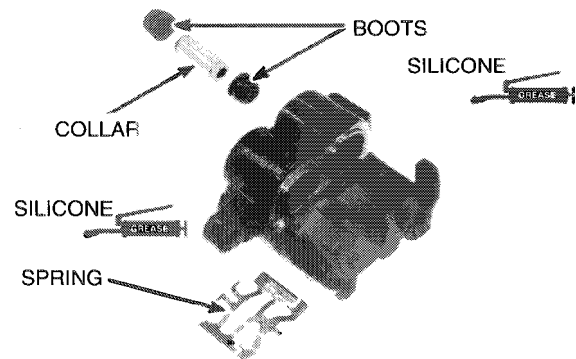
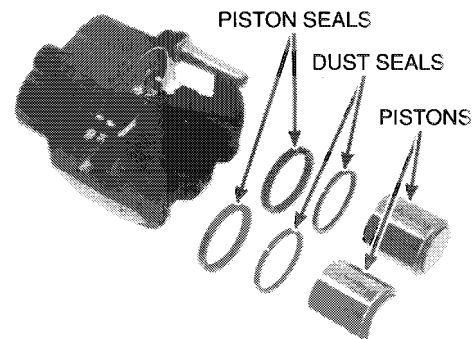
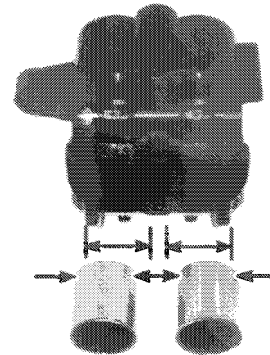
Torque: 35 N-m (3.5 kg-m, 25 ft-lb)

NOTE

- Align the hose joint with the caliper boss.

Fill and bleed the brake pedal system (see page 14-5).

Install the left saddlebag (see page 13-17).

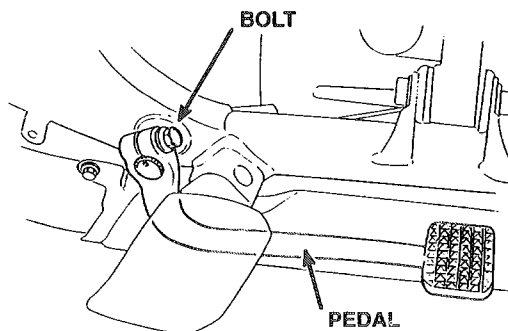




Brake Pedal

Removal

Remove the brake pedal bolt and brake pedal. Remove the right exhaust pipe protector (see page 7-29).

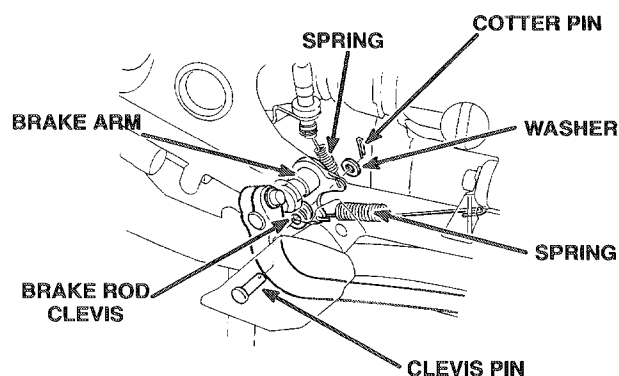


Remove the cotter pin, washer, and clevis pin.

Disconnect the brake rod clevis from the brake arm.

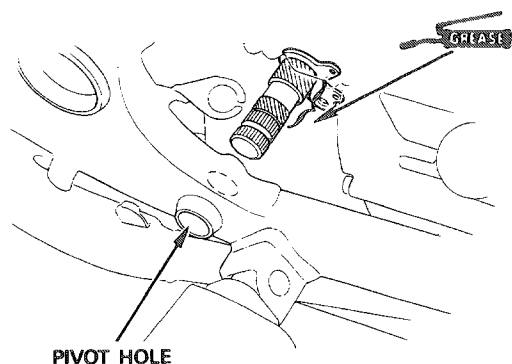
Remove the rear brake light switch spring and brake pedal return spring.

Remove the brake arm.



Installation

Apply grease to the brake pedal shaft and install it to the pivot hole.



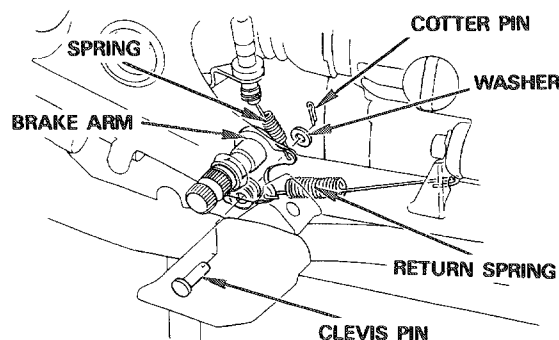
Install the brake pedal return spring and rear brake light switch spring to the brake arm.

Connect the brake rod clevis to the brake arm with the clevis pin.

Install the washer and a new cotter pin to the clevis pin.

NOTE

- Bend the cotter pin as shown.



Brakes

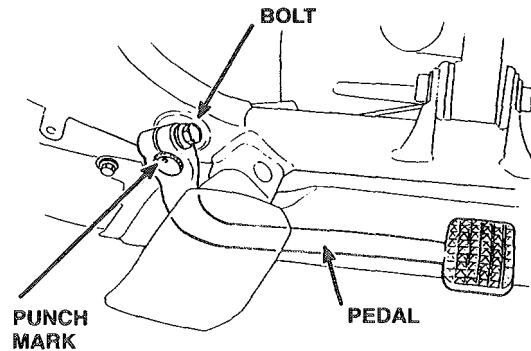
Brake Pedal (cont'd)

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 (see page 3-27).



Metal Brake Line

Removal

Drain the brake fluid from the hydraulic system (see page 14-5).

Remove the following:

- battery and battery holder (see page 17-7).
- left rear side cover (see page 13-8).
- left saddlebag (see page 13-17).

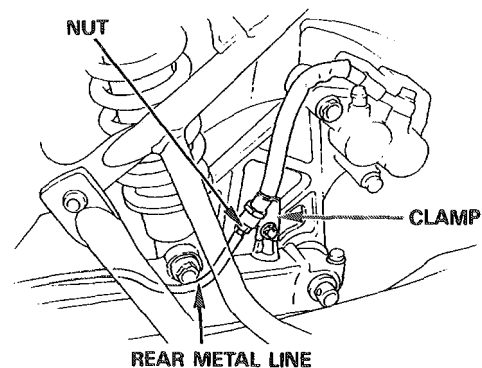
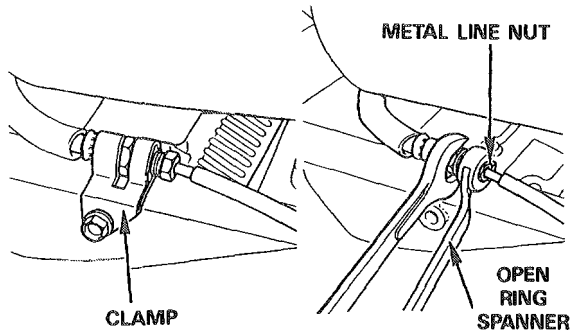
Remove the metal line clamp from the swing arm.

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.

Disconnect the metal line by loosening the nut.

Remove the rear metal line.

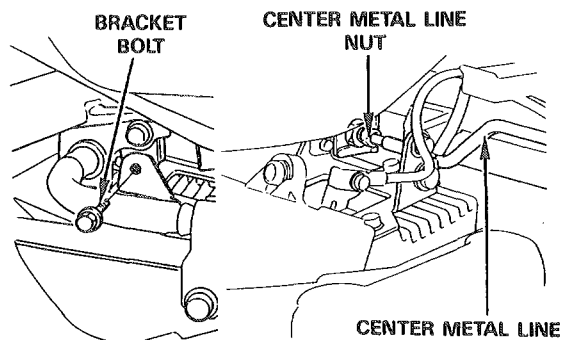




A & SE: Remove the power control reverse resistor assembly (see page 18-42).

Remove the metal line bracket bolt and bracket from the frame.

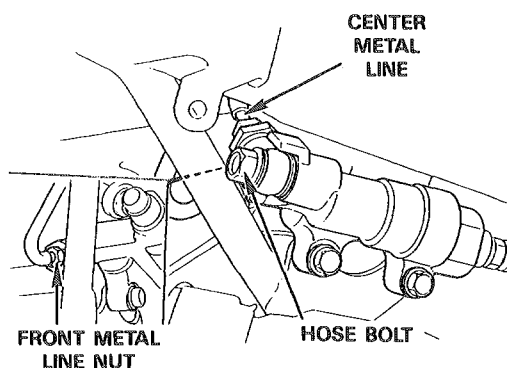
Loosen the center metal line nut, using an open ring spanner.



Remove the hose bolt from the rear master cylinder.

Remove the center metal line sideways to the right.

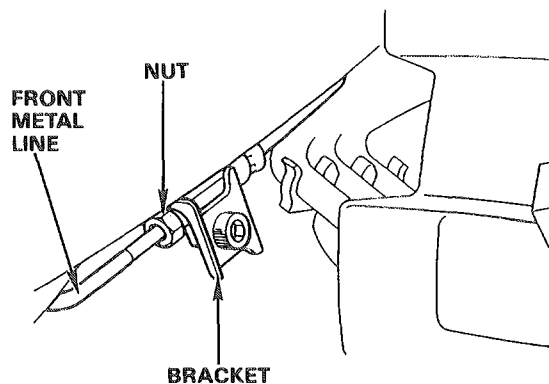
Loosen the front metal line nut, using an open ring spanner from the rear master cylinder.



Remove the right fairing inner cover (see page 13-12).

Remove the front metal line bracket. Loosen the front metal line nut, using an open ring spanner.

Remove the front metal line upwards.



Brakes

Metal Brake Line (cont'd)

Installation

Install the metal lines in the reverse order of removal.

Torque:

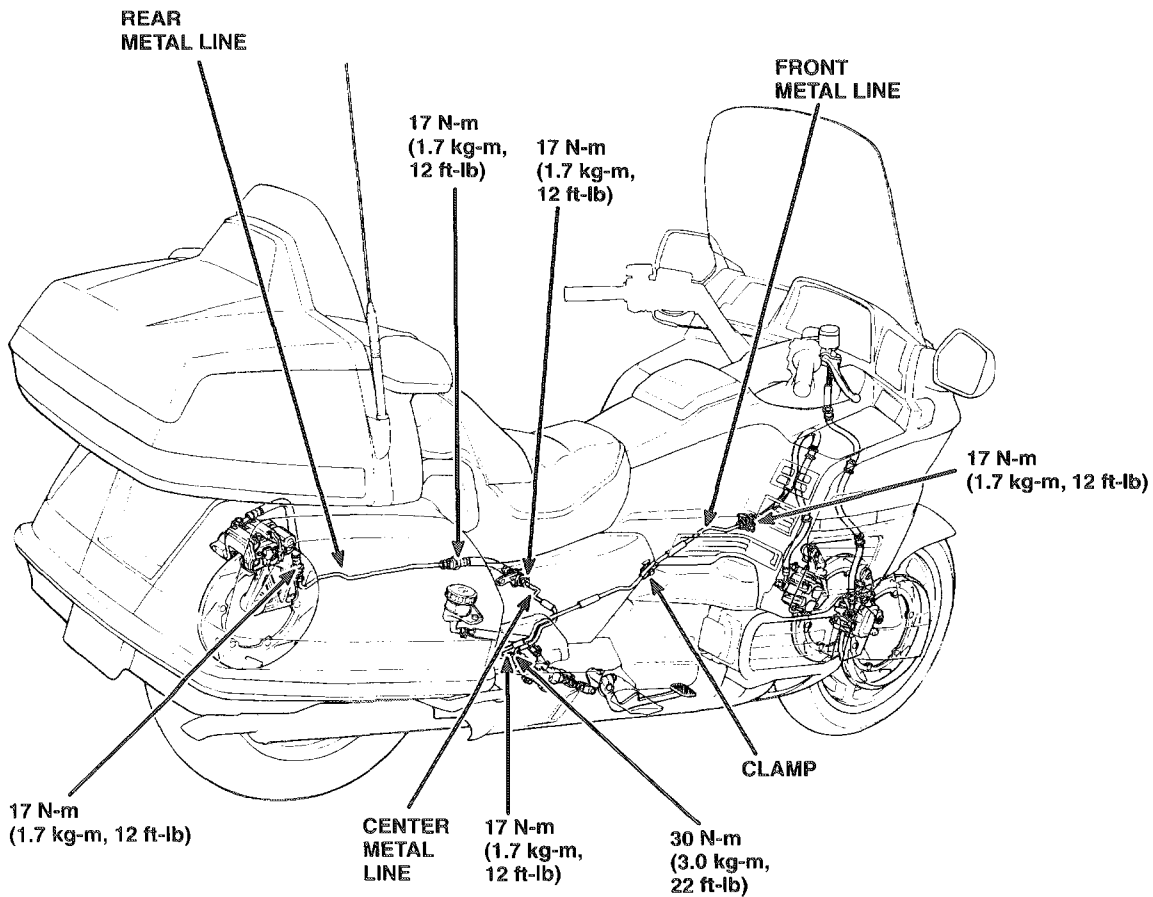
Metal brake line nut: 17 N-m (1.7 kg-m, 12 ft-lb)

Brake hose bolt: 35 N-m (3.5 kg-m, 25 ft-lb)

NOTE

- Be careful not to twist the metal lines when tightening the 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 (see page 14-6).





Wheels/Tires

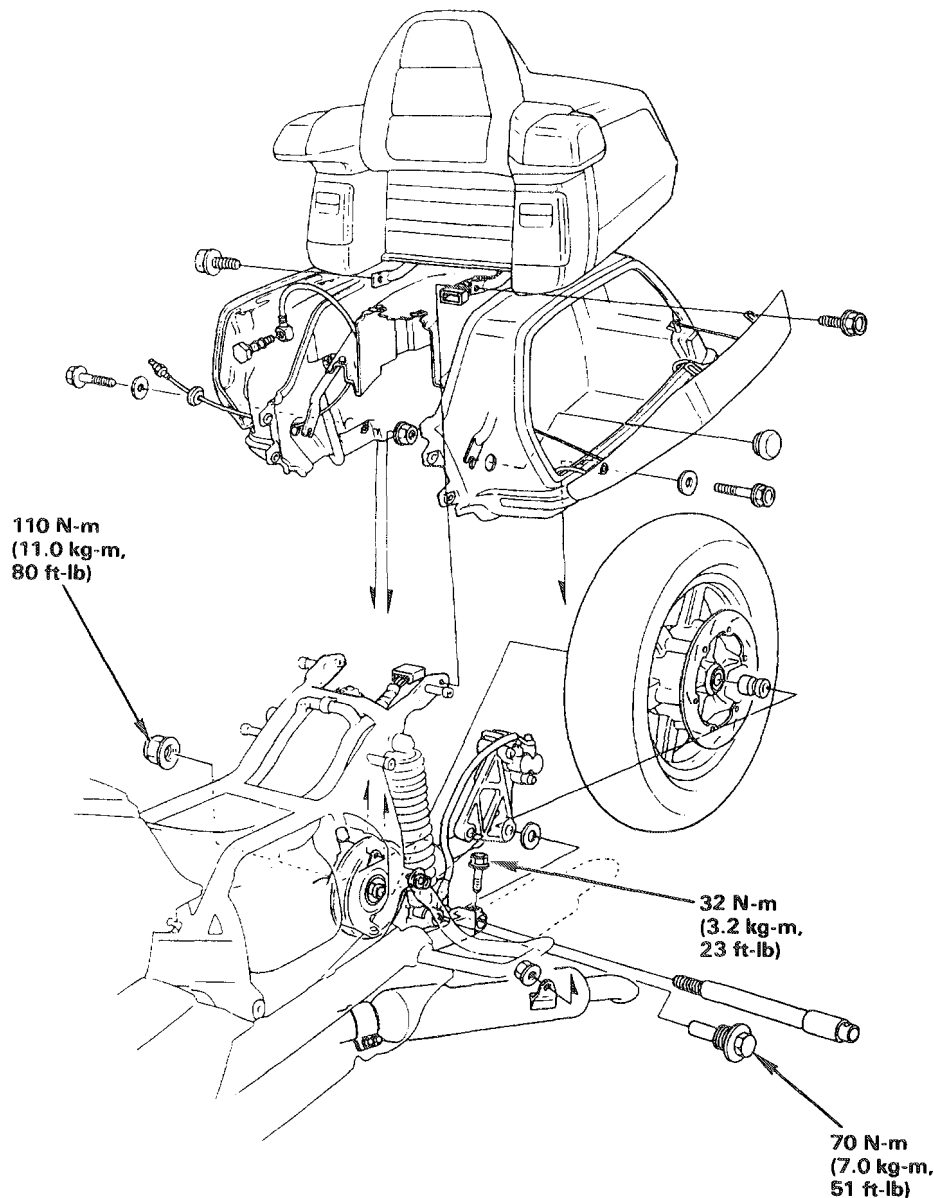
Service Information	15-2
Troubleshooting	15-4
Front Wheel	15-5
Rear Wheel	15-10
Wheel Balancing	15-20

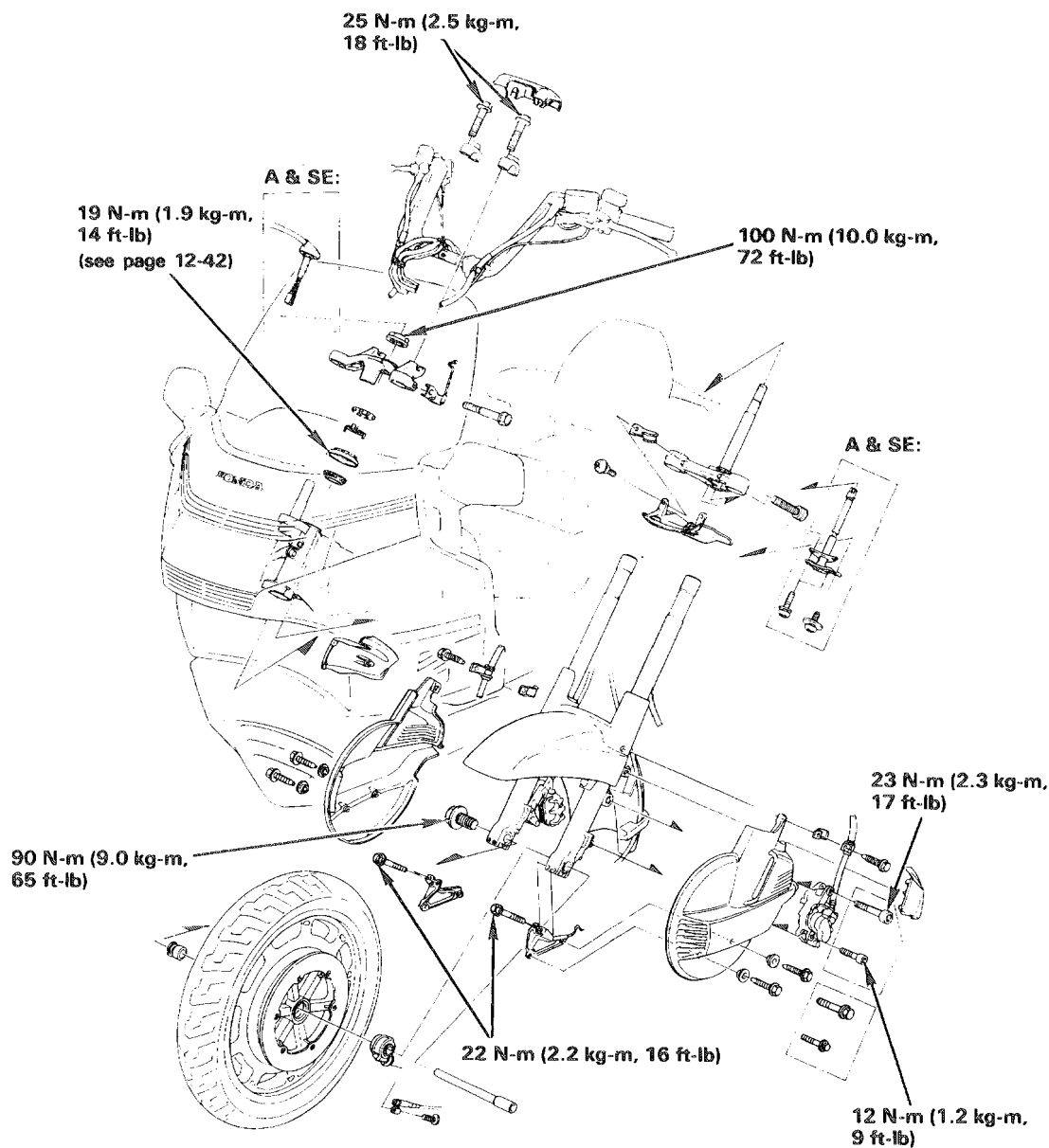
Wheels/Tires

Service Information

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 ways to remove the trunk/saddlebag rear section of the motorcycle. If a helper is available, the entire trunk/saddlebag section may be removed as an assembly. If a helper is not available, remove the individual components as instructed.
- A jack or other support is required to support the motorcycle. The motorcycle may be damaged if it is not supported on the indicated jack point (see page 15-5).
- Wheel bearings must not be re-used after they have been removed. Always use new bearings.
- 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.
- This motorcycle is equipped with tubeless tires, valves, and wheel rims. Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE." Never mount tires designed for use on automobiles on a motorcycle rim.





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 adjustment nut	19 N-m (1.9 kg-m, 14ft-lb) – see page 12-44
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)
Right front caliper bracket bolt (I model)	31 N-m (3.1 kg-m, 22 ft-lb)

Wheels/Tires

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 wobble or vibration

- Loose axle (front or rear)
- Loose wheel bearings
- Loose steering stem nut or bearings
- Loose swing arm pivot bolt lock nut
- 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.

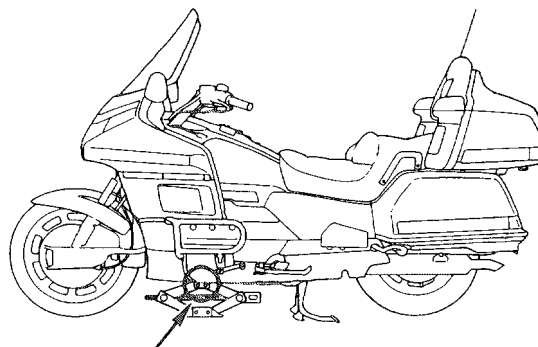
Raise the front wheel off the ground by placing a jack or other support on the fixed point under the engine, as shown.

CAUTION

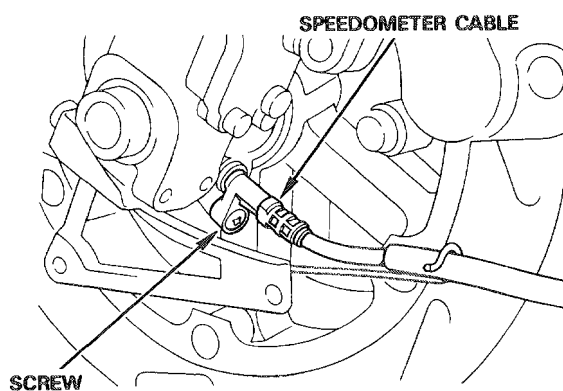
- Do not use the oil filter as a jack point.

Remove the right and left disc covers (see page 13-18).

Disconnect the speedometer cable from the speedometer gear box.



JACK POINT



SPEEDOMETER CABLE

SCREW

Remove the caliper bracket bolt and anti-dive piston bolt.

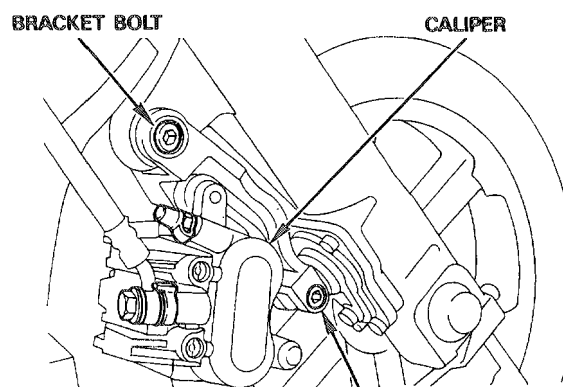
Remove either the right or left caliper assembly.

CAUTION

- Support 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.



BRACKET BOLT

CALIPER

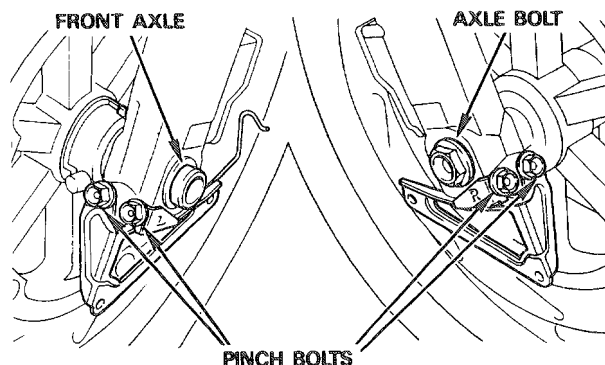
ANTI-DIVE PISTON BOLT

Remove the axle bolt.

Loosen the axle pinch bolts.

Remove the following:

- front axle
- front wheel



FRONT AXLE

AXLE BOLT

PINCH BOLTS

Wheels/Tires

Front Wheel (cont'd)

Wheel Bearing Inspection

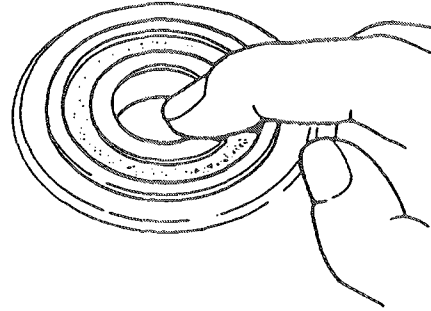
Turn the inner race of each bearing with your finger. The bearing should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the wheel hub.

Replace the bearings if necessary (see page 15-7).

NOTE

- Replace the wheel bearings as a set.



Wheel Rim Runout Inspection

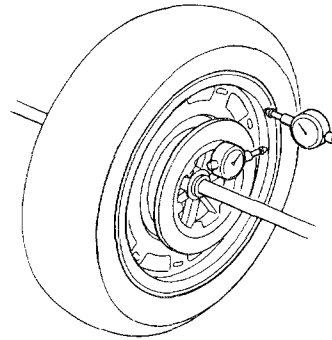
Place the wheel in a truing stand. Spin the wheel slowly and measure the runout with a dial indicator gauge.

Service Limits:

Radial Runout: 2.0 mm (0.08 in)

Axial Runout: 2.0 mm (0.08 in)

Replace the wheel if the runout exceeds the service limits.

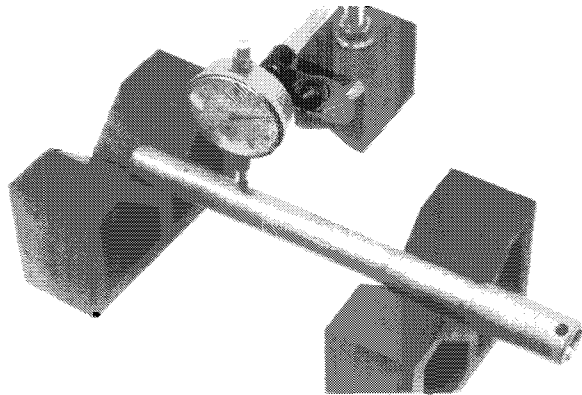


Axle Inspection

Set the axle in V blocks and measure the runout.

The actual runout is 1/2 of the total indicator reading.

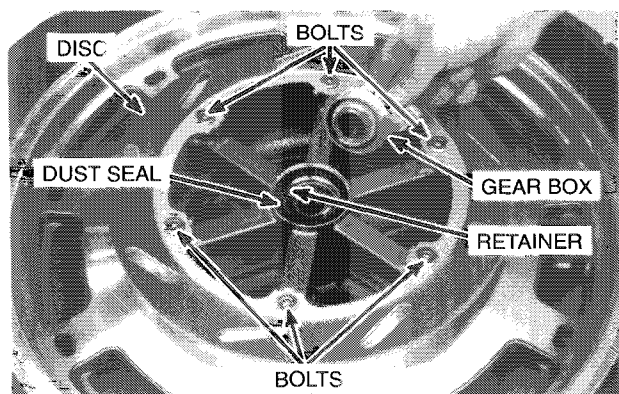
Service Limit: 0.2 mm (0.01 in)

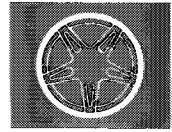


Disassembly

Remove the following from the left side of wheel:

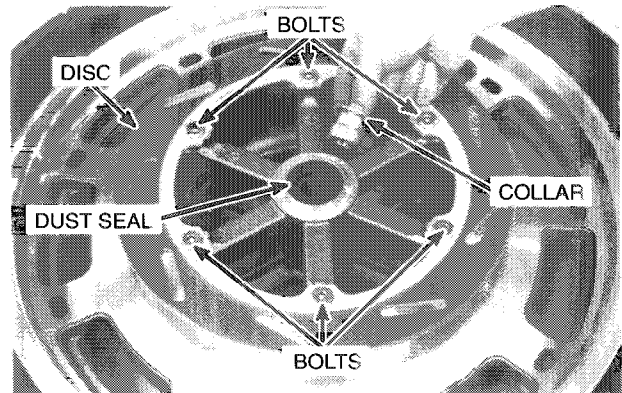
- speedometer gear box.
- dust seal.
- retainer.
- brake disc.





Remove the following from the right side of wheel:

- axle collar.
- dust seal.
- brake disc.



Bearing Replacement

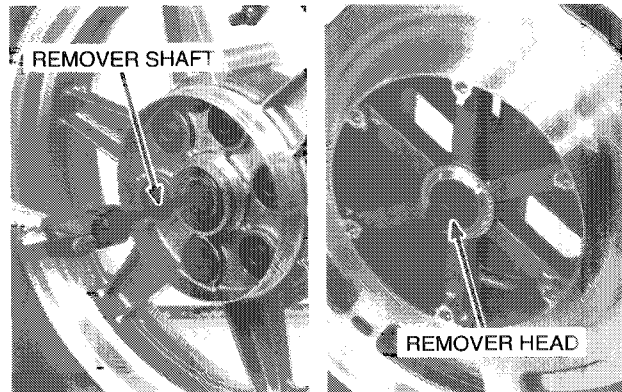
Remove the bearings and the distance collar from the hub.

Tools:

Bearing remover
Commercially available

NOTE

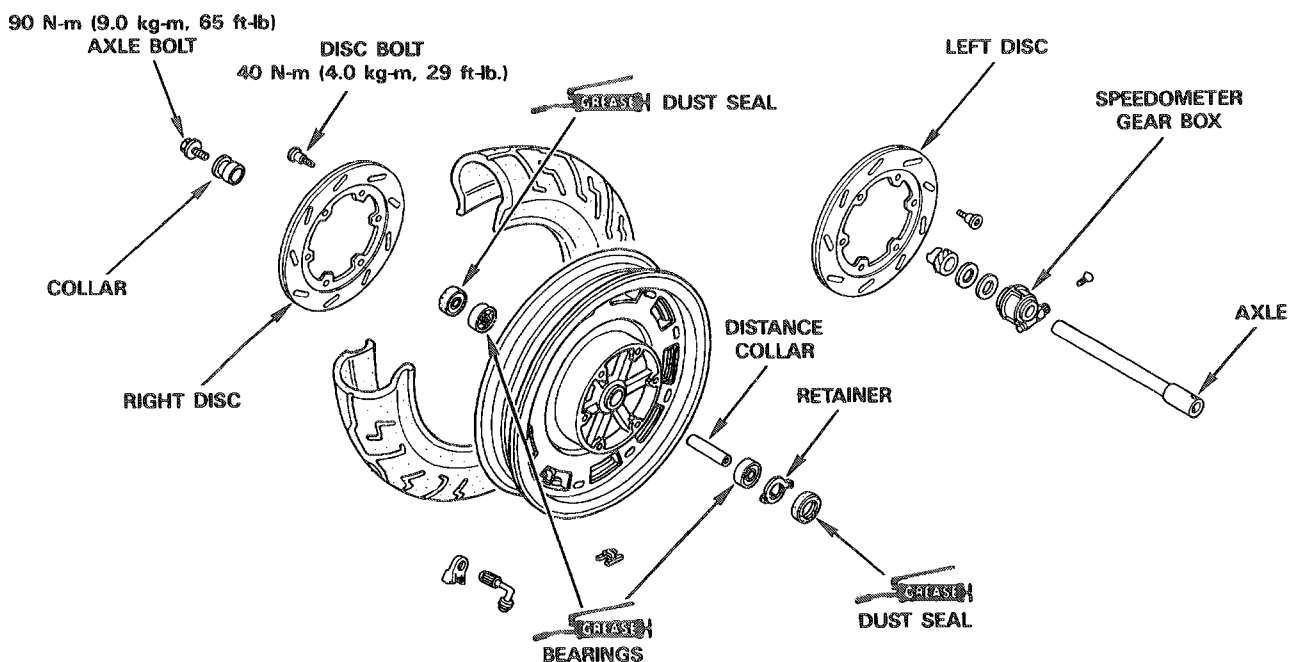
- Do not reuse the removed bearings. Install new bearings.



Assembly

⚠ WARNING

- Do not get grease on the brake disc or braking power will be eliminated.



Wheels/Tires

Front Wheel (cont'd)

Pack the new bearing with grease.

Drive in the right bearing first with the sealed end facing out.

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. 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 grease on the outside surface of the dust seal.

Install the axle collar into the dust seal, positioning it 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 grease on the outside surface of the dust seal.

Installation

Position the front wheel between the fork legs.

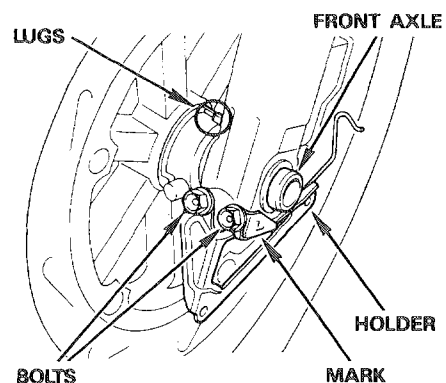
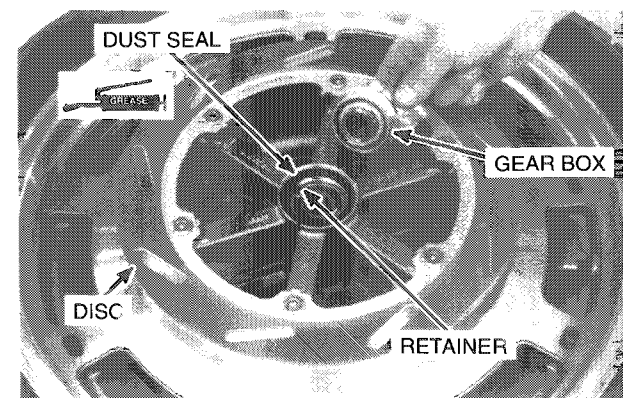
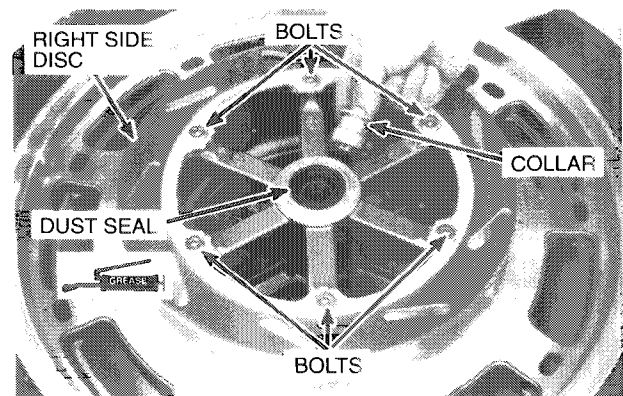
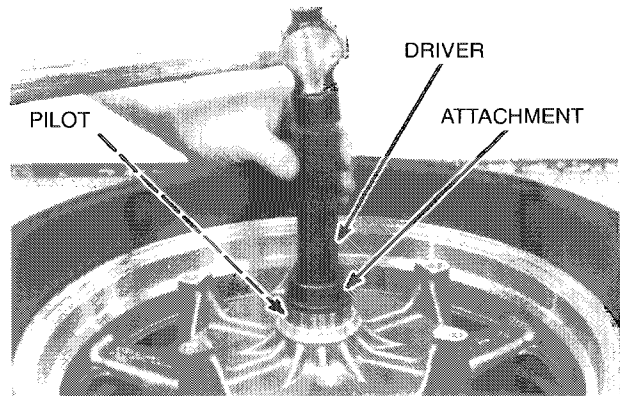
Install the front axle from the left fork slider through the wheel to the right fork slider.

Position the speedometer gear box so that the lug on the gear box is against the rear of the stopper lug on the 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 identification marks: "L" for the left side and "R" for the right side.





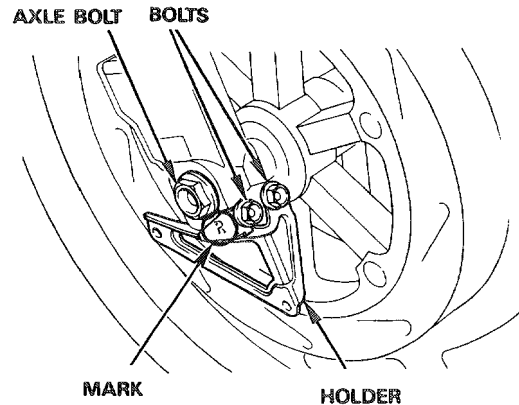
Install and tighten the front axle bolt.

Torque: 90 N-m (9.0 kg-m, 65 ft-lb)

Install the disc cover holder with the "R" mark, if removed.

Tighten the axle pinch bolts (each side).

Torque: 22 N-m (2.2 kg-m, 16 ft-lb)



Install a caliper and the caliper bracket and anti-dive piston bolts.

Tighten the bolts.

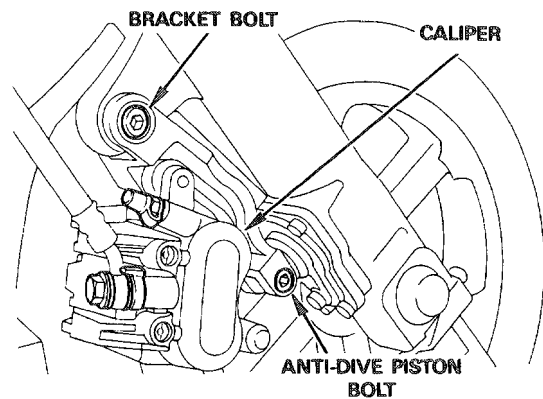
Torque:

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)

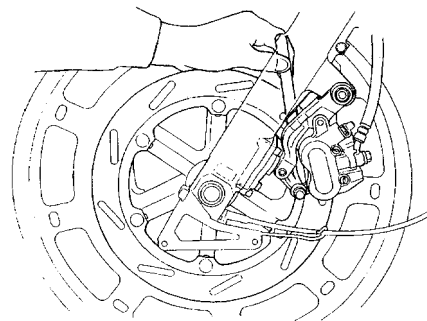
Right front caliper bracket bolt (1 model):

31 N-m (3.1 kg-m, 22 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 and move the left fork slider out until the gauge can be inserted. Then retighten the left axle pinch bolts.



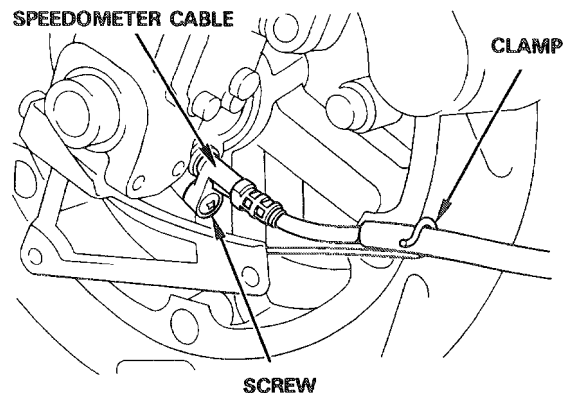
CAUTION

- 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 covers (see page 13-18).



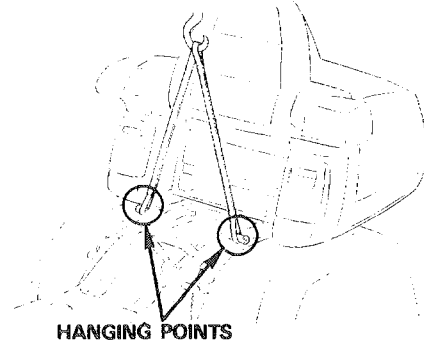
Wheels/Tires

Rear Wheel

Removal

Put the motorcycle on its center stand.

If necessary, remove the seat (see page 13-8) and raise the rear wheel off the ground by hanging the motorcycle on the fixed points as shown.



Trunk/Saddlebags

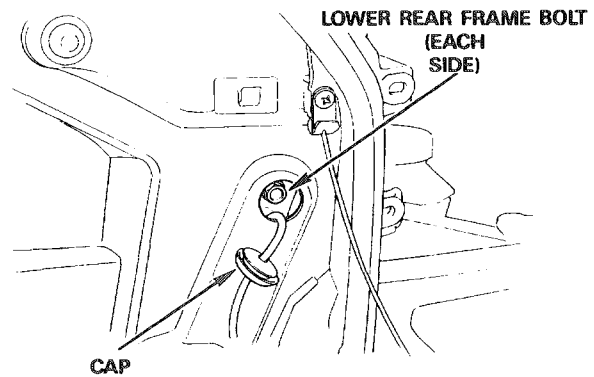
– Removal with a helper

Remove the seat (see page 13-8).

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.

Loosen the lower rear frame bolt (each side).



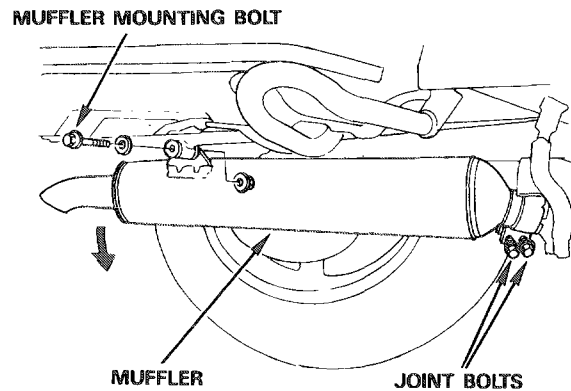
Loosen the muffler joint bolts (each side).

Remove the muffler mounting bolt, washer, and nut (each side).

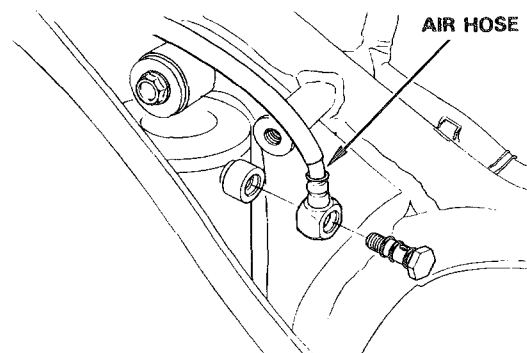
Lower the mufflers to remove the axle nut and shaft.

CAUTION

- Do not damage the muffler gaskets.



A & SE: Disconnect the air hose from the right shock absorber.





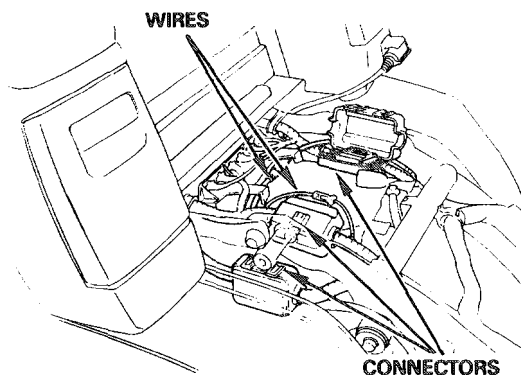
Disconnect the antenna wire.

Disconnect the ground wire near the antenna wire.

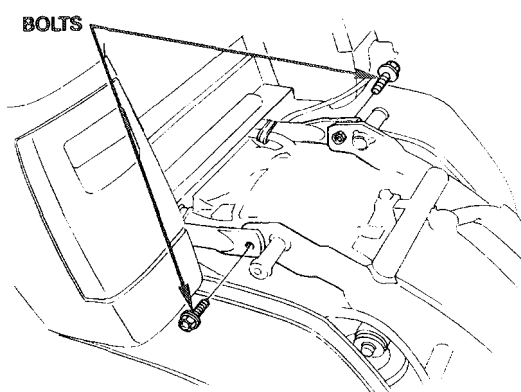
A & SE: Open the three black plastic cases covering the three (red, black, and white) connectors.

Disconnect the connectors. (I model: connector.)

SE: Disconnect the CB antenna wire connector and rear speaker (4P-BLK) connector.

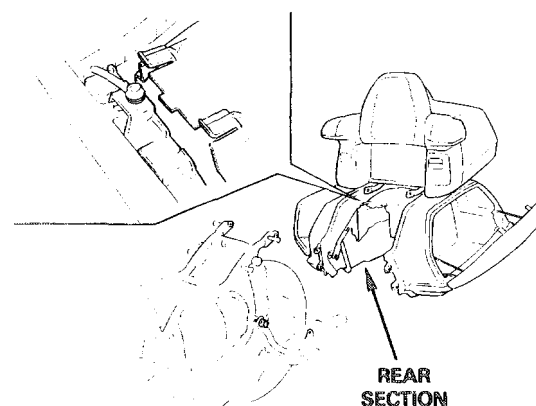


Remove the upper rear frame bolts.



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.



Trunk/Saddlebags

— Removal without a helper

Remove the following:

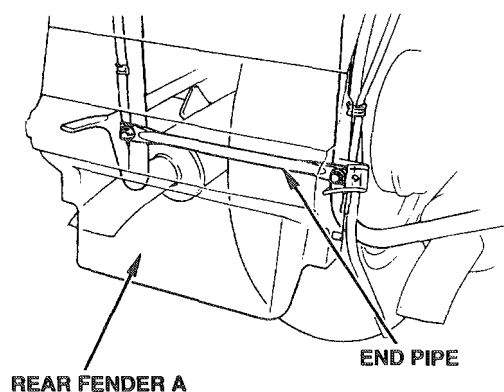
- trunk lower cover (see page 13-15).
- left and right saddlebags (see page 13-17).
- rear fender A (see page 13-19).
- rear frame end pipe.

Remove the muffler mounting bolt and loosen the joint bolts (each side) (see page 7-33).

Lower the muffler (each side) so that the axle shaft can be removed.

CAUTION

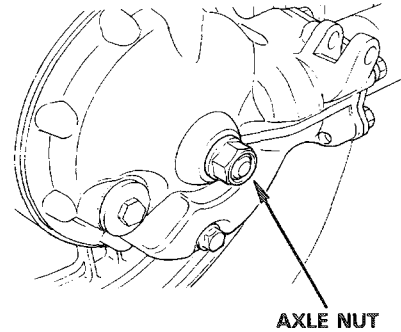
- Do not damage the muffler gaskets.



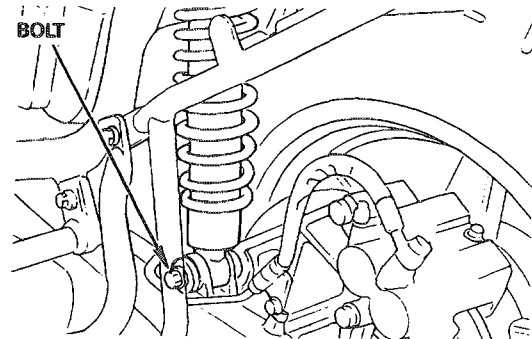
Wheels/Tires

Rear Wheel (cont'd)

Remove the rear axle nut.



Remove the left shock absorber lower mount bolt.



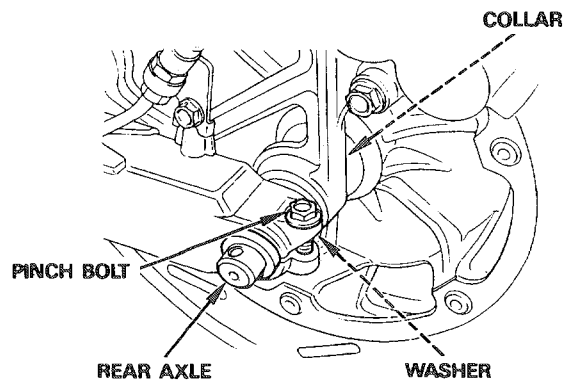
Remove the rear axle pinch bolt and pull the rear axle out of the wheel.

Remove the following:

- caliper assembly with bracket.
- washer.
- collar.

CAUTION

- Support the caliper with a wire so that it does not hang from the brake hose. Do not twist the brake hose.



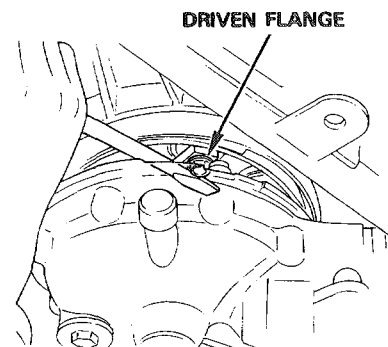
NOTE

- Do not depress the brake pedal when the caliper is removed, or it will be difficult to refit the disc between the brake pads.

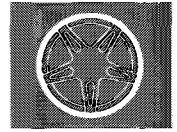
Remove the rear wheel from the final gear.

NOTE

- If necessary, push the driven flange on the final gear side against the wheel to allow clearance for removal.

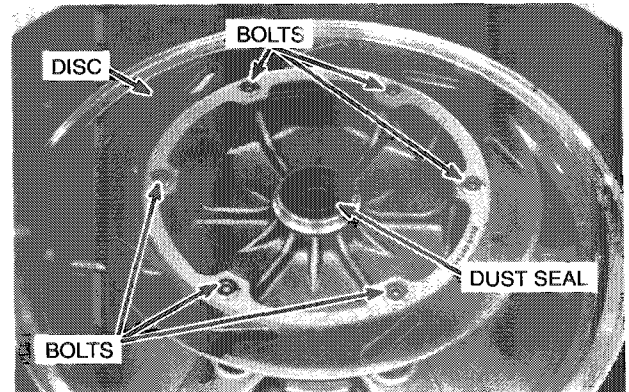


Inspect the wheel as described in front wheel section.



Inspection

- Axle inspection (see page 15-6).
- Wheel bearing inspection (see page 15-6).
- Wheel rim runout inspection (see page 15-6).



Disassembly

Remove the brake disc and dust seal from the wheel hub.
Remove the driven flange from the wheel hub.

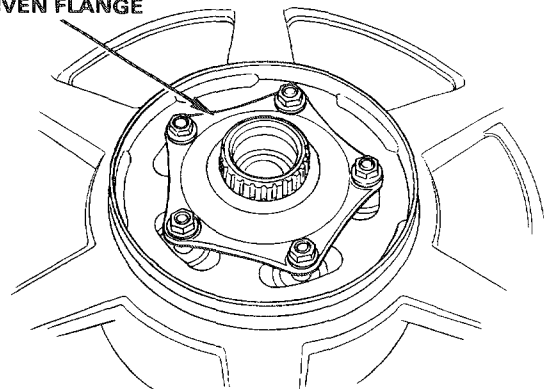
CAUTION

- Be careful not to damage the wheel hub.

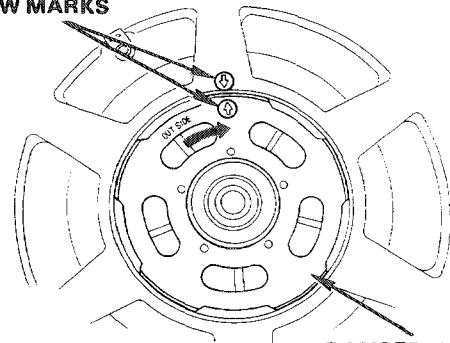
NOTE

- The pins and nuts cannot be removed.

DRIVEN FLANGE



ARROW MARKS



DAMPER HOLDER

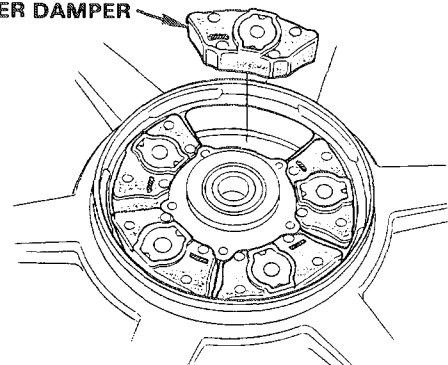
Remove the damper holder bolts.

Turn the damper holder clockwise and align the arrow marks on the damper holder and wheel hub.

Remove the damper holder from the wheel hub.

Replace the rubber dampers if they are damaged or deteriorated.

RUBBER DAMPER



Wheels/Tires

Rear Wheel (cont'd)

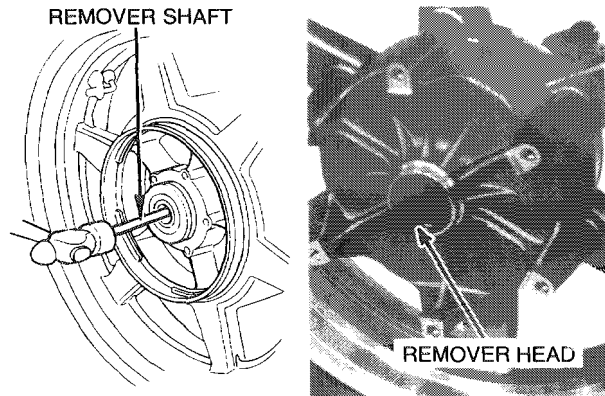
Remove the bearings and distance collar from the rear wheel hub.

Tools:

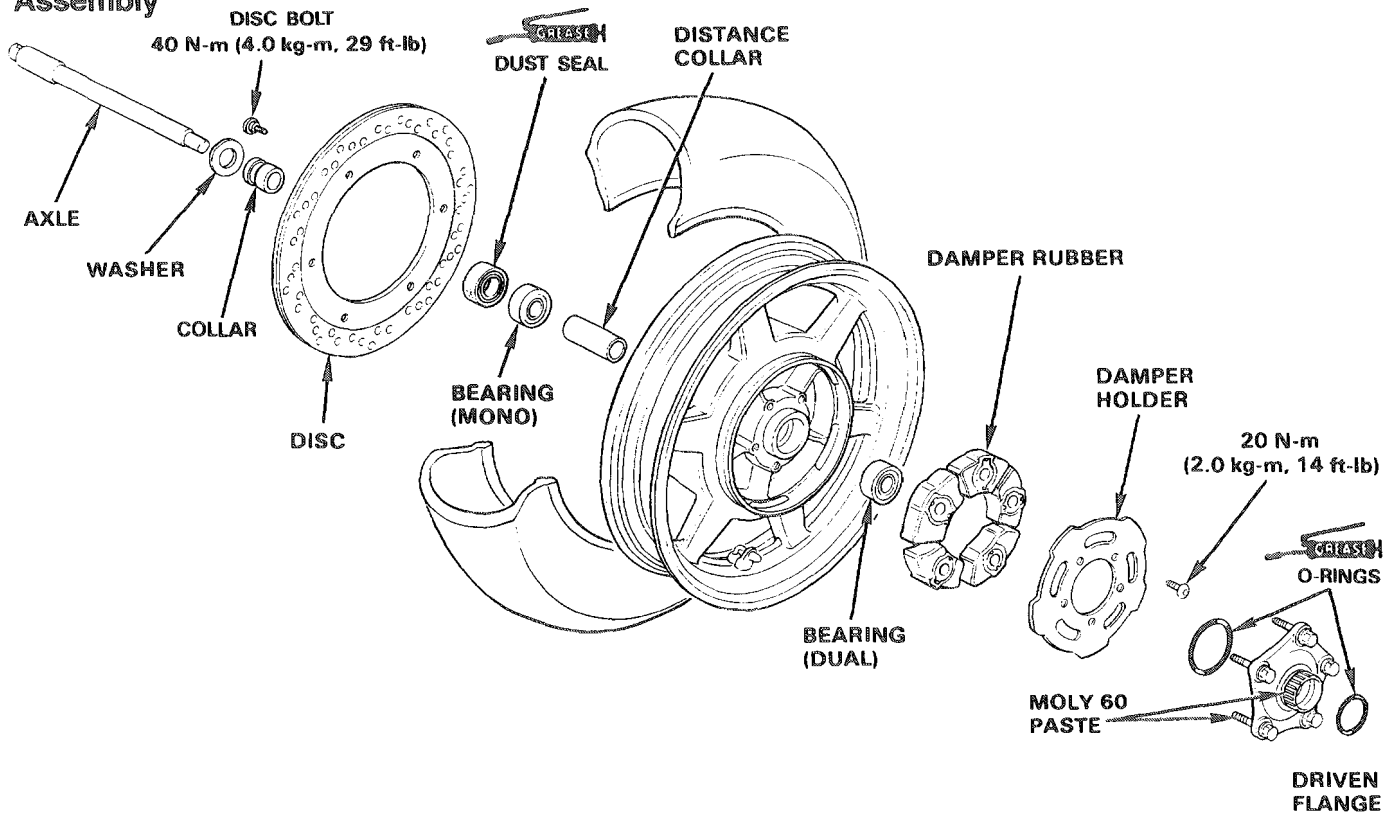
Bearing remover, commercially available

NOTE

- Do not reuse the removed bearings. Install new bearings.



Assembly



Pack the new bearing cavities with grease. Drive in the left bearing (mono) first.

Tools:

Driver

07749-0010000

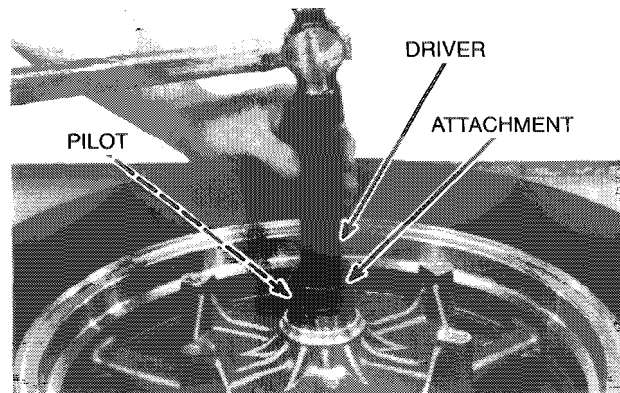
Attachment, 42 x 47 mm

07746-0010300

Pilot, 20 mm

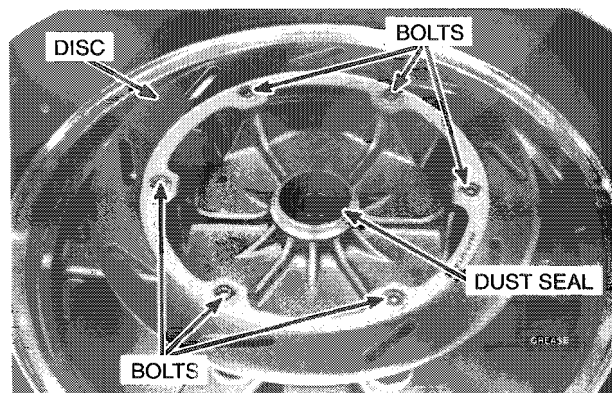
07746-0040500

Install the distance collar and then drive in the right bearing (dual).





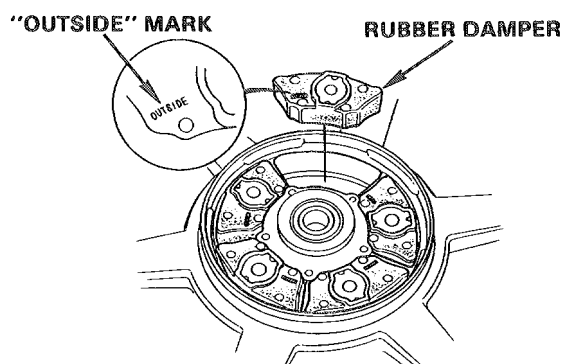
Pack the dust seal lip cavity with grease.
Install the dust seal in the wheel hub.
Install the brake disc and tighten the bolts.
Torque: 40 N-m, (4.0 kg-m, 29 ft-lb)



Install the rubber dampers into the wheel hub.

NOTE

- Install each rubber damper with the "OUTSIDE" mark facing outward.

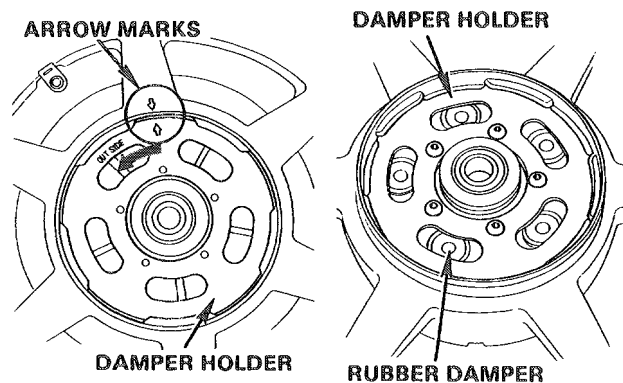


Install the damper holder into the wheel hub.

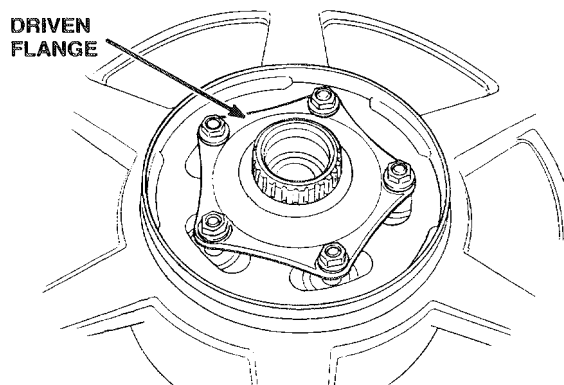
Align the arrow marks on the damper holder and wheel hub, then turn the damper holder counterclockwise.

Install and tighten the damper holder bolts.

Torque: 20 N-m (2.0 kg-m, 14 ft lb)



Install the driven flange to the wheel hub.

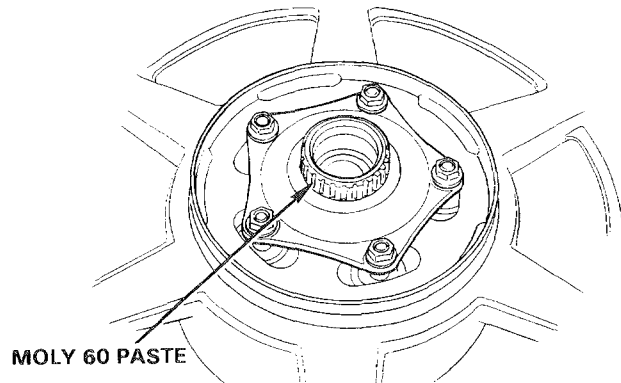


Wheels/Tires

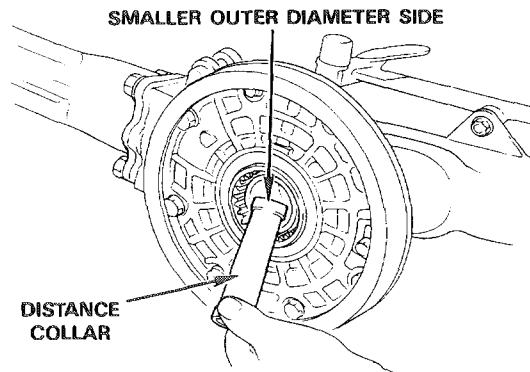
Rear Wheel (cont'd)

Installation

Apply Pro-Honda Moly 60 paste or equivalent to the driven flange splines.

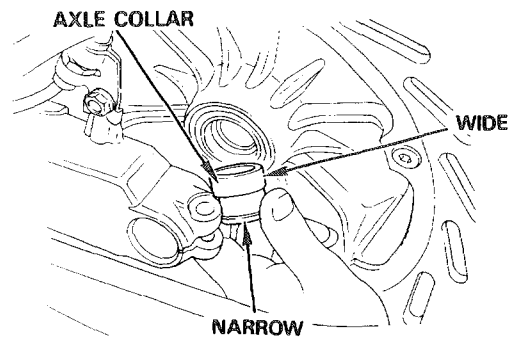


Install the distance collar with its smaller outer-diameter side facing inside.



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.

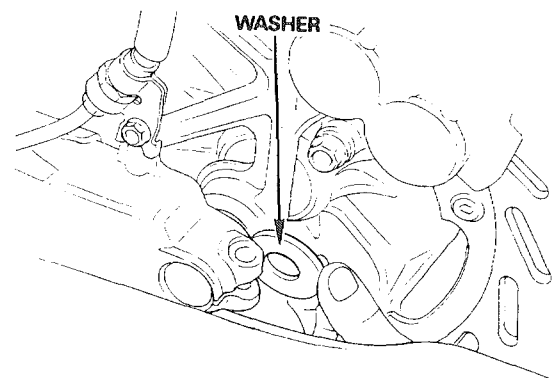


Position the caliper and bracket as an assembly over the disc.

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.



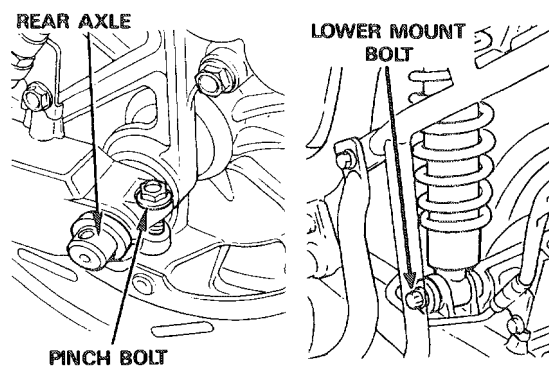


Insert the rear axle through the swing arm, washer, caliper bracket, collar, and rear wheel.

Install the pinch bolt.

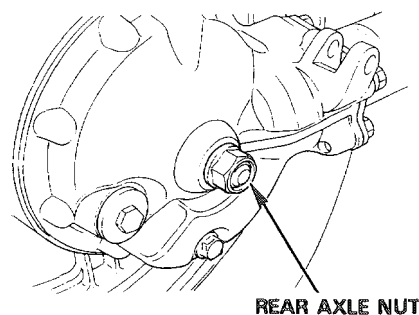
Install and tighten the left shock absorber lower mount bolt.

Torque: 70 N-m (7.0 kg-m, 51 ft-lb)



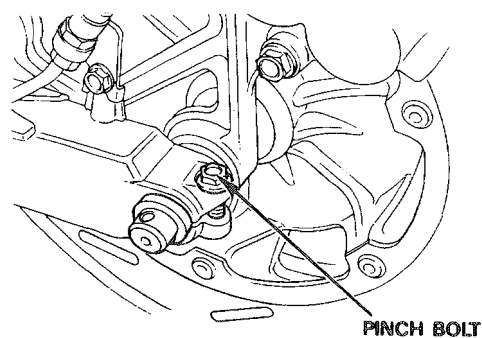
Install and tighten the rear axle nut.

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)



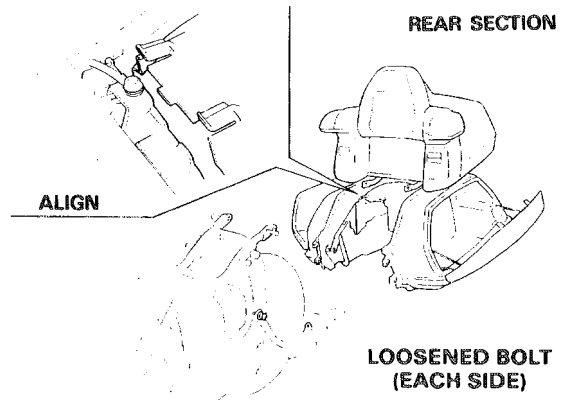
Wheels/Tires

Rear Wheel (cont'd)

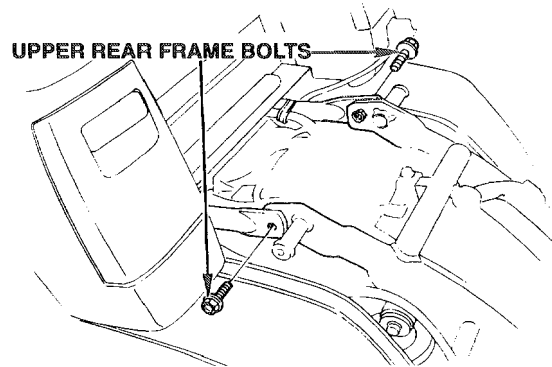
Trunk/Saddlebag

– Installation with a helper

Install the rear section, sliding the lower rear frame tubes into the loosened bolts and aligning the upper fender tabs.



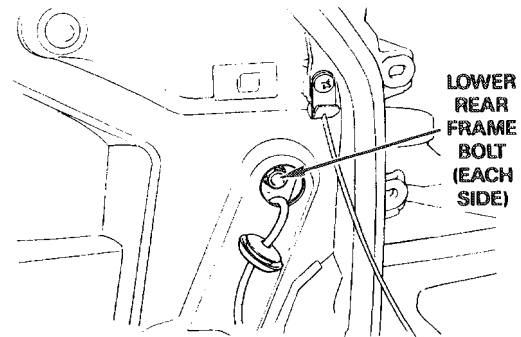
Install the upper rear frame bolts.



Push the rear frame forward. Tighten the lower rear frame bolts (each side).

Install the cap securely (each side).

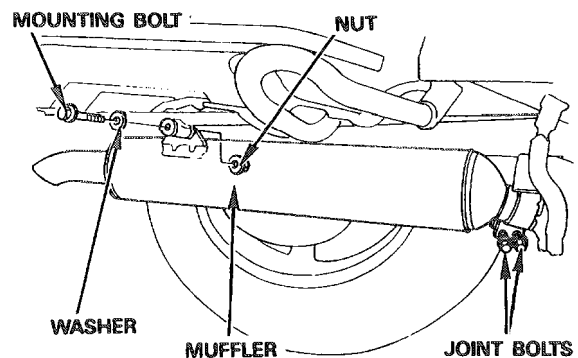
Tighten the upper rear frame bolts.



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).





SE model:

Connect the CB antenna wire connector and rear speaker (4P-BLK) connector.

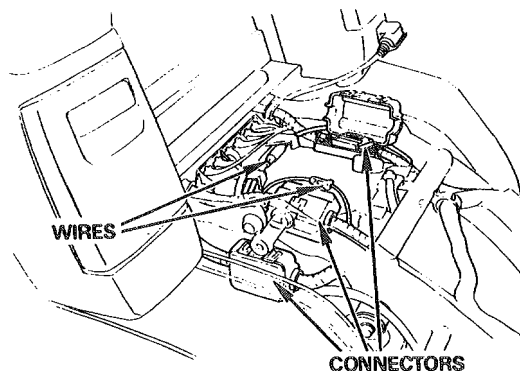
A & SE models:

Connect the three connectors (red, black, and white) securely and close the plastic cases.

Connect the antenna wire and ground wire.

I model:

Connect the white connector.



A & SE models:

Apply a thin coat of suspension fluid to new O-rings.

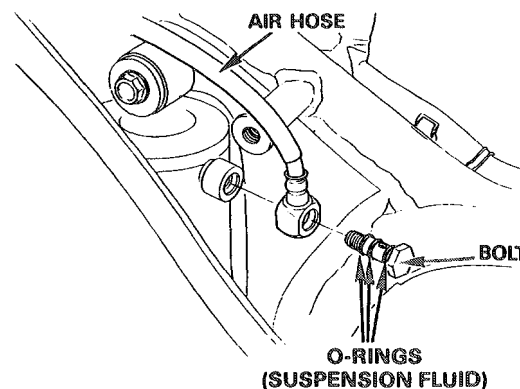
Connect the air hose to the shock absorber.

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.



All models:

Install the seat (see page 13-8).

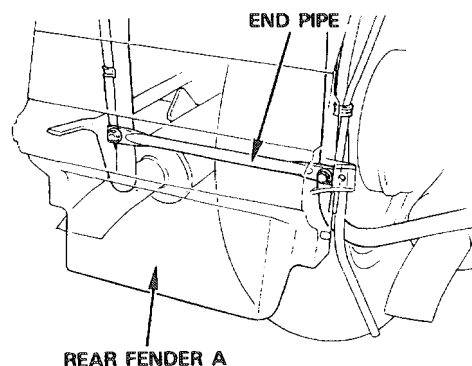
Close the saddlebags.

Trunk/Saddlebag

– Installation without a helper

Install the following:

- rear frame and pipe.
- rear fender A (see page 13-19).
- left and right muffler (see page 7-33).
- left and right saddlebags (see page 13-17).
- trunk lower cover (see page 13-15).



Wheels/Tires

Wheel Balancing

CAUTION

- Wheel balance directly affects the stability, handling, and overall safety 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, preferably, a vise with soft jaws.)

Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.

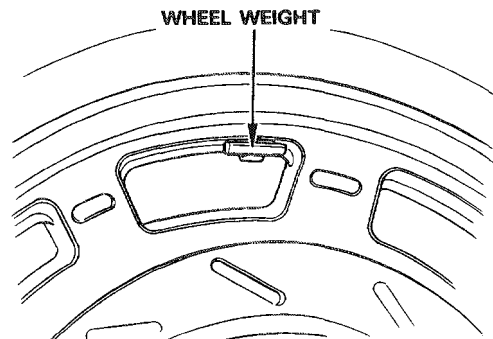
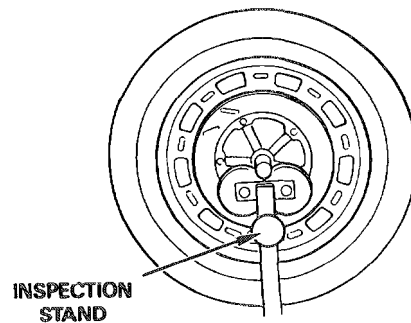
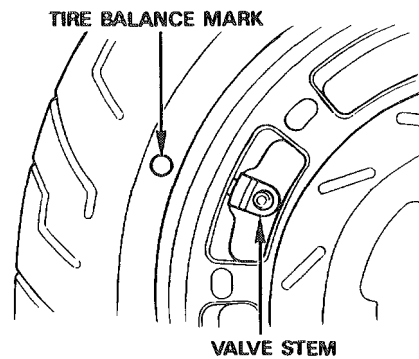
Do this two or three times to verify the heaviest area. If the wheel is balanced, it will not stop consistently in the same position.

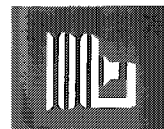
To balance the wheel, install wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it's spun.

Do not exceed the following weight limits:

Front: 60 grams

Rear: 70 grams





Ignition

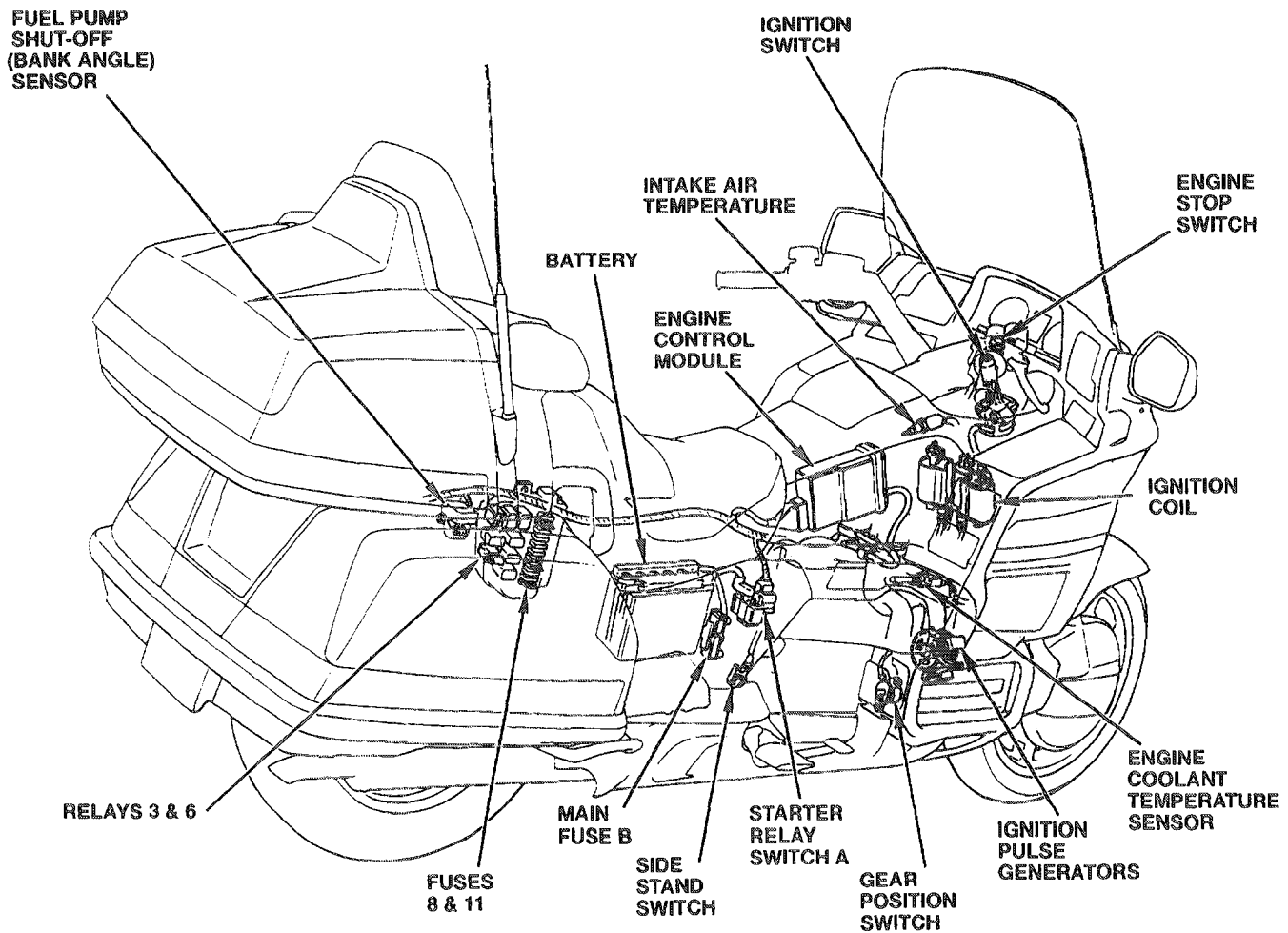
Service Information	16-2
Troubleshooting	16-4
Engine Control	
Module	16-7
Ignition Coil	16-8
Ignition Pulse	
Generator	16-10
Gear Position	
Switch	16-13
Side Stand Switch	16-14
Engine Coolant	
Temperature	
Sensor	16-15
Engine Stop Switch	16-16
Ignition Timing	16-17

Ignition

Service Information

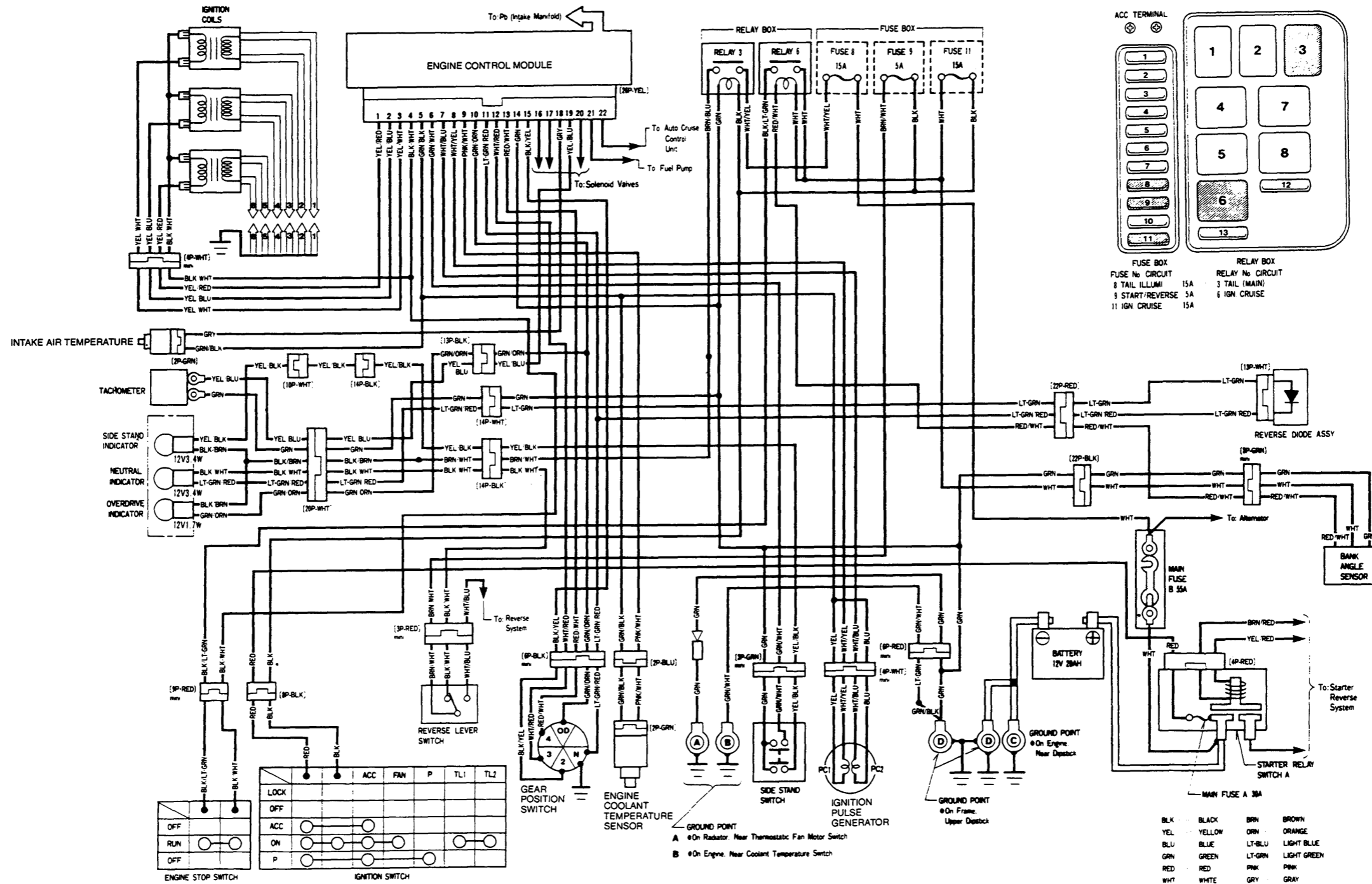
- All electrical components can be inspected without removing them from the motorcycle.
- Be sure the battery is fully charged before troubleshooting the ignition system.
- Current is sent through the ignition coil primary circuit by the engine control module. When the ignition pulse generator rotor tooth 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 GL1500 ignition control module electronically varies ignition times according to engine speed and intake manifold vacuum. The gear position switch, engine coolant temperature sensor and intake air temperature sensor signal the engine control module to compensate the ignition timing according to the gear position, coolant temperature and atmospheric temperature.
- When inspecting the ignition system, check the system components and lines step-by-step according to the troubleshooting chart on page 16-4.
- For spark plug gap inspection and adjustment procedure, see page 3-19.
- For intake air temperature sensor inspection, see page 4-52.

System Location



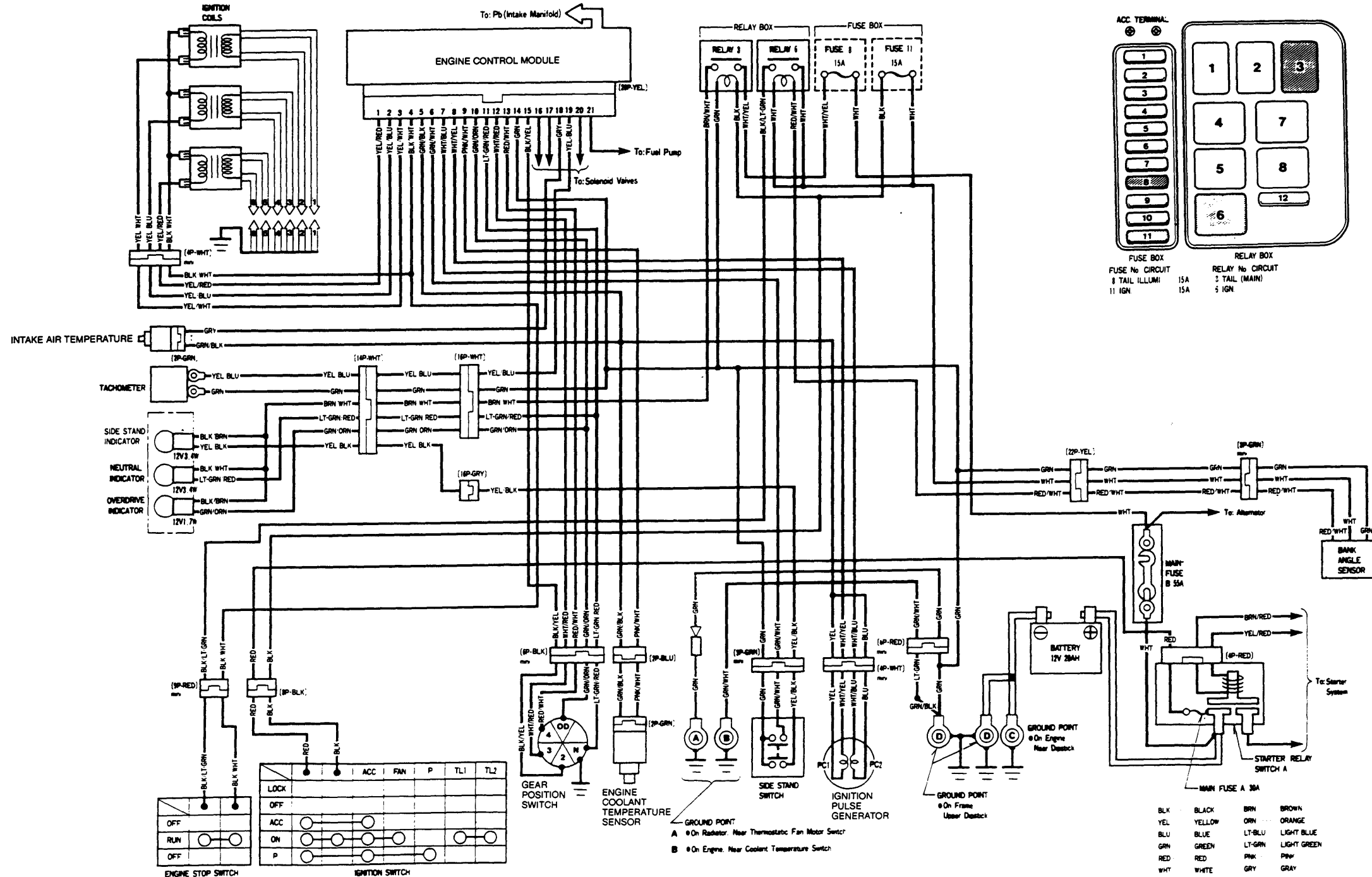


**Circuit Diagram:
A & SE Models**





Circuit Diagram:
I Model



Ignition Troubleshooting

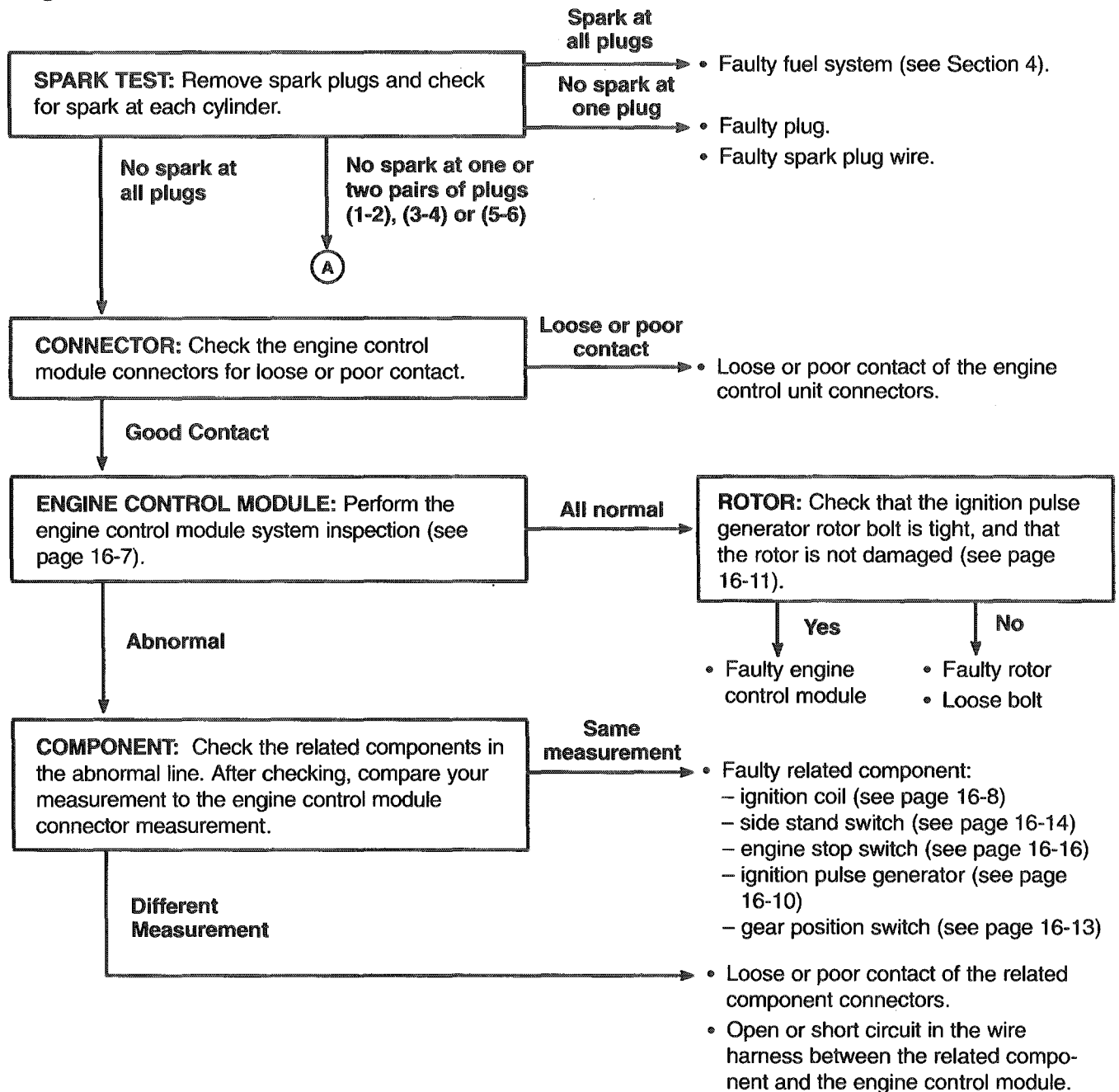
WARNING

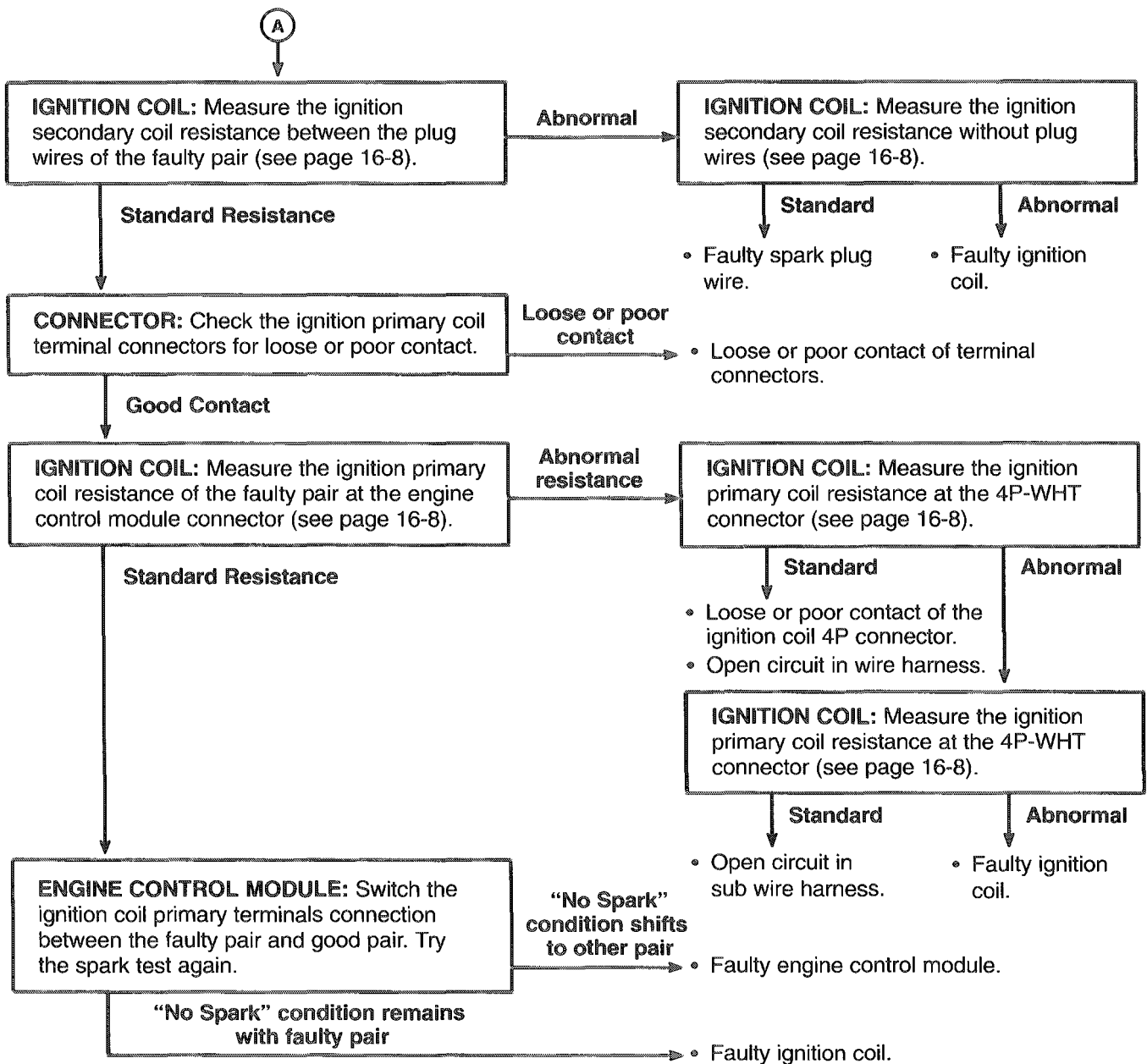
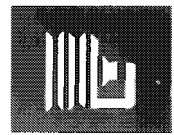
- When performing a spark test, keep open flames or sparks away from the work area.

NOTE

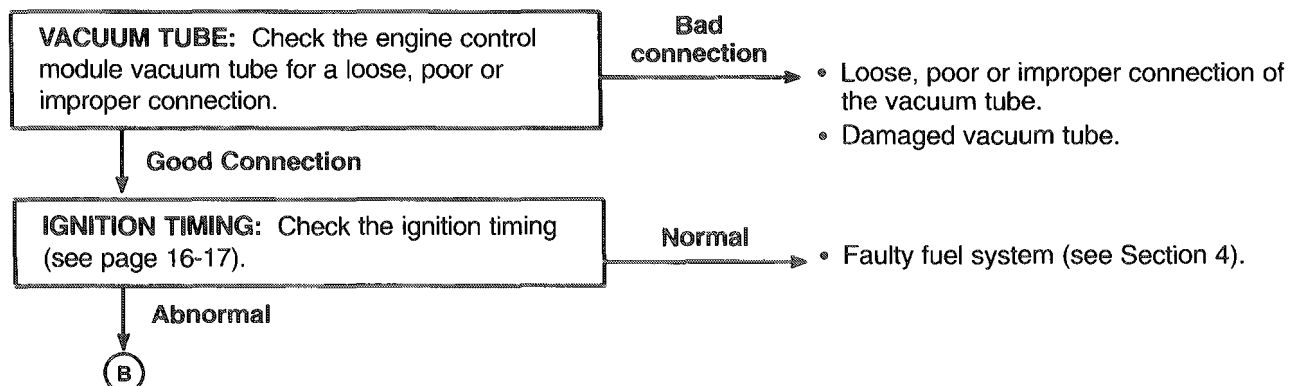
- Before beginning, be sure that the battery is fully charged.
- Each pair of spark plugs (1-2, 3-4, 5-6) has its own ignition circuit.

Engine does not start or is hard to start.



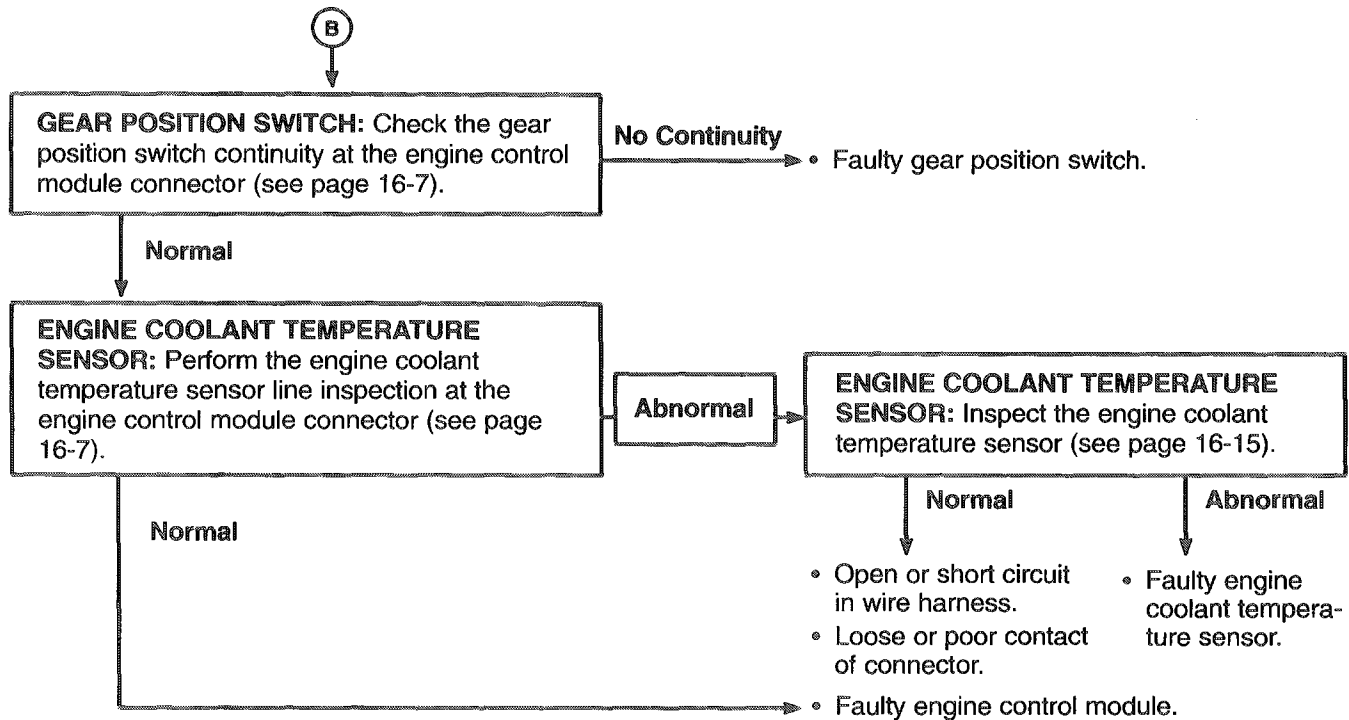


Engine starts, but runs rough at low engine speed (below 2,000 rpm)



Ignition

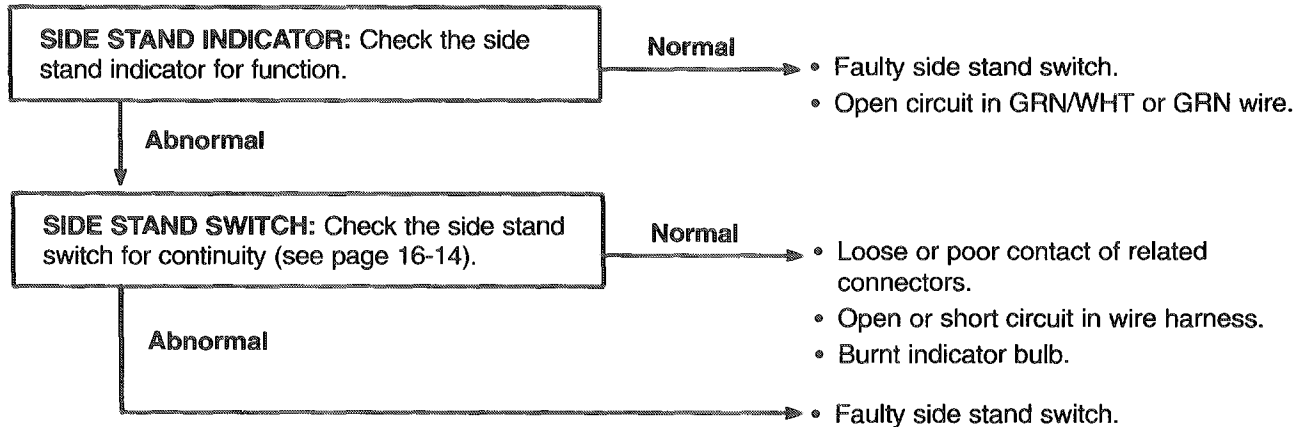
Troubleshooting (cont'd)



Poor performance (driveability) and poor fuel economy

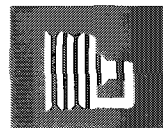
- Faulty ignition timing (see page 16-17).
- Fuel system malfunction (see Section 4).

Engine starts, but side stand switch does not function



Rich mixture or hesitation

- Faulty engine control module or loose or poor contact of related connector terminals (see page 16-7).



Engine Control Module

System Inspection

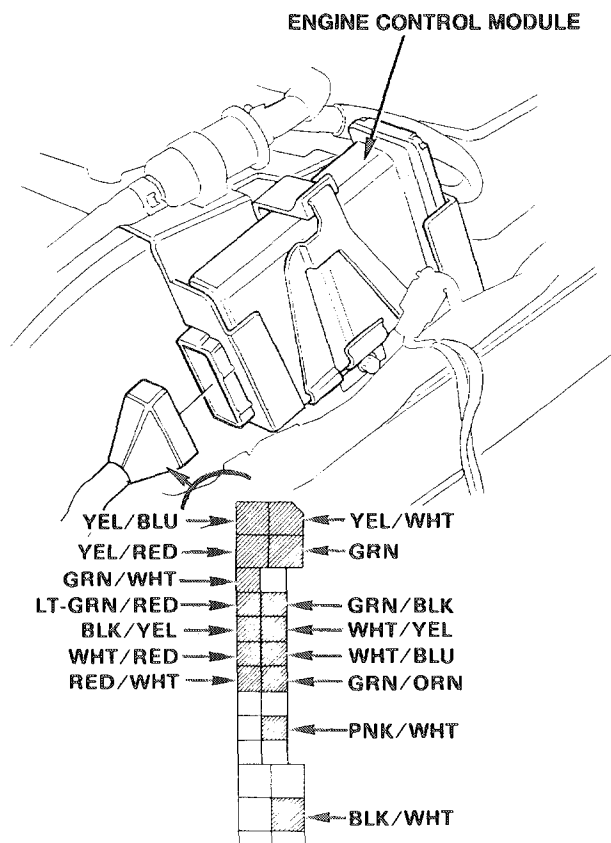
Remove the right fairing inner cover (see page 13-12).

Disconnect the engine control module connector and check it for loose contact or corroded terminals.

Measure the following between the connectors terminals on the wire harness side:

NOTE

- For intake air temperature sensor inspection, see page 4-52).



ITEM	TERMINALS	SPECIFICATION
Ignition coil (primary, 5-6) (primary, 3-4) (primary, 1-2)	YEL/RED and BLK/WHT YEL/BLU and BLK/WHT YEL/WHT and BLK/WHT	2.6-3.2 Ohms (20°C/68°F)
Ground line	GRN and body ground	CONTINUITY
Battery voltage input	BLK/WHT (+) and ground (-) with the ignition switch ON and engine stop switch RUN.	Battery voltage should register
Ignition pulse (PC 1) Generator coil (PC 2)	WHT/YEL and GRN/BLK WHT/BLU and GRN/BLK	400-500 Ohms (20°C/60°F)
Side stand switch	GRN/WHT and ground	CONTINUITY with the side stand up NO CONTINUITY with the side stand down
Gear position (Neutral) switch (Second gear) (Third gear) (Fourth gear) (Overdrive)	LT GRN/RED and ground BLK/YEL and ground WHT/RED and ground RED/WHT and ground GRN/ORN and ground	CONTINUITY
Engine coolant temperature sensor	PNK/WHT and GRN/BLK	2.0-3.0 k ohms (20°C/68°F) 200-400 ohms (80°C/176°F)

Ignition

Ignition Coil

Inspection

Remove the fairing lower cover (see page 13-12).

Disconnect the spark plug caps from the spark plugs.

Measure the secondary resistance through the spark plug caps for each ignition pair (1-2, 3-4 and 5-6).

Standard: 20.2-26.8 K ohms (20°C/68°F)

If the secondary resistance is not within specification, remove the ignition coils and check resistance again without the spark plug wires (see below).

Remove the right fairing inner cover (see page 13-11).

Disconnect the 4P-WHT connector from the wire harness.

Measure the primary coil resistance between the following 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).

Standards:

Primary coil: 2.6-3.2 ohms (20°C/68°F)

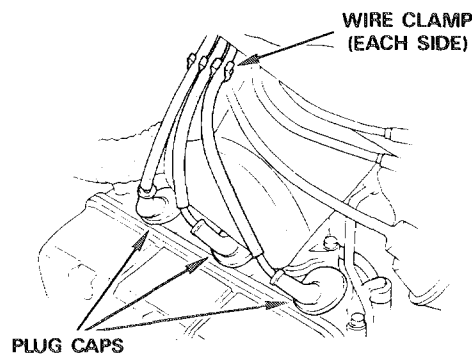
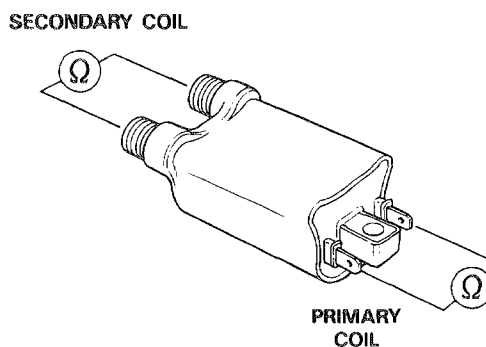
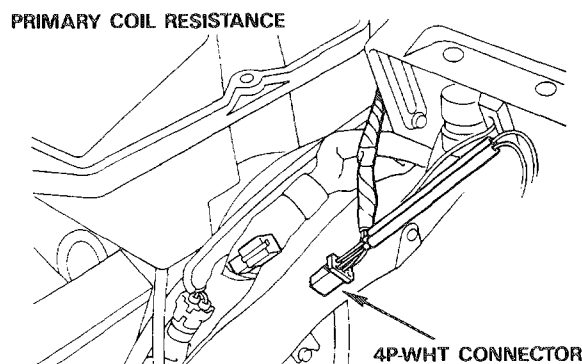
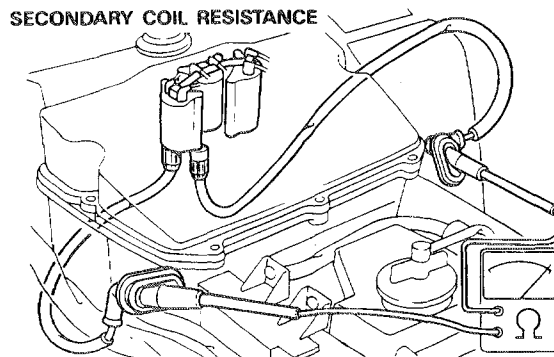
Secondary coil: 11.7-14.3 K ohms (20°C/68°F)

Removal

Remove the fairing lower cover (see page 13-12).

Remove the spark plug caps from the spark plugs.

Release the spark plug wires from the wire clamps of the cooling fans.





Remove the carburetor (see page 4-19).

NOTE

- Do not disconnect the cables and water hoses from the carburetor.

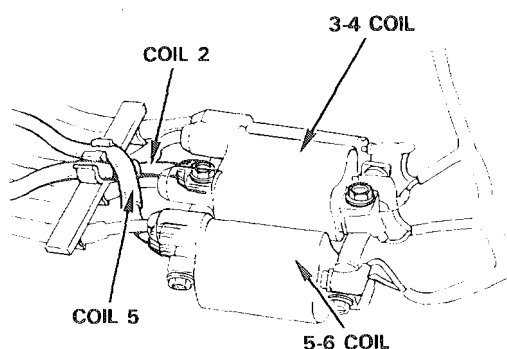
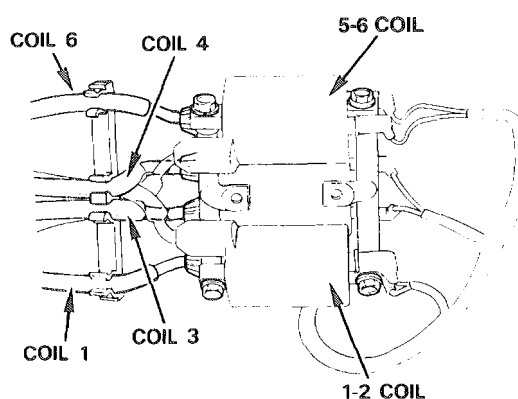
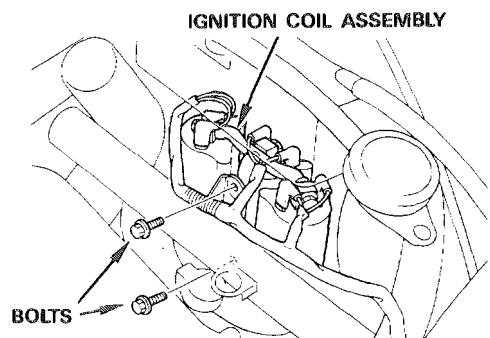
Remove the ignition coil stay mounting bolts. Move the coil assembly down and remove the radiator reserve tank (see page 5-12).

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.

Disassemble the ignition coils.



Installation

Install the ignition coils on the ignition coil stay as shown.

Route the spark plug wires properly onto the wire clamp as shown.

Connect the ignition coil wires on the primary terminals properly.

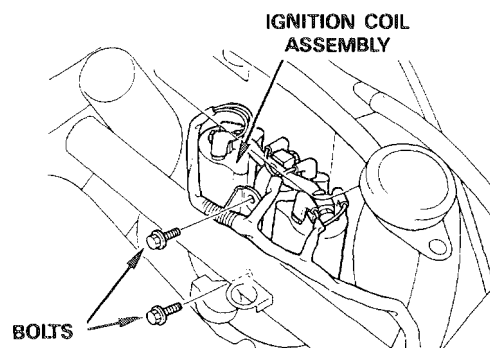
	Black Terminal	Green Terminal
1-2 Coil	BLK/WHT wire	YEL/WHT wire
3-4 Coil	BLK/WHT wire	YEL/BLU wire
5-6 Coil	BLK/WHT wire	YEL/RED wire

Install the ignition coil assembly onto the frame, but do not install the mounting bolts.

Install the radiator reserve tank (see page 5-12).

Install and tighten the ignition coil stay mounting bolts.

Install the carburetor (see page 4-36).



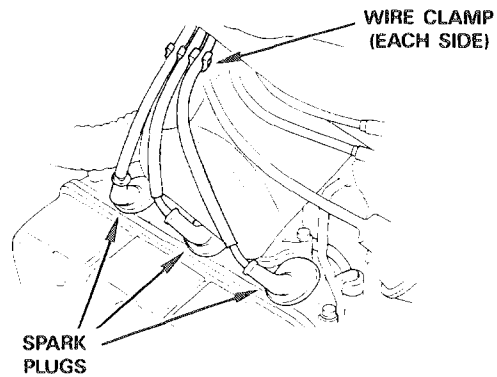
Ignition

Ignition Coil (cont'd)

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 (see page 13-12).

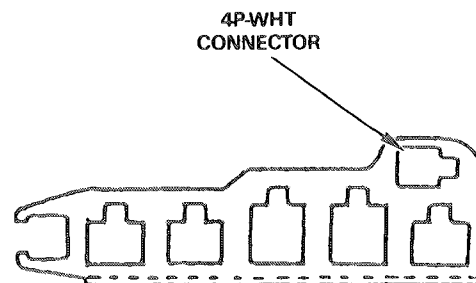


Ignition Pulse Generator

Inspection

Remove the right fairing lower cover (see page 13-12).

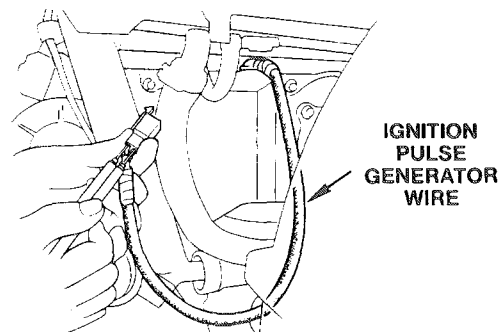
Disconnect the 4P-WHT connector of the connector holder on the right cooling fan.

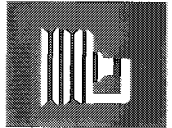


Measure the following resistances:

- YEL and WHT/YEL wire terminals (pulse generator 1).
- BLU and WHT/BLU wire terminals (pulse generator 2).

Standard: 400-500 ohms (20°C/68°F)

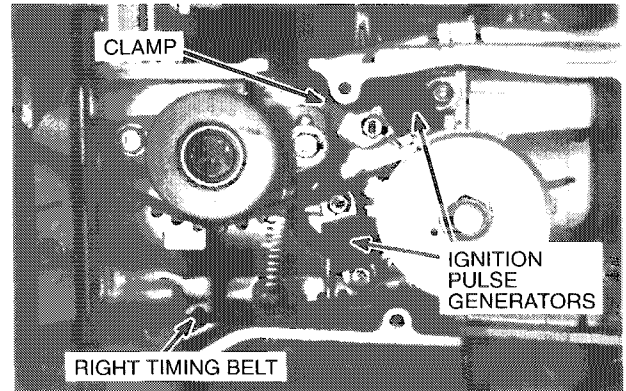




Removal

Remove the following:

- fairing front cover (see page 13-11).
- under cover (see page 13-11).
- timing belt covers (see page 7-4).
- right timing belt (see page 7-4).
- ignition pulse generator mounting bolts.
- wire clamp.
- ignition pulse generators.



Installation

Set the ignition pulse generator wire grommet into the crankcase groove properly.

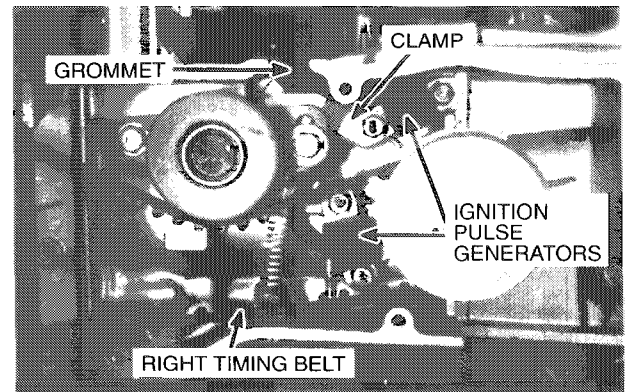
Install the ignition pulse generators with the wire clamp.

Tighten the mounting bolts securely.

Connect the 4P-WHT connector.

Install the following:

- right timing belt (see page 7-22).
- timing belt covers.
- under cover, fairing front cover (see page 13-11) and right fairing lower cover (see page 13-12).



Ignition Pulse Rotor Removal/Installation

NOTE

- It is not necessary to remove the ignition pulse generator and tensioner rollers.

Remove the timing belts (see page 7-4).

Remove the timing belt drive pulley bolt.

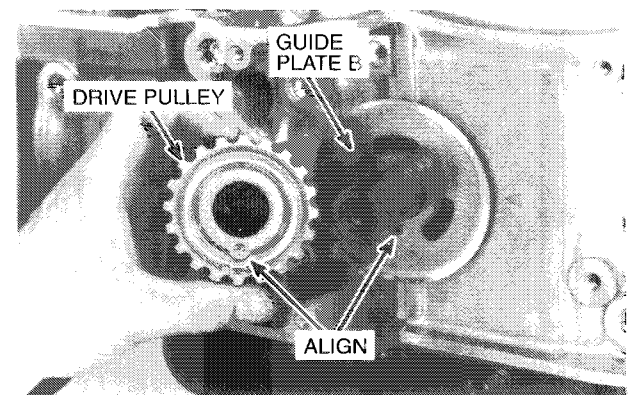
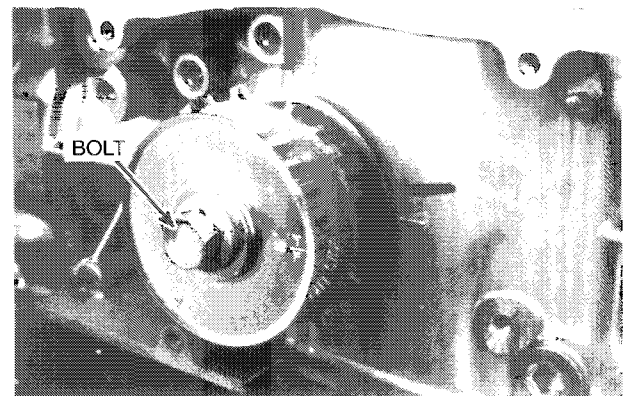
Disassemble the rotors.

Install guide plate B with its projection facing out.

Install one timing belt drive pulley, aligning the pulley hole with the guide projection.

NOTE

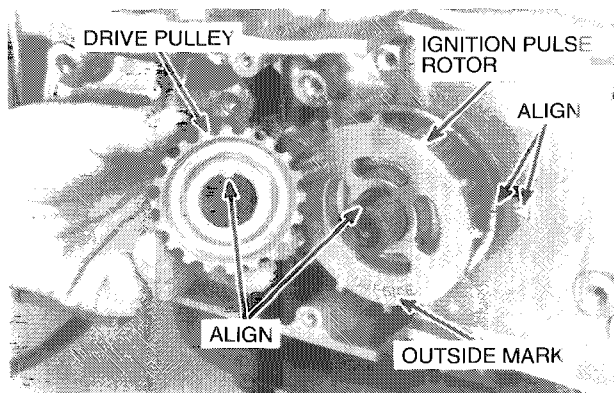
- Align the pulley key with the crankshaft keyway.



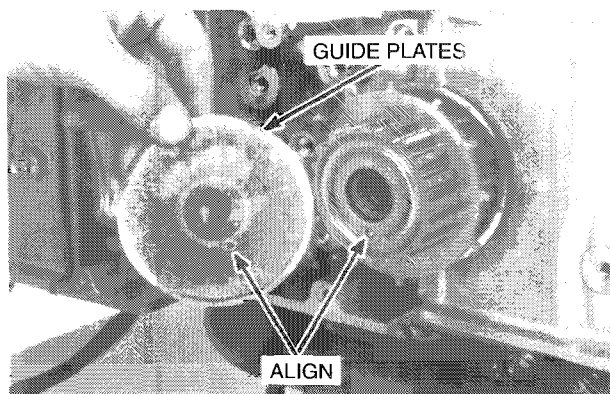
Ignition

Ignition Pulse Generator (cont'd)

Install the ignition pulse rotor with its "OUTSIDE" mark facing out, aligning the rotor key with the crankshaft keyway.



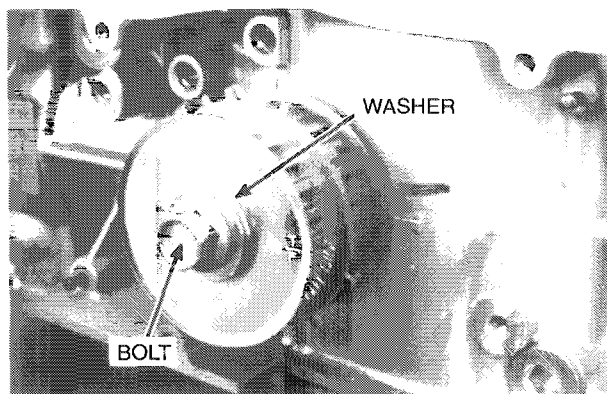
Install guide plate A, aligning its projection with the pulley hole.

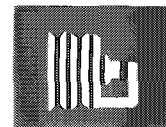


Install the washer and timing belt drive pulley bolt.

Tighten the bolt to the specified torque.

Torque: 75 N-m (7.5 kg-m, 54 ft-lb)



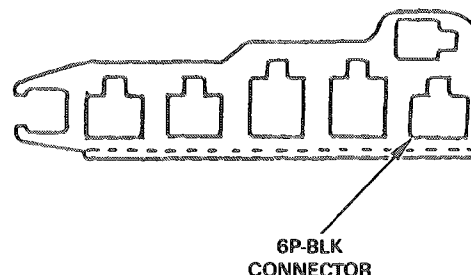


Gear Position Switch

Inspection

Remove the right fairing lower cover (see page 13-12).

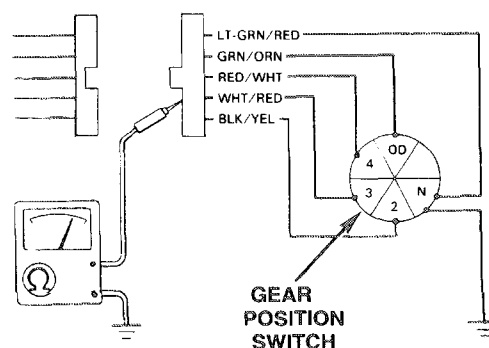
Disconnect the 6P-BLK connector from the connector holder on the right cooling fan.



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	LT GRN/RED and ground	Continuity
Second gear	BLK/YEL and ground	Continuity
Third gear	WHT/RED and ground	Continuity
Fourth gear	RED/WHT and ground	Continuity
OD gear	GRN/ORN and ground	Continuity

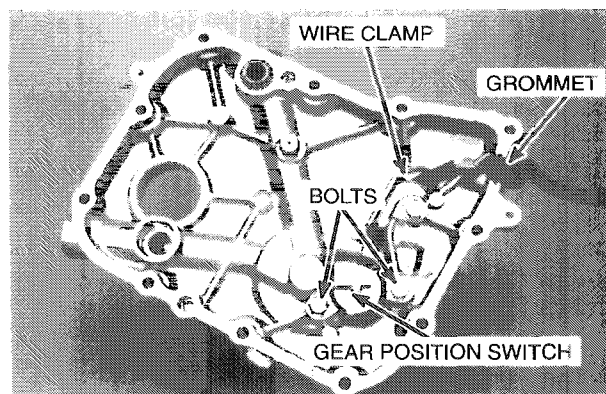
6P-BLK CONNECTOR



Removal

Remove the front engine cover (see page 8-6).

Remove the bolt and gear position switch.



Installation

Install the gear position switch with the wire grommet set into the cover groove.

Install and tighten the bolt with the wire clamp.

Install the front engine cover (see page 8-32).

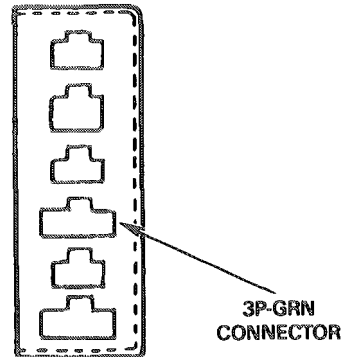
Ignition

Side Stand Switch

Inspection

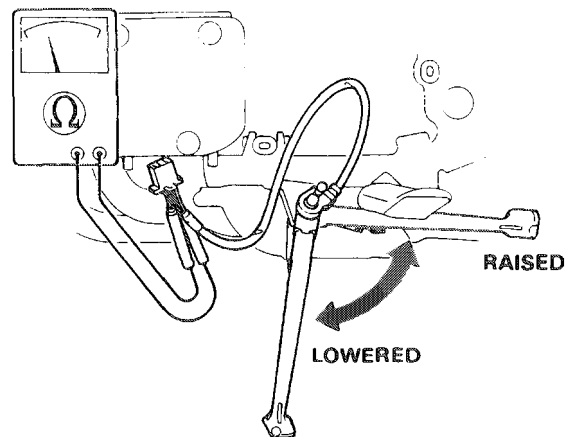
Remove the left fairing inner cover (see page 13-12).

Disconnect the 3P-GRN connector from the connector holder behind the cruise control valve unit.



Check for continuity between each terminal as shown below:

Item	Terminals	Specification
Side stand lowered.	GRN/WHT and GRN	No Continuity
	YEL/BLK and GRN	Continuity
Side stand raised.	GRN/WHT and GRN	Continuity
	YEL/BLK and GRN	No Continuity



Removal

Remove the left front side cover (see page 13-8).

Remove the side stand switch mounting bolt.

Release the wire clamps and remove the side stand switch from the side stand.

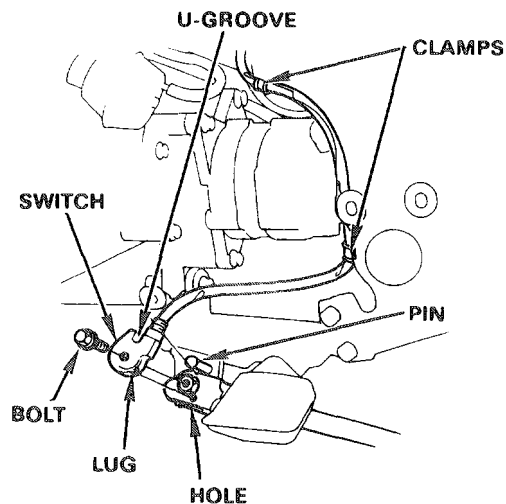
Installation

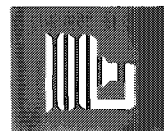
Install the side stand switch, aligning its U-groove with the pin.

Align the lug of the switch rotor with the hole in the side stand and install the mounting bolt.

Torque: 10 N-m (1.0 kg-m, 7 ft-lb)

Install the removed parts in the reverse order of removal.





Engine Coolant Temperature Sensor

Inspection/Removal

Remove the following:

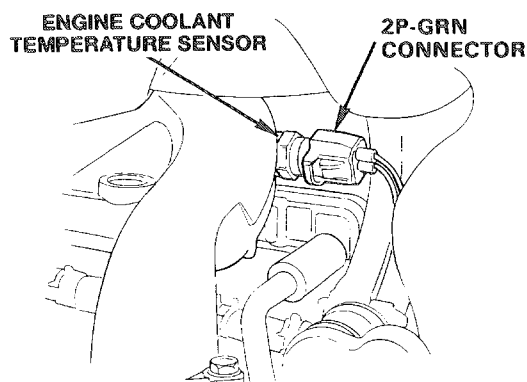
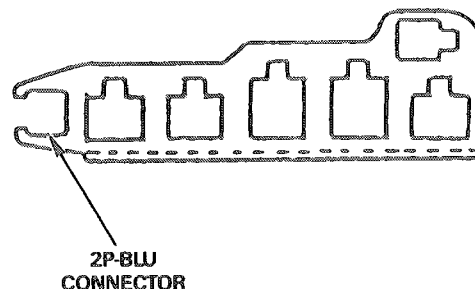
- right fairing lower cover (see page 13-12).
- right cooling fan (see page 5-11).
- right radiator (see page 5-9).

NOTE

- It is not necessary to disconnect the radiator hoses.

Disconnect the waterproof 2P-BLU connector from the connector holder on the right cooling fan.

Disconnect the 2P-GRN connector from the engine coolant temperature sensor.



Check for continuity between the connectors of the sub wire harness:

There should be continuity between same color wires.

There should be no continuity between different color wires.

Drain the coolant (see page 5-8).

Remove the engine coolant temperature sensor from the right intake manifold. Suspend the sensor in cold water. Heat the water slowly, using an electric heating element.

WARNING

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

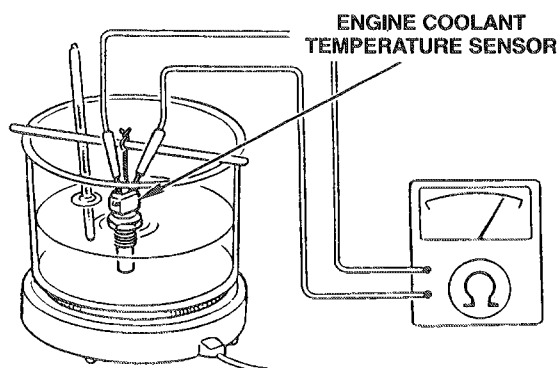
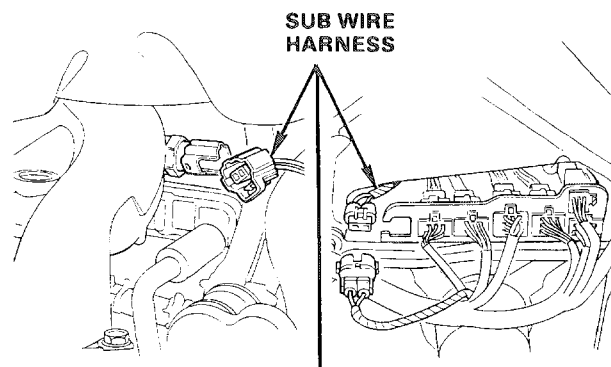
Measure resistance between the terminals.

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

NOTE

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

If resistance is outside the above ranges, replace the engine coolant temperature sensor.



Ignition

Engine Coolant Temperature Sensor (cont'd)

Installation

Install the engine coolant temperature 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)

CAUTION

- Keep water off the sensor terminals.

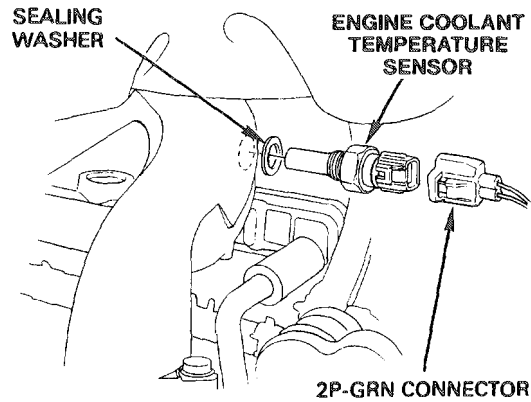
Connect the 2P-GRN connector to the engine coolant temperature sensor.

Connect the waterproof 2P-BLU connector of the connector holder on the right cooling fan.

Install the following:

- right cooling fan (see pages 5-11).
- right radiator (see page 5-10).
- right fairing lower cover (see page 13-12).

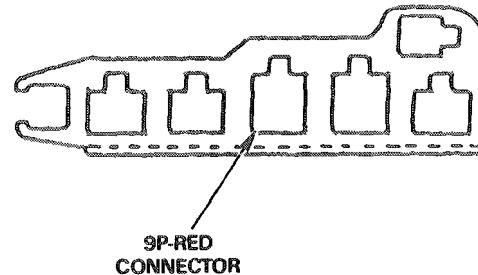
Fill the cooling system with coolant (see page 5-8).



Engine Stop Switch

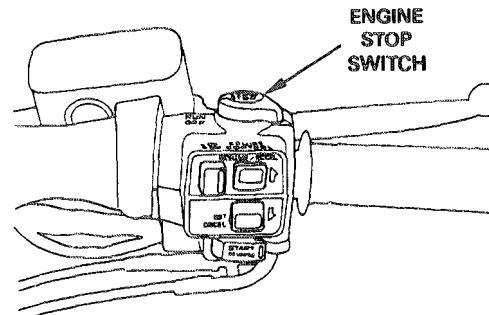
Remove the right fairing lower cover (see page 13-12).

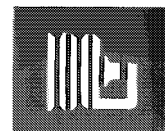
Disconnect the 9P-RED connector from the connector holder on the right cooling fan.



Test for continuity between the color coded wires:

Color	BLK/LT GRN	BLK/WHT
OFF		
RUN	○	○
OFF		





Ignition Timing

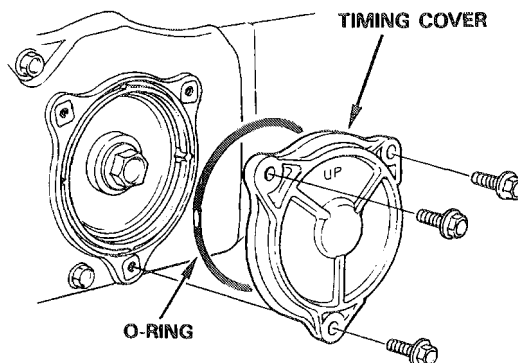
Remove the following:

- fairing lower covers (see page 13-12).
- fairing front cover (see page 13-11).
- timing cover and O-ring.

Start the engine and warm it to operating temperature (above 50°C/122°F).

NOTE

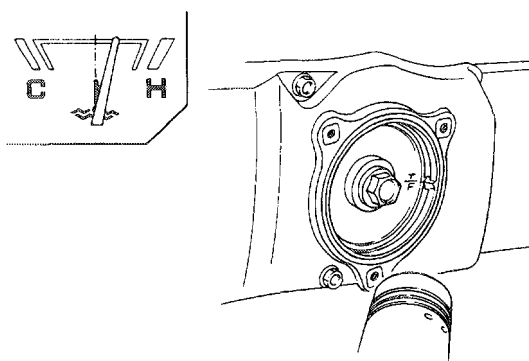
- Make sure the temperature gauge registers above the center position.



Idle 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 the engine idle at 900 ± 50 rpm by adjusting the throttle stop screw.



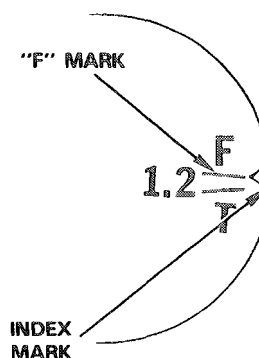
The timing is correct if the guide plate F 1.2 mark aligns with the timing cover index mark at idle.

Connect the timing light to the No. 3 or No. 4 cylinder spark plug wire and check the ignition timing as previously described by observing the F 3.4 mark.

Check the No. 5 or No. 6 cylinder in the same way, using the F 5.6 mark.

Reset the idle speed to 800 ± 80 rpm.

Stop the engine and check the vacuum advance.

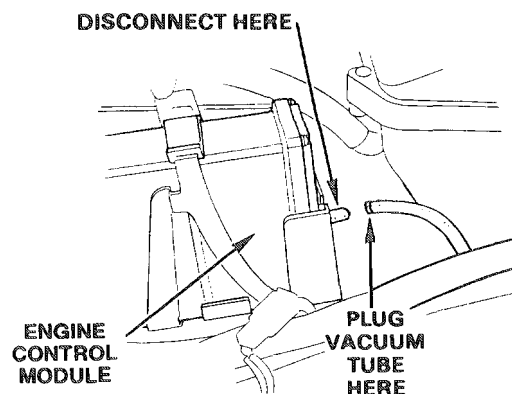


Vacuum Advance Inspection

Remove the top compartment (see page 13-9) and right fairing inner cover (see page 13-12).

Disconnect the vacuum tube where it connects to the engine control module. Be careful not to disconnect the vacuum tube from connections below.

Plug the end of the vacuum line as shown.



Ignition

Ignition Timing

Connect a vacuum pump to the engine control module.

Tool:

Vacuum pump

ST-AH-260-MC7

Place the motorcycle on the center stand, start the engine and warm it to operating temperature (above 50°C/122°F).

Move the clutch lever to the handlebar and let the engine idle (800 ± 80 rpm) with the transmission in 3rd, 4th, or OD.

Apply vacuum to the engine control module and check the "F" mark movement with a timing light. The advance should start at 60-160 mmHg (2.4-6.3 inHg) at atmospheric pressure, 760 mmHg (29.9 inHg).

The advance should 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. Disconnect the vacuum pump and reattach the vacuum line to the engine control module. Check the gear position switch timing shift (below).

Gear Position Switch Timing Shift Inspection

NOTE

- Connect a vacuum tube to the ignition control module.

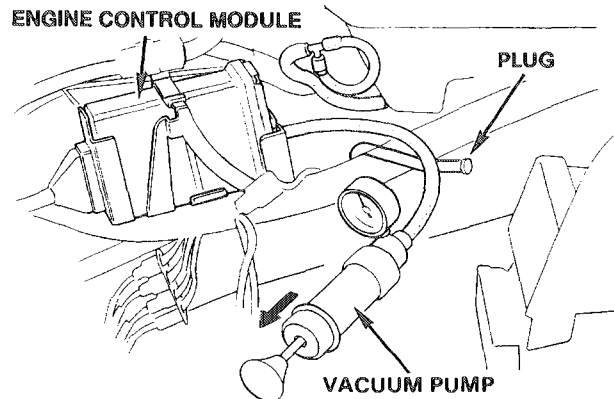
Start the engine and warm it to operating temperature (above 50°C/122°F).

Let the engine run at 1,200 ± 100 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 100 rpm.

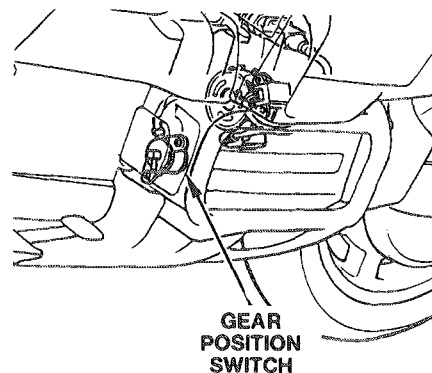
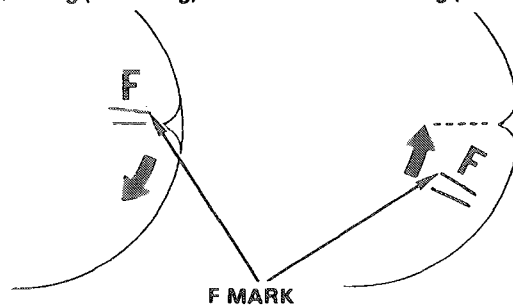
Reset the idle speed to 800 ± 80 rpm.

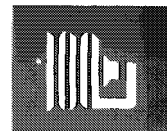
Stop the engine and check the intake air temperature sensor timing shift (see page 4-52).



ADVANCE START
60-160 mmHg
(2.4-6.3 inHg)
at atmospheric pressure,
760 mmHg (29.9 inHg)

RETARD START
310-360 mmHg
(12.2-14.2 inHg)
at atmospheric pressure,
760 mmHg (29.9 inHg)





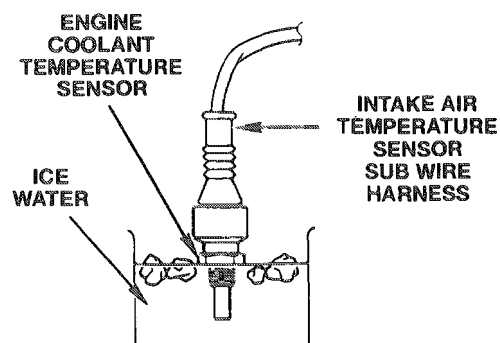
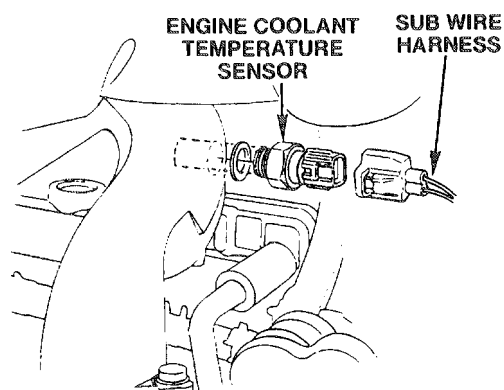
Engine Coolant Temperature Sensor Timing Shift Inspection

NOTE

- Use a known good engine coolant temperature sensor for this test to avoid draining and refilling the coolant and removing and replacing the engine coolant temperature sensor in the GL.

Remove the intake air temperature sensor (see page 4-52).

Disconnect the intake air temperature sensor sub wire harness from the intake air temperature sensor and temporarily connect the sub wire harness to the test engine coolant temperature sensor.

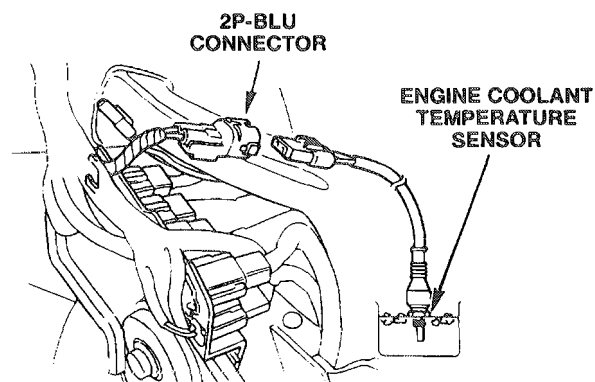


Cool the test engine coolant temperature sensor in the ice water for approximately ten minutes.

Start the engine and warm it to operating temperature (above 50°C/122°F).

Connect the cooled engine coolant temperature sensor to the waterproof 2P-BLU connector of the connector holder on top of the right cooling fan.

The engine speed should increase by approximately 200 rpm.



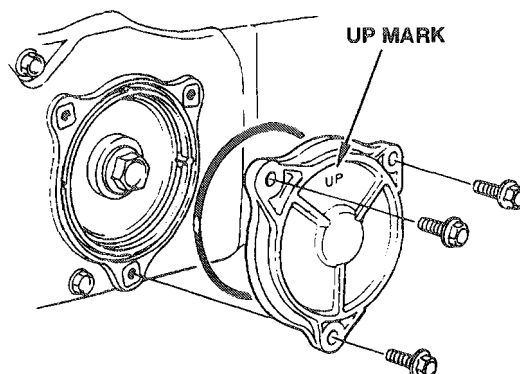
NOTE

- If ignition timing is not correct, check all individual ignition system components except the ignition control module. If the individual components are good, replace the ignition control module.

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.



Charging

Service Information	17-2
Troubleshooting	17-5
Battery	17-7
Charging System	
Output	17-9
Alternator and Regulator/ Rectifier	17-10
Alternator Drive/ Driven Gears	17-19

Charging

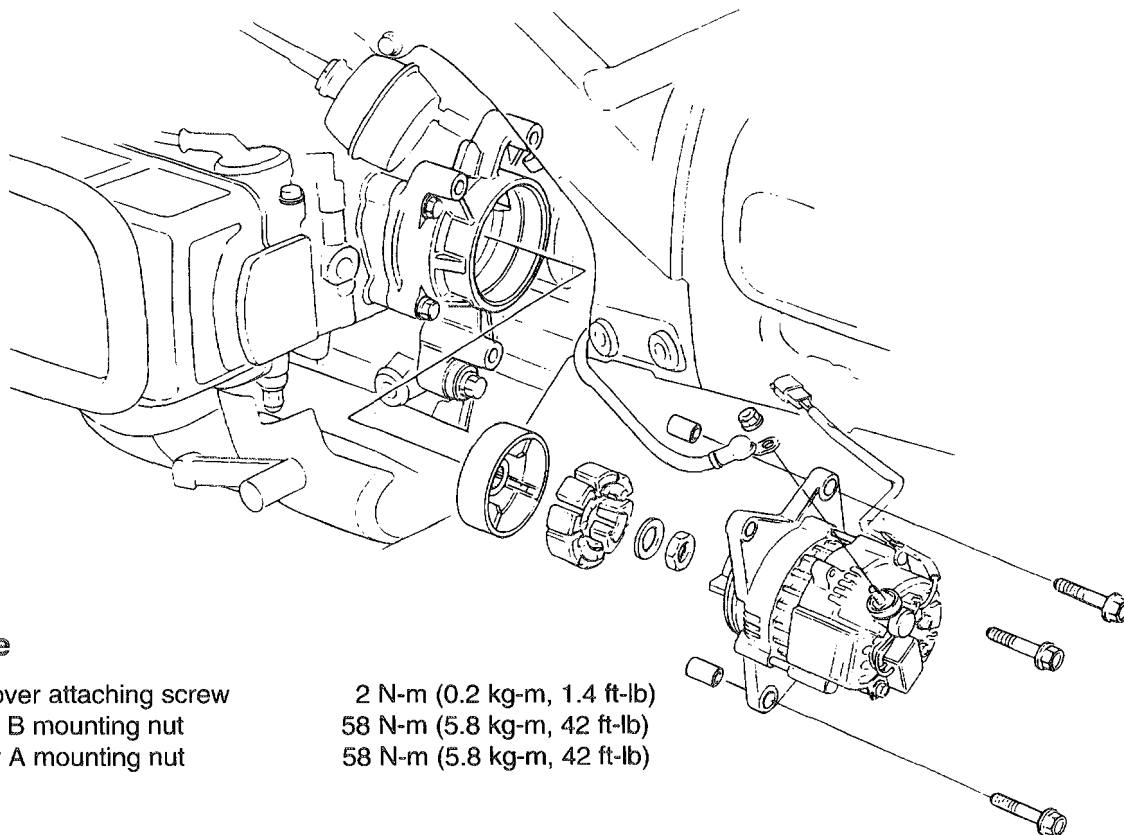
Service Information

⚠ 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 the WHT wire terminal from the alternator, first disconnect the battery negative cable from the battery.

CAUTION

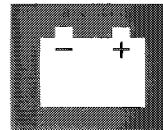
- For battery charging, do not exceed the charging current and time specified on the battery (and shown below). Use of excessive current or charging time may damage the battery.
- The battery fluid level should be checked regularly. Fill with distilled water when necessary.
- Slow charge the battery whenever possible. Quick charging should be an emergency procedure only.
- Remove the battery from the vehicle for charging.
- When inspecting the charging system, check the system components and lines step-by-step according to the troubleshooting on page 17-5.
- The regulator/rectifier is located in the alternator.
- For starter clutch removal/installation, see Section 18.
- Maintenance services and repairs of the alternator gears described in this section must be performed with the engine removed from the frame.
- Refer to Service Letter #48 (June 1987) for additional battery servicing information. Also refer to the Honda Battery Tester/Christie Battery Charger Operation Manual (Reorder #S0536).



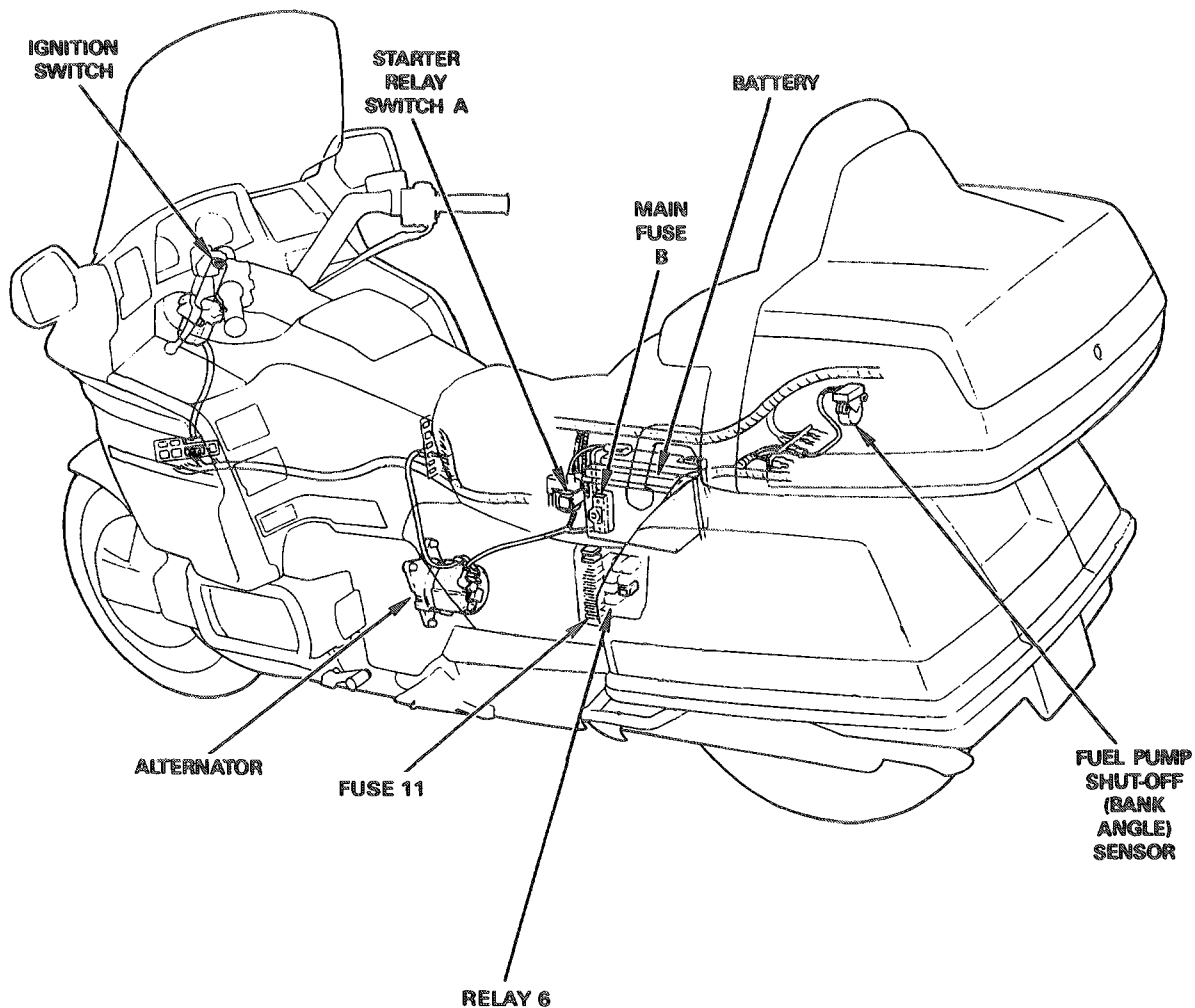
Torque

Front cover attaching screw
Coupler B mounting nut
Coupler A mounting nut

2 N-m (0.2 kg-m, 1.4 ft-lb)
58 N-m (5.8 kg-m, 42 ft-lb)
58 N-m (5.8 kg-m, 42 ft-lb)

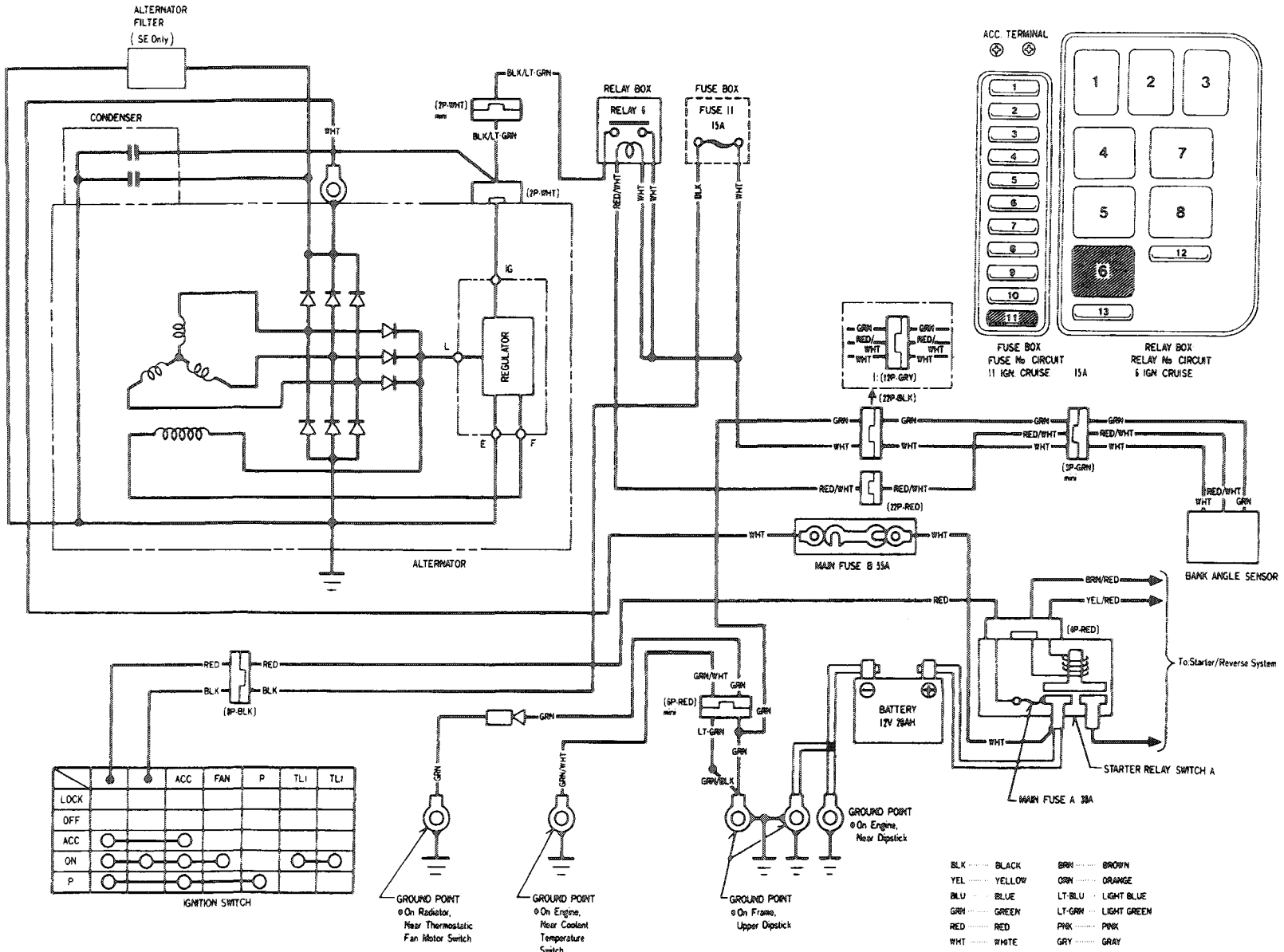


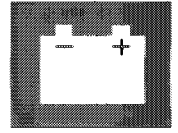
System Location



Charging Service Information (cont'd)

Circuit Diagram



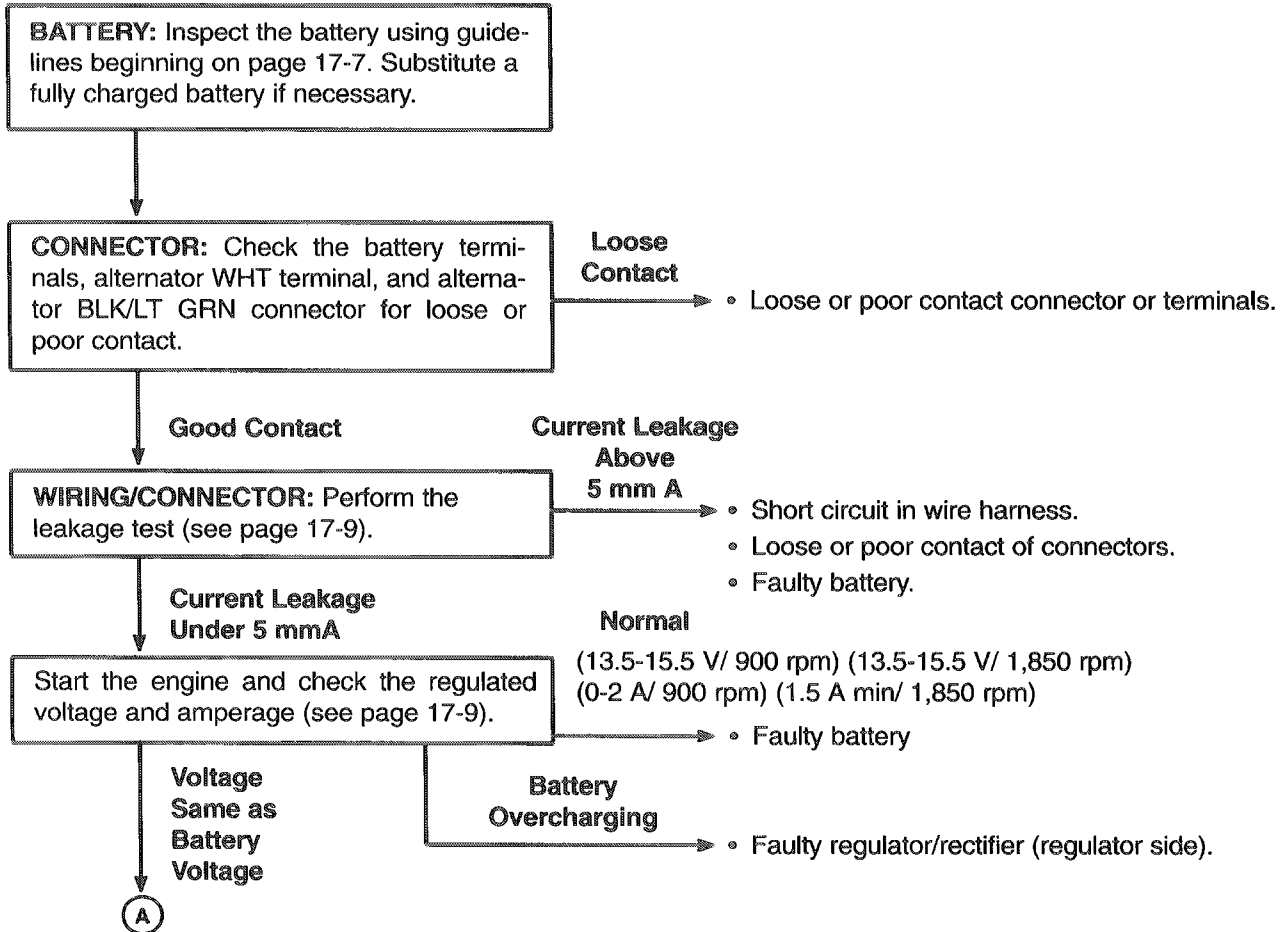


Troubleshooting

Abnormal engine noise (gear noise)

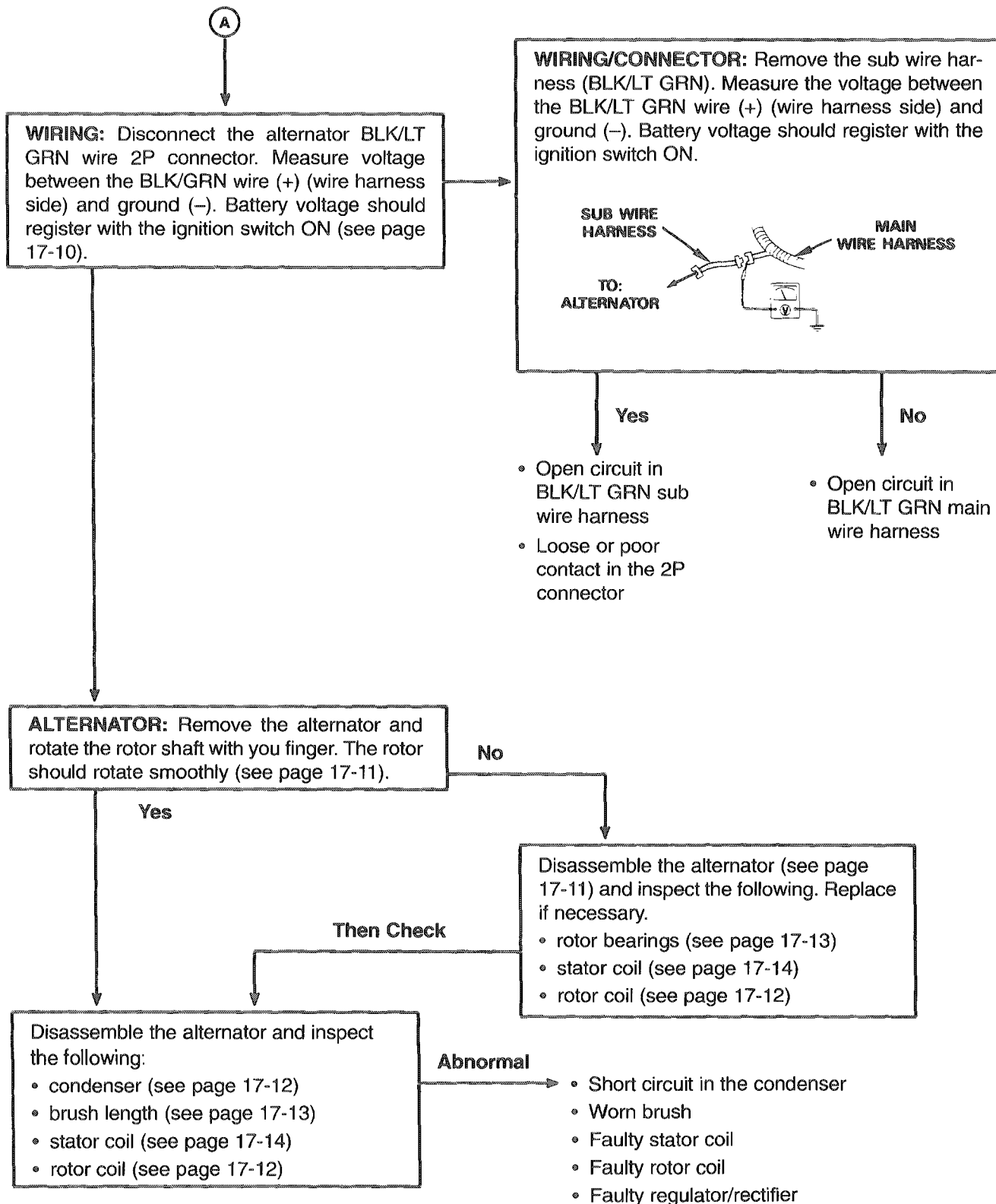
- Worn or damaged alternator drive gear or driven gear.

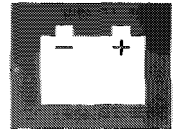
Battery discharging/overcharging



Charging

Troubleshooting (cont'd)

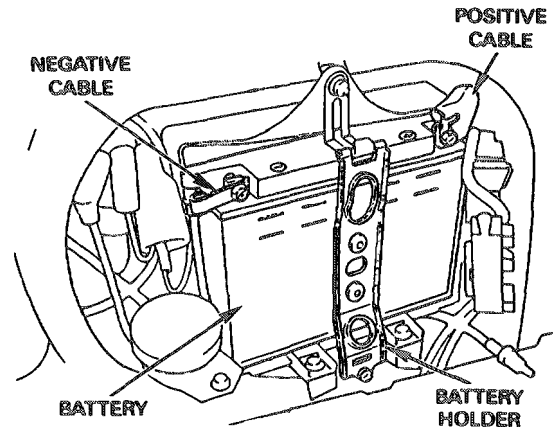




Battery

WARNING

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



Removal

Remove the left rear side cover (see page 13-8).

Disconnect the negative cable first, then the positive cable. On installation, reconnect the negative cable last.

Remove the nut, bolt, and battery holder.

Disconnect the breather tube.

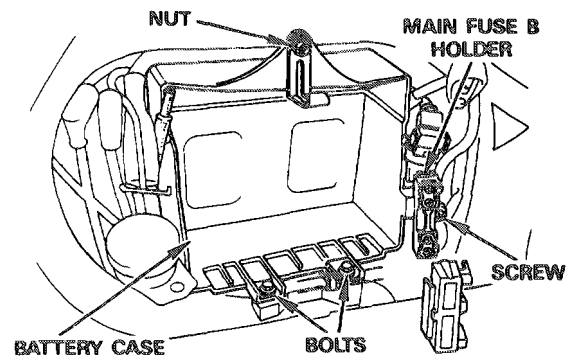
Remove the battery from the case.

Check for a cracked or broken case or plates. Replace the battery if it is damaged, or if sulfation or sediment has accumulated on the bottom.

Check the electrolyte level in the cells. If it is 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, bolts, and battery case.



NOTE

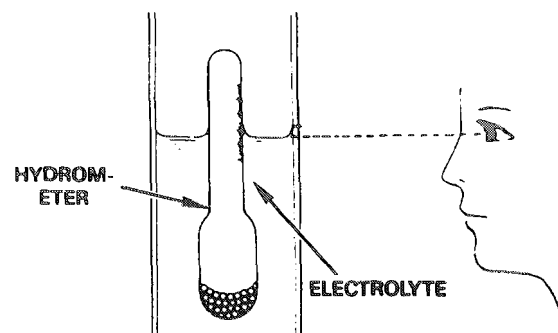
- In order to obtain accurate test readings when checking the charging system, the battery must be fully charged and in good condition. Perform the following inspections and tests before attempting to troubleshoot charging system problems.

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



Charging

Battery (cont'd)

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

Charge the battery until specific gravity is 1.270-1.290 at 20°C (68°F).

Battery Charging

Refer to Service Letter #48 (June 1987) for additional battery servicing information. Also refer to the Honda Battery Tester/Christie Battery Charger Operation Manual (Reorder #S0536).

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

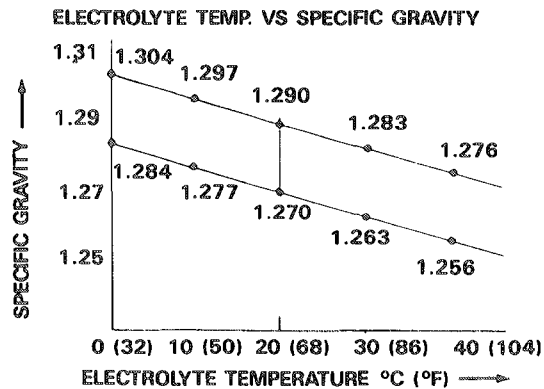
- Quick charging should only be done in emergency; slow charging is preferred.

Installation

Install the battery in the reverse order of removal. Connect the positive cable first, then the negative cable. After installing the battery, coat the terminals with clean grease.

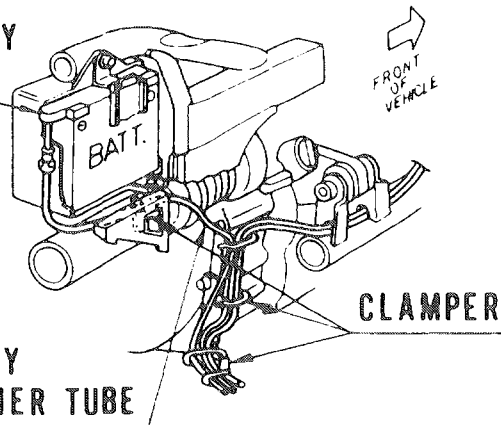
CAUTION

- Make sure the positive cable is not forced against any metal parts, otherwise a short may occur.
- Route the breather tube as shown.
- Make sure the breather tube does not bend, after the battery has been installed into the case.



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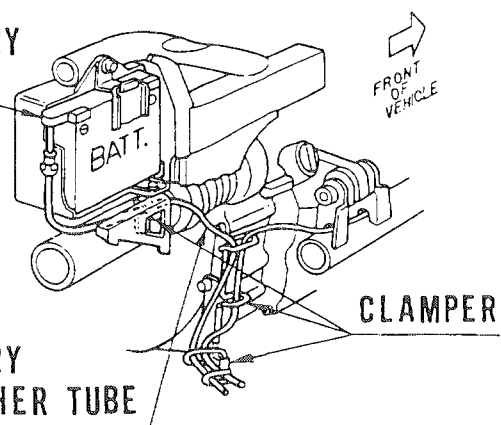
BATTERY ELBOW



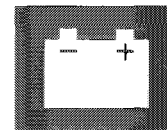
BATTERY BREATHER TUBE

CALIFORNIA

BATTERY ELBOW



BATTERY BREATHER TUBE



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 range from higher to lower.
- While measuring, do not turn the ignition switch ON.

Specified Current Leakage: 5 mA 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, warm it 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 an ammeter directly between the battery positive (+) terminal and negative (-) cable of the battery, or the ammeter may burn out.

NOTE

- Use an ammeter which can measure current flow in both directions.

Connect a voltmeter between the positive and negative battery terminals as shown.

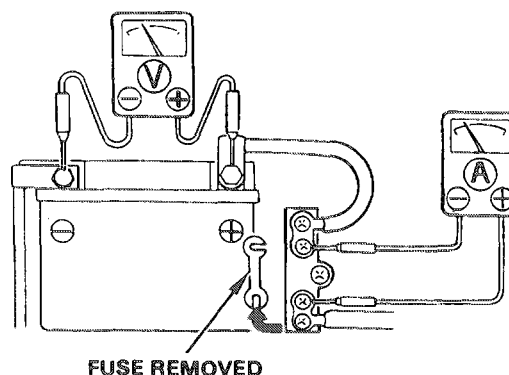
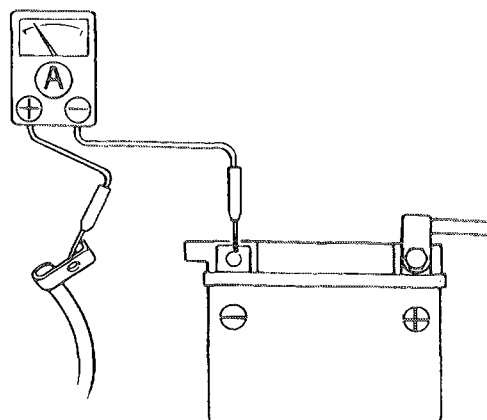
Start the engine and observe the meter readings:

- Check the charging outputs at the speeds shown in the chart.

Charging Start RPM: 800-1,000 rpm

NOTE

- Measure the current after the fan motor has come to a complete stop.



REGULATED CHARGING OUTPUT:

ENGINE RPM	AMPERAGE	VOLTAGE
900 rpm	0-2	13.5-15.5 V
1,850 rpm	1.5 A min.	13.5-15.5 V

Charging

Charging System Output (cont'd)

Wire Harness Inspection

Disconnect the battery negative cable.

⚠ WARNING

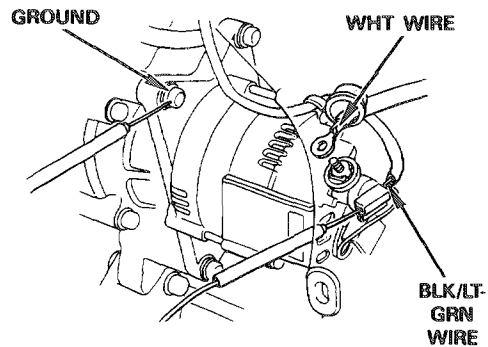
- Disconnect the battery negative cable from the battery to prevent sparking when disconnecting the WHT wire terminal.

Disconnect the WHT wire terminal and BLK/LT GRN wire connector from the alternator.

Connect the battery negative cable onto the battery.

Measure the voltage between each wire (wire harness side) and ground as indicated on the chart.

Disconnect the battery negative cable to avoid sparking which would otherwise occur when connecting each wire to the alternator.



ITEM	TERMINALS	SPECIFICATION
Battery charging line	WHT (+) and ground (-)	Battery voltage should register.
Battery voltage input line	BLK/LT GRN (+) and ground (-)	Battery voltage should register with the ignition switch ON.

Alternator and Regulator/Rectifier

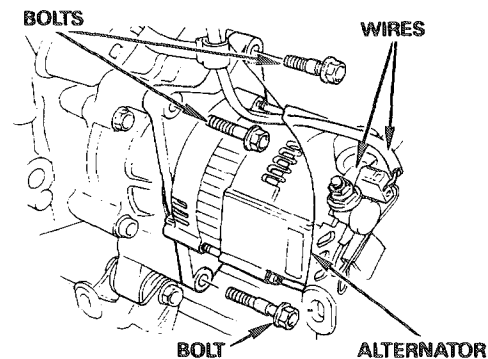
Removal

Disconnect the battery negative cable.

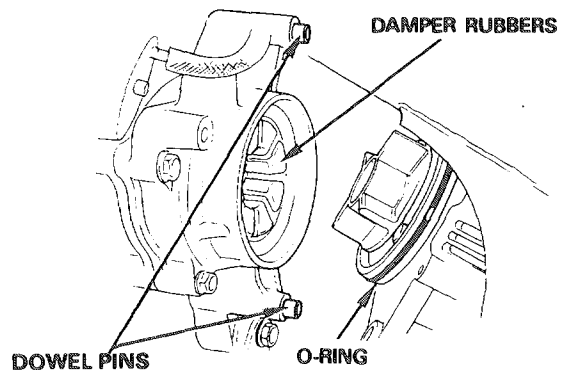
Disconnect the alternator WHT wire terminal and BLK/LT GRN wire connector from the alternator.

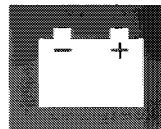
Remove the alternator mounting bolts and alternator and regulator/rectifier assembly.

Remove the dowel pins from the rear case cover.



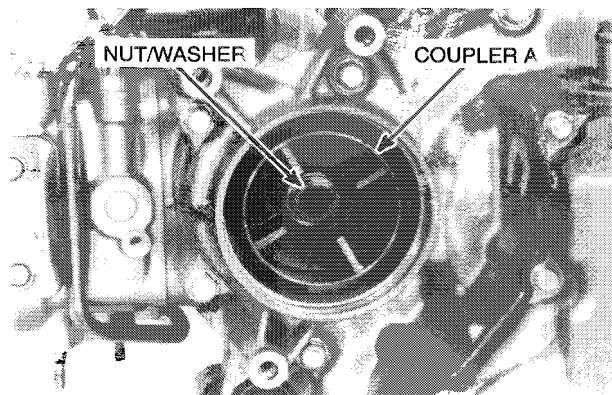
Remove the O-ring and alternator damper rubbers.





Set the transmission in any gear. Check that the transmission is in gear by trying to move the rear wheel.

Remove the nut, washer and alternator coupler A.



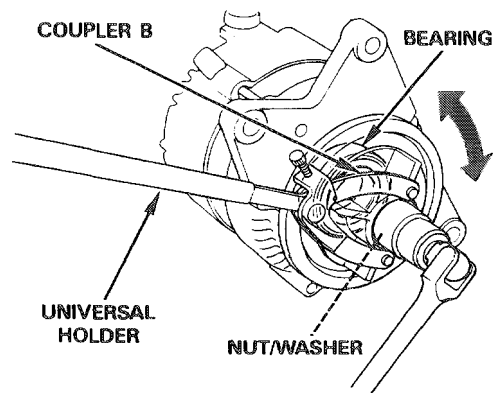
Disassembly

Check the rotor rotation by rotating the rotor shaft with your finger. The rotor should rotate smoothly.

Hold coupler B with a tool, as shown, and remove the nut, washer, and coupler B.

NOTE

- It is not necessary to remove the couplers unless servicing the rotor front bearing and oil seal is required.



Tool:

Universal holder

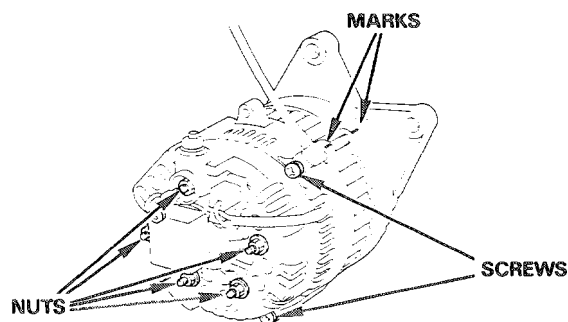
07725-0030000 or commercial equivalent.

Mark the front and rear cover before removal to identify their original position.

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.



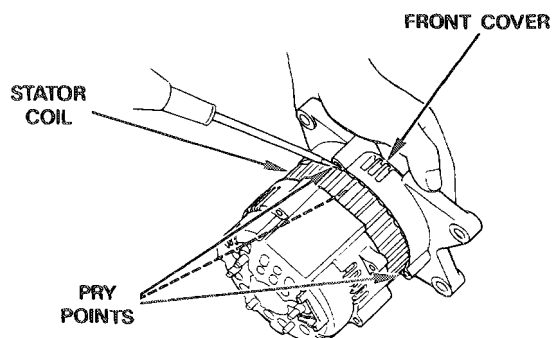
CAUTION

- 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 it with a shop towel.



Charging

Alternator and Regulator/Rectifier (cont'd)

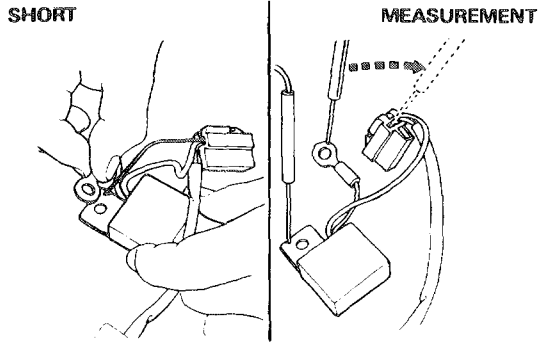
Condenser Inspection

Short each terminal of the condenser as shown. Then, check for continuity between each terminal with an analog ohmmeter. The tester needle should swing momentarily, then return to ∞ .

NOTE

- Use a circuit tester for this test.

If continuity does exist or the tester needle will not swing, replace the condenser.



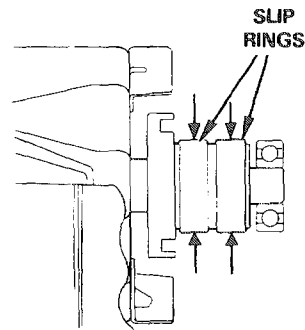
Rotor Coil Inspection

Inspect the slip rings for discoloration.

Measure the O.D. of the slip rings.

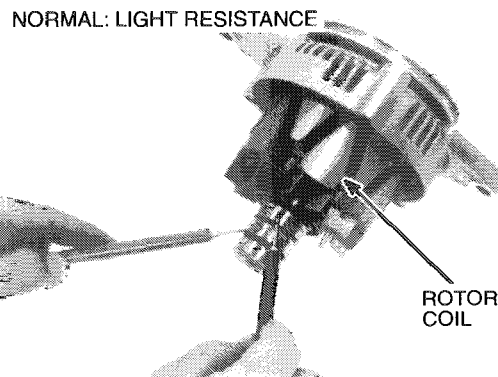
Service Limit: 26.0 mm (1.02 in)

For rotor replacement, see page 17-15 (rotor bearing replacement).

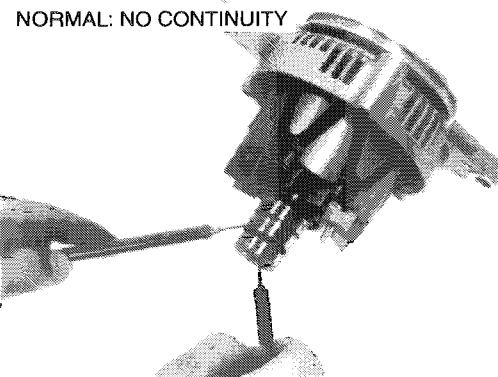


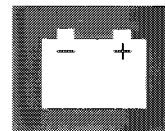
Check for resistance between the slip rings. There should be light resistance.

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 bearing races fit tightly on the rotor shaft.

Remove and discard the bearings if the races do not turn smoothly and quietly or if they fit loosely on the shaft (see page 17-15).

NOTE

- Replace the 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 installed length as shown.

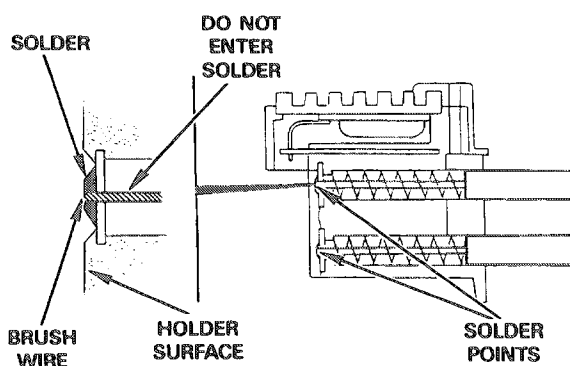
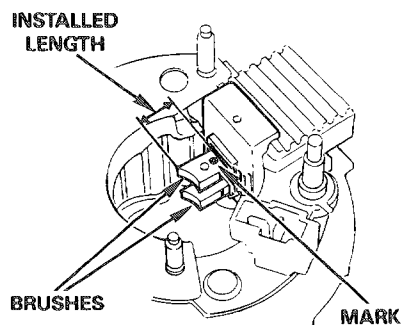
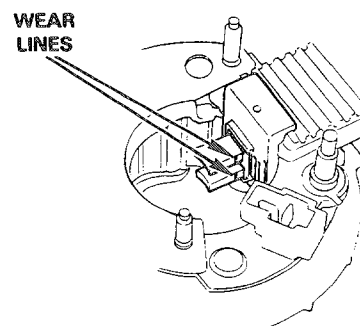
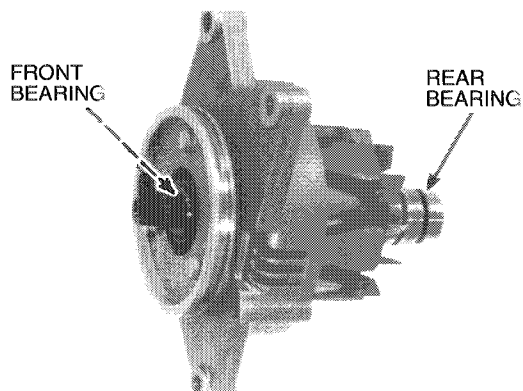
Installed Length: 18.0 mm (0.71 in)

Heat the soldering iron (Capacity: about 32 W). Use low-temperature (180°-200°F) solder to solder the new brushes.

CAUTION

- Take care that solder does not enter the 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.



Charging

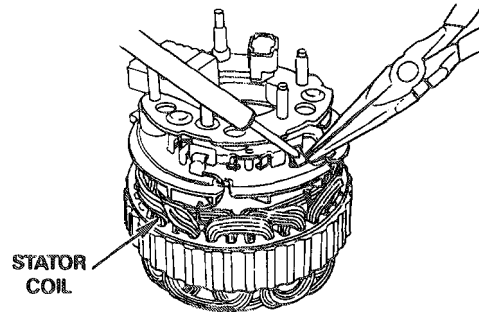
Alternator and Regulator/Rectifier (cont'd)

Stator Coil Inspection

Melt the solder and separate the stator coil from the regulator/rectifier.

CAUTION

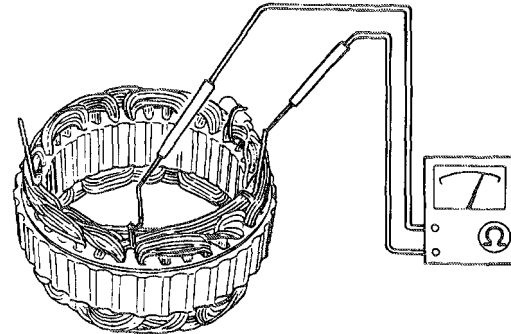
- Work quickly to avoid heat-damage to the regulator/rectifier.
- Hold the stator coil lead wire with pliers to dissipate heat.



Check for resistance between the stator coil wires. There should be light resistance

Standard: 0.1-0.3 ohms (20°C/68°F)

NORMAL: LIGHT RESISTANCE

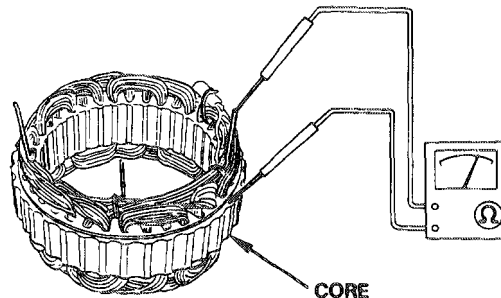


Check for continuity between the wire and stator cord. There should be no continuity.

NOTE

- The green part of the core is insulated. Put the tester probe on the silver color part of the cord.

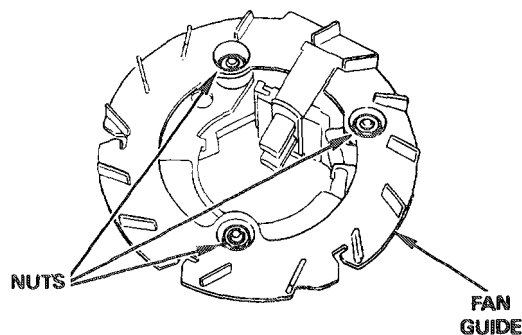
For stator coil assembly, see page 17-16).

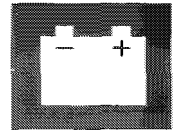


Fan Guide Inspection

If you need to remove the fan guide, separate it from the regulator/rectifier by removing the three attaching nuts.

Install the fan guide in the reverse order of removal.





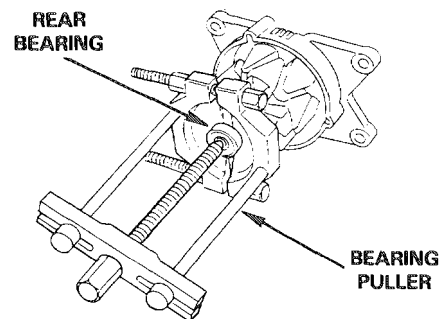
Rotor Bearing Replacement

Remove the rear rotor bearing using a bearing puller.

Tool:

Bearing puller

Equivalent commercially available in U.S.A.



Drive a new bearing onto the rotor shaft.

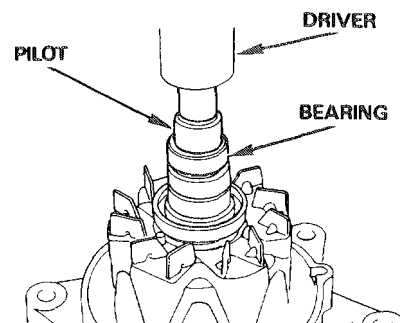
Tools:

Driver

07749-0010000

Pilot, 20 mm

07746-0040500

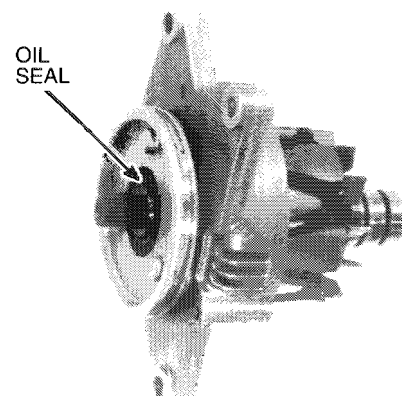


Oil Seal Replacement

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 front cover A as shown.

Tools:

Driver

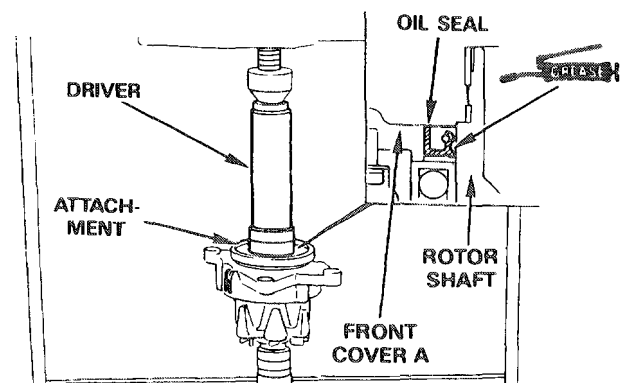
07746-0030100

Attachment, 30 mm

07746-0030300

NOTE

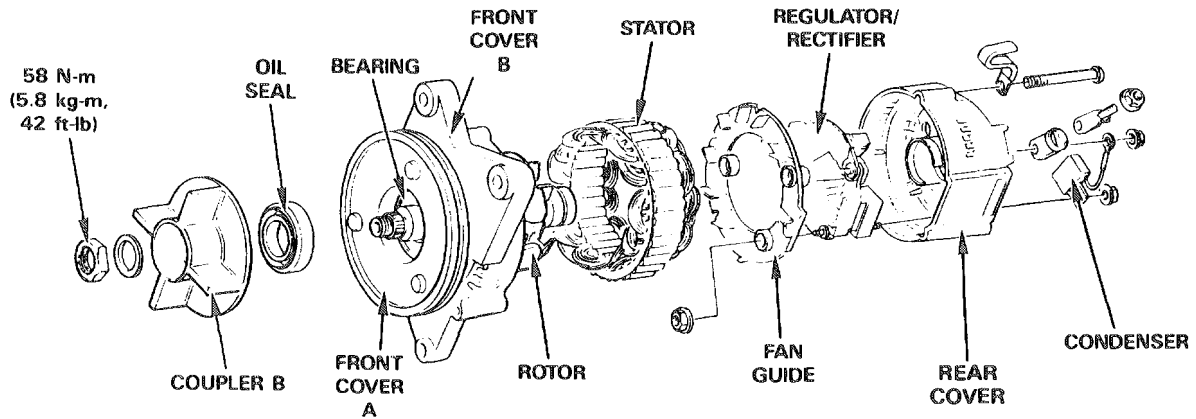
- Make the oil seal surface flush with front cover A.



Charging

Alternator and Regulator/Rectifier (cont'd)

Assembly

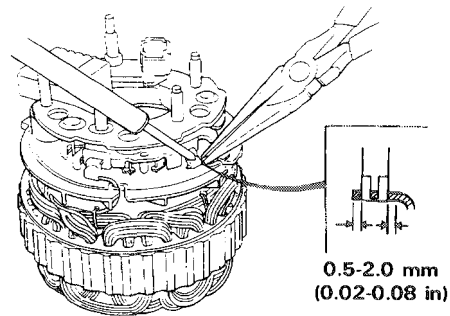


Heat a high-amperage soldering iron (capacity: about 110 W).

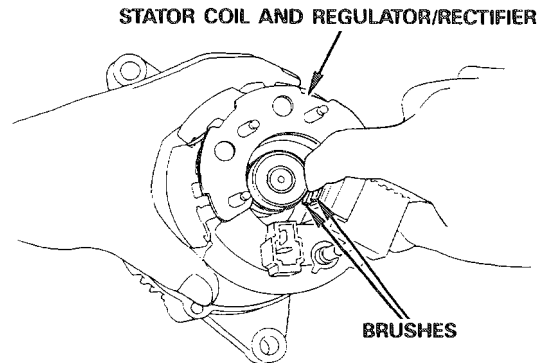
Using a high-temperature (300°C), high-lead content solder, join the stator and regulator/rectifier by soldering the stator coil wires on the diode terminals.

CAUTION

- Work quickly to avoid heat-damage to the regulator/rectifier.
- Position the wires onto the terminals as shown.



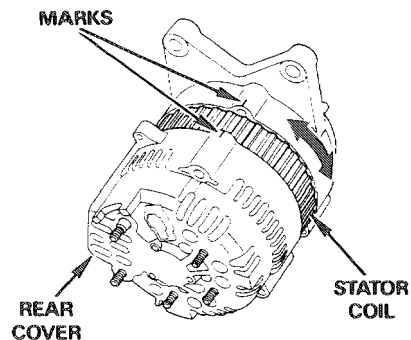
Install the stator coil and regulator/rectifier assembly in front cover, while pressing the brushes into the holder.

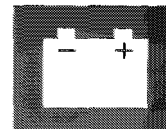


Install the rear cover on the regulator/rectifier and align the marks on the front and rear covers while moving the stator coil.

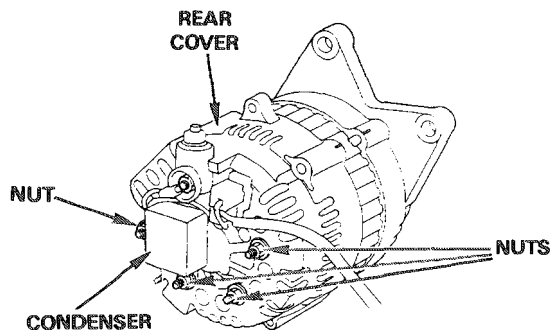
CAUTION

- Do not move the rear cover when aligning the marks, or damage to the stator coil wire will result.

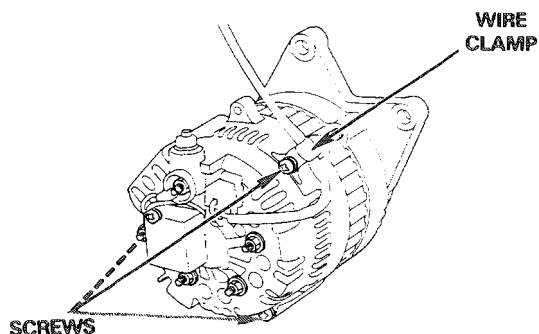




Install the condenser and tighten the rear cover nuts.



Install and tighten the three screws securely with the wire clamp.



Install coupler B and its washer and nut.

Hold coupler B with a tool, as shown, and tighten the nut to the specified torque.

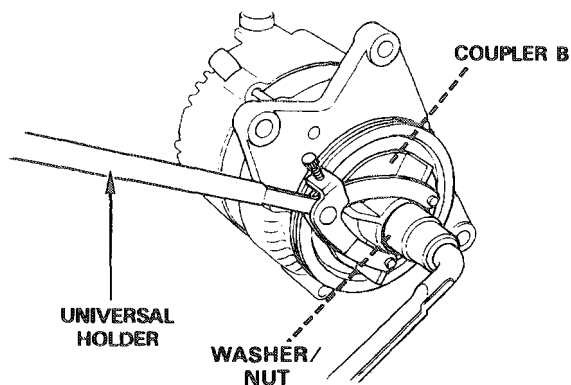
Torque: 58 N-m (5.8 kg-m, 42 ft-lb)

Tool:

Universal holder

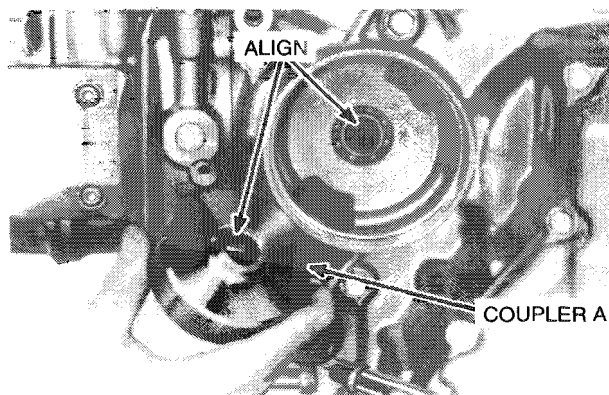
07725-0030000

or equivalent commercially available in U.S.A.



Installation

Install coupler A, aligning the splines on the coupler and alternator driven gear.



Charging

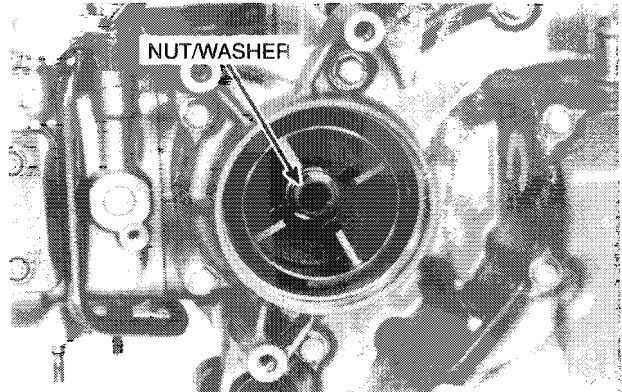
Alternator and Regulator/Rectifier (cont'd)

Set the transmission in any gear. Check the transmission is in gear by trying to move the rear wheel.

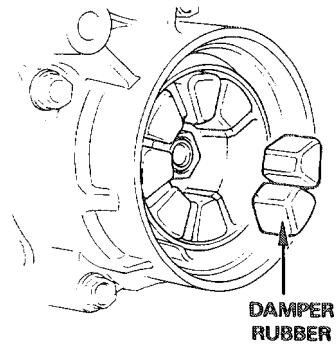
Apply a locking agent to the nut threads.

Install the washer and nut. Tighten the nut to the specified torque.

Torque: 58 N-m (5.8 kg-m, 42 ft-lb)



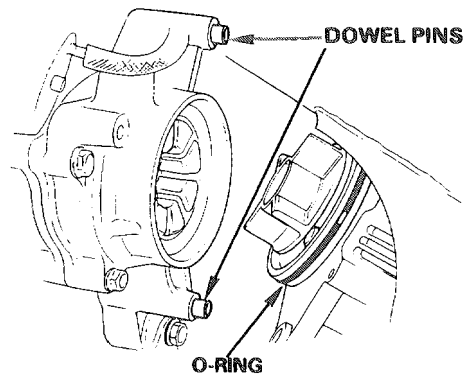
Install the four damper rubbers in coupler A.



Apply oil to the O-ring and install it on the front cover.

Install the two dowel pins.

Install the alternator onto the engine, aligning the tabs of coupler B with the damper rubber grooves.



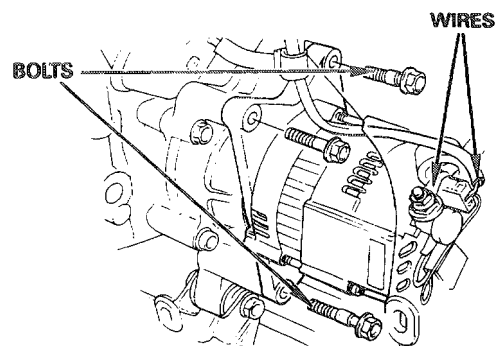
Connect the alternator BLK/LT GRN wire connector and WHT wire terminal onto the alternator.

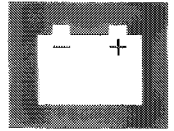
Install and tighten the alternator mounting bolts.

Connect the battery negative cable to the battery.

Install the following:

- left front side cover (see page 13-8).
- right rear side cover (see page 13-8).



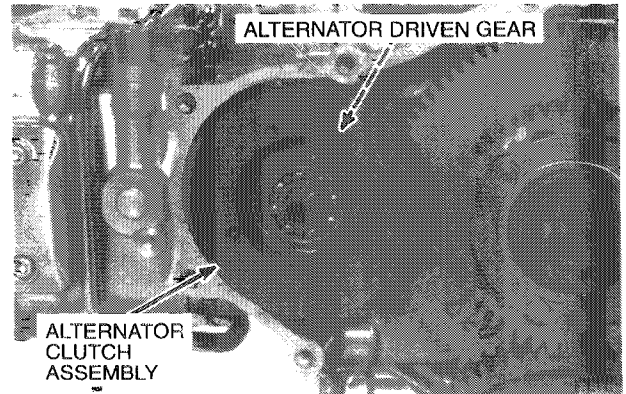


Alternator Drive/Driven Gears

Removal

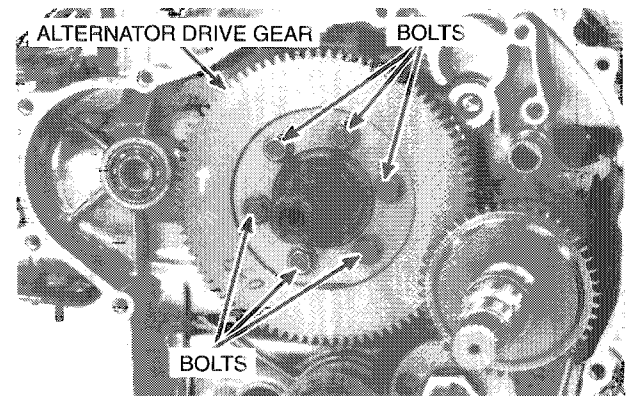
Remove the starter clutch (see section 18).

Remove the alternator clutch assembly and driven gear.



Remove the primary drive and driven gears (see page 10-22).

Remove six bolts and the 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.

Replacement:

Remove the bearing from the case.

Tools:

Bearing remover 07936-3710300

Remover handle 07936-3710100

Remover sliding weight 07741-0010201

Install a new alternator shaft oil pass plate and a new thrust spring with the OUTSIDE mark facing out. Drive a new bearing into the case

NOTE

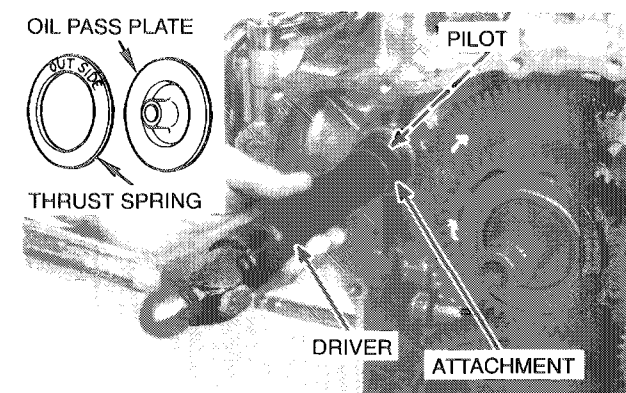
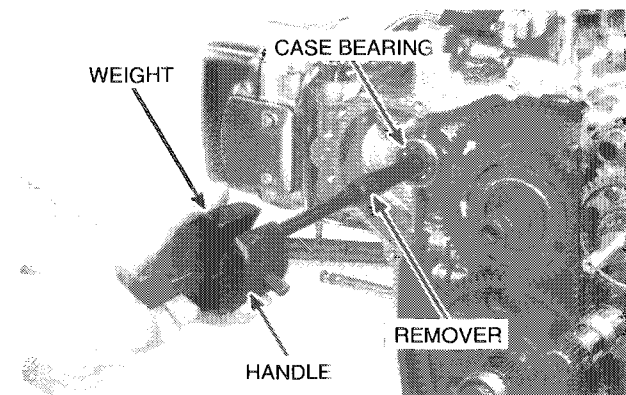
- Install the new bearing with its sealed side facing inside.

Tools:

Driver 07749-0010000

Attachment, 32 x 35 mm 07746-0010100

Pilot, 17 mm 07746-0040400



Charging

Alternator Drive/Driven Gear (cont'd)

Alternator Driven Gear Disassemble/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.

Press the driven shaft out of the bearing.

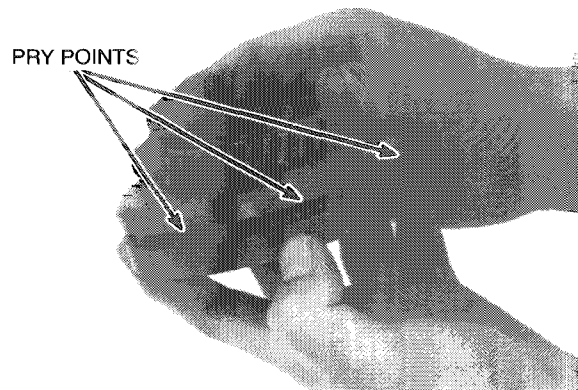
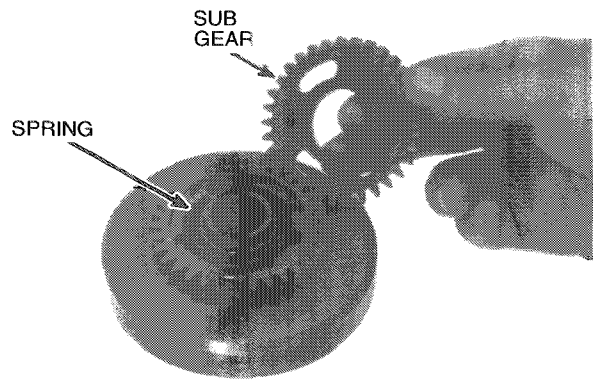
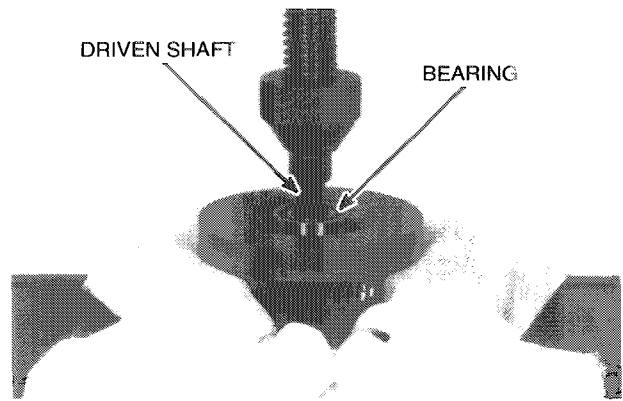
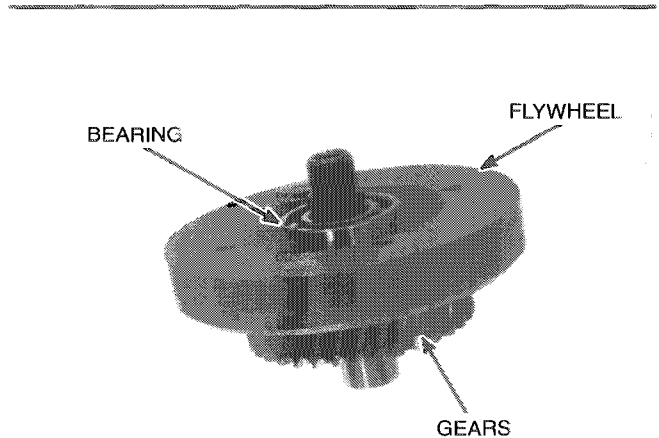
Discard the bearing.

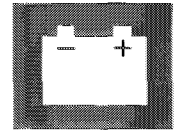
Remove the alternator driven sub gear and gear spring.

Separate the flywheels while prying open evenly.

NOTE

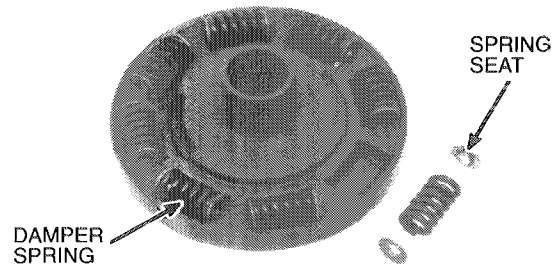
- There are eight pry-point positions.
- Do not damage the flywheels when prying.



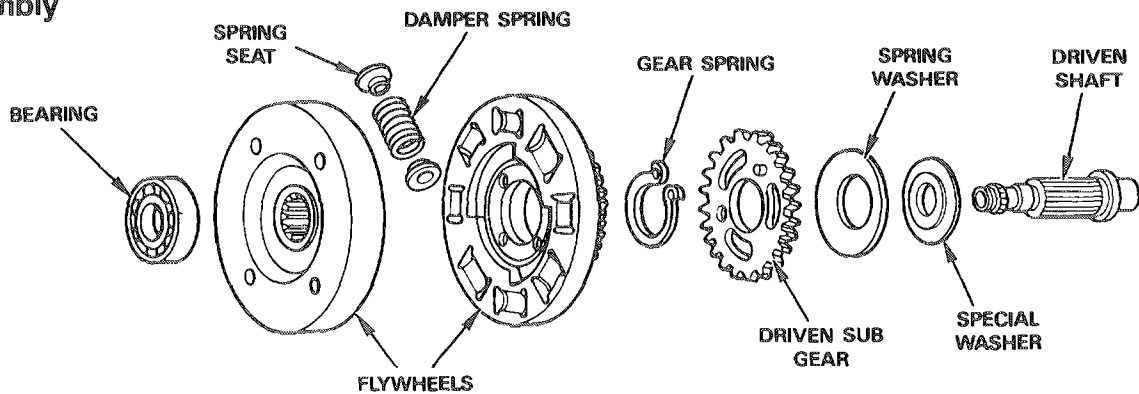


Remove the damper springs and spring seats from the flywheel.

Check the springs and seats for damage or fatigue.

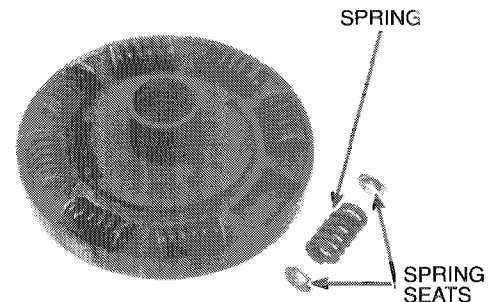


Assembly



Apply oil to the damper springs.

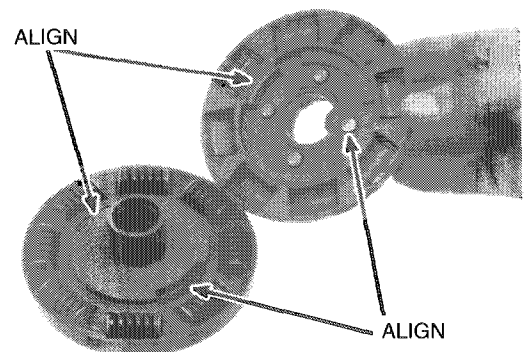
Install the spring and spring seats into the flywheel as shown.



Assemble the flywheels, aligning the bosses with the grooves.

CAUTION

- Do not damage the spring seats.

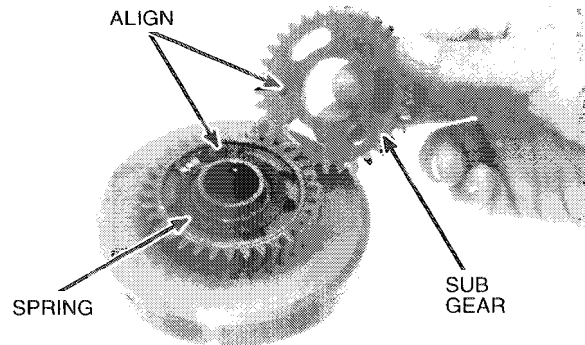


Charging

Alternator Drive/Driven Gear (cont'd)

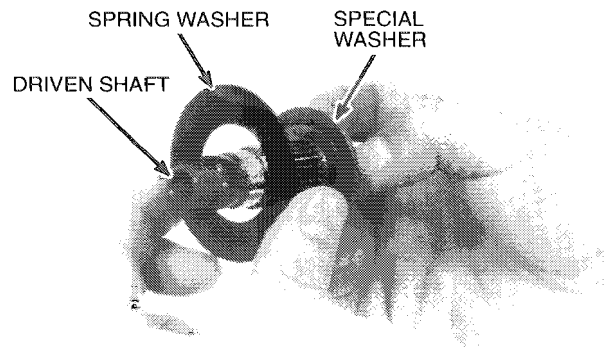
Install the driven gear spring onto the driven gear as shown.

Install the sub gear, aligning the gear boss with the spring hole.



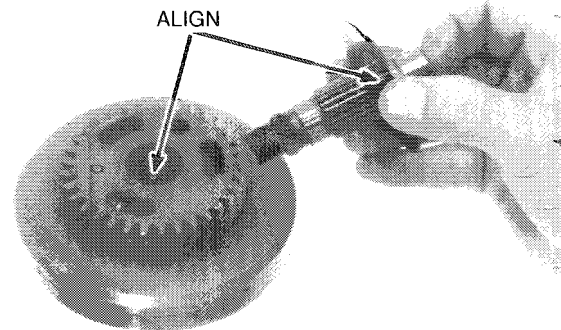
Install the special washer onto the driven shaft as shown.

Install the spring washer onto the special washer with its dished side facing the driven gears.



Install the alternator driven shaft into the flywheel, aligning the holes of the flywheel and shaft.

Press a new bearing onto the shaft.



Tools:

Inner driver B

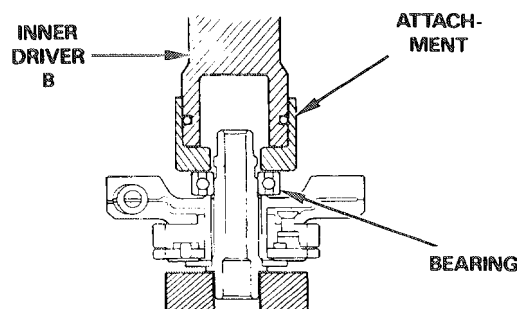
07746-0020100

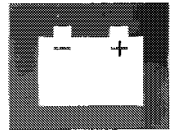
Attachment, 17 mm I.D.

07746-0020300

NOTE

- Support the driven shaft as shown with blocks.





Installation

Apply oil to the flange and threads of the alternator drive gear bolts.

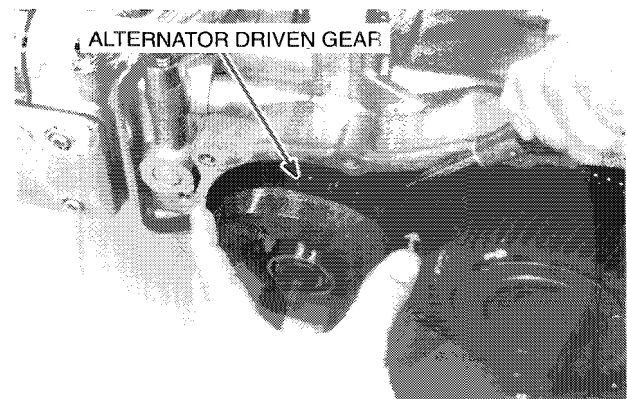
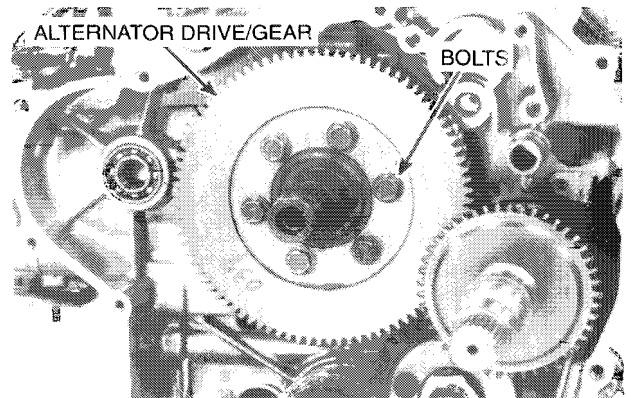
Install the alternator drive gear onto the crankshaft. Tighten the bolts to the specified torque

Torque: 27 N-m (2.7 kg-m, 20 ft-lb)

Install the primary drive and driven gears (see page 10-23).

Aligning the serrated teeth of the alternator driven gear with the drive gear teeth, install the alternator driven gear.

Install the starter clutch (see page 18-24).





Starter/Reverse

A & SE Models:

Service Information	18-2
Troubleshooting	
(Starter)	18-5
Troubleshooting	
(Reverse)	18-8
Starter/Reverse	
Motor	18-13
Starter Clutch	18-22
Fuel Pump Shut-Off	
(Bank Angle)	
Sensor	18-25
Starter Relay	
Switch A	18-26
Starter Relay	
Switch B	18-26
Reverse Relay	
Switch	18-27
Relay Box	18-27
Diodes	18-28
Reverse Switch	18-28
Starter/Reverse	
Switch	18-29
Clutch Switch	18-30
Reverse System	18-30
Reverse Control	
Unit	18-39
Starter Relay	
Regulator	18-41
Reverse Resistor	
Assembly	18-42
Power Control Relay . . .	18-43
Speed Limiter Relay . . .	18-44
Reverse Lever	
Switch	18-44

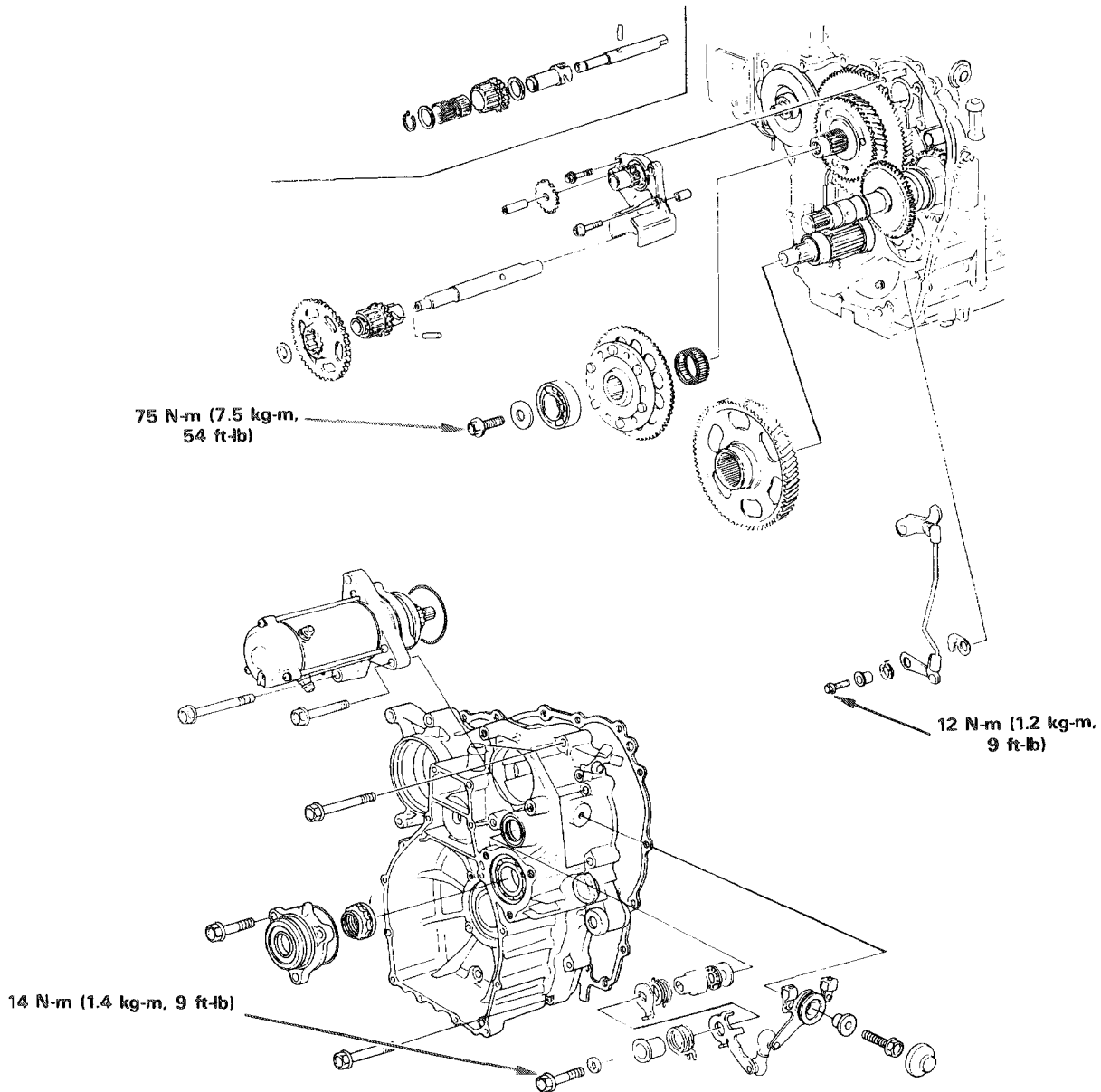
I Model:

Service Information	18-45
Troubleshooting	18-47
Starter Motor	18-49
Diodes	18-51
Starter Drive Gear	18-52

Starter/Reverse

Service Information (A & SE Models)

- The starter/reverse motor can be serviced without removing the engine on the frame. To service the starter clutch and reverse 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 motorcycle stops running in reverse 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 inspecting the starter/reverse system, check the system components and wiring step-by-step according to the troubleshooting chart.

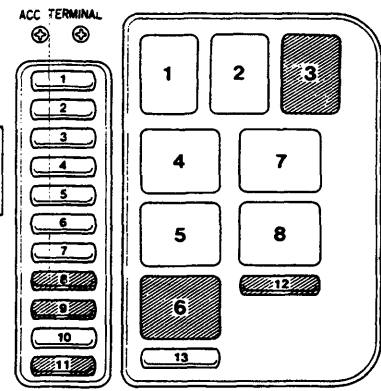
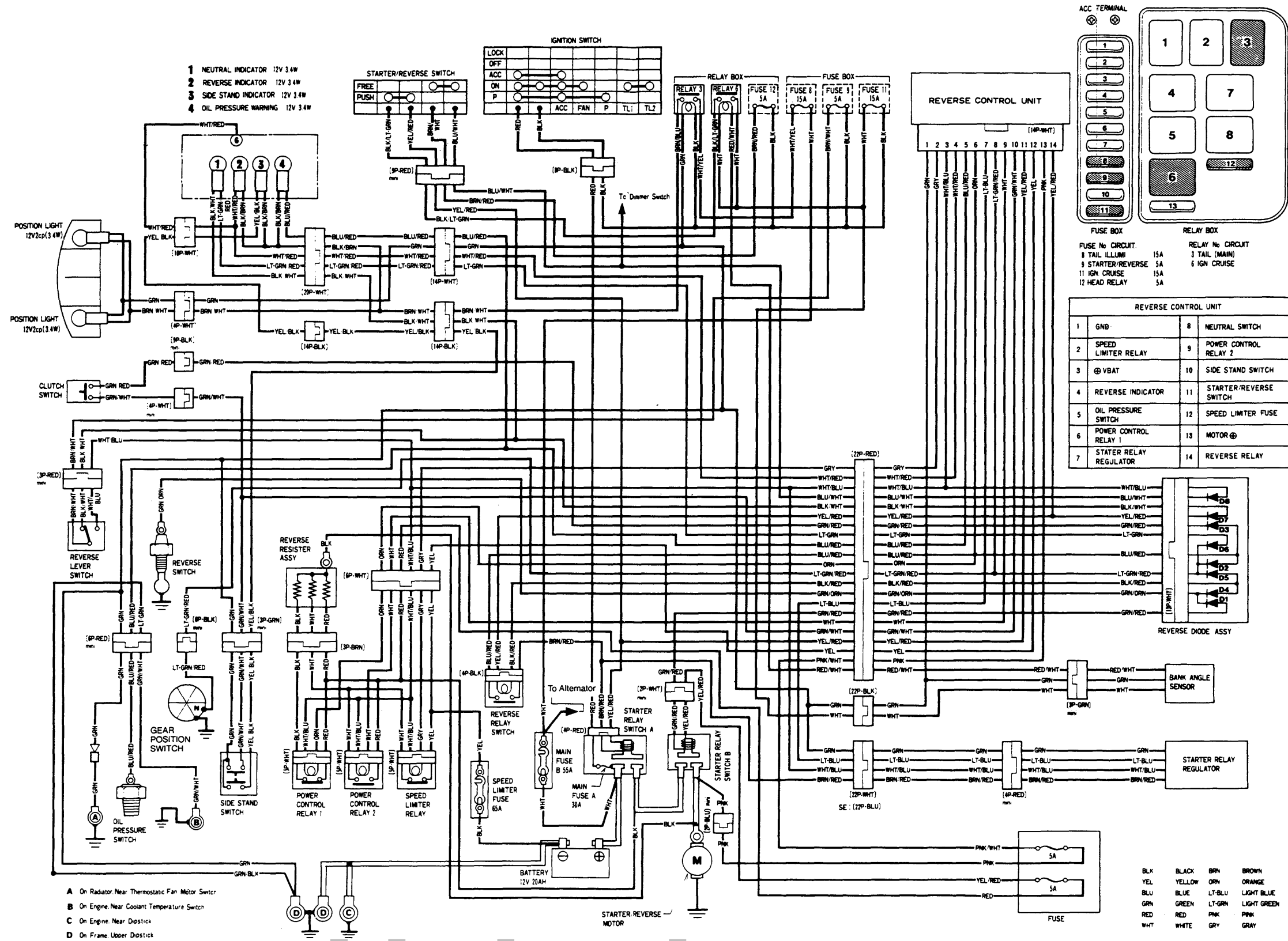


Torque Values

Starter one-way clutch socket bolt	16 N-m (1.6 kg-m, 12 ft-lb)
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)
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)



**Circuit Diagram
A & SE Only:**



FUSE No	CIRCUIT	RELAY No	CIRCUIT
8	TAIL ILLUM	3	TAIL (MAIN)
9	STARTER/REVERSE	5A	IGN CRUISE
11	IGN CRUISE	15A	
12	HEAD RELAY	5A	

REVERSE CONTROL UNIT	
1	GNB
2	SPEED LIMITER RELAY
3	⊕VBAT
4	REVERSE INDICATOR
5	OIL PRESSURE SWITCH
6	POWER CONTROL RELAY 1
7	STARTER 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

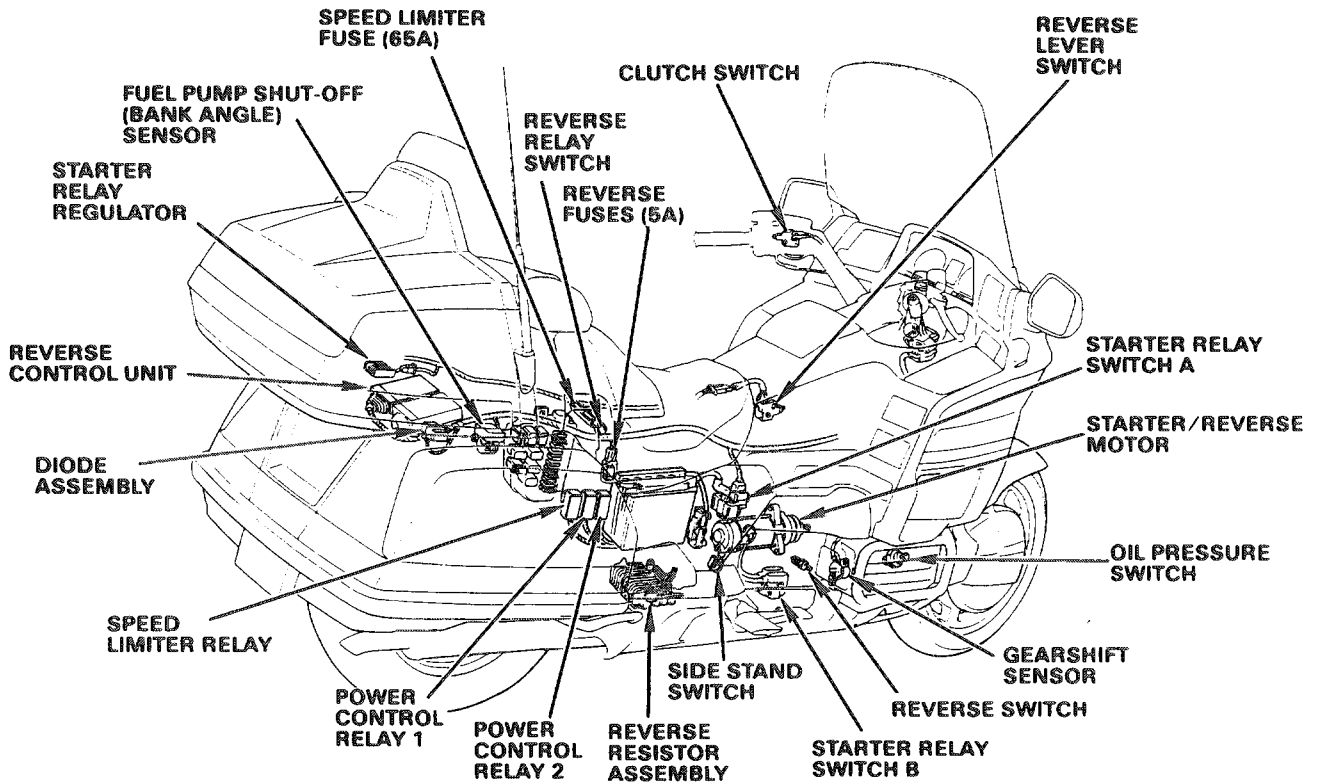
- A On Radiator Near Thermostatic Fan Motor Switch
- B On Engine Near Coolant Temperature Switch
- C On Engine Near Dostick
- D On Frame Upper Dostick

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

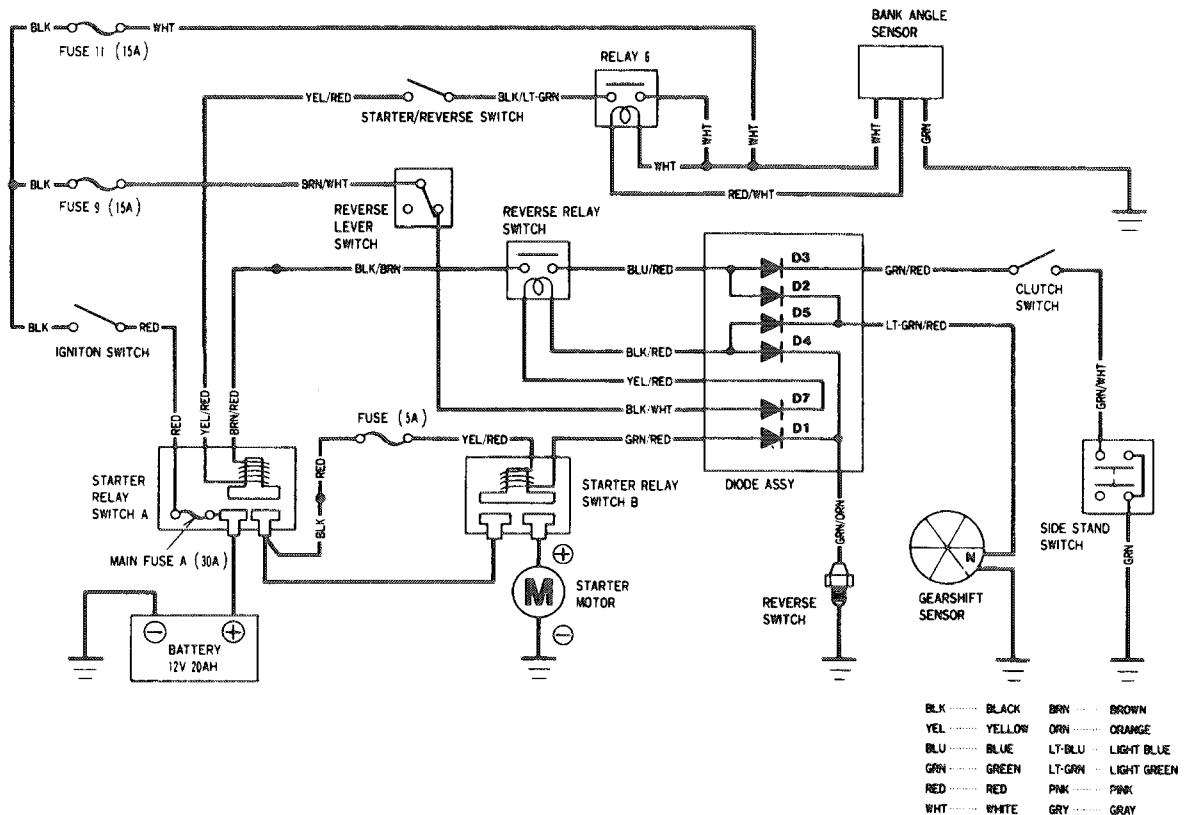
Starter/Reverse

Service Information (A & SE Models) (cont'd)

System Location



Starting System Diagram





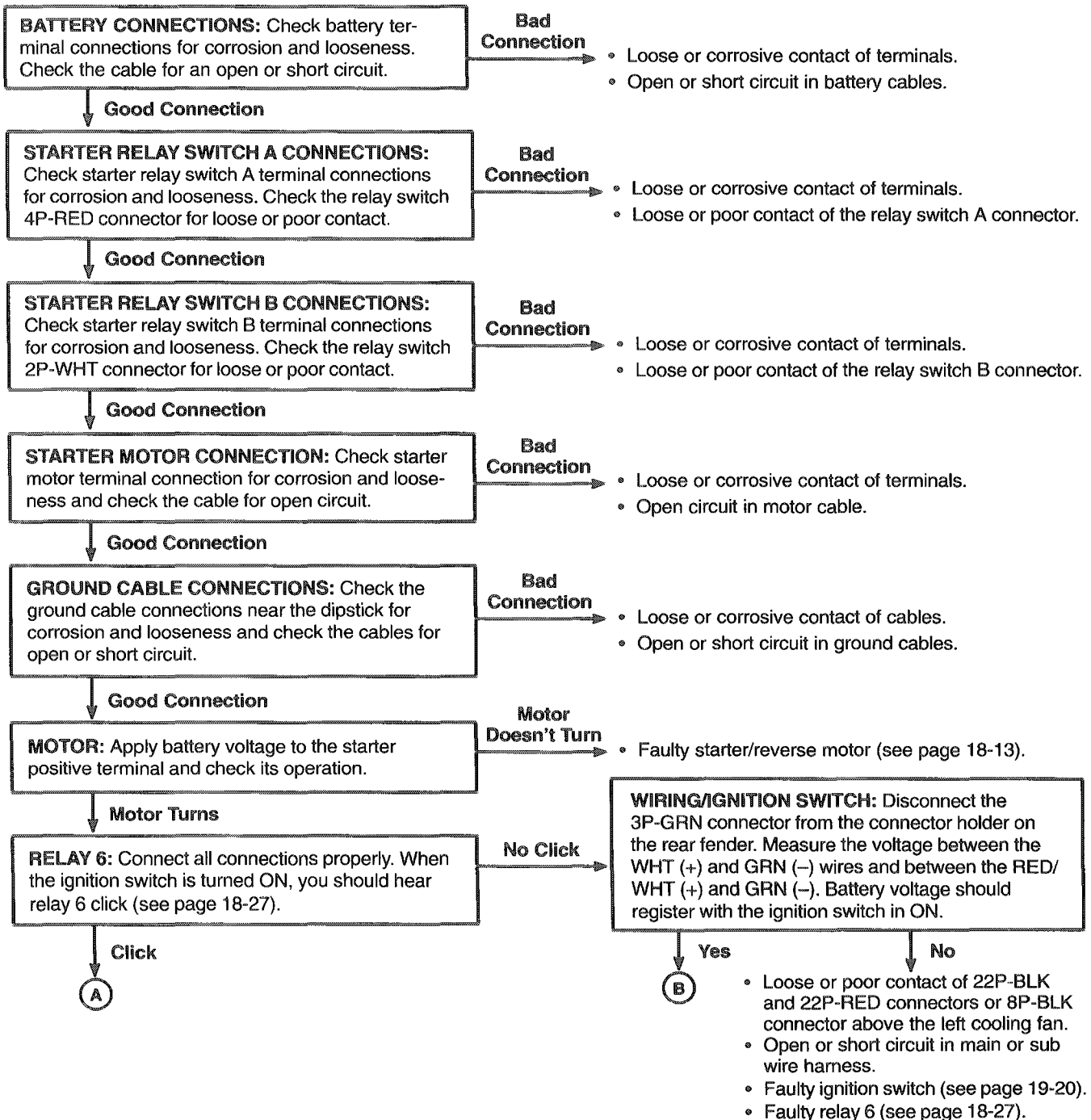
Troubleshooting (A & SE Models)

The starter/reverse motor for starting does not turn.

NOTE

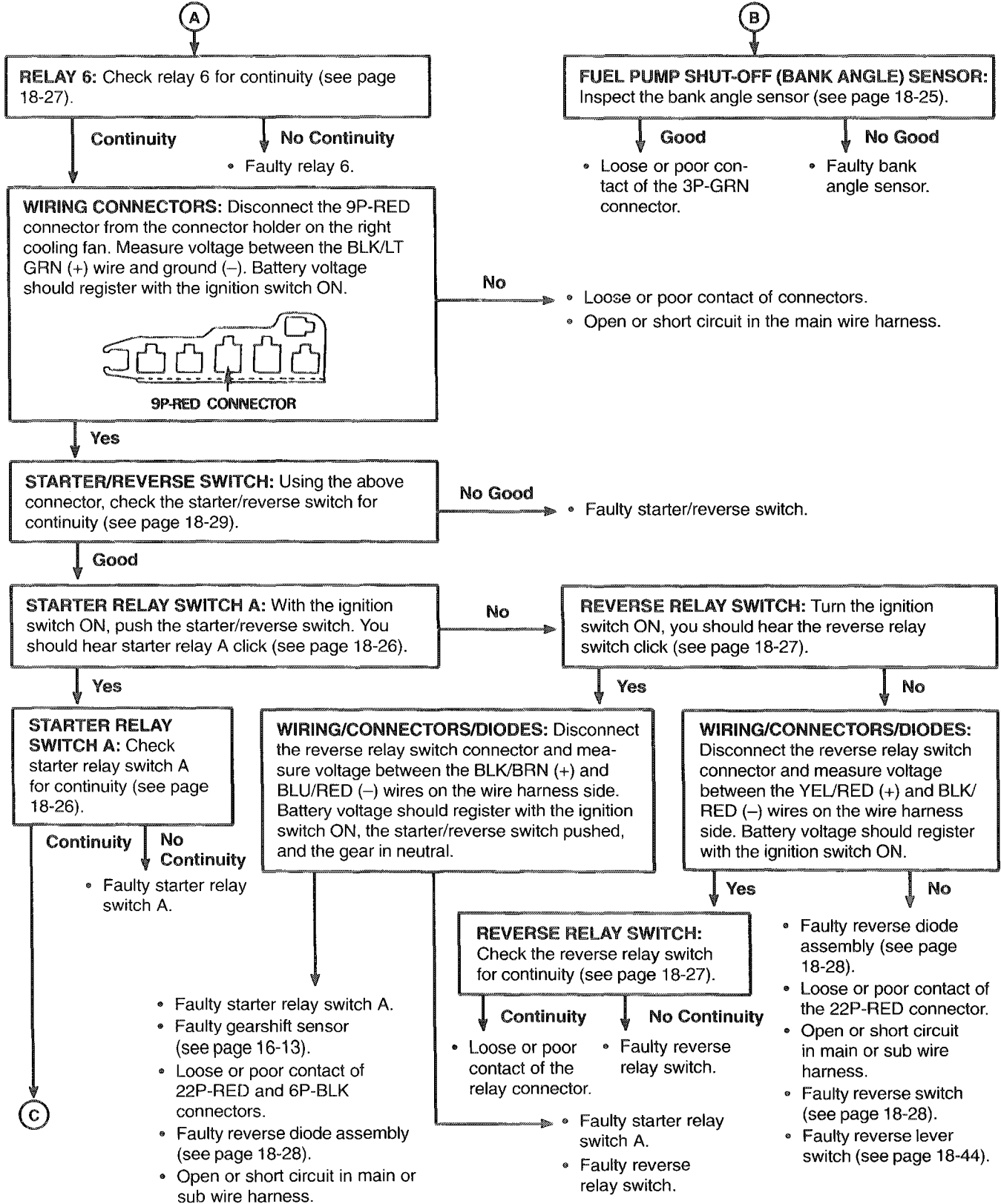
Inspect the following before troubleshooting the starter system:

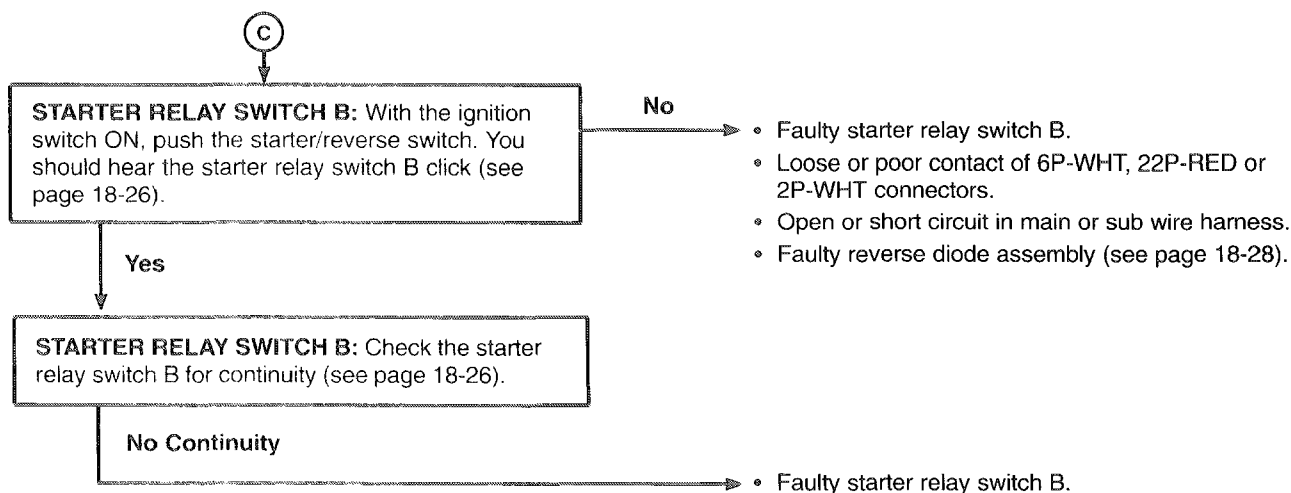
- Be sure the battery is fully charged and in good condition.
- Be sure the reverse lever is in the OFF position and the reverse cable is properly adjusted (see page 3-30).
- Be sure the reverse switch is not damaged (see page 18-31).
- Be sure the following fuses are good: main fuse A (30A) – inside starter relay switch A; fuse 9 (15A) – inside the fuse box; fuse 11 (15A) – inside the fuse box; fuse 5A – on the left side of the battery.
- Be sure the fuel pump shut-off (bank angle) sensor is installed properly (see page 18-25).



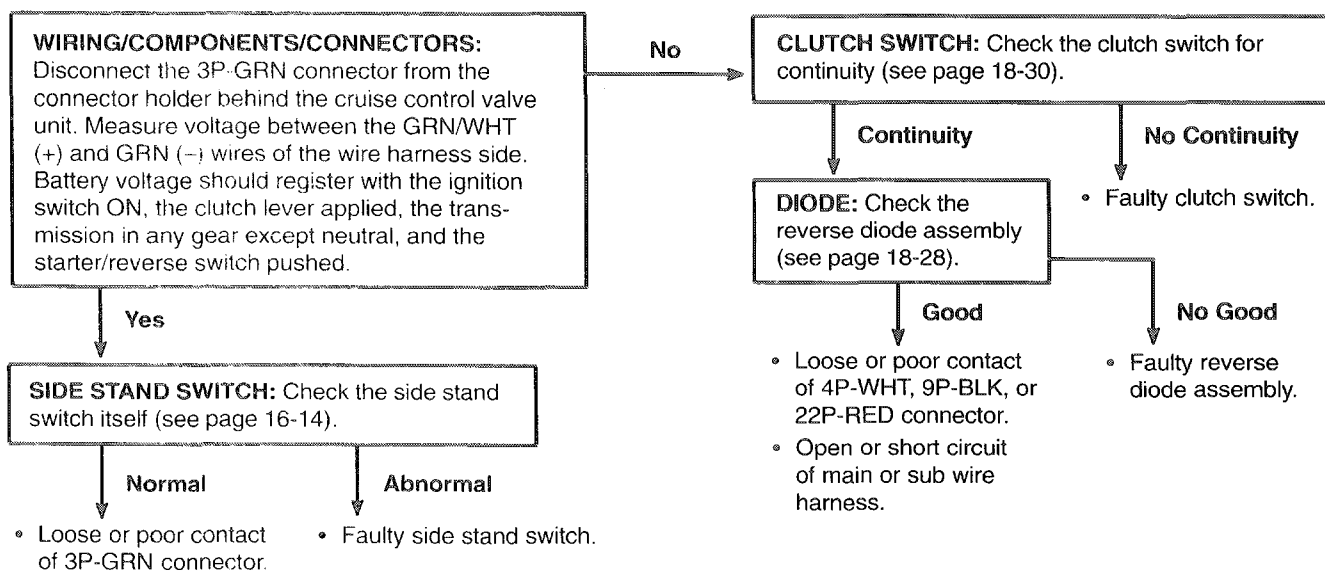
Starter/Reverse

Troubleshooting (A & SE Models) (cont'd)





The starter/reverse motor turns in neutral position, but does not turn in gear with the side stand up and the clutch lever pulled in.



Starter motor turns engine slowly.

- Low battery.
- Excessive resistance in circuit.
- Faulty starter motor (see page 18-13).

Starter motor turns, but engine does not turn.

- Faulty starter clutch (see page 18-22).
- Faulty starter drive/or driven gear.
- Faulty starter idle gear.

Starter motor and engine turn, but engine does not start.

- Faulty ignition system.
- Engine problems, see engine related sections.

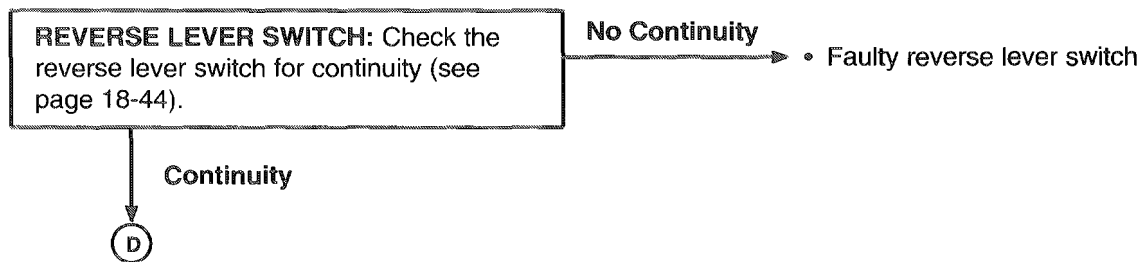
Starter/Reverse

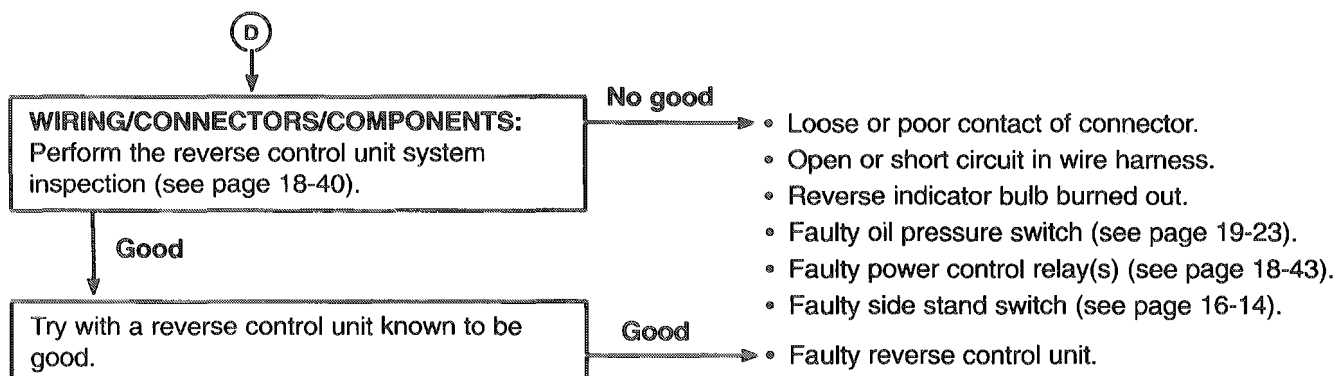
Troubleshooting (A & SE Models) (cont'd)

The starter/reverse motor does not turn for reverse.

NOTE

- When the speed limiter is activated during reverse running, followed by the electrical motor brake, (when the motor is overloaded more than three seconds), the reverse system is turned OFF 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.
 - Inspect the following before troubleshooting the reverse system:
 - Be sure the transmission gear 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 good: fuse 5A – the left side of the battery
reverse fuse 65A – under the seat.
-

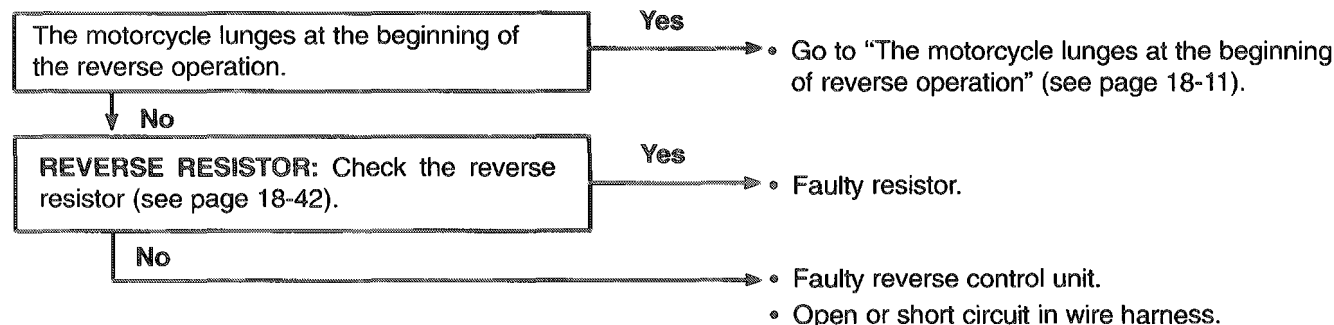




The reverse system works, but reverse indicator does not come on.

- Burnt out reverse indicator bulb.
- Faulty reverse control unit.
- Open or short circuit in wire harness.

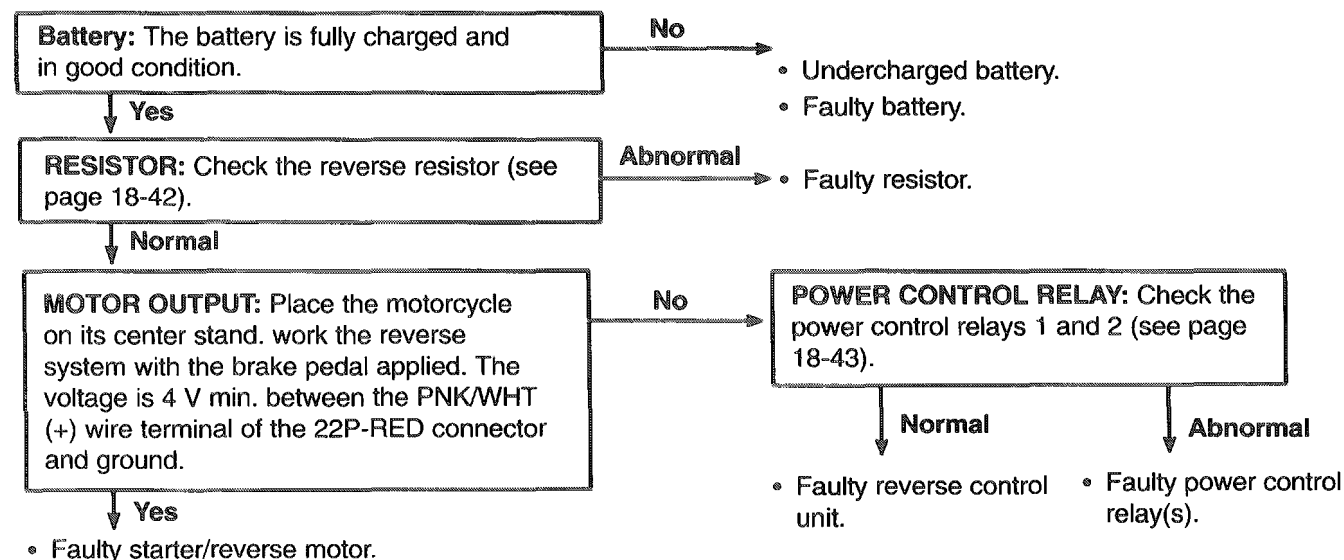
The reverse speed is fast (above 1.8 km/h on a flat road).



The reverse speed is slow (below 1.0 km/h on a flat road)

- Undercharged or faulty battery.
- Faulty resistor.
- Faulty power control relay.
- Faulty starter/reverse motor.

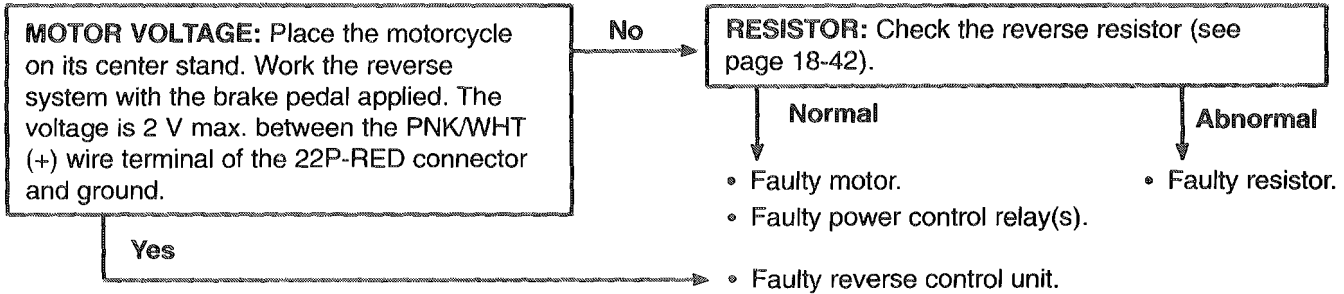
Lack of uphill power



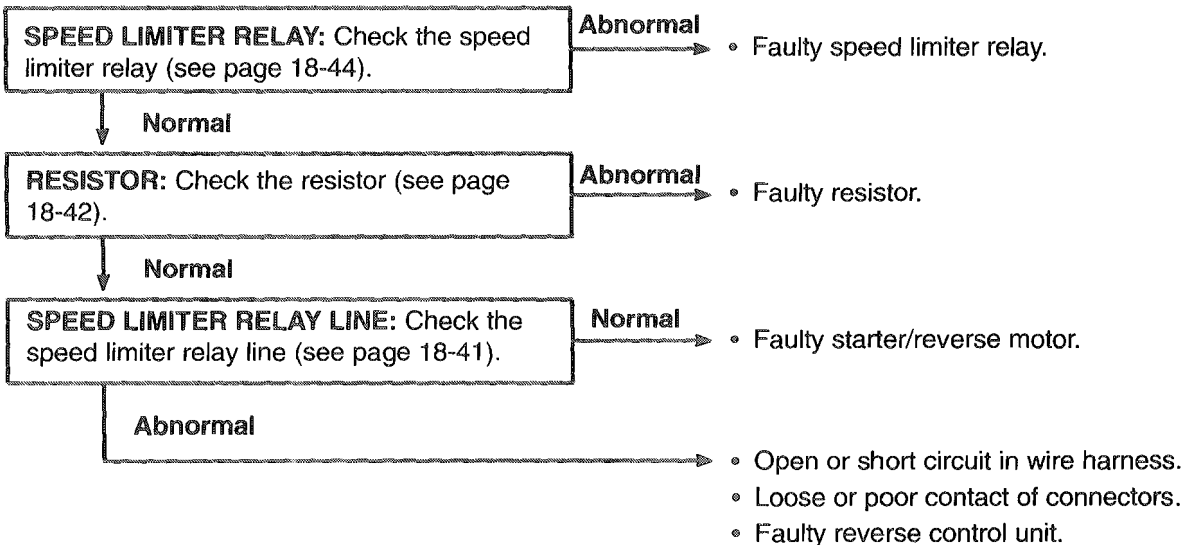
Starter/Reverse

Troubleshooting (A & SE Models) (cont'd)

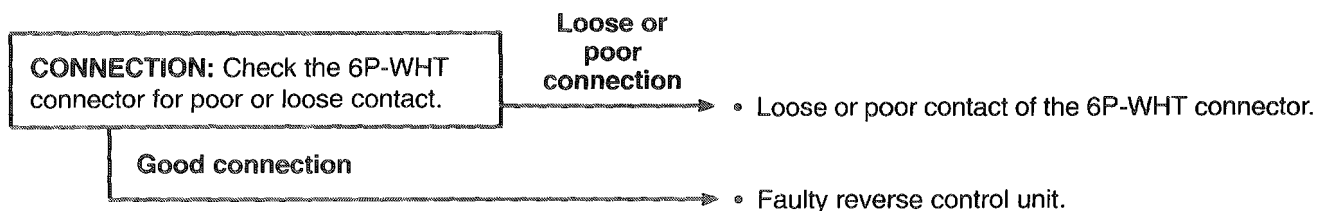
The reverse system works, but the motor does not stop if it is overloaded more than three seconds.



The speed limiter system is not activated at or above 2.5 km/h in reverse.



Reverse operation is rough, or reverse motor runs poorly.

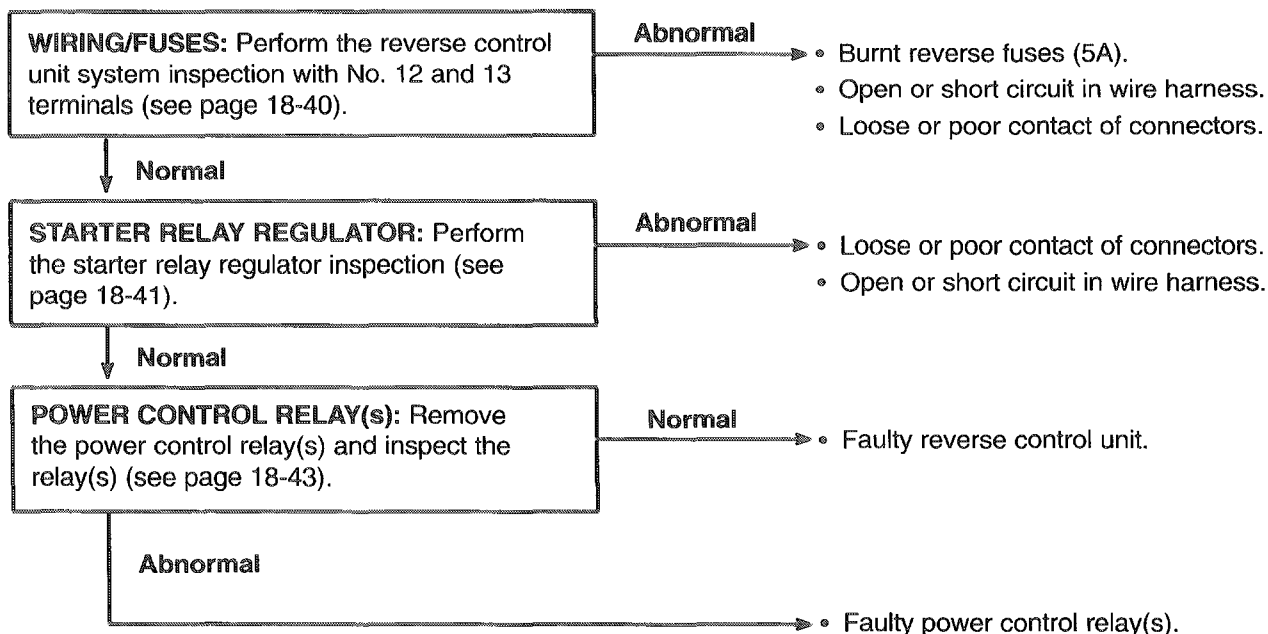


Continues operating in reverse even if the starter/reverse switch is free.

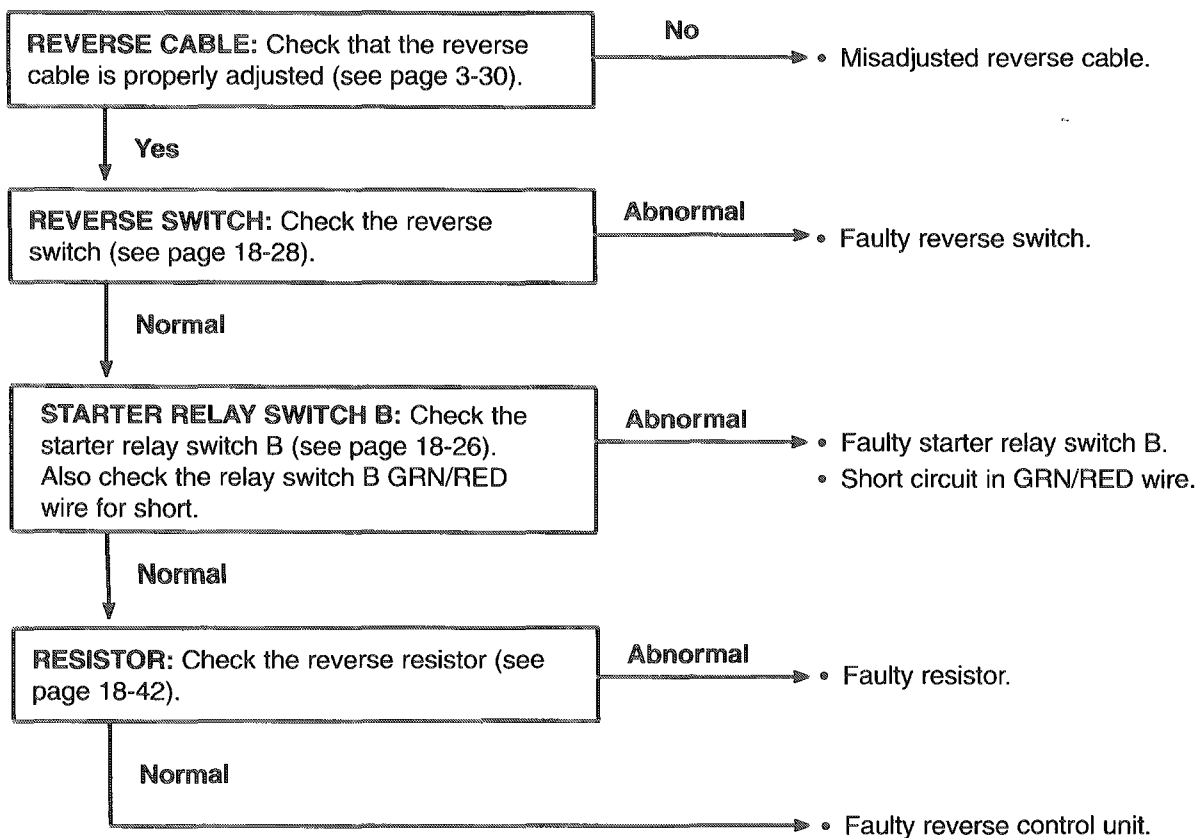
- Faulty starter/reverse switch.
- Faulty starter relay switch A.
- Short circuit in YEL/RED wire.



Stops immediately when reverse operation is initiated.



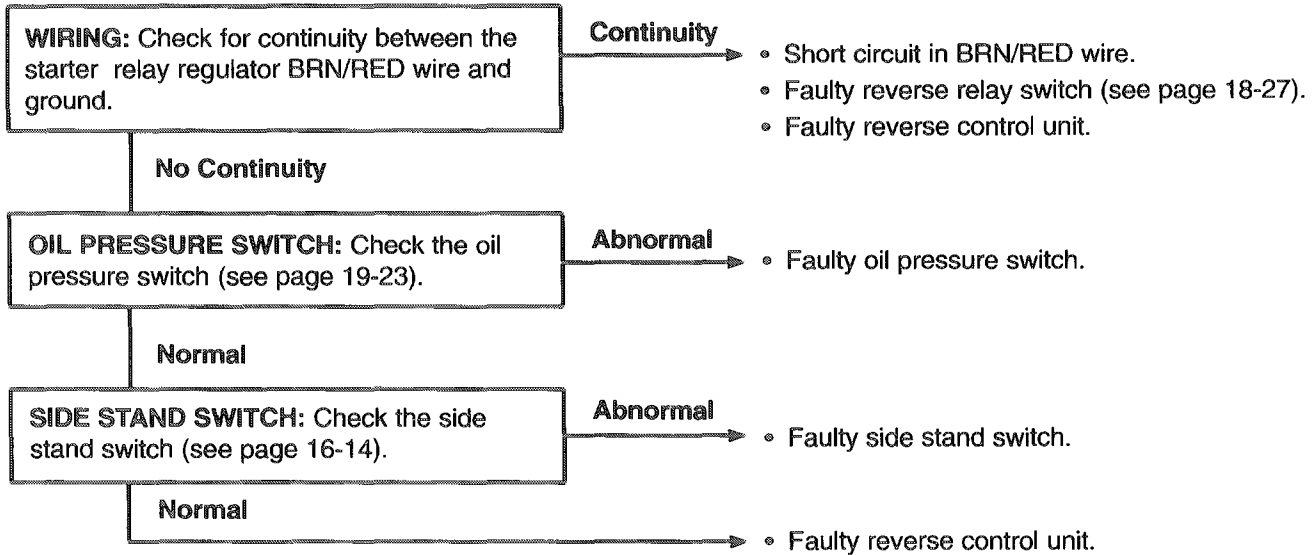
The motorcycle lunges at the beginning of reverse operation.



Starter/Reverse

Troubleshooting (A & SE Models) (cont'd)

The reverse system operates before being properly selected.



During reverse operation, the headlight goes out.

- Go to “Headlight goes off during reverse operation” (see page 19-5).

During reverse operation, the motor idles.

- Misadjusted reverse cable (see page 3-30).
- Faulty reverse shift system (see page 18-31).

Transmission is hard to shift with reverse lever in OFF position.

- Misadjusted reverse cable (see page 3-30).
- Damaged shift drum lock system (see page 18-33).

During forward operation, the rear wheel is locked suddenly.

- Damaged reverse shift system (see page 18-31).

After shifting into reverse, the transmission is easy to shift.

- Damaged shift drum lock system (see page 18-33).
- Misadjusted reverse cable (see page 3-30).

Hard to shift to reverse.

- Damaged reverse shift system (see page 18-31).
- Faulty reverse cable.



Starter/Reverse Motor (A & SE Models)

Removal

Remove the following:

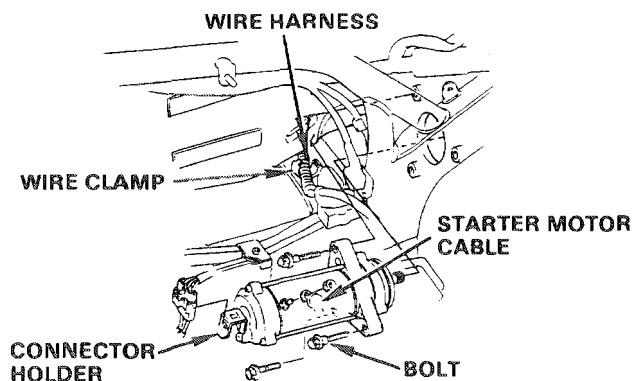
- right front side cover (see page 13-8).
- battery and battery case (see page 17-7).

Remove the connector from the connector holder.

Remove the wire harness from the wire clamp.

Disconnect the starter motor cable from the motor.

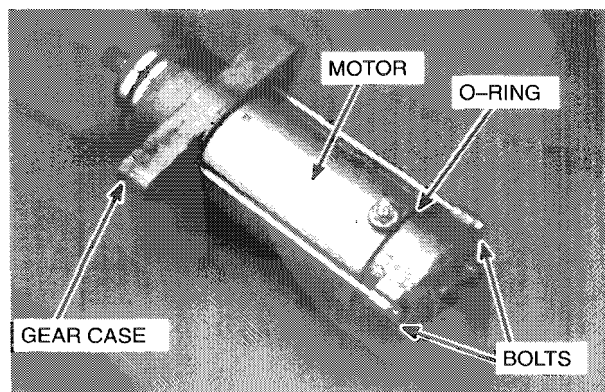
Remove the motor mounting bolts and motor from the engine.



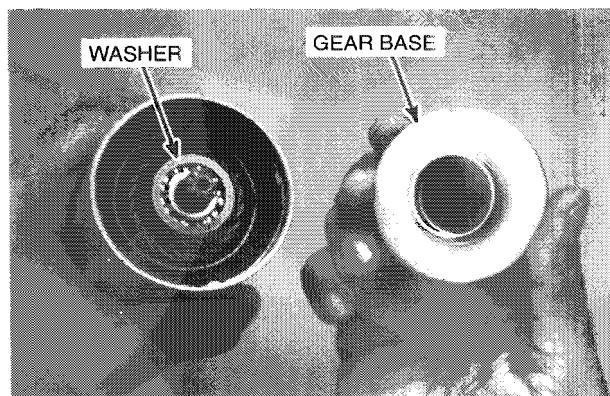
Disassembly

Remove the motor attaching bolts and separate the motor reduction gear case from the starter motor.

Remove the O-ring.

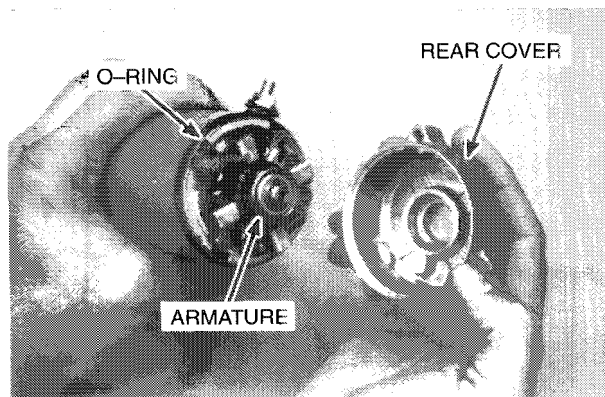


Remove the starter reduction gear base and washer.



Remove the rear cover and O-ring.

Remove the armature.

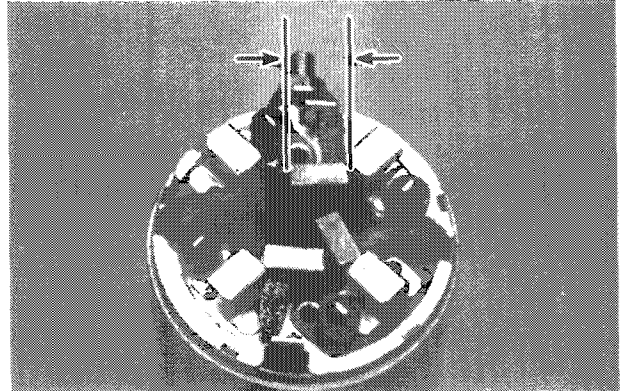


Starter/Reverse

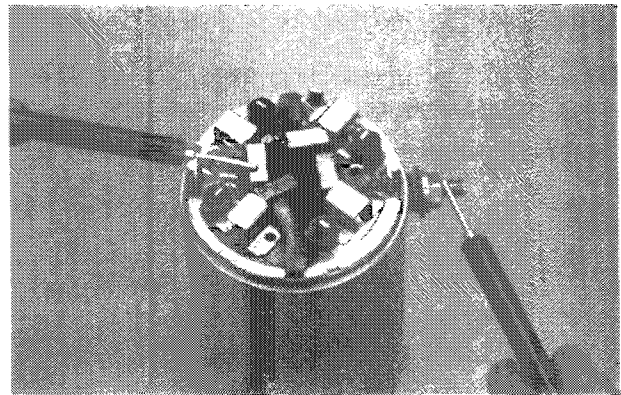
Starter/Reverse Motor (A & SE Models) (cont'd)

Inspect the brushes and measure the brush length.

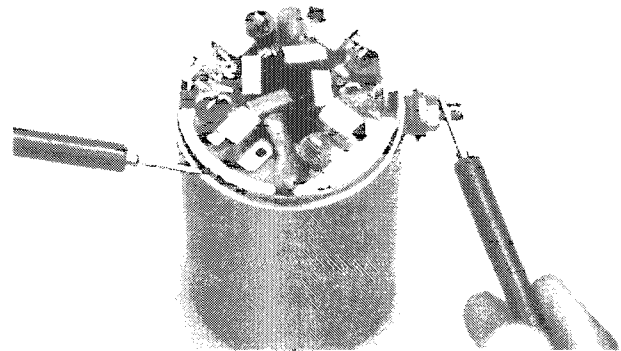
Service Limit: 6.0 mm (0.24 in)



Check the continuity between the motor cable terminal and brushes with insulated wire. There should be continuity.



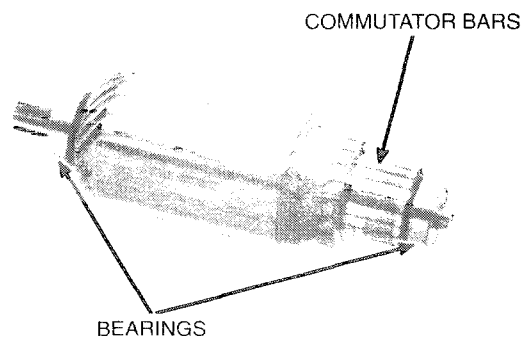
Check for continuity between the motor cable terminal and motor case. There should be no continuity.



Inspect the commutator bars for discoloration. Bars discolored in pairs indicate grounded armature coils.

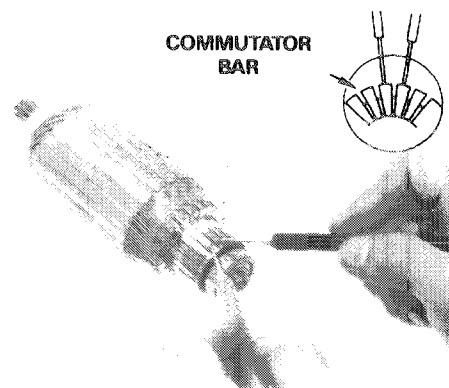
Turn the outer race of the bearings with your finger. The bearings should turn smoothly and quietly.

Also check that the inner race of the bearings fit tightly in the shaft.

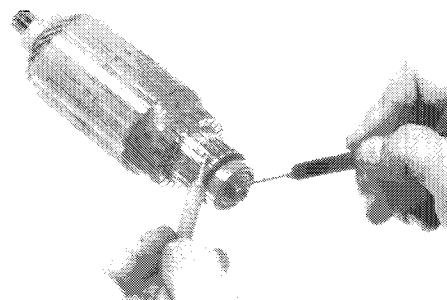




Check for continuity between parts of commutator bars.
There should be continuity.



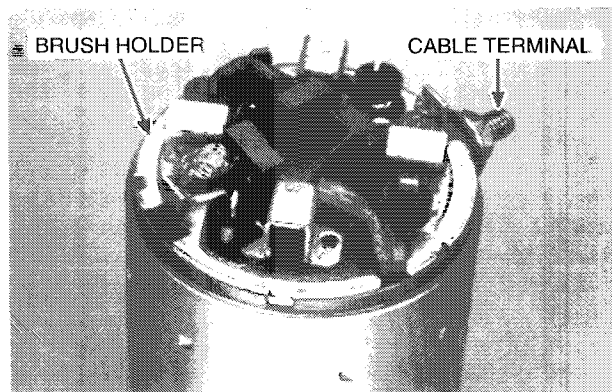
Check for continuity between the commutator bars and
armature shaft. There should be no continuity.



Remove the brush holder.

Remove the terminal from the motor case.

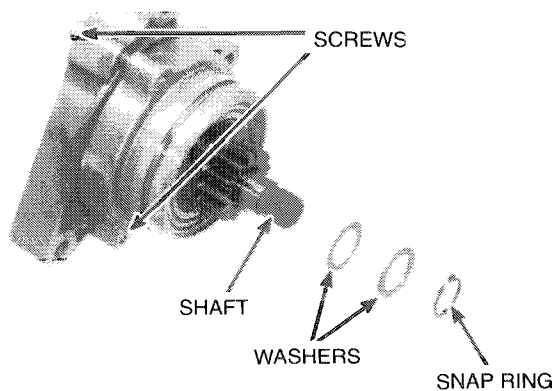
Remove the brushes.



Reduction Gear Case Disassembly/Inspection

Remove the snap ring and washers from the starter shaft.

Separate the reduction gear case from the starter shaft
case by removing three screws.

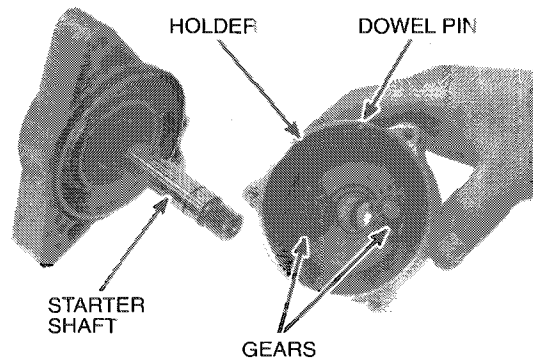


Starter/Reverse

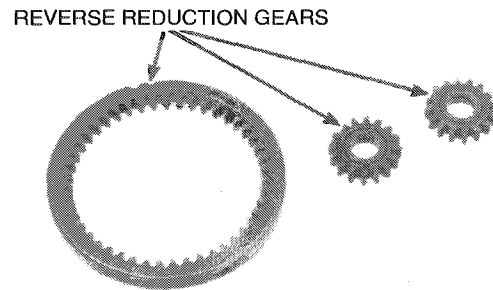
Starter/Reverse Motor (A & SE Models) (cont'd)

Remove the gear holder, dowel pin, and reverse reduction gears from the reduction gear case.

Remove the starter shaft from the starter shaft case.

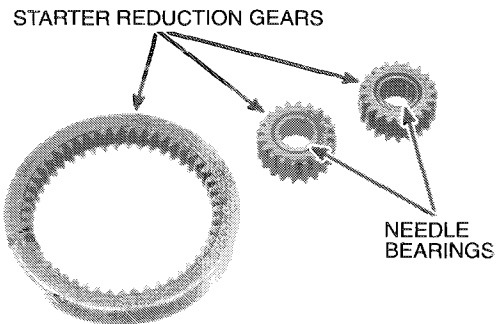


Check the reverse reduction gears for excessive or abnormal wear.



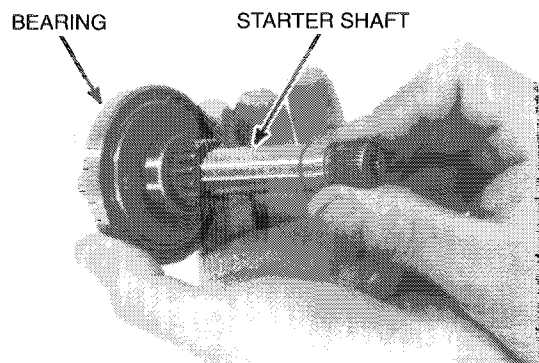
Check the starter reduction gears for excessive or abnormal wear.

Check the planetary gear needle bearings for damage or excessive wear.



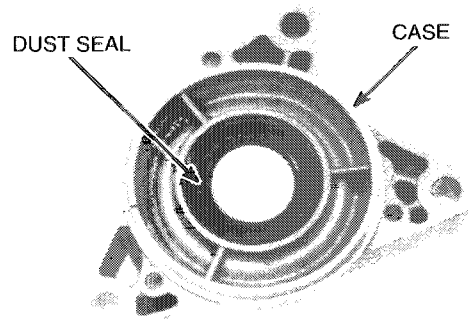
With the starter shaft installed into the bearing, turn the shaft with your finger, as shown. The bearing should turn smoothly and quietly.

Replace the bearing, if necessary.



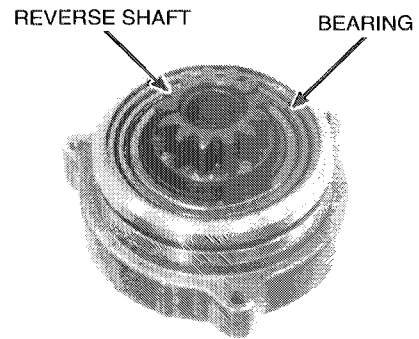


Inspect the dust seal of the starter shaft case for fatigue or damage.

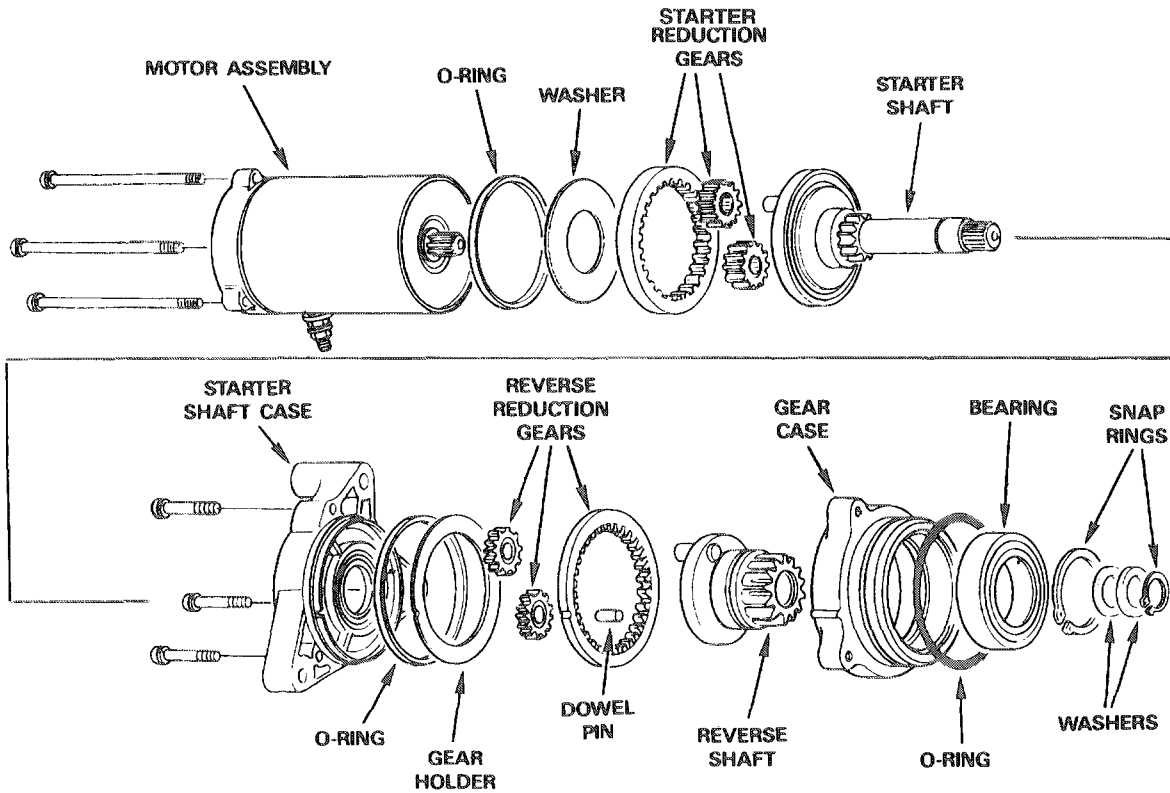


Turn the reverse shaft with your finger. The bearing should turn smoothly and quietly.

If necessary, replace the reverse gear case assembly.



Reduction Gear Case Assembly



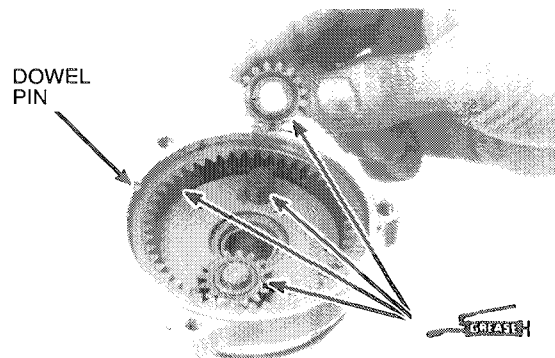
Starter/Reverse

Starter/Reverse Motor (A & SE Models) (cont'd)

Apply grease to the gear teeth and reverse shaft bosses. Install the dowel pin onto the reverse reduction gear case.

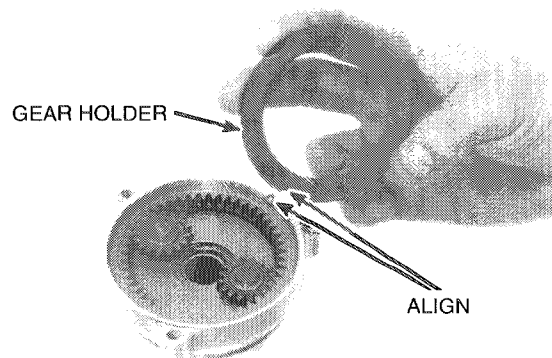
Install the sun gear, aligning the gear groove with the dowel pin.

Install the planetary gears onto the shafts.



Install the gear holder, aligning the holder groove with the dowel pin.

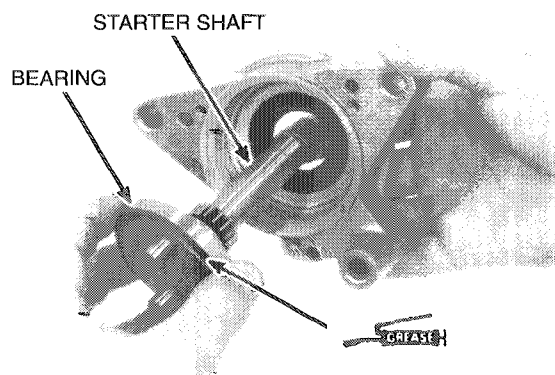
Check the gears for rotation. They should rotate freely.



Pack the bearing cavities with grease.

Install the bearing onto the starter shaft.

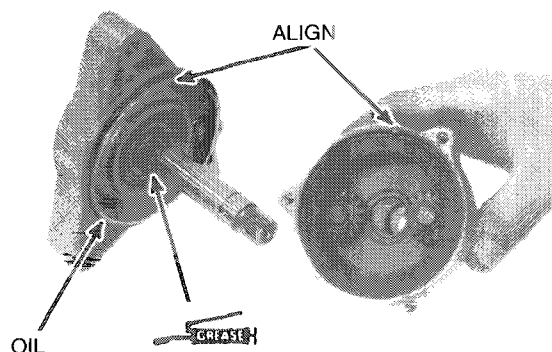
Install the starter shaft and bearing into the starter shaft case.



Apply motor 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 reduction gear case assembly onto the starter shaft case, aligning the dowel pin of the gear case with the groove of the shaft case.



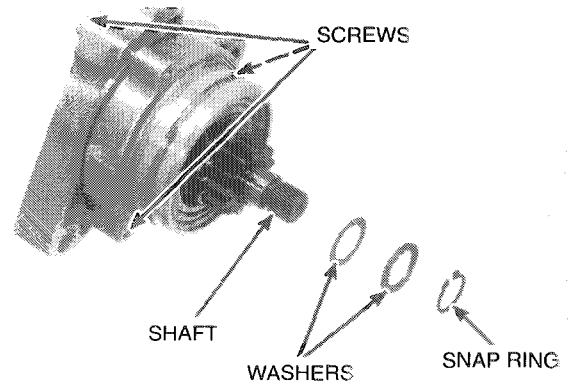


Install and tighten the three screws securely.
Install the washers and snap ring onto the starter shaft.

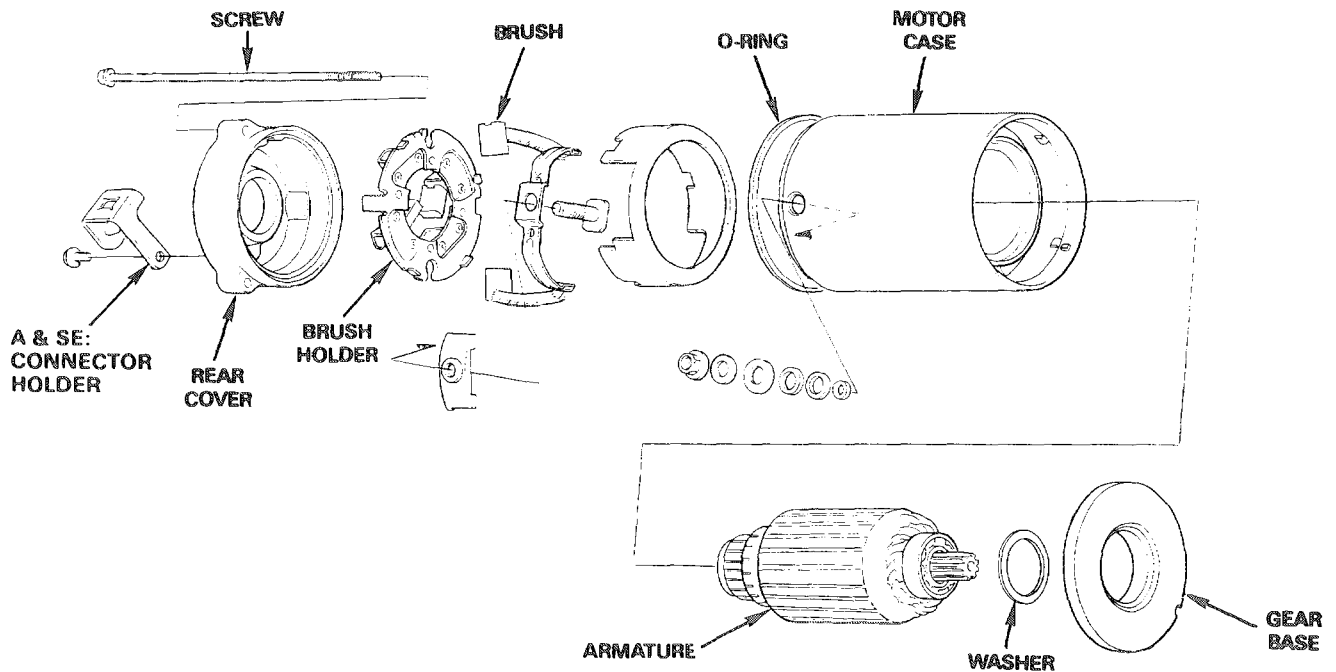
NOTE

- Install the thinner washer, inside: the thicker one, outside.

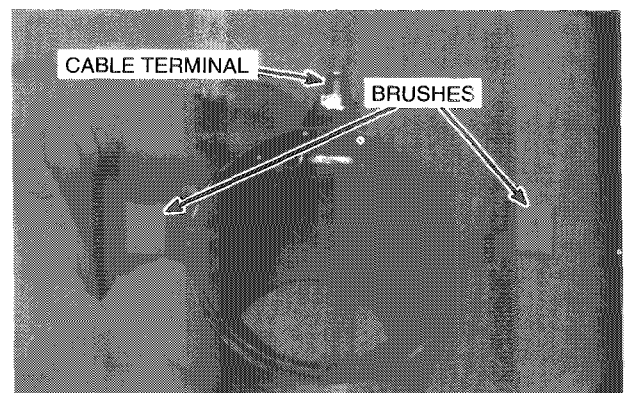
Check the reduction gear case for rotation.



Motor Assembly



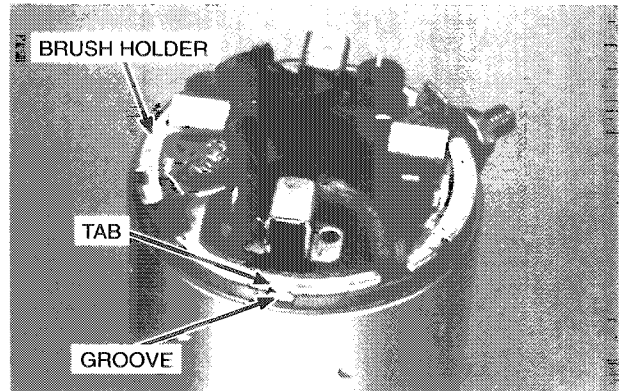
Install the cable terminal and brushes.



Starter/Reverse

Starter/Reverse Motor (A & SE Models) (cont'd)

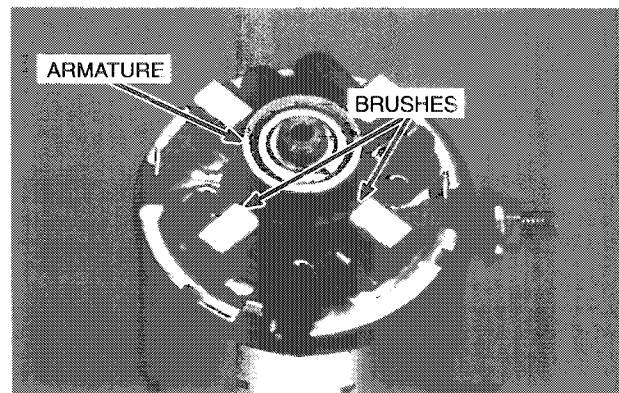
Install the brush holder, aligning its tab with the case groove.



Install the brushes into the brush holder.

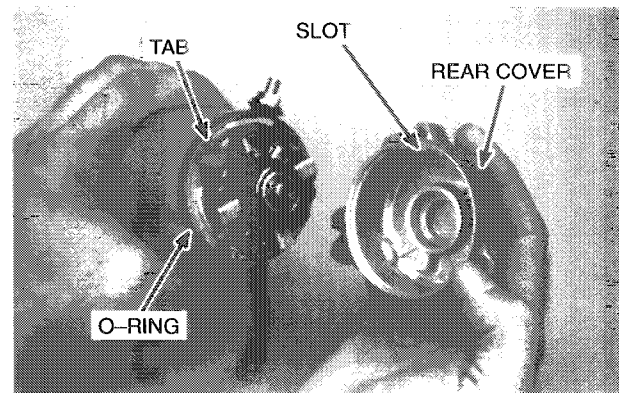
Pack the bearing cavities with grease.

Install the armature into the case.



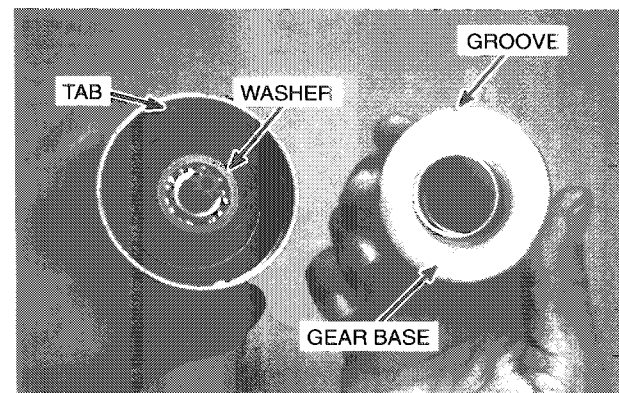
Install the O-ring.

Install the rear cover, aligning the tab of the brush holder with the slot in the rear cover.



Install the washer.

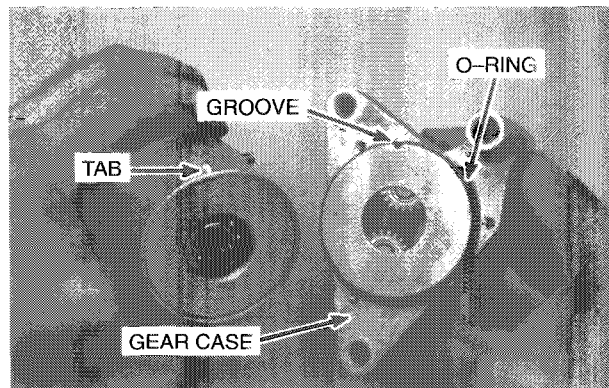
Install the starter reduction gear base, aligning its groove with the case tab.



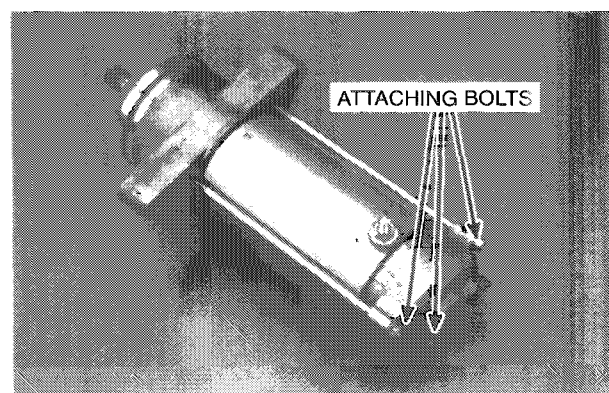


Install the O-ring onto the starter reduction gear case.

Install the starter reduction gear case, aligning the grooves in the gear holder and sun gear with the starter motor case tab.



Install the motor attaching bolts and tighten them securely.



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 the starter motor mounting bolts.

Tighten the bolts.

NOTE

- Two of the mounting bolts are dowel bolts. Install them as shown.

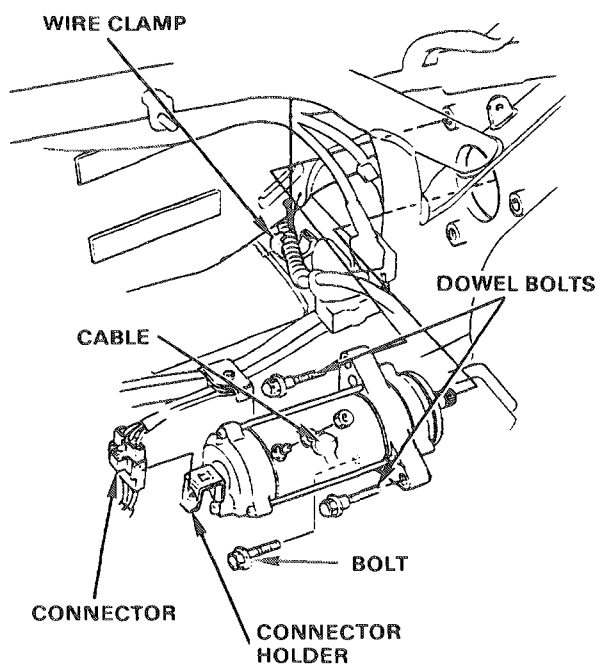
Connect the starter motor cable to the terminal. Install the wire harness onto the wire clamp.

Install the wire harness onto the wire clamp.

Install the connector onto the connector holder.

Install the following:

- battery case and battery (see page 17-7).
- right front side cover (see page 13-8).



Starter/Reverse

Starter Clutch (A & SE Models)

Removal

Remove the rear case cover (see page 8-7).

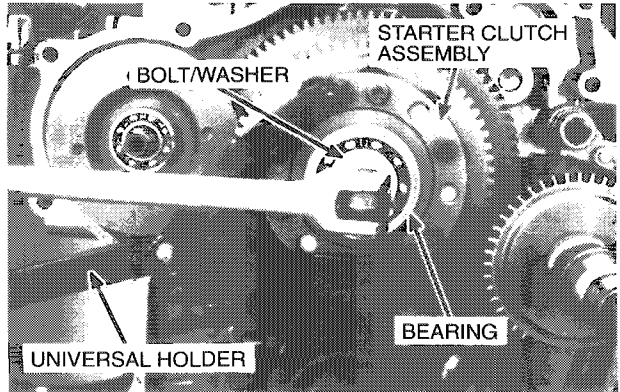
Hold the starter clutch with the universal holder and remove the starter clutch bolt.

Tool:

Universal holder
07725-0030000

Remove the washer and bearing.

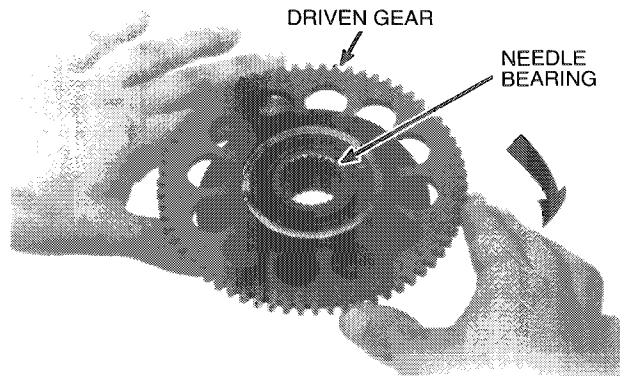
Remove the starter clutch assembly.



Inspection/Disassembly

Make sure that the starter driven gear only rotates clockwise.

Remove the starter driven gear and needle bearing from the starter clutch.

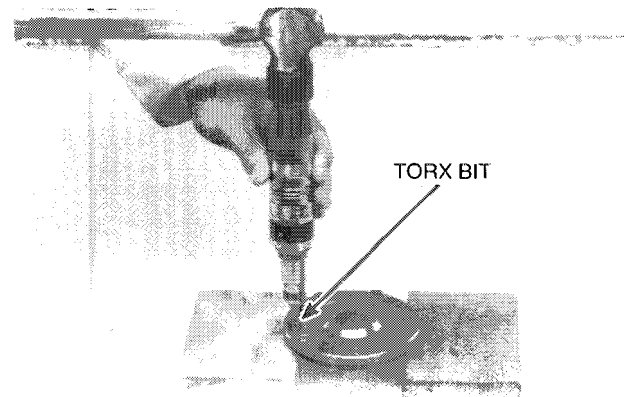




Remove the bolts using the special tool.

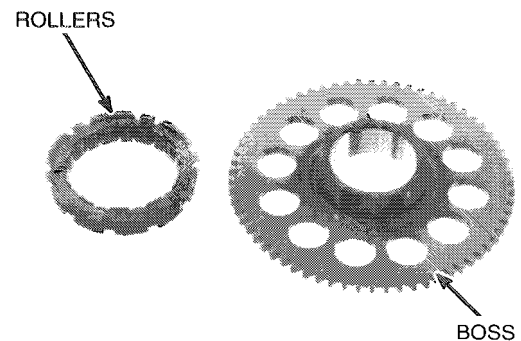
Tools:

Torx bit, T-30, commercially available



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

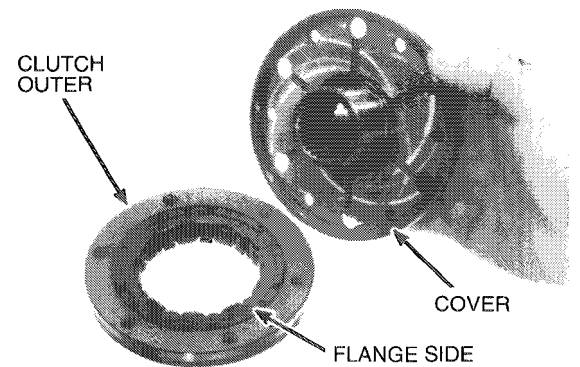
Check the one-way clutch rollers for wear or damage.



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.

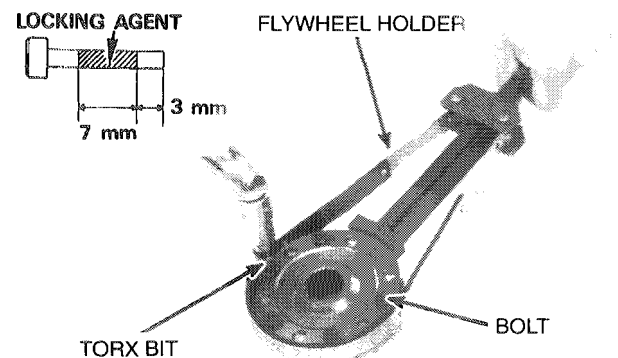
Install and tighten the bolts with the tools.

Torque: 16 N-m (1.6 kg-m, 12 ft-lb)

Tools:

Torx bit, T-30, commercially available

Flywheel holder, commercially available

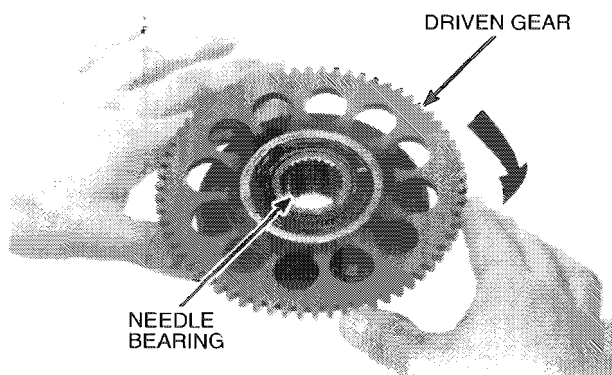


Starter/Reverse

Starter Clutch (A & SE Models) (cont'd)

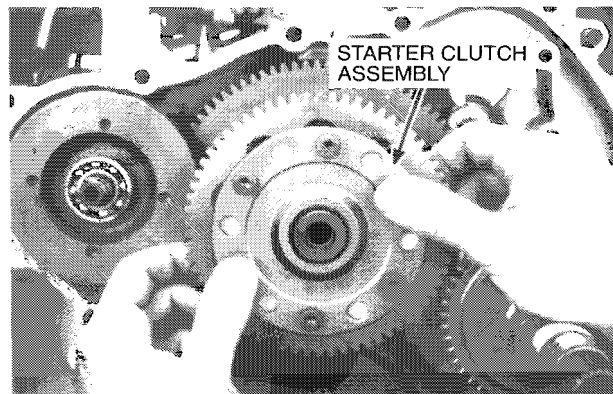
Install the needle bearing into the starter clutch.

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.

Install the washer with its chamfered surface facing out.

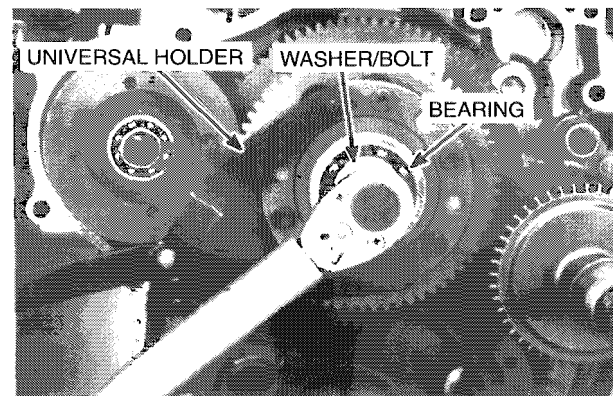
Hold the starter clutch with the universal holder and tighten the bolt to the specified torque.

Torque: 75 N-m (7.5 kg-m, 54 ft-lb)

Tool:

Universal holder
07725-0030000

Install the rear case cover (see page 8-33).





Fuel Pump Shut-Off (Bank Angle) Sensor (A & SE Models)

Inspection

Remove the seat (see page 13-8), trunk, and right saddle-bag (see page 13-17).

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.

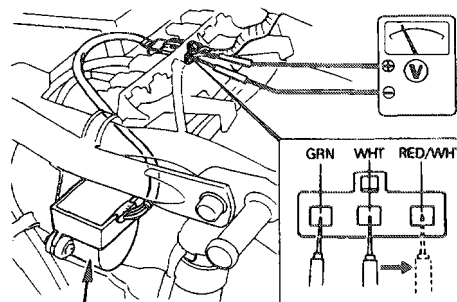
The bank angle sensor is normal if relay 6 (IGN. CRUISE) clicks and the power supply line is closed.

Incline the bank angle sensor approximately 49 degrees to the left or right with the ignition switch ON.

The bank angle sensor is normal if relay 6 clicks and the power supply is open.

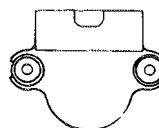
NOTE

- If you repeat this test, first turn the ignition switch OFF; then ON.

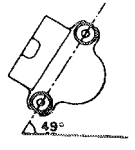
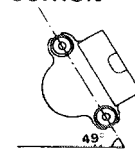


BANK ANGLE SENSOR

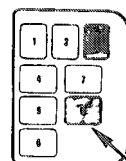
NORMAL POSITION



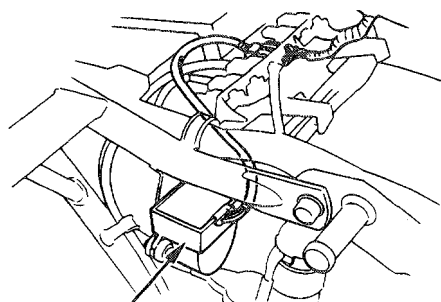
49° BANK ANGLE POSITION



49° (APPROXIMATELY)



RELAY 6



BANK ANGLE SENSOR

Installation

Install the bank angle sensor in the reverse order of removal.

NOTE

- Do not install the bank angle sensor upside down. The starter/reverse motor will not turn over.

Starter/Reverse

Starter Relay Switch A (A & SE Models)

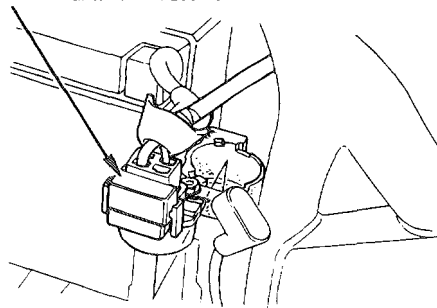
Operation Inspection

Remove the right rear side cover (see page 13-8).

Depress the starter/reverse switch button with the ignition switch ON.

The relay primary coil is normal if it clicks.

STARTER RELAY SWITCH A

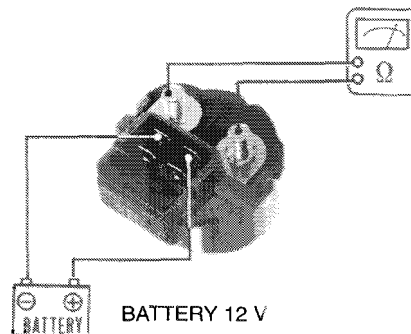


Continuity Inspection

Disconnect the battery negative cable from the battery.

Disconnect the relay connectors and remove starter relay switch A.

Connect an ohmmeter and 12 V battery to starter relay switch A, as shown. The switch is normal if there is continuity.



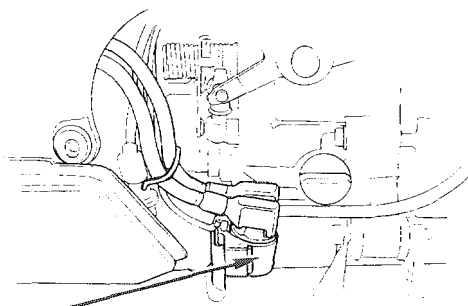
Starter Relay Switch B (A & SE Models)

Remove the right front side cover (see page 13-8).

Depress the starter/reverse switch button with the ignition switch ON.

The relay primary coil is normal if it clicks.

STARTER RELAY SWITCH B

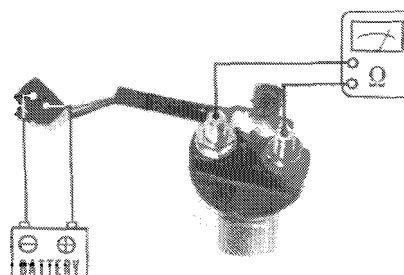


Continuity Inspection

Disconnect the 2P-BLK connector and relay terminals.

Remove 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 (A & SE Models)

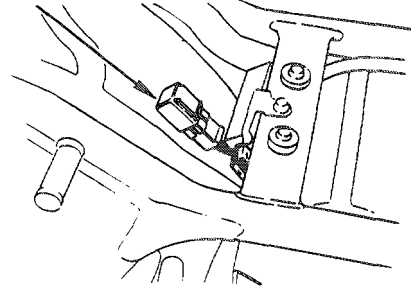
Operation Inspection

Remove the seat.

Turn the ignition switch ON.

The relay primary coil is normal if it clicks.

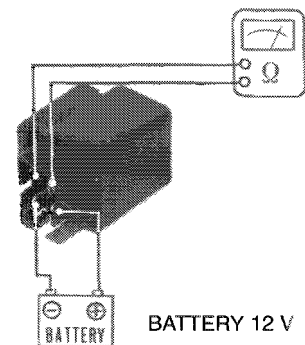
REVERSE RELAY SWITCH



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.



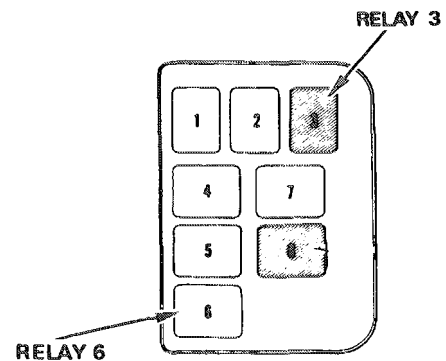
Relay Box (A & SE Models)

Operation Inspection

Remove the left rear side cover (see page 13-8). Open the relay box cover.

Relay 3 and 6:

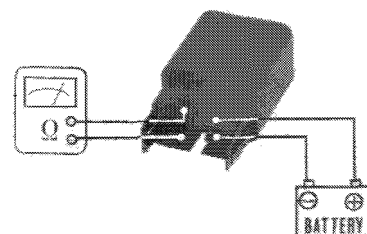
When turning the ignition switch ON, the relay primary coil is normal if it clicks.



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.



Starter/Reverse

Diode Assembly (A & SE Models)

Continuity Inspection

Remove the right saddlebag (see page 13-17). 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 (neutral switch side)
 D3: Ground of reverse relay switch (clutch 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 relay

Perform the continuity check for each diode as follows:

Normal direction: Continuity

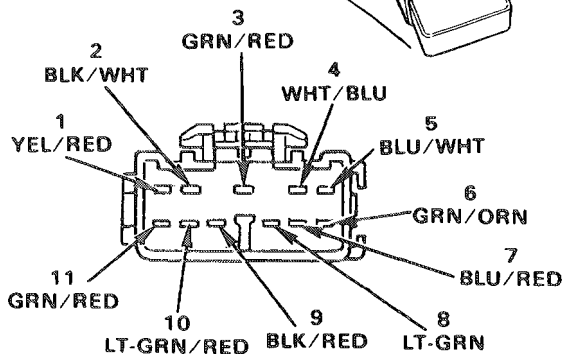
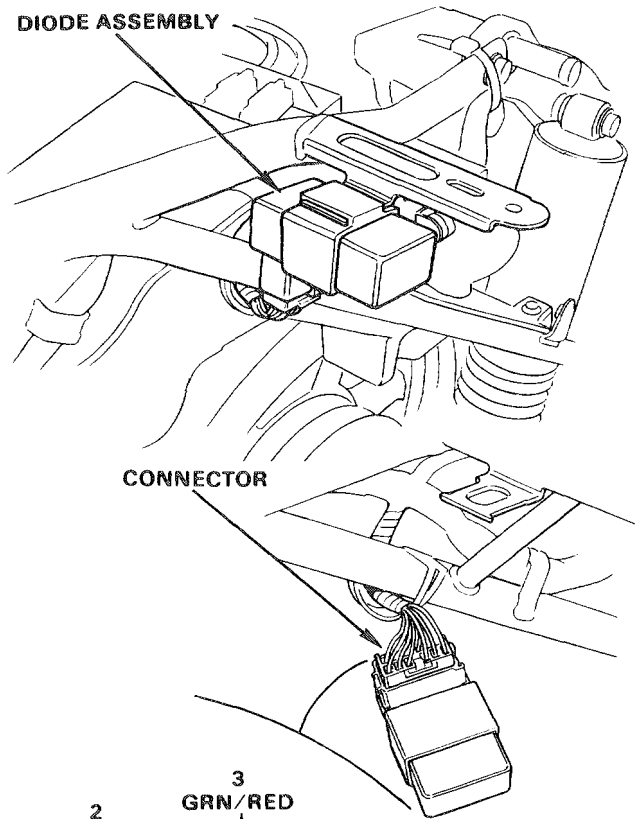
DIODE	D1	D2	D3	D4	D5	D6	D7	D8
⊕ Probe	6	10	3	6	10	10	1	5
⊖ Probe	11	7	7	9	9	8	2	4

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



Reverse Switch (A & SE Models)

Inspection/Removal

Remove the right front side cover (see page 13-8).

Disconnect the GRN/ORN wire terminal from the reverse switch.

Check for continuity between the switch terminal and ground, as shown.

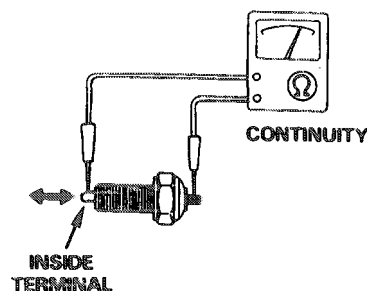
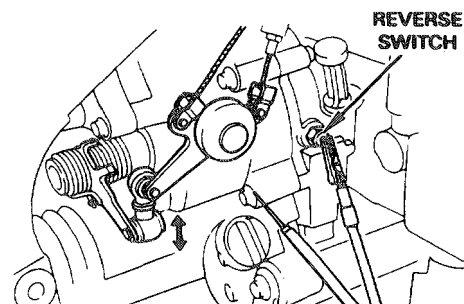
There should be continuity with the reverse lever in the OFF position; no continuity with the lever in the ON position.

Perform the next check, if necessary:

Remove the reverse switch and washer. Inspect the inside terminal's operation. It should move in and out smoothly.

Check for continuity between the terminals. There should be continuity.

Check the reverse shift system, if necessary (see page 18-31).





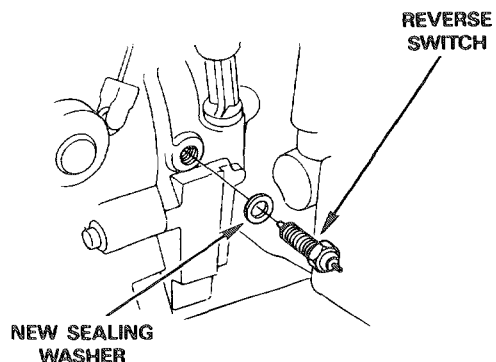
Installation

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.

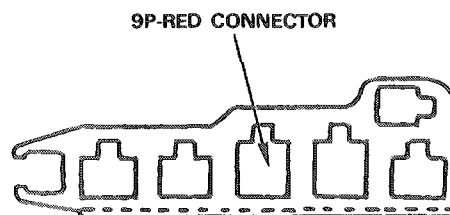


Starter/Reverse Switch (A & SE Models)

Inspection

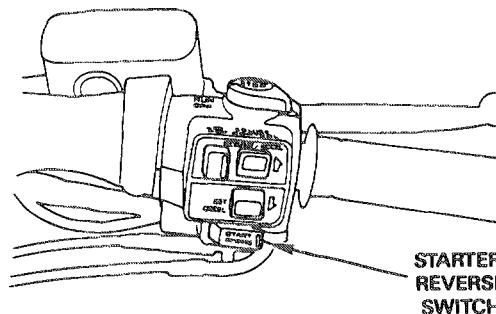
Remove the right fairing lower cover (see page 13-12).

Disconnect the 9P-RED connector from the connector holder on the right cooling fan.



Continuity should exist between the color coded wires in the chart below

Color	BLK/ LT GRN	YEL/RED	BRN/WHT	BLU/WHT
Free			○	○
Push	○	○		



Starter/Reverse

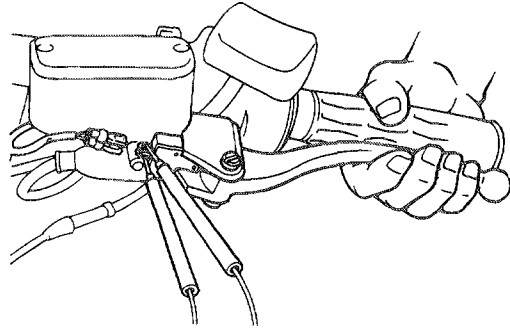
Clutch Switch (A & SE Models)

Inspection

Disconnect the clutch switch wire connectors.

Check for continuity between the switch terminals.

There should be continuity with the clutch lever pulled in; no continuity with the lever released.

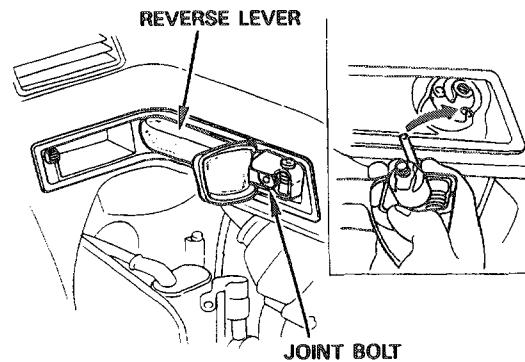


Reverse System (A & SE Models)

Cable Replacement

Remove the reverse joint bolt and reverse lever from the reverse drum.

Remove the fairing inner covers (see page 13-12).



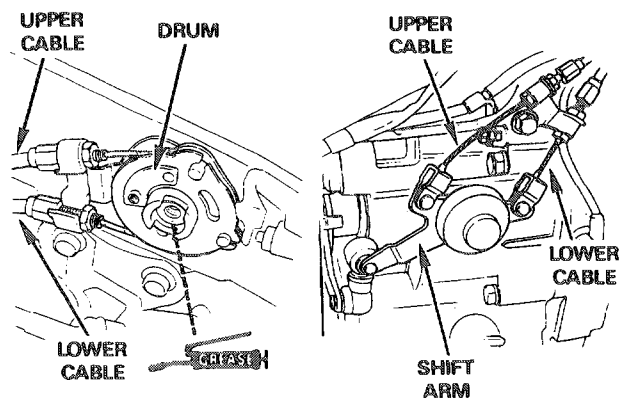
Disconnect the reverse cables from the reverse drum. Remove the reverse drum.

Disconnect the reverse cables from the reverse shift arm. Remove the cables.

Install new cables to the reverse drum. 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.



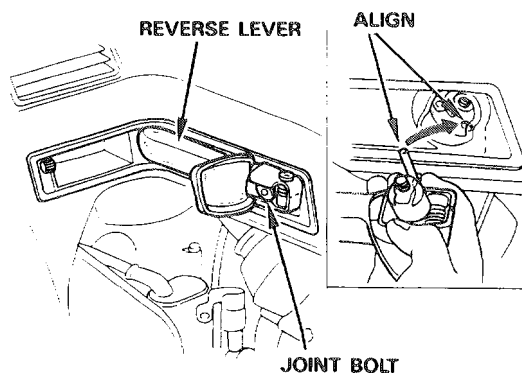


Adjust the reverse cables (page 3-30).

Install the fairing inner covers (see page 13-12).

Install the reverse lever, aligning the lever pin with the drum hole. Tighten the joint bolt securely.

Check the reverse operation and readjust the cables, if necessary.

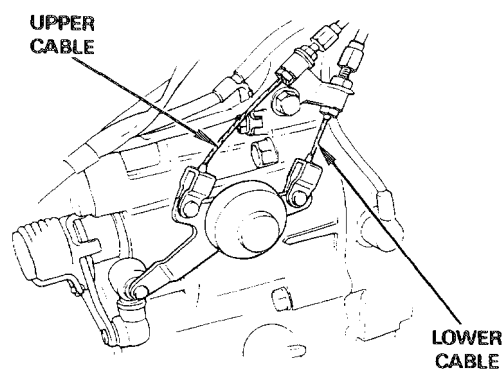


Reverse Shift System Removal

Disconnect the reverse cables from the shift arm.

NOTE

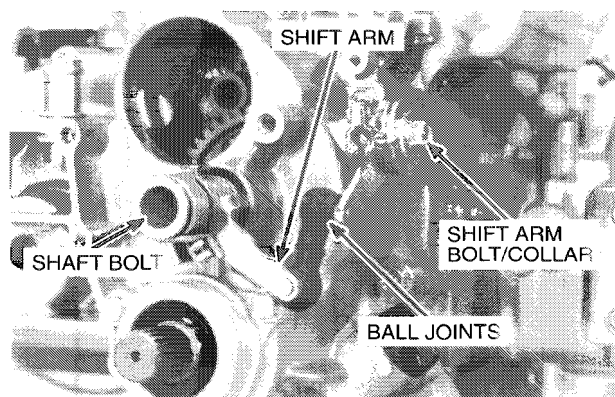
- Mark the cables to indicate their original position, before disconnecting them.



Remove the shift arm bolt and collar.

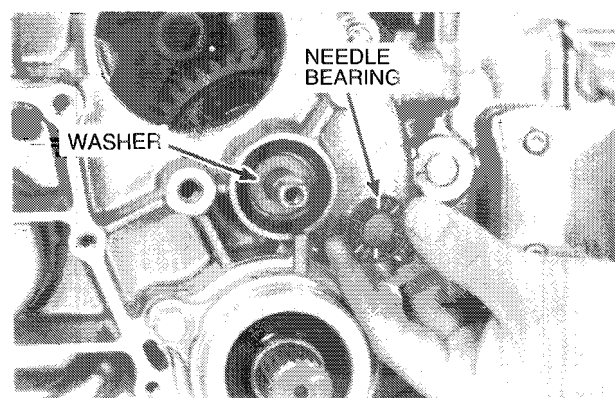
Remove the reverse shifter shaft bolt. Then remove the collars, springs, and shift arm.

Check the shift arm ball joints for operation. The joints should rotate smoothly.



Remove the needle bearing and washer.

Remove the rear case cover (see page 8-7).

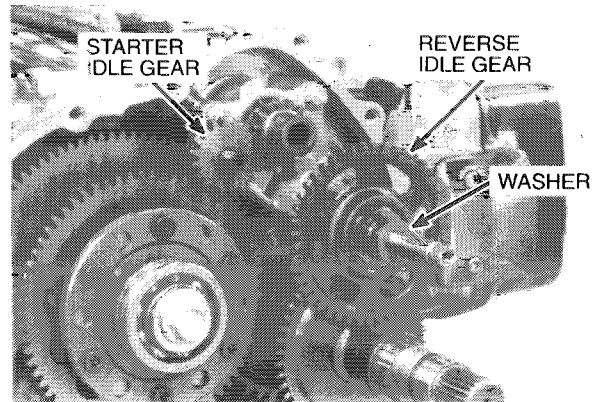


Starter/Reverse

Reverse System (A & SE Models) (cont'd)

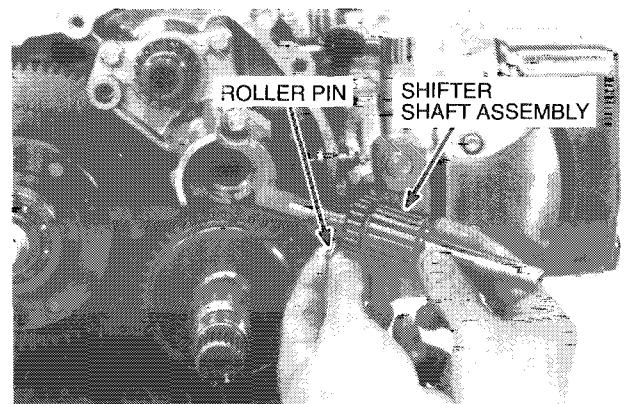
Remove the washer and reverse idle gear.

Remove the starter idle gear and shaft.



Remove the reverse shifter shaft assembly.

Remove the roller pin from the shaft.

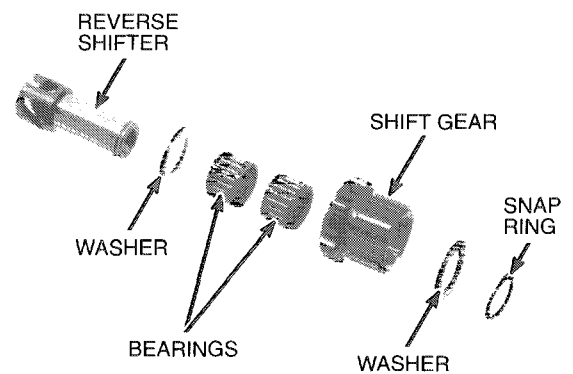


Remove the snap ring and disassemble the shaft assembly.

Check the needle bearings for damage or excessive wear.

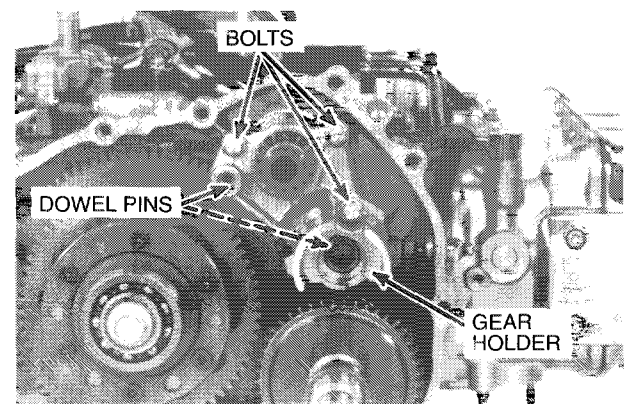
Check the reverse shift gear teeth for excessive or abnormal wear.

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.

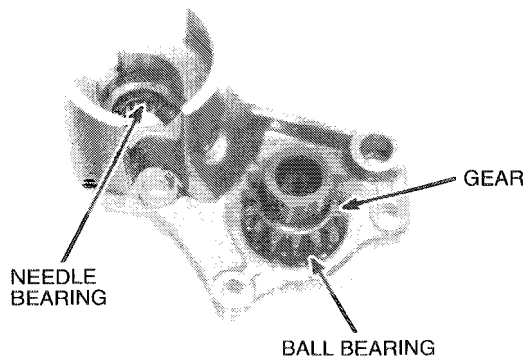
The ball bearing should turn smoothly and quietly.

Also check that the outer race of the bearing fits tightly in the holder.

Replace the bearing, if necessary (see below).

Check the needle bearing for damage or abnormal noise. Replace it, if necessary (see page 18-34).

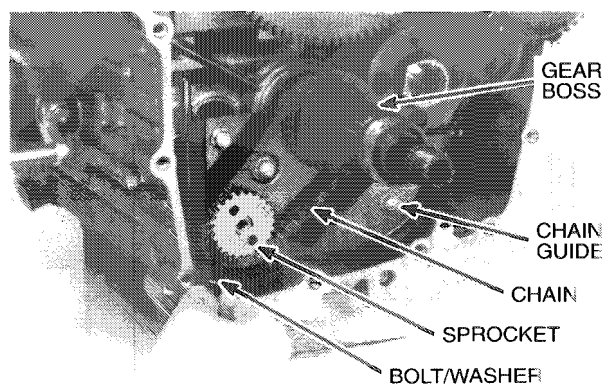
Also check the gear teeth for damage or wear.



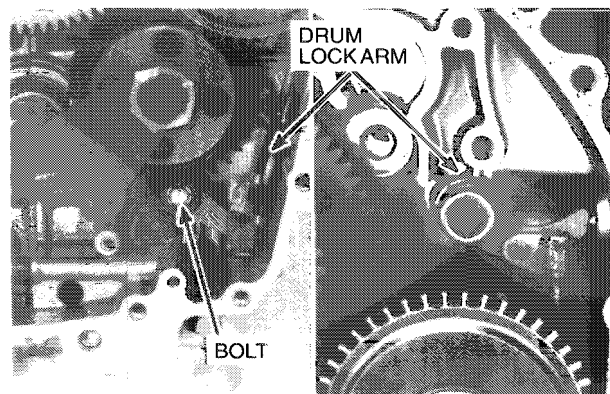
Shift Drum Lock System Removal

Remove the following:

- starter clutch (see page 18-22).
- primary driven gear (see page 10-22).
- oil pump sprocket bolt and washer.
- oil pump sprocket, drive chain, and primary driven gear boss as an assembly.
- drive chain guide.



Remove the bolt and shift drum lock arm assembly.



Bearing Replacement

— Ball bearing

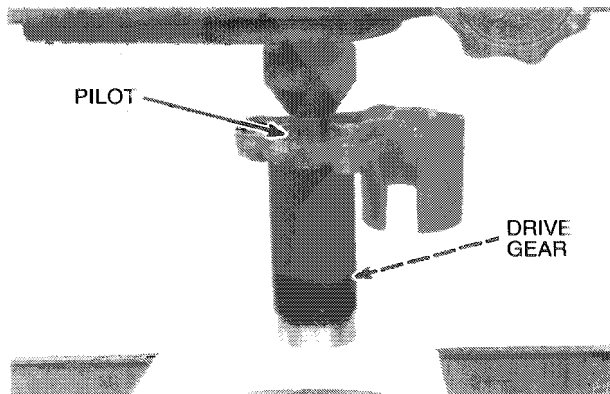
Hold the gear holder with a suitable tool and press the starter drive gear out of the bearing.

Tool:

Pilot, 20 mm

07746-0040500

Drive the ball bearing out of the holder.



Starter/Reverse

Reverse System (A & SE Models) (cont'd)

Hold the gear holder with a suitable tool and press the bearing into the holder.

Tools:

Driver

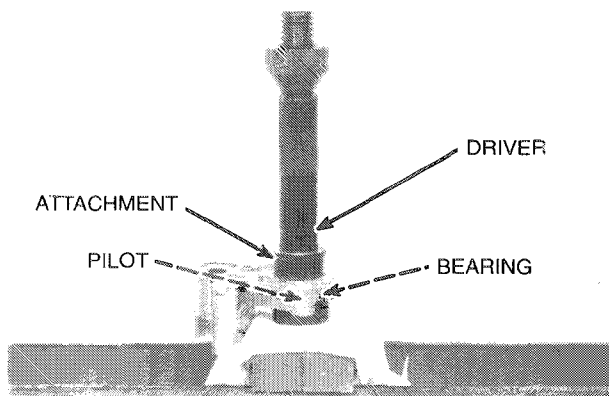
07749-0010000

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.

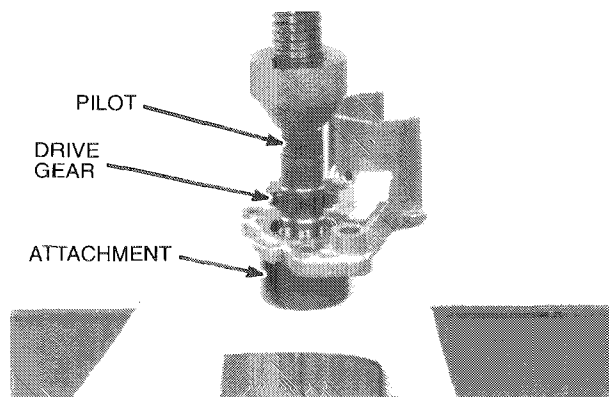
Tools:

Attachment, 20 mm, I.D.

07746-0020400

Pilot, 20 mm

07746-0040500



- Needle bearing

Remove the starter drive gear (see page 18-32).

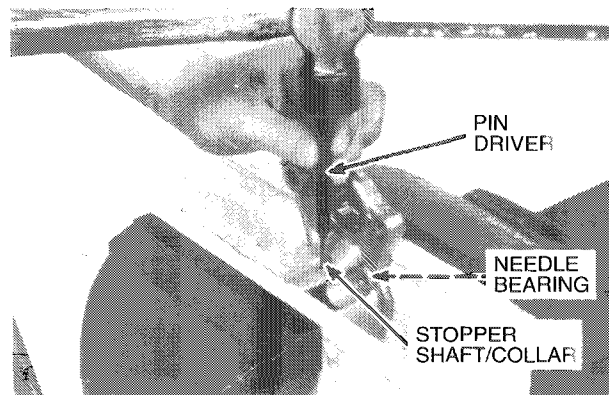
Hold the gear holder in a vise with a block as shown and drive the reverse stopper shaft and collar out of the holder.

Tool:

Pin driver, 4 mm

07944-SA00000

Remove the needle bearing out of the holder.



Press the new needle bearing into the holder.

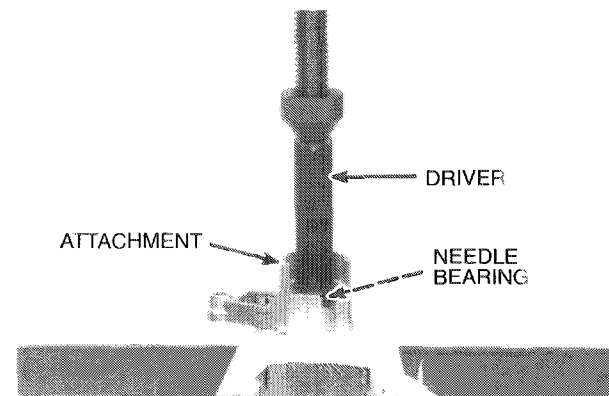
Tools:

Driver

07749-0010000

Attachment, 24 x 26 mm

07746-0010700



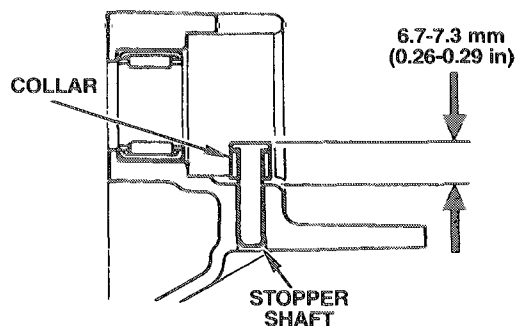


Drive the reverse stopper shaft with its collar into the holder.

NOTE

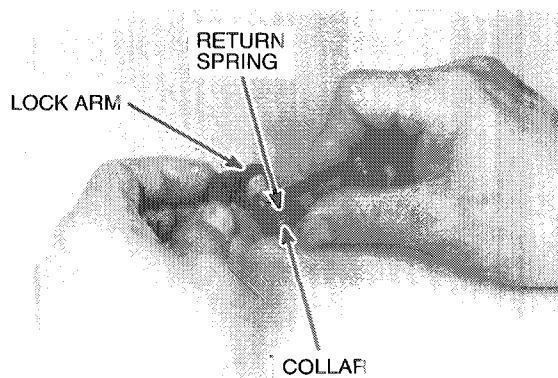
- Keep the installed height as shown.

Install the starter drive gear.



Shift Drum Lock System Installation

Install the cam, 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)

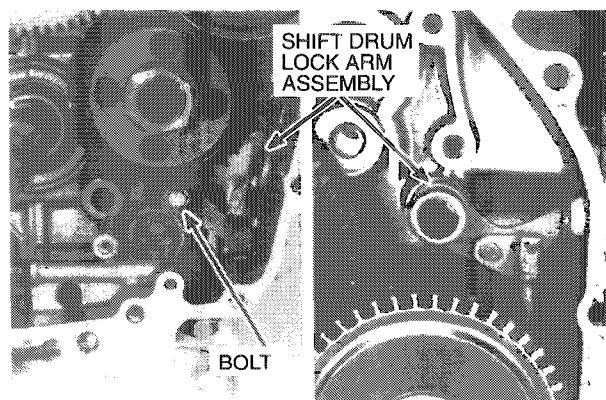
With the transmission in neutral, check the arm assembly for operation.

Install the following:

- drive chain guide.
- oil pump sprocket, drive chain, and primary driven gear boss as an assembly.

NOTE

- Install the sprocket with the "OUT" mark facing out.



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

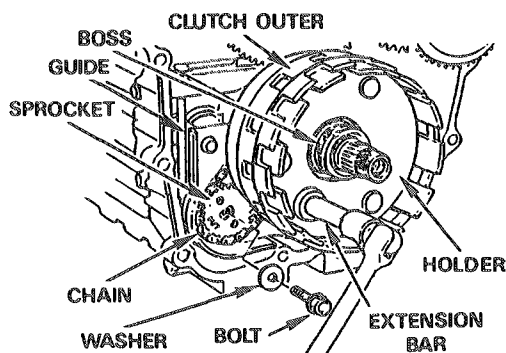
Tool:

Clutch outer holder
07JMB-MN50100

Apply 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 (see page 10-24).
- starter clutch.



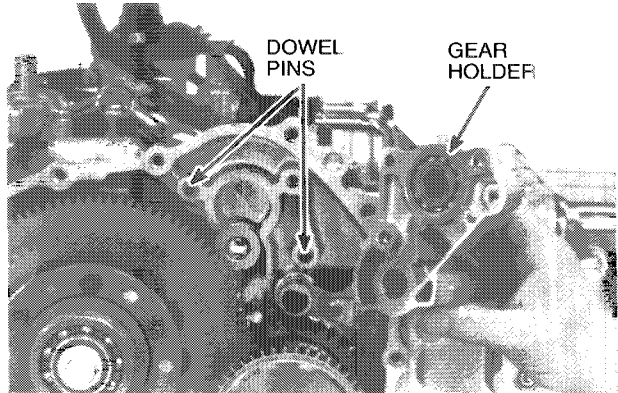
Starter/Reverse

Reverse System (A & SE Models) (cont'd)

Reverse Shift System Installation

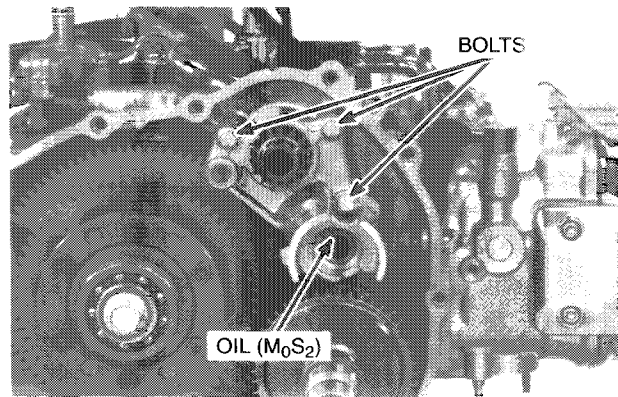
Install the dowel pins.

Install the starter drive gear holder.



Install and tighten the starter drive gear holder bolts securely.

Apply molybdenum disulfide oil to the stopper shaft.

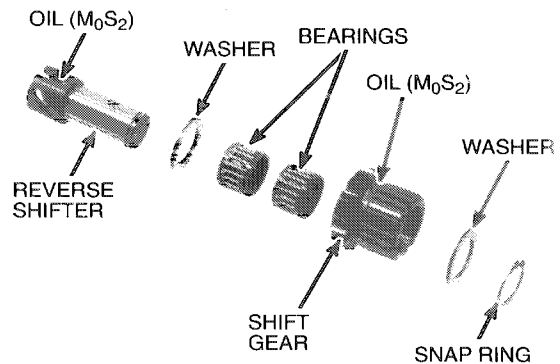


Apply oil to the needle bearings.

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.

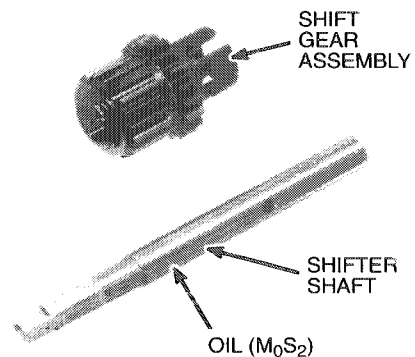
Install the snap ring with its chamfered surface facing inside.



Check the shift gear for rotation.

Apply molybdenum disulfide oil to the shifter shaft.

Install the shift gear assembly onto the shifter shaft.

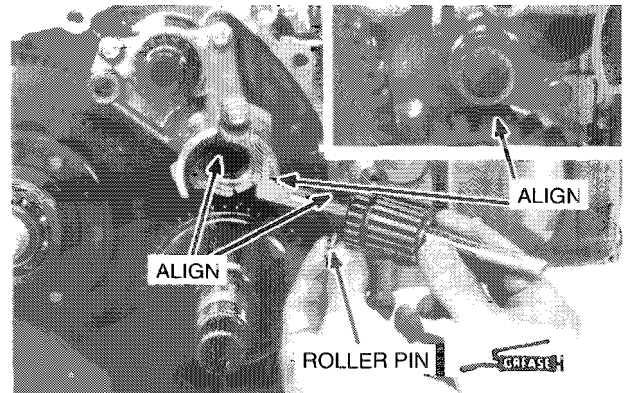




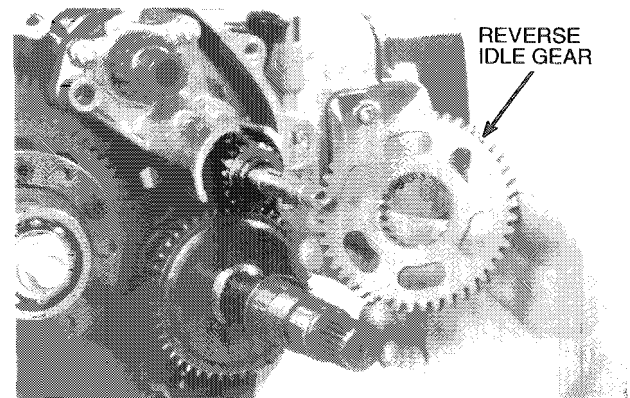
Apply grease to the roller pin.

Install the roller 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 the shaft cut-outs with the shift drum lock arm boss.

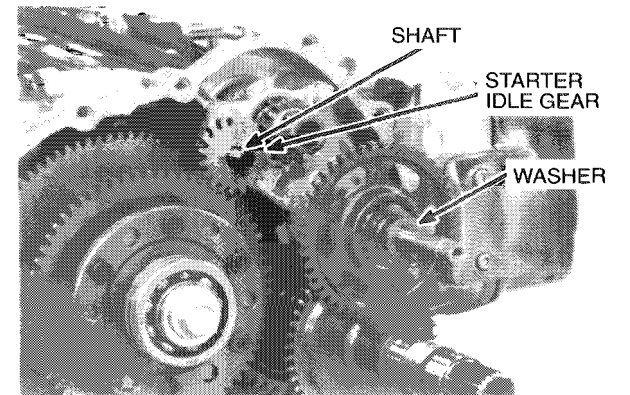


Install the reverse idle gear with its flat surface facing inside.



Install the washer.

Install the starter idle gear and shaft.



Install the rear case cover (see page 8-33).

Install the washer.

Apply molybdenum disulfide oil to the needle bearing.

Install the needle bearing to the shifter shaft.

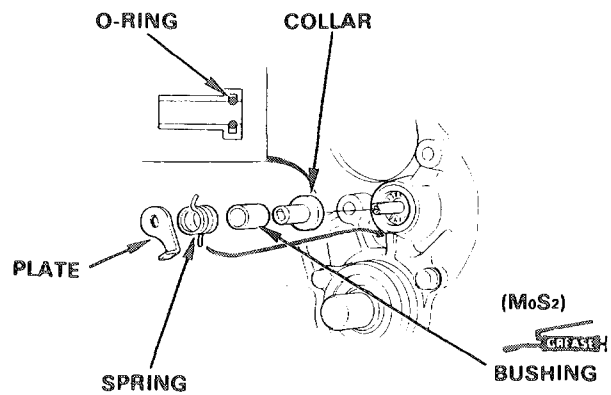


Starter/Reverse

Reverse System (A & SE Models) (cont'd)

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 bushing.



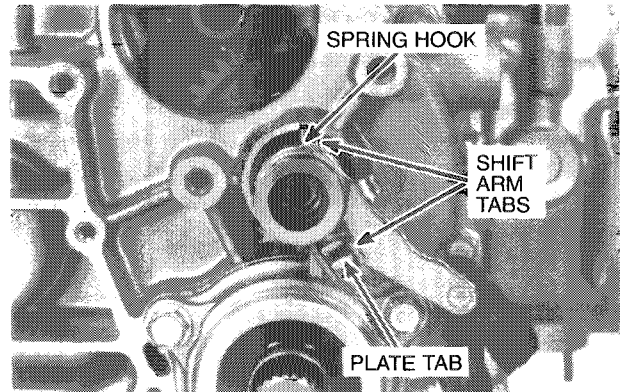
Install the spring, hooking it onto the tab of the output shaft bearing holder as shown.

Install the plate.

Install the shift arm, spring and spring collar to the shifter shaft as shown.

NOTE

- Make sure the locations of the spring hooks, shift arm tabs, and 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)

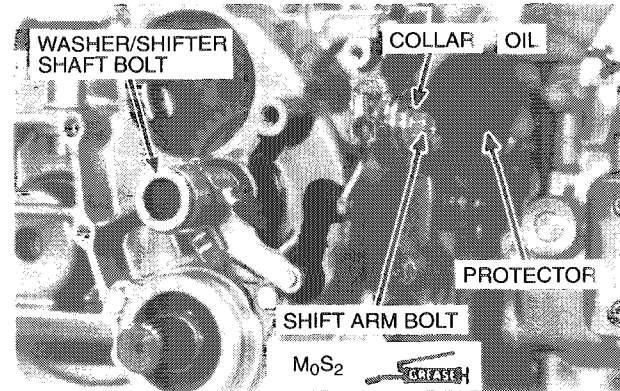
Apply oil to the reverse shift collar.

Install the shift collar and shift arm bolt.

Install the rubber protector.

Apply molybdenum disulfide grease (approximately 0.5 g/0.02 oz.) to the shift arm joints (2 plcs.)

Check the shift arm for operation.





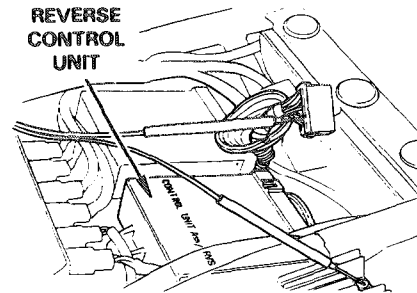
Reverse Control Unit (A & SE Models)

System Inspection

Remove the seat (see page 13-8) and trunk (see page 13-14).

Disconnect the 14P-WHT connector of the reverse control unit and check it for loose contacts or corroded terminals.

Using the chart on the next page, measure the indicated connector terminals on the wire harness side.



REVERSE CONTROL UNIT CONNECTOR OF THE WIRE HARNESS SIDE

13	6	8	X		1	12	3
10	7	9	5	4	11	2	14

Starter/Reverse

Reverse Control Unit (A & SE Models) (cont'd)

TERMINAL NUMBER/ITEM		TERMINALS	CONDITIONS	SPECIFICATION
1	Ground wire	GRN and ground	–	Continuity should exist.
2	Speed limiter relay wire	GRY (+) and ground (–)	Ignition switch ON Reverse lever switch ON	Battery voltage should register
3	Reverse lever wire	WHT/BLU (+) and ground(–)	Ignition switch ON Reverse lever switch	Battery voltage should register
4	Reverse indicator wire	WHT/RED	Short it to ground and turn the ignition switch ON	Reverse indicator should come on
5	Oil pressure wire	BLUE/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 wire	LT BLU and LT BLU of the unit and regulator	Disconnect the starter relay regulator 4P-RED connector (page 18-42) and check for continuity between the same color wire terminals	Continuity should exist
8	Neutral switch	LT GRN/RED and ground	Transmission in neutral	Continuity should exist
9	Power control relay 2 wire	WHT (+) and ground (–)	Ignition switch ON Reverse lever switch ON	Battery voltage should register
10	Side stand switch wire	GRN/WHT and ground	Side stand up	Continuity should exist
			Side stand down	No continuity exists
11	Starter/reverse switch wire	YEL/RED (+) and ground (–)	Ignition switch ON Starter/reverse switch pushed	Battery voltage should register
12	Speed limiter fuse wire	YEL and ground	–	Continuity should exist
13	Motor wire	PNK and motor cable	–	Continuity should exist
14	Reverse relay switch wire	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 18-13).

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.

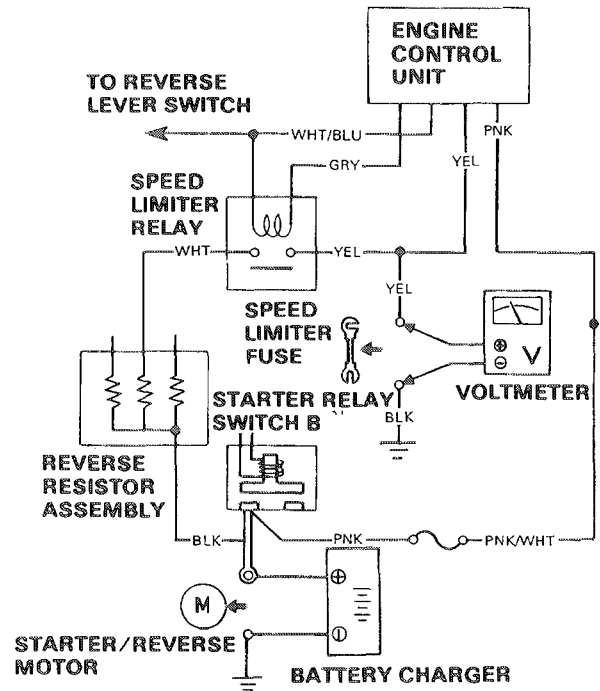
With the reverse conditions ready (gear in neutral, side stand up, engine running, and reverse lever switch ON), be sure the charger switch is ON and apply 13-20 V between the motor cable and engine ground. A reading of 13-20 V should appear between the speed limiter fuse terminals.

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.



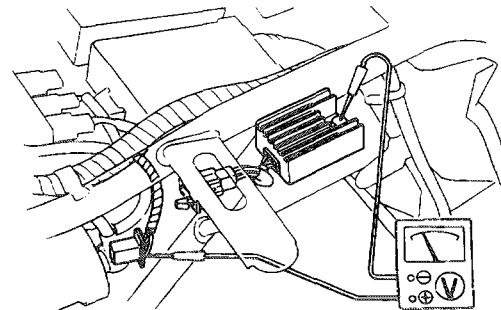
Starter Relay Regulator (A & SE Models)

Wiring Inspection

Remove the seat (see page 13-8) and trunk (see page 13-14).

Disconnect the 4P-RED connector of the starter relay regulator and check it for loose contact or corroded terminals.

Measure the following connector terminals on the wire harness side.



ITEM	TERMINALS	CONDITION(S)	SPECIFICATION
Battery voltage line	WHT/BLU (+) and ground (-)	Ignition switch in ON. Reverse lever switch in 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 starter relay switch A (see page 18-27) 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 (see page 18-40) and check for continuity between the LT BLU wire terminals.	Continuity should exist at all times.
Reverse fuse wire	GRN and ground	At all times.	Continuity should exist.

Starter/Reverse

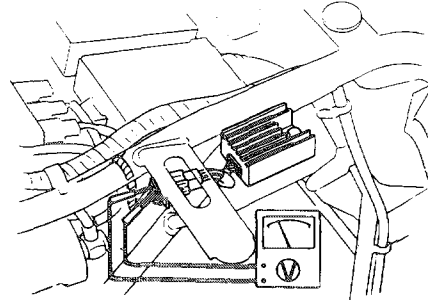
Starter Relay Regulator (A & SE Models) (cont'd)

Regulated Voltage Inspection

Turn the ignition switch ON and the 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.

There should be 0-1.0 V when the starter/reverse switch is pushed.



Turn the ignition switch ON and the 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.

When the starter/reverse switch is pushed, the voltage should be approximately 0 V for the first 0.3 seconds; then a minimum of 4.0 V should register.

Reverse Resistor Assembly (A & SE Models)

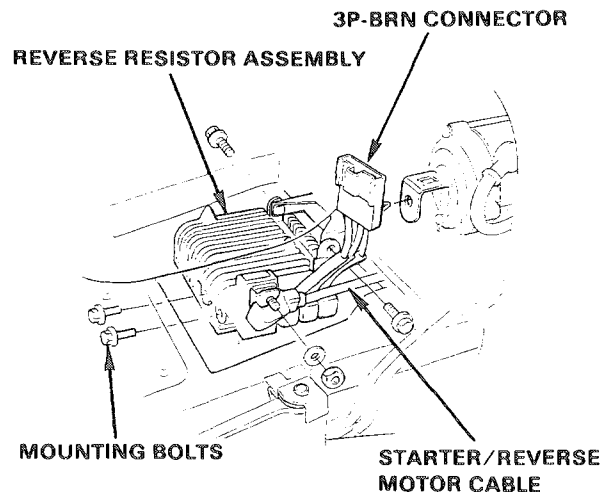
Removal

Remove the battery case (see page 17-7). Disconnect the 3P-BRN connector.

Remove the starter/reverse motor cable from the resistor terminal.

Remove the exhaust chamber (see page 7-33). Remove the heat protector.

Remove the four mounting bolts and the reverse resistor assembly.





Inspection

Measure the resistances between the connector terminals and resistor terminal.

Standards (20°C/68°F)

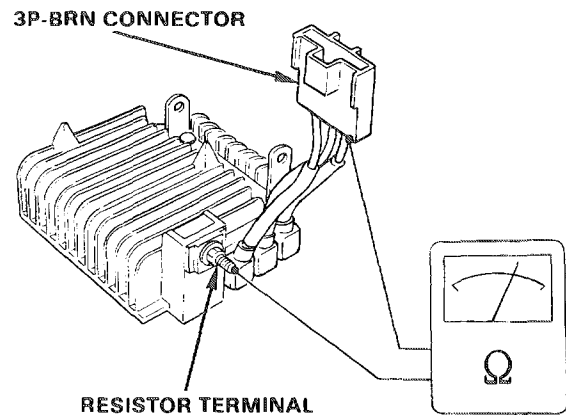
BLK wire terminal – resistor terminal: 0.12–0.17 ohm

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 (A & SE Models)

Operation Inspection

Remove the right rear side cover (see page 13-8) and trunk (see page 13-14).

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.

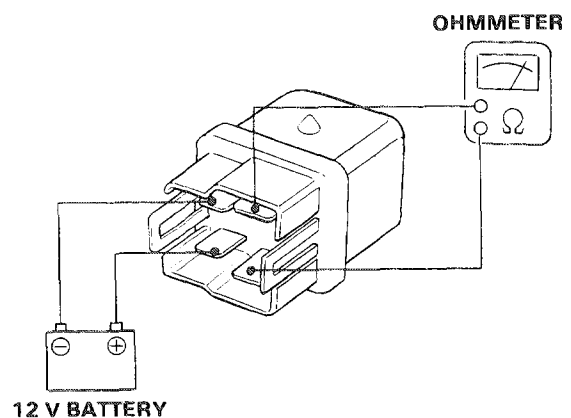
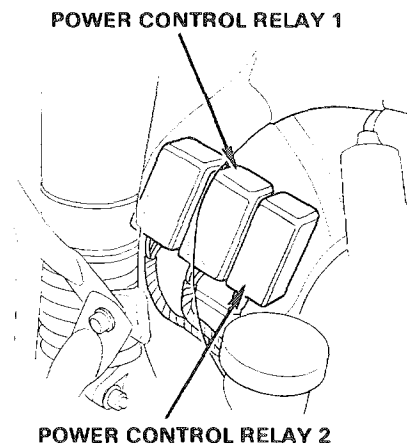
Continuity Inspection

Remove the power control relay and its rubber protector 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.



Starter/Reverse

Speed Limiter Relay (A & SE Models)

Operation Inspection

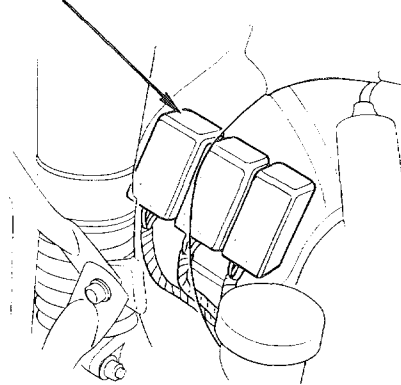
Remove the right rear side cover (see page 13-8) and trunk (see page 13-14).

Disconnect the 14P-WHT connector from the reverse control unit and connect the GRY 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.

SPEED LIMITER RELAY

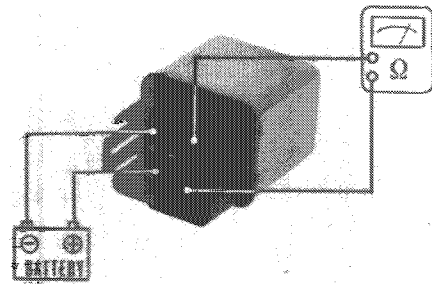


Continuity Inspection

Remove the speed limiter relay and its 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.

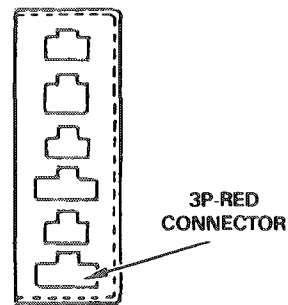


Reverse Lever Switch (A & SE Models)

Inspection

Remove the left fairing inner cover (see page 13-12).

Disconnect the 3P-RED connector from the connector holder behind the cruise control valve unit.



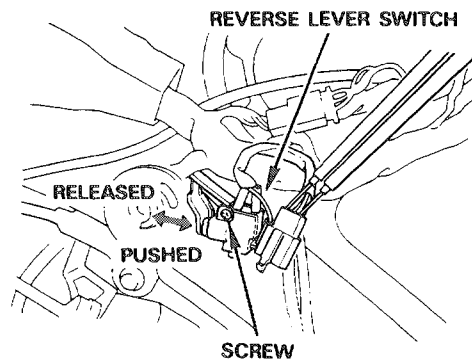
Check for continuity between each terminal as follows:

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.

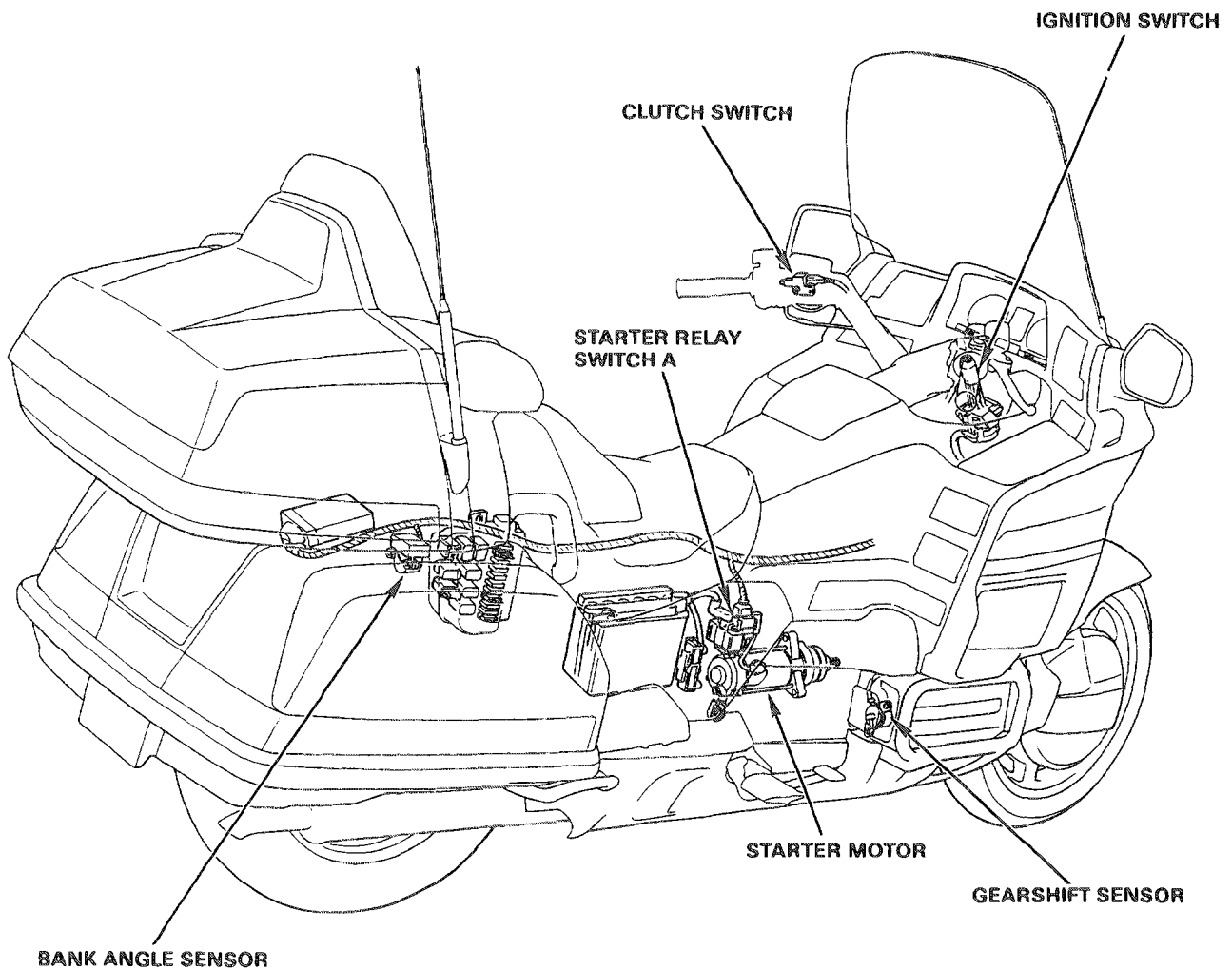




Service Information (I Model)

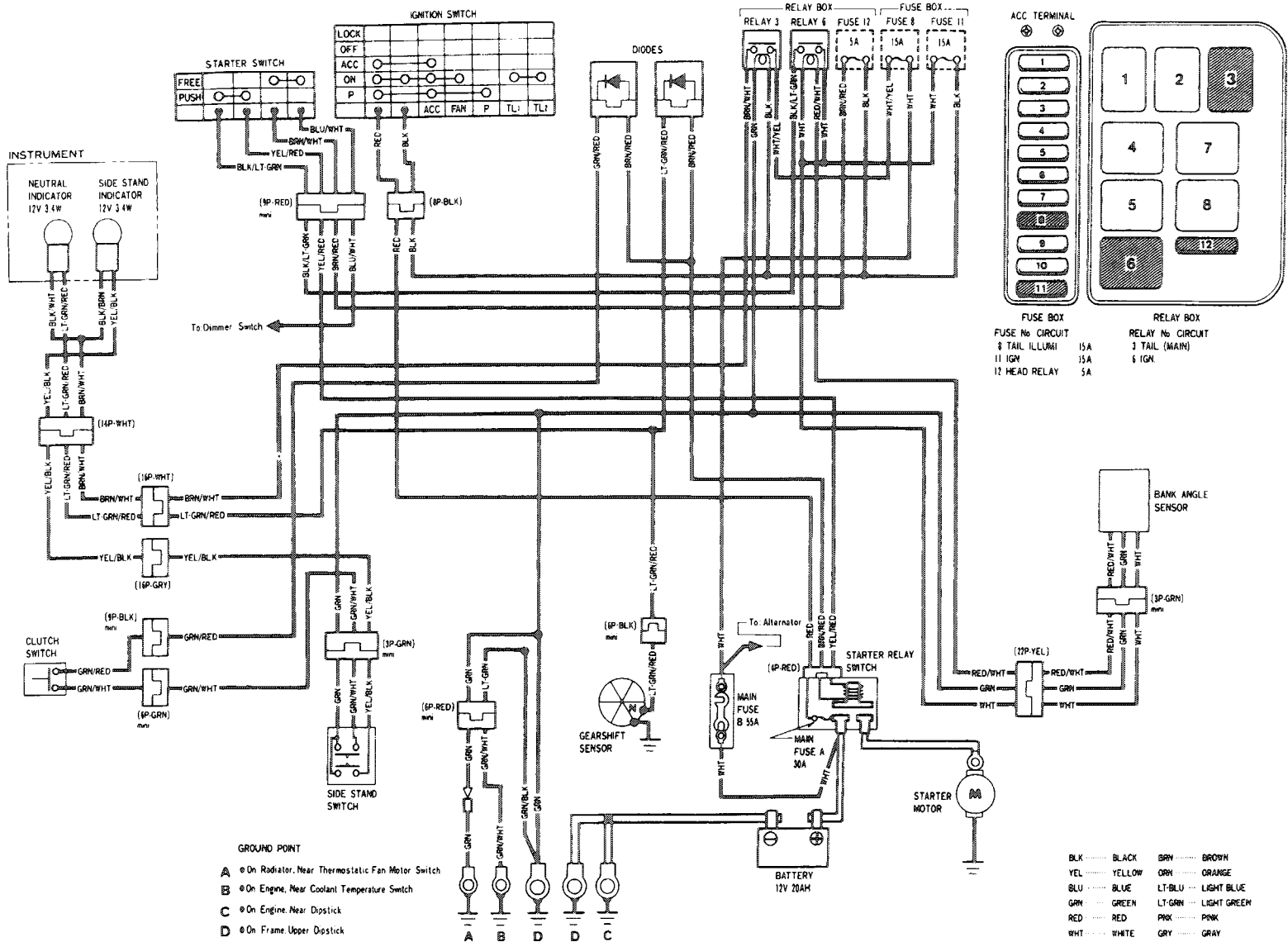
- The starter motor can be serviced without removing the engine from the frame. To service the starter clutch, the engine must be removed from the frame, see section 6.
- When inspecting the starter system, check the system components and wiring step-by-step according to the troubleshooting chart.
- For the starter clutch servicing, see page 18-22.
- For the fuel pump shut-off (bank angle) sensor inspection, see page 18-25.
- For starter relay switch inspection, see page 18-26.
- For the relay box inspection, see page 18-27.
- For the starter switch inspection, see page 18-29.
- For the clutch switch inspection, see page 18-30.

System Location



Starter/Reverse Service Information (I Model) (cont'd)

Circuit Diagram





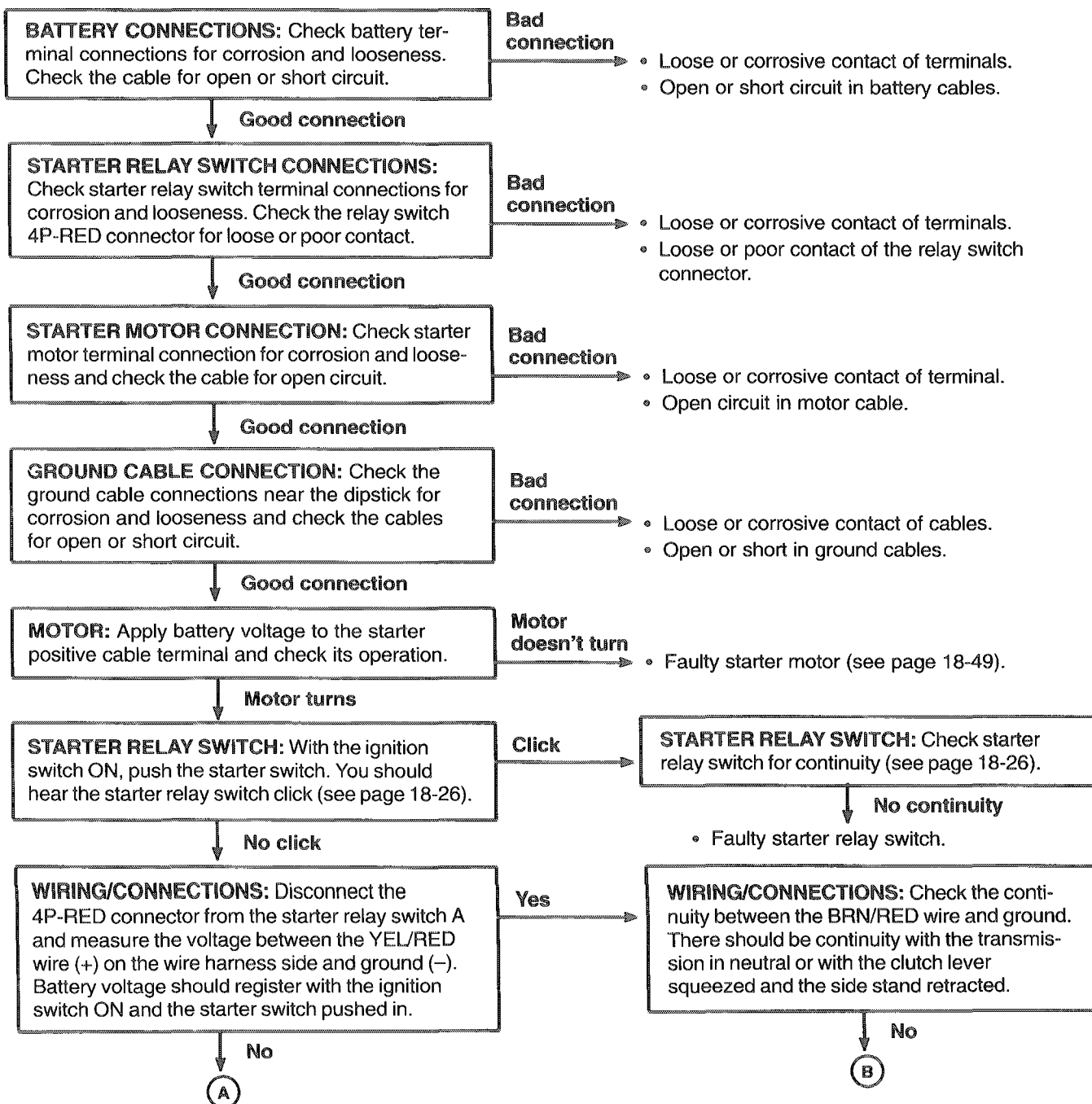
Troubleshooting (I Model)

The starter motor does not turn.

NOTE

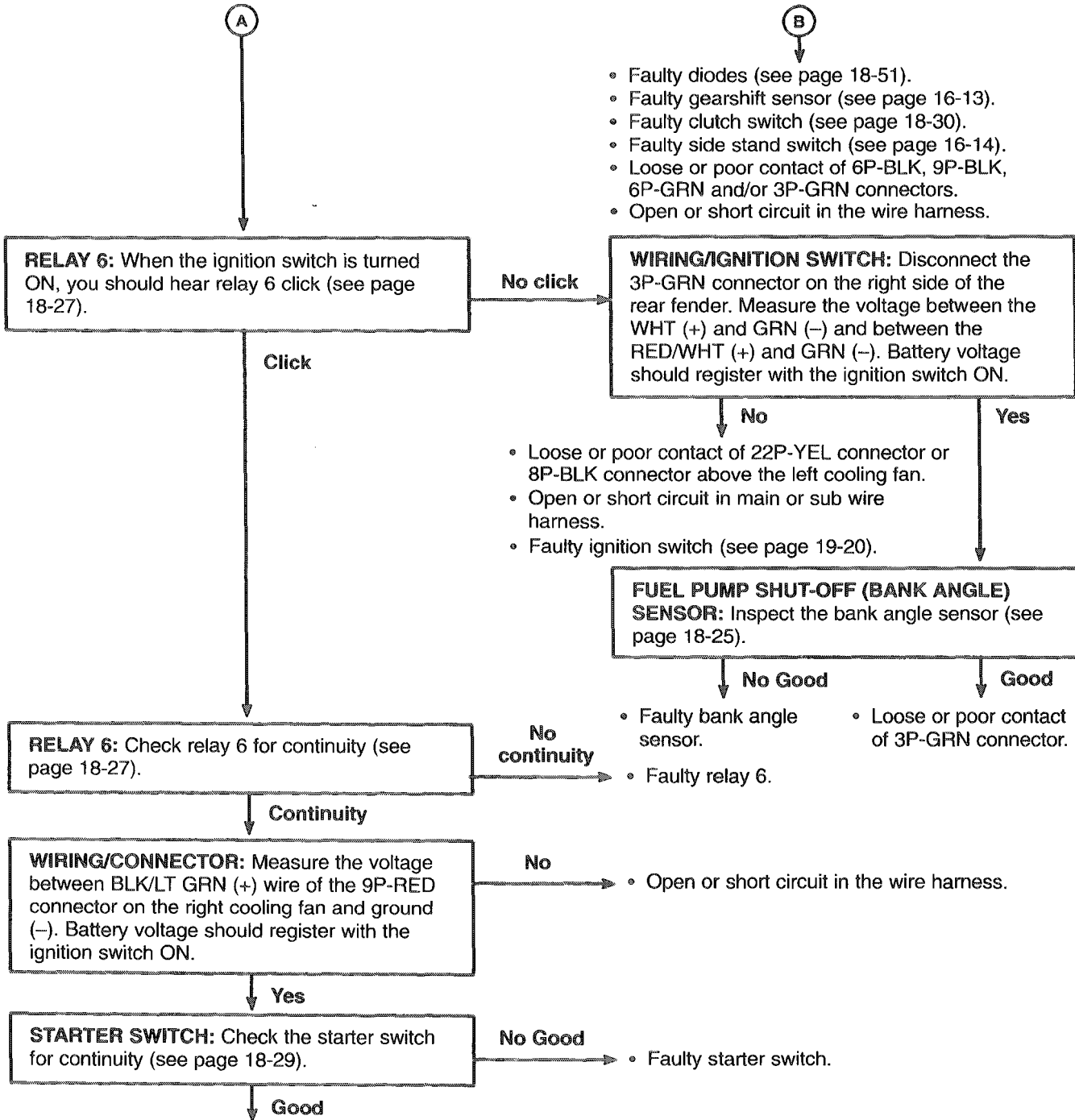
Inspect the following before troubleshooting the starter system:

- Be sure the battery is fully charged and in good condition.
- Be sure the following fuses are good: main fuse A (30A) – inside starter relay switch A; 11 (15A) – inside the fuse box;
- Be sure the fuel pump shut-off (bank angle) sensor is installed properly (see page 18-25).



Starter/Reverse

Troubleshooting (I Model) (cont'd)



- Faulty diodes (see page 18-51).
- Faulty gearshift sensor (see page 16-13).
- Faulty clutch switch (see page 18-30).
- Faulty side stand switch (see page 16-14).
- Loose or poor contact of 6P-BLK, 9P-BLK, 6P-GRN and/or 3P-GRN connectors.
- Open or short circuit in the wire harness.

No click

WIRING/IGNITION SWITCH: Disconnect the 3P-GRN connector on the right side of the rear fender. Measure the voltage between the WHT (+) and GRN (-) and between the RED/WHT (+) and GRN (-). Battery voltage should register with the ignition switch ON.

No

Yes

- Loose or poor contact of 22P-YEL connector or 8P-BLK connector above the left cooling fan.
- Open or short circuit in main or sub wire harness.
- Faulty ignition switch (see page 19-20).

FUEL PUMP SHUT-OFF (BANK ANGLE) SENSOR: Inspect the bank angle sensor (see page 18-25).

No Good

Good

No continuity

- Faulty bank angle sensor.
- Loose or poor contact of 3P-GRN connector.
- Faulty relay 6.

No

- Open or short circuit in the wire harness.

No Good

- Faulty starter switch.

- Loose or poor contact of 9P-RED connector.

Starter motor turns engine slowly.

- Low battery.
- Excessive resistance in circuit.
- Faulty starter motor (see page 18-49).

Starter motor and engine turn, but engine does not start.

- Faulty ignition system.
- Engine problems, see engine related sections.

Starter motor turns, but engine does not turn.

- Faulty starter clutch (see page 18-22).
- Faulty starter drive/or driven gear.
- Faulty starter idle gear.



Starter Motor (I Model)

Removal

Remove the following:

- right front side cover (see page 13-8).
- battery and battery case (see page 17-7).

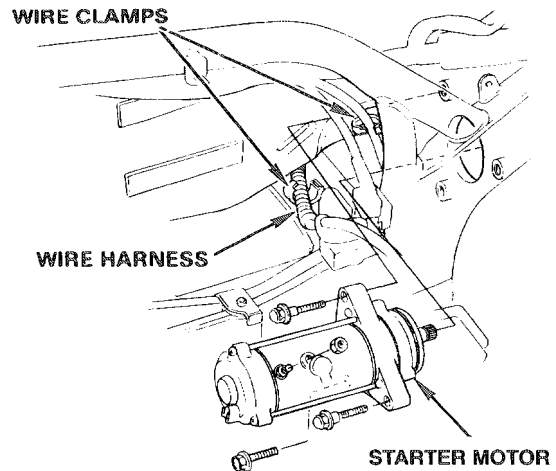
Remove the wire harness from the wire clamps.

Disconnect the starter motor cable from the motor.

Remove the motor mounting bolts and the motor from the engine.

NOTE

- For starter motor disassembly, see page 18-13.

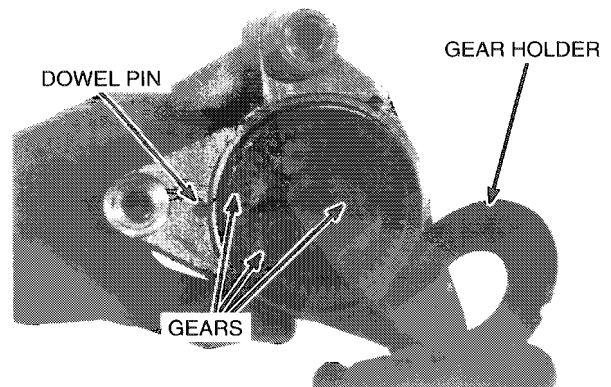


Reduction Gear Case Disassembly/Inspection

Remove the gear holder.

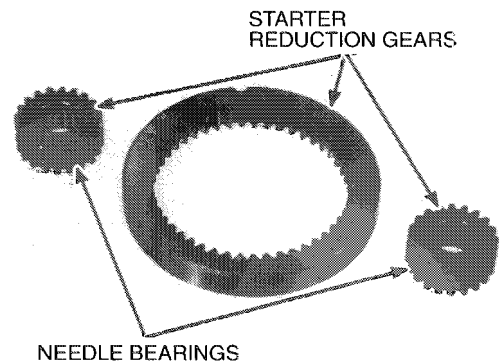
Remove the starter reduction gears.

Remove the dowel pin.



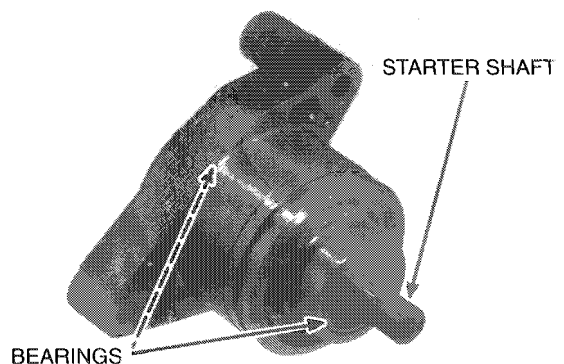
Check the starter reduction gears for excessive or abnormal wear.

Check the planetary gear needle bearings for damage or excessive wear.



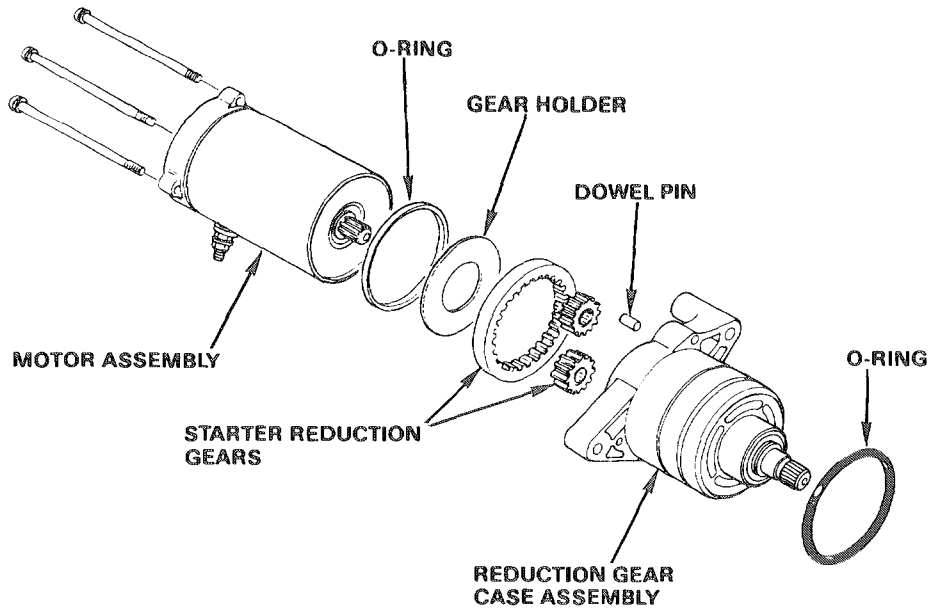
Turn the starter shaft and check the bearing condition. The bearing should turn smoothly and quietly.

Replace the reduction gear case assembly if the bearings do not turn smoothly and quietly.



Starter/Reverse

Starter Motor (I Model) (cont'd)

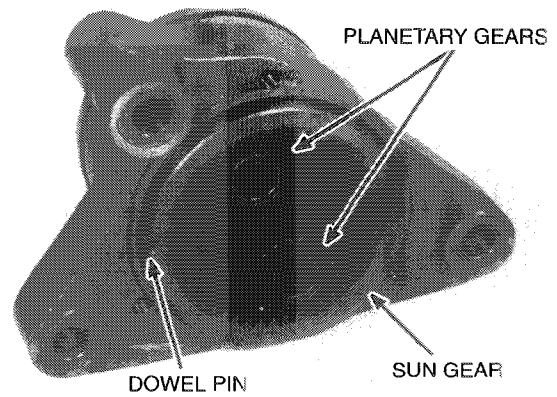


Install the dowel pin into the gear case.

Apply grease to the gear teeth.

Install the sun gear, aligning the gear groove with the dowel pin.

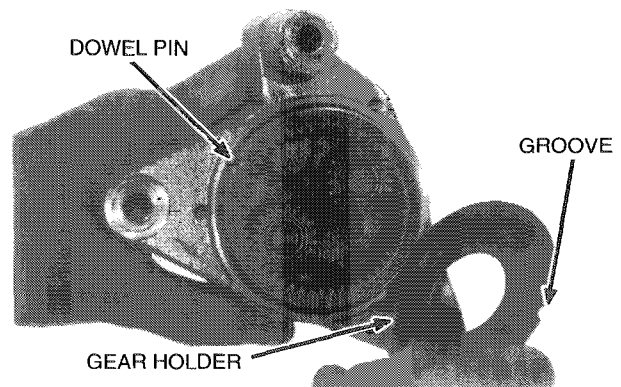
Install the planetary gears onto the shaft.



Install the gear holder, aligning the holder groove with the dowel pin.

NOTE

- For motor assembly, see page 18-19.





Installation

Apply oil to the O-ring and install the starter motor onto the engine.

Install the starter motor mounting bolts and tighten them.

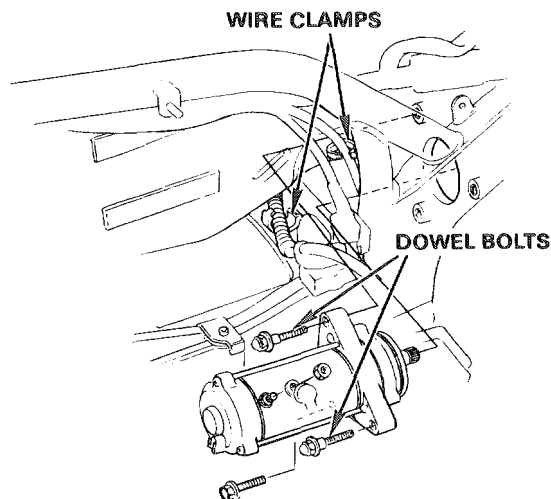
NOTE

- Two of the mounting bolts are dowel bolts. Install them as shown.

Connect the starter motor cable to the terminal. Install the wire harness onto the wire clamps.

Install the following:

- battery case and battery (see page 17-8).
- right front side cover (see page 13-8).



Diode (I Model)

Remove the right fairing inner cover (see page 13-12).

Remove the diode from the main wire harness.

Check the diode for continuity.

NOTE

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

Normal direction: Continuity

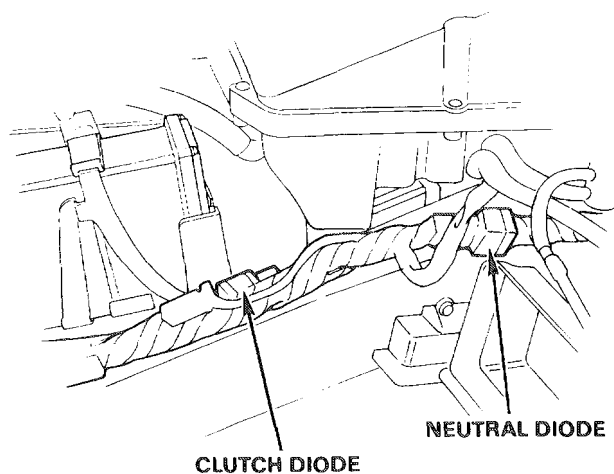
+ probe: (+) terminal

- probe: (-) terminal

Reverse direction: No continuity

+ probe: (-) terminal

- probe: (+) terminal



Starter/Reverse

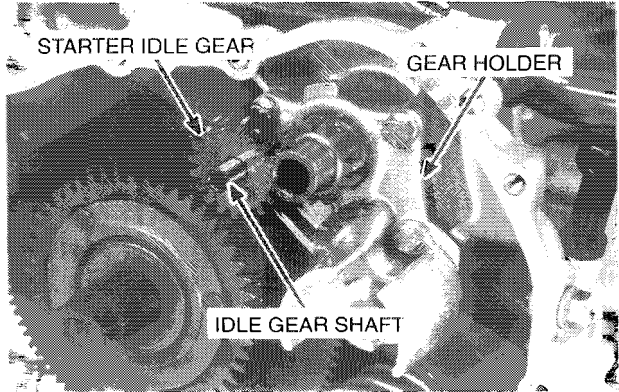
Starter Drive Gear (I Model) (cont'd)

Remove the rear case cover (see page 8-7).

Remove the starter idle gear and shaft.

Remove the bolts and starter drive gear holder.

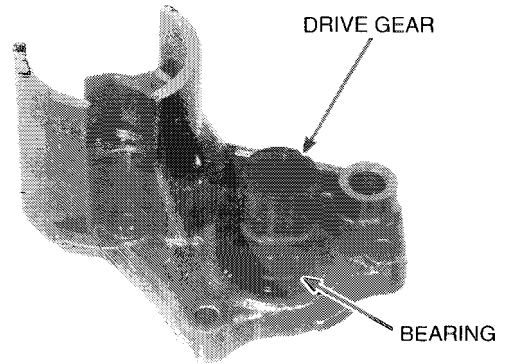
Remove the dowel pins.



Turn the drive gear and check the bearing condition. The bearing should turn smoothly and quietly.

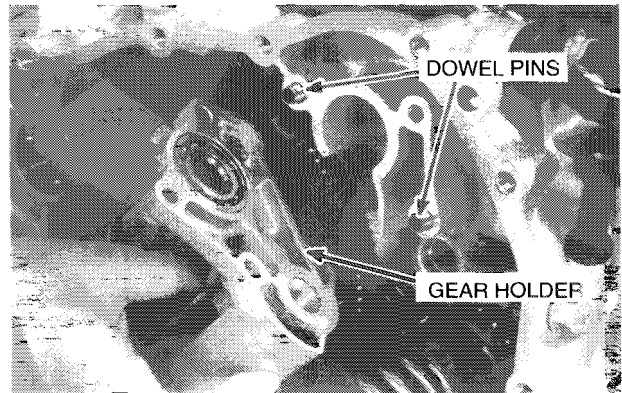
Also check that the outer race of the bearing fits tightly in the holder.

Replace the bearing, if necessary (see page 18-33).



Install the dowel pins.

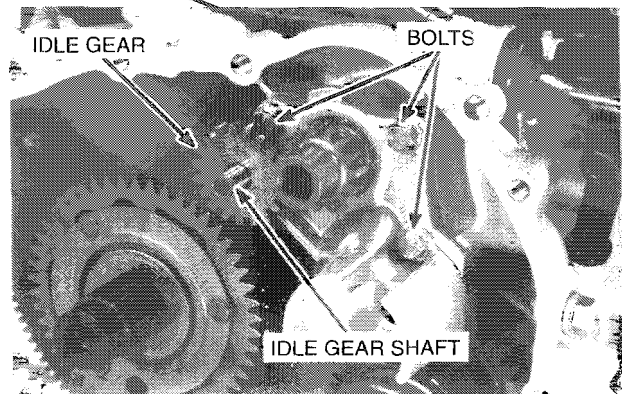
Install the starter drive gear holder.

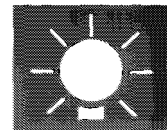


Install and tighten the starter drive gear holder bolts securely.

Install the starter idle gear and shaft.

Install the rear case cover (see page 8-33).





Lights/Switches/Instruments

Service Information	19-2
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Horn	19-28
High Mount Accessory	
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Cornering Light (SE)	19-30

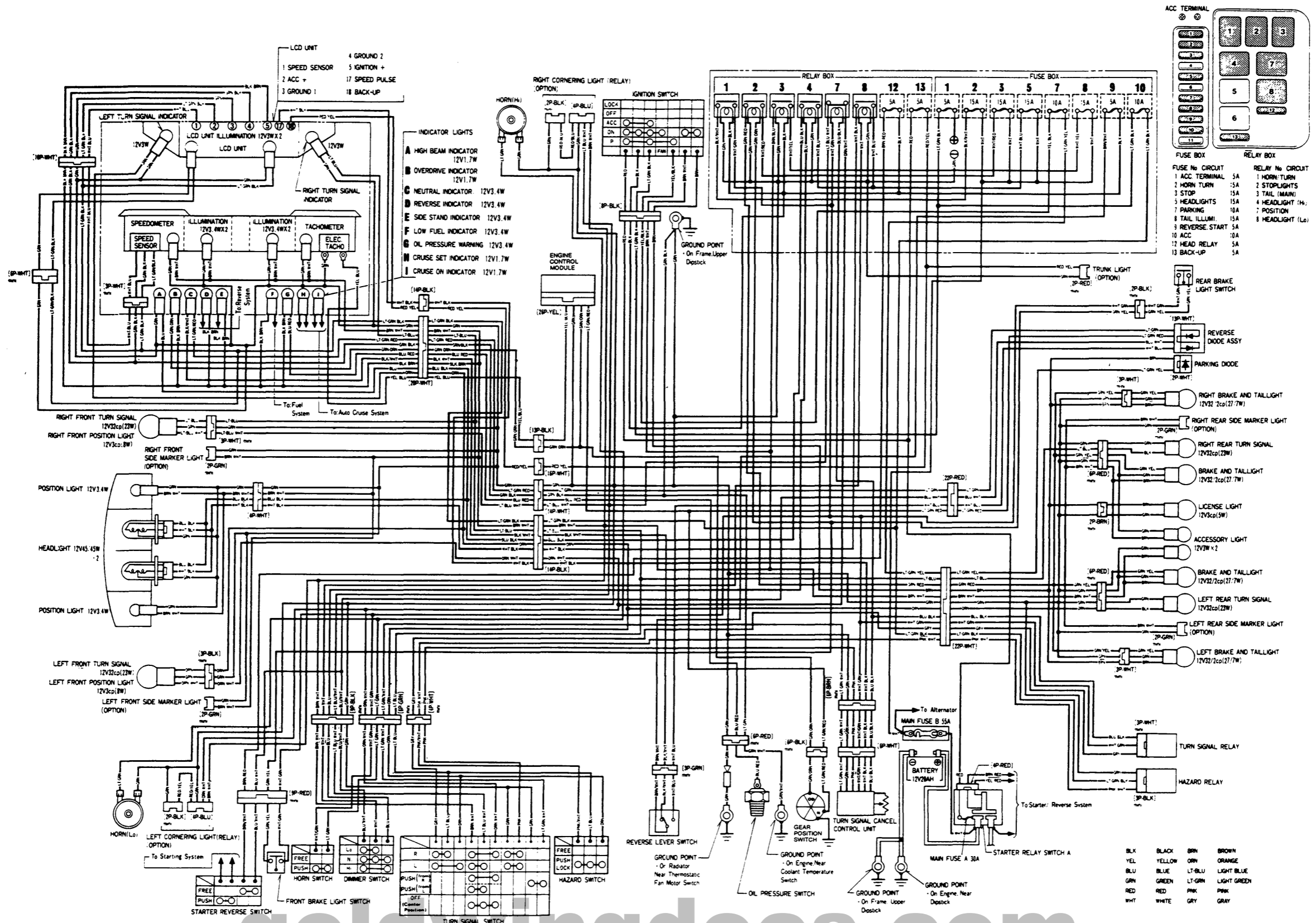
Lights/Switches/Instruments

Service Information

- All plastic connectors 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 specific coil resistance involved, or when checking for high resistance by corroded connections.
- For the following switches, see the indicated section:
 - Intake air temperature sensor (Section 4)
 - Coolant temperature sensor (Section 5)
 - Thermostatic fan motor switch (Section 5)
 - Air pressure switch (Section 12)
 - Side stand switch (Section 16)
 - Engine coolant temperature sensor (Section 16)
 - Engine stop switch (Section 16)
 - Gear position switch (Section 16)
 - Reverse switch (Section 18)
 - Starter/reverse switch (Section 18)
 - Clutch switch (Section 18)
 - Reverse lever switch (Section 18)
 - Muting/search switch (Section 20)
 - Cruise cancel switches (Section 4)
 - Cruise control switches (Section 4)



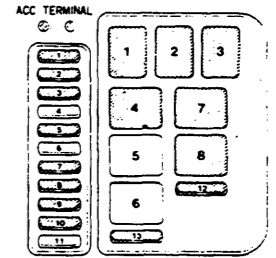
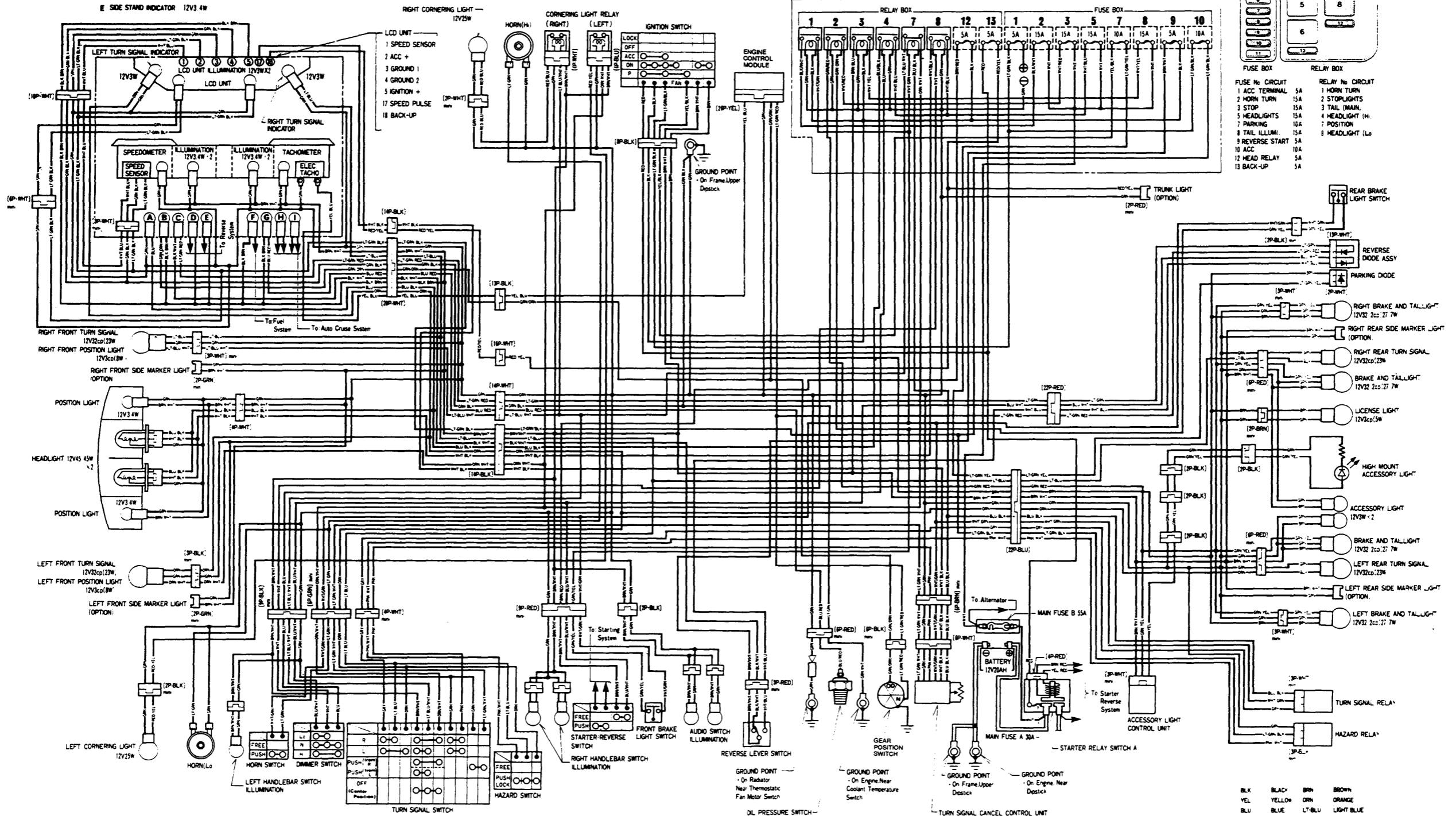
**Circuit Diagram:
A Model**





**Circuit Diagram:
SE Model**

- 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

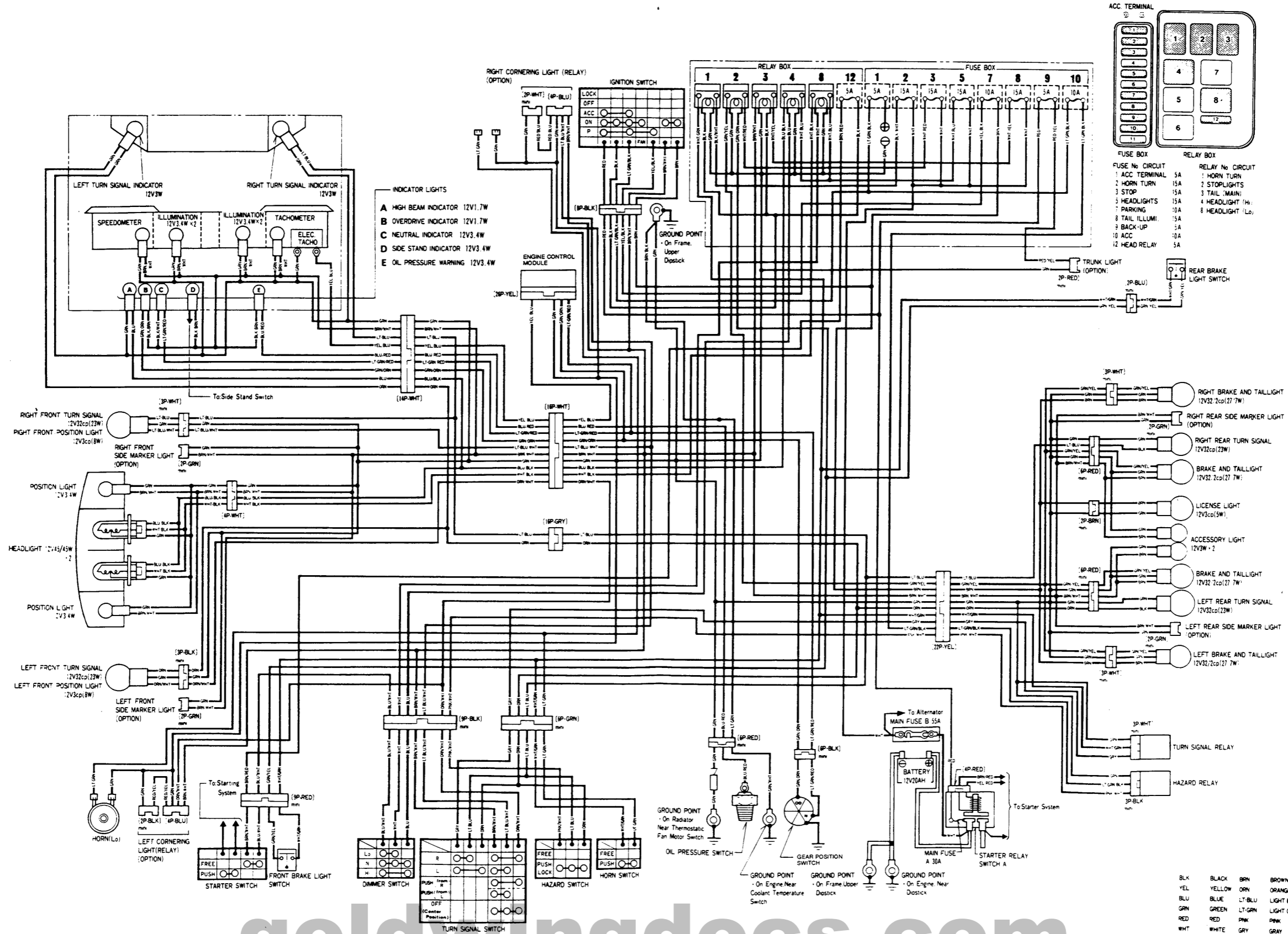


FUSE No.	CIRCUIT	RELAY No.	CIRCUIT
1	ACC TERMINAL	5A	1 HORN TURN
2	HORN TURN	15A	2 STOPLIGHTS
3	STOP	15A	3 TAIL (MAIN)
4	HEADLIGHTS	15A	4 HEADLIGHT (H)
5	PARKING	10A	5 HEADLIGHT (L)
6	TAIL ILLUM.	15A	6 POSITION
7	REVERSE START	5A	7 HEADLIGHT (L)
8	ACC	10A	
9	HEAD RELAY	5A	
10	BACK-UP	5A	

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



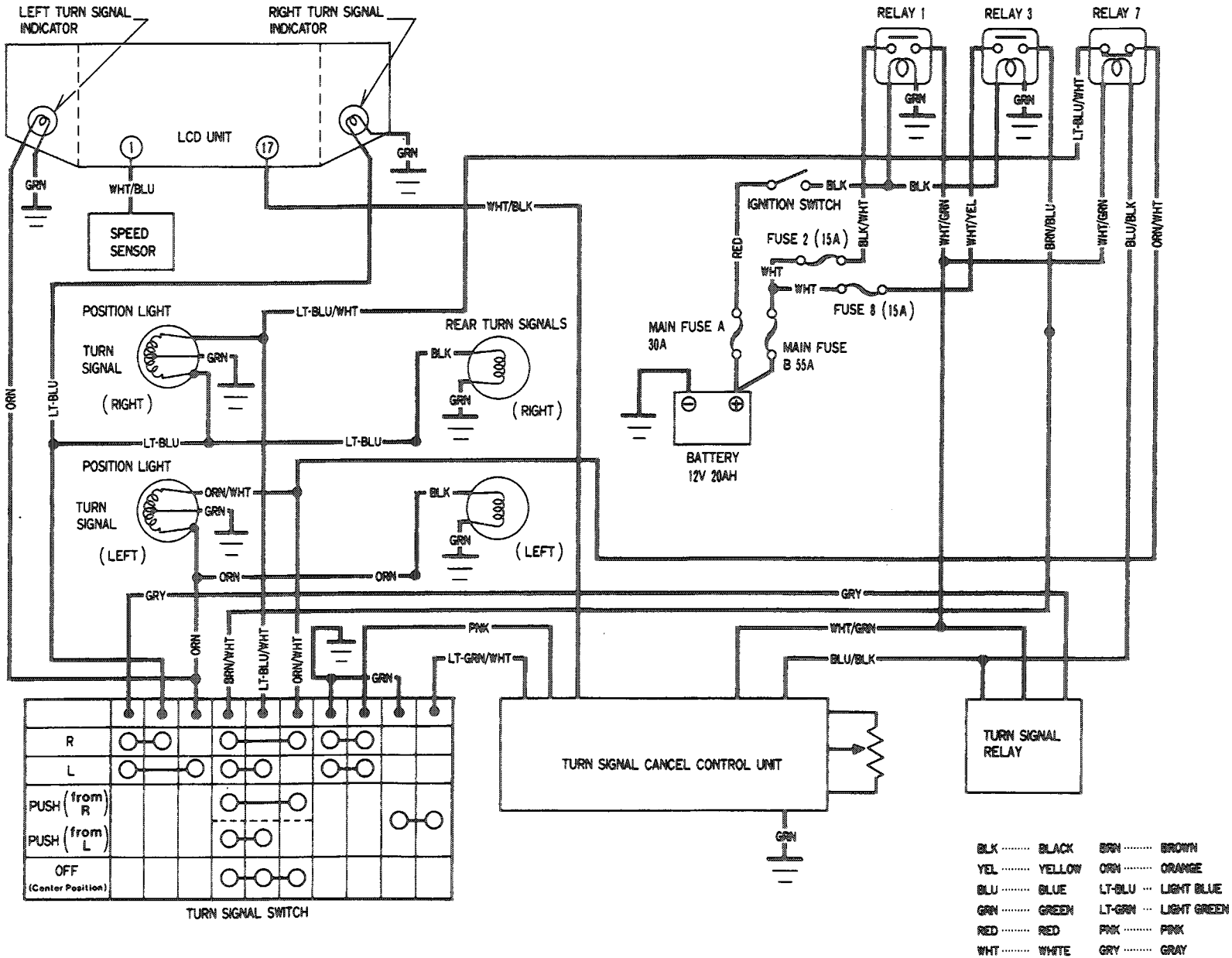
Circuit Diagram:
A Model

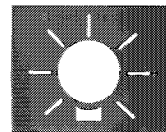


Lights/Switches/Instruments

Service Information (cont'd)

Self Cancelling Turn Signal System Diagram (A & SE only)





Troubleshooting

NOTE

Inspect the following before troubleshooting:

- Be sure the battery is fully charged.
 - Be sure fuses 1 (5 A), 2 (15 A), 3 (15 A), 7 (10 A), 8 (15 A), 9 (5 A), 10 (10 A), 12 (5 A) and 13 (5 A) are good.
 - Upon starting, the headlight should go off with the starter/reverse switch depressed.
 - During reverse operation, the headlight should remain on even if the starter/reverse switch is depressed.
-

Lights come on but are dim; engine starts but components or lights don't work.

- Faulty bulb
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness

No lights (except LCD unit illumination) come on with the ignition switch on.

- 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.

- Faulty headlight bulb
- Faulty relay 8 (HEADLIGHT Lo) and/or relay 4 (HEADLIGHT Hi)
- A & SE: Faulty starter/reverse switch (see page 18-29)
- Faulty dimmer switch (see page 19-22)
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness

Headlight goes off during reverse operation (A & SE only).

- Faulty reverse lever switch (see page 18-44)
- Faulty headlight diode for reverse (WHT/BLU & BLU/WHT) (page 18-28)
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness

Parking lights (License Light and Taillights on saddlebags) do not come on with the ignition switch in P position.

- Faulty ignition switch (page 19-20)
- A & SE: Faulty parking diode (LT GRN/YEL & BRN) (page 19-24)
- 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
- Faulty relay 2 (STOPLIGHTS)
- 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 (see page 16-13)
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness
- A & SE: Faulty neutral diode (LT-GRN & LT-GRN/RED) (page 18-28)

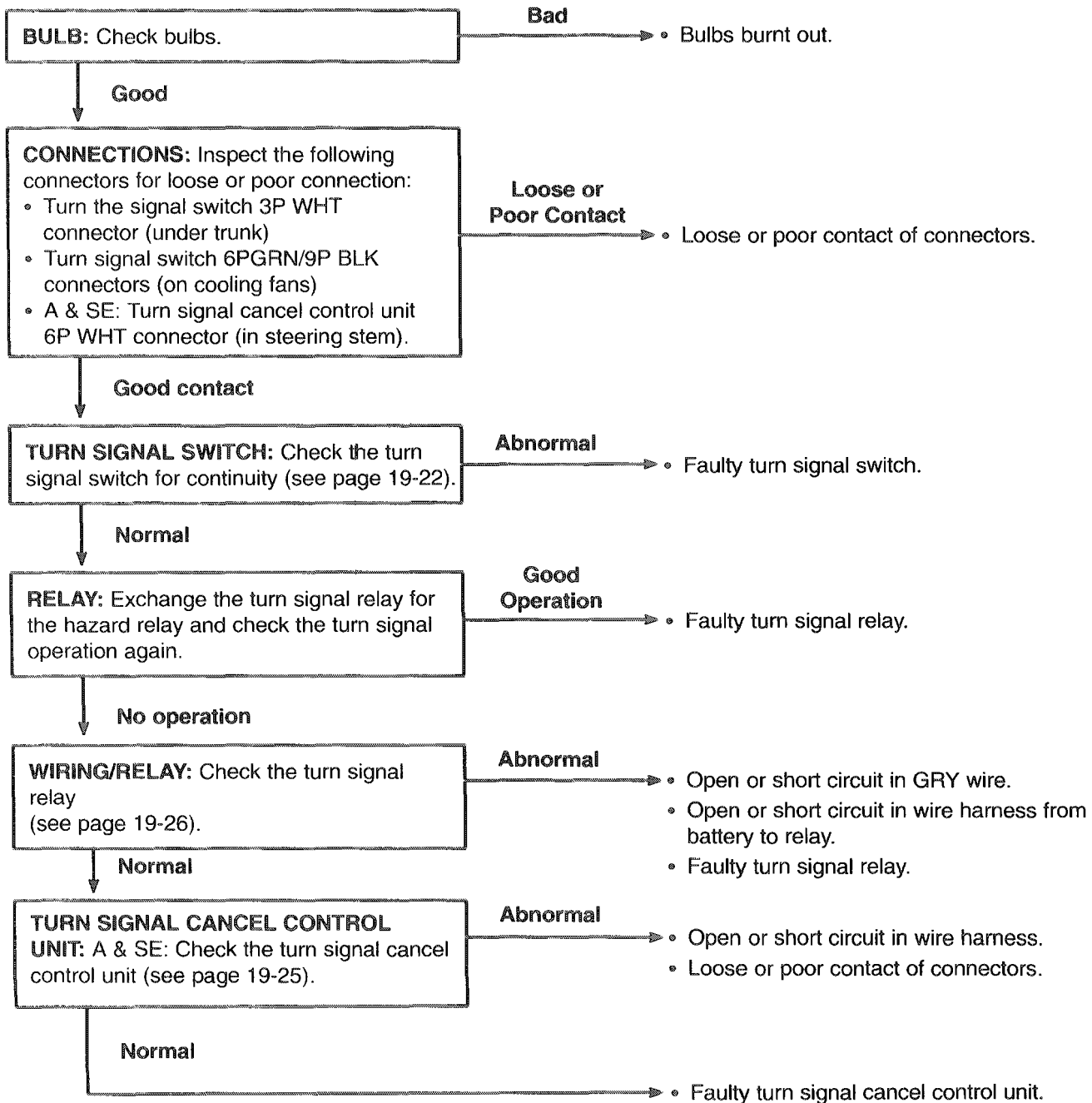
Lights/Switches/Instruments

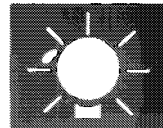
Troubleshooting (cont'd)

Turn signals do not operate.

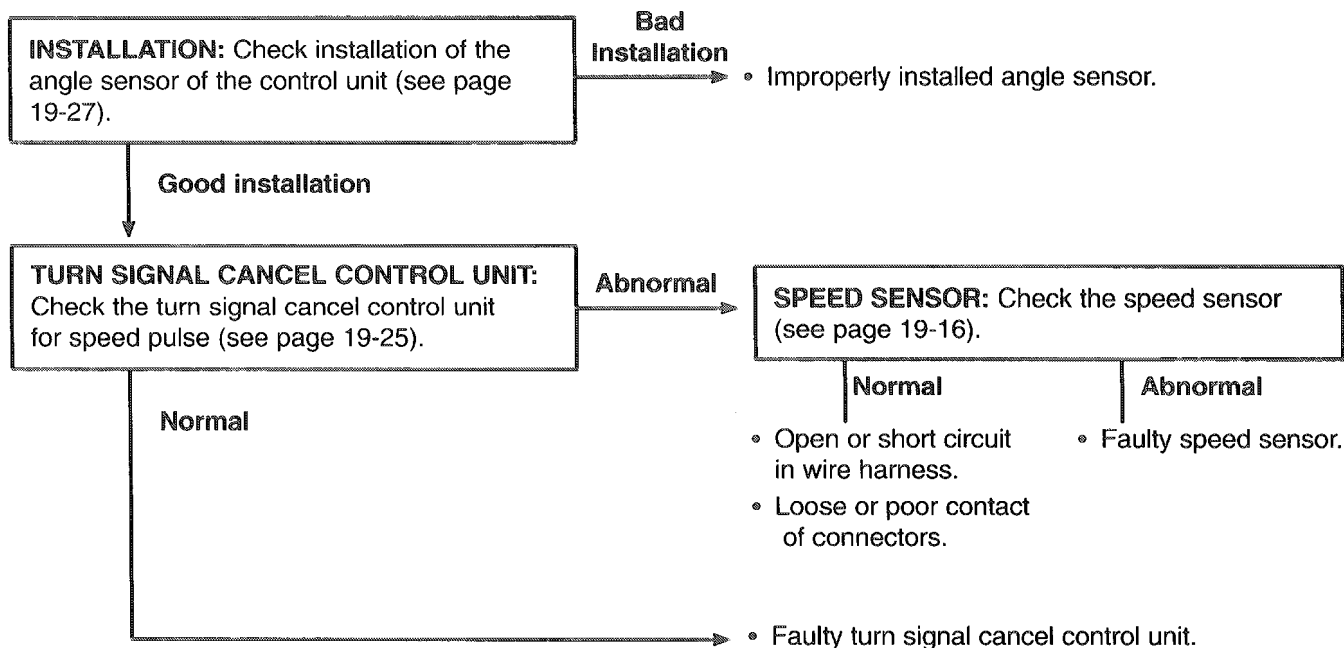
NOTE

- If one bulb is burnt out, turn signals should blink faster than normal.

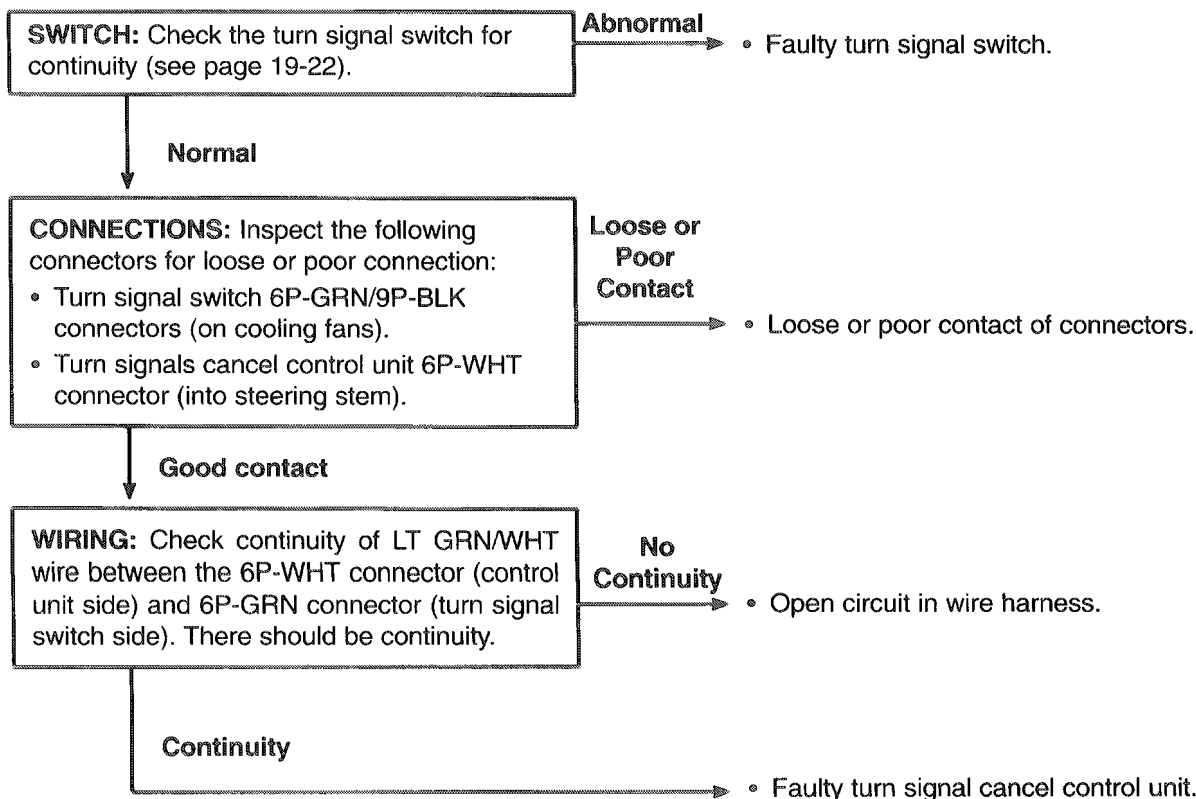




Turn signals do not cancel automatically (A & SE only).



Turn signals do not cancel manually (A & SE only).



Lights/Switches/Instruments

Troubleshooting (cont'd)

On parking, when the front wheel is turned slowly from left to right, turn signal is cancelled (A & SE only).

- Faulty turn signal cancel control unit.

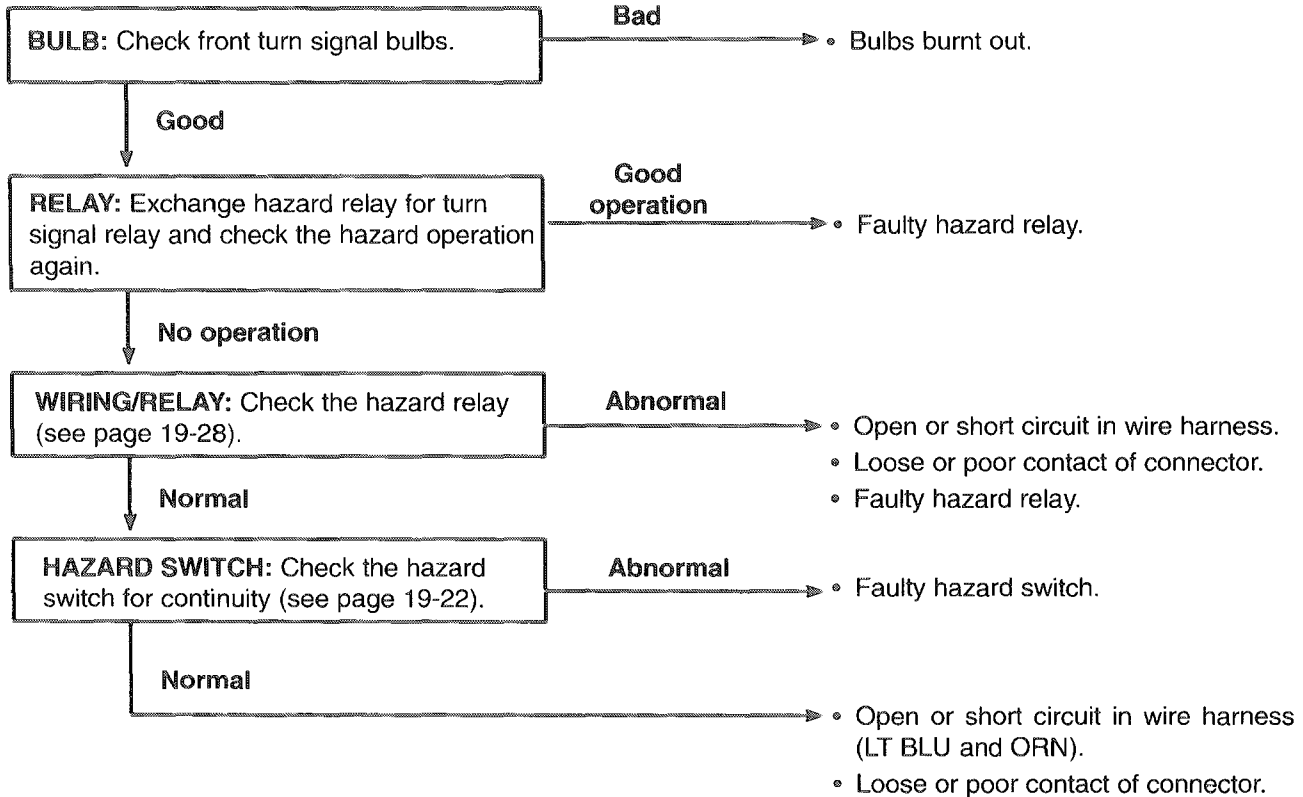
Turn signal lights do not come on

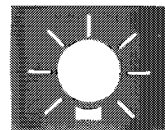
- Faulty turn signal switch.
- Light bulbs not securely installed.
- Open or short circuit in wire harness (BRN/WHT, ORN/WHT and/or LT-BLU/WHT wires).
- Loose or poor contact of related connectors.

One turn signal light does not come on

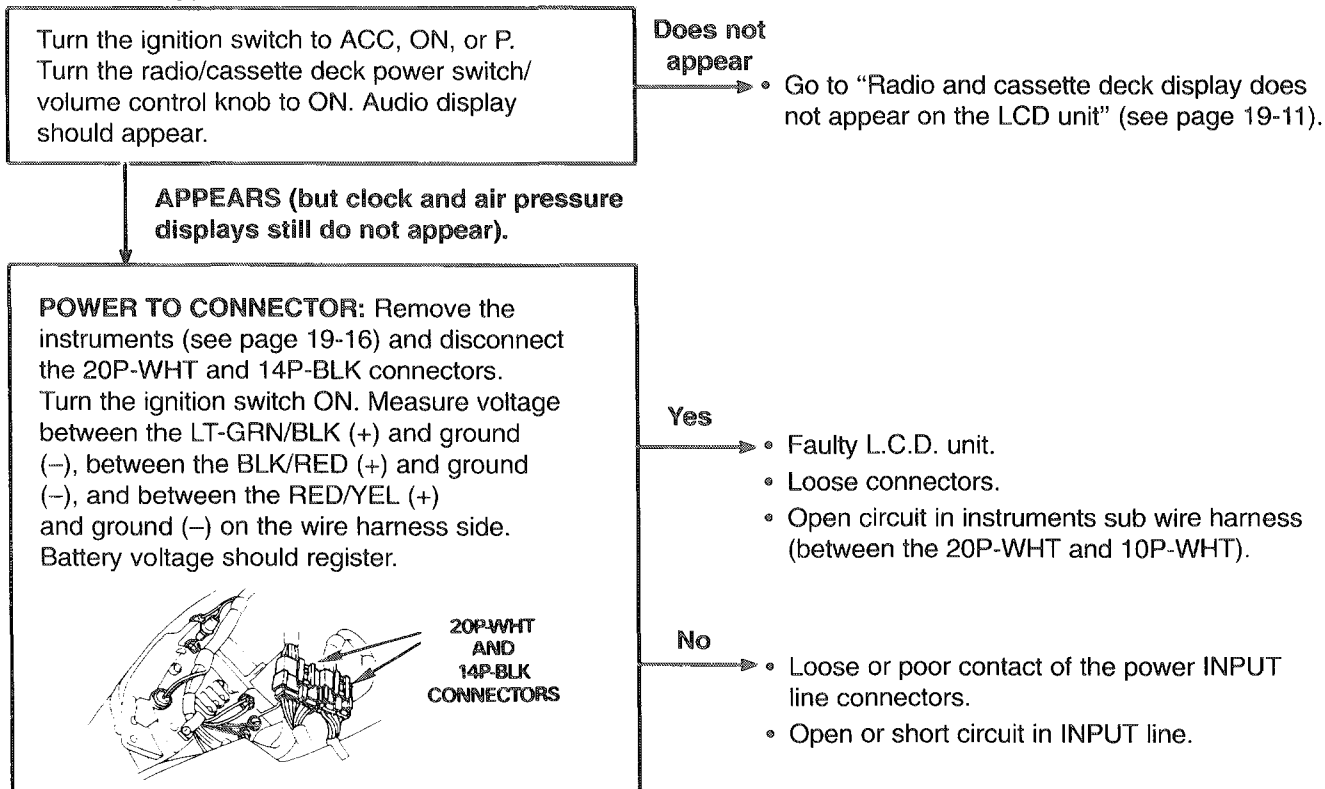
- Faulty turn signal switch.
- Light bulb not securely installed.
- A & SE: Faulty relay 7 (see page 19-24).

Hazard system does not operate

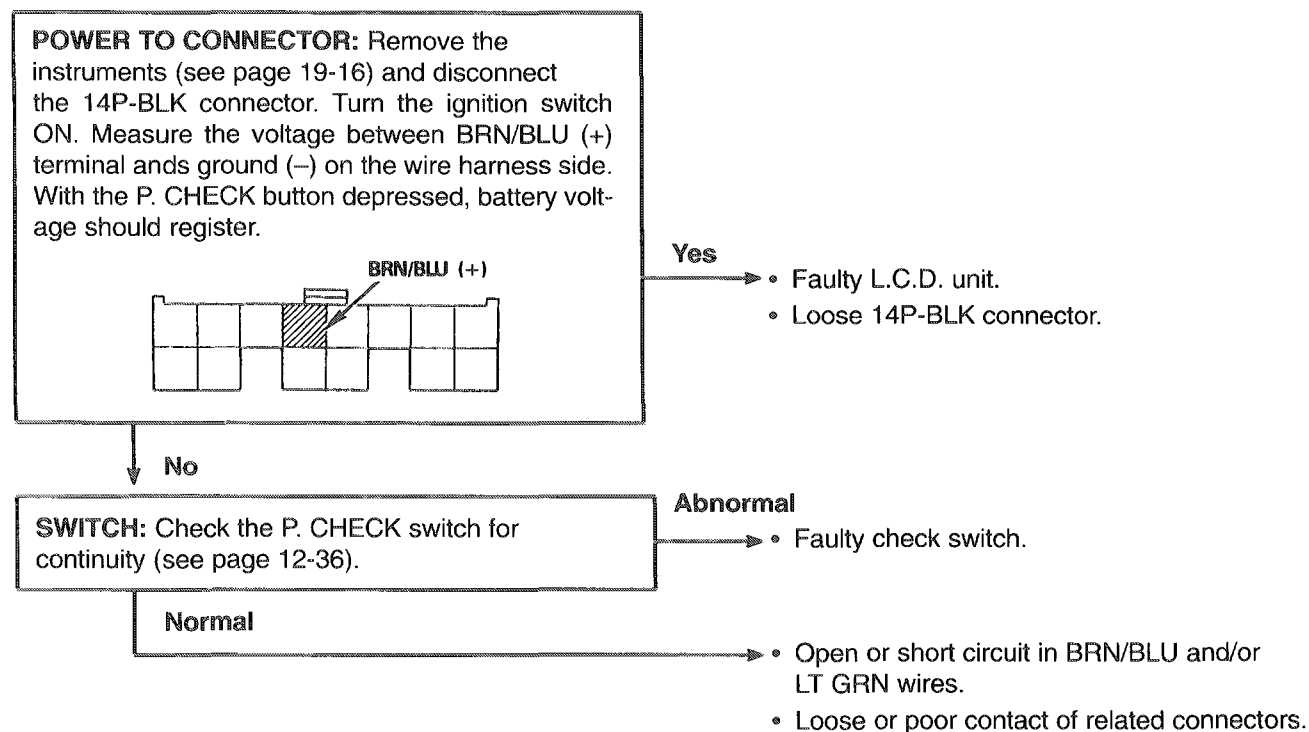




Liquid crystal display (L.C.D.) does not appear upon turning the ignition switch to ACC, ON, or P. (A & SE only)



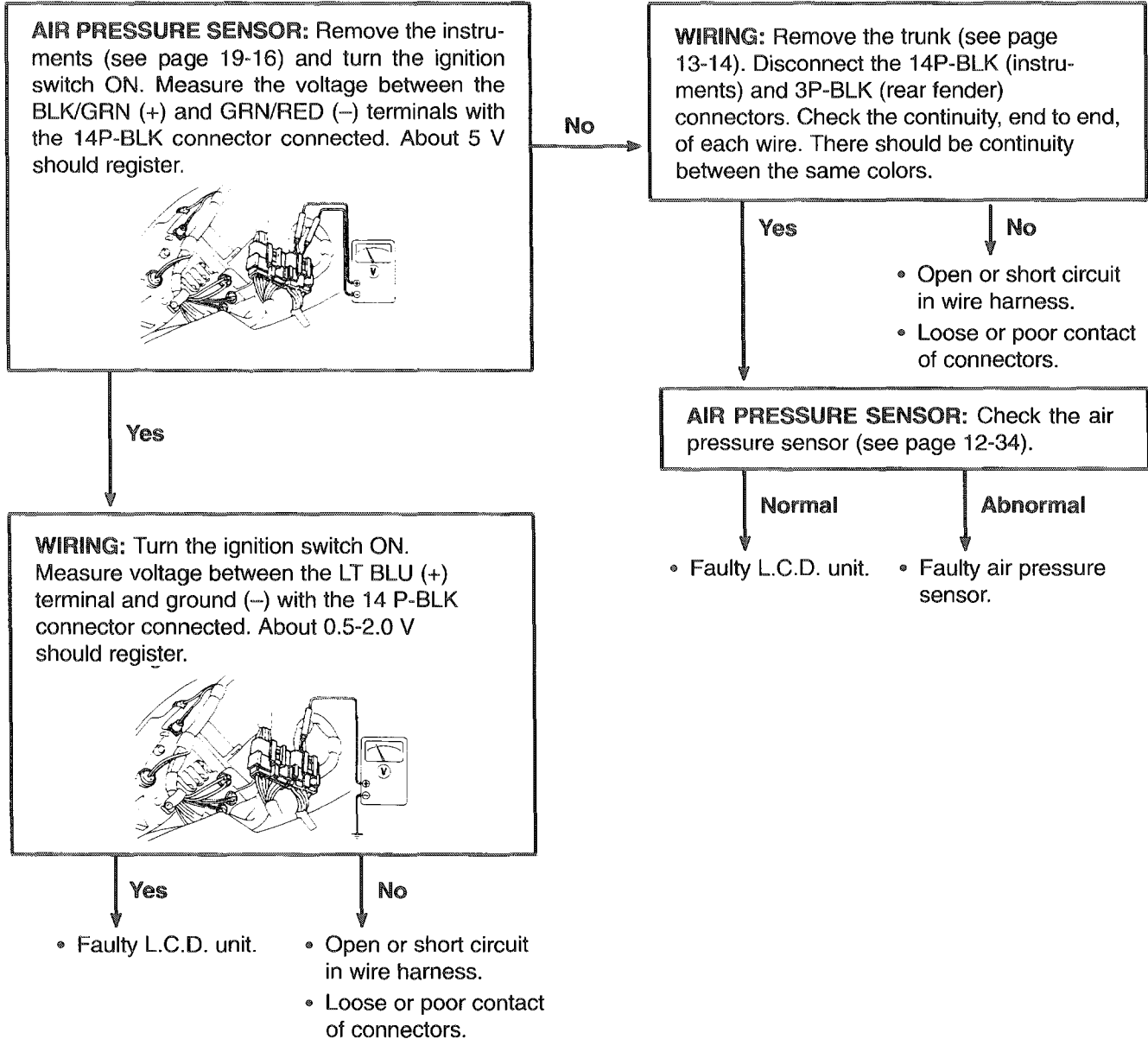
Clock displays, but air pressure display will not come on when the check switch is depressed with the motorcycle stopped. (A & SE only)

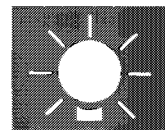


Lights/Switches/Instruments

Troubleshooting (cont'd)

Air pressure display doesn't change, but the on-board air compressor system is operating properly. (A & SE only)

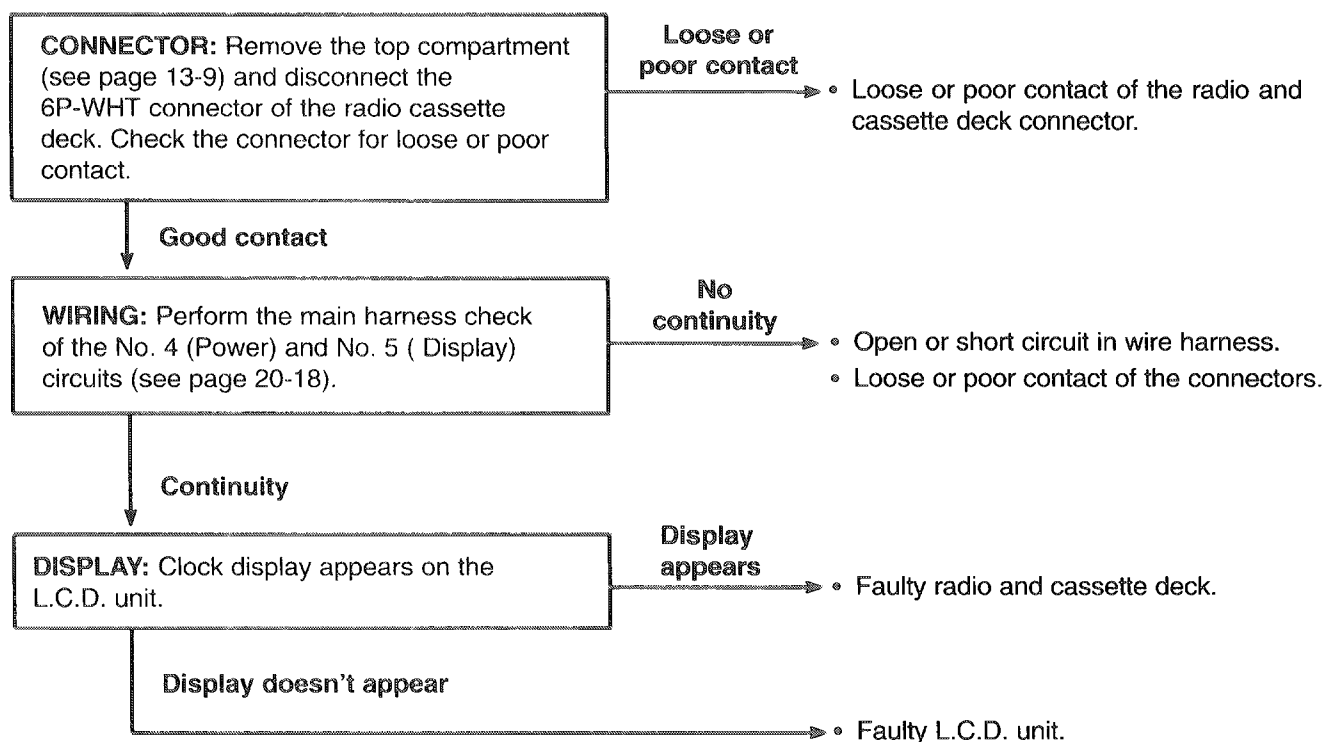




Radio & cassette deck display does not appear on the LCD unit. (A & SE only)

NOTE

- Turn the radio/cassette deck power switch/volume control knob to ON. The audio display should appear. Pushing the radio/cassette switch should put the display in the radio mode, indicating AM or FM.



Lights/Switches/Instruments

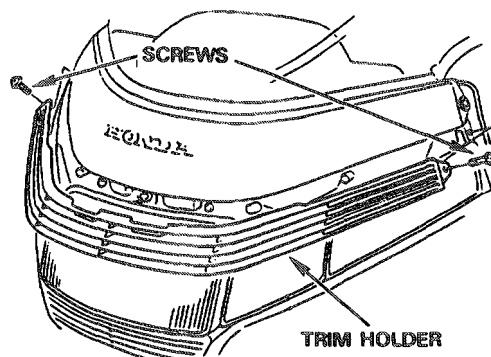
Headlight/Position Light

Removal

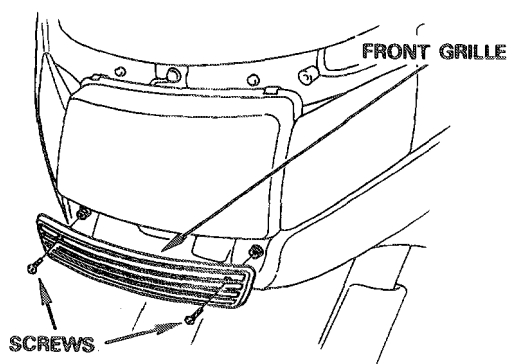
Remove two screw.

A & SE: Remove the windshield trim from the windshield height adjustment level tension plate.

Free the trim grooves from the fairing tabs and remove the trim from the fairing.



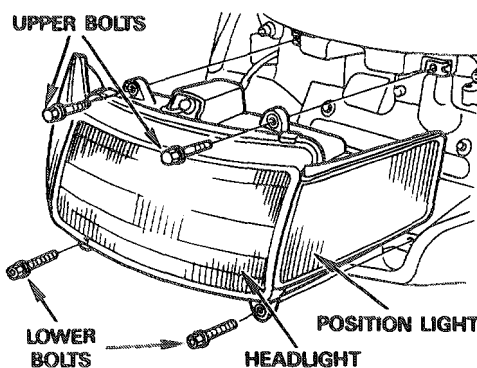
Remove the front grille by removing the two attaching screws.



Remove the headlight by removing the four mounting bolts.

NOTE

- The lower mounting bolts have screw threads in their heads.



Bulb Replacement

Remove the headlight connector and rubber bulb cover.

Remove the headlight bulb.

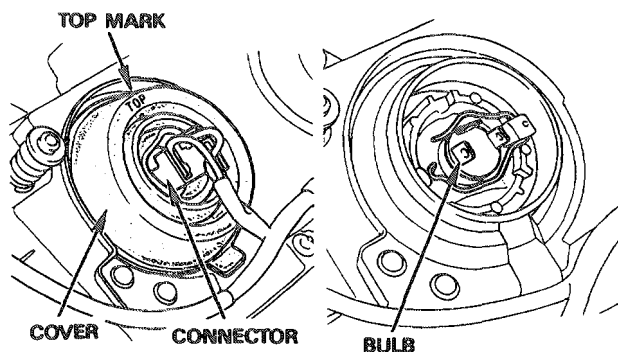
Install a new headlight bulb.

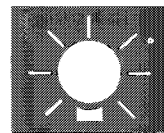
CAUTION

- If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent early failure.

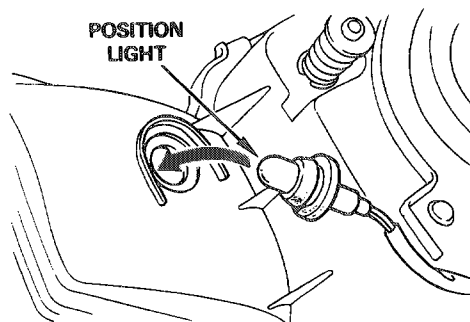
NOTE

- Install the rubber bulb cover with its "TOP" mark up.





Pull the position light out of the side portion of the headlight and replace it with a new one.



Installation

Install the headlight in the reverse order of removal.

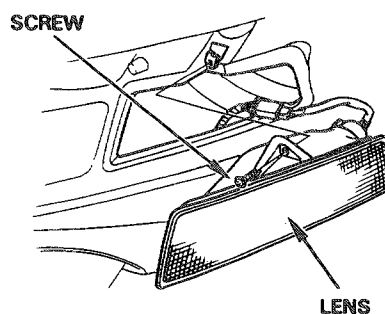
NOTE

- Be sure to install the headlight mounting bolts properly. The lower bolts have screw threads in their heads.

Turn Signals/Brake Lights

Front Turn Signal/Position Lights

Remove the front turn signal/position light lens by removing the screw.



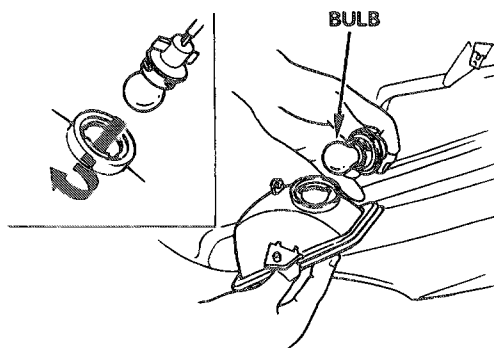
Remove the bulb by turning it counterclockwise.

Insert a new bulb into the bulb socket and turn it clockwise

Install the lens.

CAUTION

- Do not overtighten the lens mounting screws. The lens will crack.



Lights/Switches/Instruments

Turn Signals/Brake Light (cont'd)

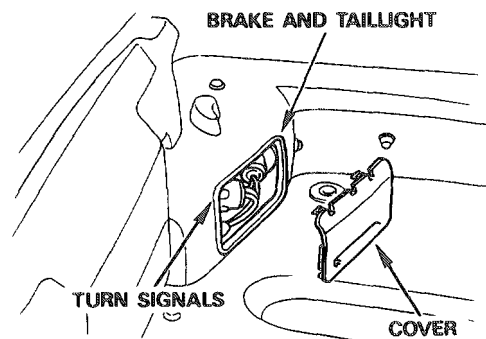
Rear Turn Signal/Brake and Taillights (Trunk)

Open the trunk lid.

Remove the bulb cover.

Remove the bulb by turning it counterclockwise.

Replace it with a new one, turning it clockwise.



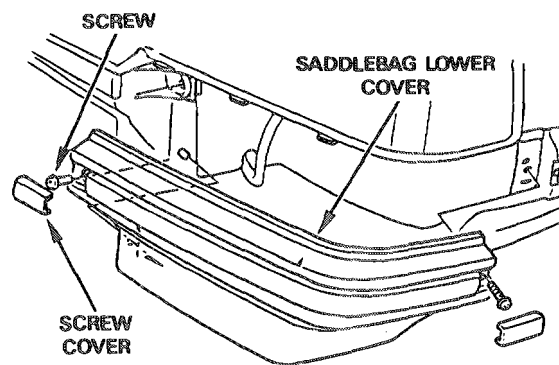
Brake and Taillights (Saddlebags)

Remove the screw covers and screws.

Remove the saddlebag lower cover.

NOTE

- Be careful of the alignment of the cover and saddlebag.

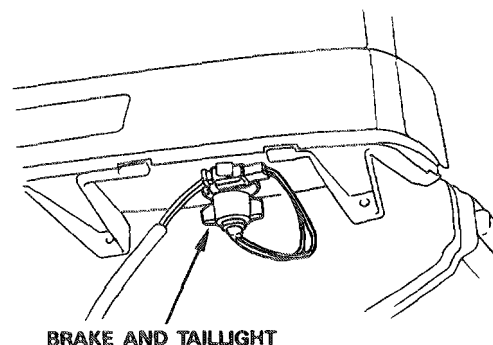


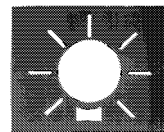
Remove the bulb by turning it counterclockwise.

Replace it with a new one, turning it clockwise.

NOTE

- Align the cover hole with the saddlebag claw.





License/Accessory Light

License Light

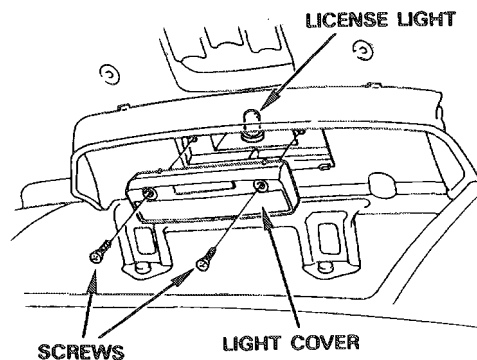
Remove the license light cover by removing two screws.

Pull the bulb out of the bulb case.

Replace it with a new one. Install it in the reverse order of removal.

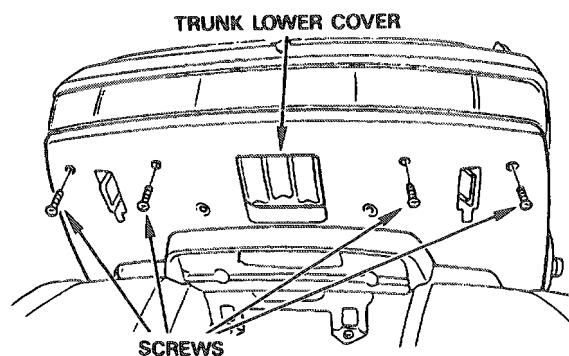
CAUTION

- Do not overtighten the light cover mounting screws. The cover will crack.



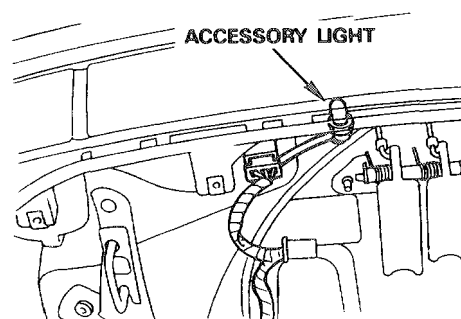
Accessory Light

Remove the trunk lower cover by removing the four mounting screws.



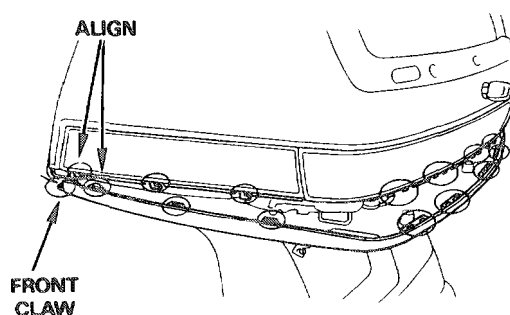
Pull the accessory light bulb socket out of the trunk.

Replace it with a new one, turning it clockwise.



NOTE

- Install the trunk lower cover by first aligning the front claws into the trunk. Then securely align the trunk claws with the lower cover slots.



Lights/Switches/Instruments

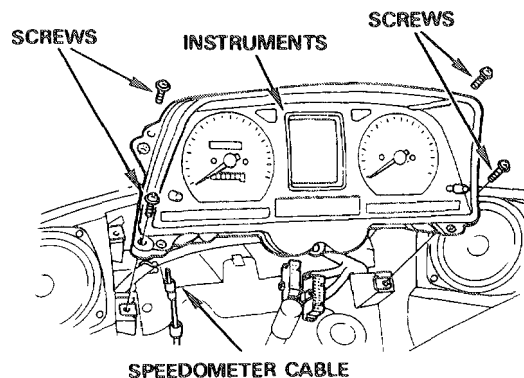
Instruments

Removal/Bulb Replacement

Remove the instrument panel (see page 13-11).

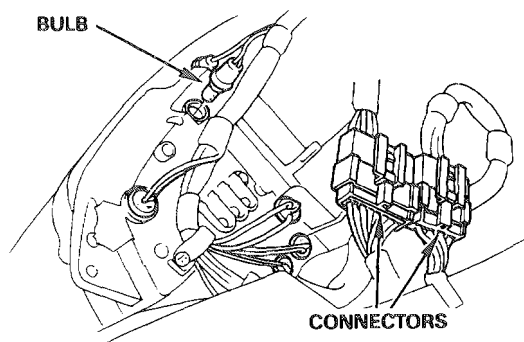
Remove the instruments mounting screws.

Disconnect the speedometer cable.



Pull the bulb out of the instrument case and replace it with a new one

To disassemble the instruments, first disconnect the 14P-BLK and 20P-WHT connectors (I model: 14P-WHT connector) and then remove the instruments from the frame.



For L.C.D. unit illumination replacement only:
Remove the L.C.D. unit as shown.

(For L.C.D. replacement, see page 19-19).

CAUTION

- Do not turn the gauges upside down because they will leak damper oil.
- Do not damage the L.C.D. unit flat cables.

Speed Sensor Inspection (A & SE only)

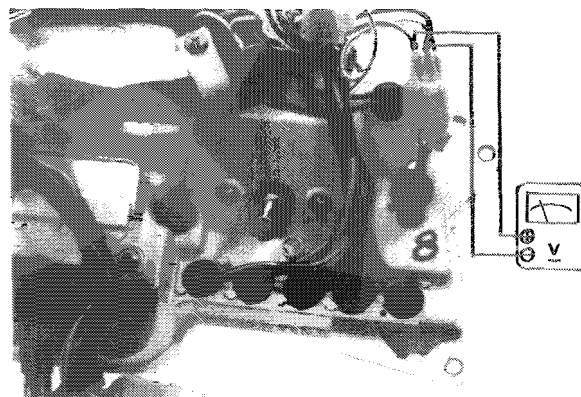
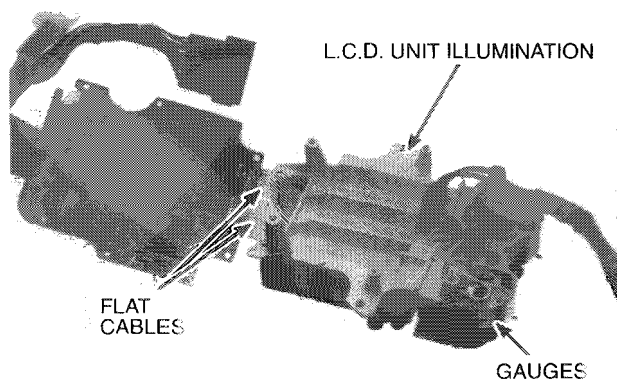
Check the speedometer cable for proper connection.

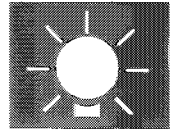
Remove the instruments with the 14P-BLK and 20P-WHT connectors connected (see above).

Connect a voltmeter across the LT-GRN/BLK (+) and GRN/BLK (-) terminals of the sensor 3P-WHT connector.

Battery voltage should register when the ignition switch is turned to ACC, ON, or P.

The absence of power indicates the speed sensor is not receiving power from the battery. Trace and repair the related wiring, connectors and/or components (relay 3 and fuse 10).





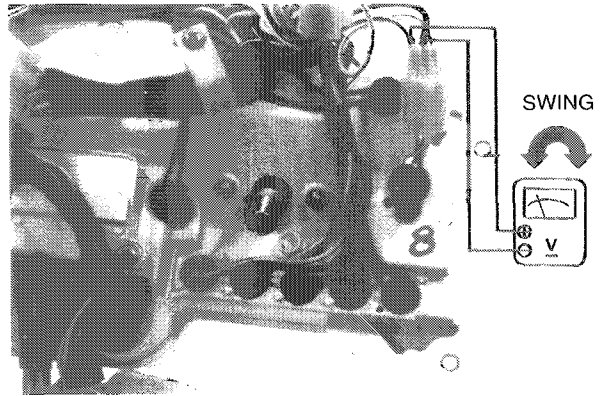
Instruments (cont'd)

Connect a voltmeter across the BLK/BRN (+) and WHT/BLU (-) terminals of the sensor 3P-WHT connector.

Turn the ignition switch ON.

The sensor is normal if the voltmeter needle slowly swings from 2 to about 10 V eight times when the speedometer drive shaft is slowly turned one full turn.

If all checks are O.K., replace the speed sensor.



Electric Tachometer Inspection

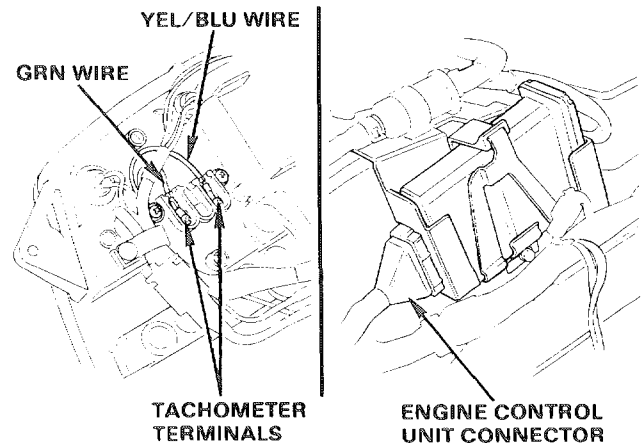
Remove the instruments with the 20P-WHT (I model: 14P-WHT) connectors connected (see page 19-16).

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 tachometer terminal and ground.

There should be continuity.

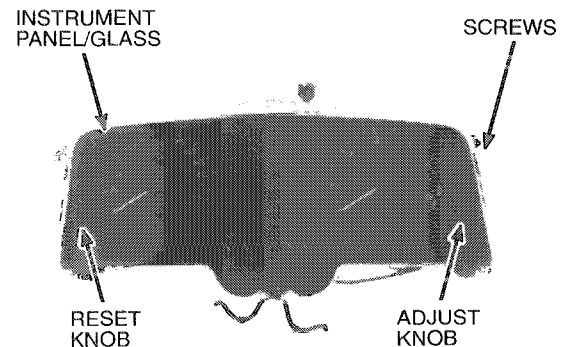


Disassembly

Remove the reset knob.

A & SE: Remove the clock adjust knob.

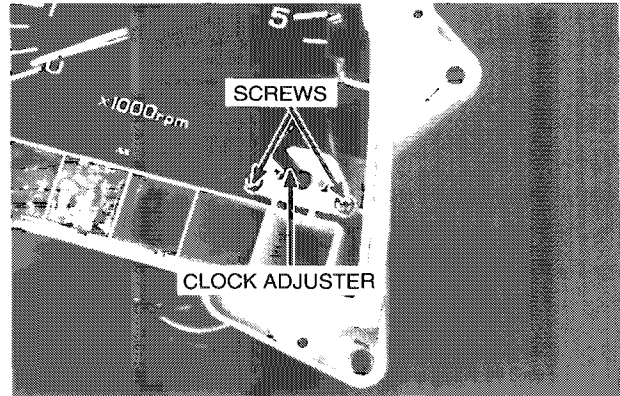
Remove the instrument panel and glass by removing six screws.



Lights/Switches/Instruments

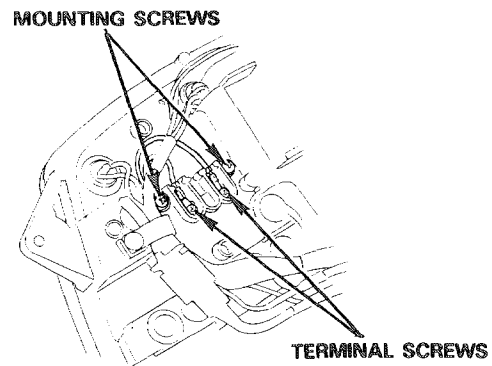
Instruments (cont'd)

A & SE: If you are replacing the clock adjuster, remove two screws and disconnect the 3P-BLK connector behind the instrument case.



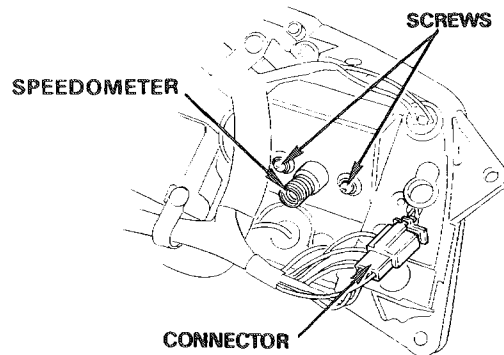
Remove two electric tachometer terminal screws and two tachometer mounting screws.

Remove the tachometer from the case.



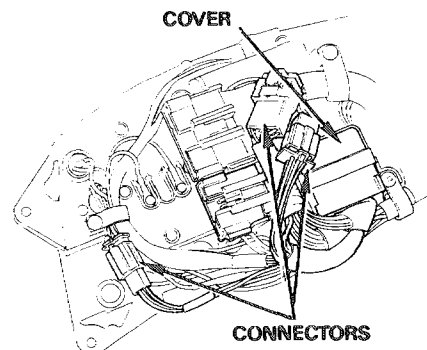
A & SE: Disconnect the 3P-WHT connector to the speed sensor.

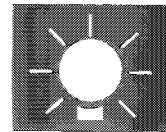
Remove the two screws. Remove the speedometer from the case.



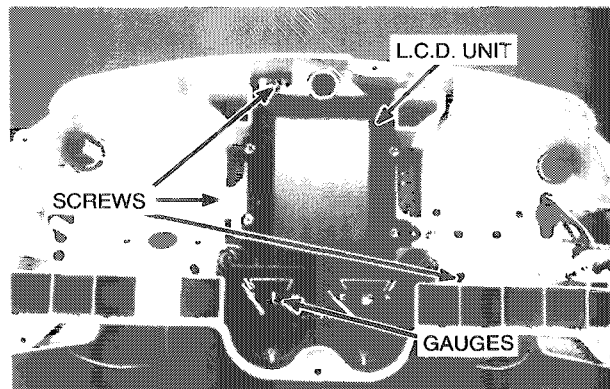
Disconnect the 10P-WHT, 6P-WHT, and 3P-BLK connectors. (I model: 4P-WHT connector).

Remove the instrument backing cover.





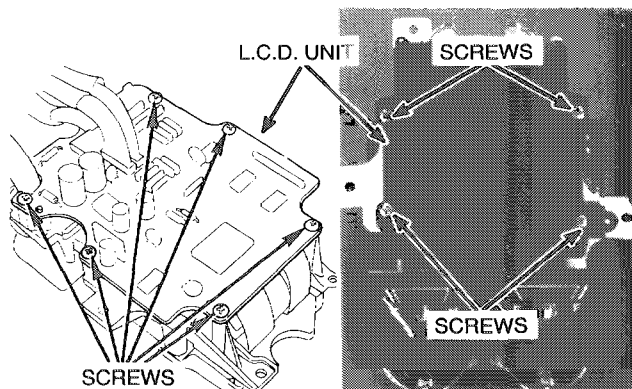
A & SE: Remove four screws. Remove the L.C.D. unit and gauges as an assembly.



If you want to remove just the L.C.D. unit, remove ten screws. Then remove the L.C.D. unit from the base.

CAUTION

- Do not damage the L.C.D. unit flat cables.



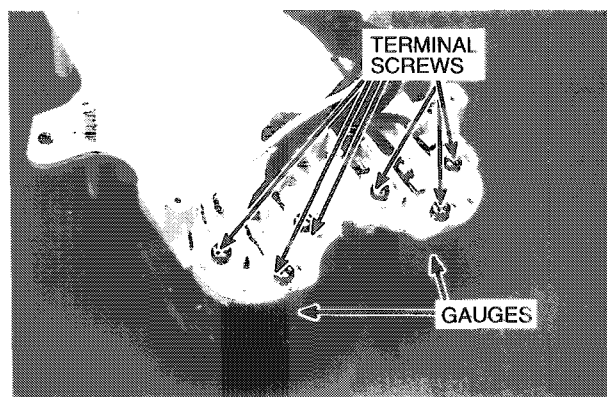
If you want to remove the gauges, remove the rear side of the L.C.D. unit (see above).

All Models: Remove the gauge terminal screws and gauge panel screws.

Remove the gauges.

CAUTION

- Do not turn the gauges upside down because they will leak damper oil.
- A & SE: Do no damage the L.C.D. unit flat cables.



Lights/Switches/Instruments

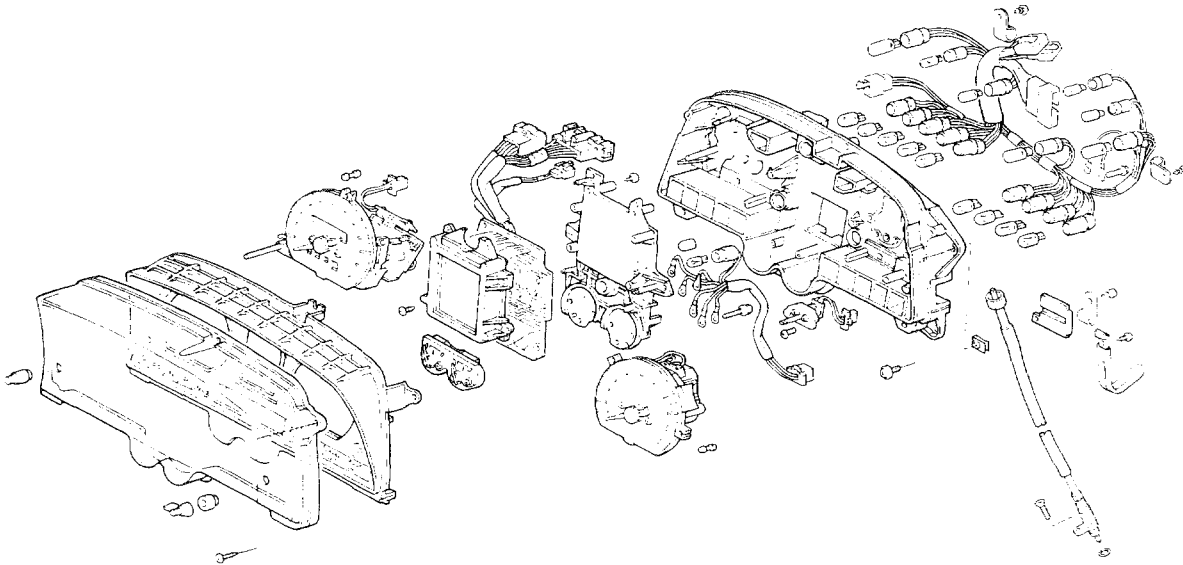
Instruments (cont'd)

Assembly/Installation

Assembly and installation are in the reverse order of disassembly and removal.

NOTE

- Connect the terminals according to the color codes on the L.C.D. unit and instrument case.



Ignition Switch

Inspection

Remove the left fairing lower cover (see page 13-12).

Disconnect the 8P-BLK connector from 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.

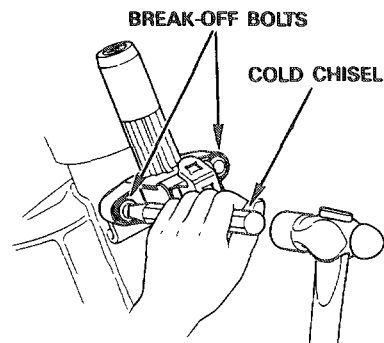
Color	RED	BLK	LT GRN/ BLK	BLU/ ORN	YEL/ BLK	BRN/ WHT	BRN
LOCK							
OFF							
ACC	○		○				
ON	○	○	○	○		○	○
P	○		○		○		

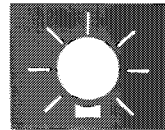
Removal

Remove the fairing (see page 13-13).

Strike the break-off bolt heads with a steel hammer.

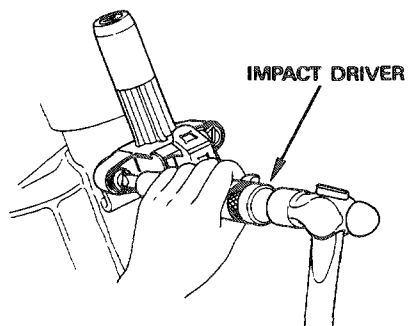
Then make a drive groove on the bolt heads using a cold chisel.





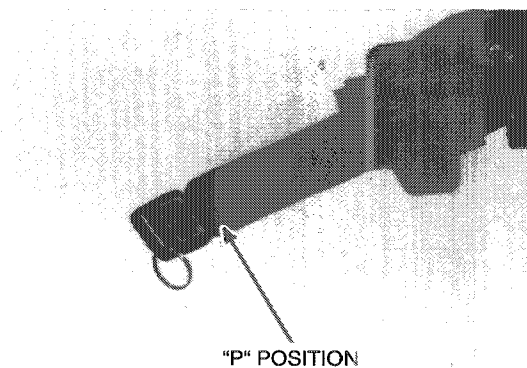
Remove the break-off bolts, using an impact driver.

Remove the ignition switch.



Disassembly

Insert the key and turn it to "P" (park).

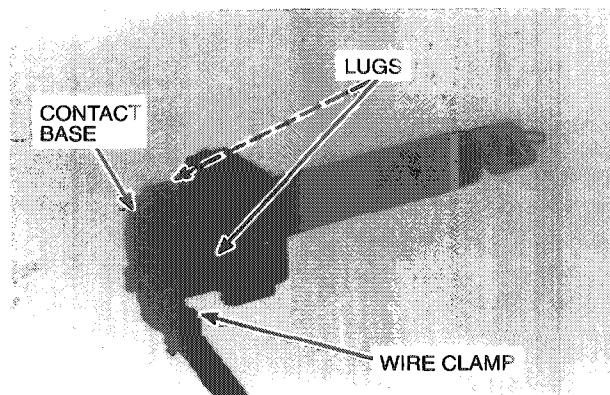


Release the wire from the wire clamp.

Push the lugs from the slots and remove the contact base.

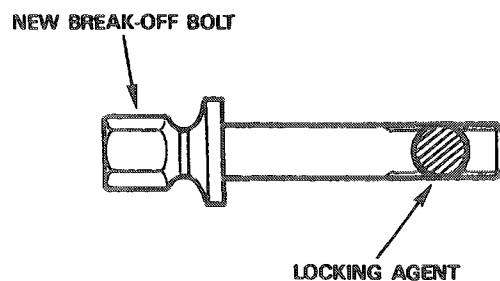
Assembly

Assemble in the reverse order of removal.



Installation

Apply a locking agent to the new break-off bolt threads, as shown.



Lights/Switches/Instruments

Ignition Switch (cont'd)

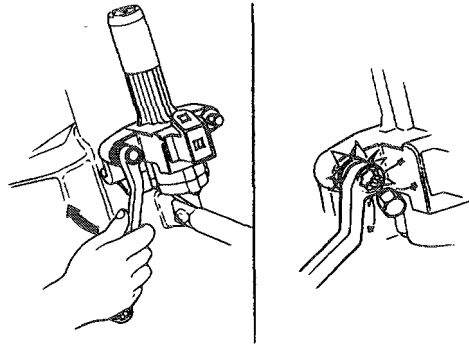
Install the ignition switch with the bolt.

Tighten the break-off bolts until the bolt heads break, as shown.

NOTE

- The bolt heads should break off with a force of 36 N-m (3.6 kgm, 26 ft-lb).

Install the fairing (see page 13-13).



Left Handlebar Switches

Inspection

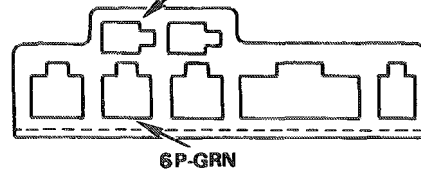
The handlebar cluster switches (dimmer, hazard, turn signals, horn) must be replaced as an assembly.

Remove the left and right fairing lower covers (see page 13-12).

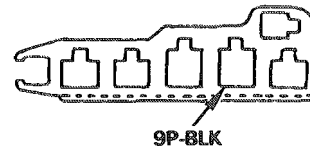
Disconnect the 9P-BLK, 6P-GRN and 4P-WHT connectors from the connector holders on the cooling fans.

Continuity tests for the components of the handlebar cluster switches follow. Continuity should exist between the color coded wires:

• LEFT 4P-WHT (A & SE only)



• RIGHT



Color	BLU/ WHT	WHT	BLU
Lo	○—○	○	
Hi	○	○—○	○

DIMMER SWITCH

Color	PNK/ WHT	LT BLU	ORN
FREE			
PUSH (LOCK)	○—○	○—○	○

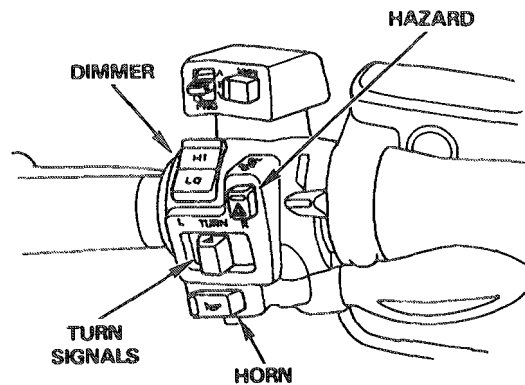
HAZARD SWITCH

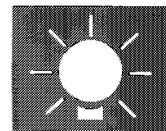
Color	WHT/ GRN	LT GRN
FREE		
PUSH	○—○	○

HORN SWITCH

Color	GRY	LT BLU	ORN	BRN/ WHT	ORN/ WHT	LT BLU/ WHT	A & SE ONLY				
							GRN	PNK	GRN	LT GRN/ WHT	
R	○—○	○		○—○	○—○	○	○—○	○	○		
L	○	○—○	○	○—○	○—○		○—○	○	○		
Push									○—○		

TURN SIGNAL SWITCH





Brake Light Switches

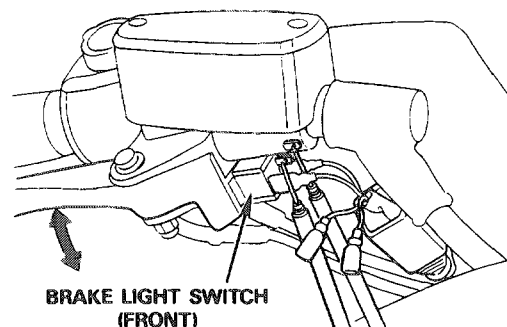
Front

Disconnect the front brake light 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 (see page 13-12).

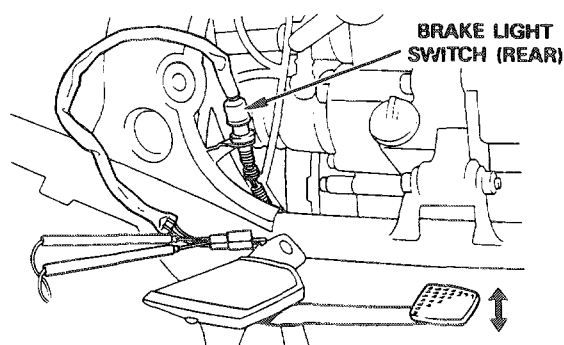
Disconnect the 2P-BLK connector from the connector holder behind the ignition control unit.

Check for continuity between connector terminals.

Brake pedal released: No continuity

Brake pedal applied: Continuity

For adjustment, refer to page 3-28.



Oil Pressure Switch

Inspection

If the oil pressure indicator light does not come on, inspect the "POWER TO PRESSURE SWITCH" line first, as follows:

Remove the under cover (see page 13-11).

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.

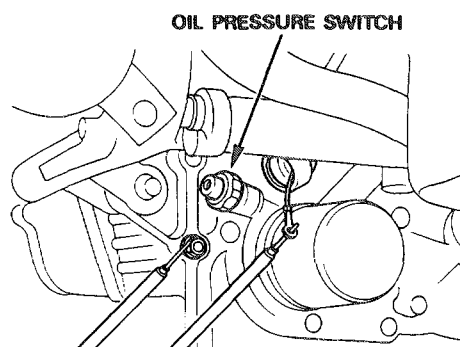
If voltage doesn't register, inspect as follows:

- indicator bulb.
- open or short circuit in wire harness.
- loose or poor contact of related connector.

If voltage registers; replace the oil pressure switch with a new one.

If the oil pressure indicator light stays on with the engine started, check oil pressure (see page 3-14).

If the oil pressure check is O.K., replace the oil pressure switch.



Lights/Switches/Instruments

Relay Box

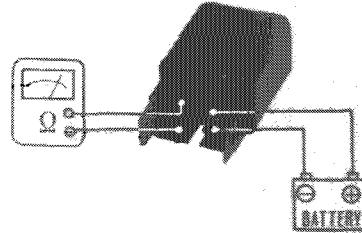
Continuity Inspection

Connect a 12 V battery as shown and check for continuity between the indicated terminals.

RELAY	Connect a battery	Disconnect a battery
1, 2, 3, and 4	YES	NO
7 (Position A & SE only)	NO	YES

YES: Continuity should exist.
NO: No continuity should exist.

BLU CONNECTOR
(ONLY RELAY 7)



Parking Diode

Inspection (A & SE only)

Remove the right saddlebag (see page 13-17).

Remove the parking diode (LT GRN/YEL & BRN) from the main wire harness.

NOTE

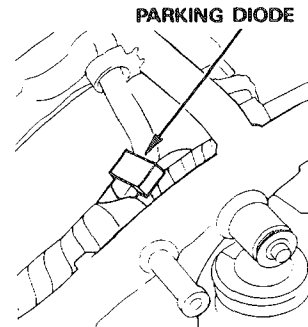
- This test chart is for a positive ground ohmmeter. The test results will be reversed if a negative ground ohmmeter is used.

Normal Direction: Continuity (About 15 ohms)

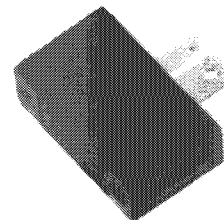
- + probe: (+) terminal
- probe: (-) terminal

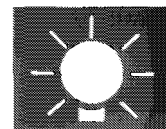
Reverse Direction: No Continuity

- + probe: (-) terminal
- probe: (+) terminal



PARKING DIODE



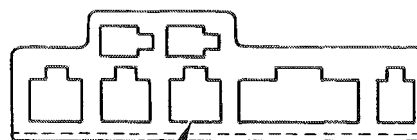


Self Cancelling Turn Signal System

Turn Signal Cancel Control Unit Inspection (A & SE only)

NOTE

- Be sure the-battery is fully charged.
- When inspecting this system, check the system components and lines step-by-step according to the troubleshooting chart on pages 19-6, 7, 8.
- Check that the sub fuses (2 and 8) are not blown.



6P-BRN CONNECTOR

Remove the left fairing lower cover (see page 13-12).

Disconnect the 6P-BRN connector from the connector holder on the left side 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 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

Lights/Switches/Instruments

Self Cancelling Turn Signal System (cont'd)

Turn Signal Relay Inspection

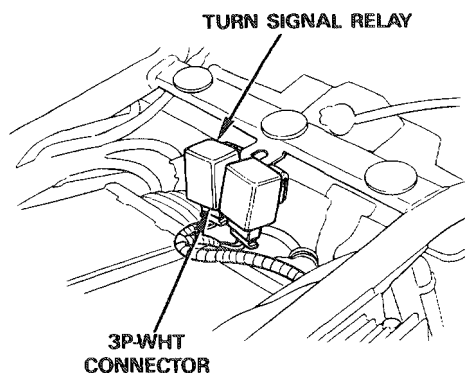
Remove the trunk (page 13-14).

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 the same color (GRY) 3P-WHT and 4P-WHT connectors.

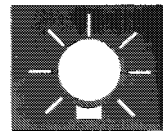
Continuity should exist at all times.



Measure voltage as follows:

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 the relay 3P-WHT connector connected to the relay.



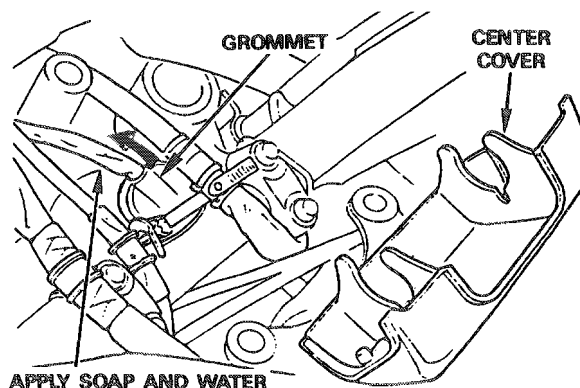
Turn Signal Cancel Control Unit Removal/Installation

Remove the handlebar center cover.

Slide the steering stem grommet to the wire harness side.

CAUTION

- Apply a small amount of soap and water solution to the turn signal cancel unit wire surface to slide the grommet smoothly.

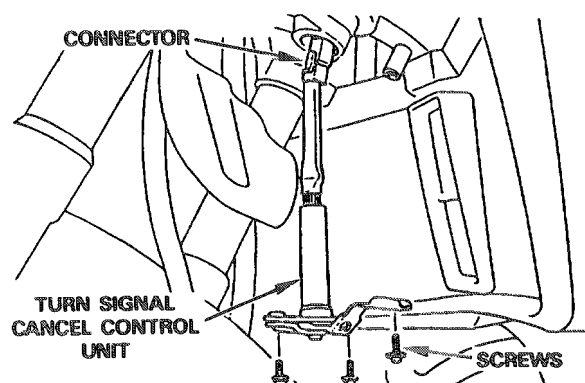


Remove the retaining screws. Move the turn signal cancel control unit enough to disconnect the unit connector.

NOTE

- If necessary, slide the steering stem grommet more.

Disconnect the turn signal cancel control unit connector and remove it.



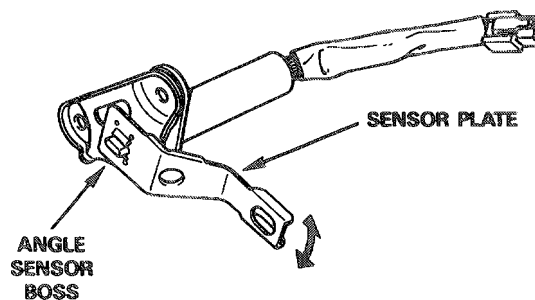
Make sure the angle sensor of the control unit rotates smoothly.

Check the angle sensor plate for damage. Check that plate is installed tightly against the sensor boss.

Install the plate in the reverse order of removal.

NOTE

- Make sure the retaining screws are tightened securely.



Lights/Switches/Instruments

Hazard Relay

Inspection

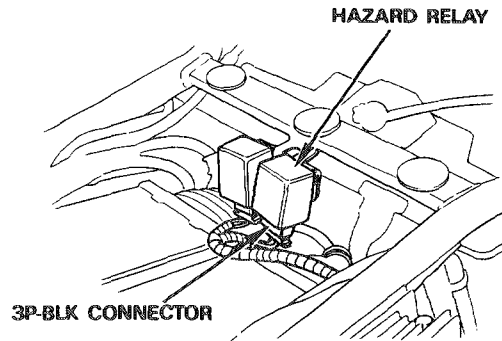
Remove the trunk (see page 13-14) and left fairing lower cover (see page 13-12).

Disconnect the 3P-BLK connector from the hazard relay.

Disconnect the 4P-WHT connector from the connector holder on the left cooling fan.

Check for continuity between the same color (PNK/WHT) 3P-BLK and 4P-WHT connectors.

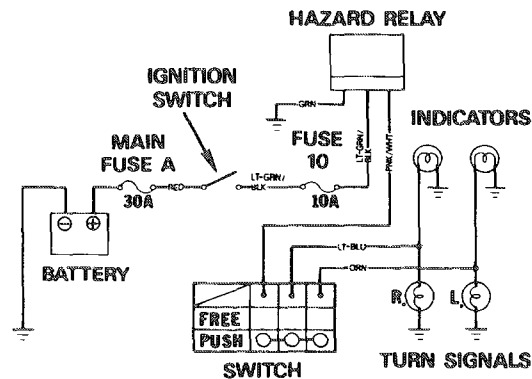
Continuity should exist at all times.



Measure voltage as follows:

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 the relay 3P-BLK connected to the relay.



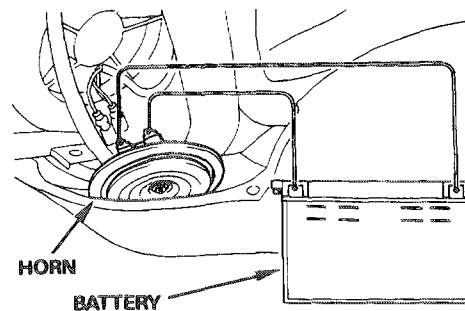
Horn

Inspection

Remove the fairing front cover.

Disconnect the horn wire connectors. 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.

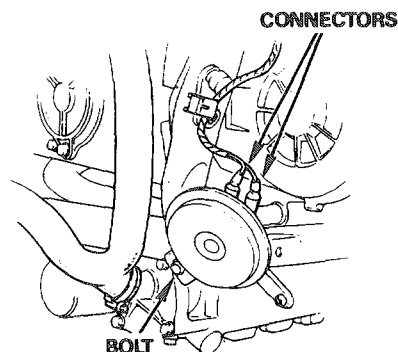


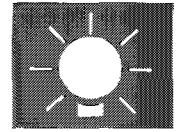
Replacement

Remove the under cover (see page 13-11).

Disconnect the horn wire connectors.

Remove the horn stay mounting bolt and horn.





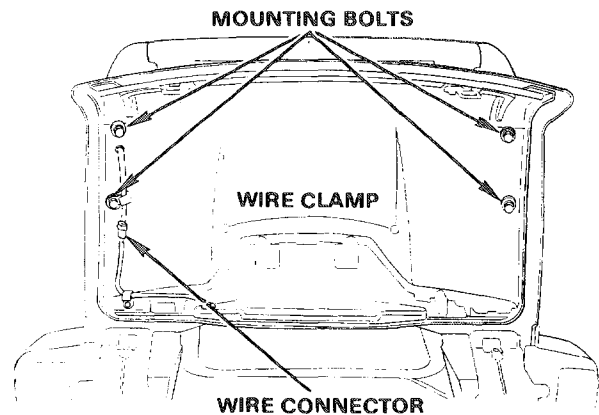
High Mount Accessory Light

Replacement (SE only)

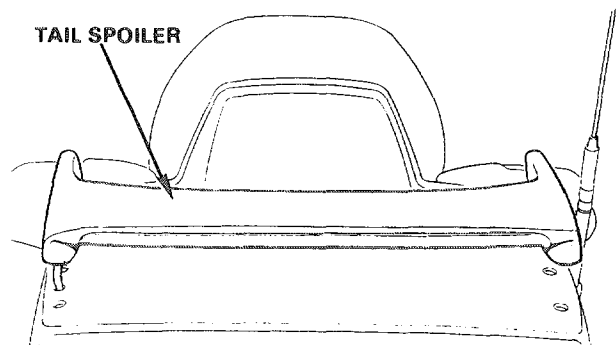
Open the trunk lid.

Disconnect the high mount accessory light wire connector.

Remove the four mounting bolts and the wire clamp.



Remove the tail spoiler from the trunk lid.

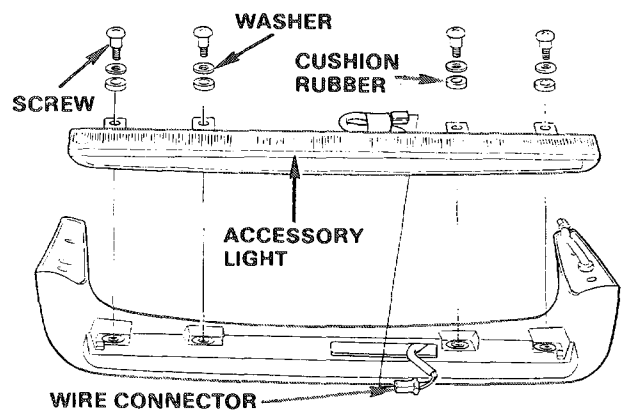


Remove the four screws, washers and rubber cushions.

Disconnect the wire connector and remove the high mount accessory light from the tail spoiler.

Install the high mount accessory light in the reverse order of removal.

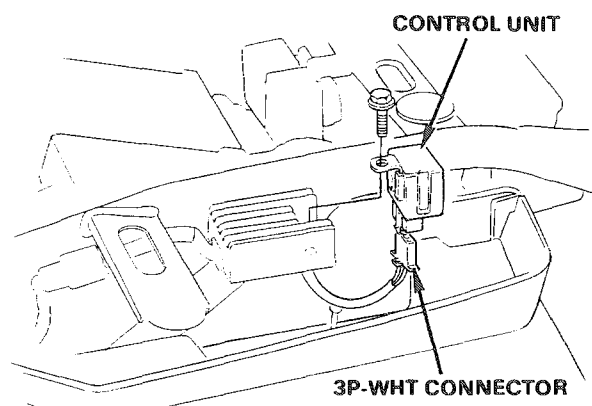
Torque: Mounting bolts 6 N-m (0.6 kg-m, 4 ft-lb)



Accessory Light Control Unit (SE only)

Remove the trunk (see page 13-14).

Remove the control unit from the frame and disconnect the 3P-WHT connector from the unit.

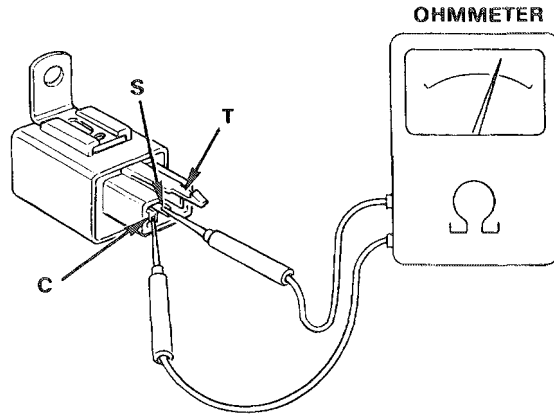


Lights/Switches/Instruments

High Mount Accessory Light (cont'd)

Check for continuity between the "C" and "S" terminals and between the "C" and "T" terminals.

Tester ⊕ probe	Tester ⊖ probe	Result
"C" Terminal	"S" Terminal	Continuity
"S" Terminal	"C" Terminal	No Continuity
"C" Terminal	"T" Terminal	Approx. 510Ω
"T" Terminal	"C" Terminal	No Continuity

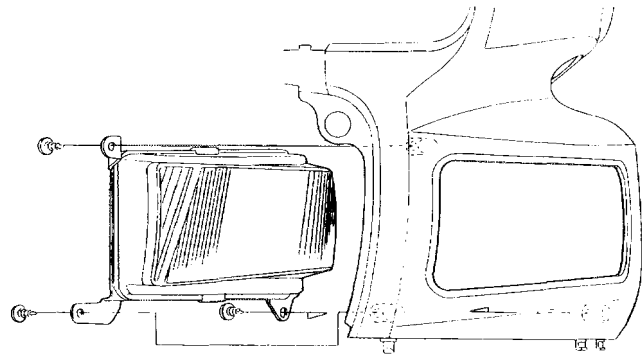


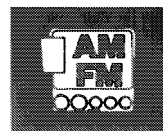
Cornering Light

Replacement (SE only)

Remove the fairing lower cover (see page 13-12).

Remove the three screws and the cornering light from the fairing lower cover.





Audio

Service Information	20-2
Troubleshooting	20-5
Speaker	20-14
Muting/Search Switch ..	20-14
CB Switch/Fader	
Control	20-15
Antenna	20-16
Radio & Cassette Deck .	20-17
CB Transceiver	20-21

Audio

Service Information

- This selection includes service information for the audio system.
- The radio model number is: A/SE model: RM-G30
I model: RM-G40
- When inspecting the audio system, check the system components and lines step-by-step, according to the troubleshooting chart.

NOTE

Before troubleshooting the audio system, check the following:

- Check AM radio reception by tuning to an AM station known to have a strong signal.
 - Check FM stereo reception by tuning to an FM stereo station known to have a strong signal. If no strong FM stereo signal is available, tune to your own voice by using an FM stereo microphone connected to the FM radio.
 - Check that the cassette deck tape heads are clean. (A and SE models)
 - Listen to a cassette tape known to be good. (A and SE models)
 - Inspect the following fuses inside the fuse box:
 - A & SE models: fuse 10 (10 A)
fuse 13 (5 A)
 - I model: fuse 9 (5 A)
fuse 10 (10 A)
-

- Tape Player Maintenance (A and SE models):

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, periodically clean the head with a commercially available cleaning cassette. As preventive maintenance, clean the head about every 30 hours of use. If preventive maintenance is delayed until the head becomes very dirty (noticeably poor sound), it may not be possible to remove all deposits with a simple cleaning cassette.

NOTE

- Failure to store cassettes in their cases or touching the magnetic tape with the fingers will increase the amount of dirt that gets to the tape head. Using low-quality "off-brand" tape will increase the amount of tape deposits that get on the head. Eventually, such practices may lead to damage of the head and playing mechanism.
 - All memorized radio channels are erased when the battery is removed. Upon reconnecting the battery, the following channels will be set automatically.
-

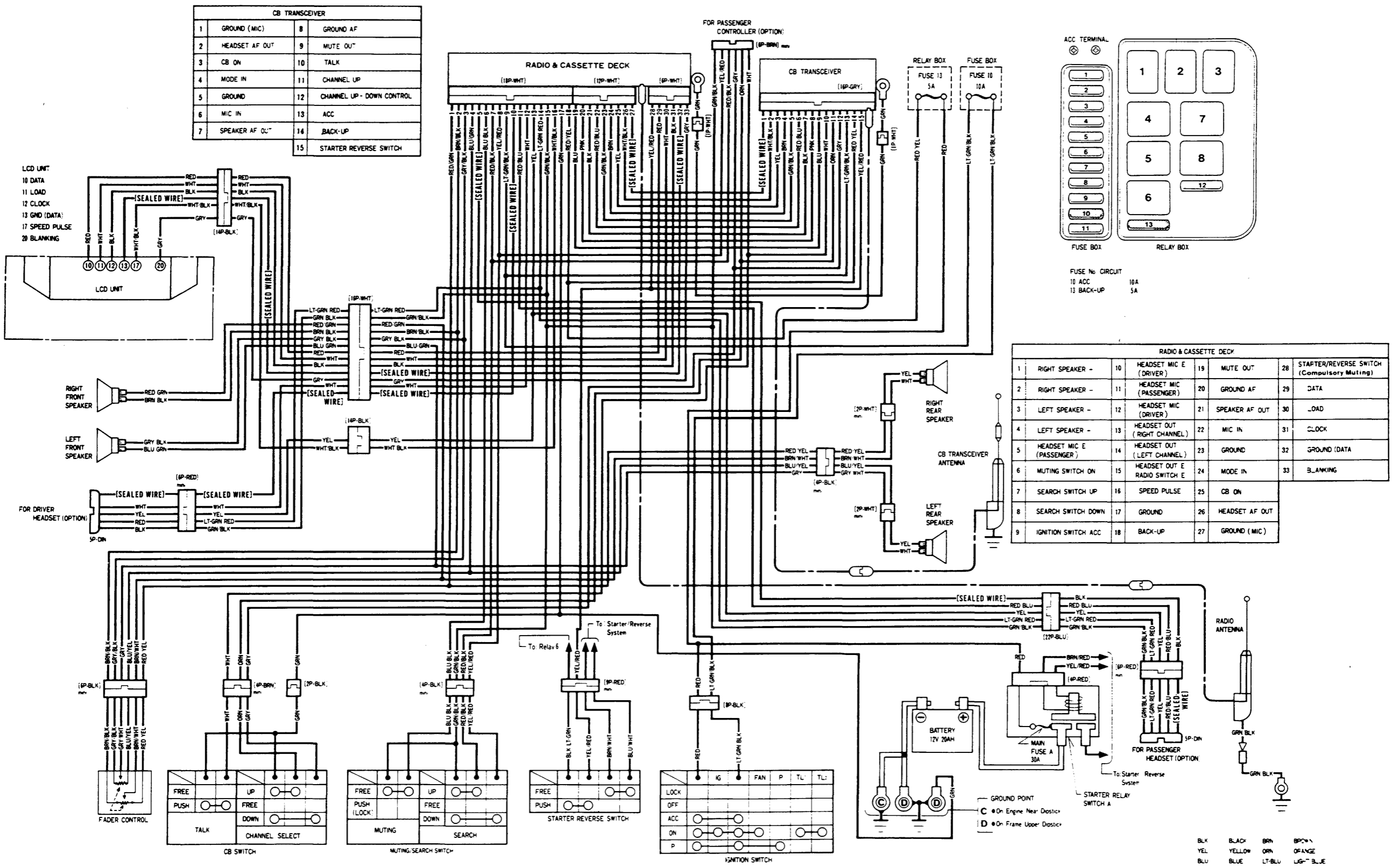
Channels	AM (kHz)	FM (MHz)
1	530	87.5
2	600	90.1
3	1000	98.1
4	1400	106.1
5	1620	107.9
6	530 (I:1710)	87.5

- A and SE models: 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.

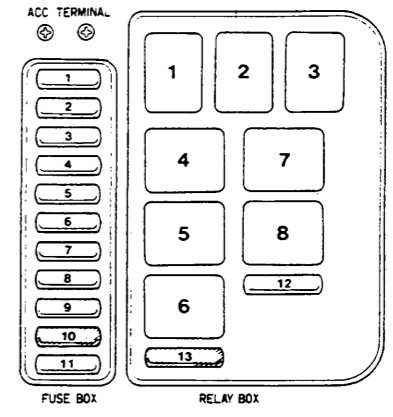
NOTE

- AMB is usable for both tape and FM stereo programs. The ambience circuit should not be used for the following:
 1. mono recorded tape
 2. AM radio signals
 3. weak FM stereo signals
 4. FM stereo signals interfered with by mountains or buildings.
-

**Circuit Diagram
A & SE Models:**



CB TRANSCEIVER			
1	GROUND (MIC)	8	GROUND AF
2	HEADSET AF OUT	9	MUTE OUT
3	CB ON	10	TALK
4	MODE IN	11	CHANNEL UP
5	GROUND	12	CHANNEL UP - DOWN CONTROL
6	MIC IN	13	ACC
7	SPEAKER AF OUT	14	BACK-UP
		15	STARTER REVERSE SWITCH

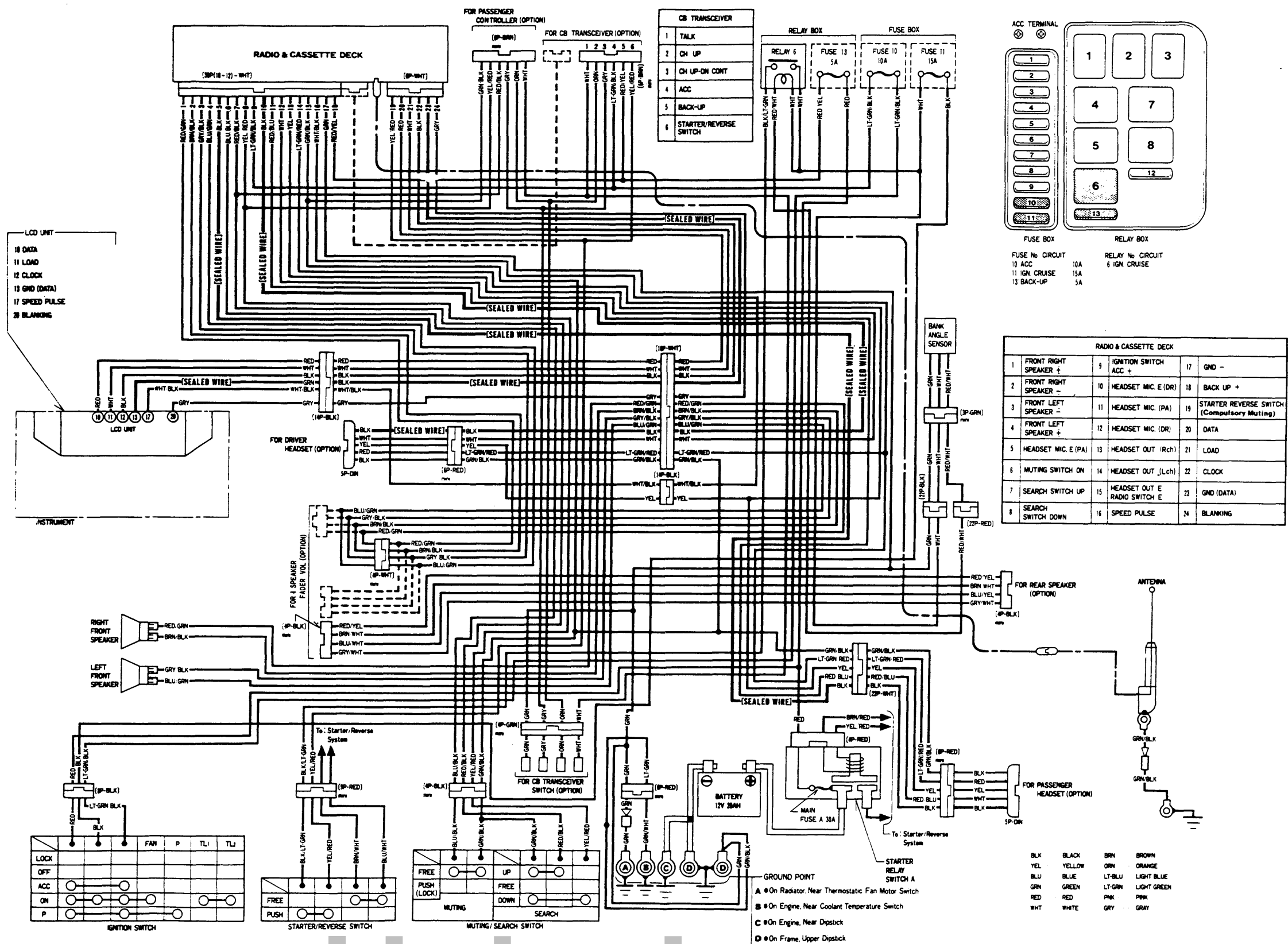


FUSE No CIRCUIT
10 ACC 10A
13 BACK-UP 5A

RADIO & CASSETTE DECK					
1	RIGHT SPEAKER -	10	HEADSET MIC E (DRIVER)	19	MUTE OUT
2	RIGHT SPEAKER -	11	HEADSET MIC (PASSENGER)	20	GROUND AF
3	LEFT SPEAKER -	12	HEADSET MIC (DRIVER)	21	SPEAKER AF OUT
4	LEFT SPEAKER -	13	HEADSET OUT (RIGHT CHANNEL)	22	MIC IN
5	HEADSET MIC E (PASSENGER)	14	HEADSET OUT (LEFT CHANNEL)	23	GROUND
6	MUTING SWITCH ON	15	HEADSET OUT E RADIO SWITCH E	24	MODE IN
7	SEARCH SWITCH UP	16	SPEED PULSE	25	CB ON
8	SEARCH SWITCH DOWN	17	GROUND	26	HEADSET AF OUT
9	IGNITION SWITCH ACC	18	BACK-UP	27	GROUND (MIC)
				28	STARTER/REVERSE SWITCH (Compulsory Muting)
				29	DATA
				30	LOAD
				31	CLOCK
				32	GROUND (DATA)
				33	BLANKING

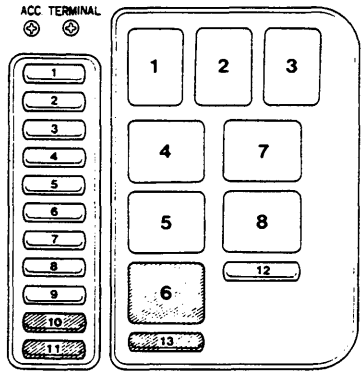
BLK BLACK BRN BROWN
YEL YELLOW ORN ORANGE
BLU BLUE LT-BLU LIGHT BLUE
GRN GREEN LT-GRN LIGHT GREEN
RED RED PNK PINK
WHT WHITE GRY GRAY

**Circuit Diagram
SE Model:**



CB TRANSCEIVER

1	TALK
2	CH UP
3	CH UP-DN CONT
4	ACC
5	BACK-UP
6	STARTER/REVERSE SWITCH



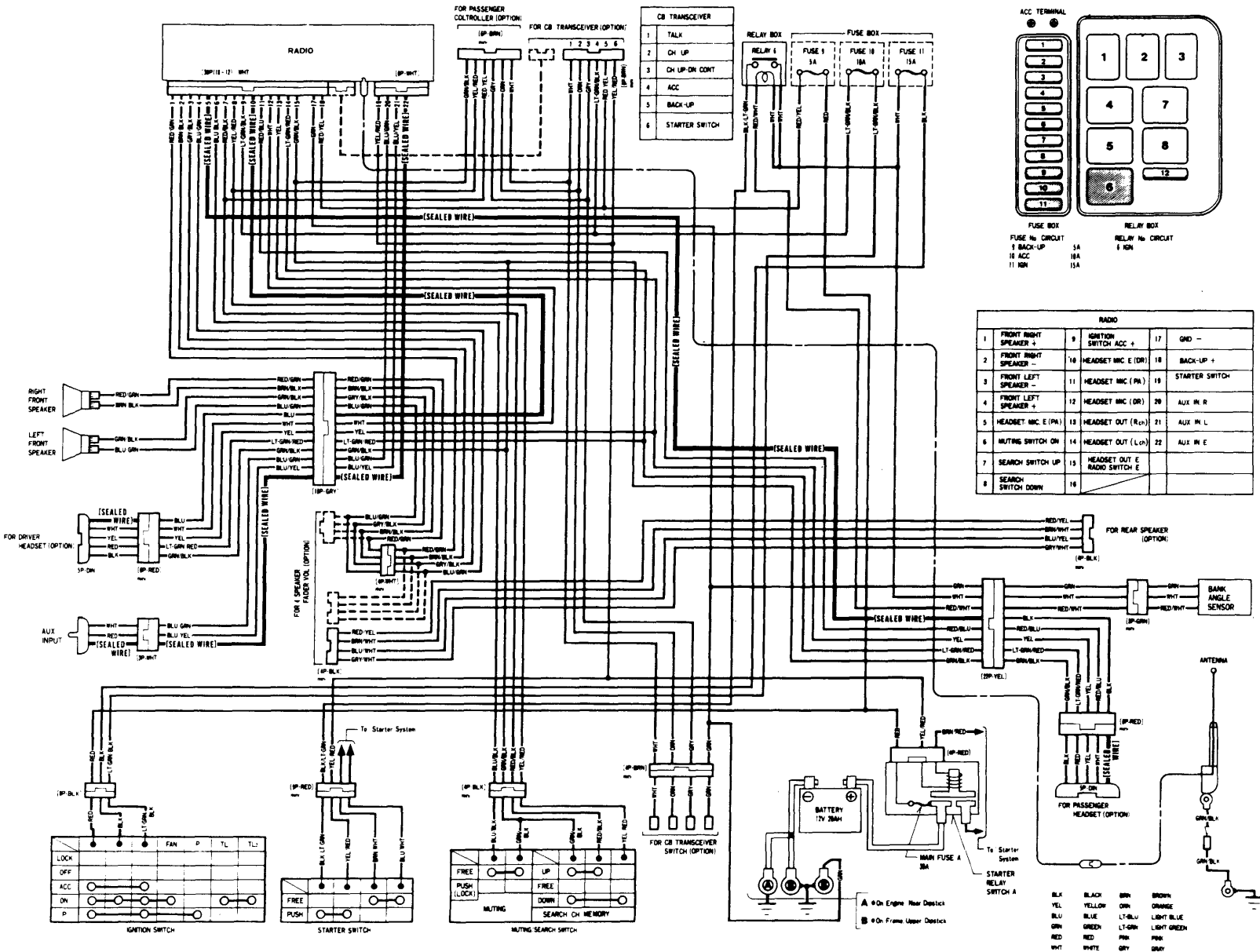
FUSE No	CIRCUIT	RELAY No	CIRCUIT
10	ACC	10A	IGN CRUISE
11	IGN CRUISE	15A	IGN CRUISE
13	BACK-UP	5A	

RADIO & CASSETTE DECK

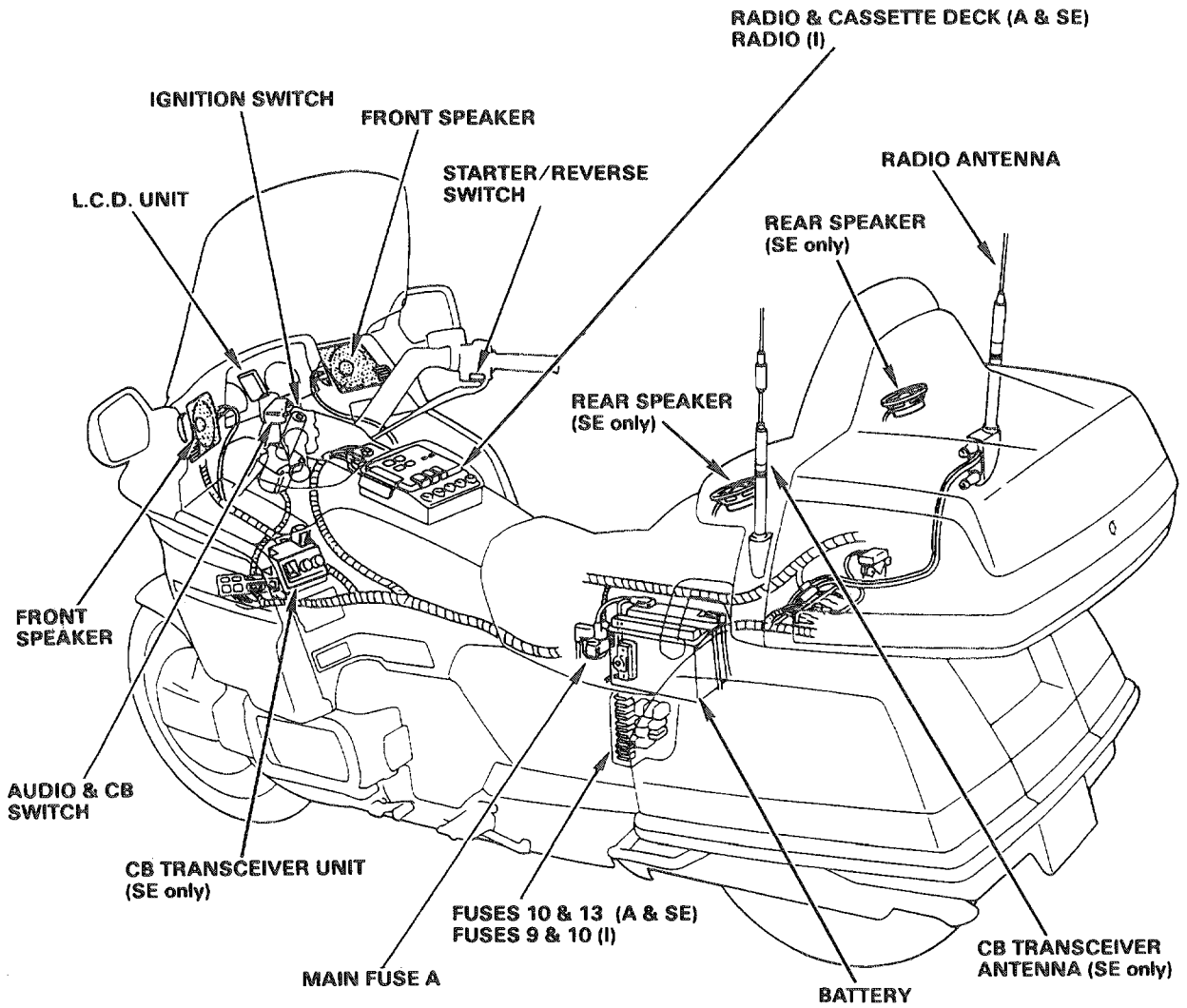
1	FRONT RIGHT SPEAKER +	9	IGNITION SWITCH ACC +	17	GND -
2	FRONT RIGHT SPEAKER -	10	HEADSET MIC. E (DR)	18	BACK UP +
3	FRONT LEFT SPEAKER -	11	HEADSET MIC. (PA)	19	STARTER REVERSE SWITCH (Compulsory Muting)
4	FRONT LEFT SPEAKER +	12	HEADSET MIC. (DR)	20	DATA
5	HEADSET MIC. E (PA)	13	HEADSET OUT (Rch)	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

Circuit Diagram

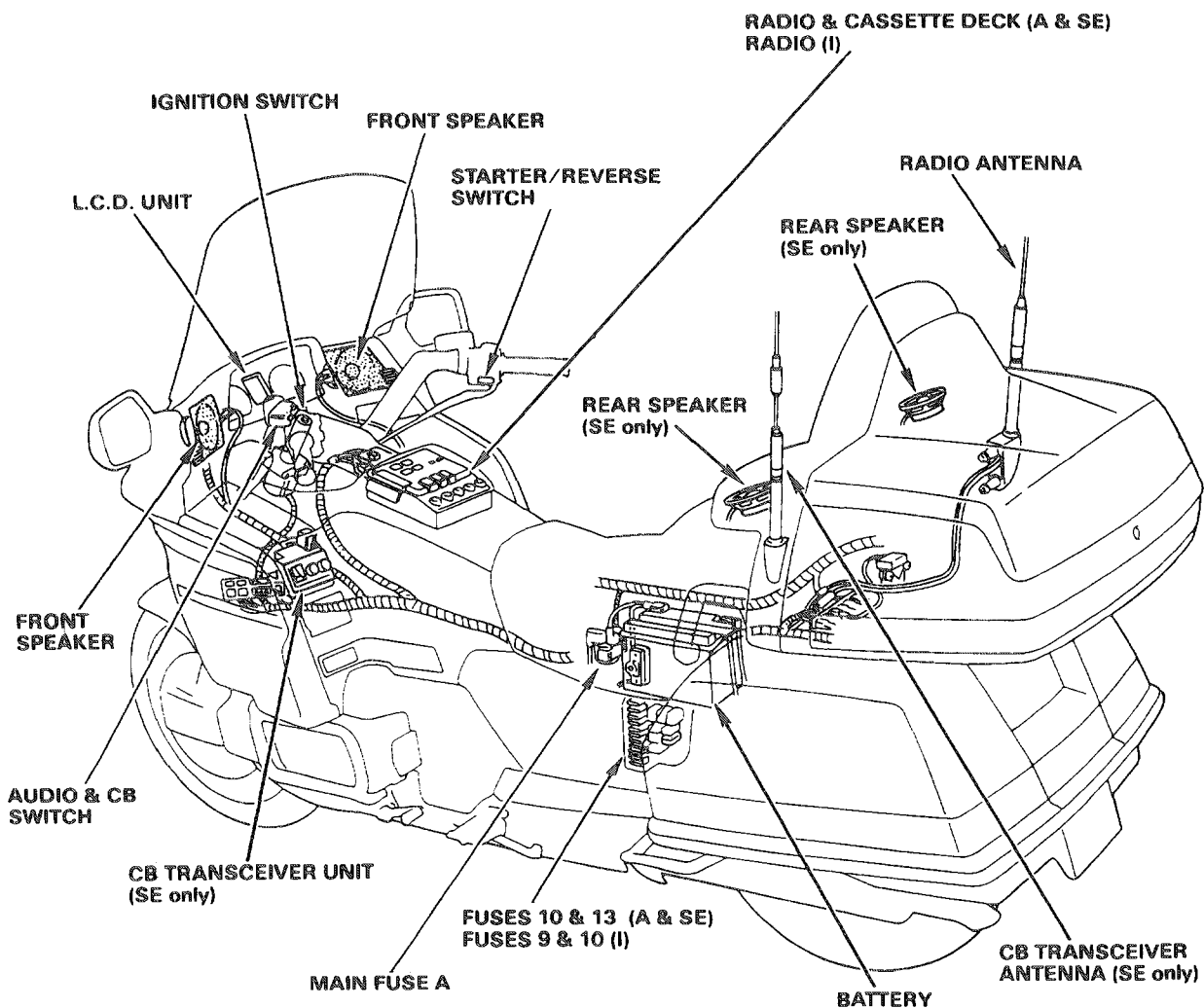
I Model:



Audio System Location



Audio System Location





Troubleshooting

Audio System

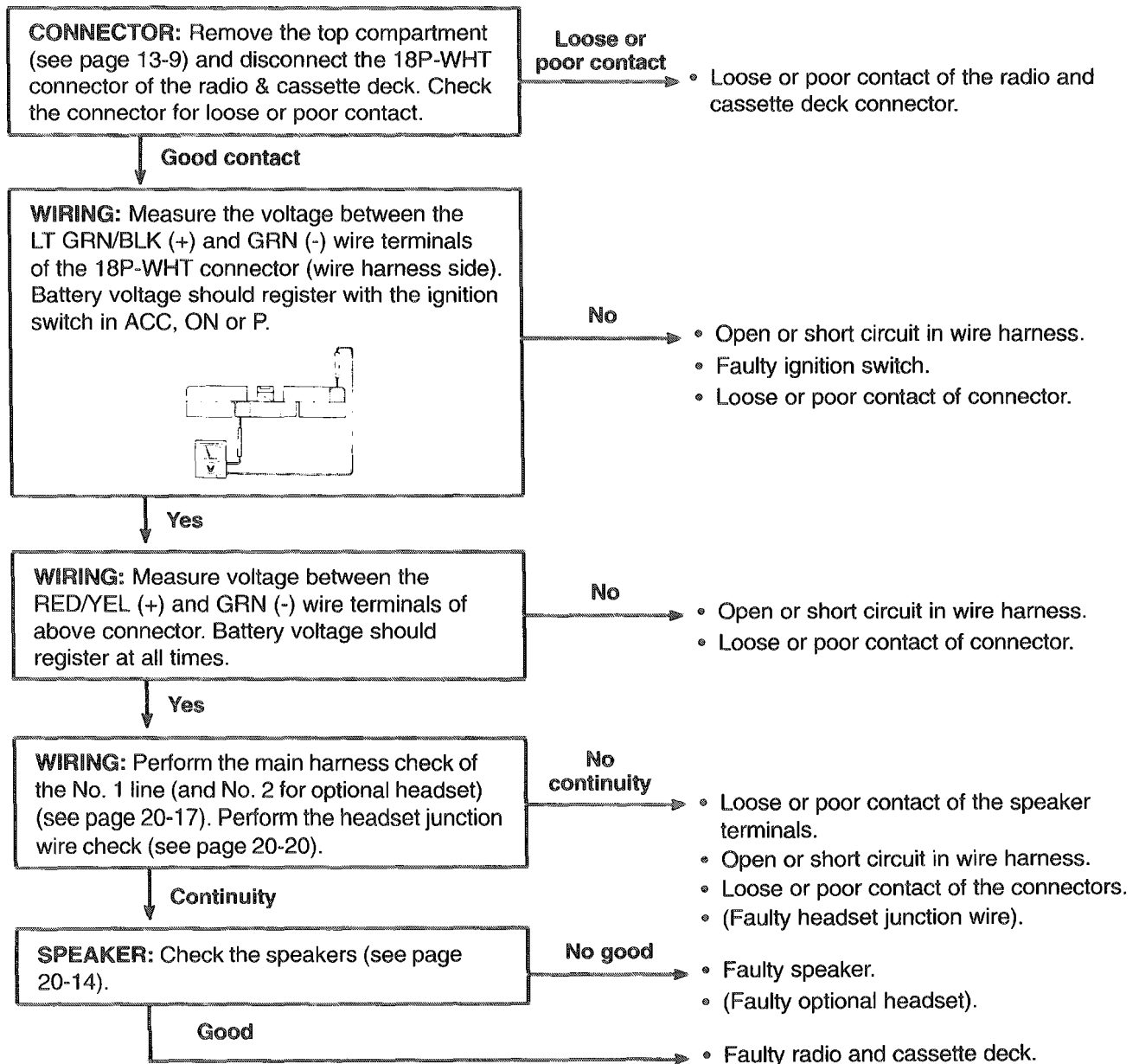
NOTE

- Before troubleshooting the audio system, be sure the following fuses (inside the fuse box) are good:
 A & SE models: fuse 10 (10A) I model: fuse 9 (5A)
 fuse 13 (5 A) fuse 10 (10 A)

Speakers (optional headsets): No sound.

NOTE

- If you use the speakers, select the speaker with the Headset/Speaker Mode Button (I model: knob). The display will indicate " " (speaker).



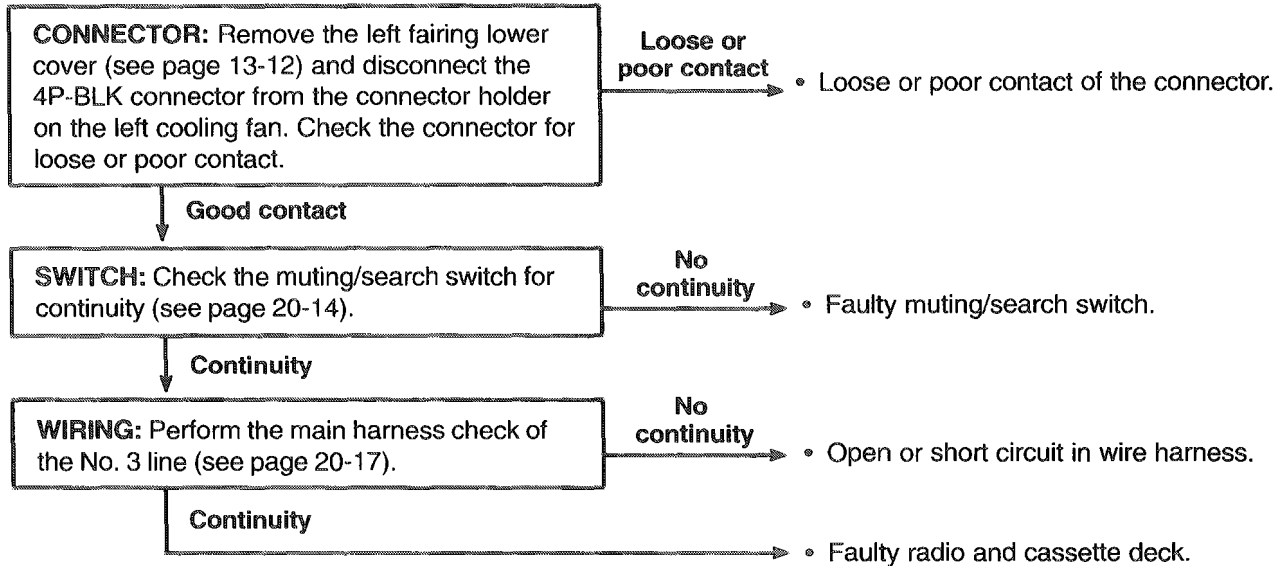
Audio

Troubleshooting (cont'd)

Radio and cassette deck work, but do not search or mute with the muting/search switch.

NOTE

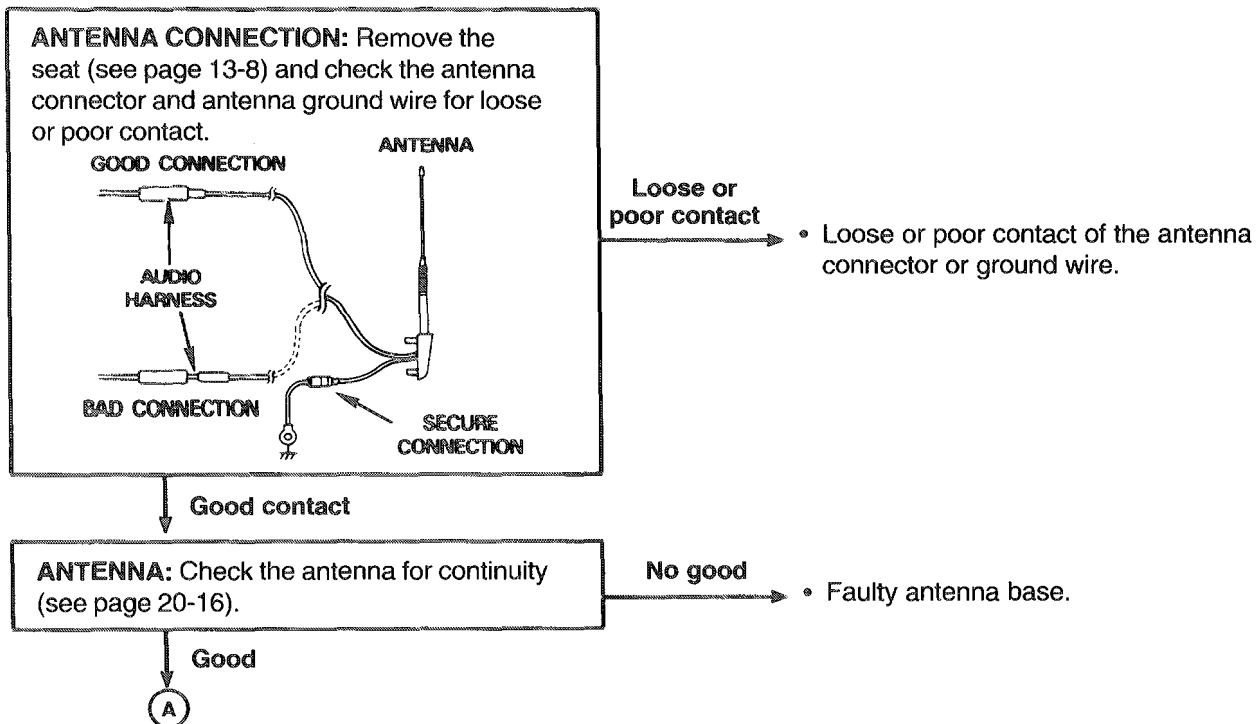
- To play the radio on the A and SE models, push the radio/cassette switch. It should be in the RADIO mode with the display indicating "AM" or "FM".

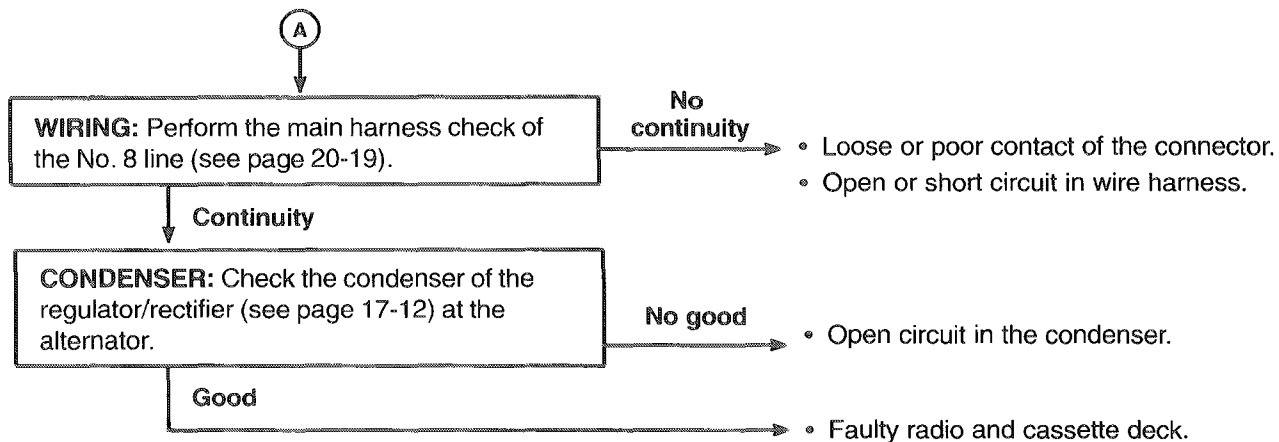


Weak (or noisy) reception

NOTE

- Use of the ambience (AMB) circuit may cause weak FM signals (A and SE models only).
- 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.

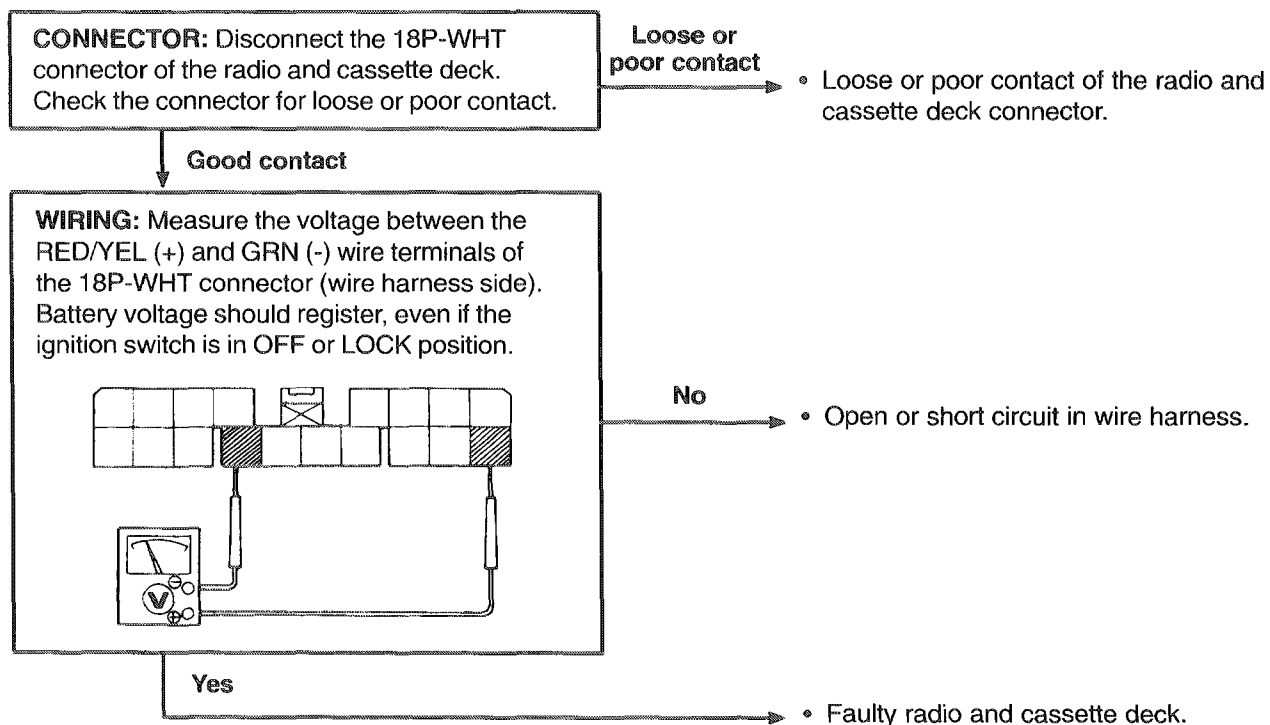




Radio cuts out and loses memory while riding.

NOTE

- If you remove the battery, all memorized channels will be erased. Upon reconnecting the battery, certain channels will be automatically (see SERVICE INFORMATION).



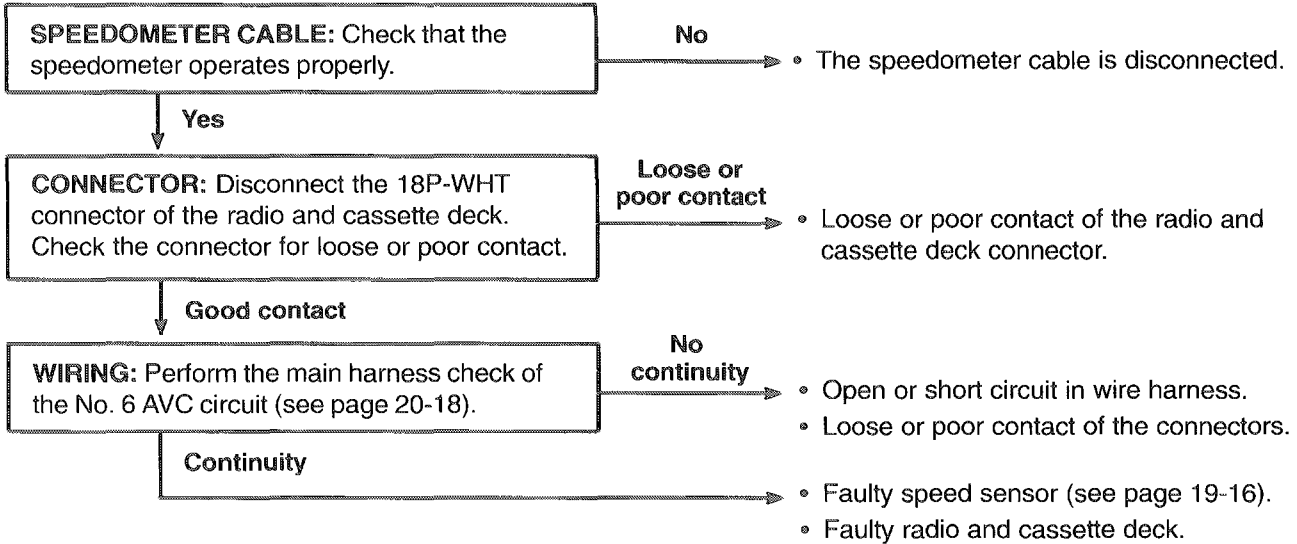
The radio and cassette deck display does not appear on the L.C.D. unit (A and SE models).

- See page 19-11.

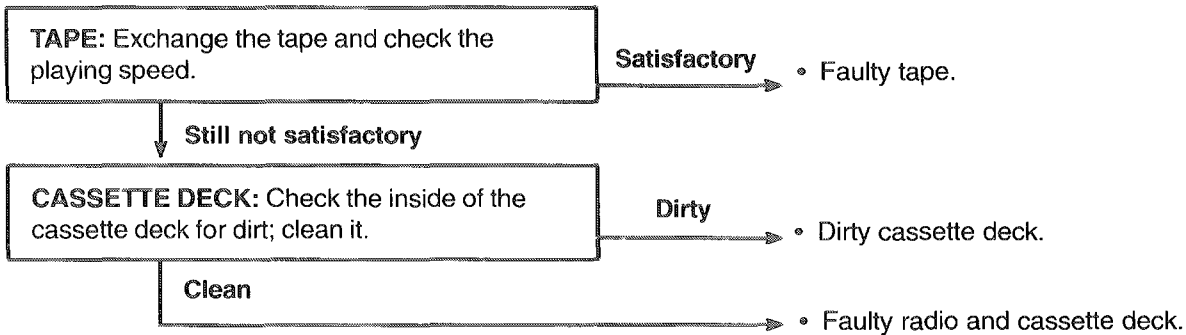
Audio

Troubleshooting (cont'd)

AVC (Auto Volume Control) does not work at all (A and SE models).



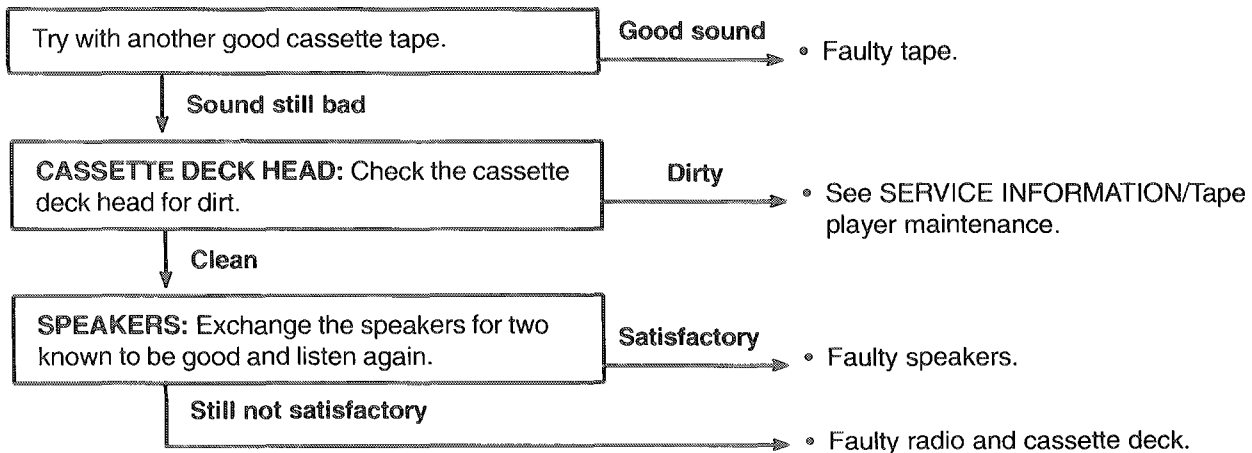
Uneven tape speed (A and SE models).



Unsatisfactory cassette deck sound (A and SE models).

NOTE

- Use of the ambience (AMB) circuit may cause poorly recorded tapes to sound worse.



Radio works, but cassette deck does not work at all (A and SE models).

- Faulty radio and cassette deck.

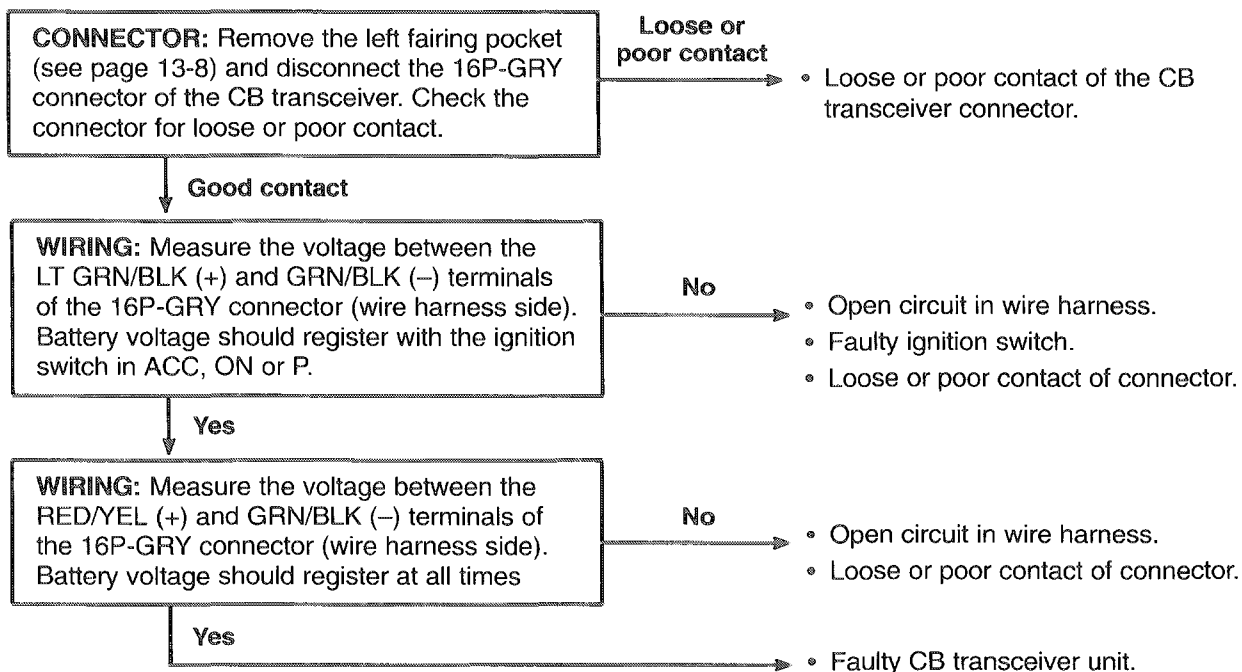


CB Transceiver System

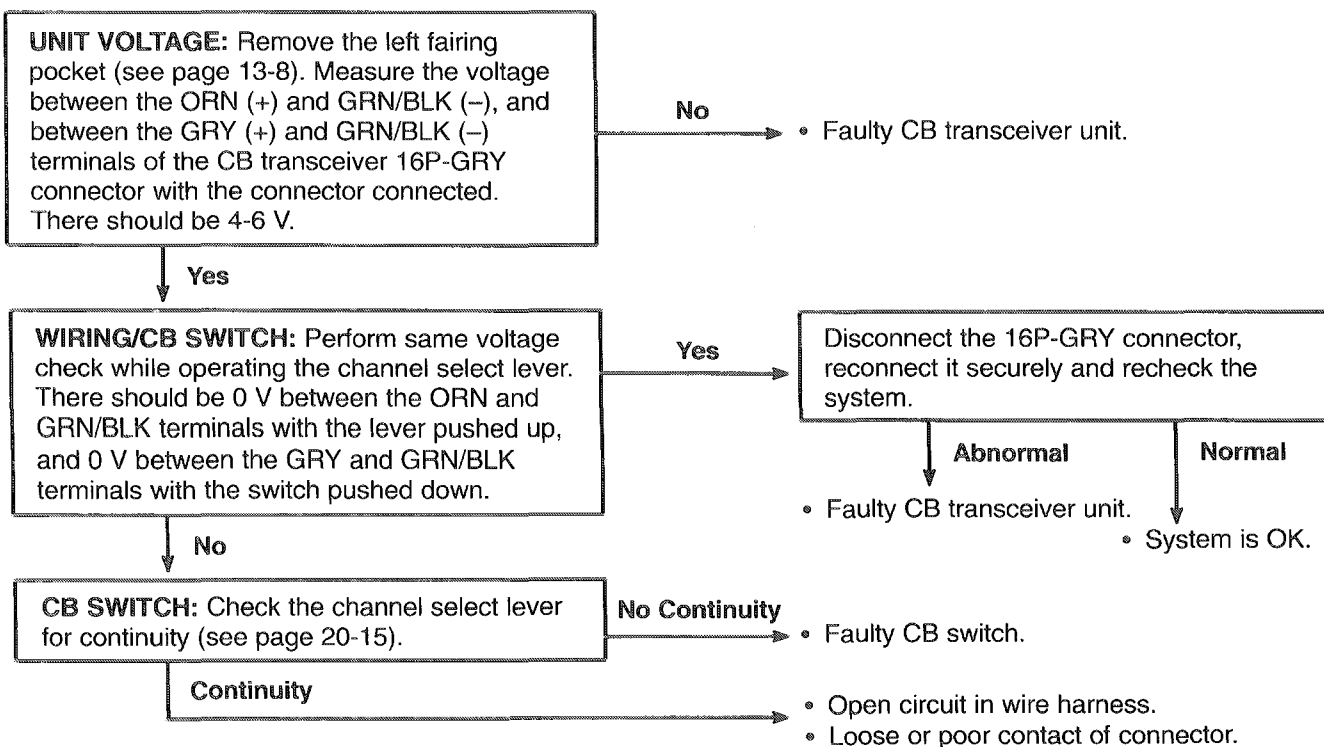
NOTE

- Before troubleshooting the CB transceiver system, be sure that fuse 10 (10A) – inside the fuse box, and fuse 13 (5A) – inside the relay box, are good.

CB transceiver does not turn on or channels are not memorized.



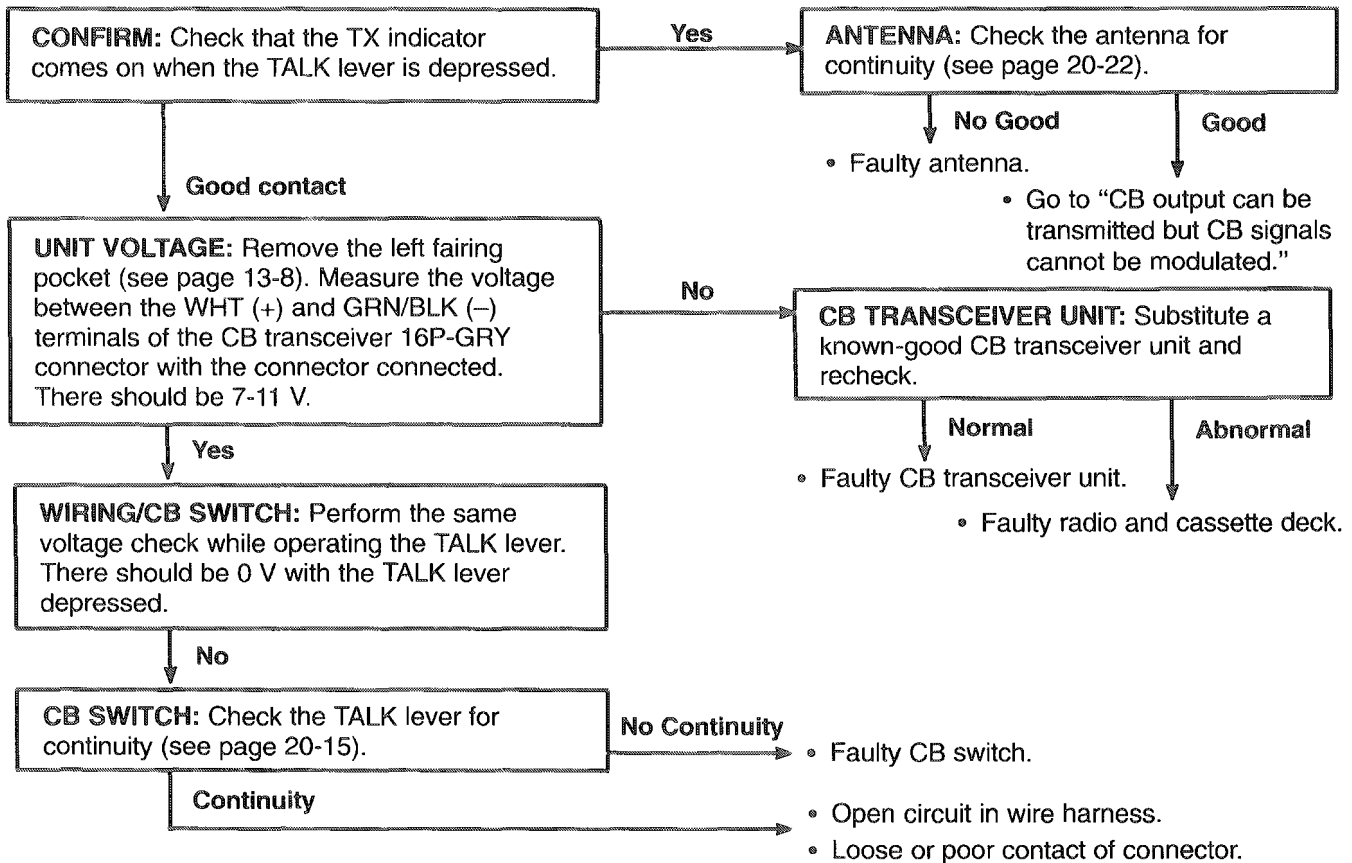
Channel cannot be changed.



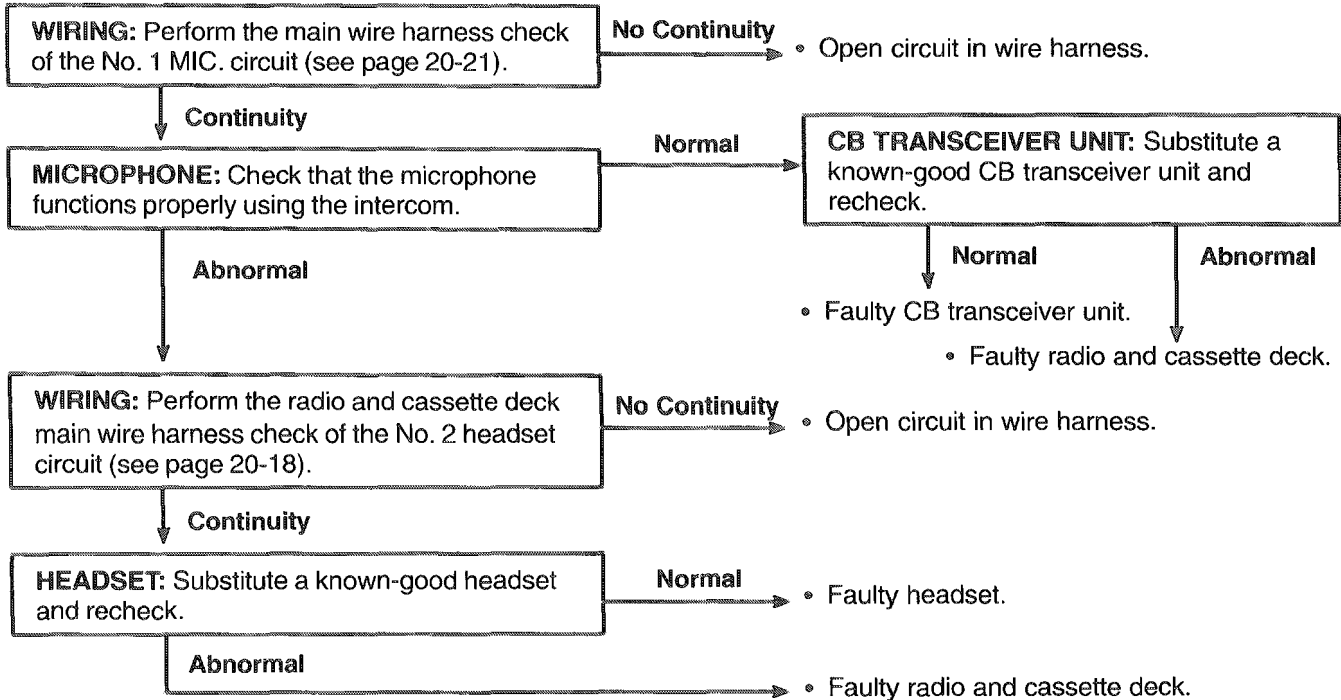
Audio

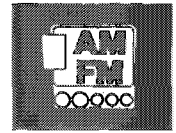
Troubleshooting (cont'd)

CB output cannot be transmitted.



CB output can be transmitted, but CB signals cannot be modulated.

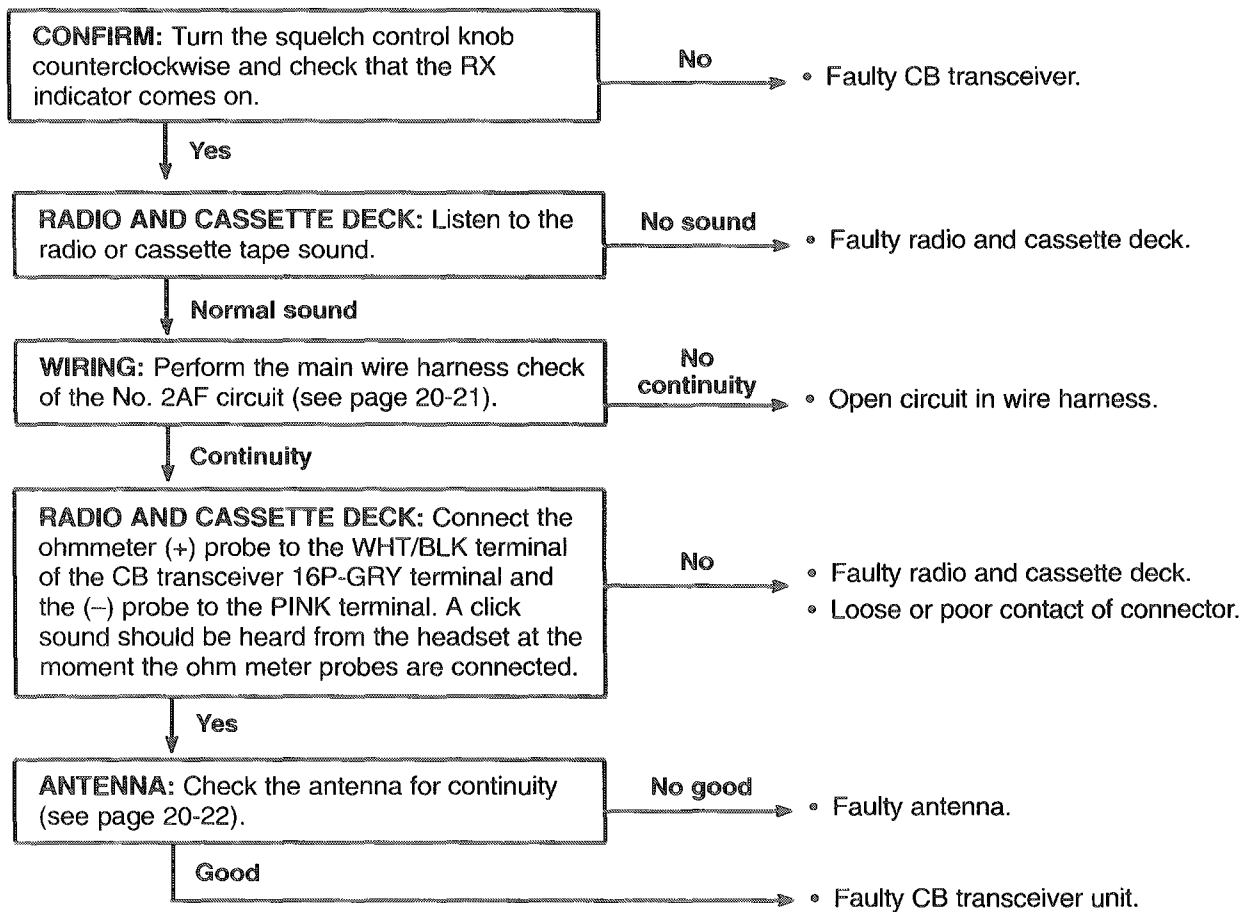




No reception or no radio and cassette sound.

NOTE

- When the squelch control knob is turned all the way counterclockwise, the CB radio is most sensitive and the RX indicator comes on. When the knob is turned clockwise, the background noise disappears and the RX indicator goes out.



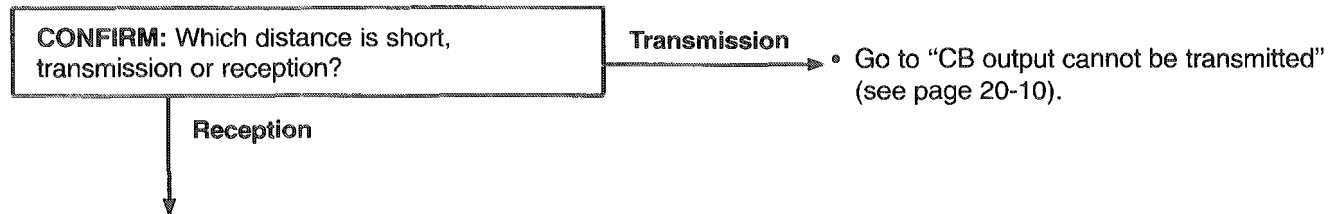
Audio

Troubleshooting (cont'd)

Communication distance is short.

NOTE

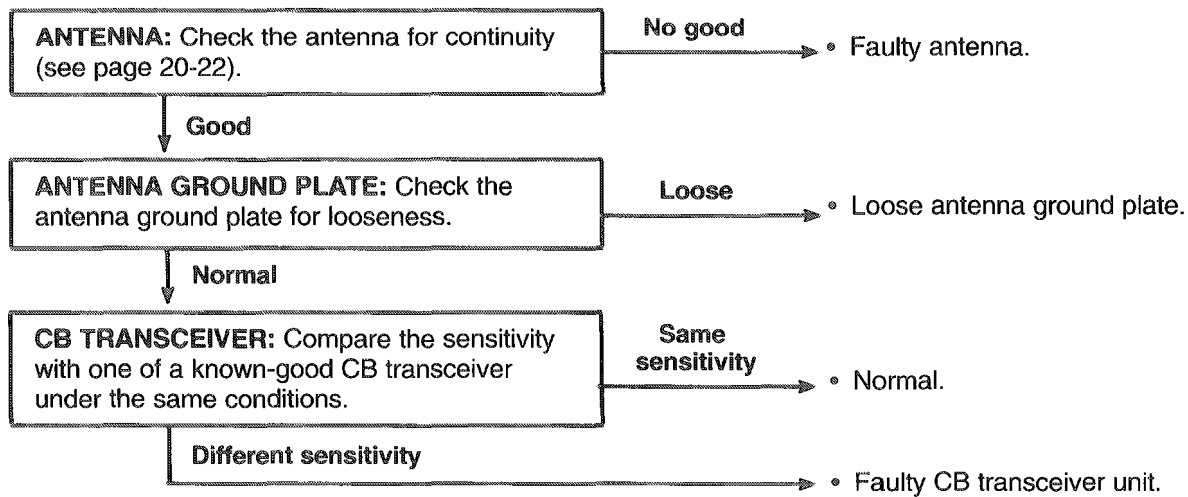
- The CB signals may be affected by jamming or interference. Try using an open channel.
 - The CB signals are interfered with by mountains or buildings.
-

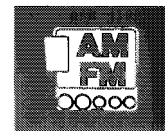


Too much noise or bad sensitivity.

NOTE

- The CB signals may be affected by jamming or interference. Try using an open channel.
 - The CB signals are interfered with by mountains or buildings.
-

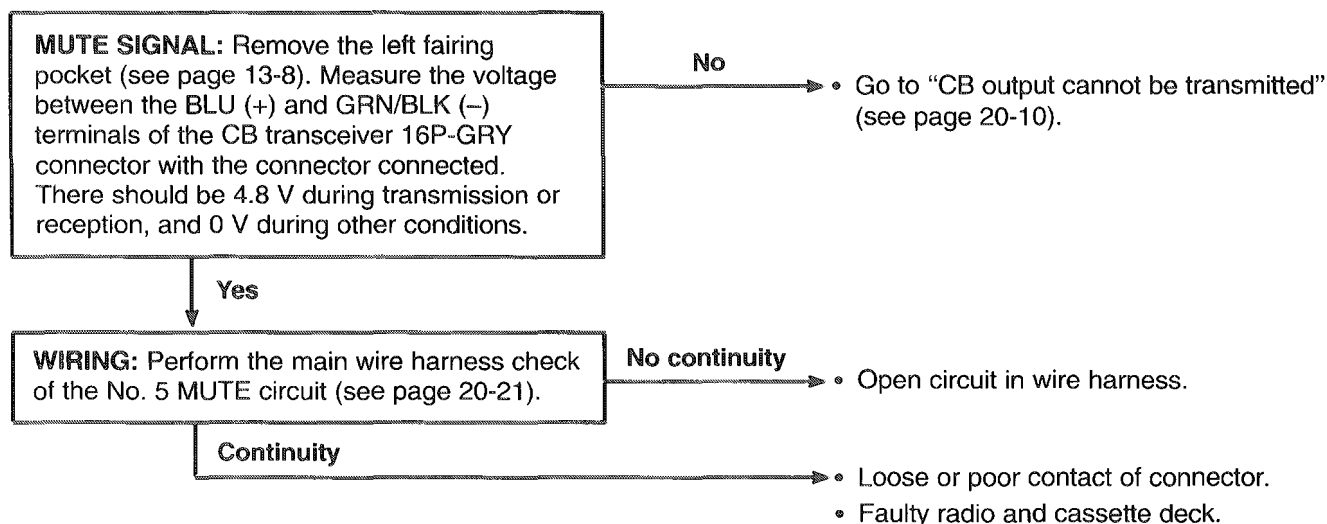




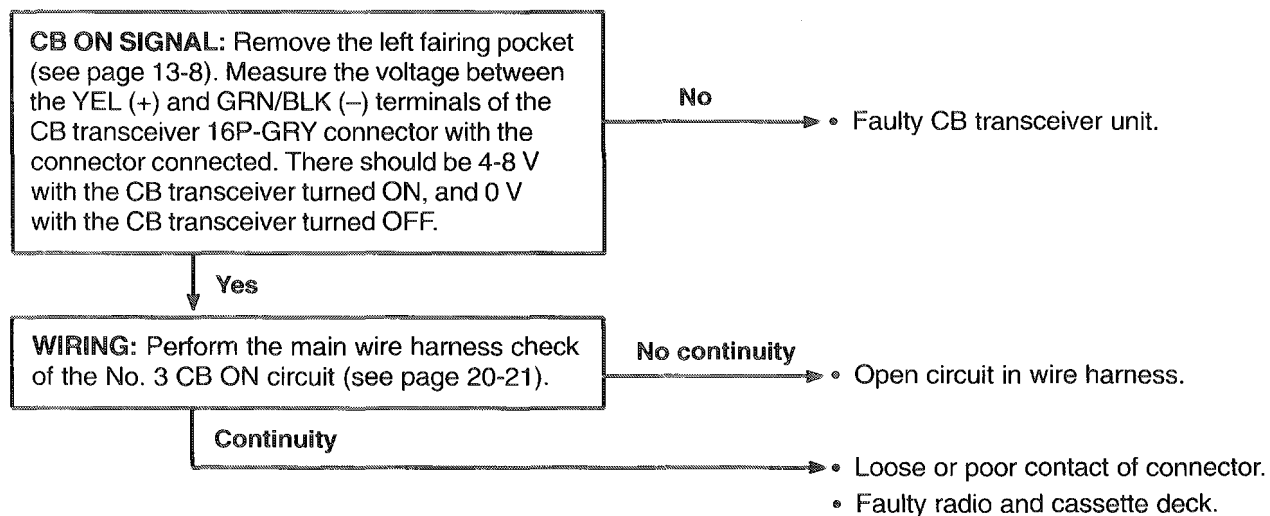
Radio/cassette sound does not mute during CB signal transmission or reception.

NOTE

- The automatic switch-over will only function when the radio/cassette deck and the CB transceiver are in the same listening mode (headset or speaker).



CB output cannot be transmitted or CB signals cannot be modulated with the radio and cassette deck turned OFF.



Audio

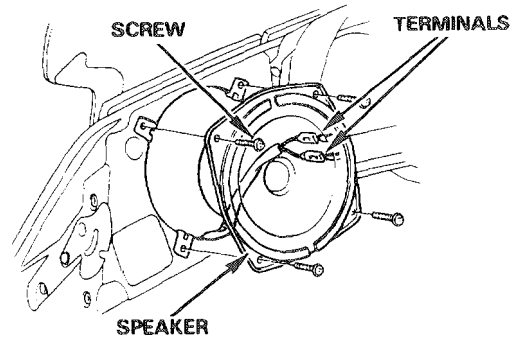
Speaker

Removal

Front: Remove the instrument panel (see page 13-11).
Rear (SE only): Remove the trunk side pocket (see page 13-15, 16).

Remove the four screws and speaker.

Disconnect the speaker terminals and remove the speaker.



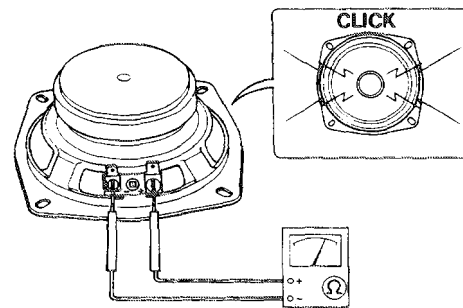
Inspection

Connect an ohmmeter to the speaker terminals as shown.

NOTE

- Select the smallest range on the ohmmeter.

The speaker is normal if it clicks at the moment the ohmmeter probes are connected to the speaker terminals.



Installation

Install the speaker in the reverse order of removal.

NOTE

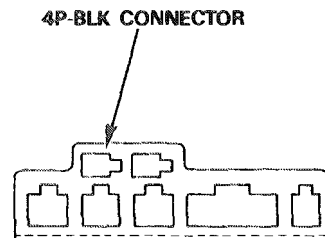
- Connect the RED/GRN wire (R ch) and BLU/GRN wire (L ch) to the front speaker (+) terminals.
- Speaker terminals location is shown above.

Muting/Search Switch

Inspection

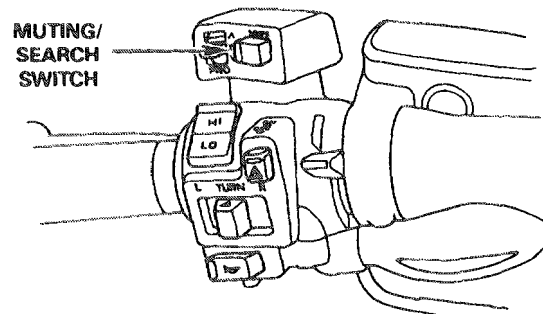
Remove the left fairing lower cover (see page 13-12).

Disconnect the 4P-BLK connector from the connector holder on the left cooling fan.



Continuity should exist between the color coded wires as indicated in chart below.

COLOR	BLU/BLK	GRN/BLK	RED/BLK	YEL/RED
FREE	○—○	UP	○—○	
PUSH LOCK		FREE		
MUTING		DOWN	○—○	○—○
		SEARCH		





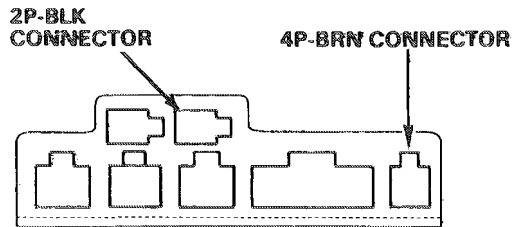
CB Switch/Fader Control (SE only)

Remove the left fairing lower cover (see page 13-12).

CB Switch — Talk/Channel Select Levers:

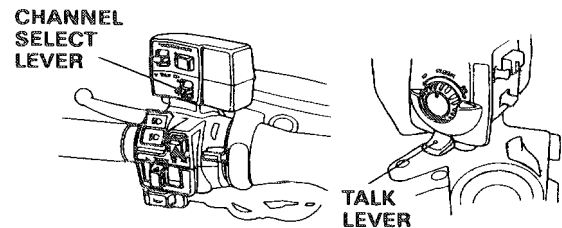
Disconnect the 4P-BRN connector from the connector holder on the left cooling fan.

Disconnect the 2P-BLK connector.



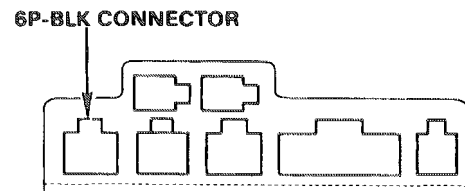
Continuity should exist between the color coded wires as indicated in the chart below.

COLOR	WHT	GRN	ORN	GRY
FREE		UP	○ — ○	
PUSH	○ — ○	FREE		
TALK		DOWN	○ — ○	○ — ○
		CHANNEL SELECT		



Fader Control:

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.

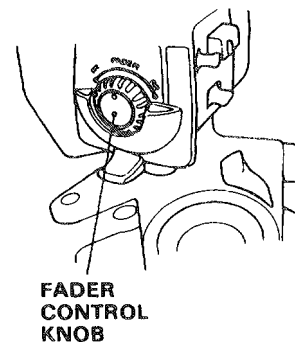
Standard Resistance:

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



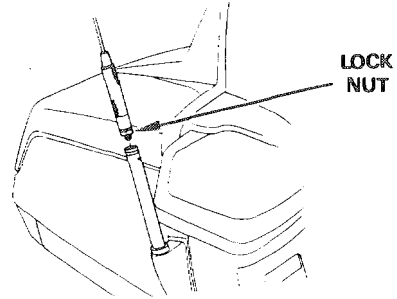
Audio

Antenna

Antenna Removal

Loosen the lock nut and remove the antenna from the antenna base.

Check the antenna for damage.



Inspection

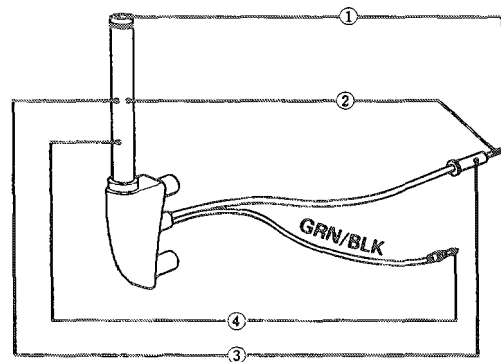
Remove the seat (see page 13-8).

Disconnect the antenna connector and antenna ground wire (GRN/BLK).

Check the antenna base for continuity, as shown. Replace, if necessary.

Normal:

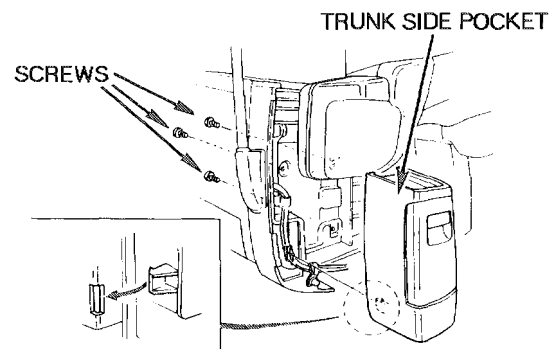
- | | |
|------------------|---------------|
| 1: Continuity | 3: Continuity |
| 2: No Continuity | 4: Continuity |



Antenna Base Replacement

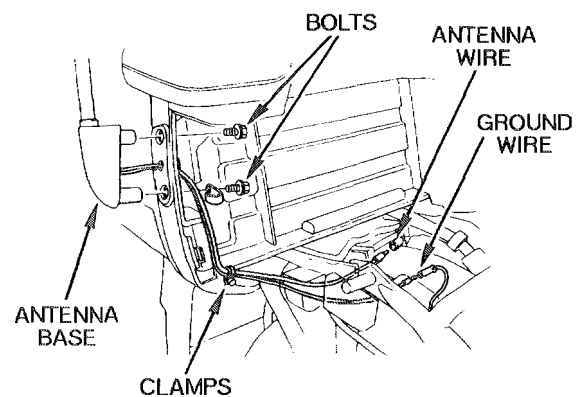
Remove the right trunk side pocket by removing the three attaching screws.

SE only: Remove the left trunk side pocket to access the CB transceiver antenna base.



Release the antenna wires from the clamp. Remove the bolts, clamp and antenna base from the trunk.

Install the antenna base and antenna in the reverse order of removal.





Radio and Cassette Deck

Main Wire Harness Check

Remove the top compartment (see page 13-9) and disconnect the 18P-WHT connector, 6P-WHT connector, and antenna connector.

Check the connectors for loose or poor contact, or corroded terminals.

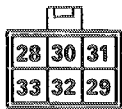
Measure the continuity between the radio and cassette deck connector terminals and other audio system terminals in the charts that follow on pages 20-18 and 20-19.

CAUTION

- Do not damage connectors when measuring continuities.

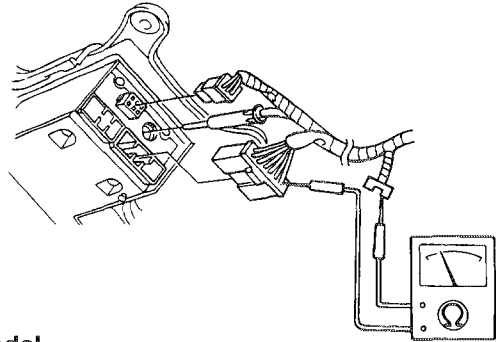
SE model

HARNESS SIDE CONNECTORS



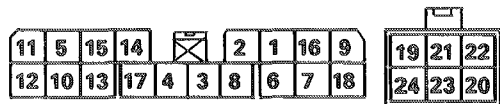
Viewed from terminal side

RADIO & CASSETTE DECK			
1	RIGHT SPEAKER (+)	12	HEADSET MIC. (DR)
2	RIGHT SPEAKER (-)	13	HEADSET OUT (R ch)
3	LEFT SPEAKER (-)	14	HEADSET OUT. (L ch)
4	LEFT SPEAKER (+)	15	HEADSET OUT. E RADIO SWITCH E
5	HEADSET MIC. E (PA)	16	SPEED PULSE
6	MUTING SWITCH ON	17	GND ⊖
7	SEARCH SWITCH UP	18	BACK UP ⊕
8	SEARCH SWITCH DOWN	19	MUTE ON
9	IGNITION SWITCH ACC +	20	GND AF
10	HEADSET MIC. E (DR)	21	SPEAKER AT OUT
11	HEADSET MIC. (PA)	22	MIC. (-) IN
		23	GND ⊖
		24	MODE IN
		25	CB ON
		26	HEADSET AF OUT
		27	GN (-) (MIC.)
		28	STARTER REVERSE SWITCH (Comp Muting)
		29	DATA
		30	LOAD
		31	CLOCK
		32	GND (DATA)
		33	BLANKING



A model

HARNESS SIDE CONNECTORS

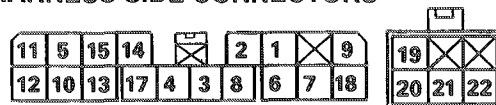


Viewed from terminal side

RADIO & CASSETTE DECK			
1	FRONT RIGHT SPEAKER (+)	9	IGNITION SWITCH ACC +
2	FRONT RIGHT SPEAKER (-)	10	HEADSET MIC. E (DR)
3	FRONT LEFT SPEAKER (-)	11	HEADSET MIC. (PA)
4	FRONT LEFT SPEAKER (+)	12	HEADSET MIC. (DR)
5	HEADSET MIC. E (PA)	13	HEADSET OUT (R ch)
6	MUTING SWITCH ON	14	HEADSET OUT. (L ch)
7	SEARCH SWITCH UP	15	HEADSET OUT. E RADIO SWITCH E
8	SEARCH SWITCH DOWN	16	SPEED PULSE
		17	GND ⊖
		18	BACK UP ⊕
		19	STARTER REVERSE SWITCH (Comp Muting)
		20	DATA
		21	LOAD
		22	CLOCK
		23	GND (DATA)
		24	BLANKING

I model

HARNESS SIDE CONNECTORS



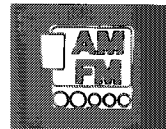
Viewed from terminal side

RADIO			
1	FRONT RIGHT SPEAKER (+)	9	IGNITION SWITCH ACC +
2	FRONT RIGHT SPEAKER (-)	10	HEADSET MIC. E (DR)
3	FRONT LEFT SPEAKER (-)	11	HEADSET MIC. (PA)
4	FRONT LEFT SPEAKER (+)	12	HEADSET MIC. (DR)
5	HEADSET MIC. E (PA)	13	HEADSET OUT (R ch)
6	MUTING SWITCH ON	14	HEADSET OUT. (L ch)
7	TUNING	15	HEADSET OUT. E RADIO SWITCH E
8	CHANNEL/MEMORY		
		17	GND ⊖
		18	BACK UP ⊕
		19	STARTER REVERSE SWITCH (Comp Muting)
		20	AUX IN (R ch)
		21	AUX IN (L ch)
		22	AUX IN E

Audio

Radio and Cassette Deck (cont'd)

Circuit Number	System	Terminal	Color	Other Terminal Color	Other terminal/Location	
1	Speaker circuit (A & I models)	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	
	Speaker circuit (SE model)	1	RED/GRN	RED/YEL	6P-BLK mini/On the left cooling fan	
				YEL	Speaker (+) terminal/Right rear speaker	
		2	BRN/BLK	←	Speaker (-) terminal/Right front speaker	
				←	6P-BLK mini/On the left cooling fan	
		3	GRY/BLK	←	Speaker (-) terminal/Left front speaker	
				←	6P-BLK mini/On the left cooling fan	
		4	BLU/GRN	BLU/YEL	6P-BLK mini/On the left cooling fan	
				YEL	Speaker (+) terminal/Left rear speaker	
2	Headset	5	BLK (sealed)	BLK	6P-RED mini/On the rear fender	
		10	BLK (sealed)	(I: BLU)	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 (A & SE only)	
				←	8P-BLK/On the left cooling fan	
		18	RED/YEL	RED	8P-BLK/On the left cooling fan	
		17	GRN	←	Body ground	
5	A & SE: Display (LCD unit) circuit	20 (SE:29)	RED	←	14P-BLK/Under the instrument	
		21 (SE:29)	WHT	←		
		22 (SE:33)	BLK	←		
		23 (SE:32)	BLK (sealed)	←		
		24 (SE:33)	GRY	←		
	I: AUX Circuit		20	BLU/GRN	←	3P-WHT/Inside the fairing (left pocket)
			21	BLU/YEL	←	
			22	BLK (sealed)	←	



Radio and Cassette Deck (cont'd)

Circuit Number	System	Terminal	Color	Other Terminal Color	Other terminal/Location
6	A & SE only: AVC circuit	16	WHT/BLK	←	14P-BLK/Under the instrument
7	Starter/ reverse (I: Starter) switch circuit	19 (SE:28)	YEL/RED	←	9P-RED mini/On the right cooling fan
8	Antenna circuit	<p>Check the wires for continuity as shown.</p> <p>NORMAL: 1. Continuity 2. Continuity 3. No Continuity</p>			
9	CB transceiver circuit (SE only)	19	BLU	←	16P-GRY/CB transceiver unit
		20	PINK	←	
		21	BLK	←	
		22	RED/BLU	←	
		23	GRN/BLK	←	
		24	BRN	←	
		25	YEL	←	
		26	WHT/BLK	←	
27	Sealed wire	←			

Audio

Radio and Cassette Deck (cont'd)

Headset Junction Wire Check

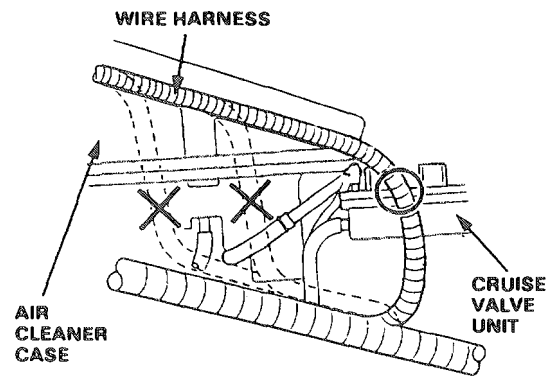
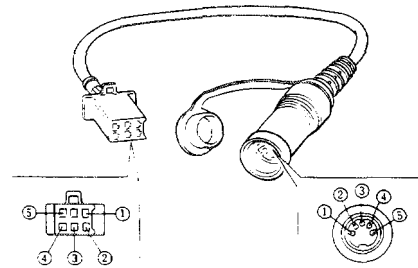
Remove the headset junction wires.

Check continuity between the same-number junction wire connectors as shown. Continuity should exist.

Headset junction wire (rider 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

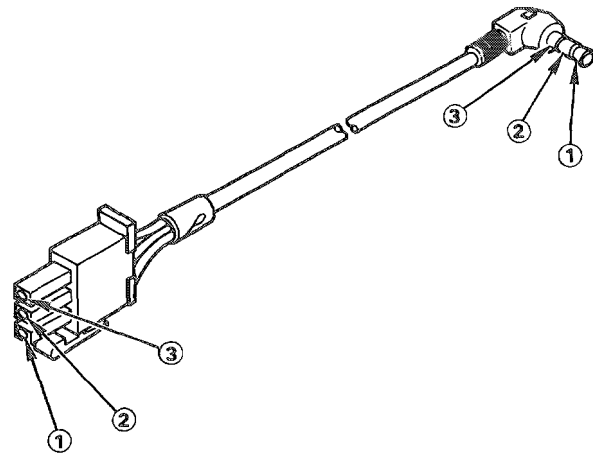
- At installation, route the radio/cassette deck wire harness properly as shown.

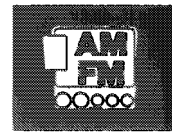


AUX Sub-Cord Check

If no sound is heard when the "AUX" position is selected, check the AUX sub-cord for continuity. There should be continuity between the same-number terminals as shown.

1	AUX INPUT (R channel)
2	AUX INPUT (L channel)
3	AUX INPUT ground





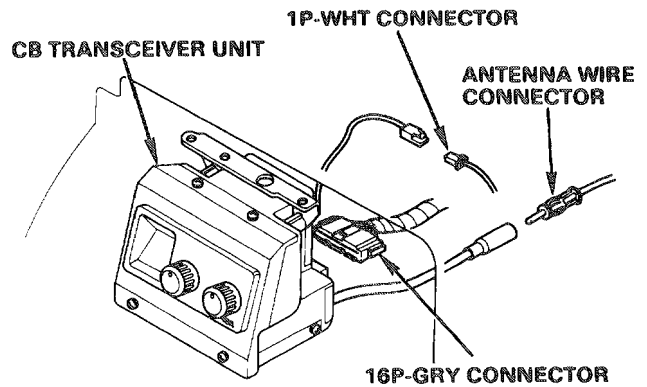
CB Transceiver

Main Wire Harness Check

Remove the left fairing pocket (see page 13-8) and disconnect the 16P-GRY connector, 1P-WHT connector and antenna wire connector.

Check the connectors for loose or poor contact, or corroded terminals.

Measure the continuity between the CB transceiver connector terminals and other audio system terminals in the chart below and on 20-22.



CB TRANSCEIVER			
1	GROUND (MIC)	9	MUTE OUT
2	HEADSET AT OUT	10	TALK
3	CB ON	11	CHANNEL UP
4	MODE IN	12	CHANNEL UP-DOWN CONTROL
5	GROUND	13	ACC
6	MIC IN	14	BACK-UP
7	SPEAKER AT OUT	15	STARTER/REVERSE SWITCH
8	GROUND AF		

HARNESS SIDE CONNECTOR

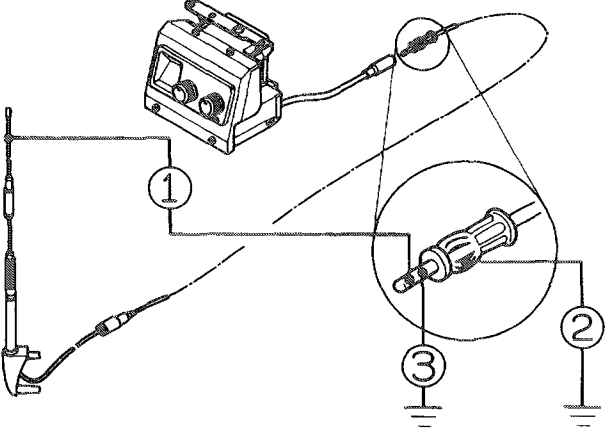


Viewed from terminal side

Circuit Number	System	Terminal	Color	Other Terminal Color	Other Terminal/Location
1	MIC circuit	1	Sealed wire	←	12P-WHT/Radio & cassette deck
		6	RED/BLU	←	
2	AF circuit	2	WHT/BLK	←	
		7	BLK	←	
		8	PINK	←	
3	CB ON circuit	3	YEL	←	
4	MODE circuit	4	BRN	←	
5	Ground circuit	5	GRN/BLK	←	
6	MUTE circuit	9	BLU	←	
7	CB switch circuit	10	WHT	←	4P-BRN mini/On the left cooling fan
		11	ORN	←	
		12	GRY	←	
8	Power circuit	13	LT GRN/BLK	←	8P-BLK/On the left cooling fan
		14	RED/YEL	RED	
9	Starter/reverse switch circuit	15	YEL/RED	←	9P-RED mini/On the right cooling fan

Audio

CB Transceiver (cont'd)

Circuit Number	System	Terminal	Color	Other Terminal Color	Other Terminal/Location
10	Antenna circuit	Check the wire for continuity as shown. NORMAL: 1: Continuity 2: Continuity 3: No continuity			 <p>The diagram illustrates the antenna circuit for a CB transceiver. It shows a transceiver unit connected to an antenna. A wire from the transceiver is connected to a terminal labeled '1'. This terminal is connected to the antenna. Another wire from the transceiver is connected to a terminal labeled '2', which is grounded. A third wire from the transceiver is connected to a terminal labeled '3', which is also grounded. The diagram includes a magnified view of the antenna connector and the ground connections.</p>

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How To Use This Manual

Page Numbering System

This manual divides the electrical system into individual sections. For example, Section 5 includes all Chassis Accessories. Component Location photographs are at the back of the manual in Section 12.

Within a section, the pages are numbered using the section number, a dash, and then a consecutive number beginning with zero. So if there are three pages in Section 2, the pages will be numbered 2-0, 2-1, and 2-2.

Outline of Each Circuit Section

A **Circuit Schematic** (wiring diagram) starts off each section. Schematics show:

- how all the components within a circuit work together
- current flow from the power source (top of page) to ground (bottom of page)
- switch positions (shown “at rest” as if the ignition was off)
- special instructions (“Solid-state: Do not check resistance”)
- those circuits sharing a common power source or ground

A **System Description** (How the Circuit Works) appears in some sections; it explains basic circuit operation.

A **Troubleshooting** guide also appears in some sections and provides step-by-step instructions for diagnosis and repair. It includes symptom and diagnosis charts and self-tests for all possible measurements in the system.

Model Abbreviations for 1994 used in this manual:

- Int** – Interstate
- Asp** – Aspencade
- SE** – Special Edition

How To Use This Manual

Symbols

The abbreviations and symbols explained here are used throughout the manual. You'll need to know what they mean before you can use the schematics effectively.

Wire Color Abbreviations

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

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

Wires

A wavy line means the wire is broken by the binding of the book but continues on the next page.



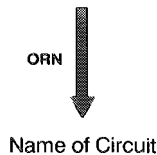
Wire insulation can be one color, or one color with another color stripe; the second color is the stripe.



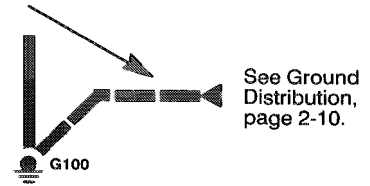
This means the current path continues on another page. The arrow shows direction of current flow. To follow the white wire in this example, you would turn to page 9-11 and look for the "R" arrow.



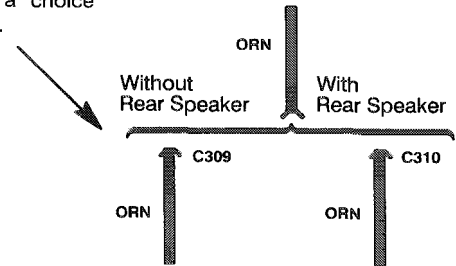
This means the branch of the wire connects to another circuit. The arrow points to the name of the circuit branch where the wire continues.



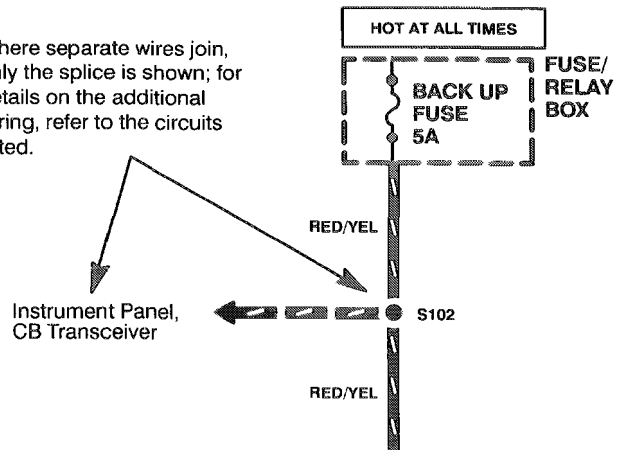
A broken line means only some of the circuit is shown; refer to the circuit listed for the complete schematic.



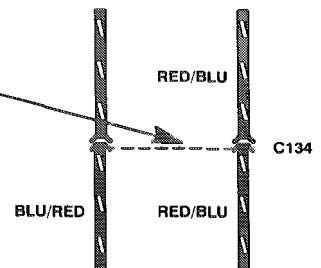
Wire choices for options or different models are labeled and shown with a "choice" bracket like this.



Where separate wires join, only the splice is shown; for details on the additional wiring, refer to the circuits listed.

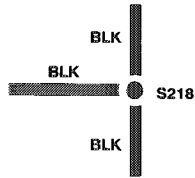


This dashed line means the BLU/RED and RED/BLU wires are both in connector C134.



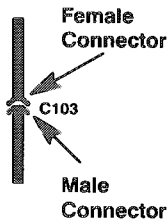
Splices — “S”

Splices (S) are numbered and shown as a dot. The location and connection of these splices may vary depending on the harness manufacturer.

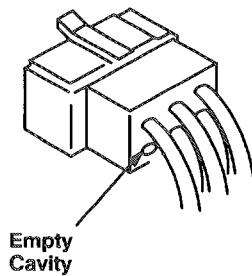


Connectors — “C”

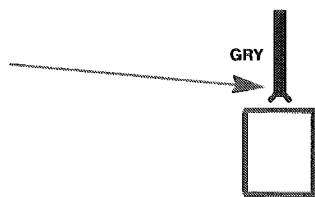
Each connector (C) is numbered for reference in the Component Location Index, Section 11.



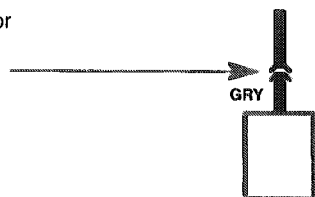
The index also lists the total number of cavities and the color of the connector. Wires may not be used in all cavities.



This means the connector connects directly to the component.



This indicates the connector connects to a lead (pigtail) wired directly to the component.



This indicates a screw terminal on the component.



Components

A solid border line means the entire component is shown.



A broken border line indicates that only part of the component is shown.



The name of the component appears next to its upper right corner.

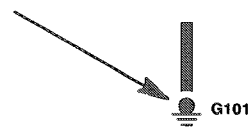


BRAKE SWITCH
Closed with pedal depressed.

Notes about component function follow its name.

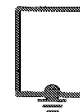
Ground — “G”

This symbol means the end of the wire is attached to a metal part of the motorcycle.



Each wire ground (G) is numbered for reference in the Component Location Index, Section 11.

This ground symbol (dot and 3 lines) overlapping the component means the housing of the component is attached directly to a metal part of the motorcycle.



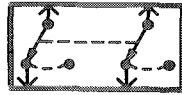
(cont'd)

How To Use This Manual

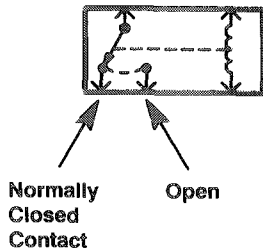
Symbols (cont'd)

Switches

These switches move together; a dashed line shows a mechanical connection between them.

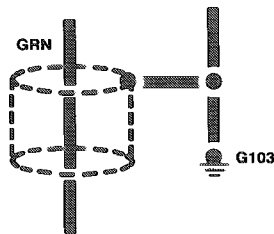


This is a relay shown with no current flowing through its coil. Unless otherwise noted, all switches are shown in their normal (rest) position, with power off.



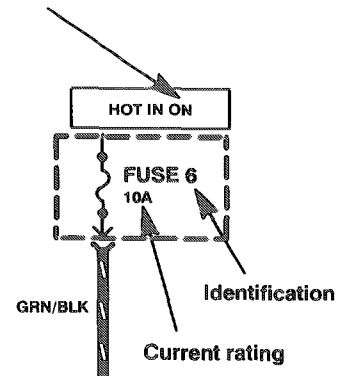
Shield

This represents RFI (Radio Frequency Interference) shielding around a wire. The shielding is always connected to ground.



Fuses

This means power is supplied when the ignition switch is in ON.



Diode

This diode allows current to flow only in the direction of the arrow.



How To Use This Manual

Circuit Schematic (cont'd)

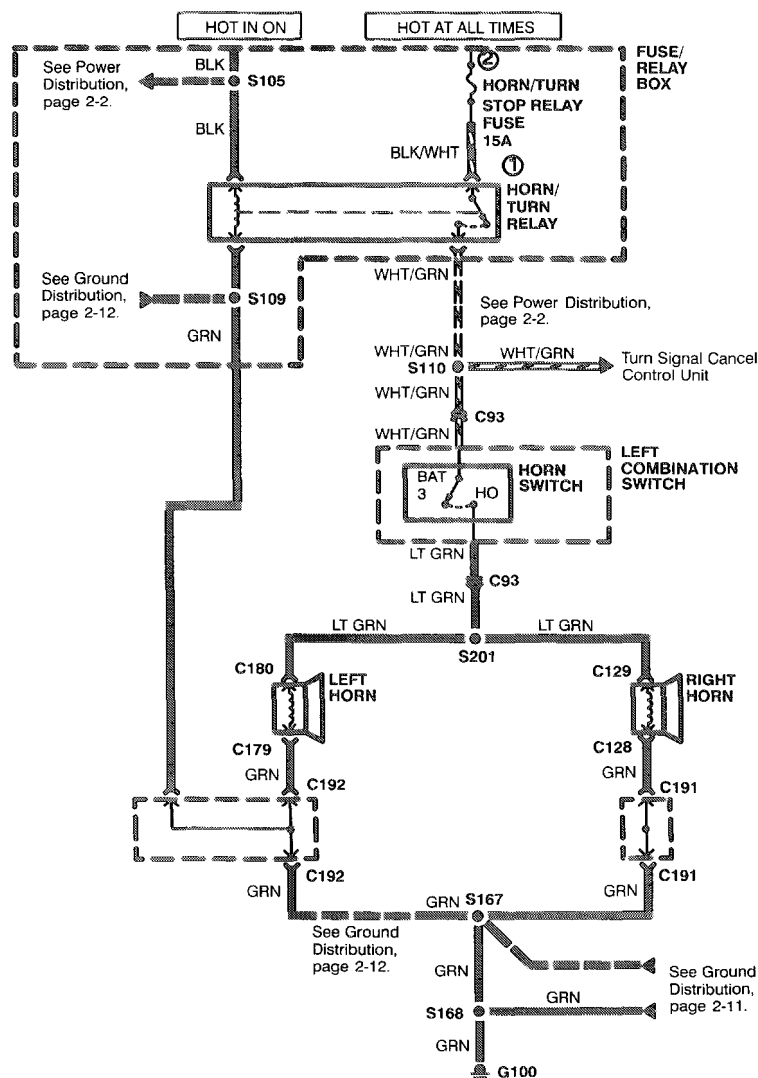
Circuit schematics break the entire electrical system into individual circuits. Electrical components that work together are shown together so that you are not distracted by wiring that is not part of the circuit you are working on.

Each drawing is arranged so current flows from positive, at the top of the page, to ground, at the bottom of the page. The "HOT" label at the top of a fuse shows when the ignition switch supplies power to that fuse.

Each circuit is shown completely and independently on one schematic. Other circuits getting their power from the same point, or grounding at the same point, are not shown. However, if other circuits actually share some wires with the circuit shown, the shared wires of the other circuits will also be shown.

Wires that connect to another circuit are shown with an arrowhead pointing in the direction of current flow. The name of the circuit or component that shares the wiring is provided for reference. You can check shared wiring by checking the operation of the other circuits.

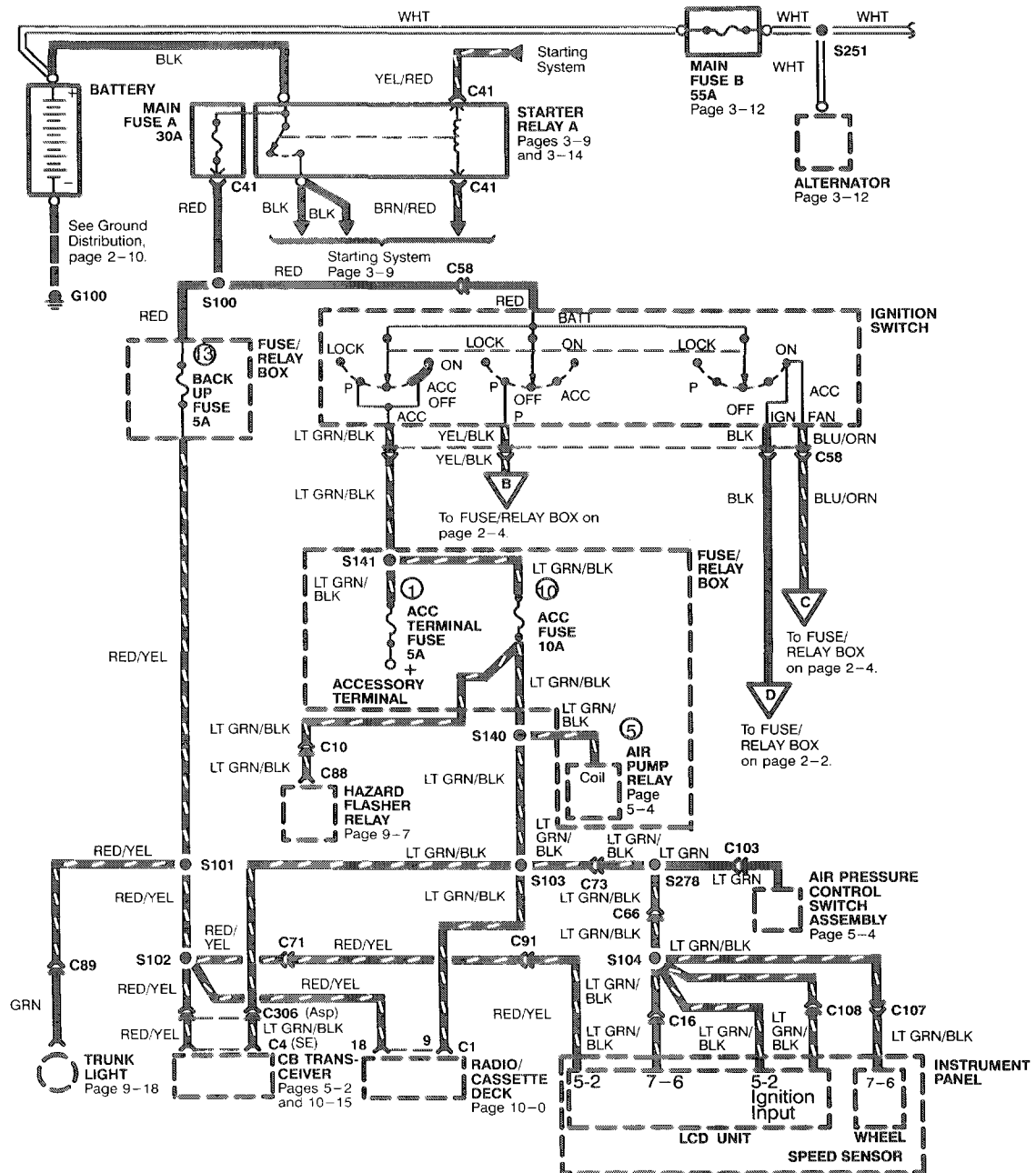
"See Power Distribution" means there are more connections to other circuits that are not shown. All such shared circuits are shown on the Power Distribution circuit schematic. "See Ground Distribution" means there are more shared ground circuits which are shown on the Ground Distribution schematic.



The sample Power Distribution schematic shows how voltage is supplied from the positive battery terminal to the various circuits in the motorcycle.

Individual circuit schematics begin with a fuse. Power Distribution shows the wiring between the battery and the fuses. By combining Power Distribution with any individual schematic, you get a complete picture of how voltage is applied to the circuit.

You can use Power Distribution to speed your troubleshooting. If Power Distribution shows that an inoperative circuit and a second circuit share a fuse, check the operation of the second circuit. If it works, you know the fuse is good and voltage is available to the inoperative circuit. You can then continue troubleshooting.

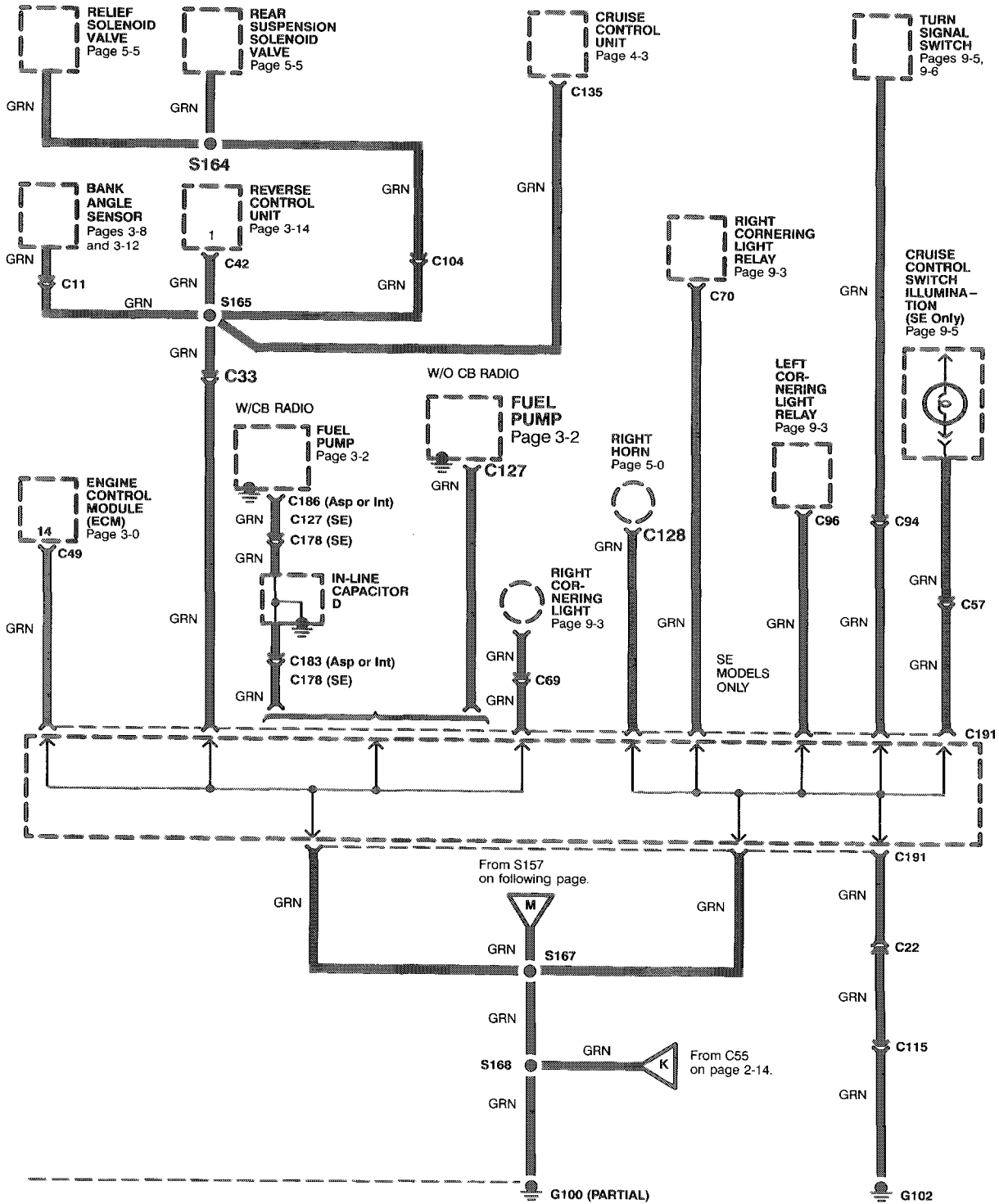


(cont'd)

How To Use This Manual

Circuit Schematic (cont'd)

The sample Ground Distribution schematic shows which components share the same ground point.



Component Location

The Component Location Index (Section 11) lists every component, connector, and ground and describes its location on the motorcycle. This index also gives references to component location photographs which are found in Section 12.

Component Location Photographs (Section 12) show the exact location and appearance of components, connectors, and grounds.

The Component Index (Section 13) lists all components and gives page references to all circuit schematics in which each component appears.

Component Location Index (Section 11)

(Refer to Section 12 for photographs.)

<u>Component</u>	<u>Photo No.</u>
Auxiliary Input Connector	55
Behind left fairing pocket	
Bank Angle Sensor (Asp, SE)	32
Below right rear of seat, on frame rail	
C6 (3-BLK)	45
Behind instrument panel	
C10 (22-BLU) (SE)	38
Behind left rear of seat	
C10 (22-WHT) (Asp)	38
Below left rear of seat	

Component or Connector Number →

Number of Cavities In Connector →

Connector Color →

Photo Number in Section 11 ←

Component Index (Section 13)

Acc Fuse 10A	
Asp and SE	2-0, 5-2, 5-4, 7-6, 9-7, 10-0, 10-6, 10-15
Int	2-6, 5-4, 9-9, 10-8
Acc Terminal Fuse 5A	
Asp and SE	2-0
Int	2-6
Accessory Terminal	
Asp and SE	2-0, 2-12
Int	2-6, 2-17
Air Pressure Control	
Switch Assembly	2-0, 2-4, 5-4, 5-5
Air Pressure Sensor	
	5-4
Air Pump Assembly	
	2-14, 5-5
Air Pump Fuse 10A	
	2-1, 5-4
Air Pump Relay	
	2-0, 2-1, 5-4

How To Use This Manual

Five-Step Troubleshooting

1. Verify The Complaint

Turn on all the components in the problem circuit to check the accuracy of the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. Analyze The Schematic

Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power source through the circuit components to ground. Also trace circuits that share wiring with the problem circuit. The names of circuits that share the same fuse, ground, or switch, and so on, are referred to on each circuit schematic. Try to operate any shared circuits you didn't check in step 1. If the shared circuits work, the shared wiring is OK, and the cause must be in the wiring used only by the problem circuit. If several circuits fail at the same time, the fuse or ground is a likely cause.

Based on the symptoms and your understanding of the circuit's operation, identify one or more possible causes of the problem.

3. Isolate The Problem By Testing The Circuit

Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

4. Fix The Problem

Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

5. Make Sure The Circuit Works

Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on that fuse. Make sure no new problems turn up and the original problem does not recur.

Test Equipment

Voltmeter and Test Light

CAUTION: A number of circuits include solid-state devices. Voltages in these circuits should be tested only with a 10-megohm or higher impedance digital multimeter. Never use a test light on circuits that contain solid-state devices. Damage to the devices may result.

On circuits without solid-state devices, use a test light to check for voltage. A test light is made up of a 12-volt bulb with a pair of leads attached. After grounding one lead, touch the other lead to various points along the circuit where voltage should be present. The bulb will go on if there is voltage at the point being tested.

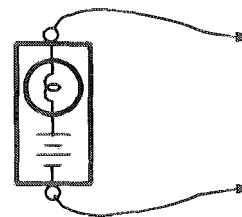
A voltmeter can be used in place of a test light. While a test light shows whether or not voltage is present, a voltmeter indicates how much voltage there is.

Self-Powered Test Light and Ohmmeter

CAUTION: Never use a self-powered test light on circuits that contain solid-state devices. Damage to these devices may result.

Diodes and solid-state devices in a circuit can make an ohmmeter give a false reading. To find out if a component is affecting a measurement, take one reading, reverse the leads, and take a second reading. If the readings differ, the component is affecting the measurement.

An ohmmeter can be used in place of a self-powered test light. The ohmmeter shows how much resistance there is between two points along a circuit. Low resistance means good continuity.



Self-Powered Test Light

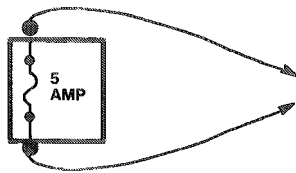
Circuits that contain solid-state devices should only be tested with a 10-megohm or higher impedance digital multimeter.

Use a self-powered test light to check for continuity. This tool is made up of a light bulb, battery and two leads. If the leads are touched together, the bulb will go on.

A self-powered test light is only used on an unpowered circuit. First disconnect the battery or remove the fuse that feeds the circuit you are working on. Select two points along the circuit through which there should be continuity. Connect one lead of the self-powered test light to each point. If there is continuity, the test light's circuit will be completed and the bulb will go on.

Jumper Wire

Use a jumper wire to bypass an open circuit. A jumper wire is made up of an in-line fuse holder connected to a set of test leads. It should have a five ampere fuse. Never use a jumper wire across any load. This direct battery short will blow the fuse.



Short Finder

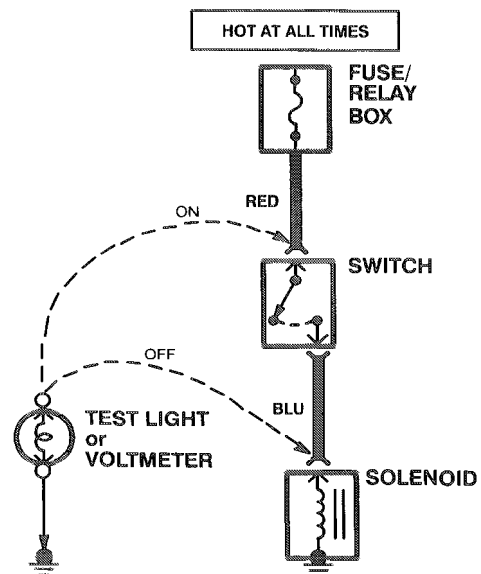
Short finders are available to locate shorts to ground. The short finder creates a pulsing magnetic field in the shorted circuit and shows you the location of the short through body trim or sheet metal. Its use is explained in the following troubleshooting tests.

Troubleshooting Tests

Testing for Voltage

This test measures voltage in a circuit. When testing for voltage at a connector, you do not have to separate the two halves of the connector. Instead, probe the connector from the back. Always check both sides of the connector because dirt and corrosion between its contact surfaces can cause electrical problems.

1. Connect one lead of test light to a known good ground, or if you are using a voltmeter, be sure you connect its negative lead to ground.
2. Connect the other lead of the test light or voltmeter to the point you want to check.
3. If the test light glows, there is voltage present. If you are using a voltmeter, note the voltage reading. It should be within one volt of measured battery voltage. A loss of more than one volt indicates a problem.



(cont'd)

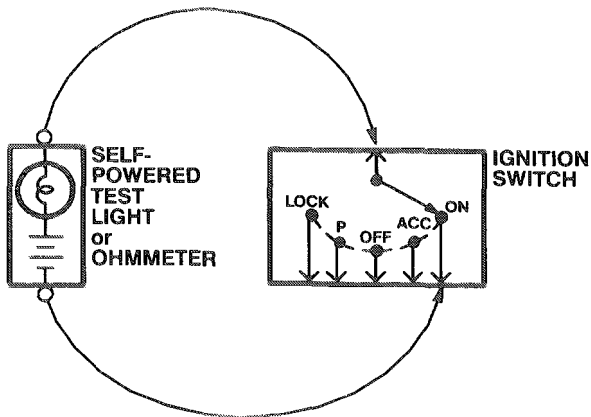
How To Use This Manual

Troubleshooting Tests (cont'd)

Testing for Continuity

This test checks for continuity within a circuit. When testing for continuity at a connector, you do not have to separate the two halves of the connector. Instead, probe the connector from the back. Always check both sides of the connector because dirt and corrosion between contact surfaces can cause electrical problems.

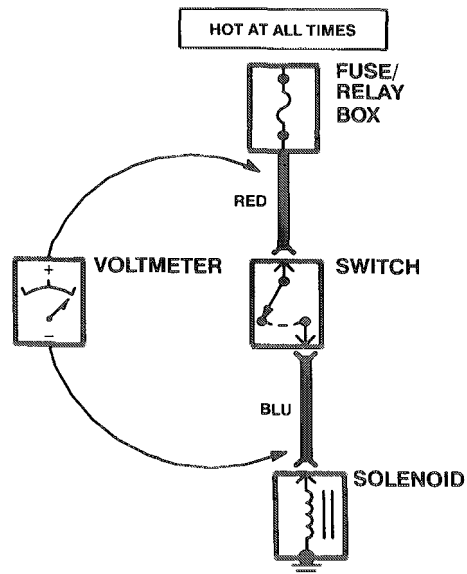
1. Disconnect the negative cable from the battery. If you are using an ohmmeter, hold the leads together and adjust the ohmmeter to read zero ohms.
2. Connect one lead of self-powered test light or ohmmeter to one end of the part of the circuit you wish to test.
3. Connect the other lead to the other end.
4. If the self-powered test light glows, there is continuity. If you're using an ohmmeter, low or no resistance means good continuity.



Testing for Voltage Drop

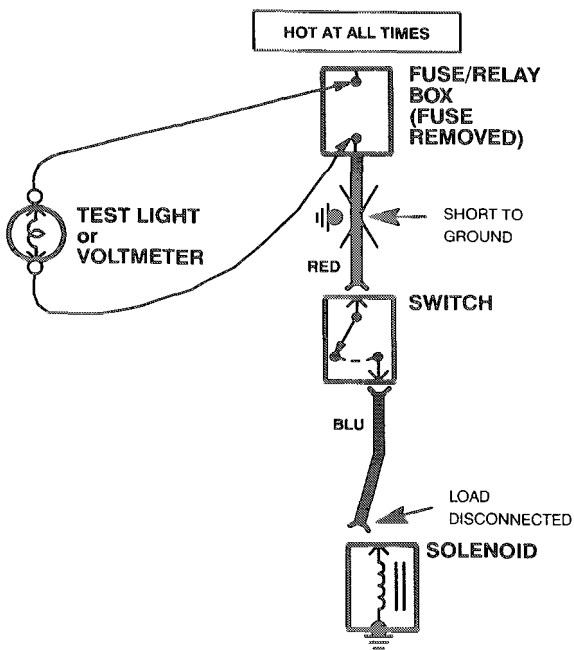
Wires, connectors and switches are designed to conduct current with a minimum loss of voltage. A voltage drop of more than one volt indicates a problem.

1. Connect the positive lead of a voltmeter to the end of the wire (or to the side of the connector or switch) closest to the battery.
2. Connect the negative lead to the other end of the wire (or the other side of the connector or switch).
3. Turn on the components in the circuit.
4. The voltmeter will show the difference in voltage between the two points. A difference, or drop, of more than one volt indicates a problem. Check the circuit for loose or dirty connections.



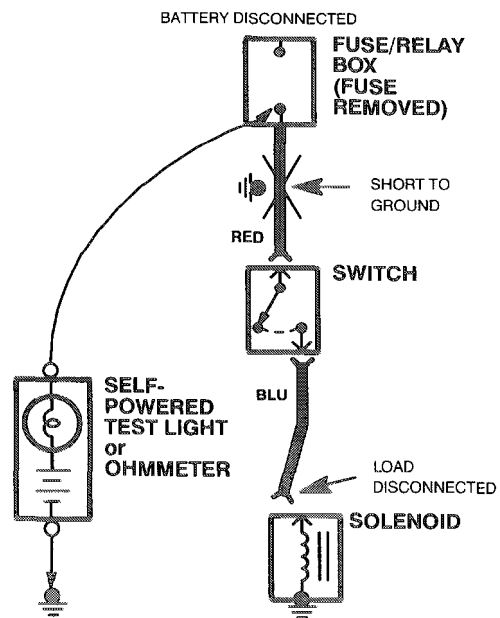
Testing for a Short with a Test Light or Voltmeter

1. Remove the blown fuse and disconnect the load.
2. Connect a test light or voltmeter across the fuse terminals. Make sure that the voltage is being applied to the fuse terminals. You might have to put the ignition switch in RUN. Check the schematic to see.
3. Beginning near the fuse/relay box, wiggle the harness. Continue this at convenient points about six inches apart while watching the test light or voltmeter.
4. When the test light blinks or the voltmeter needle moves, there is a short to ground in the wiring near that point.



Testing for a Short with a Self-Powered Test Light or Ohmmeter

1. Remove the blown fuse and disconnect the battery and load.
2. Connect one lead of a self-powered test light or ohmmeter to the fuse terminal on the load side.
3. Connect the other lead to a known good ground.
4. Beginning near the fuse/relay box, wiggle the harness. Continue this at convenient points about six inches apart while watching the test light or ohmmeter.
5. If the self-powered test light blinks or the ohmmeter needle moves, there is a short to ground in the wiring near that point.



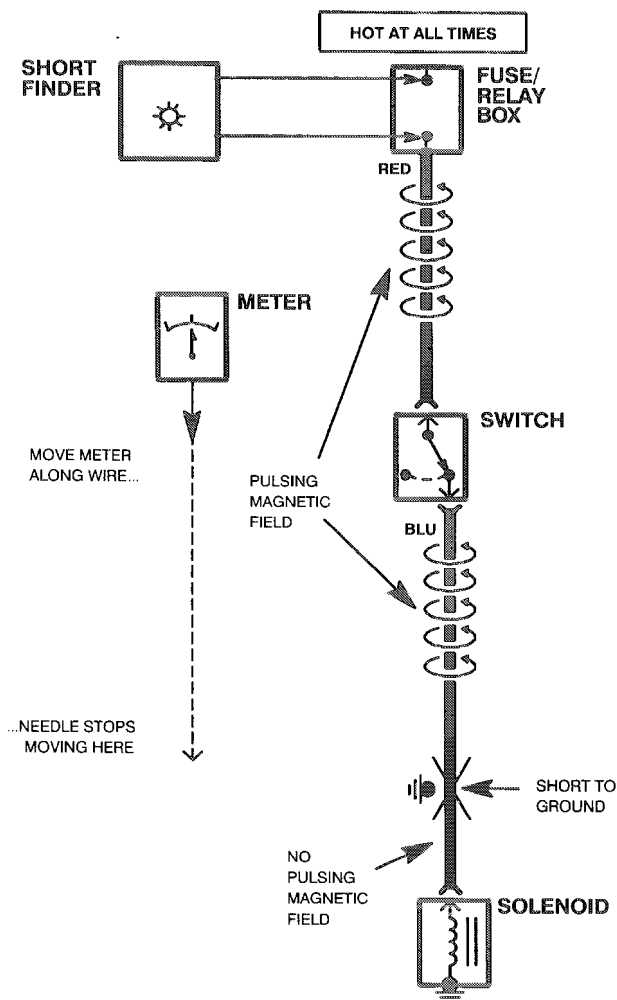
(cont'd)

How To Use This Manual

Troubleshooting Tests (cont'd)

Testing for a Short with a Short Circuit Locator

1. Remove the blown fuse. Leave the battery connected.
2. Connect the short finder across the fuse terminals.
3. Close all switches in series in the circuit you're testing.
4. Turn on the short circuit locator. It sends pulses of current to the short. This creates a pulsing magnetic field around the wiring between the fuse/relay box and the short.
5. Beginning at the fuse/relay box, slowly move the short finder along the circuit wiring. The meter will show current pulses through sheet metal and plastic. As long as the meter is between the fuse and the short, the needle will move with each current pulse. Once you move the meter past the point of the short, the needle will stop moving. Check around this area to locate the cause of the short circuit.



Troubleshooting Precautions

Before Troubleshooting

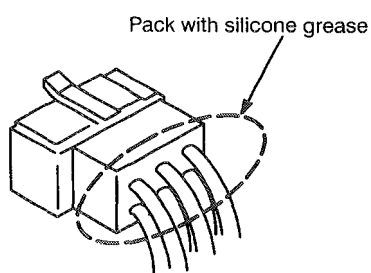
- Check the main fuse and the fuse/relay box.
- Check the battery for damage, state of charge, and clean and tight connections.

CAUTION:

- Do not quick-charge a battery unless the battery ground cable has been disconnected or you will damage the alternator diodes.
- Do not attempt to crank the engine with the ground cable disconnected or you will severely damage the wiring.

While You're Working

- Make sure connectors are clean and have no loose pins or receptacles.
- Make sure multiple pin connectors are packed with silicone grease.

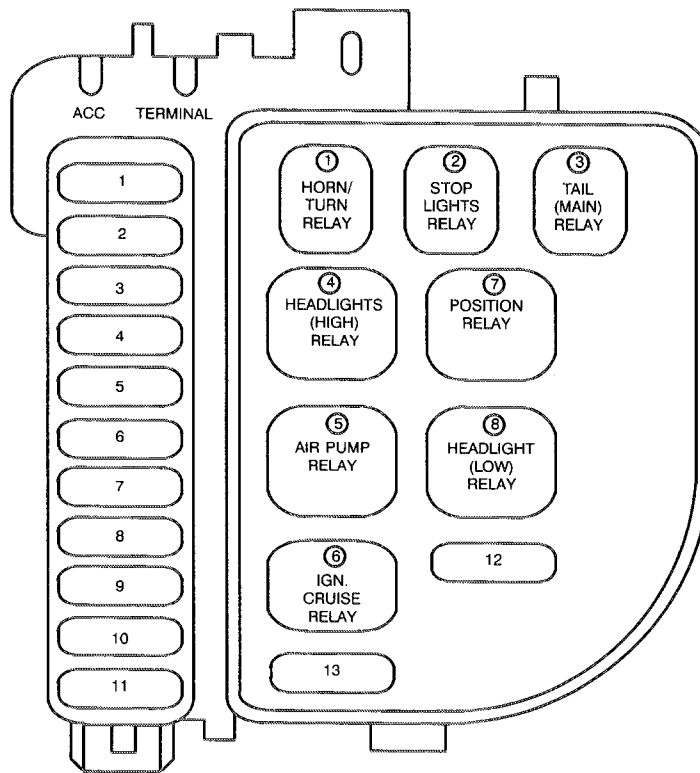


CAUTION:

- Do not pull on the wires when disconnecting a connector. Pull only on the connector housings.
- When connecting a connector, push it until it clicks into place.
- Refer to page 1-10 for cautions about troubleshooting circuits that contain solid-state devices.

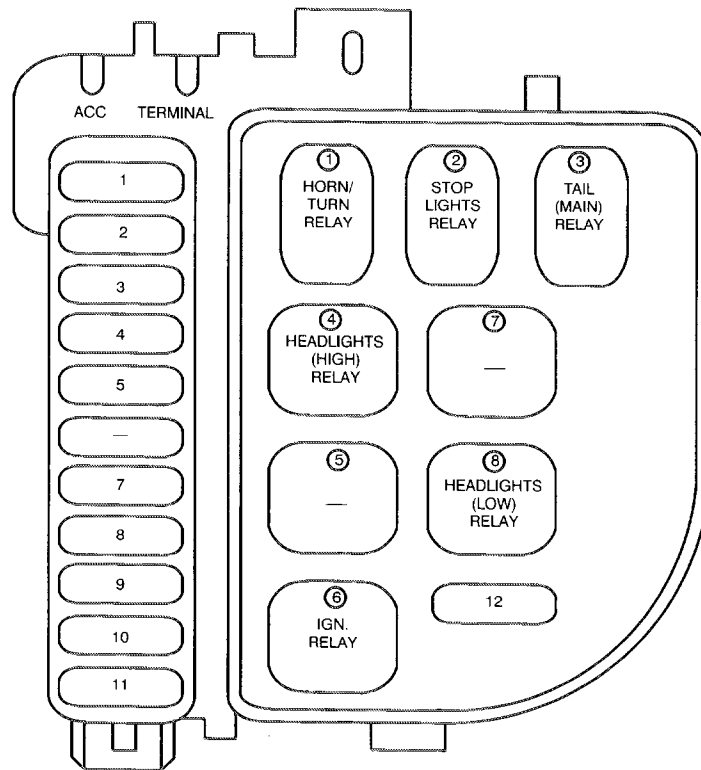
Fuse Information: Asp and SE

Fuse/Relay Box



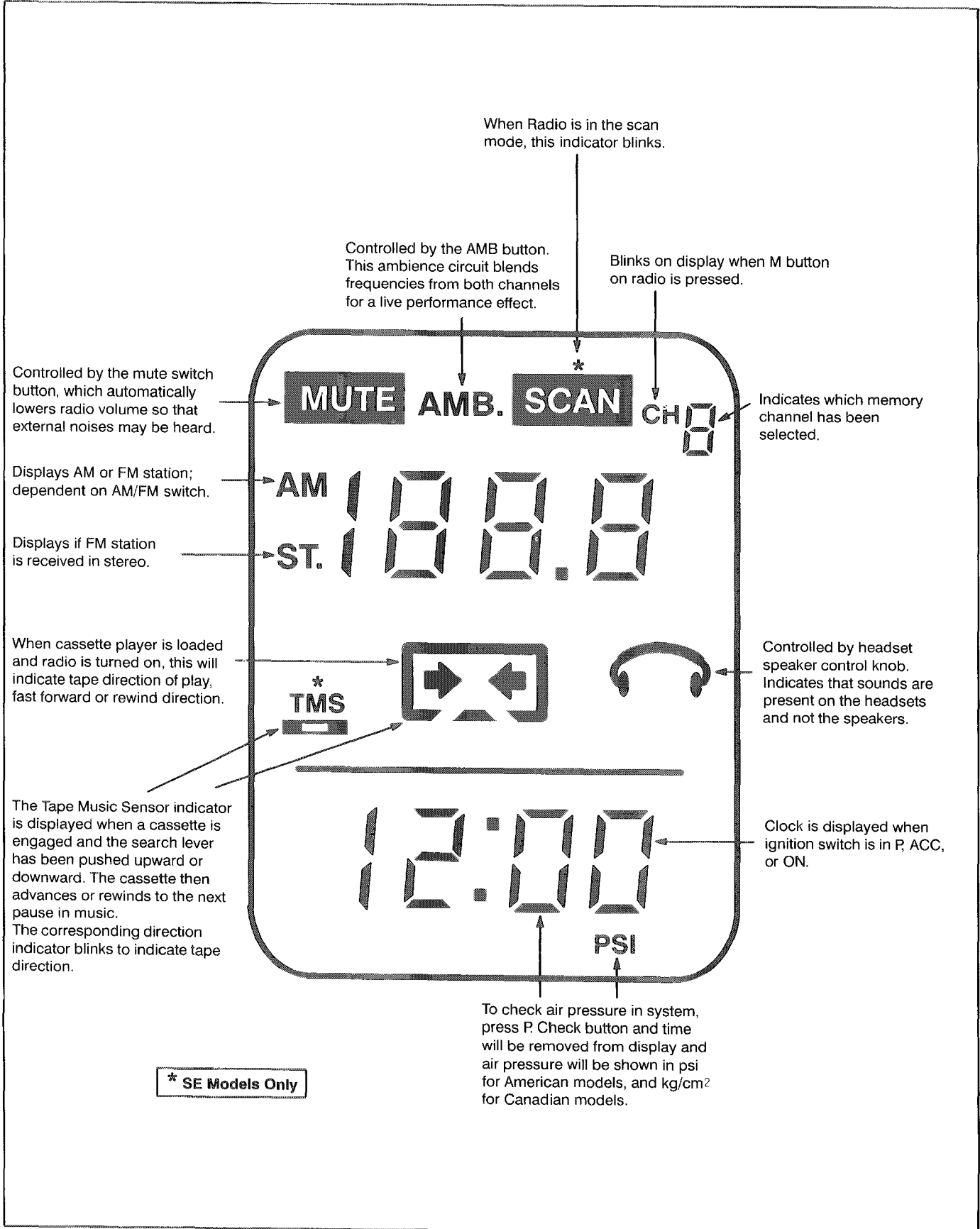
Fuse Number	Fuse Identification	Amps	Circuit or Component Protected
1	Acc Terminal	5	Optional accessories
2	Horn/Turn/Stop Relay	15	Horns, Horn turn relay coil, Position relay coil, Stop light relay coil, Turn signal cancel control unit, Turn signal flasher relay coil
3	Stop	15	Brake lights
4	Fan	10	Cooling fans
5	Head	15	Headlights, Instrument panel indicators
6	Air Pump	10	Auto level control system
7	Parking	10	Air pump (outlet), Parking lights
8	Tail Meter Position	15	Accessory lights; Instrument panel gauges, Instrument panel indicators, Cornering lights, Headlight relays, License plate light, Position lights, Side marker lights, Taillights, Reverse system control, Handlebar illumination
9	RVS Start	5	Reverse system
10	Acc	10	Air pump relay, CB radio, Stereo/cassette deck, Hazard lights, Instrument panel indicator illumination, Wheel speed sensor
11	Ign. Start Cruise	15	Bank angle sensor, Charging system, Cruise control indicators, Emission controls, Engine control module (ECM), Ignition coils, Ignition/cruise relay coil, Starting system
12	Head Relay	5	Headlights (high & low relay coils)
13	Back Up	5	CB radio, Stereo/cassette deck, Instrument panel indicator illumination, Trunk light

- Fuse/Relay Box



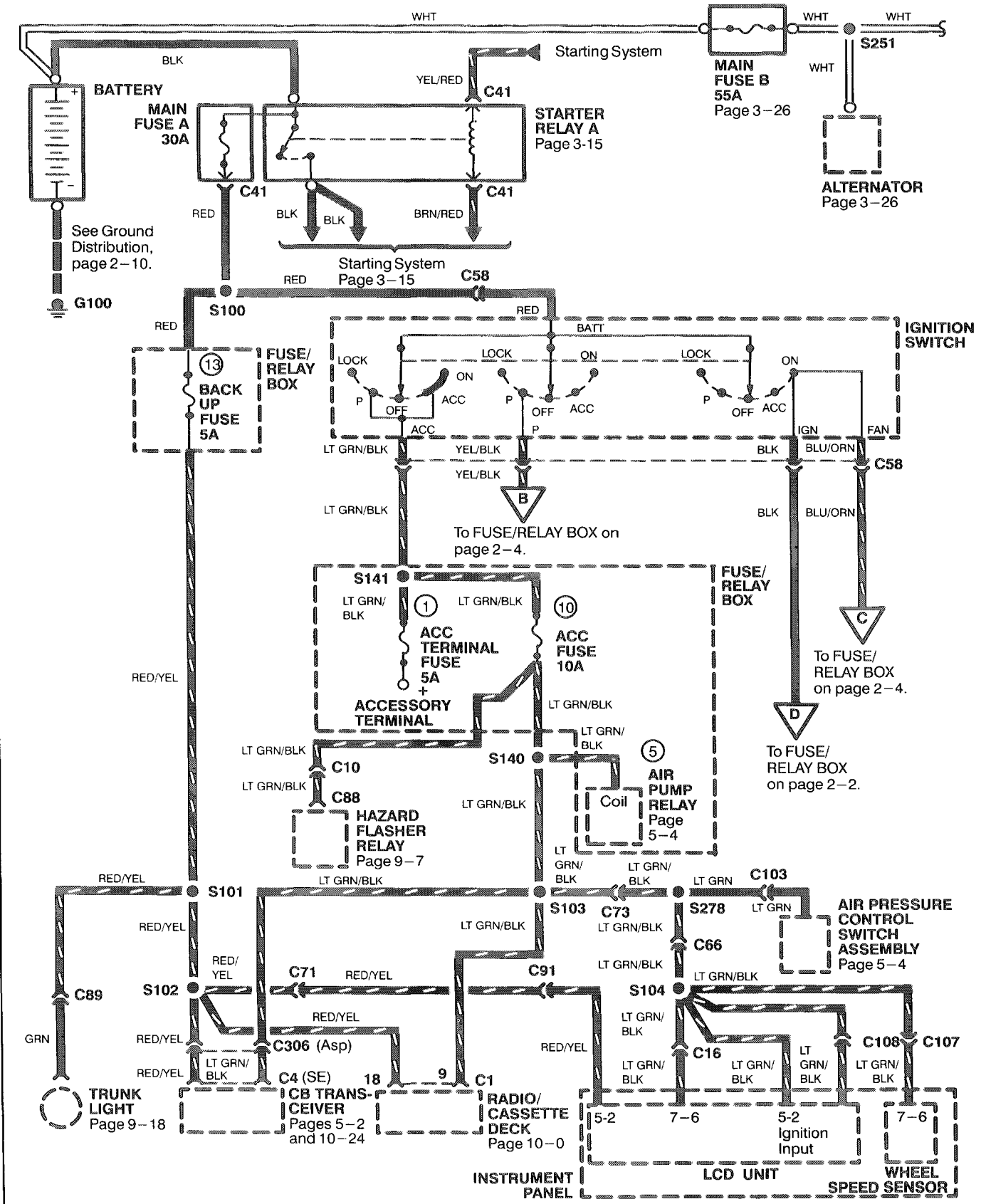
Fuse Number	Fuse Identification	Amps	Circuit or Component Protected
1	Acc Terminal	5	Optional accessories
2	Horn/Turn/Stop Relay	15	Horns, Stop relay coil, Turn signal flasher relay
3	Stop	15	Brake lights
4	Fan	10	Cooling fans
5	Head	15	Headlights, Instrument panel indicators
6	(Not Used)		
7	Parking	10	Parking lights
8	Tail Meter Position	15	Accessory lights, Instrument panel gauges, Instrument panel indicators, Cornering lights, Headlight relays, License plate light, Position lights, Side marker lights, Taillights
9	Back Up	5	Stereo, Trunk light, CB radio (optional), LCD unit
10	Acc	10	Stereo, Hazard lights
11	Ign. Start	15	Bank angle sensor, Charging system, Emission controls, Engine control module (ECM), Ignition coils, Ign-relay coil, Starting system
12	Head Relay	5	Headlights (high & low relay coils)

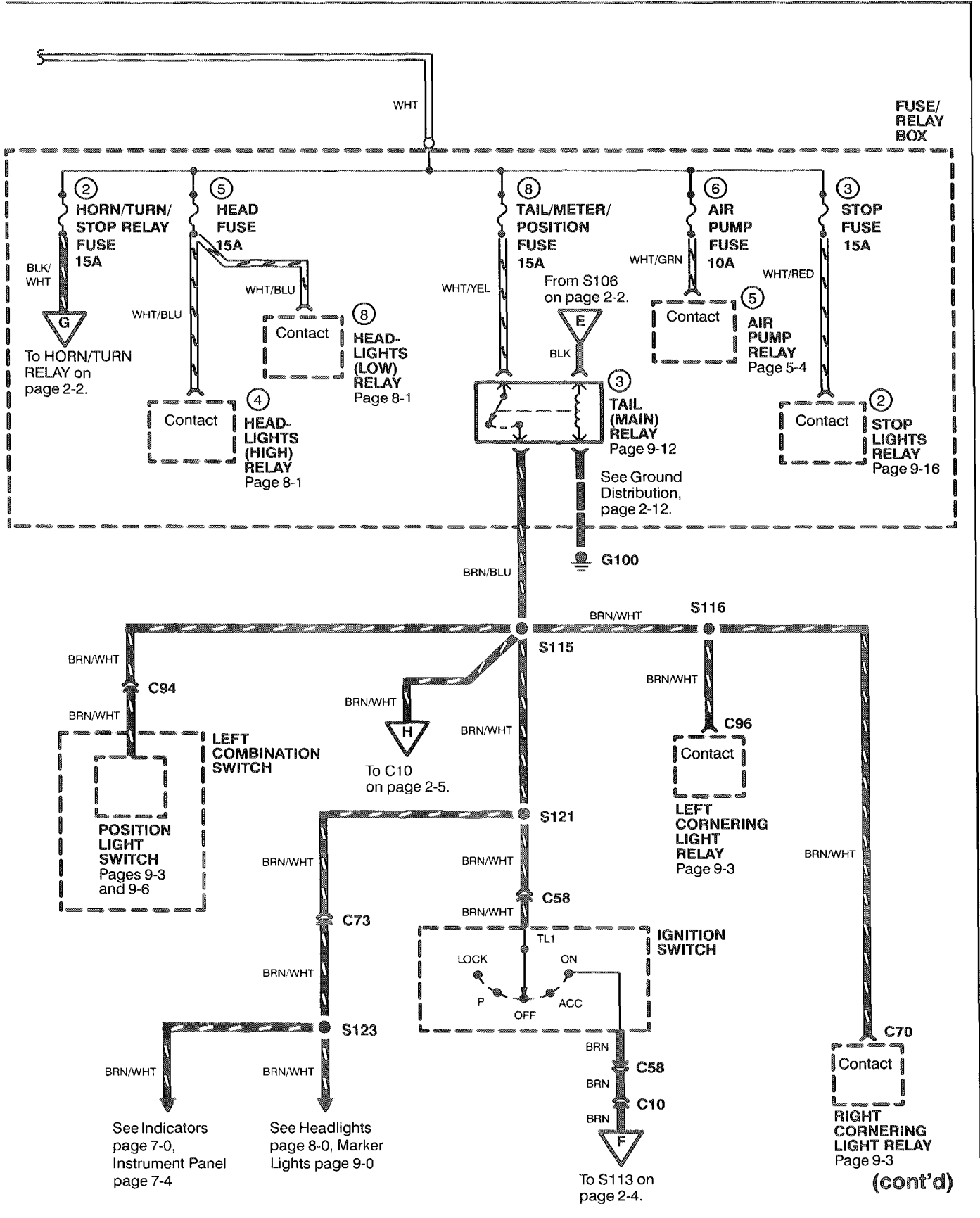
LCD Unit Display



Power Distribution: Asp and SE

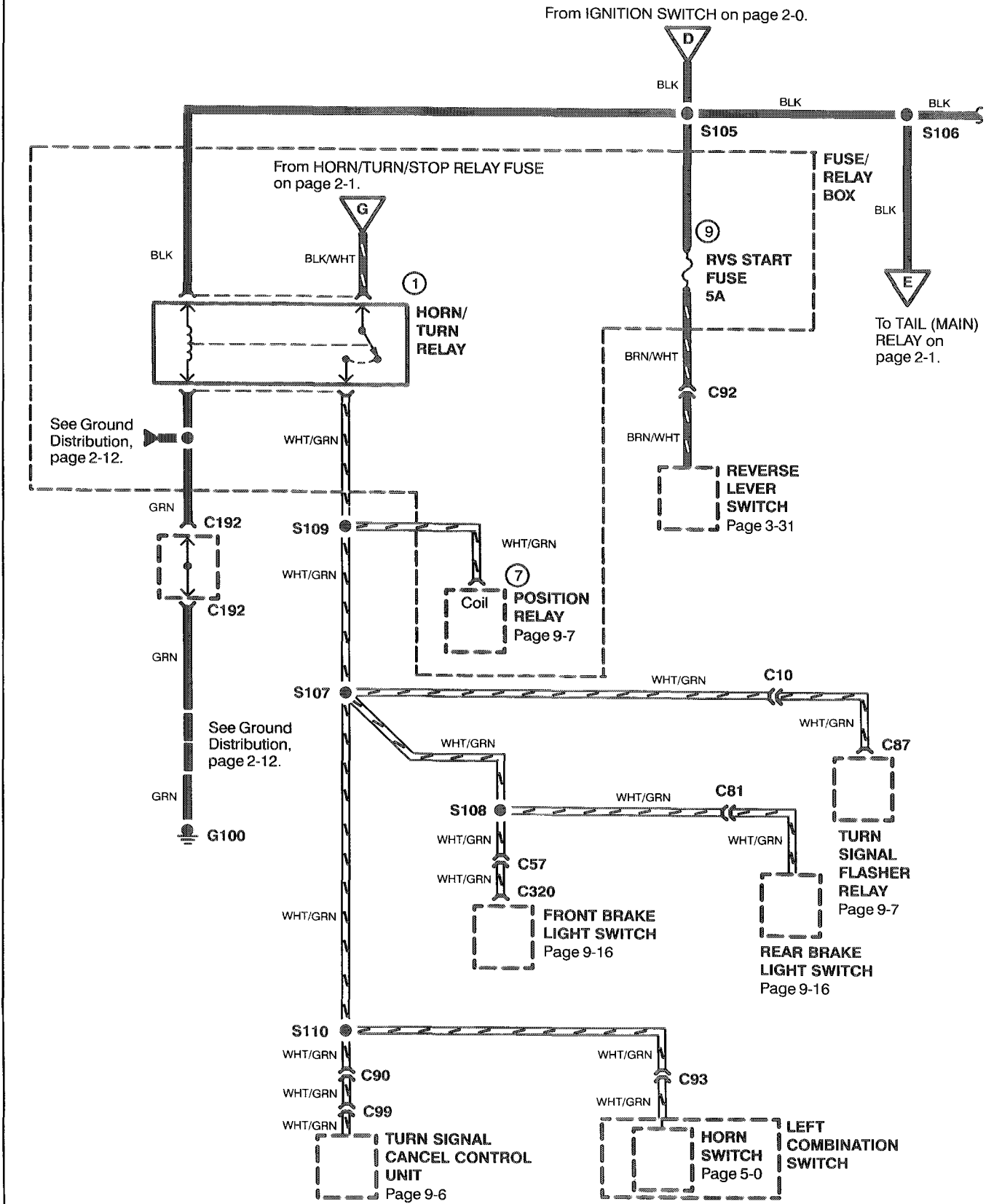
Circuit Schematic

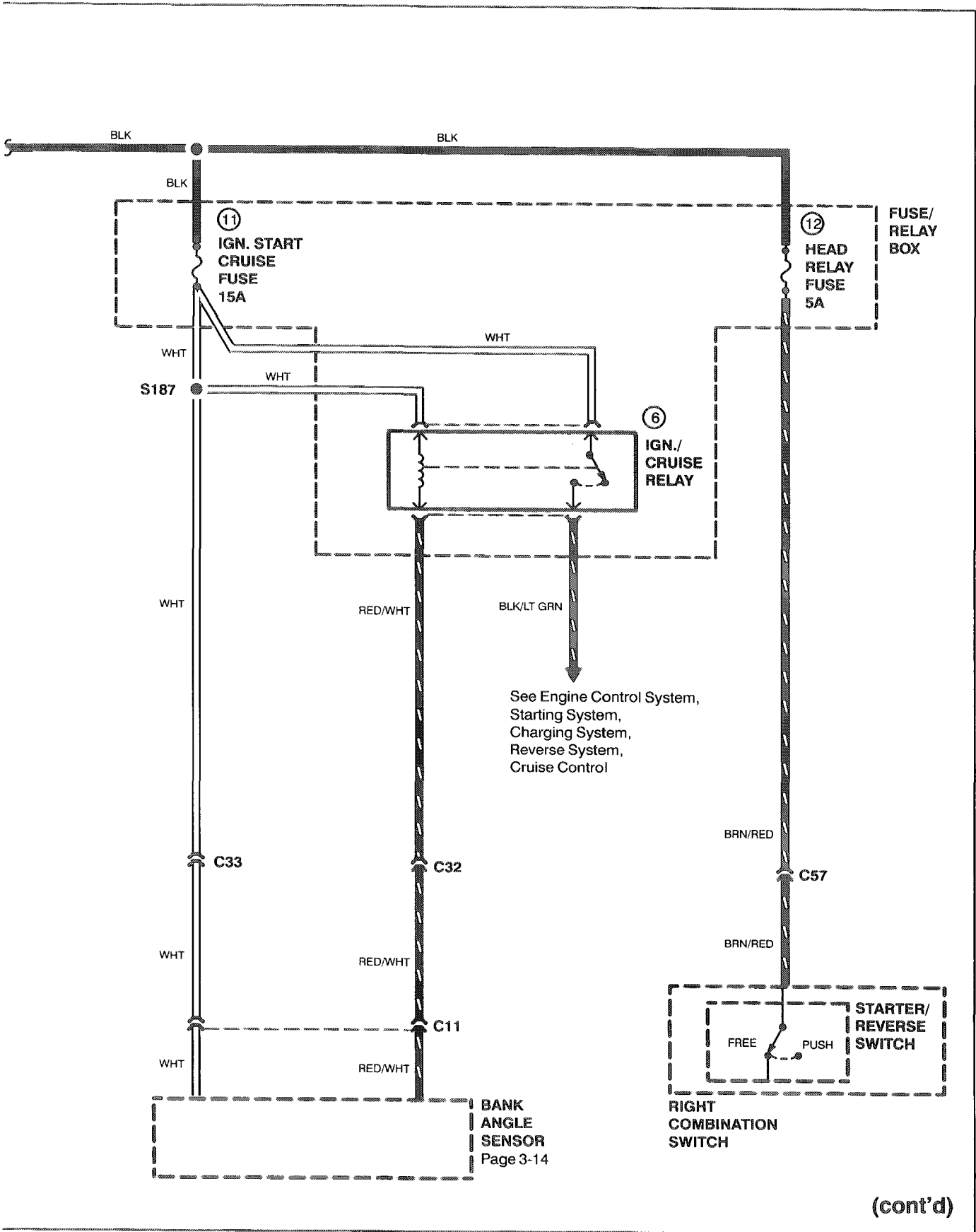




Power Distribution: Asp and SE

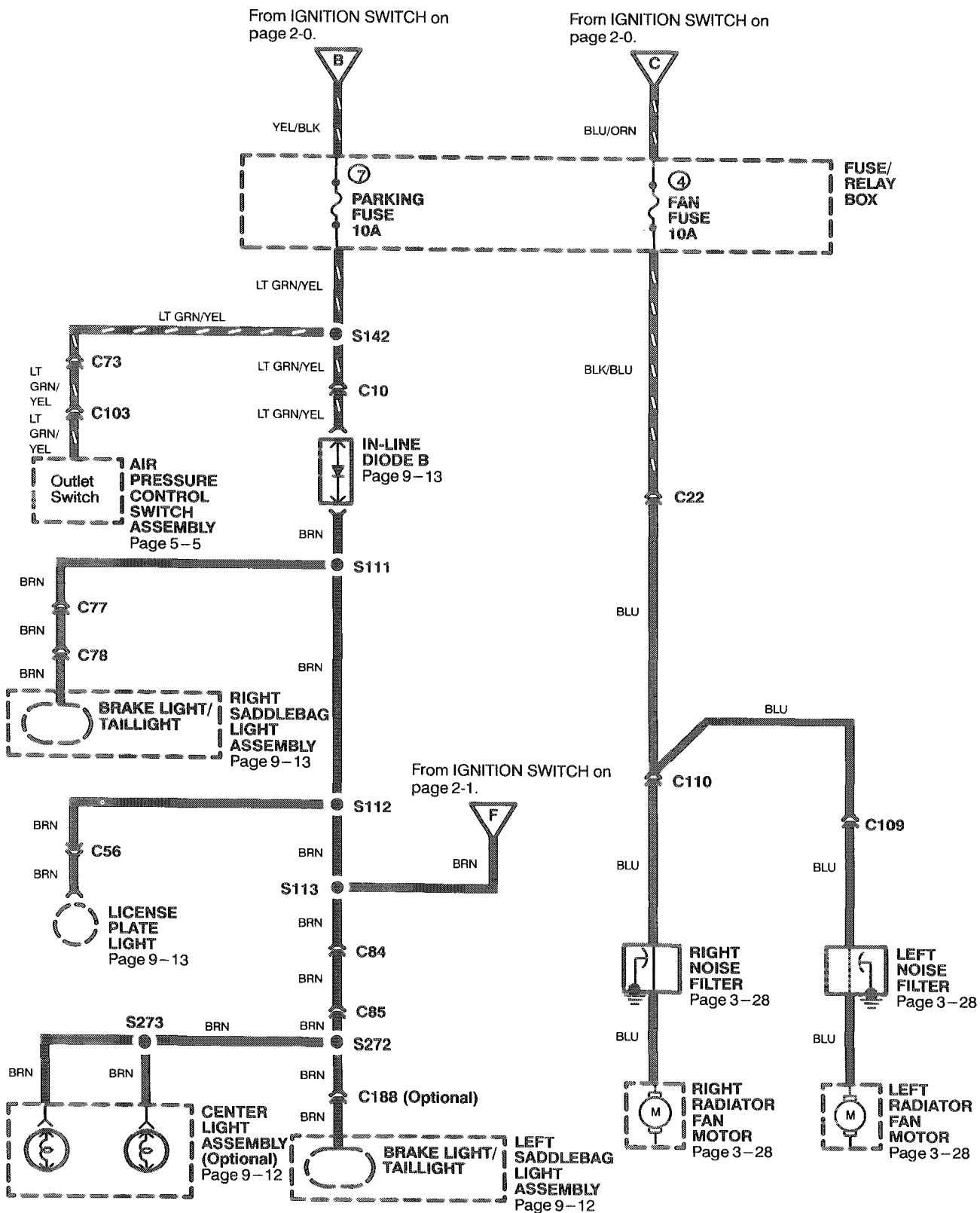
Circuit Schematic (cont'd)

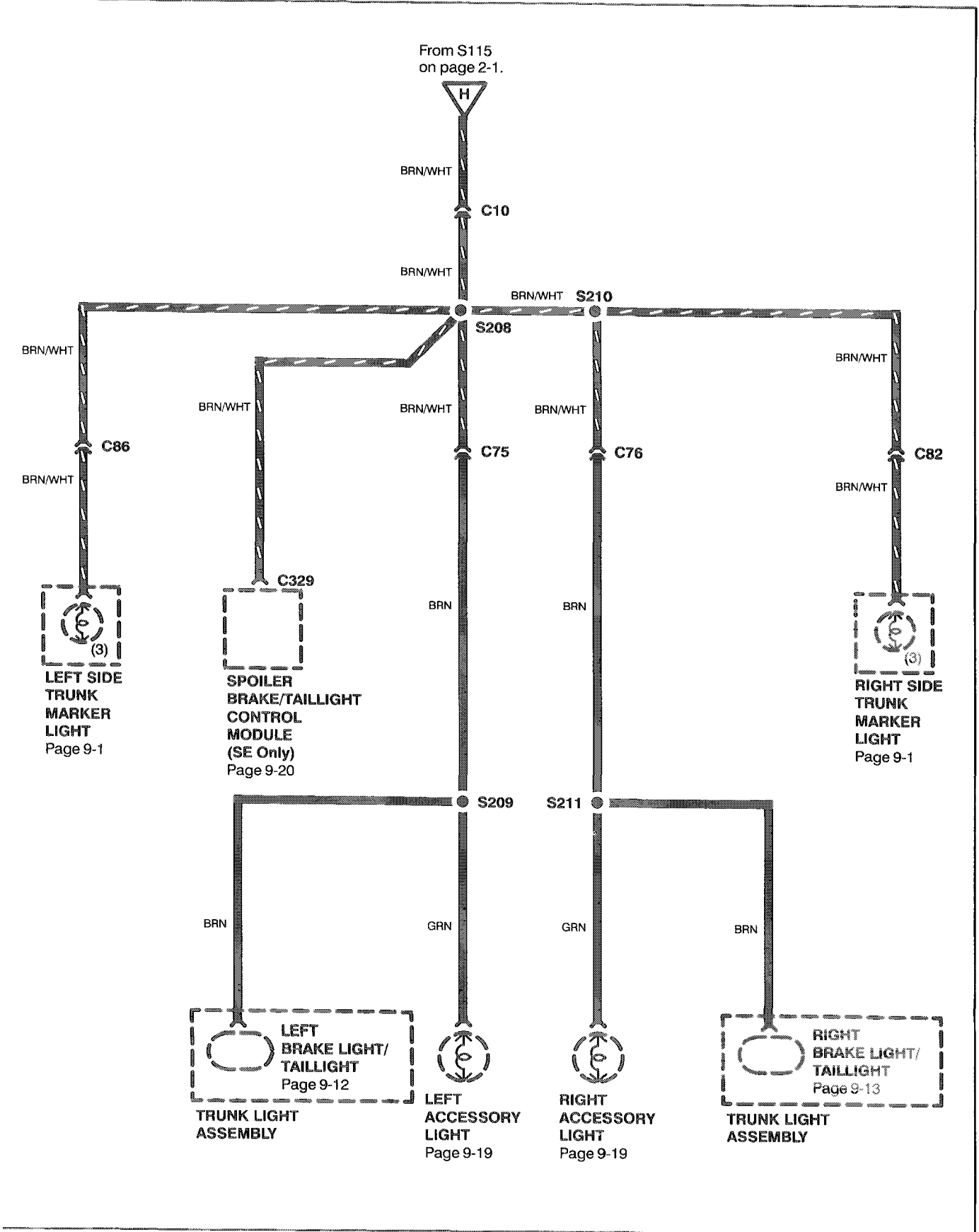




Power Distribution: Asp and SE

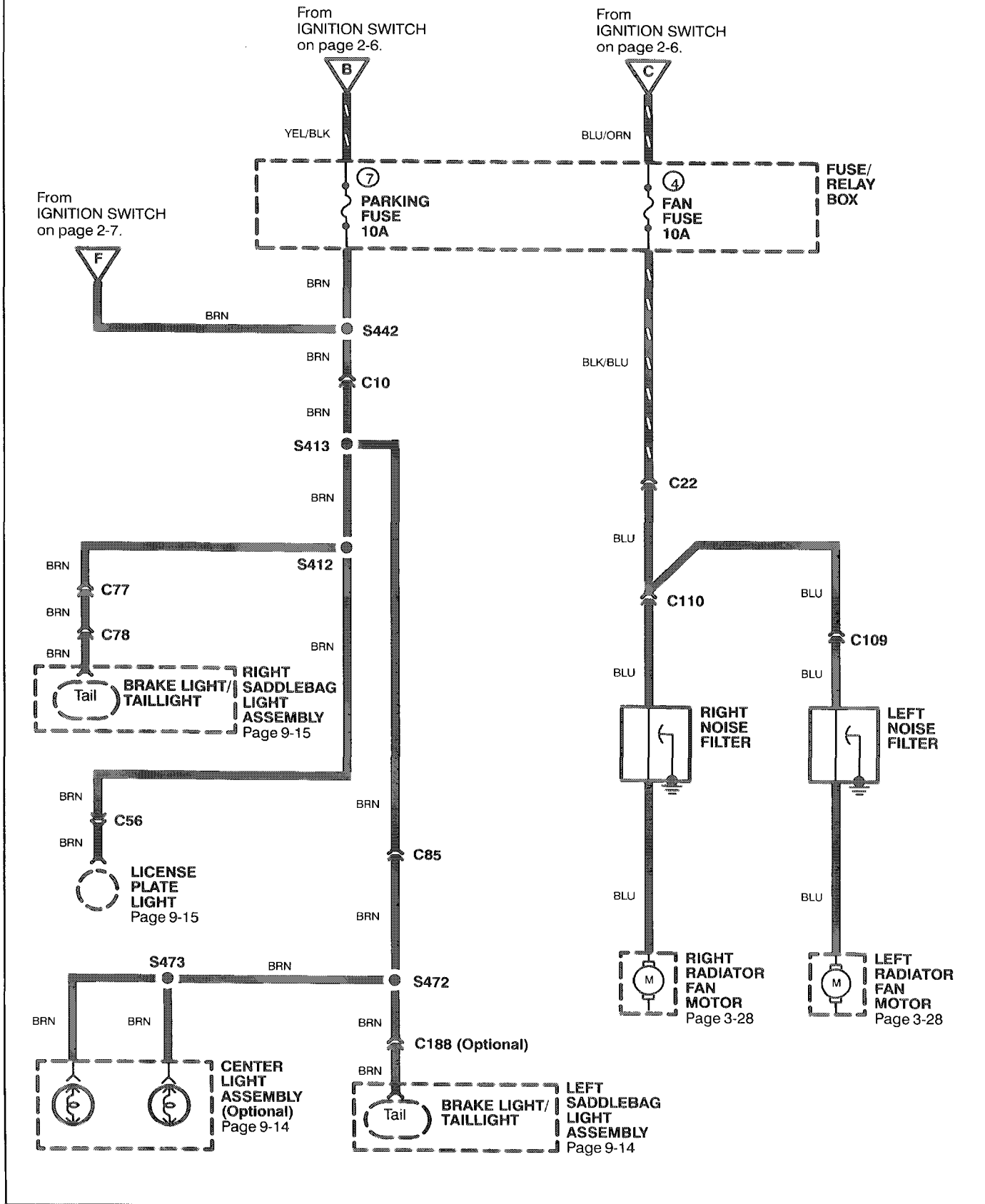
Circuit Schematic (cont'd)





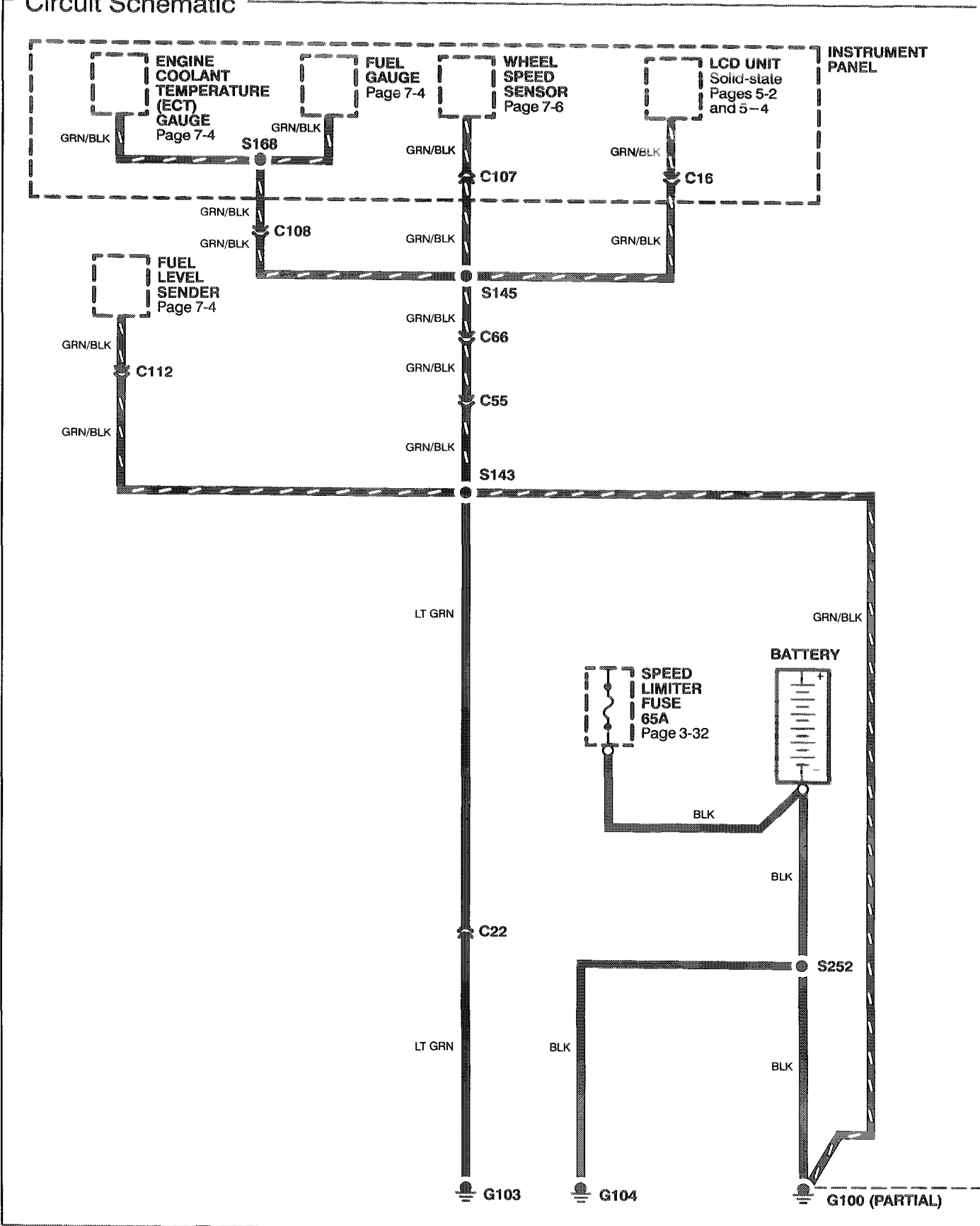
Power Distribution: Int

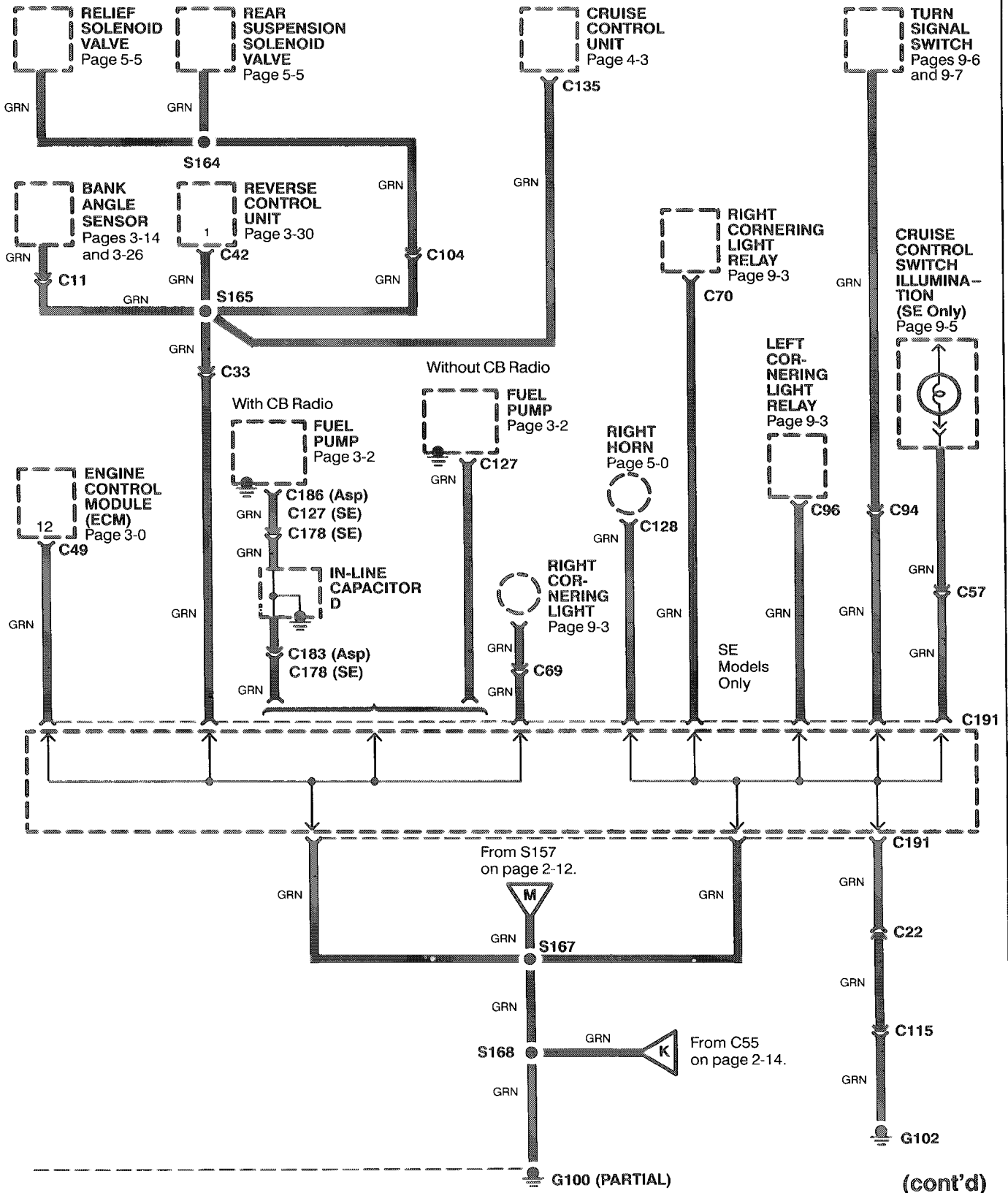
Circuit Schematic (cont'd)



Ground Distribution: G100, G102, G103, and G104 (Asp & SE)

Circuit Schematic

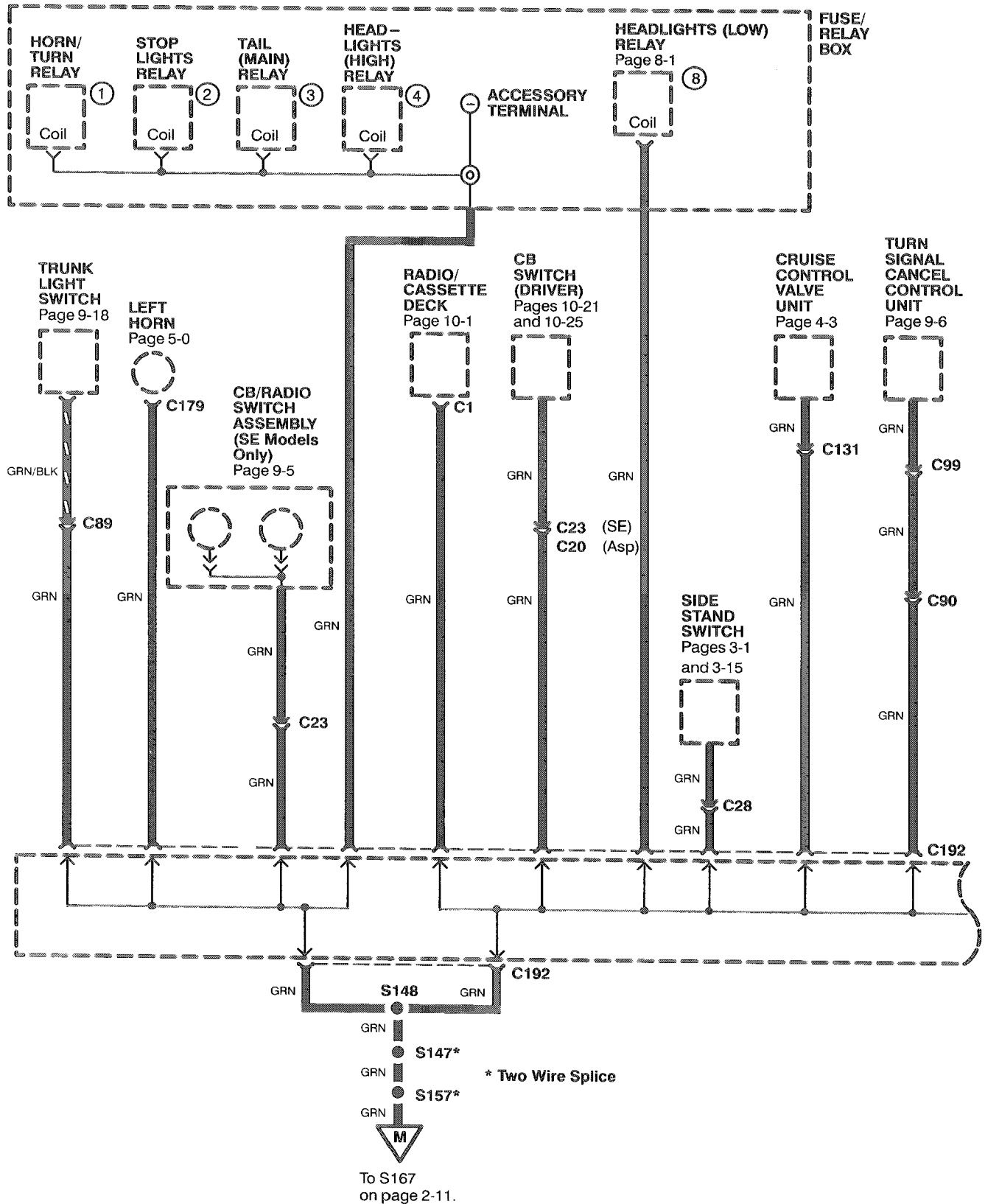


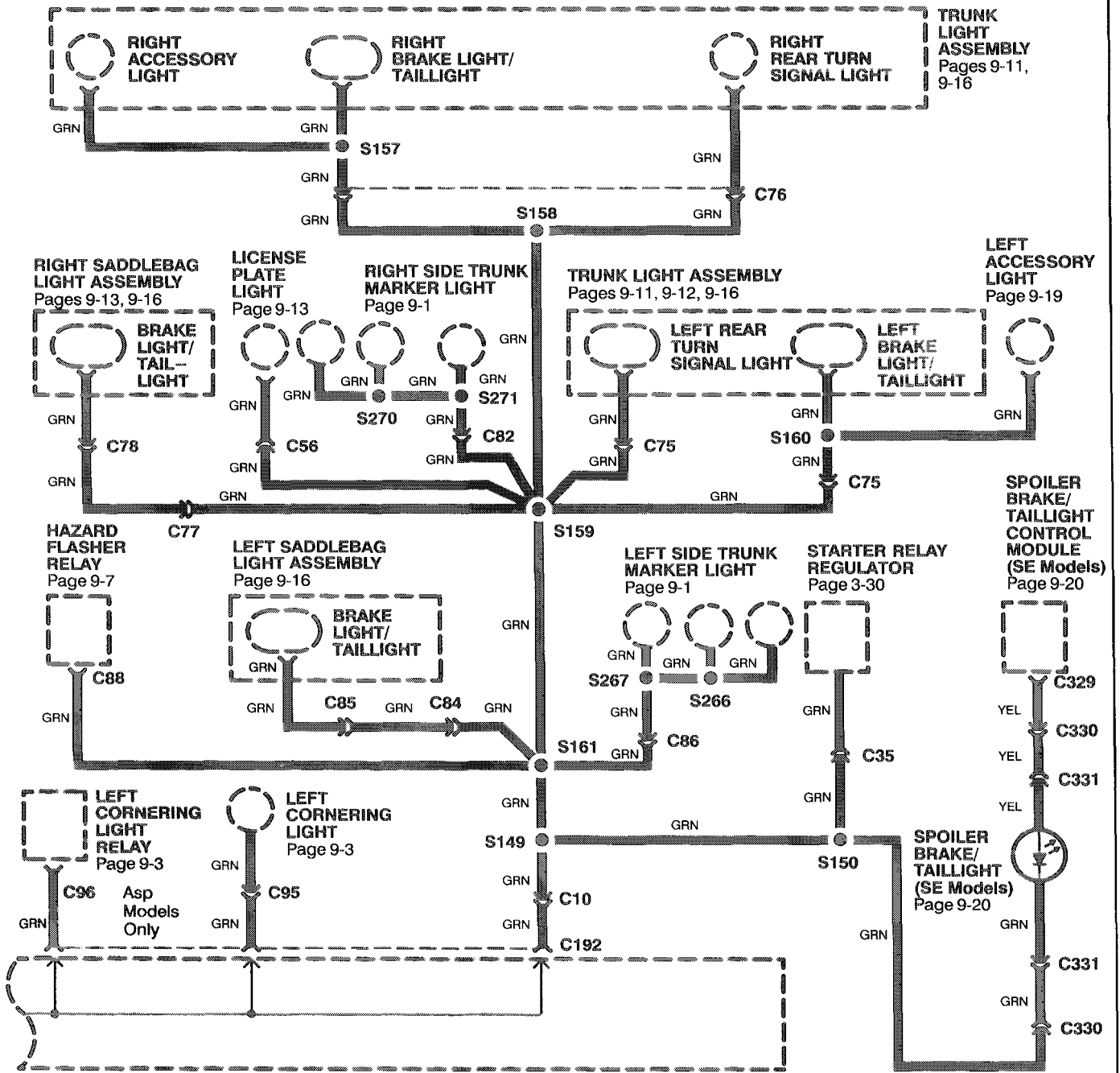


(cont'd)

Ground Distribution: G100, G102, G103, and G104 (Asp & SE)

Circuit Schematic (cont'd)

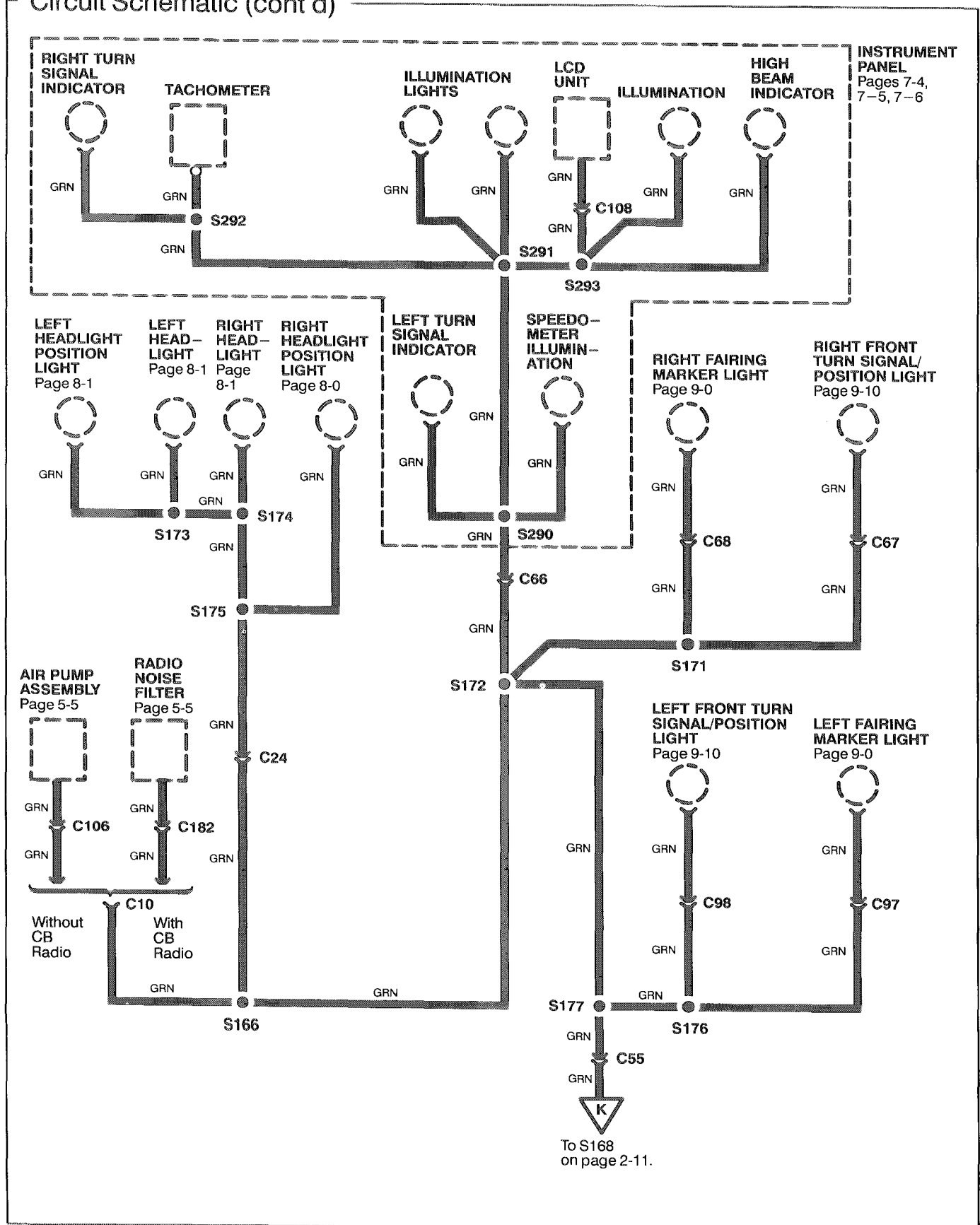




(cont'd)

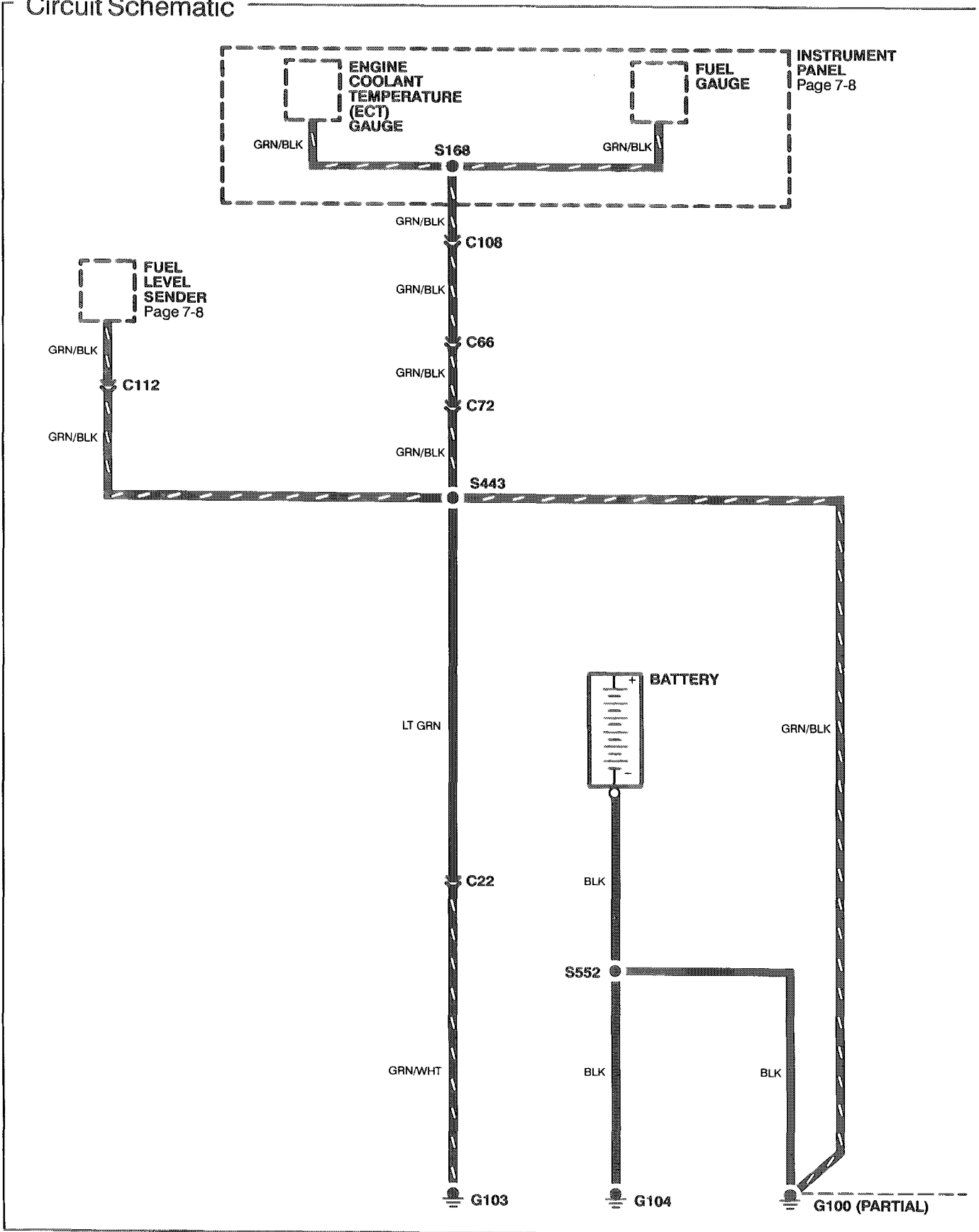
Ground Distribution: G100, G102, G103, and G104 (Asp & SE)

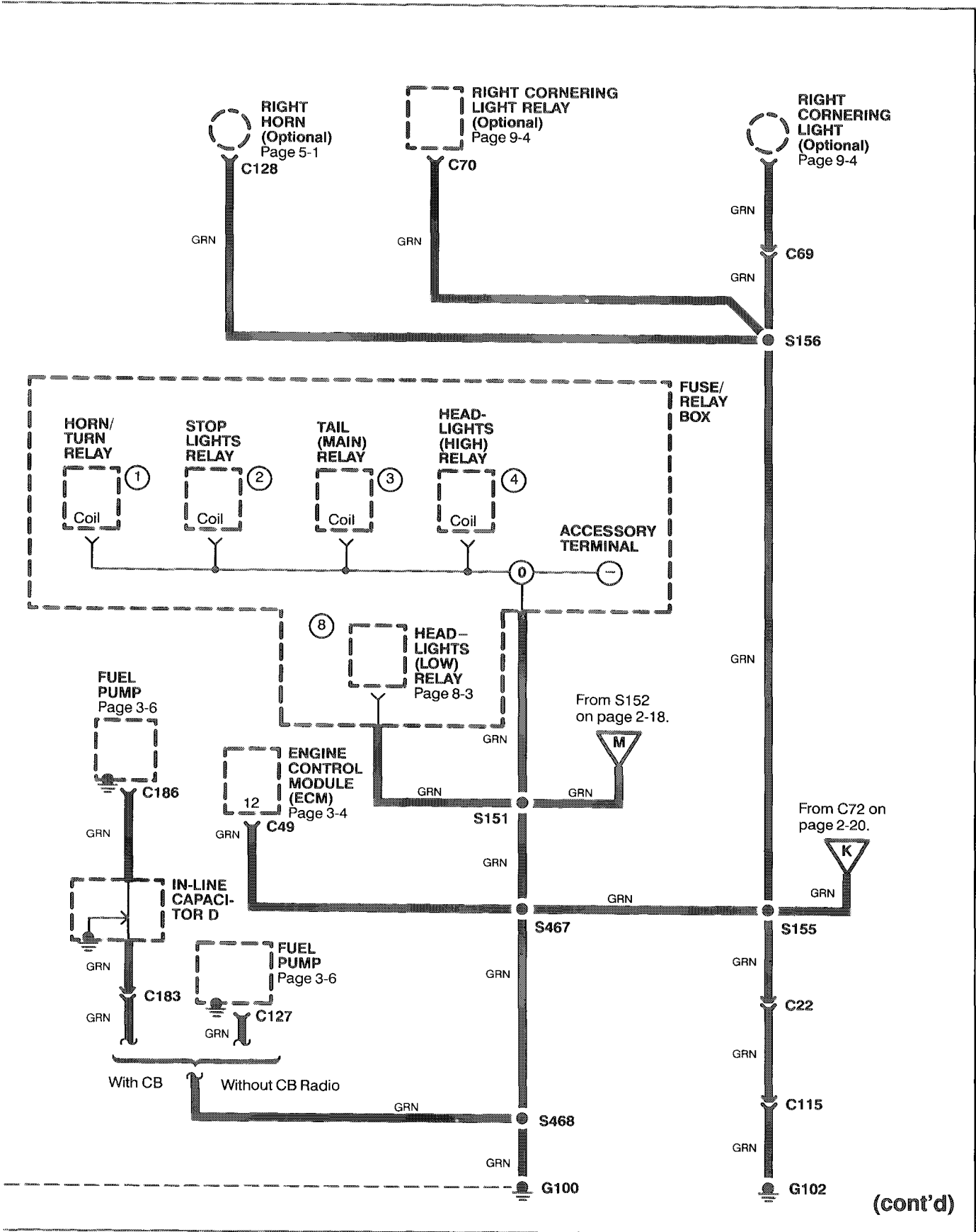
Circuit Schematic (cont'd)



Ground Distribution: G100, G102, G103, and G104 (Int)

Circuit Schematic

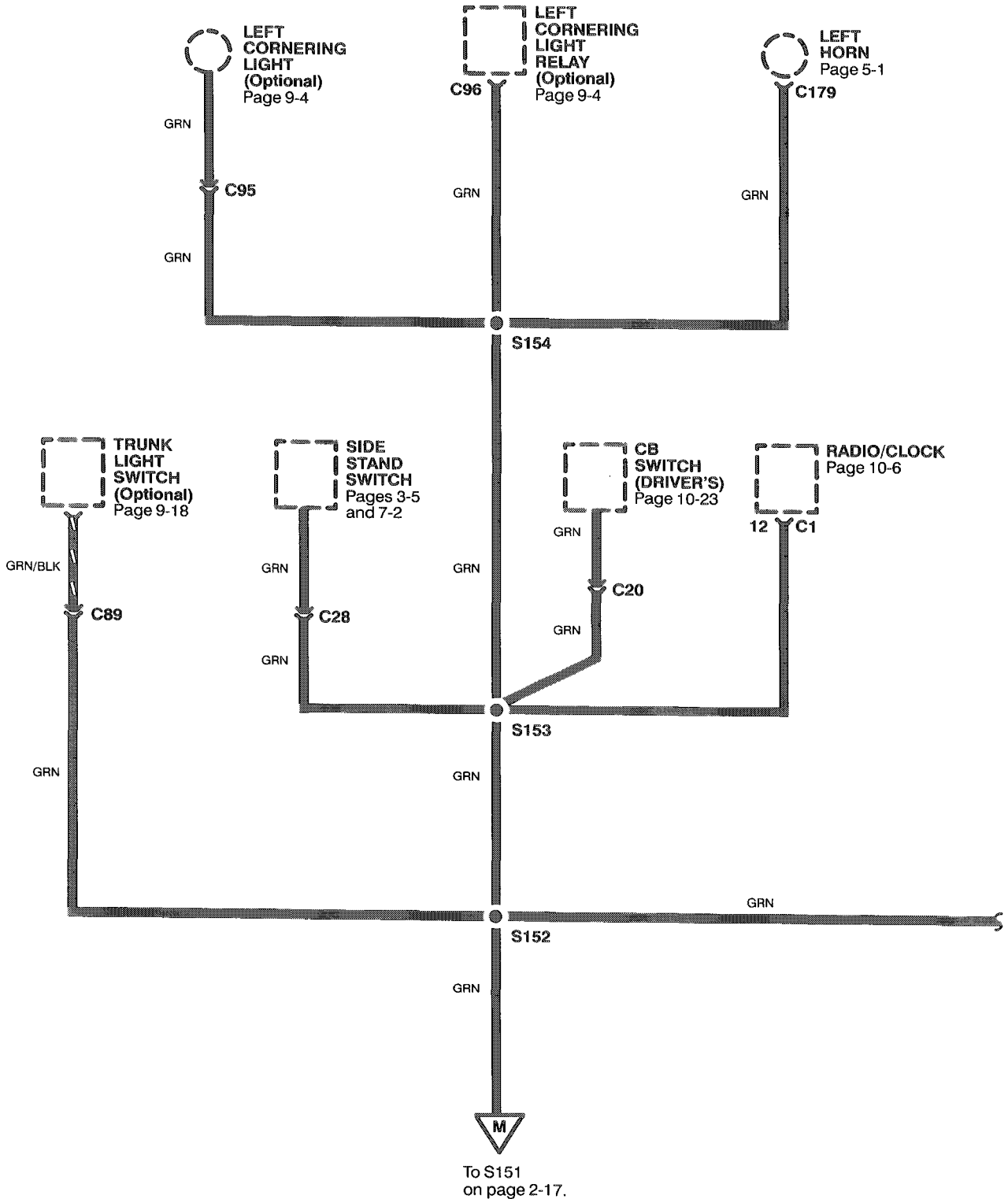


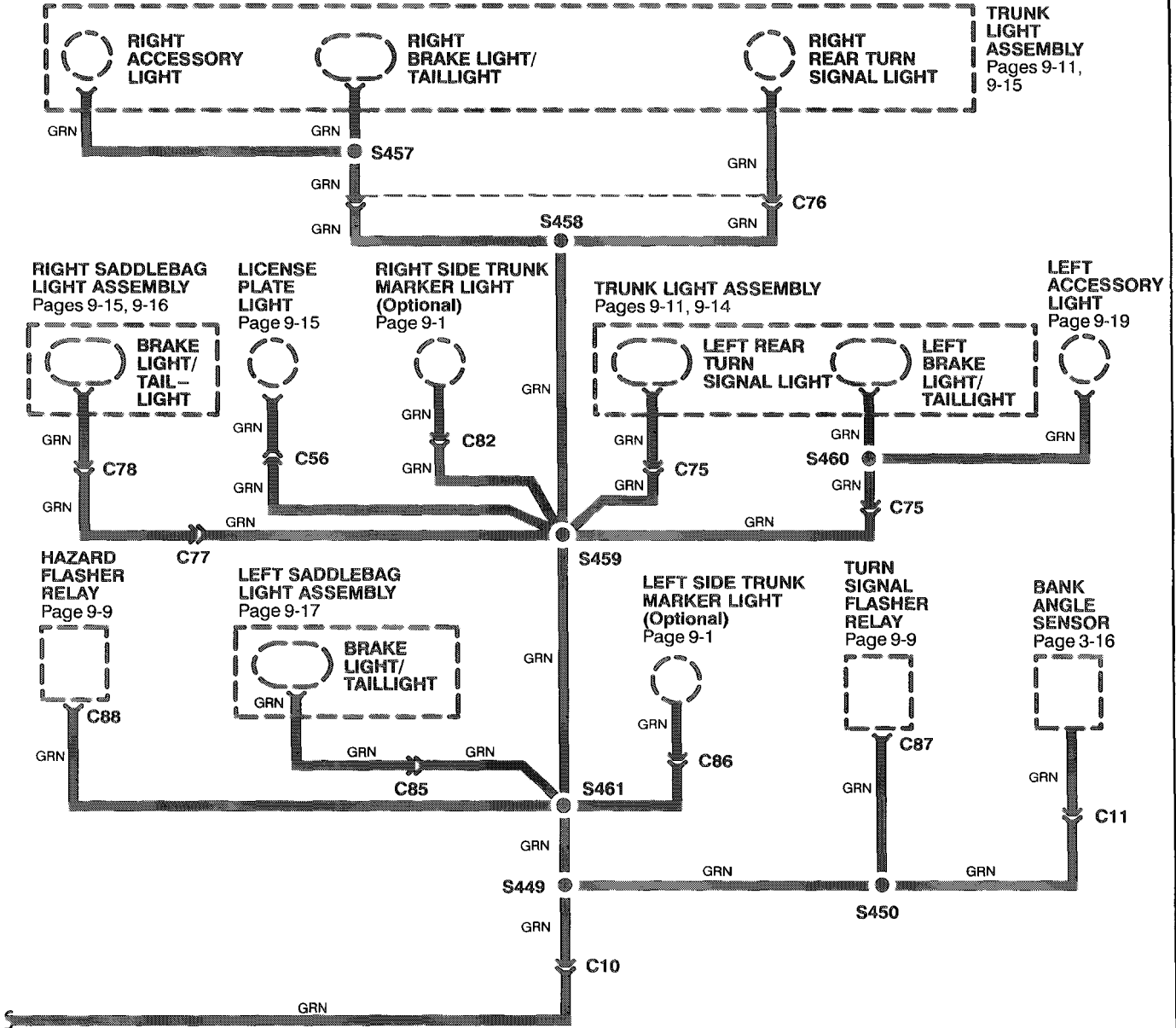


(cont'd)

Ground Distribution: G100, G102, G103, and G104 (Int)

Circuit Schematic (cont'd)

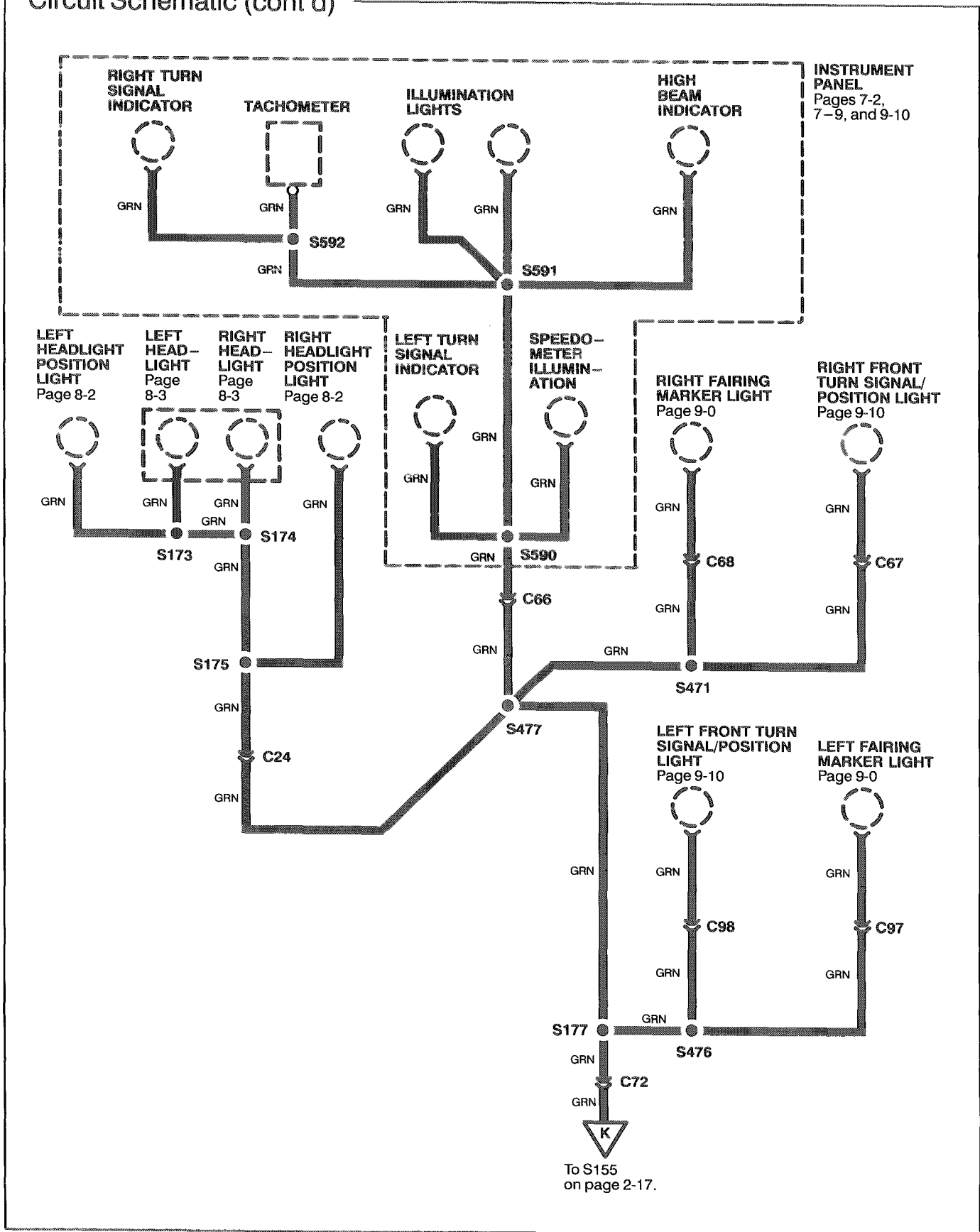




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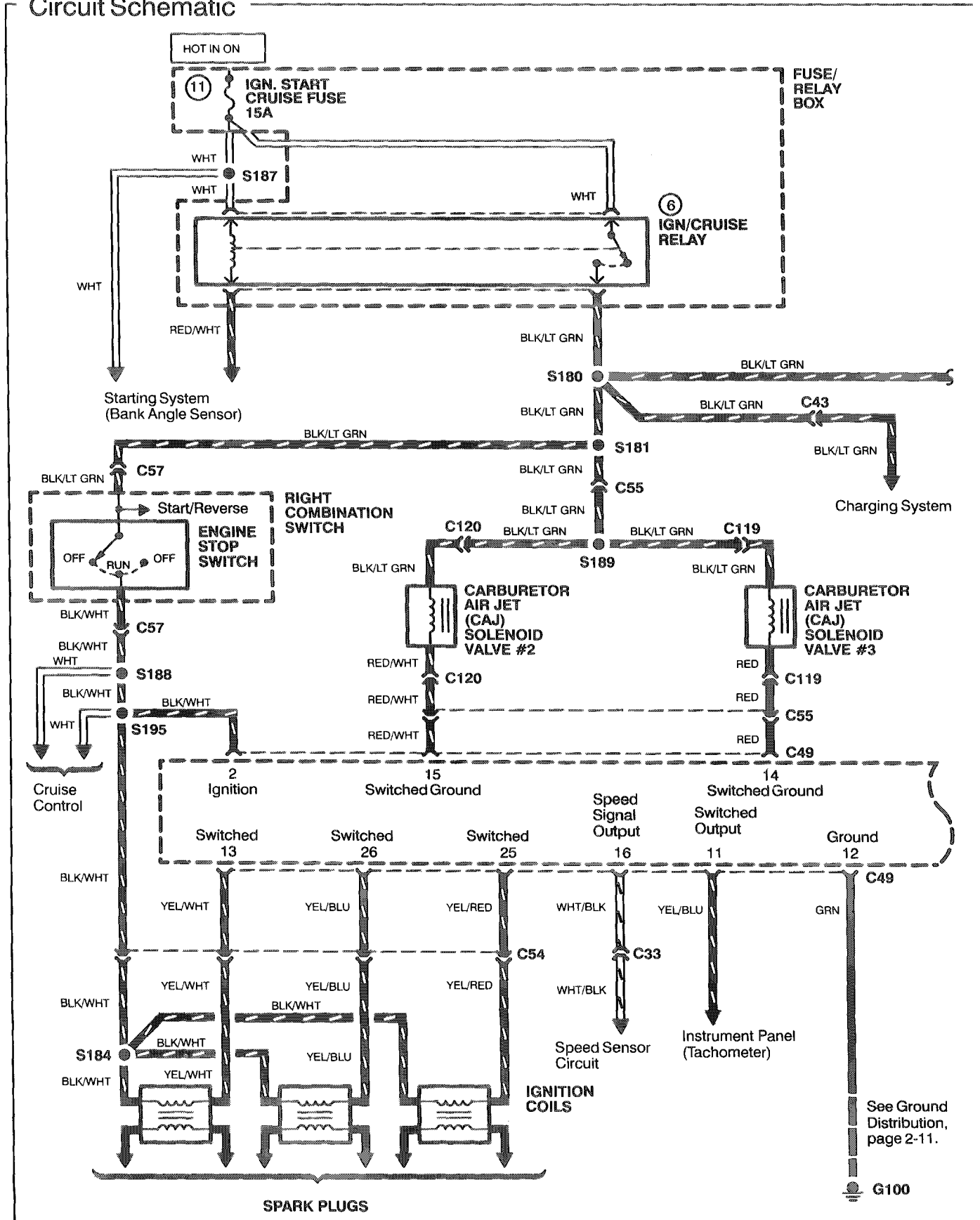
Ground Distribution: G100, G102, G103, and G104 (Int)

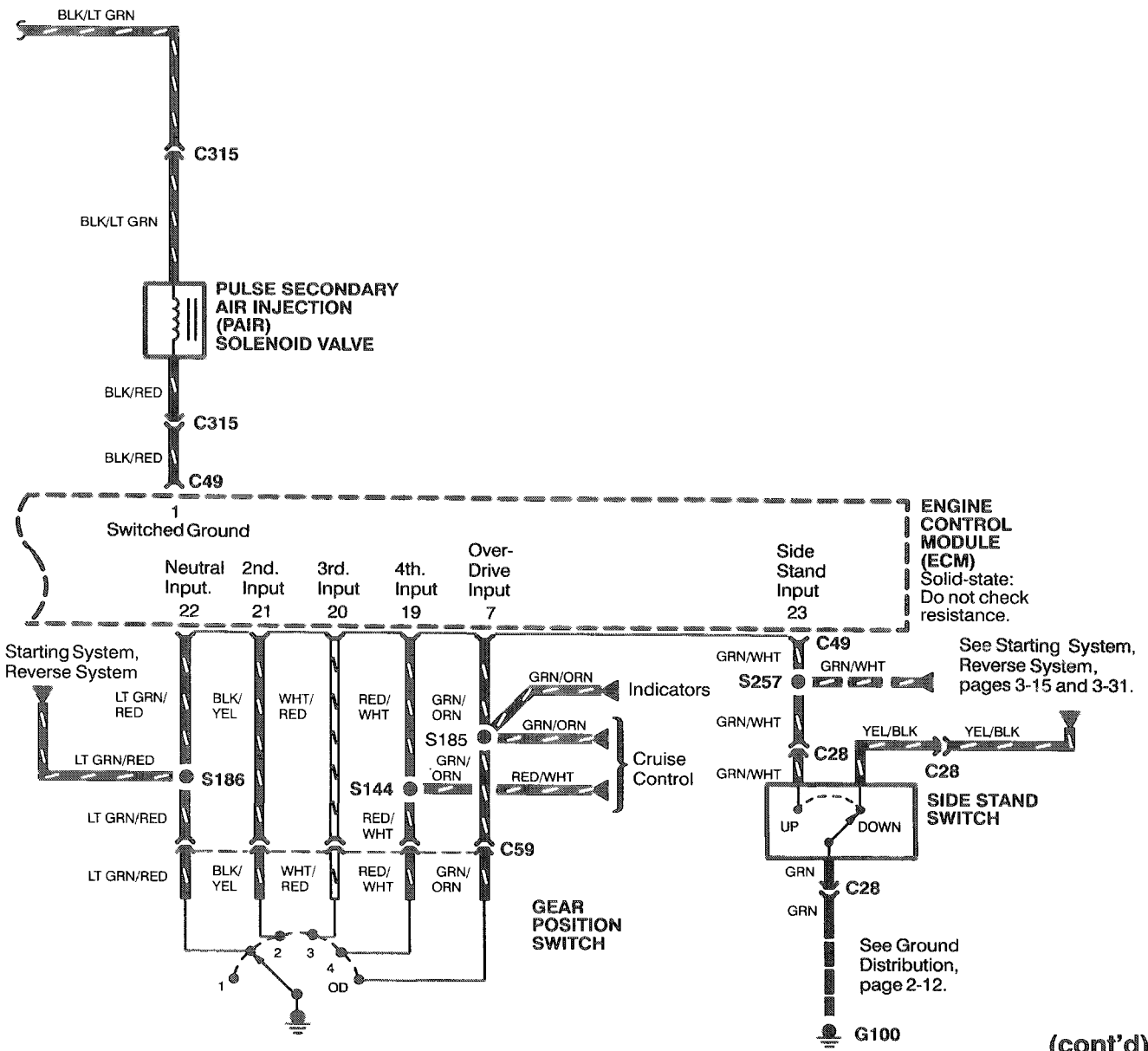
Circuit Schematic (cont'd)



Engine Control System: Asp and SE

Circuit Schematic

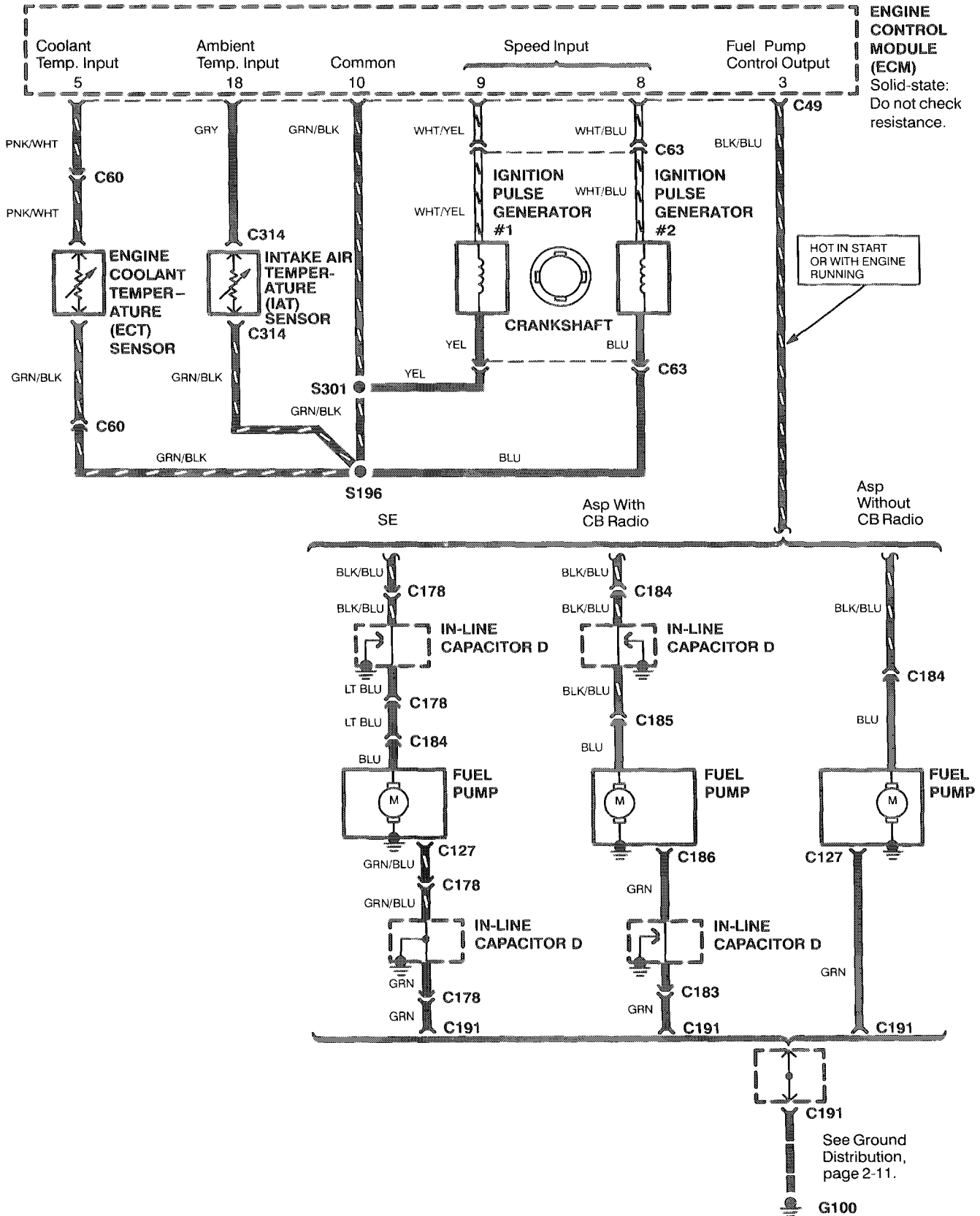




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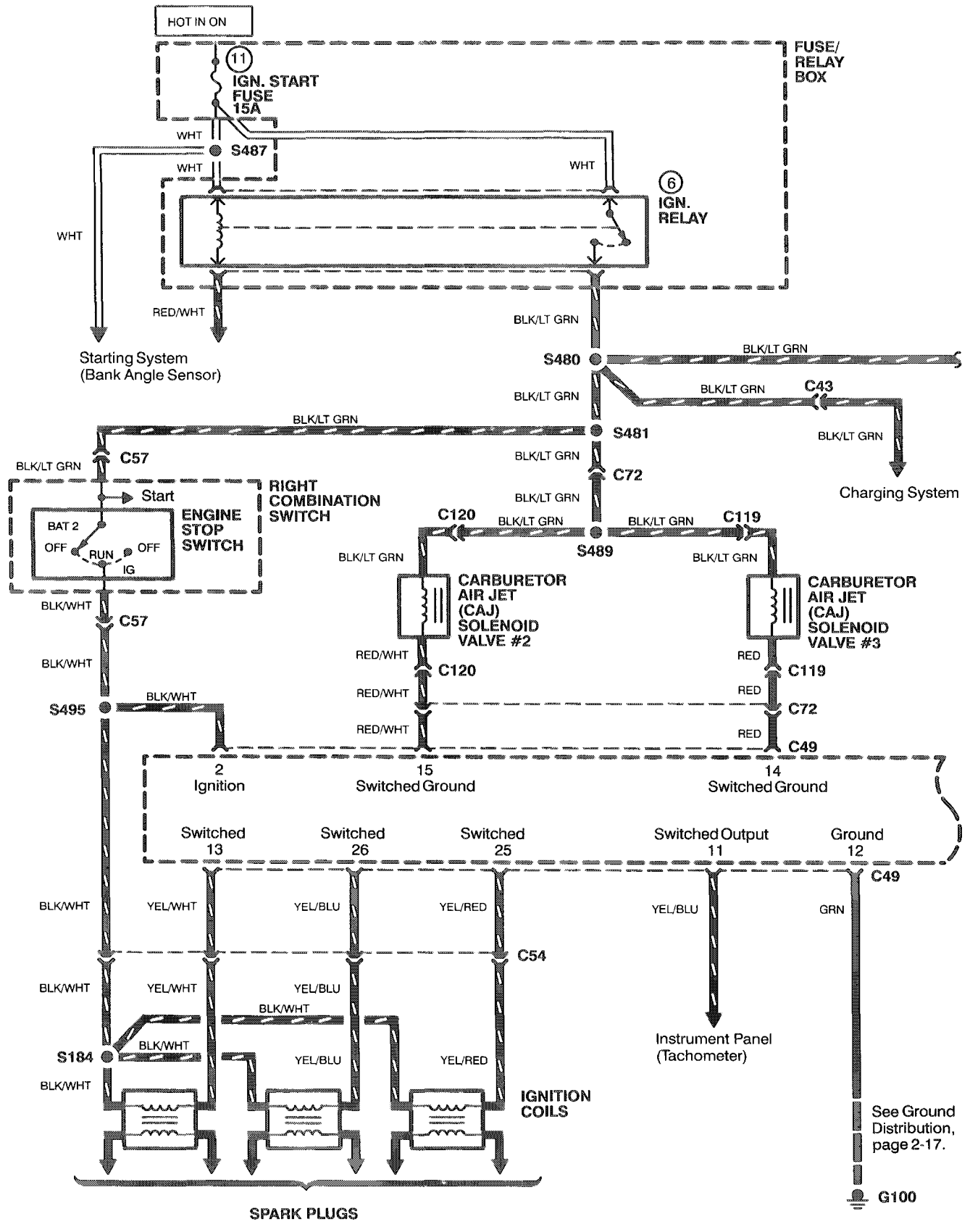
Engine Control System: Asp and SE

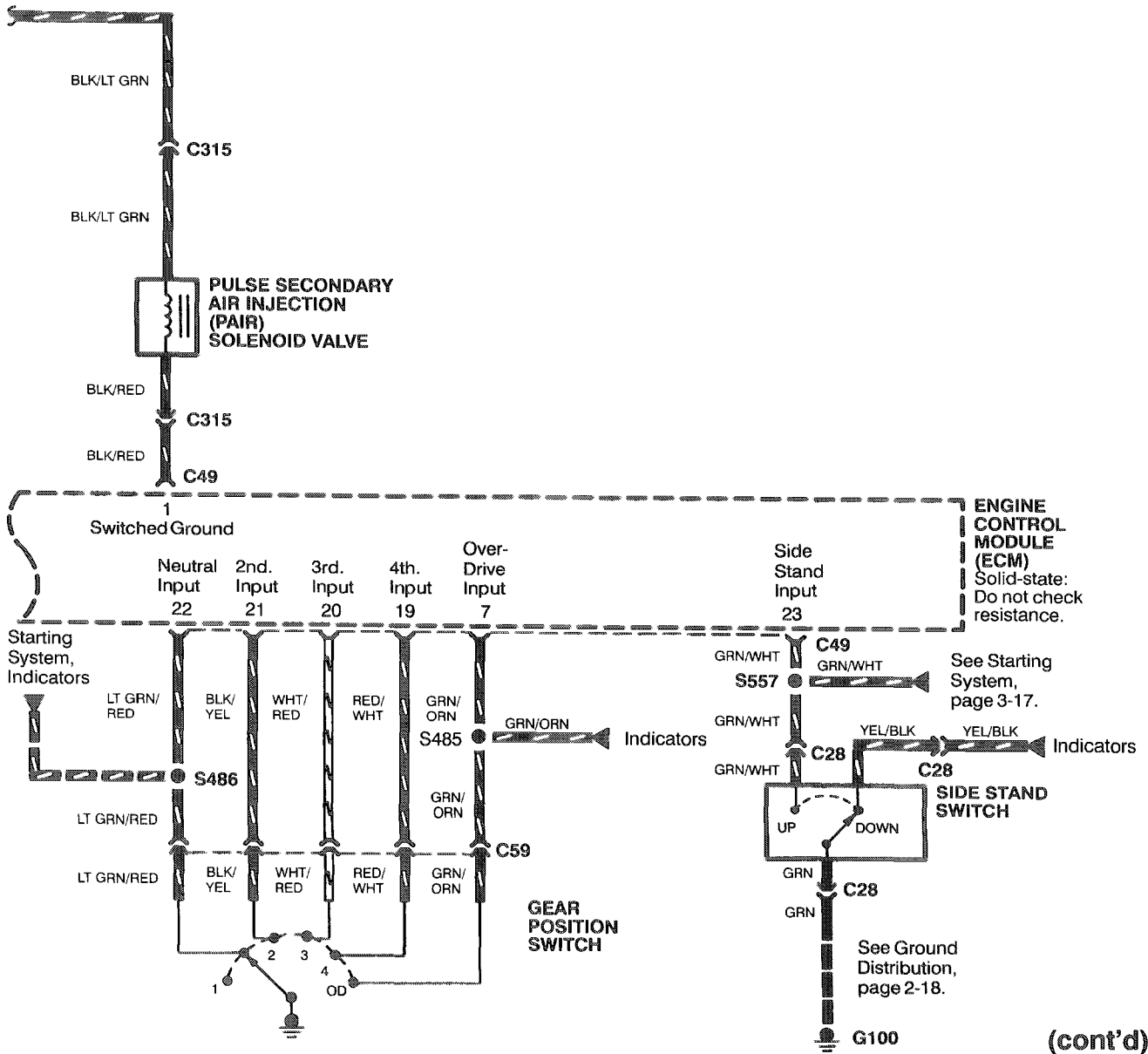
Circuit Schematic (cont'd)



Engine Control System: Int

Circuit Schematic

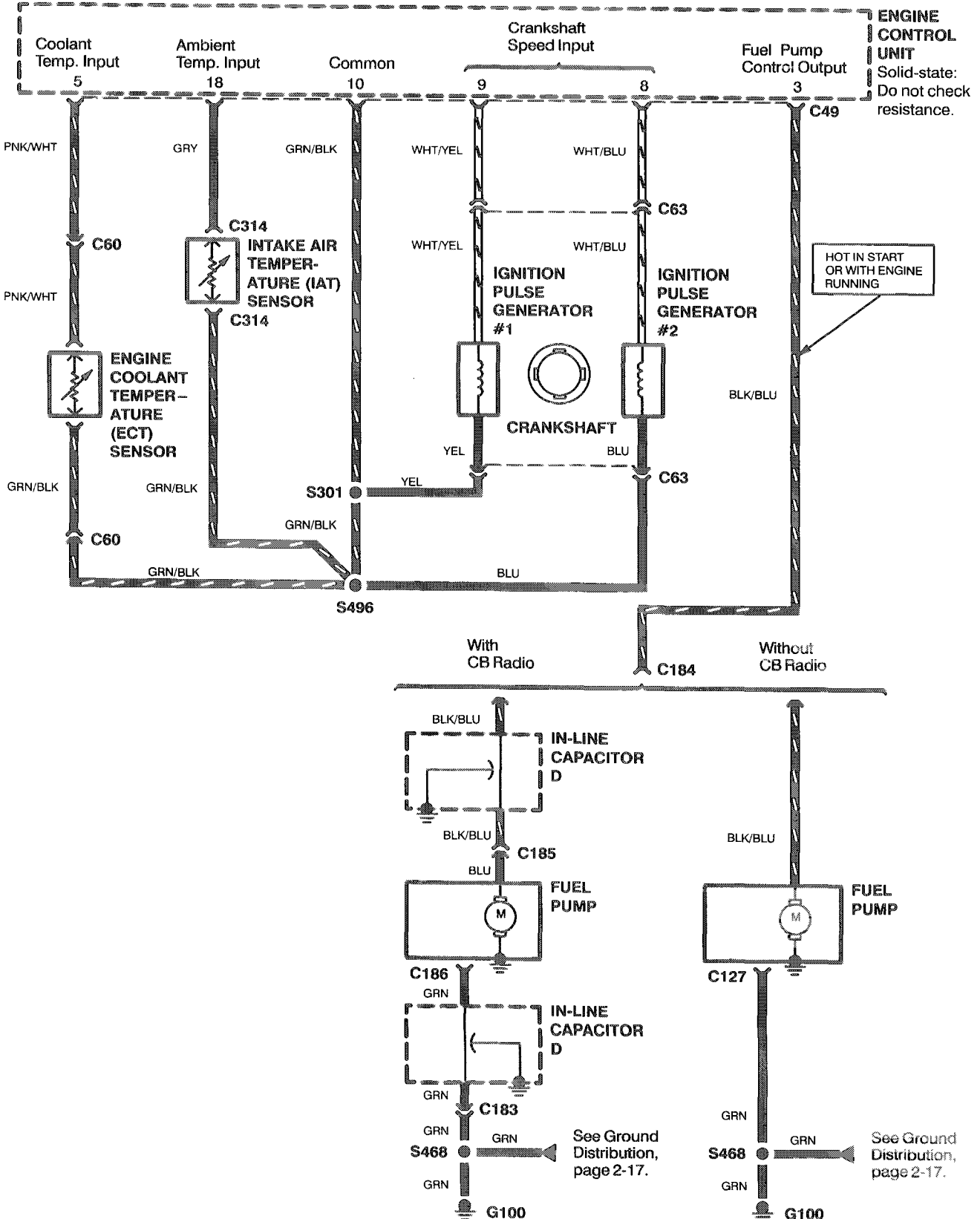




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Engine Control System: Int

Circuit Schematic (cont'd)



How the Circuit Works

Engine performance is controlled by the engine control module (ECM). The ECM receives battery voltage when the engine stop switch is in RUN. The ECM monitors coolant temperature, intake air temperature, gear position, and engine speed. It also controls engine operation by operating several solenoid valves, ignition coils, and the fuel pump.

Carburetor Air Jet (CAJ) Solenoid Valves

The CAJ solenoid valves receive battery voltage from the ignition/cruise relay with the ignition ON. They receive a ground control signal from the ECM.

Pulse Secondary Air Injection (PAIR) Solenoid Valve

The PAIR solenoid valve receives battery voltage from the ignition/cruise relay with the ignition ON. It is controlled by a ground control signal from the ECM.

Ignition Coils

The three ignition coils receive battery voltage with the ignition ON and the engine stop switch in RUN. Each coil is fired individually when the ECM grounds the corresponding coil control line. The ECM can vary ignition timing based on other sensor information.

Gear Position Switch

The gear position switch supplies five input circuits to the ECM for the positions N, 2, 3, 4, and OD. The respective circuits are ground when in the associated gear and open otherwise.

Side Stand Switch

The side stand switch sends a ground signal to the ECM with the side stand switch in UP and is open in DOWN.

Intake Air Temperature (IAT) Sensor

The intake air temperature (IAT) sensor is a resistor that increases resistance with a decrease in temperature and decreases resistance with an increase in temperature. The IAT sensor sends this resistance signal to the ECM through the GRN/BLK sensor common and the GRY ambient air temperature input circuit.

Ignition Pulse Generators

The ignition pulse generators are coils that generate a magnetic pulse when the crankshaft magnet passes by the pulse generator pickups. This pulsing signal conveys crankshaft position and engine RPM information to the ECM. One end of these generators is tied to the GRN/BLK sensor common. The ignition pulse generator signals are sent to the ECM through the WHT/YEL and WHT/BLU circuits.

Fuel Pump

The fuel pump is a DC motor that receives ground through the GRN circuit. It receives a voltage control signal from the ECM.

Engine Coolant Temperature (ECT) Sensor

The engine coolant temperature (ECT) sensor is a resistor that increases resistance with a decrease in temperature and decreases resistance with an increase in temperature. The ECT sensor sends this resistance signal to the ECM through the GRN/BLK sensor common and the PNK/WHT coolant temperature input circuit.

Troubleshooting

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> ● Engine cranks but does not start. ● Engine runs poorly. 	<ul style="list-style-type: none"> ● Do Isolation Procedure 1. ● Do Isolation Procedure 2.

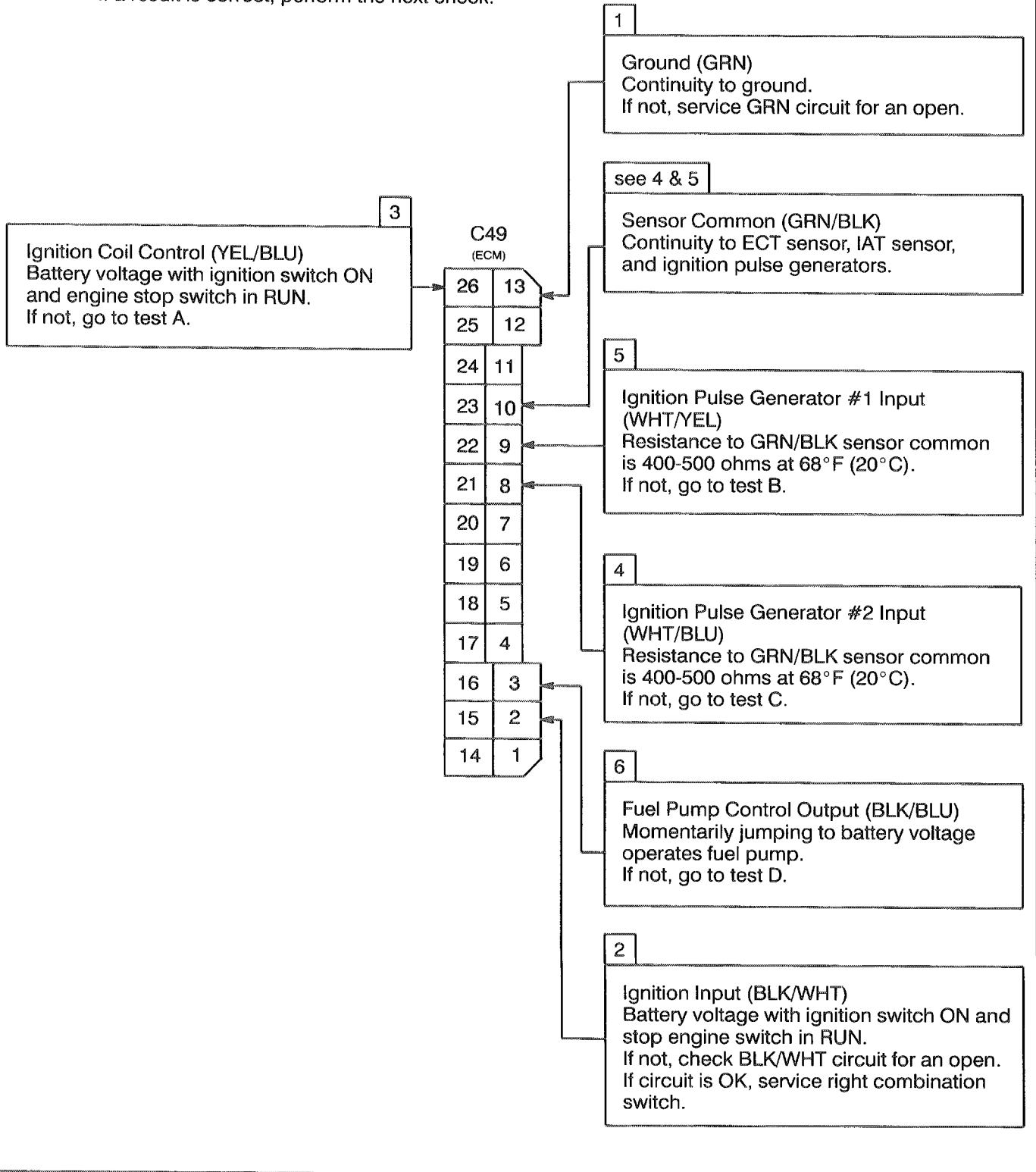
(cont'd)

Engine Control System

Troubleshooting (cont'd)

ISOLATION PROCEDURE 1

Note: Perform all checks in order.
 If a result is incorrect, go to the test referenced.
 If a result is correct, perform the next check.



ISOLATION PROCEDURE 2

Note: Perform all checks in order.
 If a result is incorrect, go to the test referenced.
 If a result is correct, perform the next check.
 If a box is not numbered, do not check.

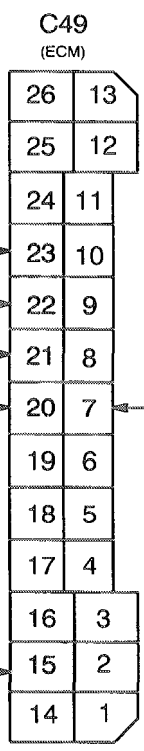
6
 Side Stand Input (GRN/WHT)
 Continuity to ground with side stand UP and open with side stand DOWN.
 If not, check GRN/WHT and GRN circuits for an open or short to ground.
 If circuit is OK, service side stand switch.

1
 Neutral Input (LT GRN/RED)
 Battery voltage with ignition switch ON, reverse lever in FORWARD, and transmission not in NEUTRAL.
 If not, service neutral indicator circuit for an open or short to ground.
 Zero volts in NEUTRAL.
 If not, check LT GRN/RED circuit and gear position switch for an open.

2
 2ND Gear Input (BLK/YEL)
 Continuity to ground with transmission in 2nd gear otherwise open.
 If not, check BLK/YEL circuit for an open or short to ground between ECM and gear position switch.
 If circuit is OK, service gear position switch.

3
 3RD Gear Input (WHT/RED)
 Continuity to ground with transmission in 3rd gear otherwise open.
 If not, check WHT/RED circuit for an open or short to ground between ECM and gear position switch.
 If circuit is OK, service gear position switch.

4
 4TH Gear Input (RED/WHT)
 With ignition OFF, connect test lamp between terminal indicated and battery voltage. Lamp lights in 4th gear and is off in all others.
 If not, check RED/WHT circuit and gear position switch for an open or short to ground.



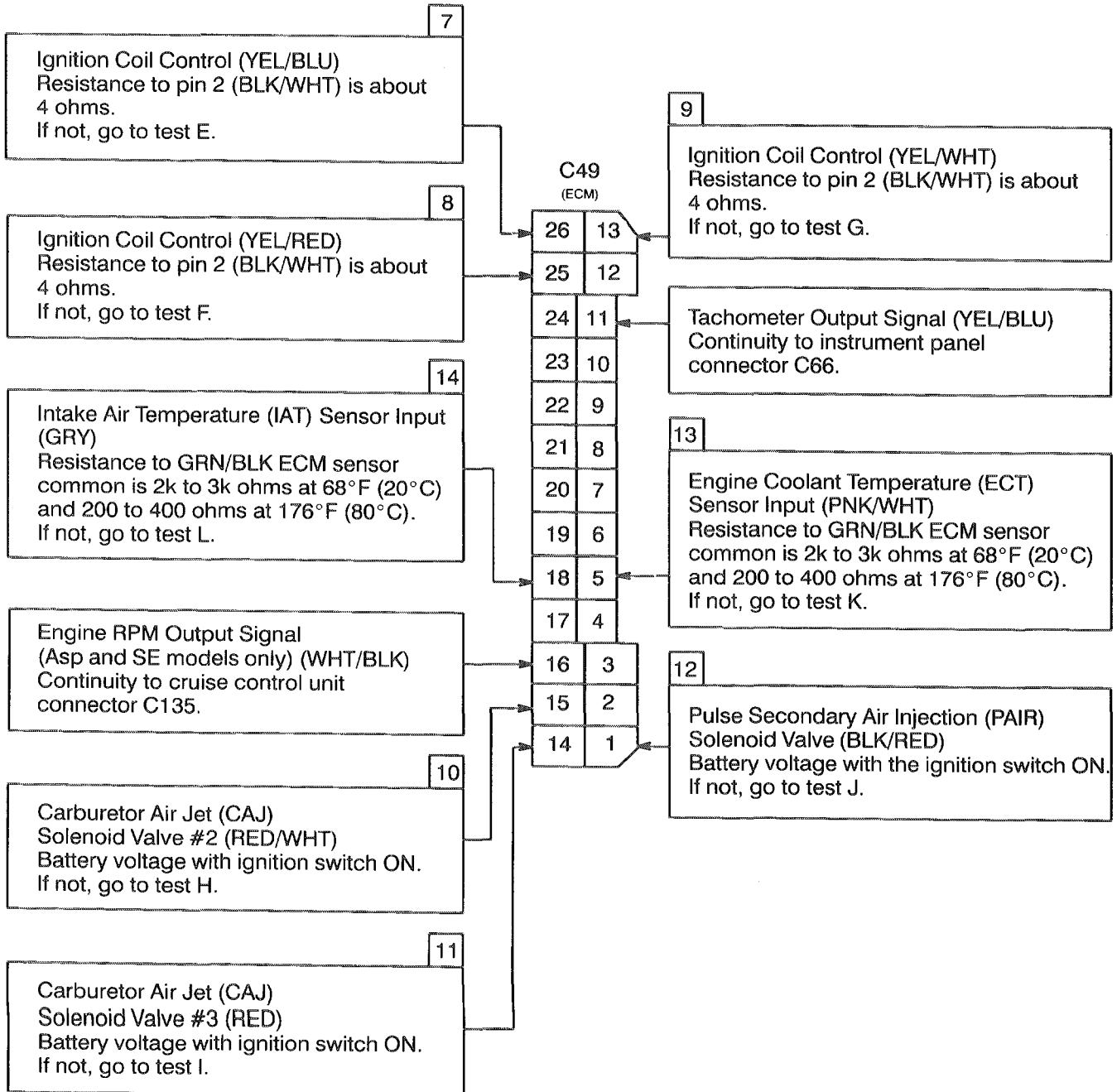
5
 Overdrive Input (GRN/ORN)
 Battery voltage with ignition switch ON.
 If not, check GRN/ORN and BLK/GRN indicator control circuits, and bulb for an open or short to ground.
 Zero volts in Overdrive (OD).
 If not, check GRN/ORN circuit and gear position switch for an open.

(cont'd)

Engine Control System

Troubleshooting (cont'd)

ISOLATION PROCEDURE 2 (cont'd)



Test A: Ignition Coil Input Test

1. Disconnect C54. Turn the ignition switch ON and place engine stop switch in RUN. Check that there is battery voltage at BLK/WHT (ECM side of C54) circuit.
If yes, go to test G.
If no, service BLK/WHT circuit for an open.

Test B: Ignition Pulse Generator #1 Input Test

1. Disconnect C63 and connect ohmmeter across WHT/YEL and YEL circuits at generator side of connector. Resistance should be about 400-500 ohms.
If yes, check YEL, GRN/BLK, and WHT/YEL circuits between ECM and ignition pulse generators for an open.
If no, replace ignition pulse generator.

Test C: Ignition Pulse Generator #2 Input Test

1. Disconnect C63 and connect ohmmeter across WHT/BLU and BLU circuits at generator side of connector. Resistance should be about 400-500 ohms.
If yes, check BLU, GRN/BLK, and WHT/BLU circuits between ECM and ignition pulse generators for an open.
If no, replace ignition pulse generator.

Test D: Fuel Pump Control Test**WARNING**

Gasoline is flammable and is explosive under certain conditions.
Do not smoke or allow flames or sparks in your working area.
Immediately wipe up any spills.

1. Disconnect C184 (except Asp model) or C185 (Asp model). Momentarily jumper BLU circuit (fuel pump side) to battery voltage. Fuel pump should run.
If yes, service BLK/BLU circuit between ECM and C184 or C185 for an open.
If no, go to step 2.
2. Disconnect C127 (except Asp model) or C186 (Asp model). Check GRN circuit (Asp model) or GRN/BLU circuit (SE model) for continuity to ground.
If yes, service fuel pump.
If no, service GRN or GRN/BLU circuit for an open.

Test E: Ignition Coil Input Test

1. Connect ohmmeter across BLK/WHT and YEL/BLU circuits at ignition coil side of C54. Resistance should be about 4 ohms.
If OK, service YEL/BLU circuit between ECM and C54 for an open.
If not OK, service ignition coil.

(cont'd)

Engine Control System

Troubleshooting (cont'd)

Test F: Ignition Coil Input Test

1. Connect ohmmeter across BLK/WHT and YEL/RED circuits at ignition coil side of C54.
Resistance should be about 4 ohms.
If OK, service YEL/RED circuit between ECM and C54 for an open.
If not OK, service ignition coil.

Test G: Ignition Coil Input Test

1. Connect ohmmeter across BLK/WHT and YEL/WHT circuits at ignition coil side of C54.
Resistance should be about 4 ohms.
If OK, service YEL/WHT circuit between ECM and C54 for an open.
If not OK, service ignition coil.

Test H: Carburetor Air Jet (CAJ) Solenoid Valve #2 Input Test

1. Disconnect C120 (CAJ solenoid valve). Turn ignition ON and check for battery voltage at BLK/LT GRN circuit.
If yes, go to step 2.
If no, service BLK/LT GRN circuit for an open.
2. Connect ohmmeter across RED/WHT and BLK/LT GRN circuits (solenoid side).
Resistance should be about 32 ohms.
If yes, service RED/WHT circuits for an open between C120 and ECM.
If no, replace CAJ solenoid valve.

Test I: Carburetor Air Jet (CAJ) Solenoid Valve #3 Input Test

1. Disconnect C119 (CAJ solenoid valve). Turn ignition ON and check for battery voltage at BLK/LT GRN circuit.
If yes, go to step 2.
If no, service BLK/LT GRN circuit for an open.
2. Connect ohmmeter across RED and BLK/LT GRN circuits (solenoid side).
Resistance should be about 32 ohms.
If yes, service RED circuits for an open between C119 and ECM.
If no, replace CAJ solenoid valve.

Test J: Pulse Secondary Air Injection (PAIR) Solenoid Valve Input Test

1. Disconnect C315 (PAIR solenoid valve). Turn the ignition ON and check for battery voltage at BLK/LT GRN circuit (harness side).
If yes, go to step 2.
If no, service BLK/LT GRN circuit for an open.
2. Connect ohmmeter across BLK/RED and BLK/LT GRN circuits (solenoid side).
Resistance should be about 32 ohms.
If yes, service BLK/RED circuits for an open between C315 and ECM.
If no, replace PAIR solenoid valve.

Test K: Engine Coolant Temperature (ECT) Sensor Input Test

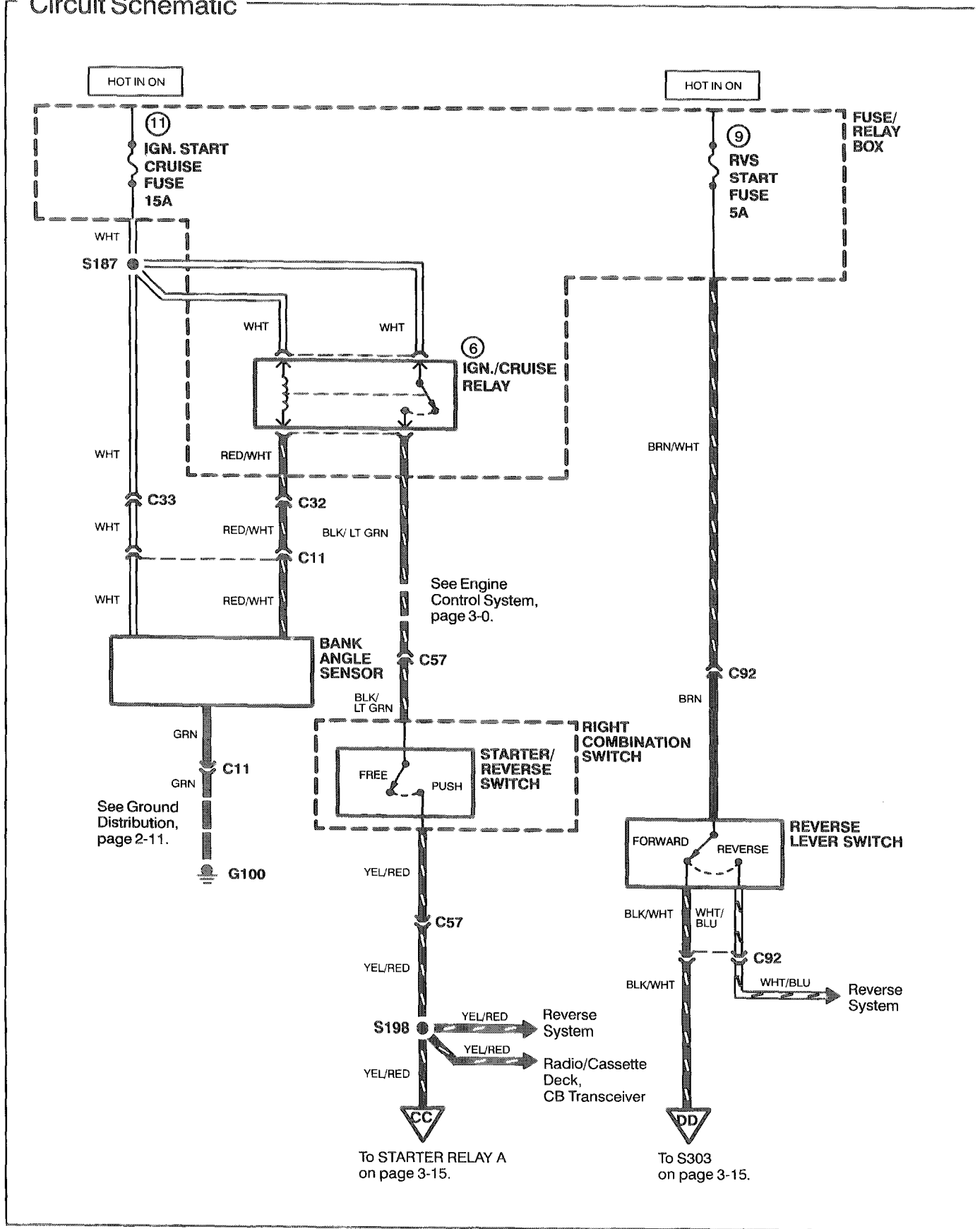
1. Disconnect coolant temperature sensor. Connect ohmmeter across sensor terminal. Resistance should be less than 2k–3k ohms at 68°F (20°C) and decrease with a temperature increase.
If yes, check GRN/BLK and PNK/WHT circuits for an open between sensor and ECM.
If no, replace sensor.

Test L: Intake Air Temperature (IAT) Sensor Input Test

1. Disconnect C314 (IAT sensor). Connect ohmmeter across sensor terminal. Resistance should be less than 2k–3k ohms at 68°F (20°C) and decrease with a temperature increase.
If yes, check GRN/BLK and GRY circuits for an open between sensor and ECM.
If no, replace sensor.

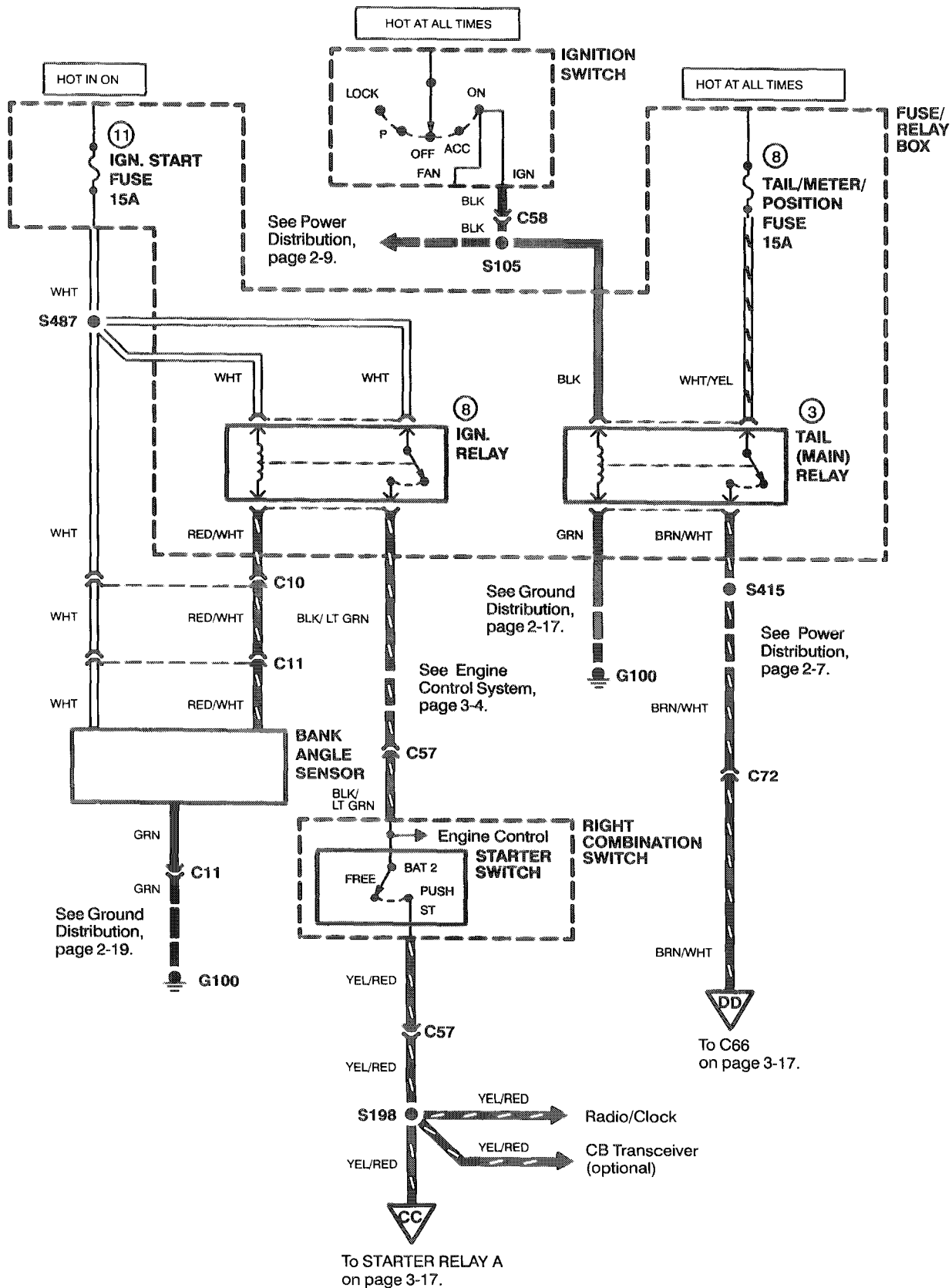
Starting System: Asp and SE

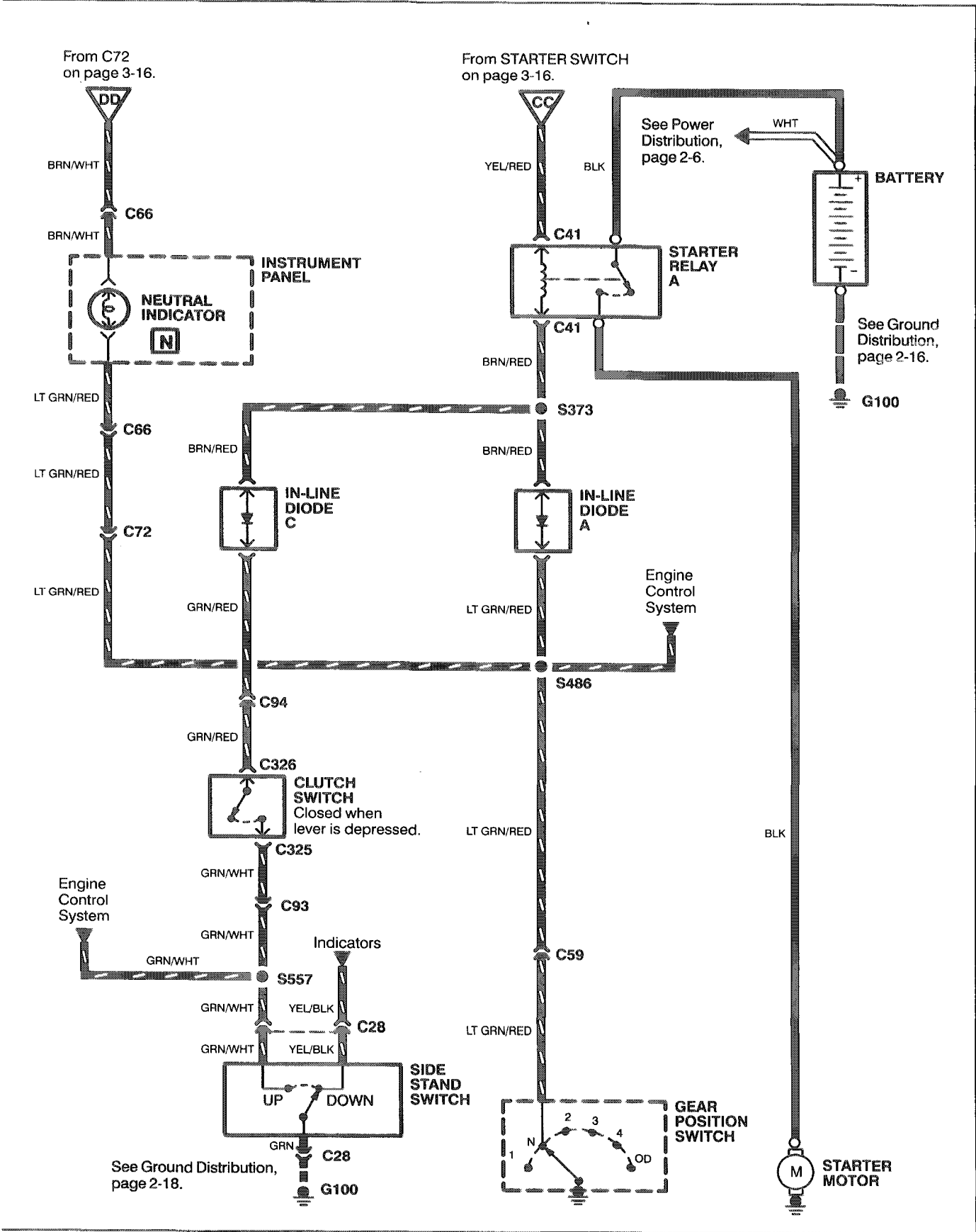
Circuit Schematic



Starting System: Int

Circuit Schematic





Starting System

How the Circuit Works

Asp and SE Models

The starting system for the Asp and SE models is made up of the following components:

- Bank angle sensor
- Clutch switch
- Gear position switch
- Ignition/cruise relay
- Reverse diode assembly
- Reverse lever switch
- Reverse switch
- Reverse switch relay
- Side stand switch
- Starter relay A
- Starter relay B
- Starter/reverse motor
- Starter/reverse switch

The starter/reverse switch receives battery voltage from the IGN/cruise relay when the ignition is switched ON. The bank angle sensor supplies ground to the IGN/cruise relay.

- The starting system is activated when the driver presses and holds the starter/reverse switch.
- Voltage from the IGN/cruise relay is then sent through the reverse diode assembly, reverse switch relay coil, and gear position switch to ground.
- The reverse switch relay energizes and completes a ground path from the coil of starter relay A to ground through the reverse diode assembly, clutch switch, and the side stand switch.
- Starter relay A energizes and applies battery voltage to the coil and contacts of starter relay B when the reverse switch is in the FORWARD position.
- Starter relay B energizes and applies voltage to the starter/reverse motor. The starter motor turns to crank the engine.

Int Models

The starting system for the Int model is made up of the following components:

- Bank angle sensor
- Clutch switch
- Gear position switch
- IGN relay
- In-line diodes A and C
- Side stand switch
- Starter relay A
- Starter motor
- Starter switch

The starter switch receives battery voltage from the IGN relay when the ignition is switched ON. The bank angle sensor supplies ground to the IGN relay.

- The starting system is activated when the driver presses and holds the starter switch.
- If the gearshift is in NEUTRAL, voltage from the IGN relay is then sent through the coil of starter relay A to the gear position switch and to ground.
- If the clutch lever is depressed and the side stand switch is UP, voltage from the IGN relay can also pass through the coil of starter relay A to the clutch switch and the side stand switch.
- The starter relay energizes and applies voltage to the starter motor. The starter motor turns to crank the engine.

Troubleshooting

Asp and SE Models

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> Starter and reverse systems do not operate but the neutral indicator operates. 	<ul style="list-style-type: none"> Weak battery or poor terminal connections. Blown RVS Start fuse. Open circuit at reverse lever switch or faulty starter/reverse motor; do test A2.
<ul style="list-style-type: none"> Starter and reverse systems do not operate and the neutral indicator does not operate. 	<ul style="list-style-type: none"> Poor battery terminal connections. Blown IGN Start Cruise fuse. Open circuit or faulty bank angle sensor, IGN/cruise relay, starter relay A; do test A1.
<ul style="list-style-type: none"> Starter operates in neutral, but not in gear with clutch lever depressed and side stand switch UP. 	<ul style="list-style-type: none"> Open circuit or faulty reverse diode assembly, clutch switch, or side stand switch; do test C1.
<ul style="list-style-type: none"> Starter operates with clutch lever depressed and side stand switch UP, but not with clutch lever released and gear selector in NEUTRAL. 	<ul style="list-style-type: none"> Open circuit or faulty reverse diode assembly or gear position switch; do test D1.
<ul style="list-style-type: none"> Neutral indicator does not light, but starter operates with clutch lever released. 	<ul style="list-style-type: none"> Open circuit to instrument panel bulb, bulb, or reverse diode assembly.

Int Models

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> Starter does not operate and indicator does not light. 	<ul style="list-style-type: none"> Weak battery or poor terminal. Poor ground at G100.
<ul style="list-style-type: none"> Starter does not operate but neutral indicator lights. 	<ul style="list-style-type: none"> Open circuit or faulty IGN relay, bank angle sensor, starter switch, starter relay A, or starter motor; do test E1.
<ul style="list-style-type: none"> Starter operates in neutral, but not in gear with clutch lever depressed and side stand switch UP. 	<ul style="list-style-type: none"> Faulty clutch switch, side stand switch, in-line diode C, or open circuit; do test F1.
<ul style="list-style-type: none"> Starter operates with clutch lever depressed and side stand switch UP, but not with clutch released and gear selector in NEUTRAL. 	<ul style="list-style-type: none"> Faulty gear position switch, in-line diode A, or open circuit; do test G1.
<ul style="list-style-type: none"> Neutral indicator does not light but starter operates with clutch lever released. 	<ul style="list-style-type: none"> Open circuit to neutral indicator. Bad indicator bulb.

(cont'd)

Starting System

Troubleshooting (cont'd)

TEST A1: Power and Ground Reverse Lever Switch Isolation

1. Disconnect C92 (reverse lever switch) and with ignition switch ON, check for battery voltage at BRN/WHT circuit.
If yes, replace reverse lever switch.
If no, service BRN/WHT circuit for an open or short to ground.

TEST A2: Power and Ground Isolation

1. Disconnect C57 (starter/reverse switch) and with ignition switch ON, check for battery voltage at BLK/LT GRN circuit.
If yes, go to test A3.
If no, go to test A4.

TEST A3: Power and Ground Starter Relay A Isolation

1. Reconnect C57 and disconnect C41 (starter relay A). With ignition switch ON, check for voltage at YEL/RED circuit with starter/reverse switch depressed.
If yes, go to step 2.
If no, service YEL/RED circuit for an open. If OK, replace starter/reverse switch.
2. Check for battery voltage at starter relay A BLK circuit from battery.
If yes, go to step 3.
If no, repair BLK circuit.
3. With ignition switch ON, gearshift in NEUTRAL, and reverse lever switch in the FORWARD position, check for voltage between BLK (battery feed) circuit and C41 BRN/RED using a test light.
If yes, go to step 4.
If no, service BRN/RED circuit for an open between starter relay A and S302.
4. Check for battery voltage across BLK circuits at starter relay A.
If yes, go to step 5.
If no, service BLK circuit between starter relay A and S227 for an open.
5. Reconnect C41 and disconnect BLK circuits at starter/reverse motor terminal. Connect test light at starter/reverse motor terminal. With ignition switch ON, reverse lever switch FORWARD and gearshift in NEUTRAL, press and hold starter/reverse switch. Test lamp should light.
If yes, replace starter/reverse motor.
If no, replace starter relay A.

TEST A4: Power and Ground IGN/Cruise Relay Isolation

1. Disconnect the IGN/cruise relay. With the ignition switch ON, check for battery voltage at both WHT circuits.
If yes, go to step 2.
If no, service WHT circuit for an open.
2. Check for battery voltage between WHT and RED/WHT circuits.
If yes, go to step 3.
If no, go to test A5.
3. Connect a fused jumper (15A) between WHT and BLK/LT GRN circuit at IGN/cruise relay and check for battery voltage at BLK/LT GRN circuit at C57.
If yes, replace IGN/cruise relay.
If no, service BLK/LT GRN circuit.

TEST A5: Power and Ground Bank Angle Sensor Isolation

1. Reconnect the IGN/cruise relay. Disconnect C11 (bank angle sensor). Turn the ignition switch ON and check for battery voltage at RED/WHT circuit.
If yes, go to step 2.
If no, service RED/WHT circuit for an open.
2. Check for battery voltage at WHT circuit.
If yes, go to step 3.
If no, service WHT circuit for an open.
3. Check for battery voltage between WHT and GRN circuits.
If yes, replace bank angle sensor.
If no, service GRN circuit for an open.

TEST B1: Reverse Switch Relay Isolation

1. Disconnect C30 (reverse switch relay). With ignition switch ON and reverse lever switch in FORWARD, check for battery voltage at YEL/RED circuit.
If yes, go to step 2.
If no, go to test B2.
2. Check for battery voltage at BRN/RED circuit with starter/reverse switch depressed.
If yes, go to step 3.
If no, service BRN/RED circuit for an open.
3. Check for battery voltage between YEL/RED and BLK/RED circuits.
If yes, go to step 4.
If no, check BLK/RED circuit between reverse switch relay and reverse diode assembly for an open. If OK, replace reverse diode assembly.
4. Check for battery voltage between YEL/RED and BLU/RED circuits.
If yes, go to step 5.
If no, check BLU/RED circuit between reverse switch relay and reverse diode assembly for an open. If OK, replace reverse diode assembly.
5. With ignition switch ON, gearshift in NEUTRAL, and reverse lever switch in FORWARD, connect a fused jumper (15A) between BRN/RED circuit at C30 and ground. The starter should crank.
If yes, replace reverse switch relay.
If no, go to test B4.

TEST B2: Reverse Diode Assembly Isolation

1. Disconnect reverse diode assembly connector. With ignition switch ON and reverse lever switch in FORWARD, check for battery voltage at BLK/WHT (diode D7) circuit.
If yes, go to step 2.
If no, go to test B3.
2. Check for continuity at YEL/RED circuit between reverse diode assembly and reverse switch relay.
If yes, replace reverse diode assembly.
If no, service YEL/RED circuit.

(cont'd)

Starting System

Troubleshooting (cont'd)

TEST B3: Reverse Lever Switch Isolation

1. Check continuity at BLK/WHT circuit between reverse switch lever and reverse diode assembly.
If yes, replace reverse lever switch.
If no, service BLK/WHT circuit for an open.

TEST B4: Starter Relay B Isolation

1. Reconnect any components disconnected in previous tests. Disconnect C313 (starter relay B connector). With ignition switch ON and reverse lever in FORWARD, depress starter/reverse switch while checking for battery voltage at BLK (starter relay A feed) circuit.
If yes, go to step 2.
If no, service BLK circuit for an open.
2. Depress starter/reverse switch while checking for battery voltage at YEL/RED circuit.
If yes, go to step 3.
If no, check in-line fuse B, YEL/RED, and RED circuits for an open.
3. Depress starter/reverse switch while checking for battery voltage between YEL/RED and GRN/RED circuits.
If yes, go to step 4.
If no, go to test B5.
4. Jumper the BLK and BLK (with PNK) circuits at starter relay B. With gear selector in NEUTRAL and reverse lever switch in FORWARD, depress starter/reverse switch. Starter motor should crank.
If yes, replace starter relay B.
If no, service BLK circuit between starter motor and starter relay B for an open.

TEST B5: Reverse Diode Assembly Isolation

1. Check GRN/RED circuit continuity between starter relay B and reverse diode assembly.
If yes, go to step 2.
If no, service GRN/RED circuit for an open.
2. With reverse switch in FORWARD, check continuity between GRN/ORN circuit and ground.
If yes, replace reverse diode assembly.
If no, check reverse switch and GRN/ORN circuit.

TEST C1: Clutch Switch Isolation

1. Disconnect C326 (clutch switch connector). With side stand switch UP, check continuity of GRN/WHT circuit to ground.
If yes, go to step 2.
If no, check GRN/WHT circuit, side stand switch, and GRN circuit at C28 for an open.
2. Disconnect C325 (clutch switch connector). Check continuity across clutch switch with clutch lever depressed.
If yes, check GRN/RED circuit for an open. If OK, replace reverse diode assembly.
If no, replace clutch switch.

TEST D1: Gear Position Switch Isolation

1. Disconnect C59 (gear position switch) and jumper LT GRN/RED circuit to ground. With side stand switch DOWN, reverse switch in FORWARD, and ignition switch ON, press starter/reverse switch. Starter should crank.
If yes, replace gear position switch.
If no, check LT GRN/RED circuit for an open between gear position switch and reverse diode assembly. If circuit is OK, replace reverse diode assembly.

TEST E1: Power and Ground Isolation

1. Disconnect C57 (starter switch) and with ignition switch ON, check for battery voltage at BLK/LT GRN circuit.
If yes, go to test E2.
If no, go to test E3.

TEST E2: Power and Ground Starter Relay A Isolation

1. Reconnect C57 and disconnect C41 (starter relay A). With ignition switch ON, check for voltage at YEL/RED circuit with starter switch depressed.
If yes, go to step 2.
If no, check YEL/RED circuit for an open. If OK, replace starter switch.
2. Check for battery voltage at starter relay A BLK circuit from battery.
If yes, go to step 3.
If no, repair BLK circuit.
3. With ignition switch ON and gearshift in NEUTRAL, check for voltage between BLK (battery feed) circuit and C41 BRN/RED using a test light.
If yes, go to step 4.
If no, service BRN/RED circuit for an open between starter relay A and S373.
4. Reconnect C41 and disconnect BLK circuit at starter motor terminal. Connect test light at starter motor terminal. With ignition switch ON and gearshift in NEUTRAL, press and hold starter switch. Test lamp should light.
If yes, replace starter motor.
If no, check BLK circuit for an open. If OK, replace starter relay A.

TEST E3: Power and Ground IGN Relay Isolation

1. Disconnect the IGN relay. With the ignition switch ON, check for battery voltage at both WHT circuits.
If yes, go to step 2.
If no, service WHT circuit for an open.
2. Check battery voltage between WHT and RED/WHT circuits.
If yes, go to step 3.
If no, go to test E4.
3. Connect a fused jumper (15A) between WHT and BLK/LT GRN circuit at IGN relay and check for battery voltage at BLK/LT GRN circuit at C57.
If yes, replace IGN relay.
If no, service BLK/LT GRN circuit.

Starting System

Troubleshooting (cont'd)

TEST E4: Power and Ground Bank Angle Sensor Isolation

1. Reconnect the IGN relay. Disconnect C11 (bank angle sensor). With the ignition switch ON, check for battery voltage at RED/WHT circuit.
If yes, go to step 2.
If no, service RED/WHT circuit for an open.
2. Check battery voltage at WHT circuit.
If yes, go to step 3.
If no, service WHT circuit for an open.
3. Check for battery voltage between WHT and GRN circuits.
If yes, replace bank angle sensor.
If no, service GRN circuit for an open.

TEST F1: Clutch Switch Isolation

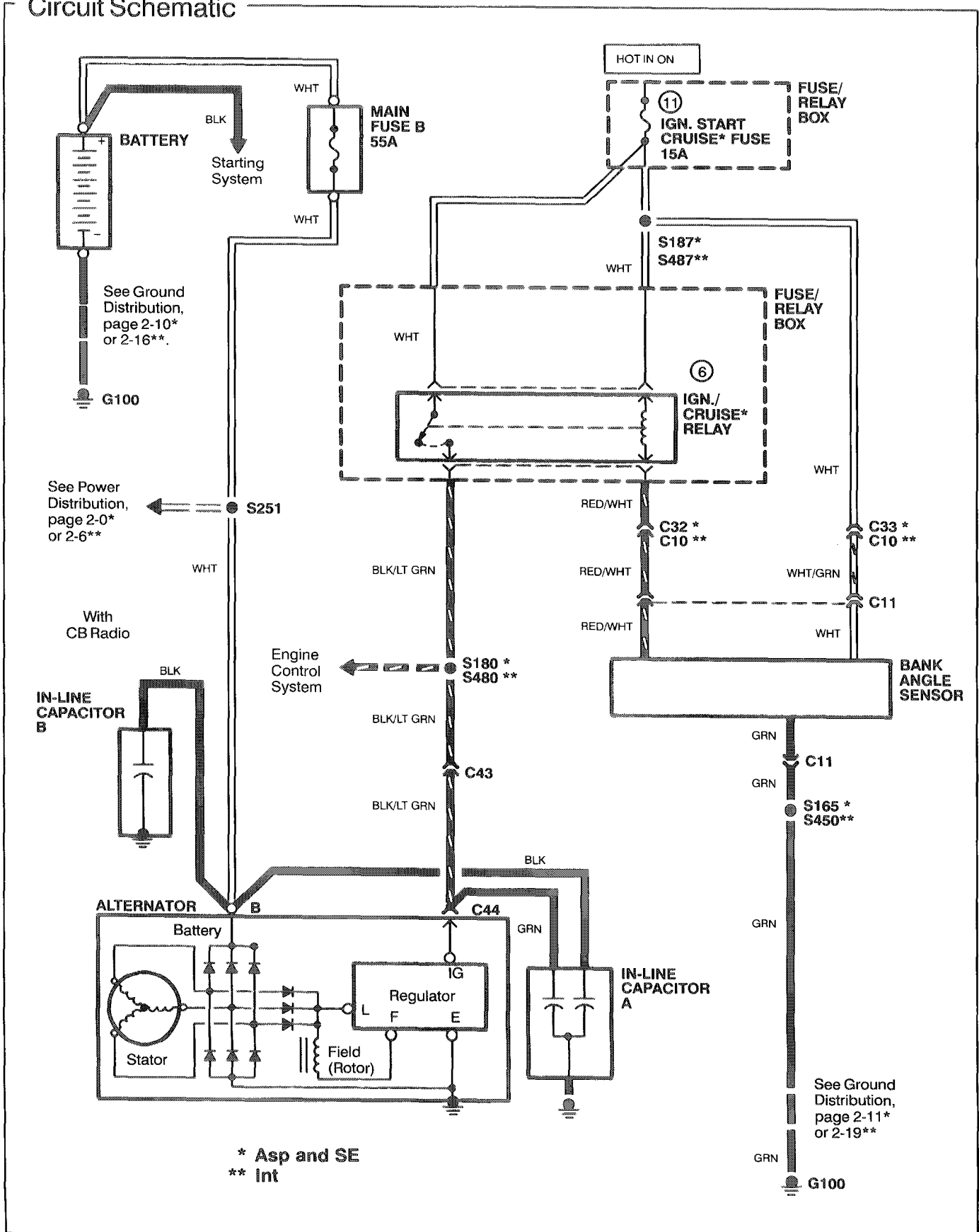
1. Disconnect C325 (clutch switch connector). With side stand switch UP, check continuity of GRN/WHT circuit to ground.
If yes, go to step 2.
If no, check GRN/WHT circuit, side stand switch, and GRN circuit at C28 for an open.
2. Disconnect C326 (clutch switch connector). Check continuity across clutch switch with clutch lever depressed.
If yes, check GRN/RED circuit in-line diode C and BRN/RED circuit for an open.
If no, replace clutch switch.

TEST G1: Gear Position Switch Isolation

1. Disconnect C59 (gear position switch) and jumper LT GRN/RED circuit to ground. With side stand switch DOWN and ignition switch ON, press starter/reverse switch. Starter should crank.
If yes, replace gear position switch.
If no, check LT GRN/RED circuit in-line diode A and BRN/RED circuit for an open.

Charging System

Circuit Schematic



* Asp and SE
 ** Int

How the Circuit Works

The alternator generates an alternating current (AC) voltage in its windings as it is driven by the engine. The integral regulator/rectifier converts this AC voltage into direct current (DC) voltage to maintain battery charge and operate the electrical system.

When the engine is running, battery voltage is supplied to the alternator regulator through the BLK/LT GRN circuit. The alternator then supplies voltage to the battery and electrical system through the WHT circuit. Capacitors are connected to each alternator terminal to reduce alternator electrical noise.

Troubleshooting

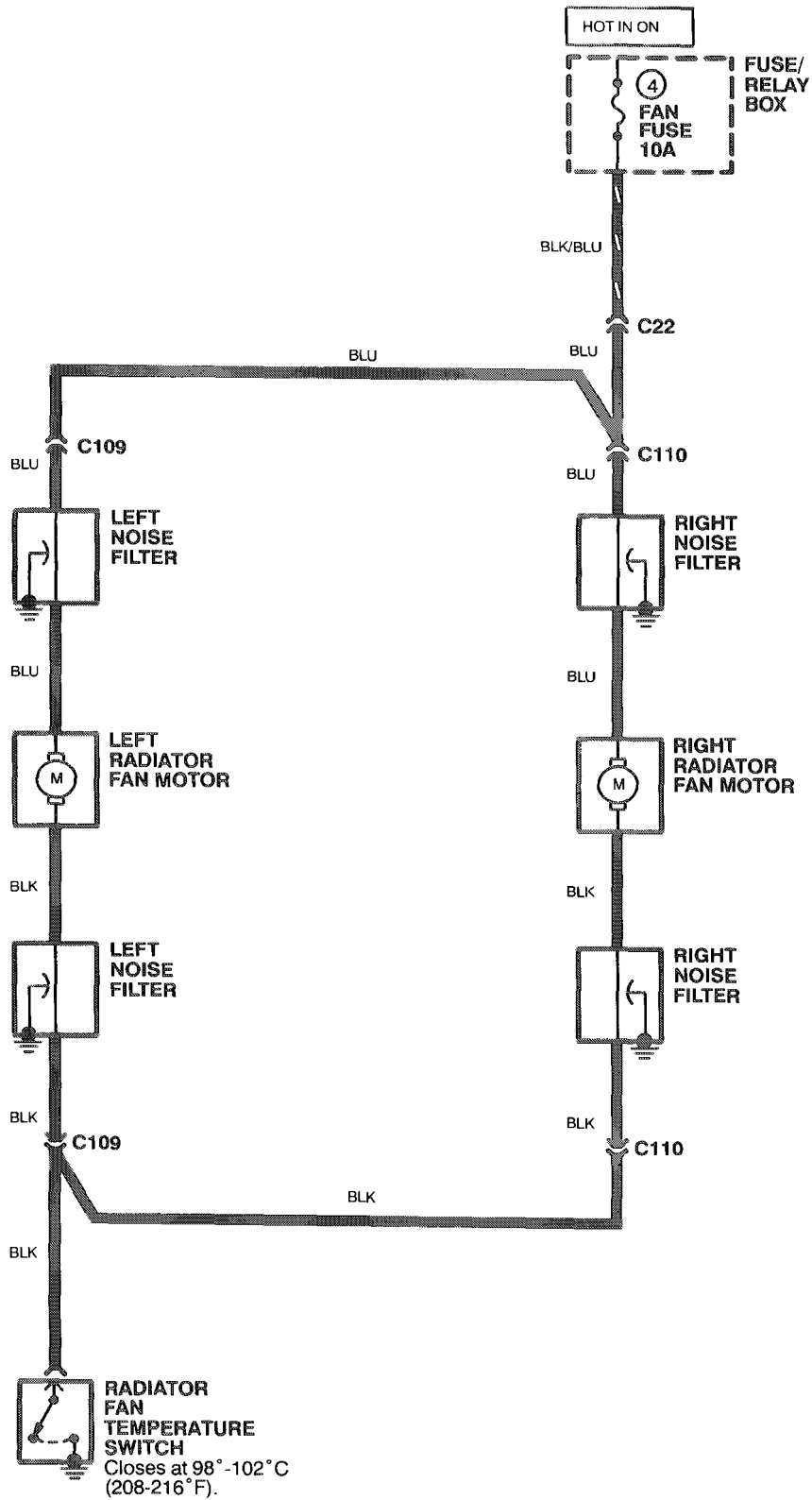
SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> Battery is overcharged or undercharged. 	<ul style="list-style-type: none"> Blown main fuse B. Open WHT circuit to battery; open circuit to regulator/rectifier or faulty alternator; do test A.

TEST A : Power and Ground Check

- Check for battery voltage at alternator terminal B.
If yes, go to step 2.
If no, service WHT circuit for an open.
- Disconnect C44 (alternator) connector. Turn ignition switch ON and check for battery voltage at BLK/LT GRN circuit.
If yes, go to step 3.
If no, service BLK/LT GRN circuit for an open.
- Reconnect C44 and start the engine. Measure voltage across the battery terminals. It should measure between 13.5 and 15.5 volts.
If yes, perform a battery load test. See service manual, charging section.
If no, service or replace alternator. See service manual, charging section.

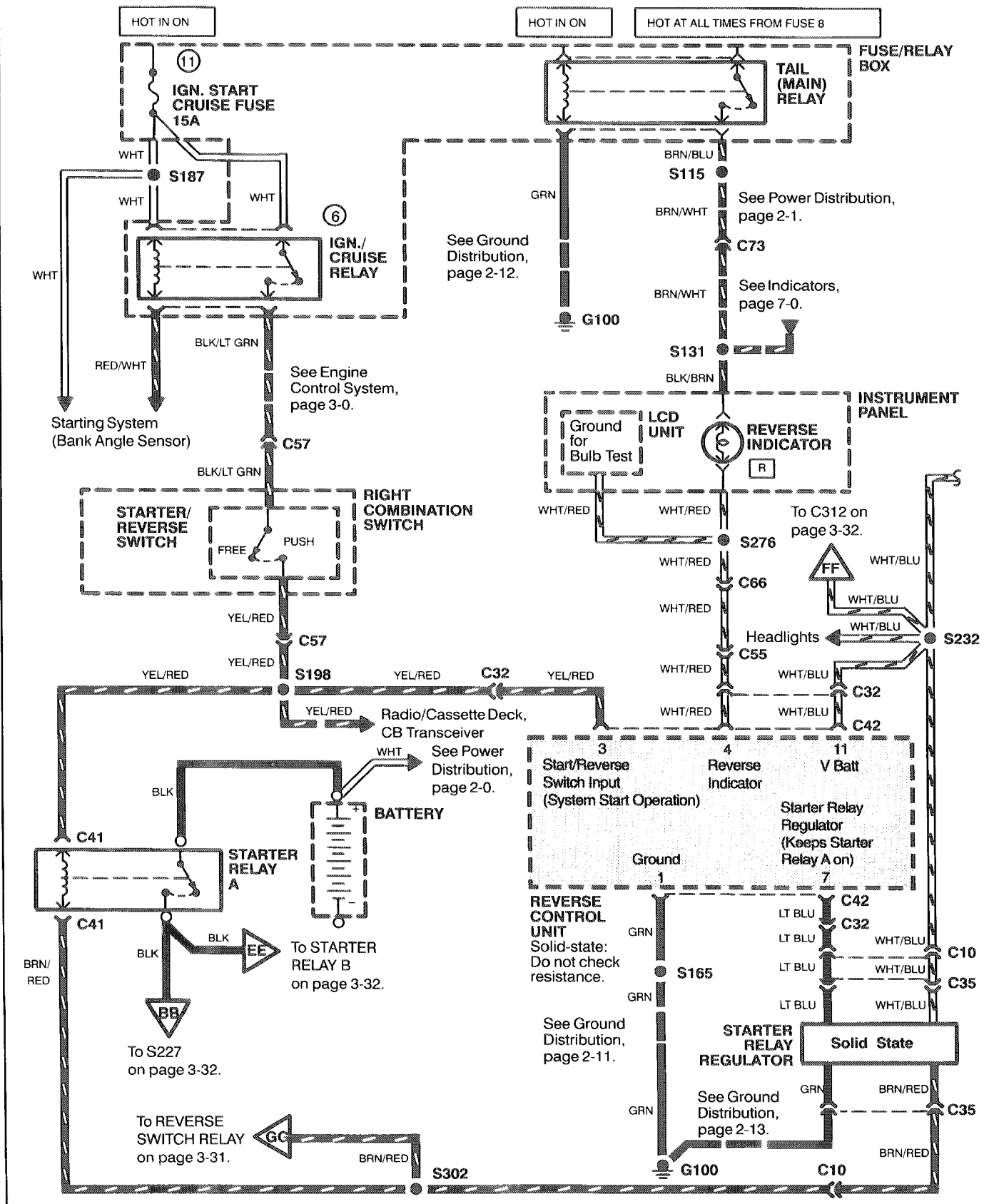
Radiator Fans

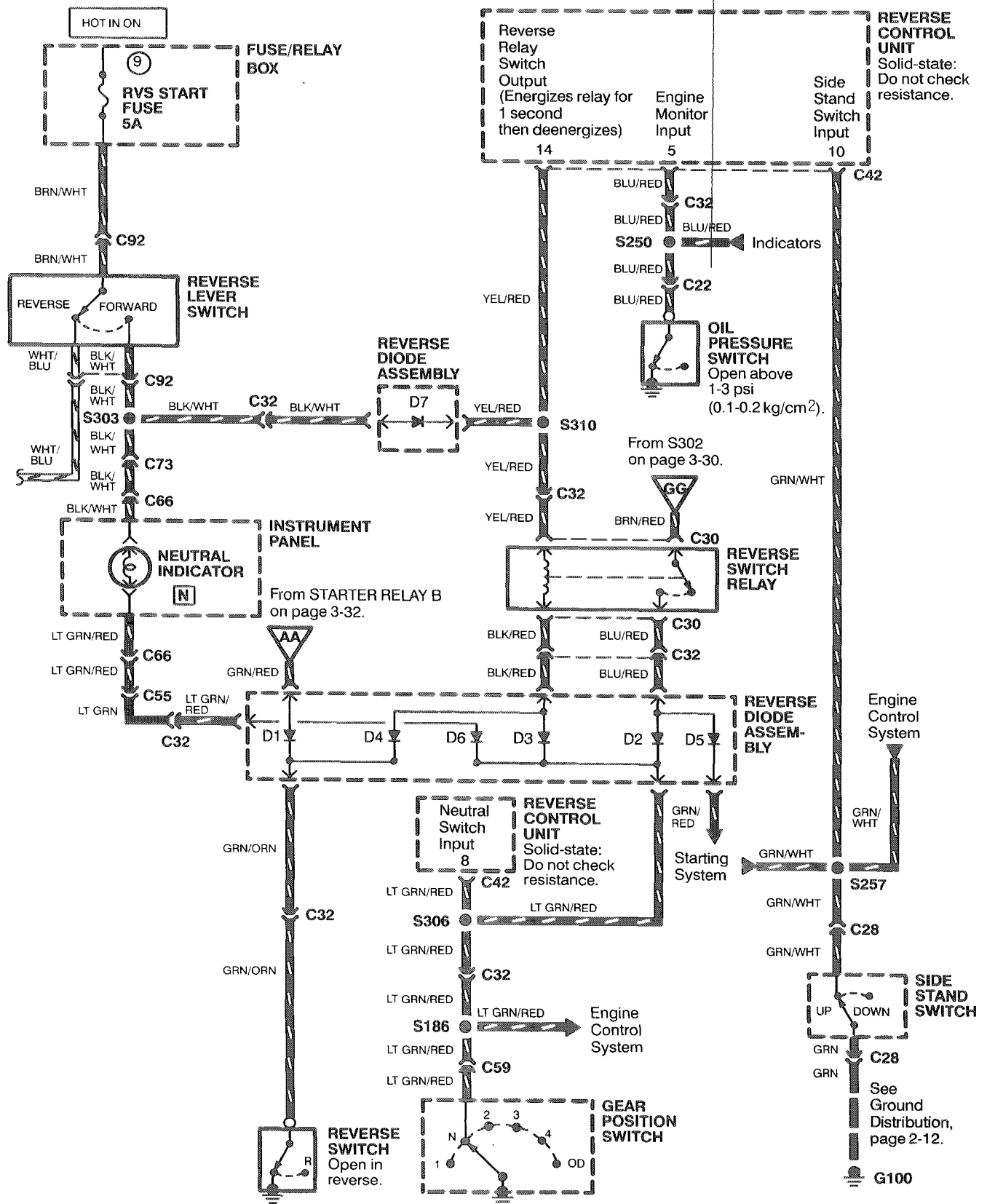
Circuit Schematic



Reverse System

Circuit Schematic

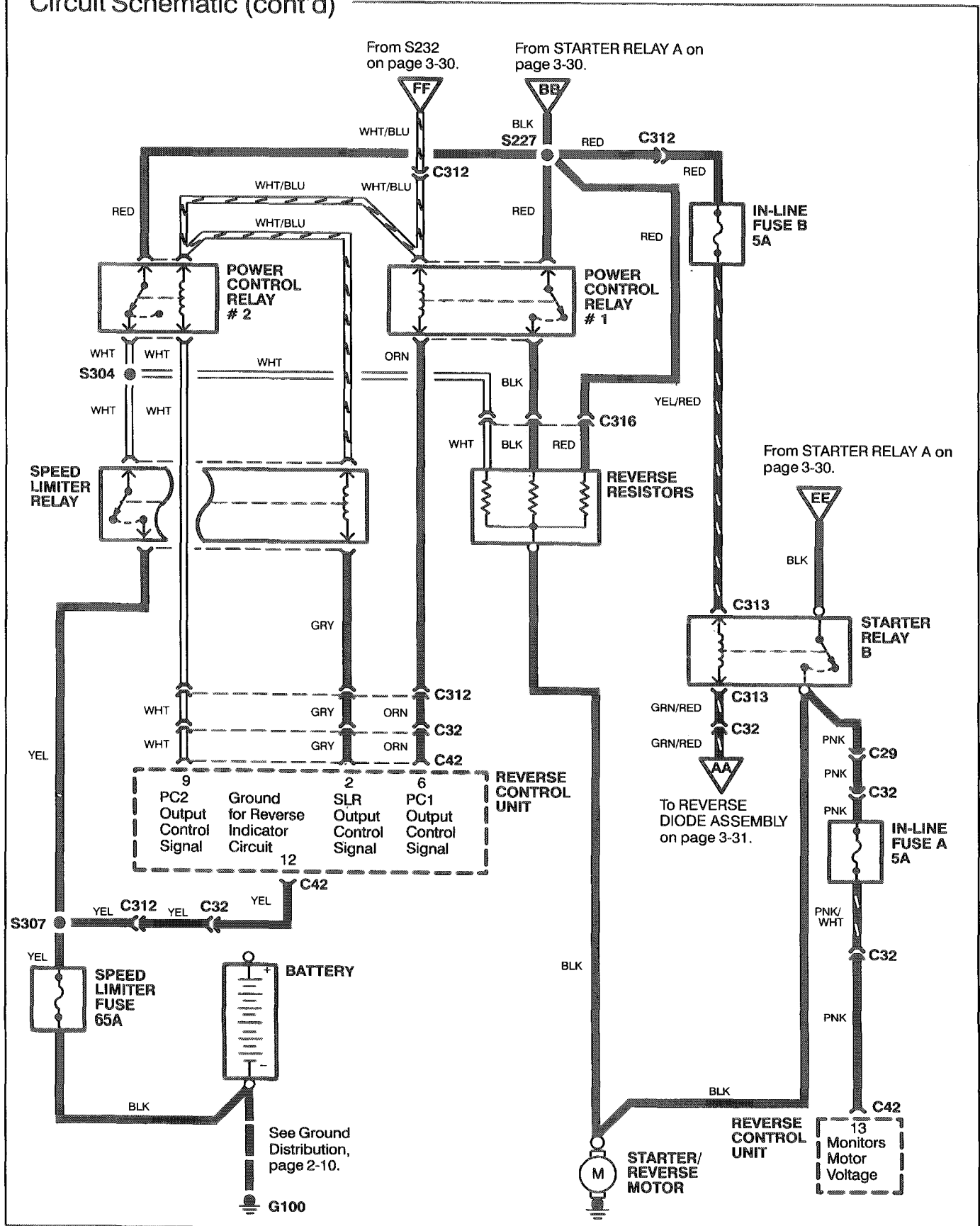




(cont'd)

Reverse System

Circuit Schematic (cont'd)



How the Circuit Works

The reverse control unit takes a series of inputs from external switches and also monitors voltage developed at the starter/reverse motor to determine what outputs should be controlled to make reverse direction possible.

When the reverse lever switch is in the REVERSE position, battery voltage is applied to pin 11 (WHT/BLU) and ground is provided on pin 1 (GRN) from G100.

System Check

If power and ground are OK, the reverse control unit then starts a system check to look for the following:

- Battery voltage applied to pin 5 (BLU/RED) when the engine is started and oil pressure is above 1-3 psi.
- Ground present at pin 8 (LT GRN/RED) when the gearshift sensor is in NEUTRAL.
- Ground present at pin 10 (GRN/WHT) when the side stand switch is in the UP position.
- Ground present on pin 12 (YEL), providing a ground for the reverse indicator and to establish that the speed limiter fuse is good.

When the reverse indicator has been illuminated, the driver knows the system is ready for operation. The driver presses the starter/reverse switch and battery voltage is applied to pin 3 (YEL/RED) of the reverse control unit. As this input is received, a set of outputs starts controlling other system components.

- The reverse control unit provides 9 volts for one second on pin 14 (YEL/RED) to briefly energize the reverse relay switch. The reverse relay switch contacts close to provide a one second path to ground. This pulls the contacts of starter relay A closed.
- At the same time that pin 14 outputs to the reverse relay switch, the reverse control unit grounds pin 7 (LT BLU), which grounds the starter relay regulator. This provides the hold-in current path (BRN/RED) to keep the contacts of starter relay A closed while the starter/reverse switch is pushed.
- Pin 6 (ORN) is grounded by the reverse control unit when the starter/reverse switch is pushed and minimum load is applied to the motor.
- Pin 9 (WHT) is grounded when maximum load is applied to the motor.

System Reset

System reset is required when vehicle speed exceeds 2.5 km/h or when the starter/reverse motor has experienced an electrical motor brake of three seconds or more. The reverse control unit monitors the starter/reverse motor's voltage, and if it determines an excessive speed, it grounds pin 2 (GRY), allowing the speed limiter relay's contacts to close. This removes some of the voltage to the starter/reverse motor.

If it determines an electrical motor brake, then the control unit removes all power to the starter/reverse motor by de-energizing starter relay A. The reverse control unit also provides battery voltage to pin 4 (WHT/RED), turning the reverse indicator off. Before the system may be operated again, the reverse lever switch must be recycled back to the forward position, applying battery voltage to pin 14 (YEL/RED).

Reverse System

Troubleshooting

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none">Reverse system doesn't operate and the reverse indicator doesn't light.	<ul style="list-style-type: none">No power to reverse control unit; do self-test A, pin 11.No ground to control module; do self-test B, pin 1.Bad side stand switch input; do self-test B, pin 10.No neutral position input from gearshift sensor; do self-test B, pin 8.Incorrect oil pressure switch input; do self-test A, pin 5.Bad speed limiter fuse (65A); do self-test B, pin 12.Faulty reverse control unit. Replace with known good reverse control unit.
<ul style="list-style-type: none">Reverse system operates for only a few seconds, then quits. Reverse indicator turns off or reverse system doesn't operate and the reverse indicator lights.	<ul style="list-style-type: none">No voltage to starter/reverse motor; do self-test A, pin 13.No control signal to reverse control unit from starter/reverse switch; do self-test A, pin 3.No control signal from reverse control unit to reverse relay switch; do self-test A, pin 14.No control signal from reverse control unit to starter relay regulator; do self-test A, pin 7.

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> ● Reverse system operates, but very slowly or no power on inclines. 	<ul style="list-style-type: none"> ● Faulty control signal from reverse control unit to power relay control #1; do self-test A pin 6. ● Faulty control signal from reverse control unit to power relay control #2; do self-test A pin 9. ● Inoperative power relays; do self-test F. ● If all the above are OK, check red circuits to power relay controls for battery voltage with ignition ON, starter reverse switch in REVERSE, and the starter/reverse switch pushed. If voltage is not present, service circuits for an open.
<ul style="list-style-type: none"> ● Reverse system operates above 2.5 km/h down inclines. 	<ul style="list-style-type: none"> ● Inoperative speed limiter relay; do self-test A pin 2.
<ul style="list-style-type: none"> ● Reverse system operates, but reverse indicator doesn't light. 	<ul style="list-style-type: none"> ● No control signal from reverse control unit indicator; do self-test A pin 4.

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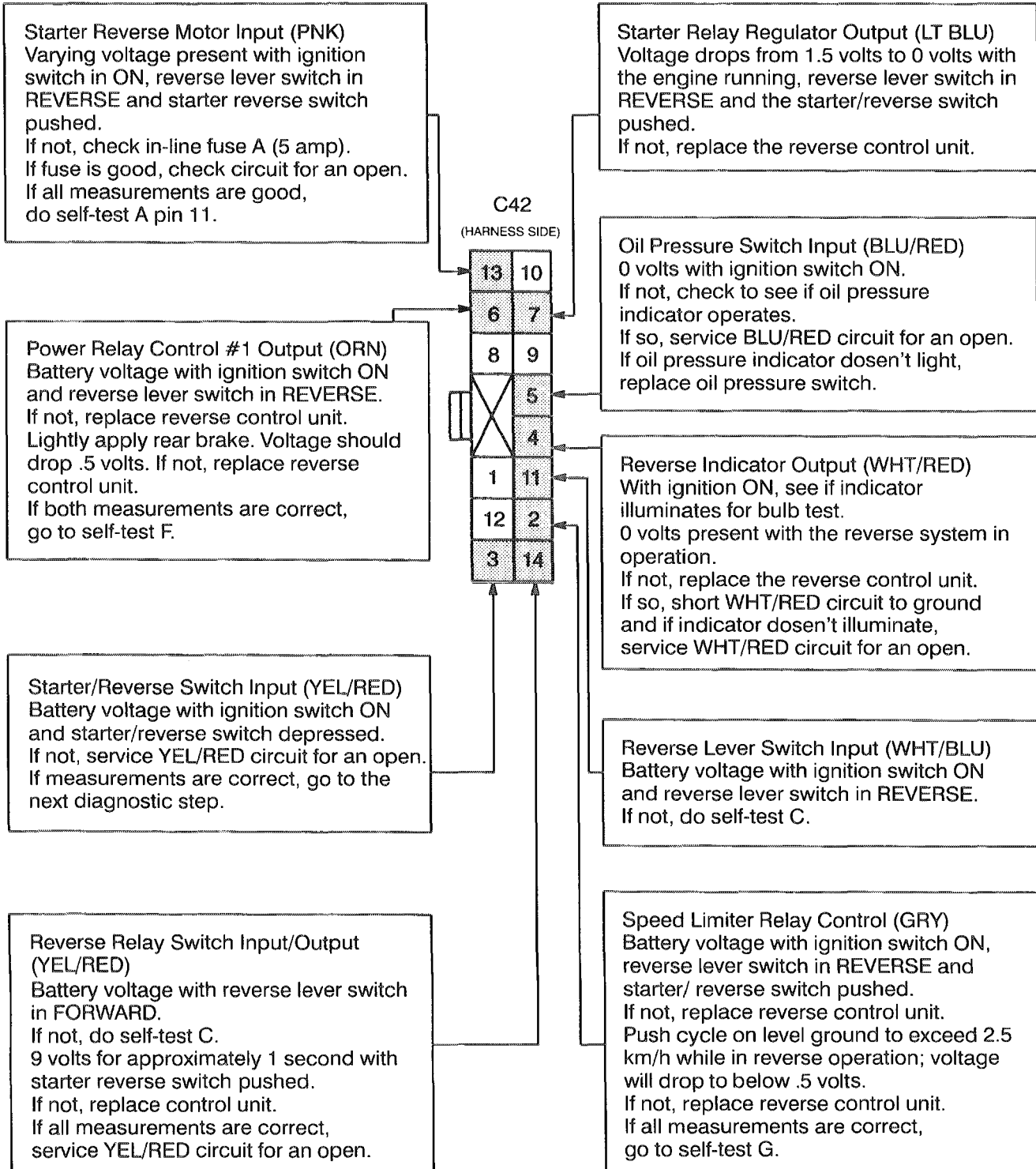
Reverse System

Troubleshooting (cont'd)

SELF-TEST A: Static Measurements

Note: Leave C42 connected to reverse control unit.

Make all measurements between pin # given in domestic table and ground (pin #1).



SELF-TEST B: Continuity Test

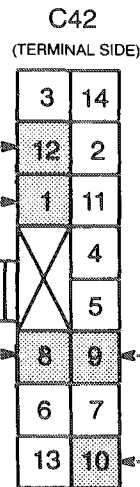
Note: Disconnect C42 from reverse control unit.

Make measurements between G100 (terminal) and desired pin on connector C42.

Speed Limiter Fuse (65 amp) Input (YEL)
 Check for continuity to ground G100.
 If bad, check speed limiter fuse (65 amp).
 If good, check (YEL) or (BLK) circuit for an open.
 If all measurements are good, go to the next diagnostic step.

Ground Input (GRN)
 Check for continuity to ground G100.
 If there is no continuity, repair GRN circuit for an open.
 If OK, go to the next diagnostic step.

Neutral Switch Input (LT GRN/RED)
 With transmission in neutral, check for continuity to ground.
 If not, check LT GRN/RED circuit for an open.
 If OK, see if neutral indicator illuminates in bulb test and then stays illuminated.
 If bulb doesn't light during bulb test, replace bulb.
 If bulb only lights for bulb test, do self-test E.



Power Relay Control #2 Output (WHT)
 Battery voltage with ignition switch ON and reverse lever switch in REVERSE.
 If not, replace reverse control unit.
 Fully apply rear brake. Voltage should drop below .5 volts.
 If not, replace reverse control unit.
 If both measurements are correct, do self-test F.

Side Stand Switch Input (GRN/WHT)
 With side stand in UP, continuity should exist to ground G100.
 If not, check GRY/WHT circuit for an open.
 If OK, go to self-test D.

(cont'd)

Reverse System

Troubleshooting (cont'd)

SELF-TEST C: Reverse Lever Switch

Note: Consult service manual for mechanical operations and alignment.

1. With transmission in NEUTRAL and reverse lever switch in FORWARD, see if the neutral indicator lights.
If yes, go to step 3.
If no, go to the next step.
2. Check for battery voltage at BRN/WHT circuit of reverse lever switch connector C92.
If yes, go to the next step.
If no, service BRN/WHT circuit for an open.
3. With C92 disconnected, check continuity between:
 - BRN and BLK/WHT circuits with reverse lever switch in FORWARD
 - BRN and WHT/BLU circuits with reverse lever switch in REVERSEIf no continuity exists, replace reverse lever switch.
If all measurements are OK, go to the next step.
4. Service WHT/BLU circuit for an open.

SELF-TEST D: Side Stand Switch

1. With the ignition ON and side stand DOWN, check to see if side stand indicator lights.
If yes, go to step 3.
If no, go to the next step.
2. With C28 disconnected, check for continuity between GRN circuit and ground G100.
If yes, go to the next step.
If no, service GRN circuit for an open.
3. Disconnect C28 and check continuity between GRN/WHT and GRN circuits on switch side of connector with side stand switch DOWN.
If yes, go to the next step.
If no, replace side stand switch.
4. With C28 still disconnected, check continuity between YEL/BLK and GRN circuits.
If no, replace side stand switch.

SELF-TEST E: Gear Position Switch Test

1. Disconnect C59. With the transmission in NEUTRAL, check continuity between LT GRN/RED circuit and ground.
If not, replace the gear position switch.

SELF-TEST F: Power Relay Control Test

1. With suspected relay disconnected, apply 12 volts across coil and measure continuity across contacts.
 - Power relay control #1 – continuity exists
 - Power relay control #2 – continuity does not existIf incorrect, replace relay.
If OK, go to next step.
2. Power relay control #1; check continuity of BLK circuit from contacts and repair if necessary. Power relay control #2; check continuity of WHT circuit from contacts and repair if necessary. If all measurements are OK, go to self-test H.

SELF-TEST G: Speed Limiter Relay Test

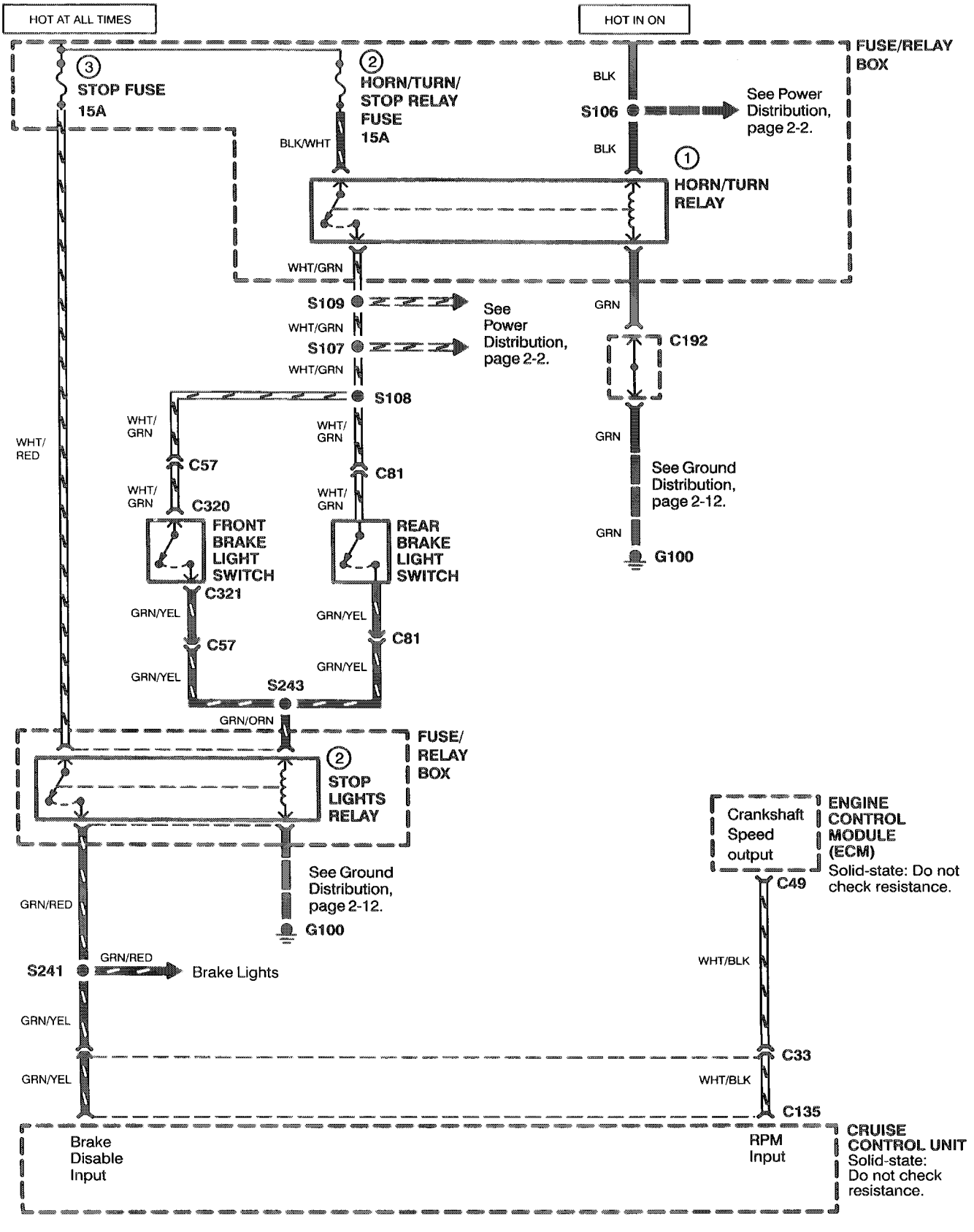
1. With relay disconnected, apply 12 volts across the coil and measure continuity across contacts; continuity should exist.
If not, replace speed limiter relay.
If OK, go to next step.
2. Check continuity of WHT circuit and YEL circuit from contacts and repair if necessary.
If OK, go to self-test H.

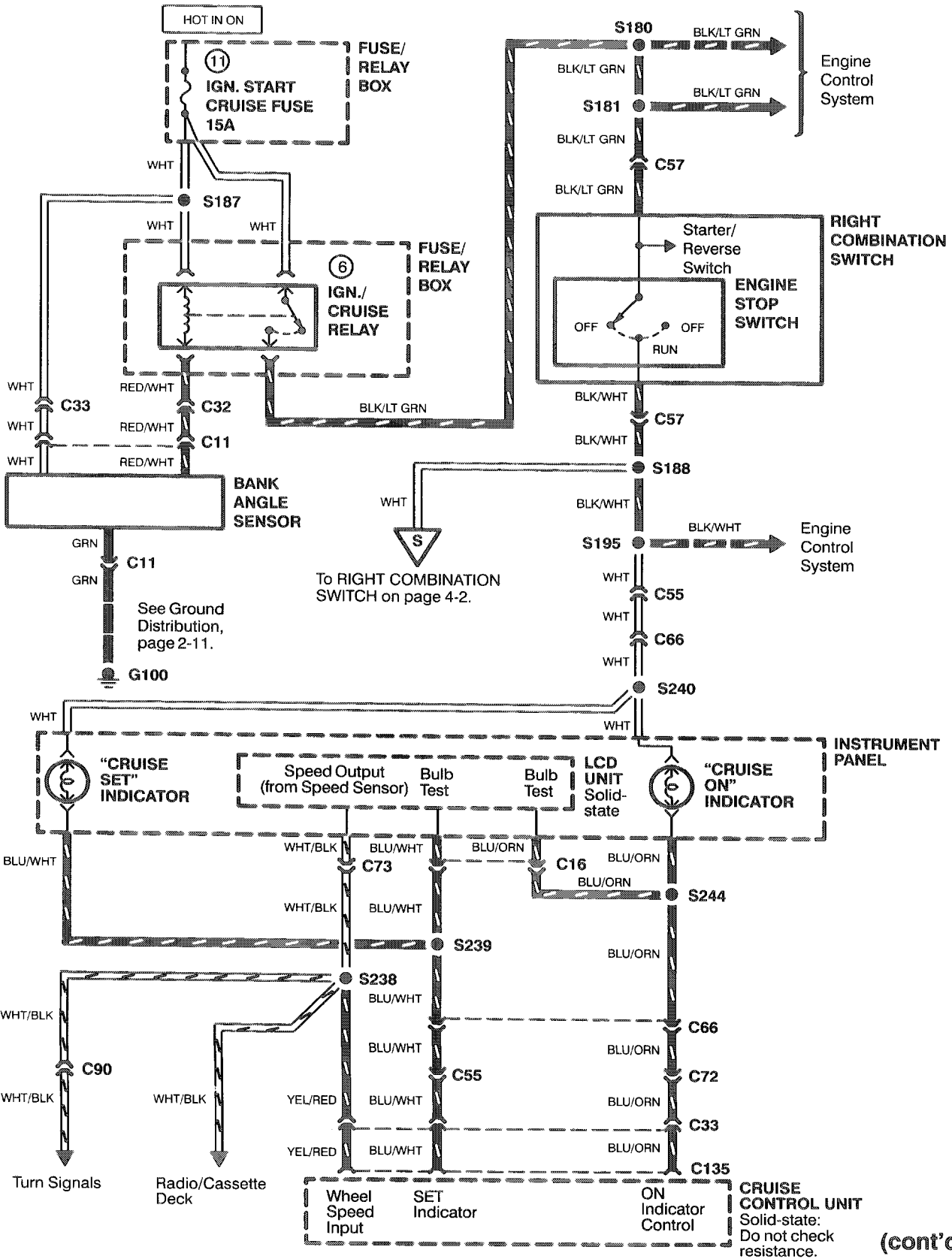
SELF-TEST H: Reverse Resistors

1. Disconnect starter/reverse motor terminal connector from reverse resistors.
2. Disconnect connector C316 and measure between all wires and terminal from previous step.
3. If resistance is above 2 ohms for any measurement, replace reverse resistors.

Cruise Control

Circuit Schematic

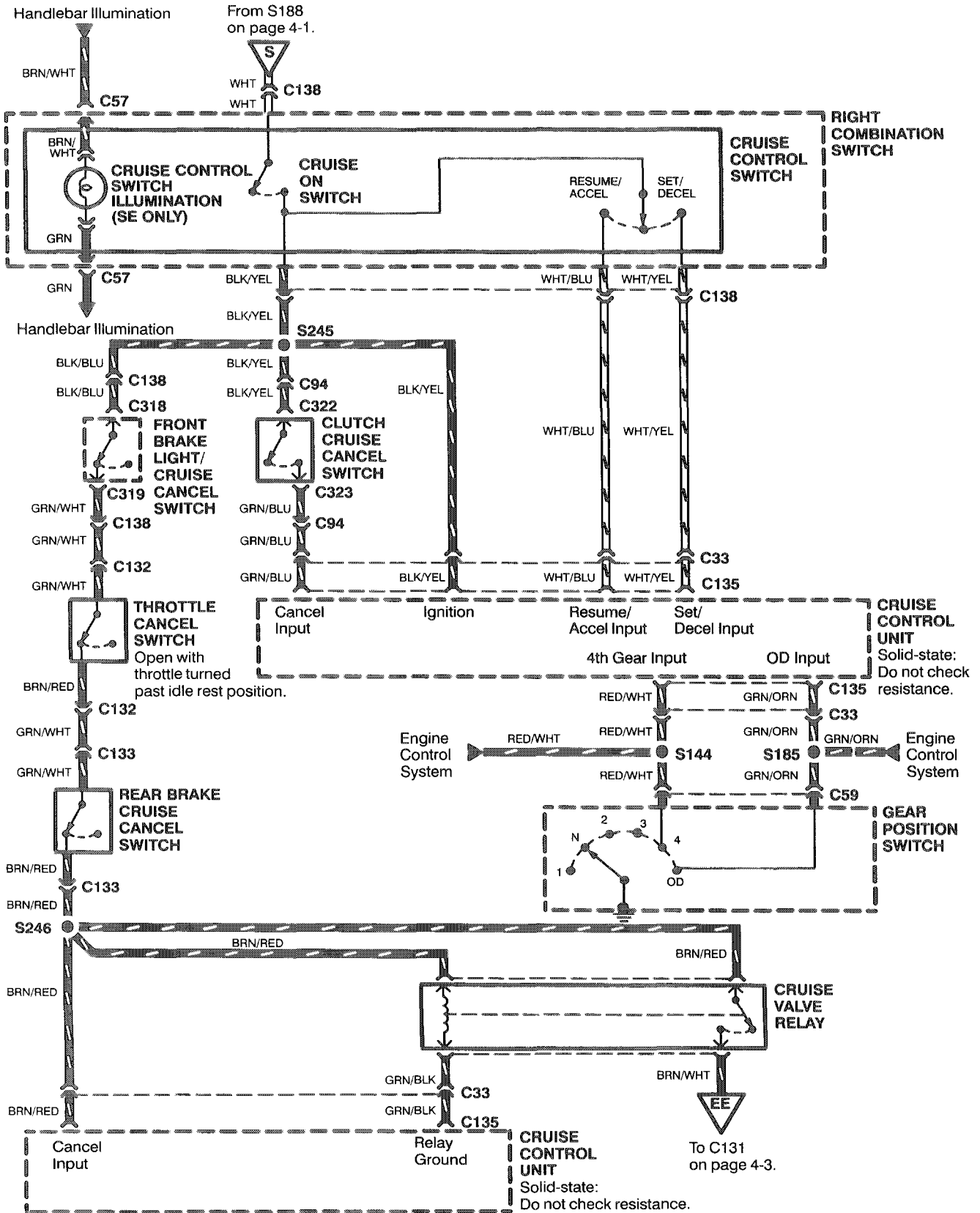


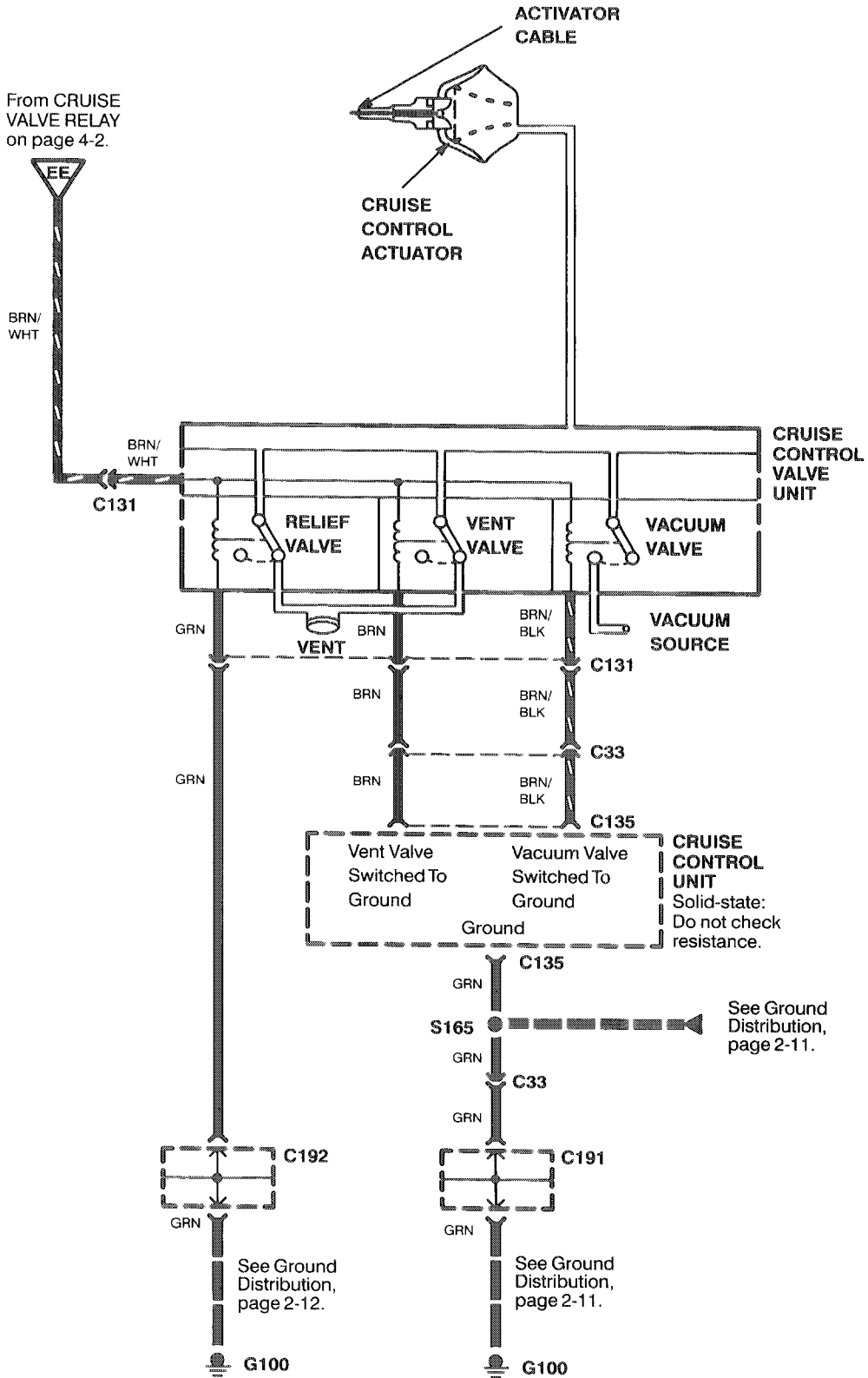


(cont'd)

Cruise Control

Circuit Schematic (cont'd)





Cruise Control

How the Circuit Works

The cruise control system uses the following components to control vehicle speed in the cruise control mode:

- Clutch cruise cancel switch
- Cruise control actuator
- Cruise control switch
- Cruise control unit
- Cruise control valve unit
- Cruise valve relay
- Engine control module (ECM)
- Front brake light/cruise cancel switch
- Gear position switch
- Instrument panel
- Rear brake cruise cancel switch
- Throttle cancel switch

The cruise control unit receives several signals to operate. It must receive a battery voltage signal from the engine stop switch and the cruise ON switch at its ignition input. There must be a battery voltage signal at the cancel input that receives voltage from the front brake light/cruise cancel switch, throttle cancel switch, and rear brake cruise cancel switch. These switches complete the current path when both brakes are released and the throttle is not OFF (pushed clockwise). The cruise control unit has a 4th gear input and an overdrive (OD) input. The module must recognize a ground signal at its 4th gear or overdrive (OD) inputs to enter the cruise mode.

When the cruise ON switch is engaged, the cruise control unit grounds the cruise ON indicator control line and the cruise ON indicator lights. The system is activated when the unit receives a momentary voltage signal at its SET/DECEL input. The unit grounds the cruise SET indicator control line. It then looks at the speed signal outputs from the instrument panel and the engine speed from the ECM. It uses the ECM speed signal to control vehicle speed and the instrument panel speed signal to determine if the vehicle is above 30 mph and below 80 mph.

The cruise control unit maintains vehicle speed by energizing the cruise valve relay and grounding and opening its vacuum vent and valve control lines. Engine vacuum is then channeled through the cruise control valve unit to the cruise control actuator. The actuator pulls on the throttle linkage to increase vehicle speed. When the vehicle set speed is reached, the unit opens the vacuum valve control line and allows vacuum in the cruise control valve unit to hold the throttle linkage to maintain vehicle speed. If the unit detects vehicle speed increasing past the set speed, or if the SET/DECEL switch is held, the unit removes ground from the vent valve control circuit. Vacuum in the cruise control actuator is decreased, the throttle cable tension is relaxed, and the engine speed slows.

The cruise mode is disengaged by applying either brake, releasing the clutch, or moving the throttle to OFF. When either brake is applied, or if the throttle is moved to OFF, battery voltage is removed from the cancel input. This forces the unit to drop out of the cruise mode. There is also a redundant brake disable input to the cruise control unit. When the brake lights come on, battery voltage is applied to the cruise module to disengage the cruise control.

Troubleshooting

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> ● Cruise ON indicator does not light briefly when stop engine switch is first turned to RUN, but lights with cruise on. 	<ul style="list-style-type: none"> ● BLU/ORN circuit open. ● Faulty instrument panel.
<ul style="list-style-type: none"> ● Cruise SET indicator does not light briefly when stop engine switch is first turned to RUN, but lights with cruise set. 	<ul style="list-style-type: none"> ● BLU/WHT circuit open. ● Faulty instrument panel.
<ul style="list-style-type: none"> ● Any other cruise related symptom. 	<ul style="list-style-type: none"> ● Perform Isolation Procedure.

(cont'd)

Cruise Control

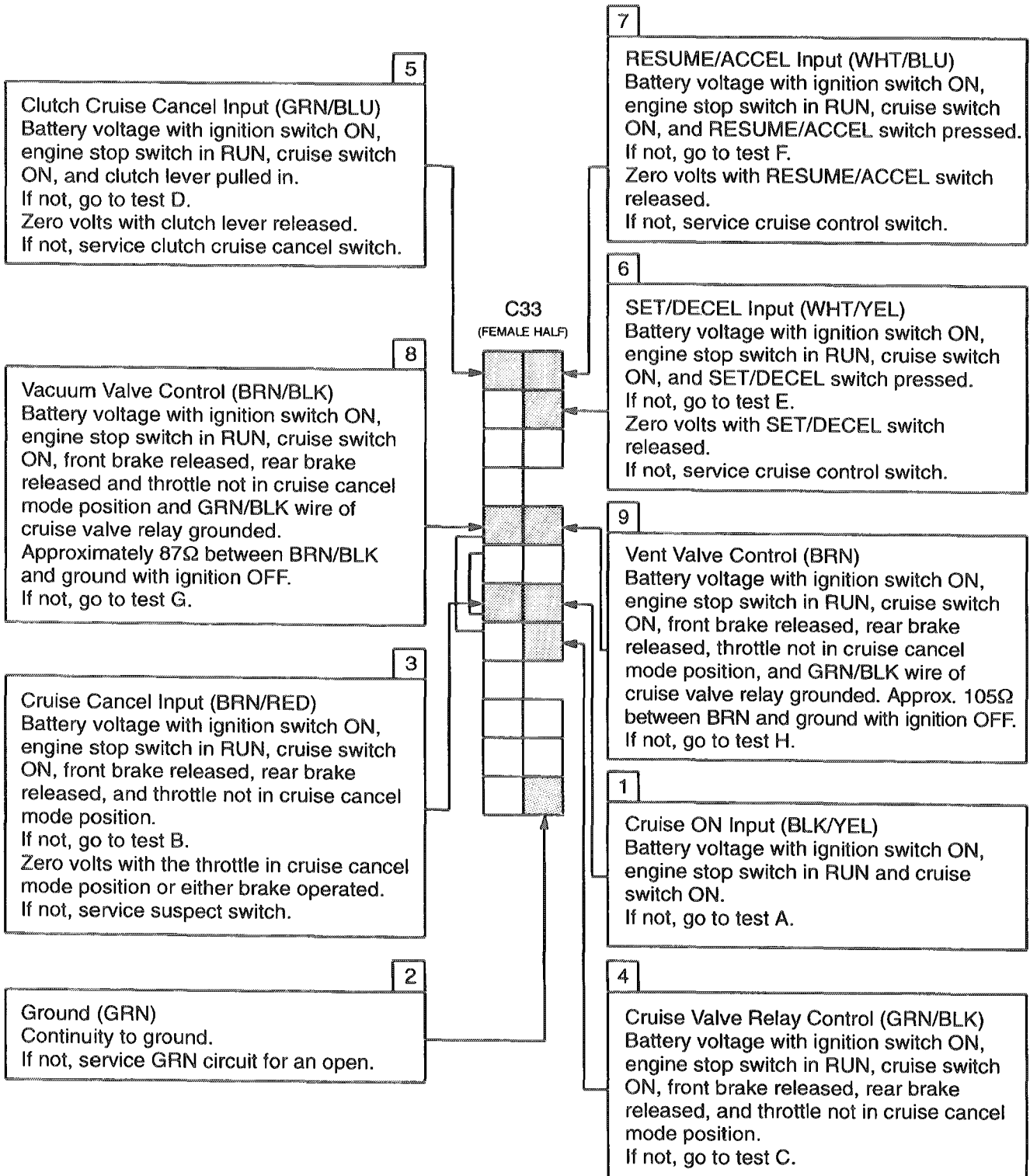
Troubleshooting (cont'd)

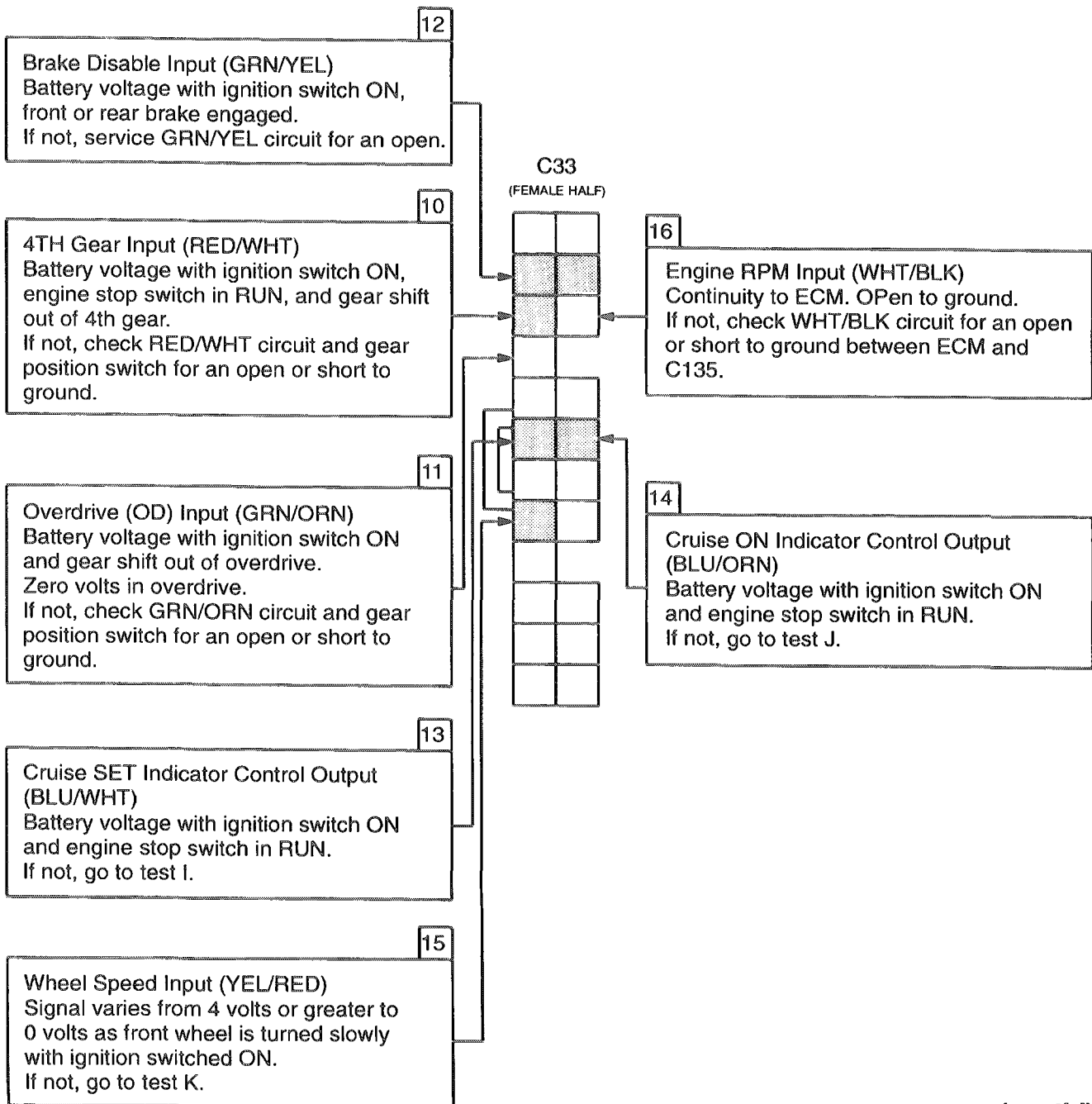
ISOLATION PROCEDURE

Note: Disconnect connector C33. Perform all checks in order.

If a result is incorrect, go to test referenced. If the result is correct, perform the next check.

Throttle is at the cruise cancel mode position when the throttle is turned clockwise past the rest position.





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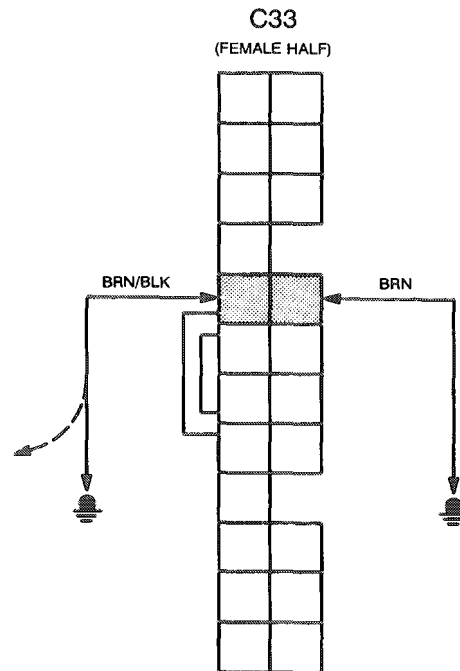
Cruise Control

Troubleshooting (cont'd)

ISOLATION PROCEDURE (cont'd)

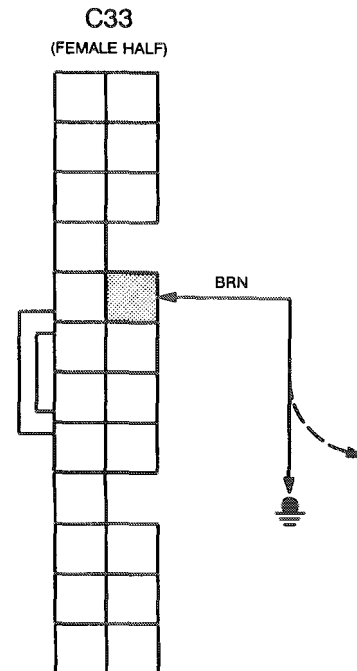
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Start engine and allow to run for 30 seconds to allow vacuum to build in accumulator. Stop engine, put ignition switch ON, engine stop switch in RUN, and ground GRN/BLK wire of the cruise valve relay. Jumper BRN circuit to ground. Put cruise switch ON. Jumper BRN/BLK circuit to ground for about 3 seconds, then disconnect and observe if throttle turns and holds. If not, go to test L.



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With ignition switch ON, cruise switch ON, engine stop switch in RUN, and ground GRN/BLK wire of the cruise valve relay, remove jumper at BRN circuit while observing throttle. Cruise control actuator releases throttle. If not, go to test M.



Note: If all isolation checks are correct, check wires between cruise control unit and male half of C33 for opens or shorts to ground. If all circuits are OK, replace cruise control unit and road-test. If not OK, speed signal from ECM may be at fault.

Test A: Cruise Unit Power

1. Turn ignition switch ON and engine stop switch in RUN. Check for battery voltage at C138 WHT circuit.
If yes, go to step 2.
If no, service WHT circuit for an open.
2. With ignition switch OFF, connect an ohmmeter across BLK/YEL and WHT circuits at C138. Check for continuity with cruise switch ON.
If yes, service BLK/YEL circuit for an open between C33 and right combination switch.
If no, replace right combination switch.

Test B: Cruise Unit Cancel Input Test

1. Disconnect C132 (throttle cancel switch). Turn ignition and cruise switches ON and the engine stop switch to RUN. With front brake released, check for battery voltage at GRN/WHT circuit.
If yes, go to step 2.
If no, check front brake light/cruise cancel switch, BLK/BLU and GRN/WHT circuits for an open between C132 and C138. Replace/repair as necessary.
2. Reconnect C132 and disconnect C133 (rear cruise brake cancel switch). Turn ignition and cruise switches and the engine stop switch to RUN. With front brake and throttle released, check for battery voltage at GRN/WHT circuit.
If yes, check rear brake cruise cancel switch and BRN/RED circuit for an open between C133 and cruise control unit. Replace/repair as necessary.
If no, check throttle cancel switch and GRN/WHT circuit for an open between throttle cancel switch and rear brake cruise cancel switch. Replace/repair as necessary.

Test C: Cruise Relay Valve Input Test

1. Disconnect cruise valve relay connector. Turn the ignition and cruise switches ON and the engine stop switch to RUN. Release front and rear brakes and release throttle. Check for battery voltage at BRN/RED coil circuit.
If yes, check relay for an open coil and GRN/BLK circuit for an open between cruise valve relay and C33. Replace/repair as necessary.
If no, service BRN/RED circuit for an open.

Test D: Clutch Cancel Input Test

1. Disconnect C323 (clutch cruise cancel switch). Turn the ignition and cruise switches ON, and the engine stop switch to RUN. Check for battery voltage at BLK/YEL circuit.
If yes, check clutch cruise cancel switch and GRN/BLU circuit for an open between C323 and C33. Replace/repair as necessary.
If no, service BLK/YEL circuit for an open.

(cont'd)

Cruise Control

Troubleshooting (cont'd)

Test E: SET/DECEL Switch Continuity Check

1. Connect ohmmeter across WHT and WHT/YEL circuits at C138. Check for continuity with the cruise switch ON and SET/DECEL switch held on.
If yes, service WHT/YEL circuit for an open between C138 and C33.
If no, replace the cruise control switch.

Test F: RESUME/ACCEL Switch Continuity Check

1. Connect ohmmeter across WHT and WHT/BLU circuits at C138. Check for continuity with the cruise switch ON and RESUME/ACCEL switch held on.
If yes, service WHT/BLU circuit for an open between C138 and C33.
If no, replace the cruise control switch.

Test G: Vacuum Valve Control Check

1. Disconnect C131 (cruise control vent valve unit). Turn ignition and cruise switches ON and engine stop switch in RUN and ground the GRN/BLK wire at the cruise valve relay. Release throttle and both brakes. Check for battery voltage at BRN/WHT circuit.
If yes, go to step 4.
If no, go to step 2.
2. Disconnect cruise valve relay connector. Check for battery voltage at BRN/RED circuits.
If yes, go to step 3.
If no, service BRN/RED circuit for an open between cruise valve relay and rear brake cruise cancel switch.
3. Check for continuity at BRN/WHT circuit between C131 (cruise valve control unit) and cruise valve relay.
If yes, replace cruise valve relay.
If no, service BRN/WHT wire for an open.
4. Check continuity to ground at C131 GRN circuit.
If yes, go to step 5.
If no, service BRN/WHT wire for an open.
5. With C131 disconnected, check continuity between BRN/WHT and BRN/BLK circuits at cruise control valve side of C131.
If yes, service BRN/BLK circuit for an open between C33 and C131.
If no, replace cruise control valve unit.

Test H: Vent Valve Continuity Check

1. Disconnect C131 (cruise control valve unit) and check continuity between BRN/WHT and BRN circuits at cruise control valve side of C131.
If yes, service BRN circuit for an open between C33 and C131.
If no, replace cruise control valve unit.

Test I: Cruise SET Indicator Control Test

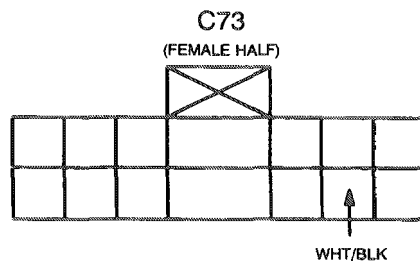
1. Put engine stop switch in RUN and turn ignition ON. Check that cruise SET indicator lights briefly.
If yes, service BLU/WHT circuit between instrument panel and cruise control unit.
If no, go to step 2.
2. Disconnect C66 (instrument panel). Turn ignition ON and put engine stop switch in RUN. Check for battery voltage at WHT circuit.
If yes, go to step 3.
If no, service WHT circuit for an open.
3. Connect ohmmeter between WHT and BLU/WHT circuits at instrument panel half of C66. Check for continuity.
If yes, check BLU/WHT circuit for an open between C66 and C33.
If no, check bulb, WHT circuit, and BLU/WHT circuit for an open. Replace/repair as necessary.

Test J: Cruise ON Indicator Control Test

1. Put engine stop switch in RUN and turn ignition ON. Check that cruise ON indicator lights briefly.
If yes, service BLU/ORN circuit between instrument panel and cruise control unit.
If no, go to step 2.
2. Disconnect C66 (instrument panel). Turn ignition ON and engine stop switch in RUN. Check for battery voltage at WHT circuit.
If yes, go to step 3.
If no, service WHT circuit for an open.
3. Connect ohmmeter between WHT and BLU/ORN circuits at instrument panel half C66. Check for continuity.
If yes, check BLU/ORN circuit for an open between C66 and C33.
If no, check bulb, WHT circuit, and BLU/ORN circuit for an open. Replace/repair as necessary.

Test K: Speed Signal Input Test

1. Disconnect C73. With ignition switch ON, check for about 5 to 10 volts at WHT/BLK circuit.



If yes, check WHT/BLK and YEL/RED circuit for an open or WHT/BLK wire between C73 & instrument panel for an open.
If no, go to step 2.

(cont'd)

Cruise Control

Troubleshooting (cont'd)

Test K: Speed Signal Input Test (cont'd)

2. Turn ignition OFF and connect ohmmeter to YEL/RED circuit at the female half of C33. Check for a short to ground.
If yes, go to next step.
If no, go to step 5.
3. With ohmmeter connected from previous step, disconnect C99 (turn signal cancel control unit) and check again for the short to ground.
If yes, go to step 4.
If no, service turn signal cancel control unit for a short to ground.
4. With ohmmeter connected from previous step, disconnect radio/cassette player connector C1 and check again for the short to ground.
If yes, service the WHT/BLK and YEL/RED circuit for a short to ground.
If no, service radio/cassette player for a short to ground.
5. With ohmmeter connected from previous step, check the male half of C33 for a short to ground.
If yes, service the YEL/RED circuit for a short to ground.
If no, replace the cruise control unit.

Test L: Cruise Control Actuator Vacuum Input Test

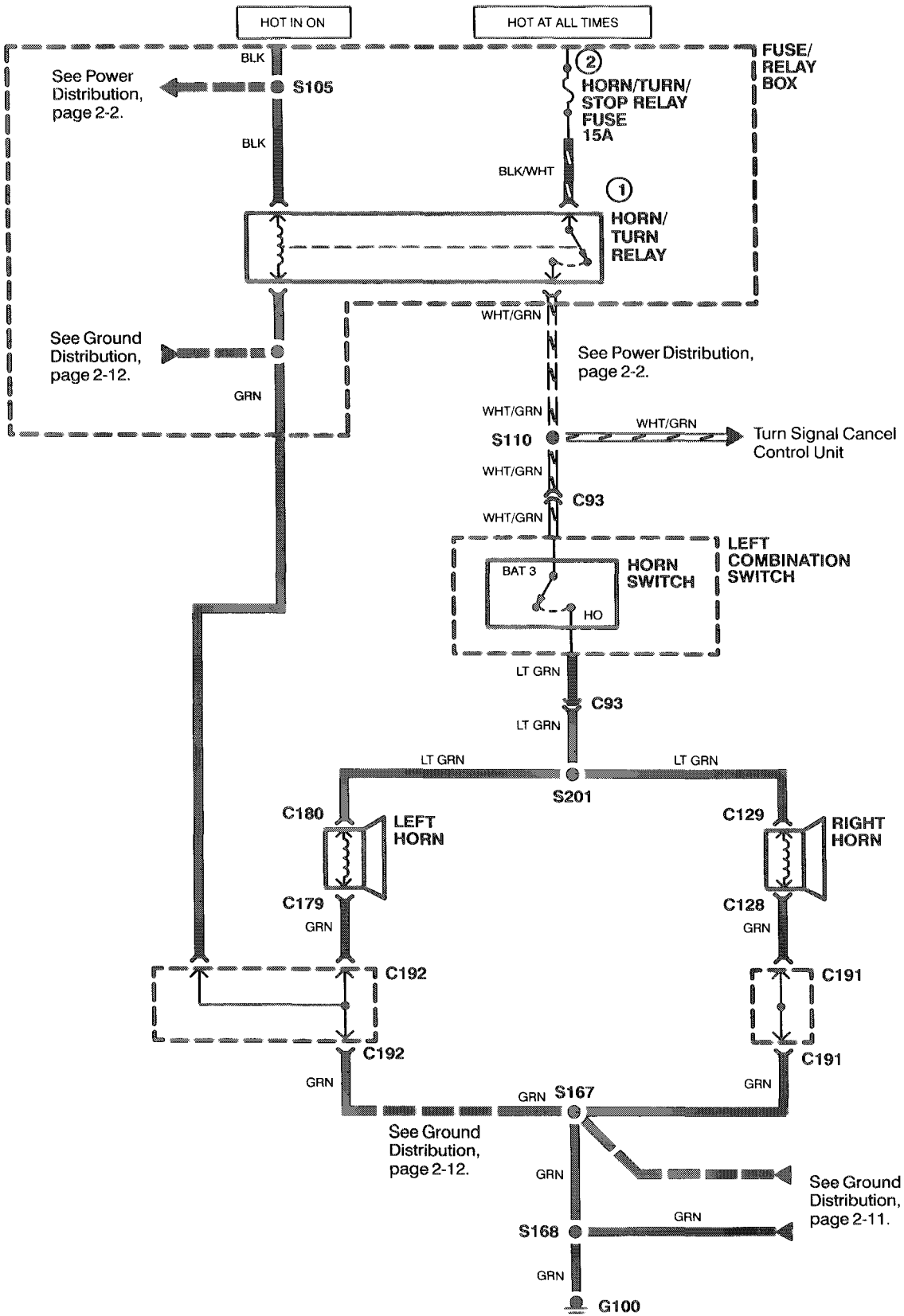
1. Connect vacuum gauge at source to cruise control valve unit. Start engine and check for vacuum.
If yes, go to step 2.
If no, service vacuum line system for a blockage or leak.
2. Stop engine and connect vacuum pump to cruise control actuator. Operate vacuum pump and check that the throttle turns, holds, and releases as vacuum is applied, maintained, and released.
If yes, go to step 3.
If no, check vacuum line to cruise control actuator for blockage or leaks. Replace/repair as necessary.
3. Disconnect C131 and check for continuity to ground at GRN circuit.
If yes, replace cruise control valve unit.
If no, service GRN circuit for an open.

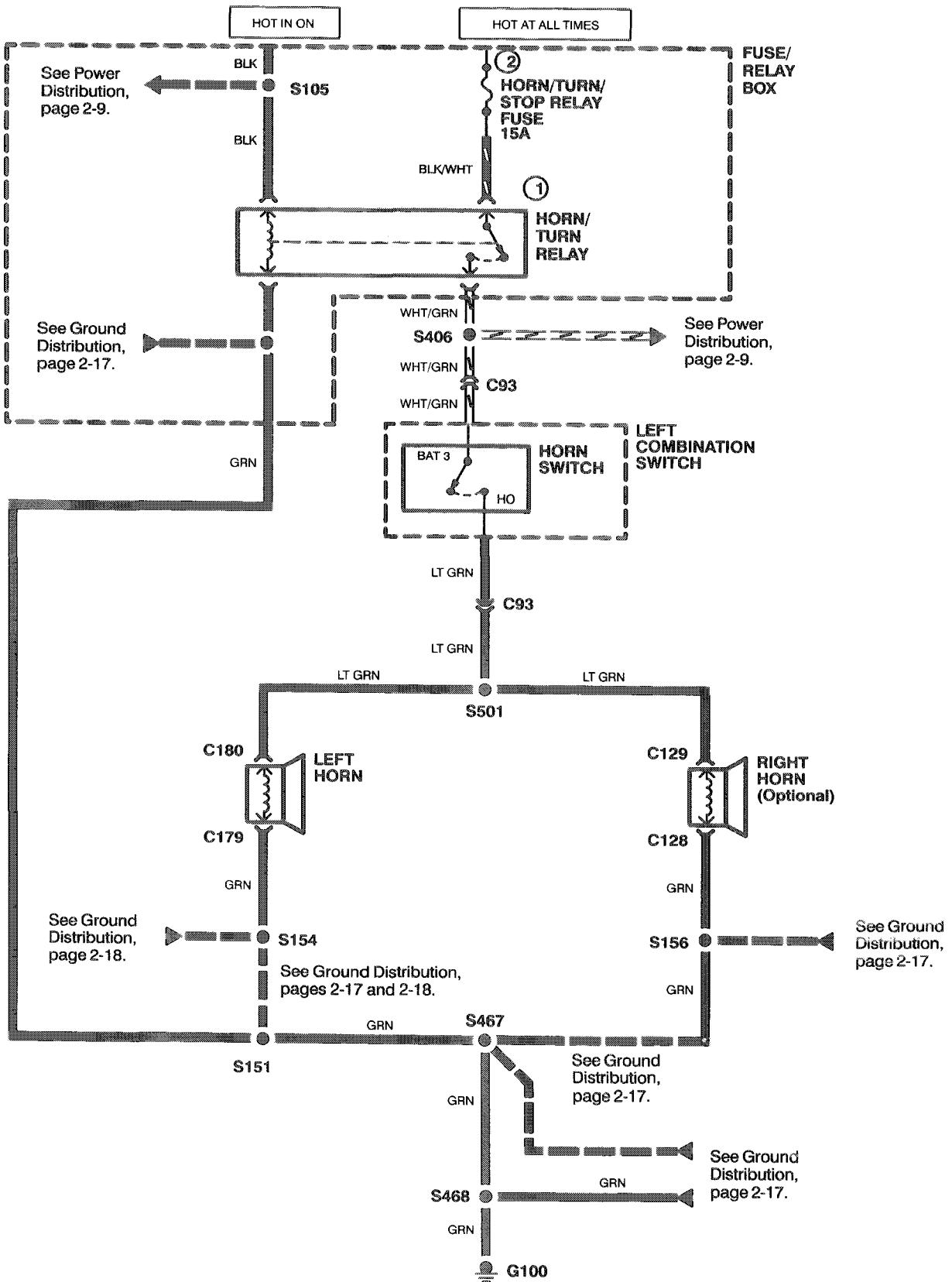
Test M: Cruise Control Actuator Vent Input Test

1. Connect vacuum pump to vacuum source line of cruise control valve unit. Jumper BRN circuit to ground. Jumper GRN circuit to ground. Jumper BRN/BLK circuit to ground. Jumper BRN/WHT circuit to battery voltage. Operate vacuum pump and allow time for cruise control actuator to pull throttle cable. Disconnect jumper at BRN/BLK circuit. Cable actuator should hold throttle cable. Disconnect jumper at BRN circuit. Cable actuator should release throttle. If yes, check BRN circuit for high resistance between C33 and C131.
If no, replace cruise control valve unit.

Horn: Asp and SE

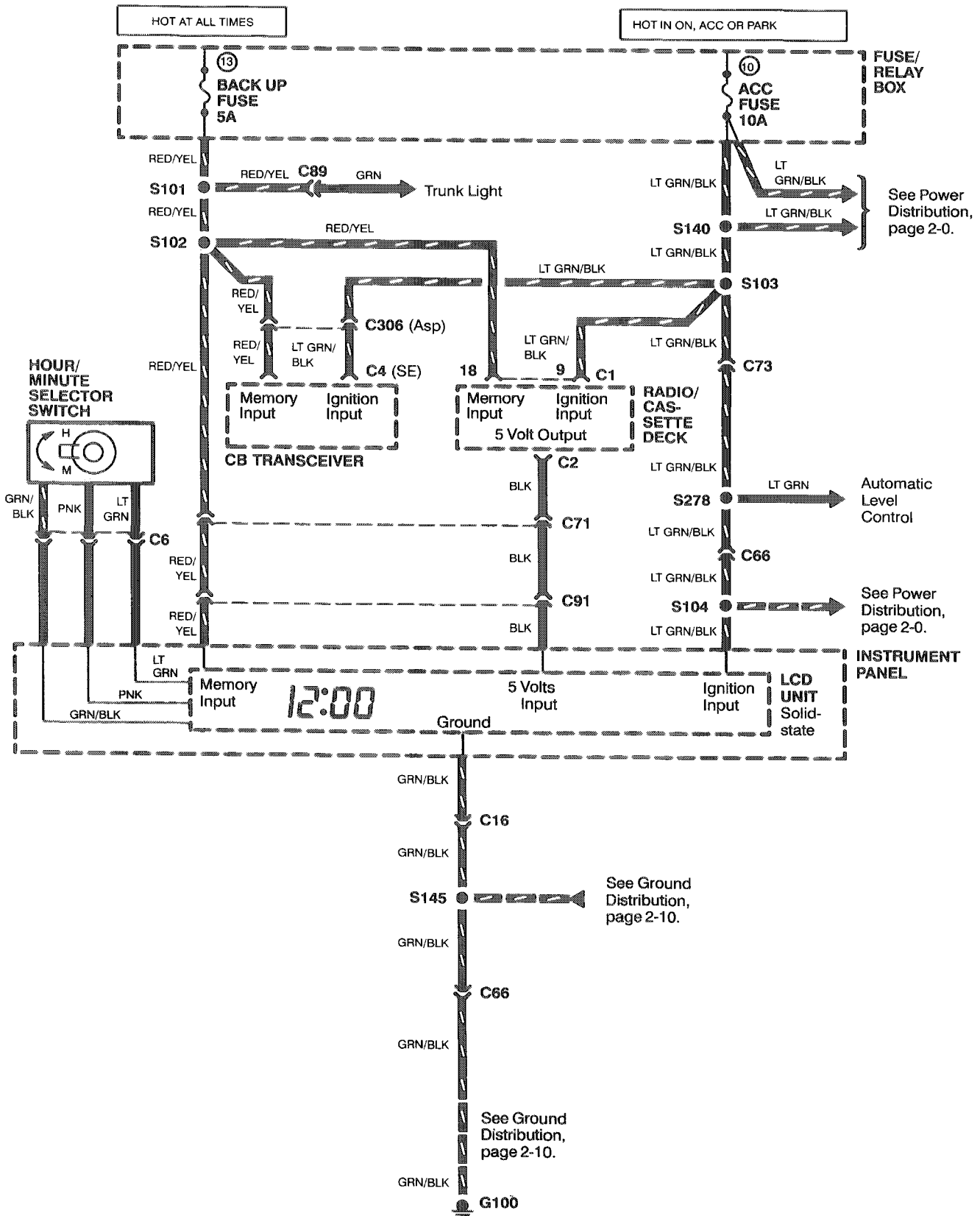
Circuit Schematic





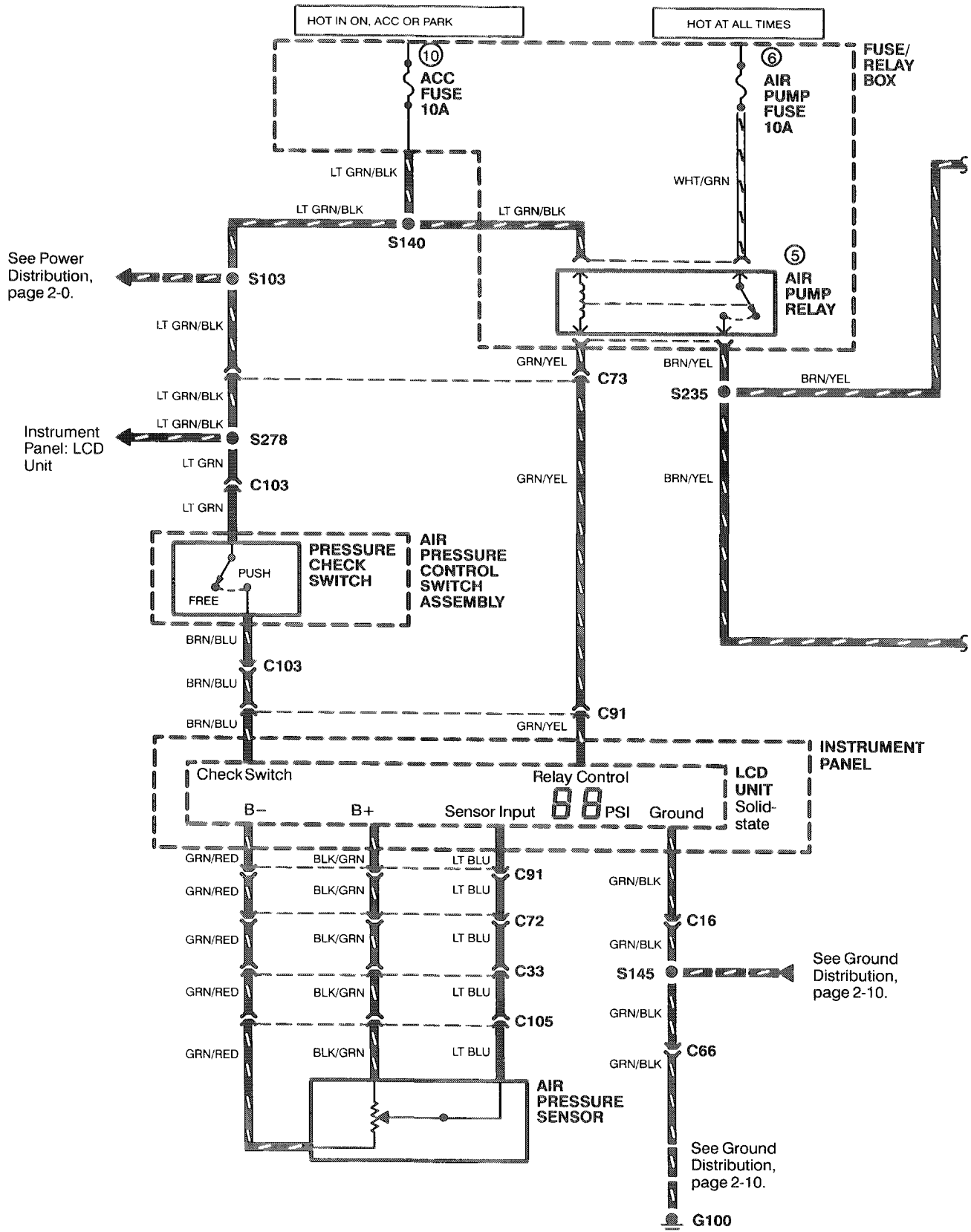
Clock: Asp and SE

Circuit Schematic



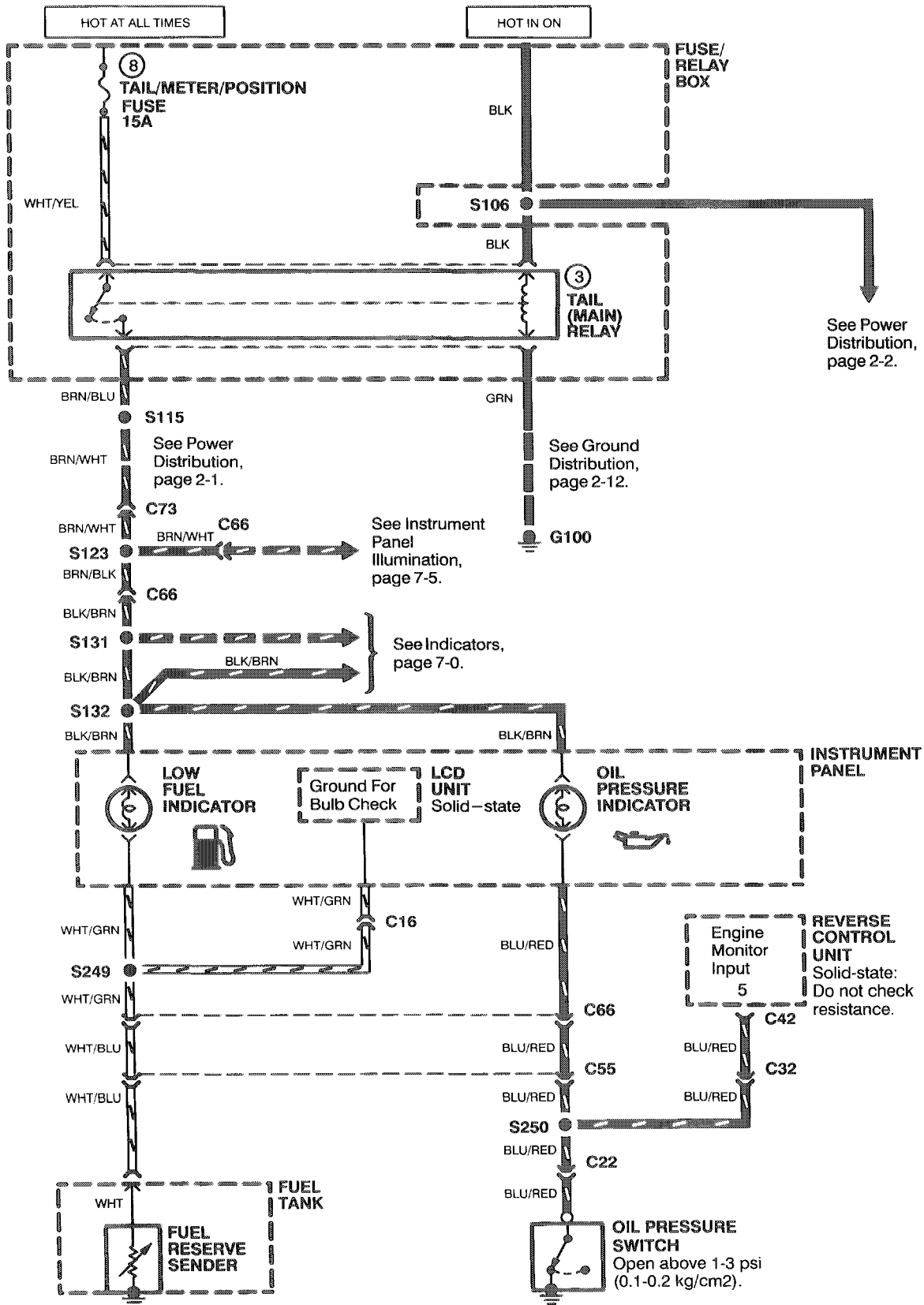
Automatic Level Control

Circuit Schematic



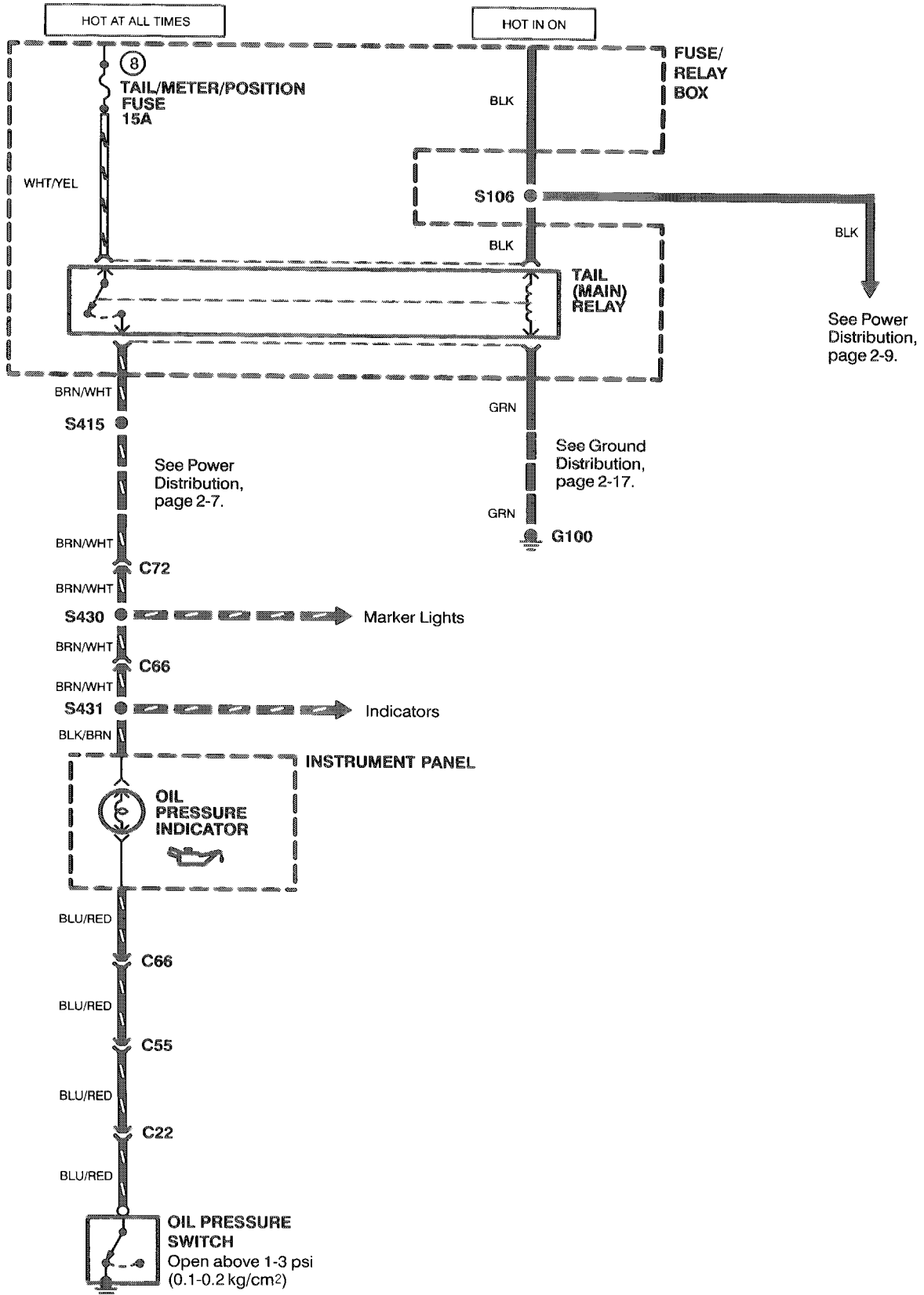
Low Fuel and Oil Pressure Warning System: Asp and SE

Circuit Schematic



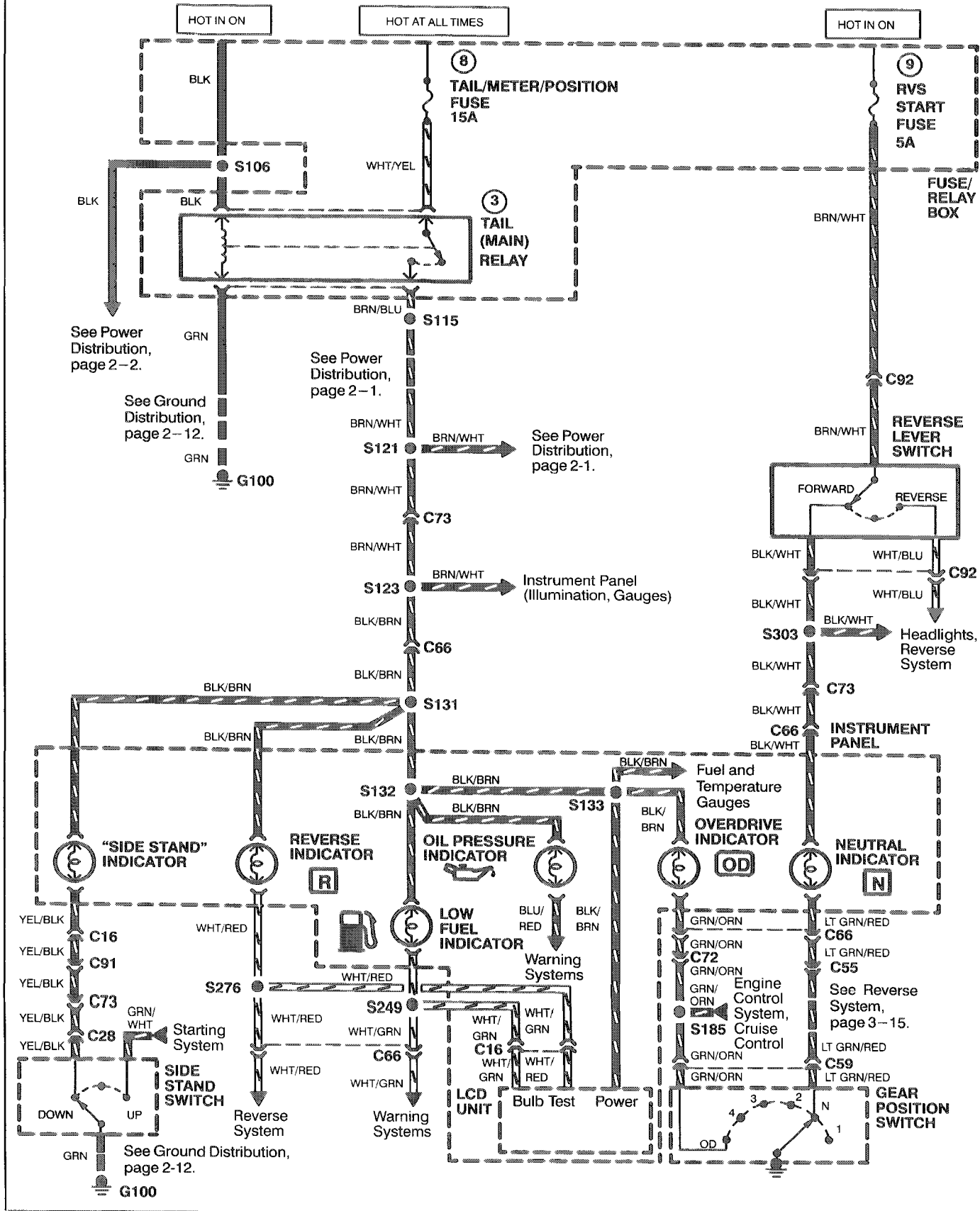
Int

- Oil Pressure Warning System

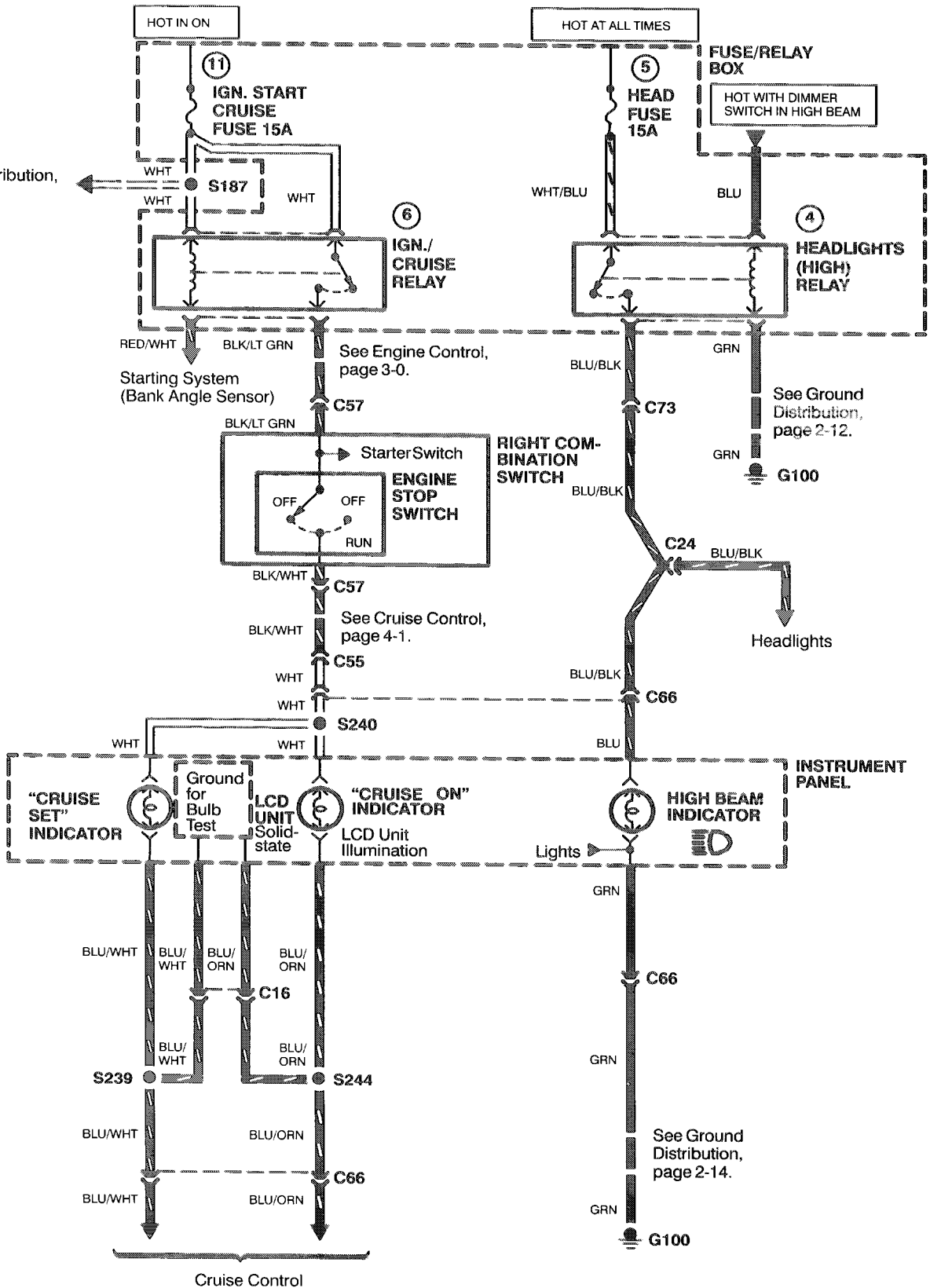


Indicators: Asp and SE

Circuit Schematic

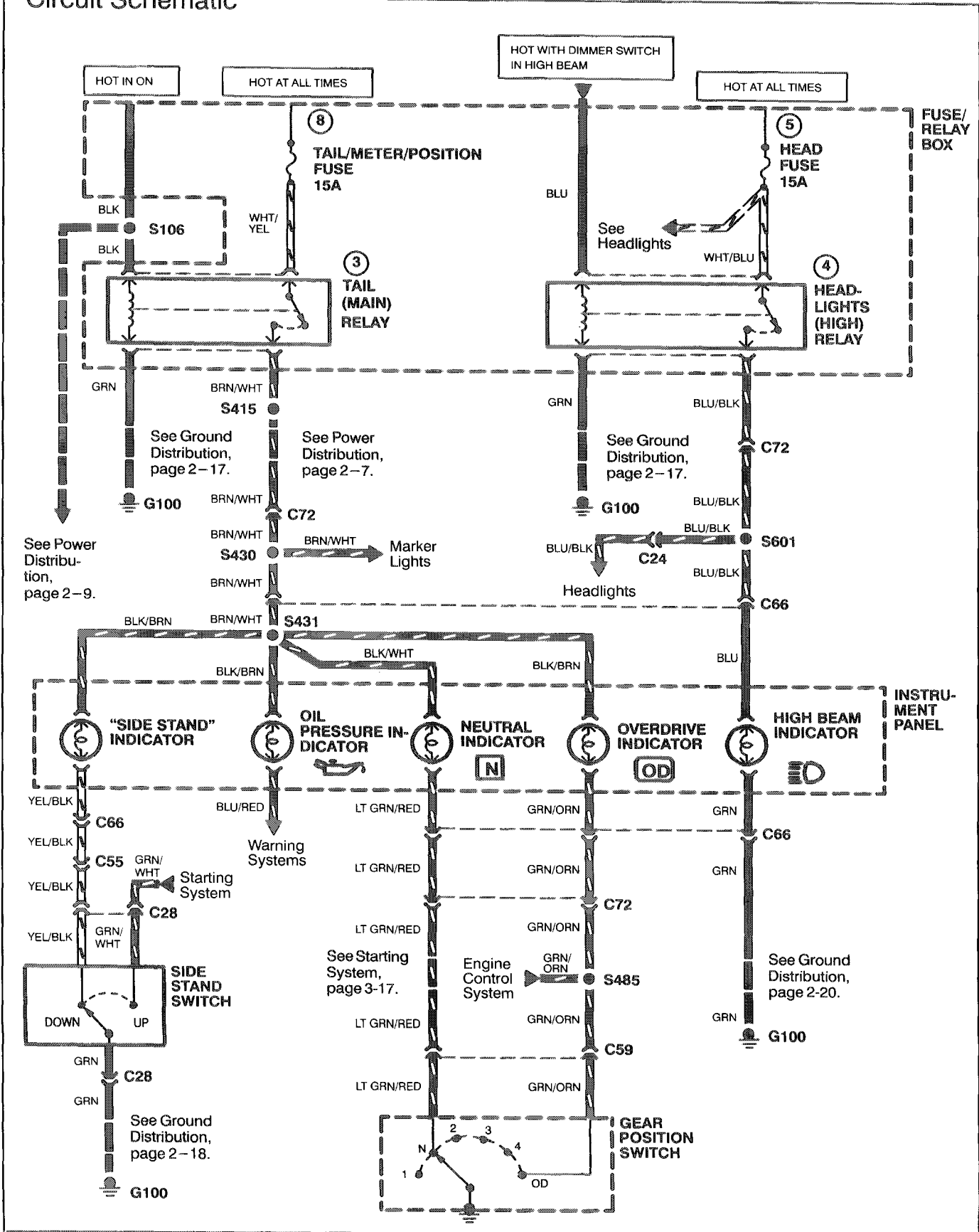


See Power Distribution, page 2-3.



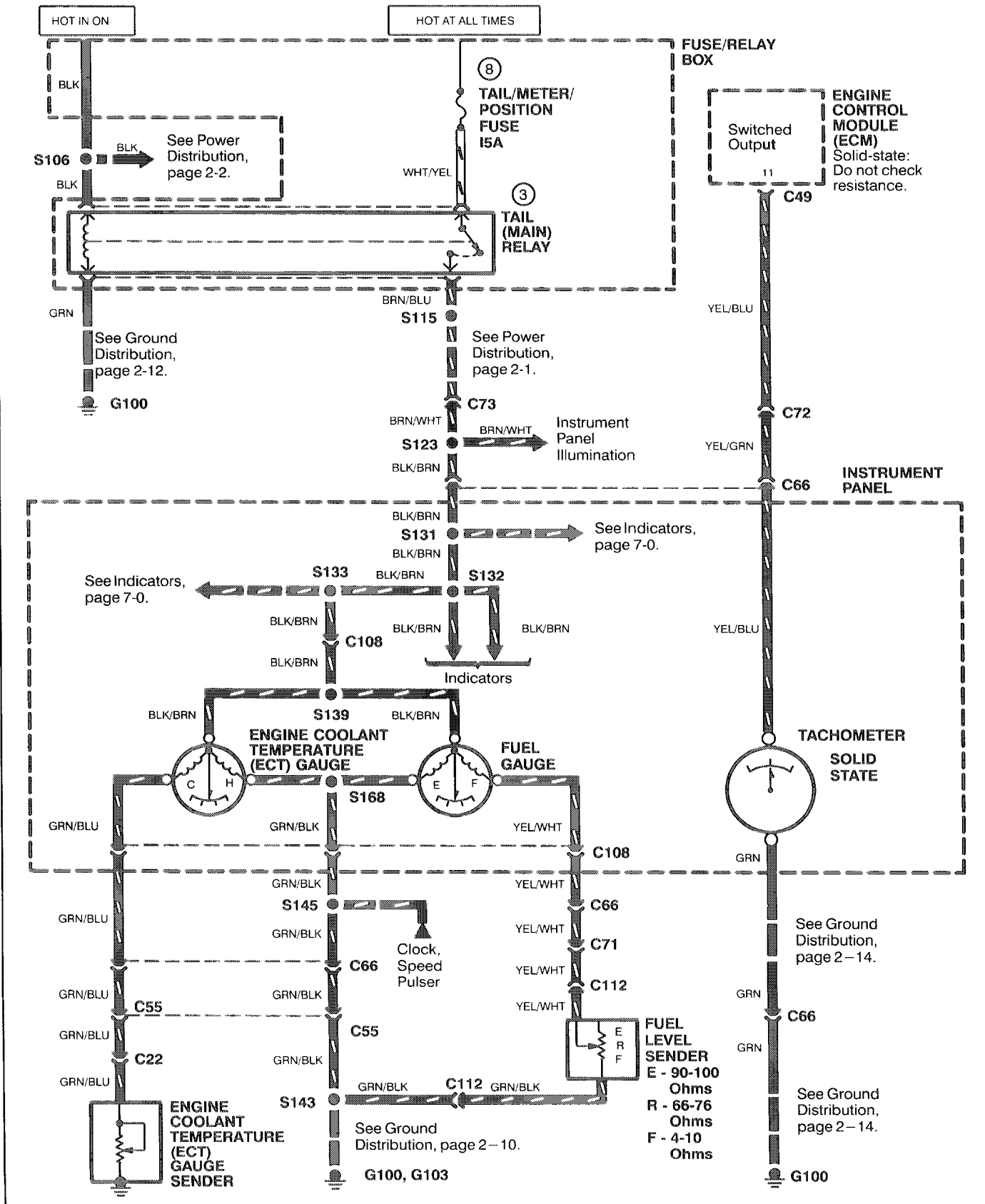
Indicators: Int

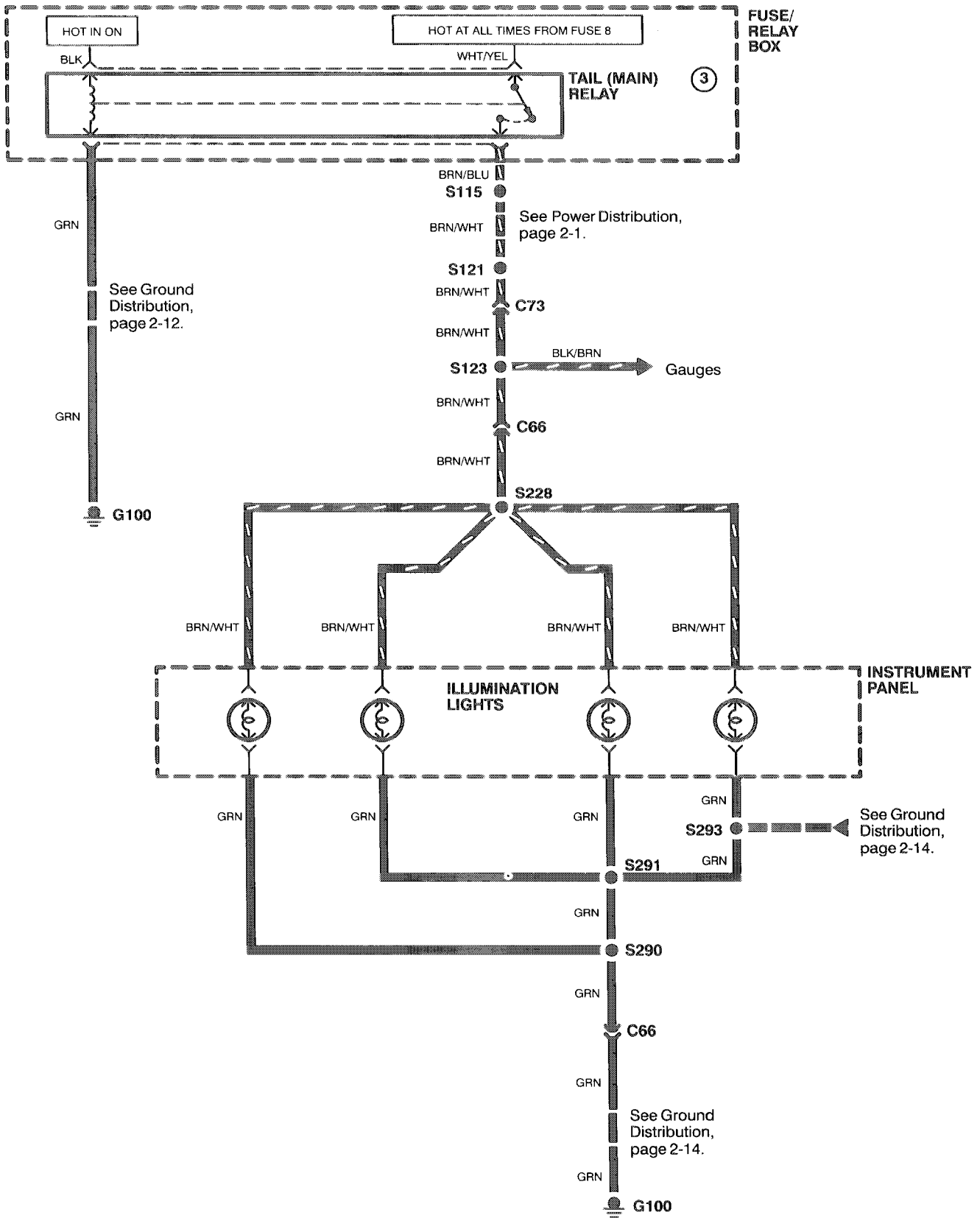
Circuit Schematic



Instrument Panel: Gauges, Illumination Lights (Asp and SE)

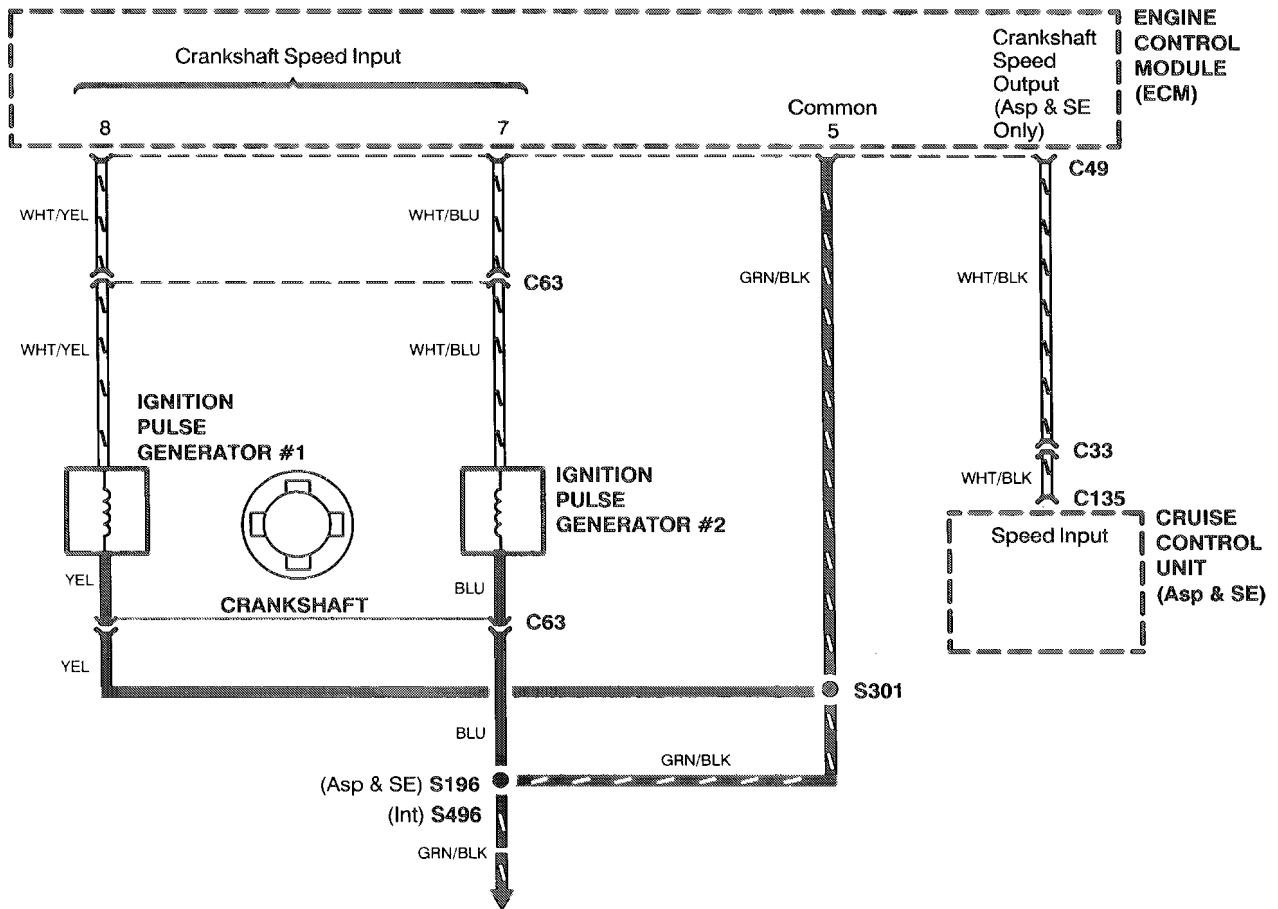
Circuit Schematic





(Crankshaft Speed)

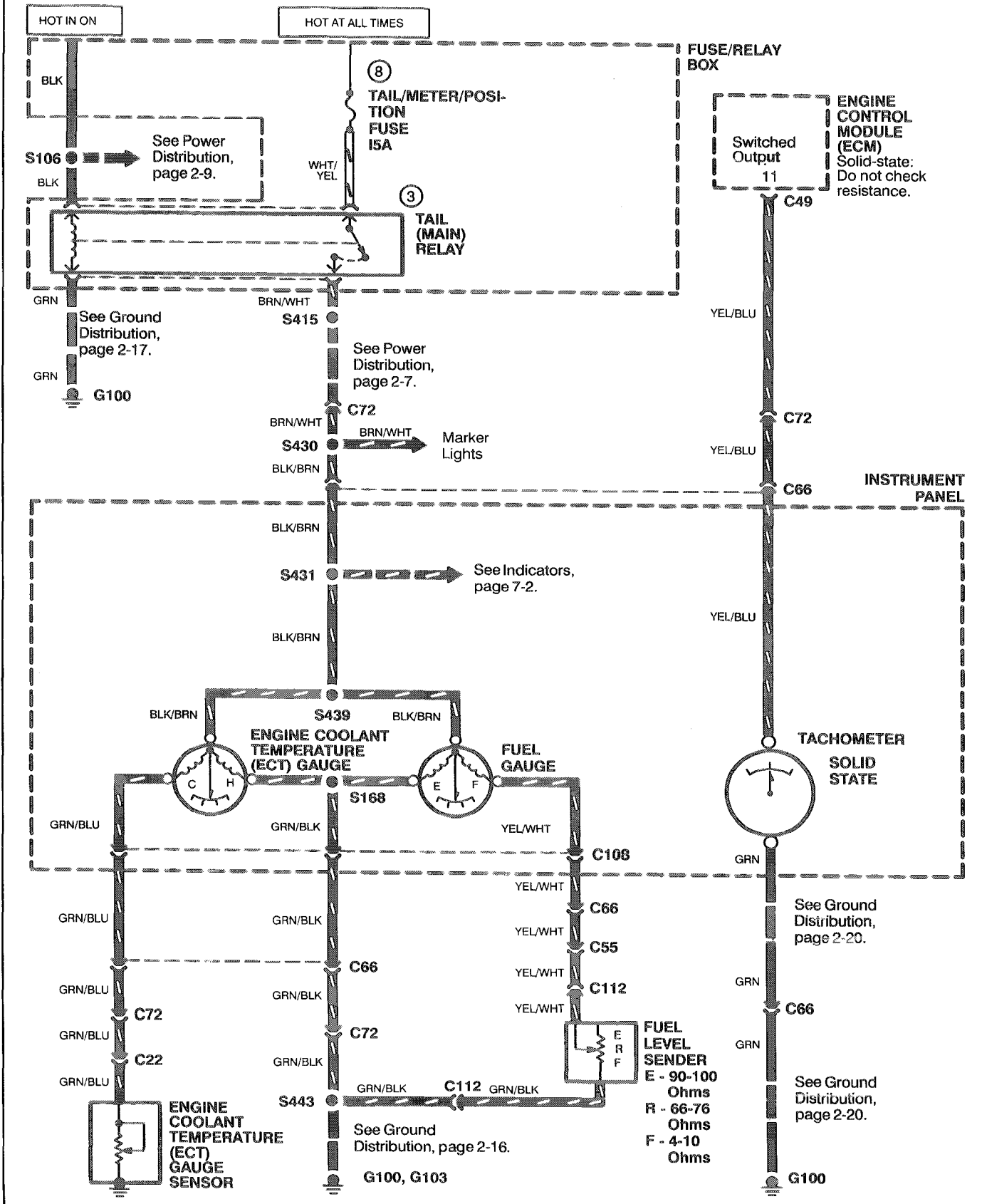
Note: For Ignition, Battery and Grounding details of the Engine Control Module ECM), see page 3-0 (Asp & SE models) or page 3-4 (Int models).

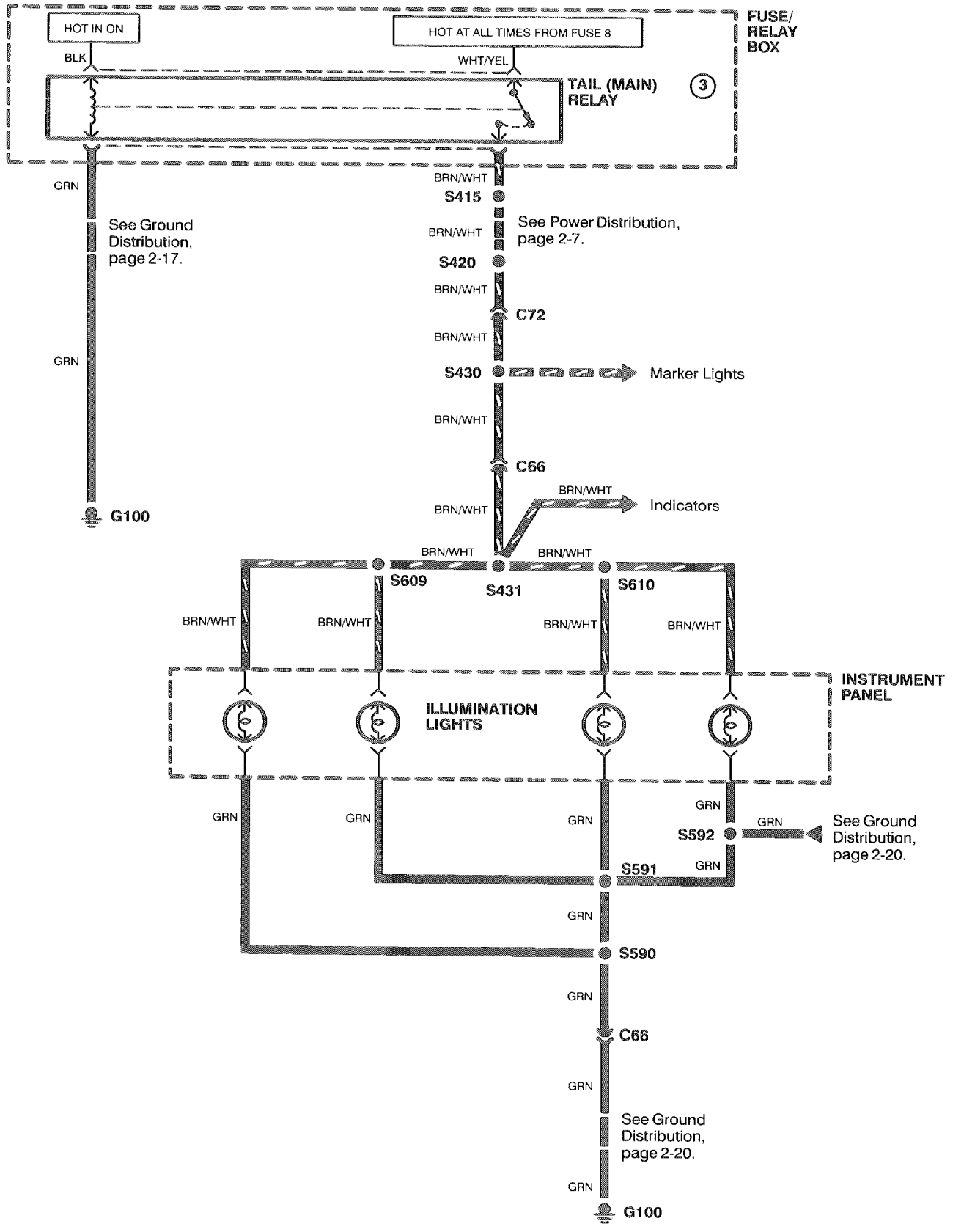


See Engine Control System, page 3-2 (Asp & SE) or page 3-6 (Int).

Instrument Panel: Gauges, Illumination Lights (Int)

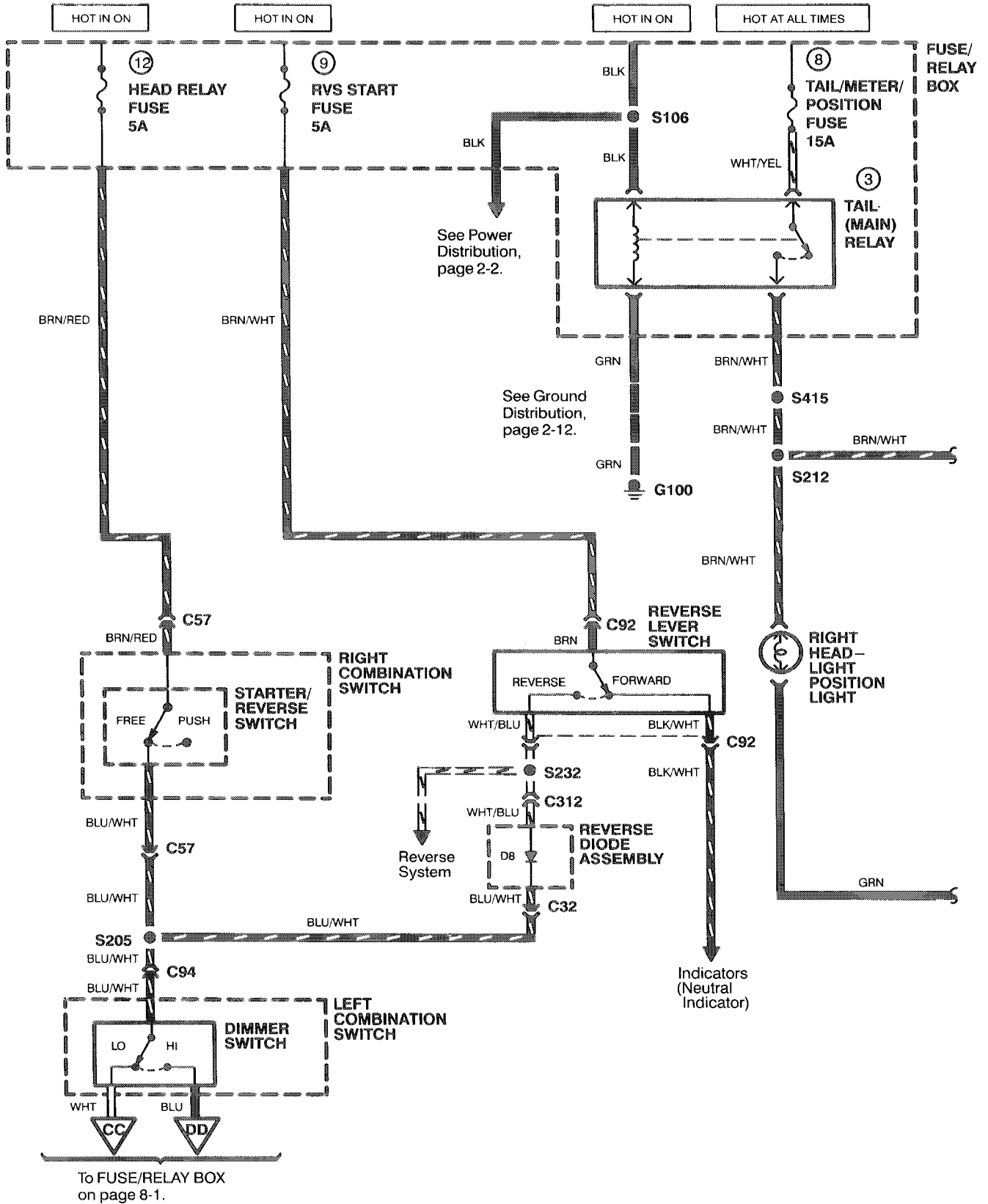
Circuit Schematic

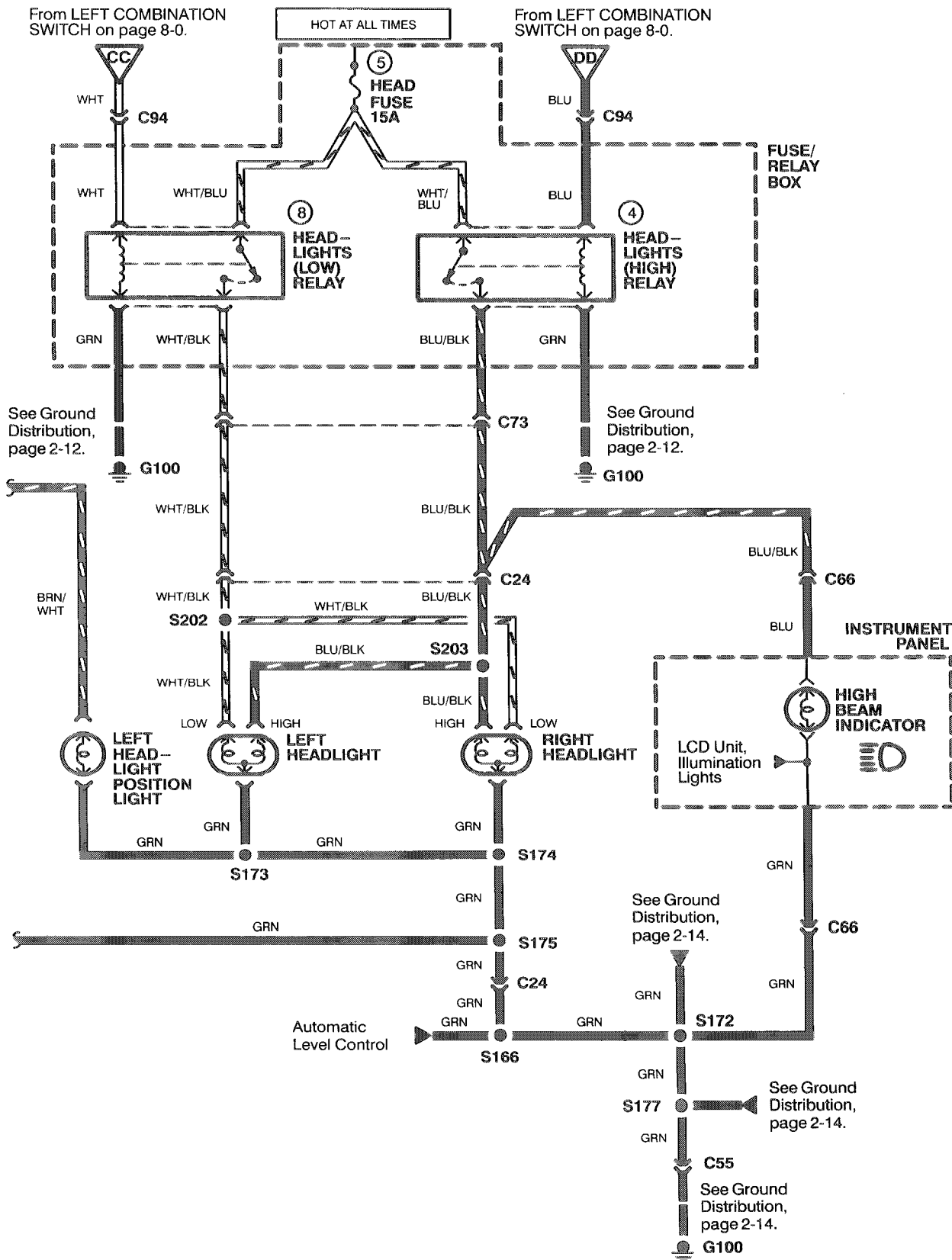




Headlights: Asp and SE

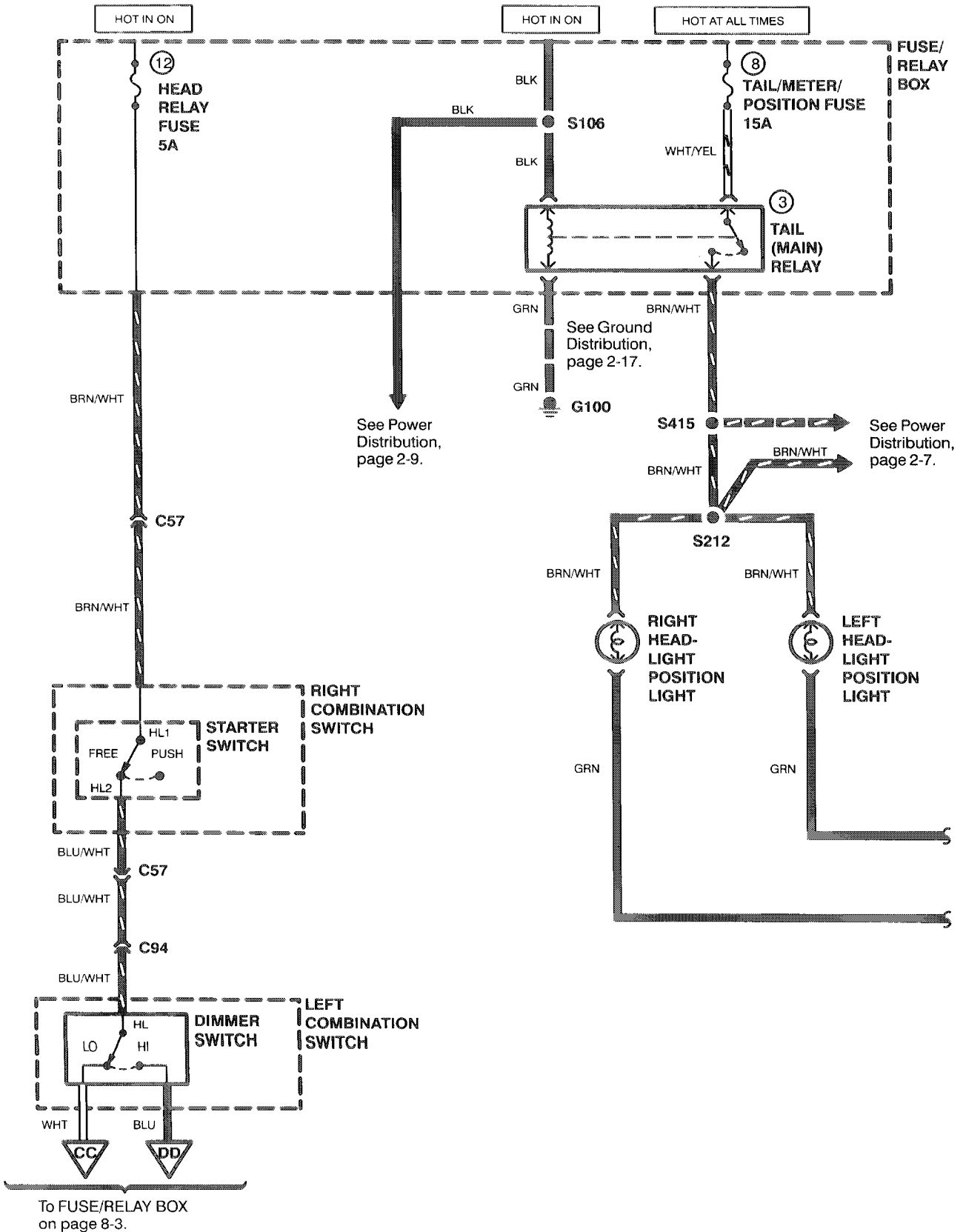
Circuit Schematic





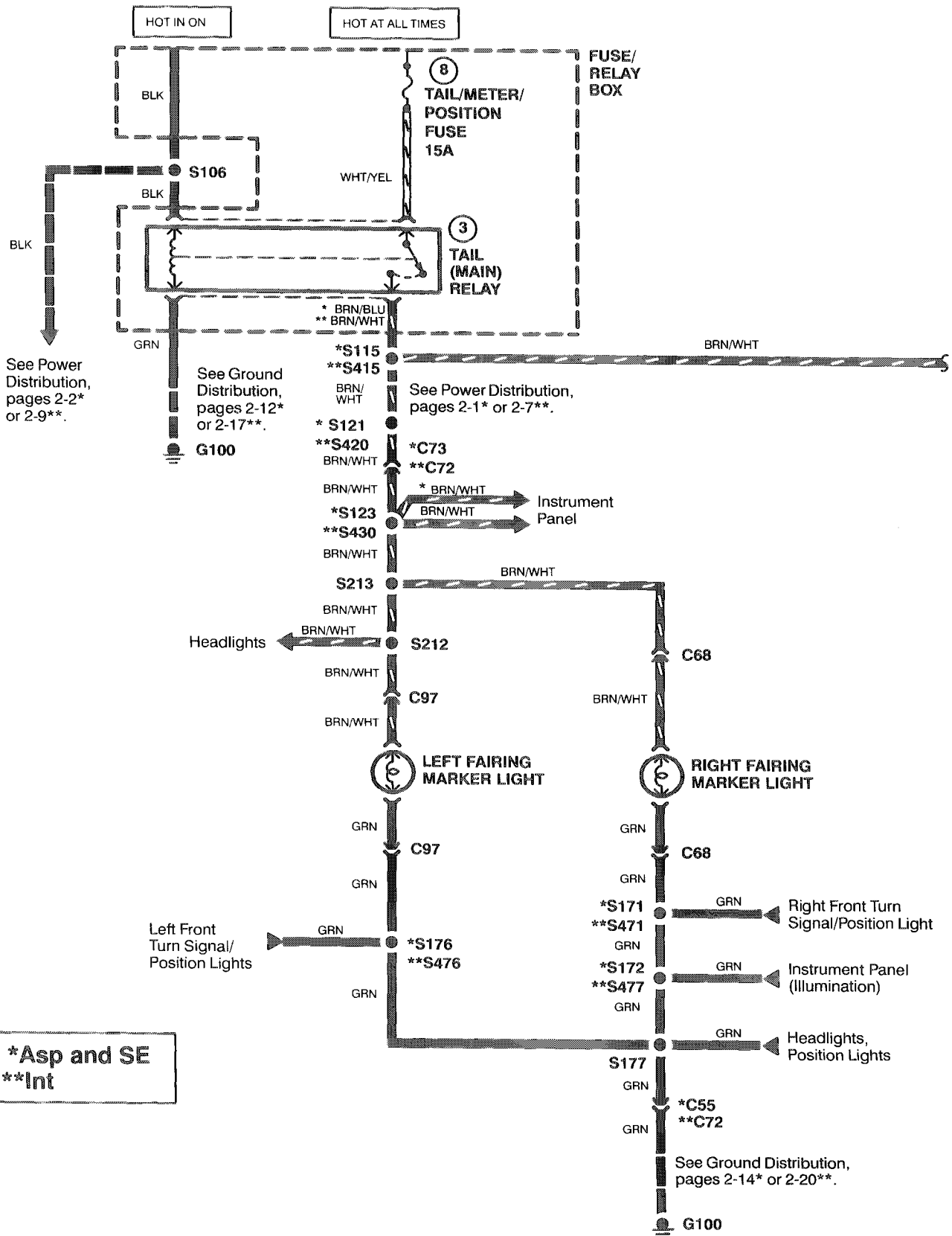
Headlights: Int

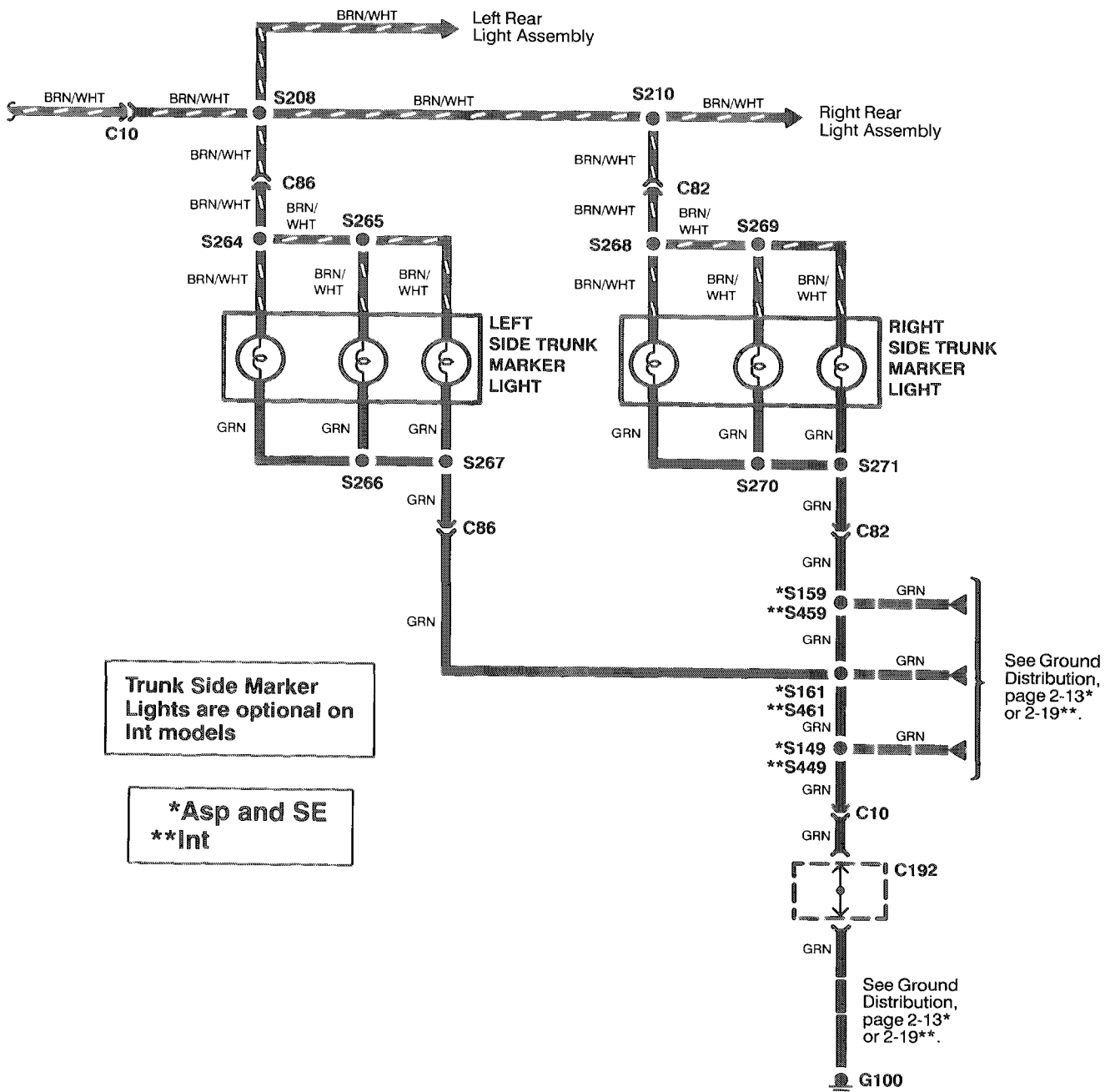
Circuit Schematic



Marker Lights: Fairing and Trunk

Circuit Schematic



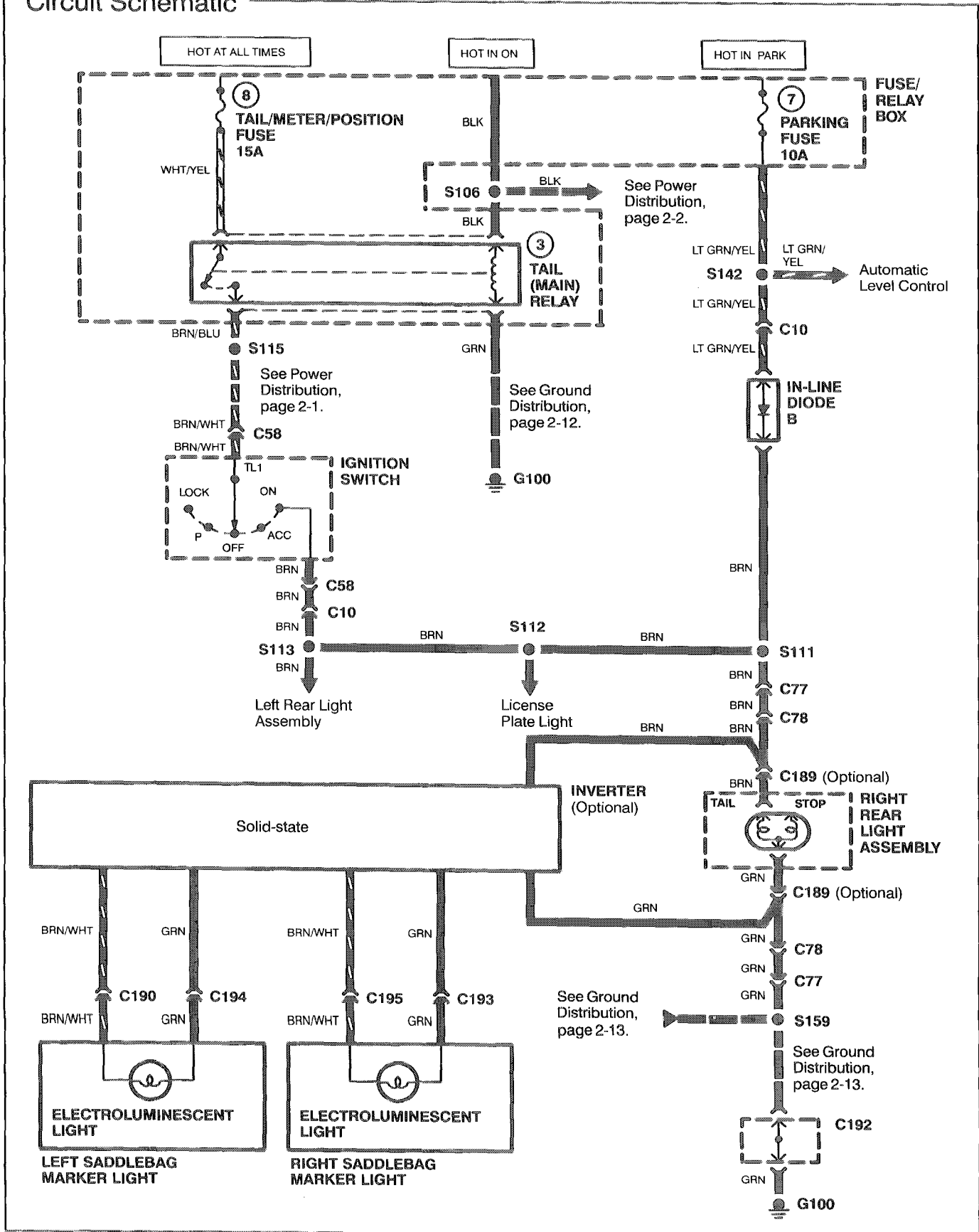


Trunk Side Marker Lights are optional on Int models

*Asp and SE
**Int

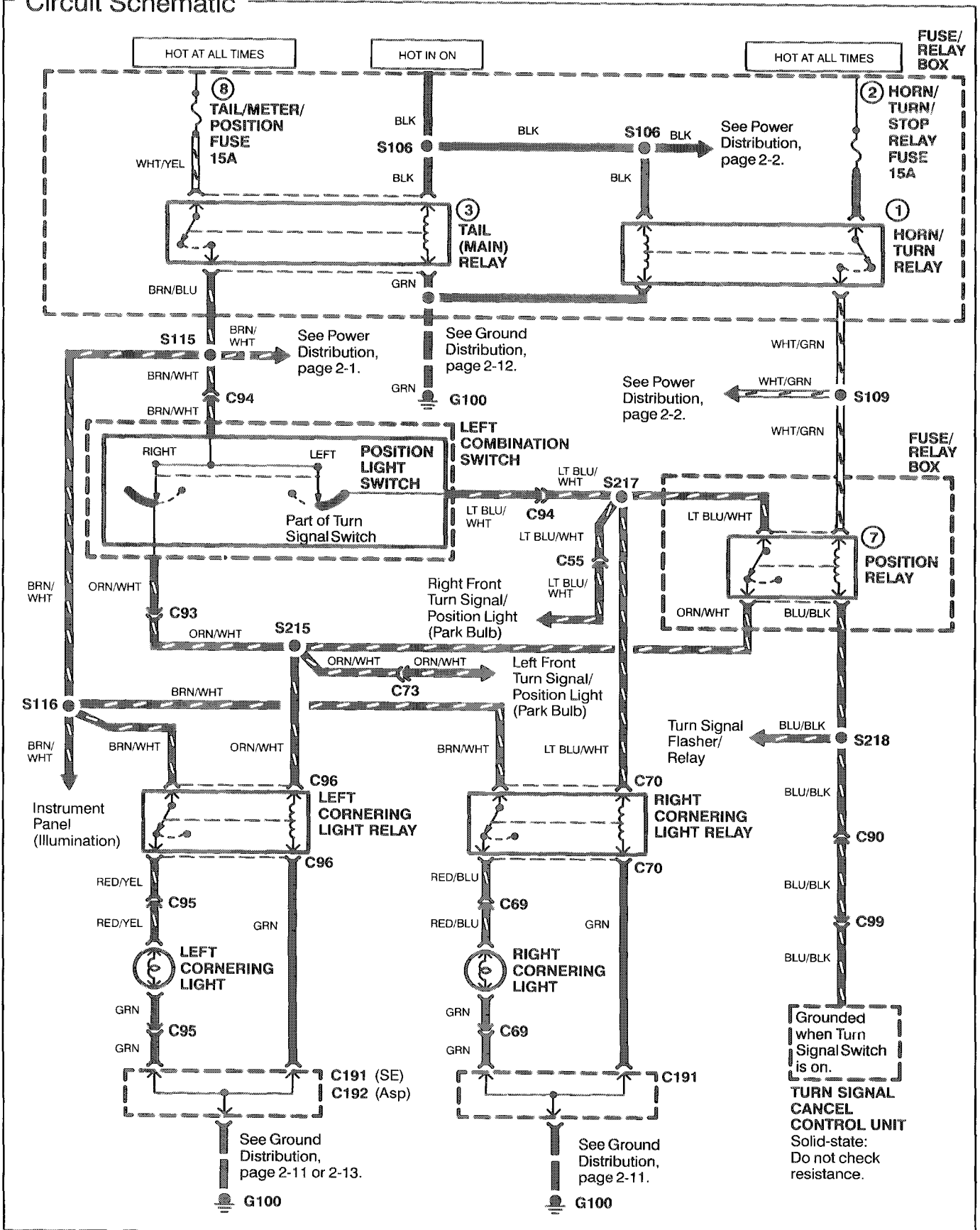
Marker Lights: Saddlebags

Circuit Schematic



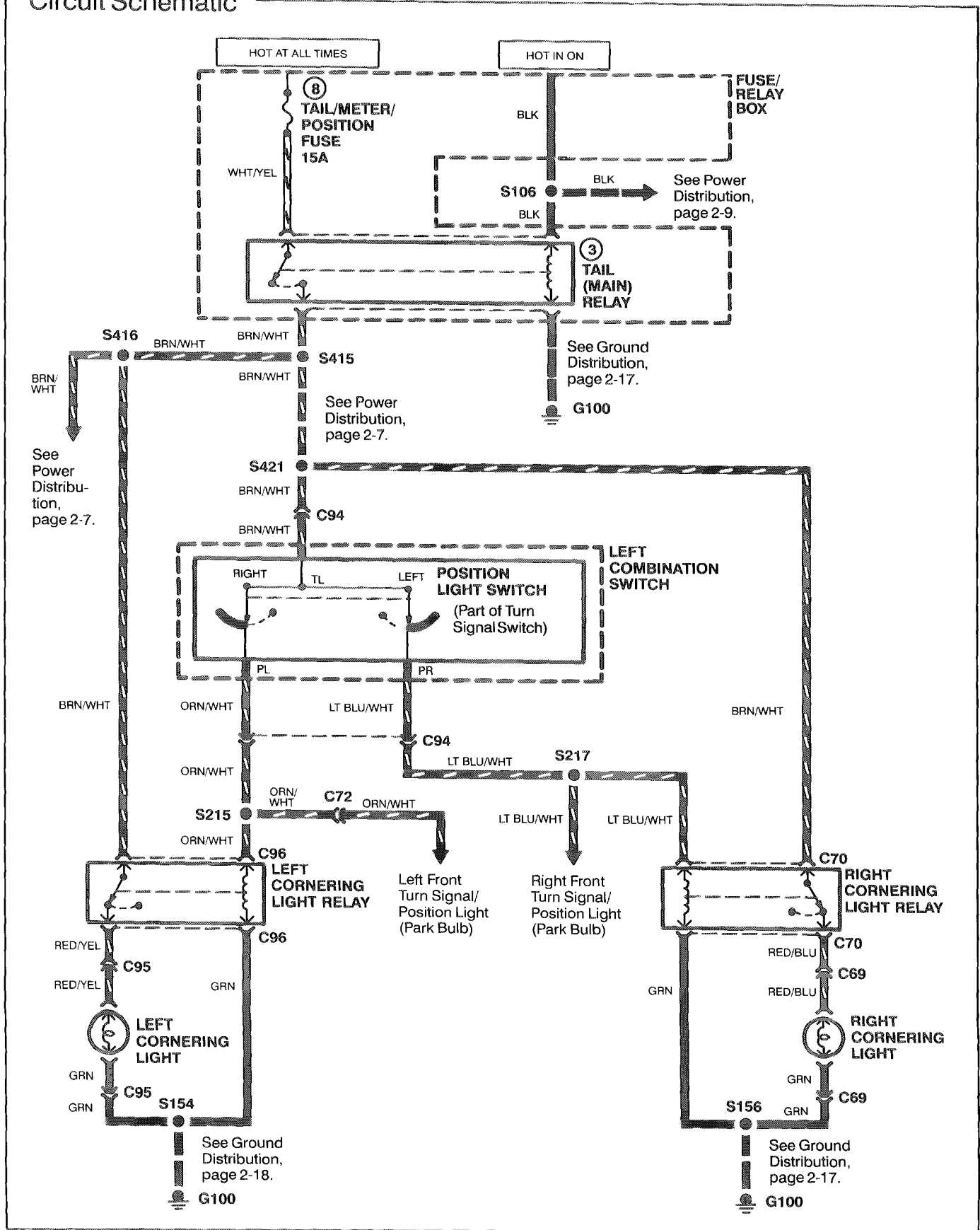
Cornering Lights: Asp and SE

Circuit Schematic



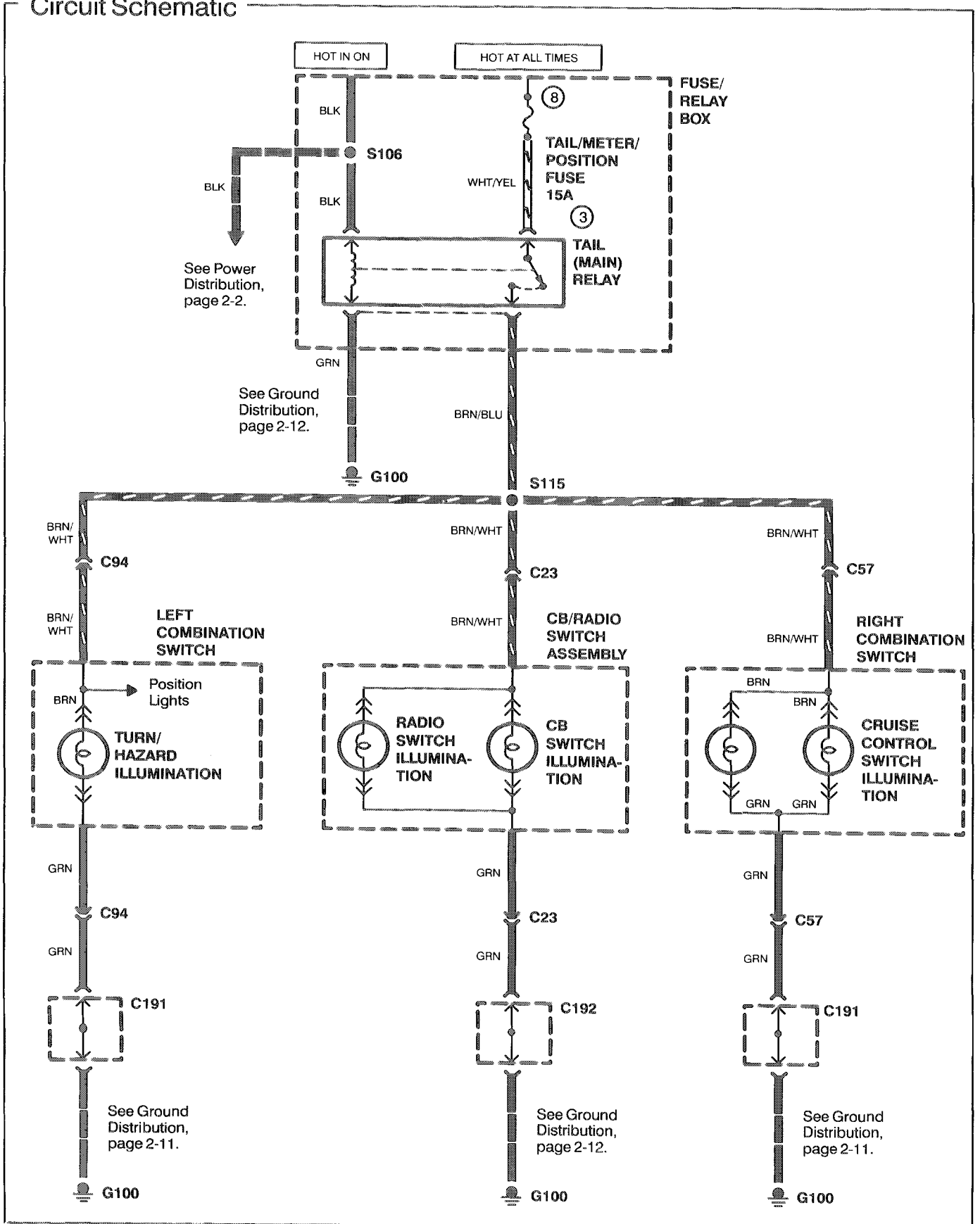
Cornering Lights: Int

Circuit Schematic



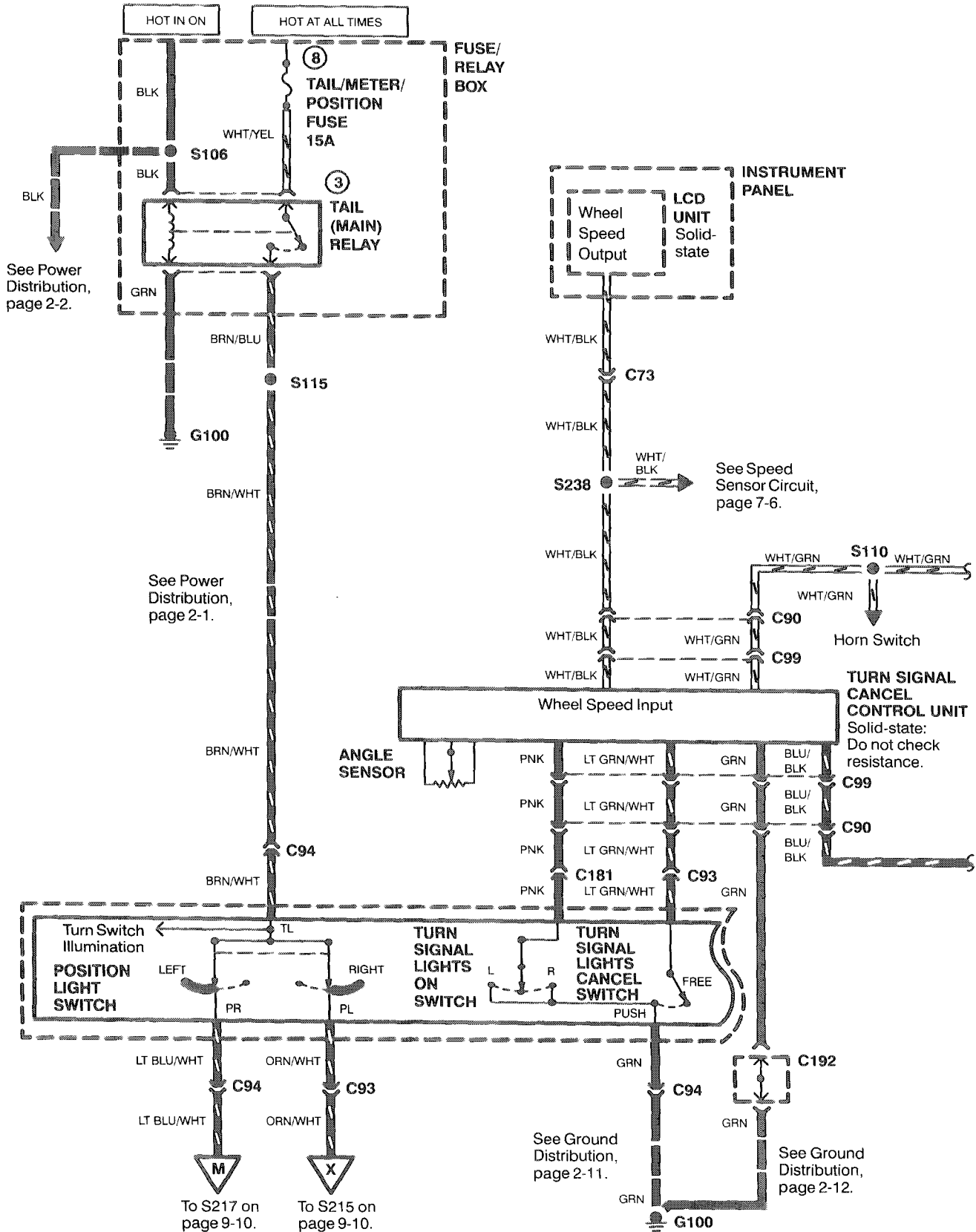
Handlebar Switch Illumination

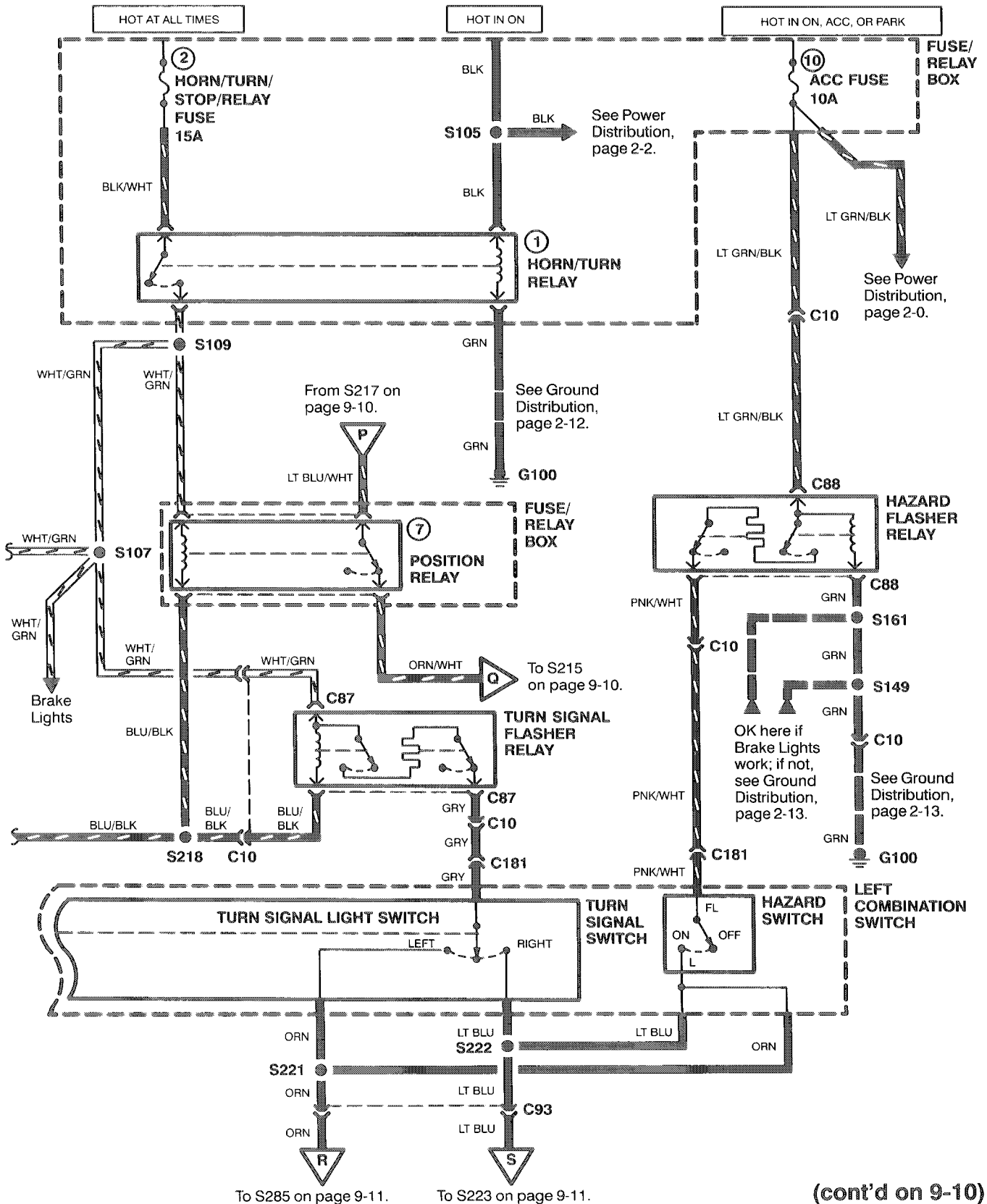
Circuit Schematic



Turn Signal, Hazard and Position Lights: Asp and SE

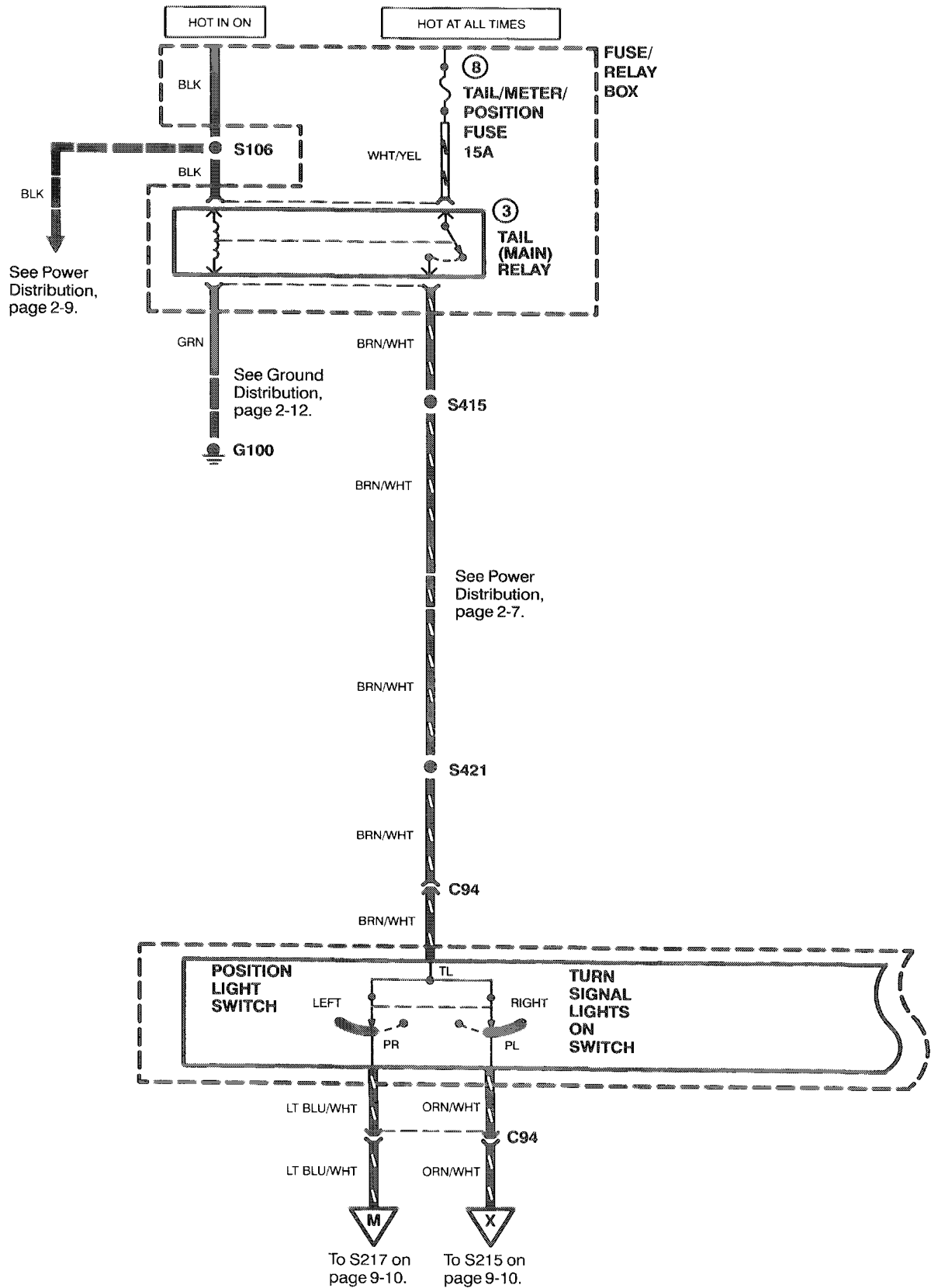
Circuit Schematic

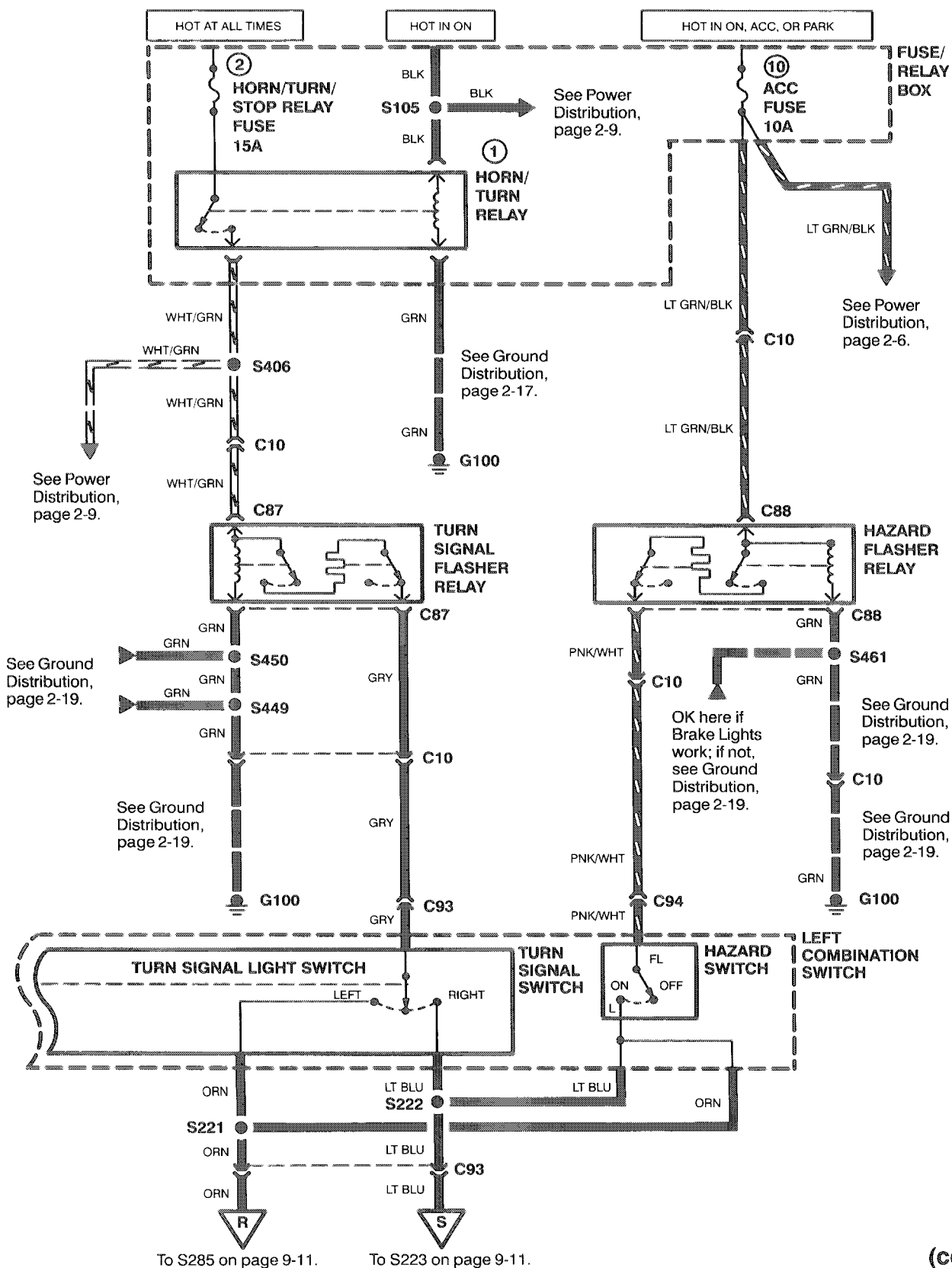


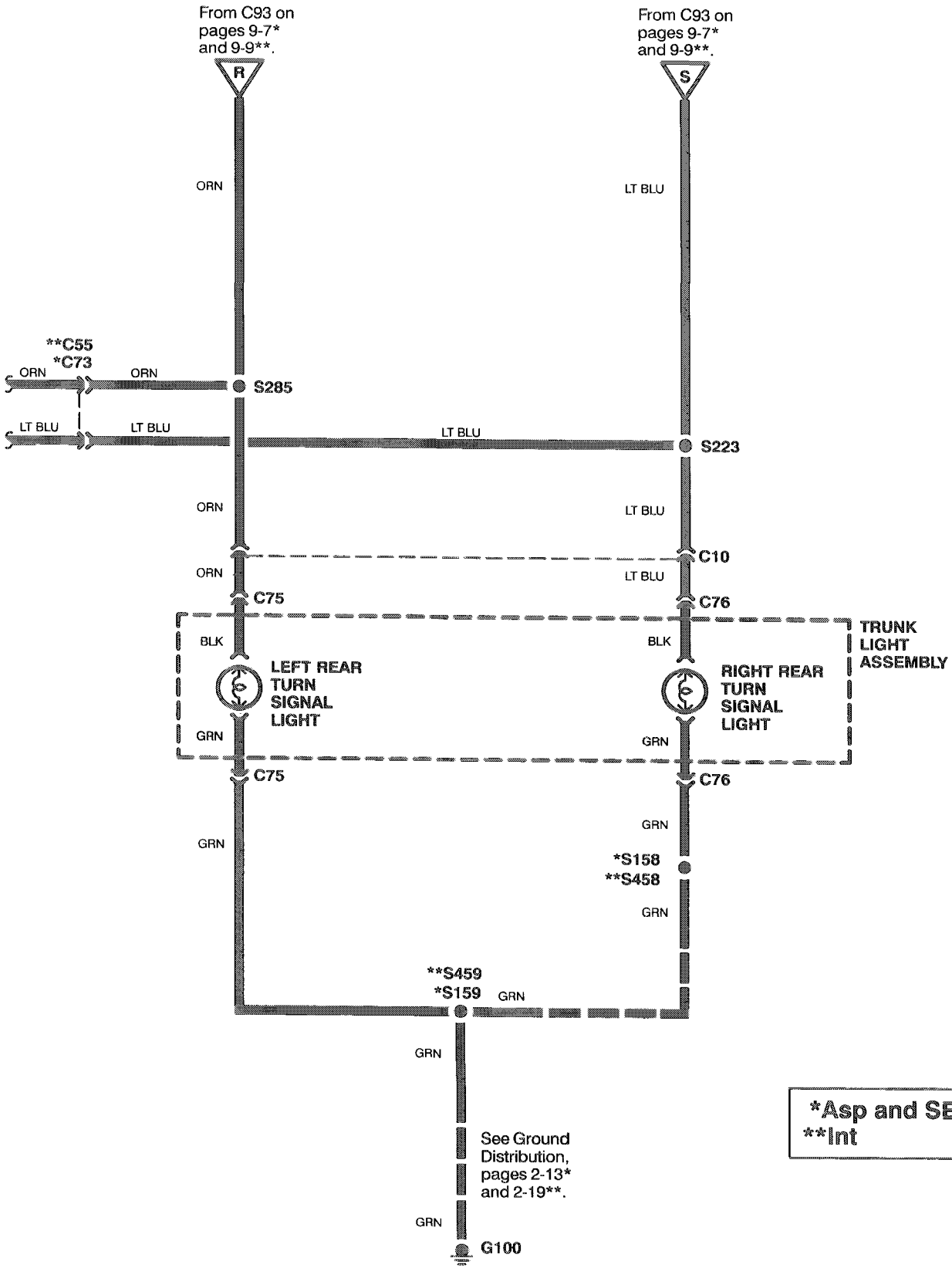


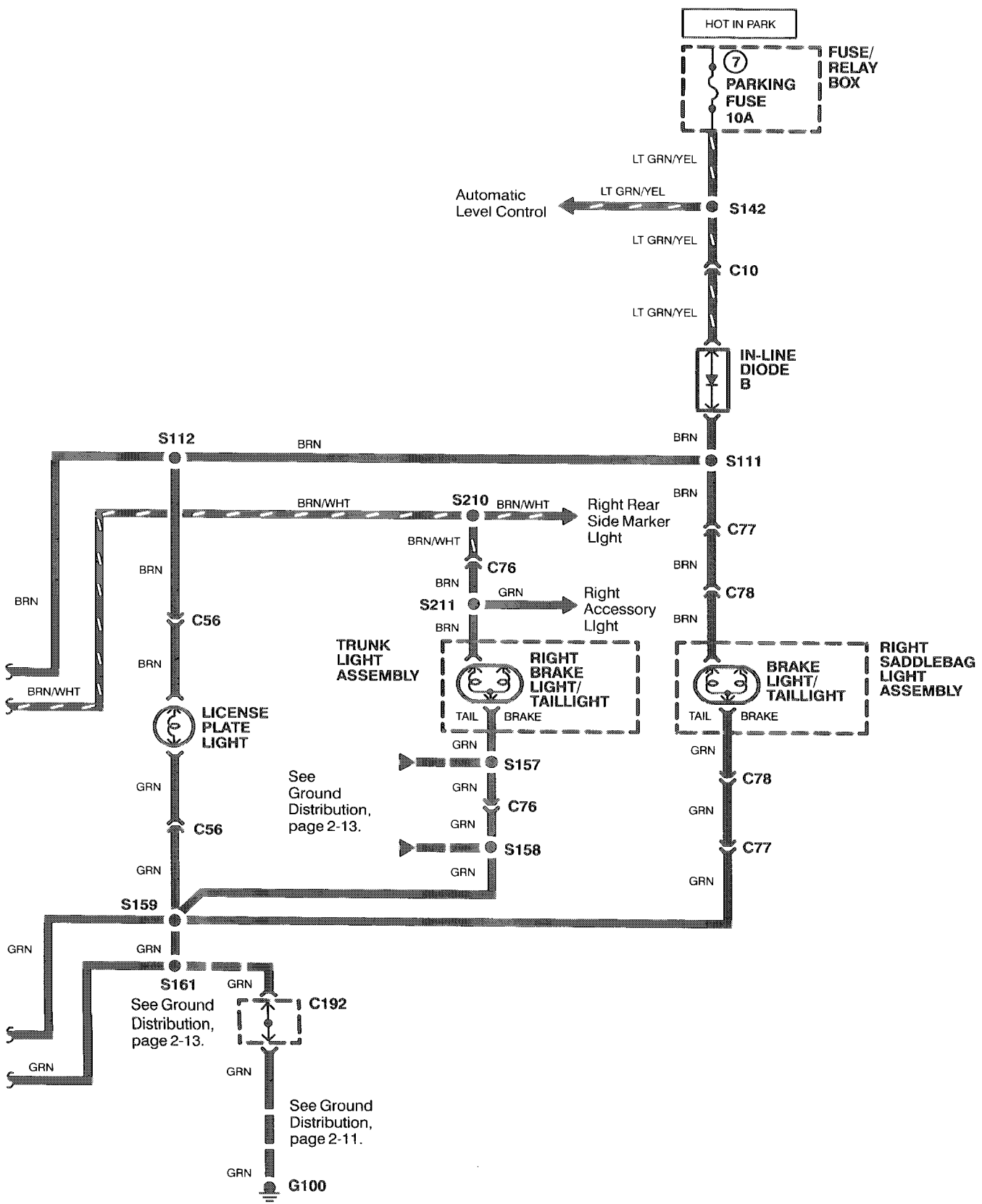
Turn Signal, Hazard and Position Lights: Int

Circuit Schematic



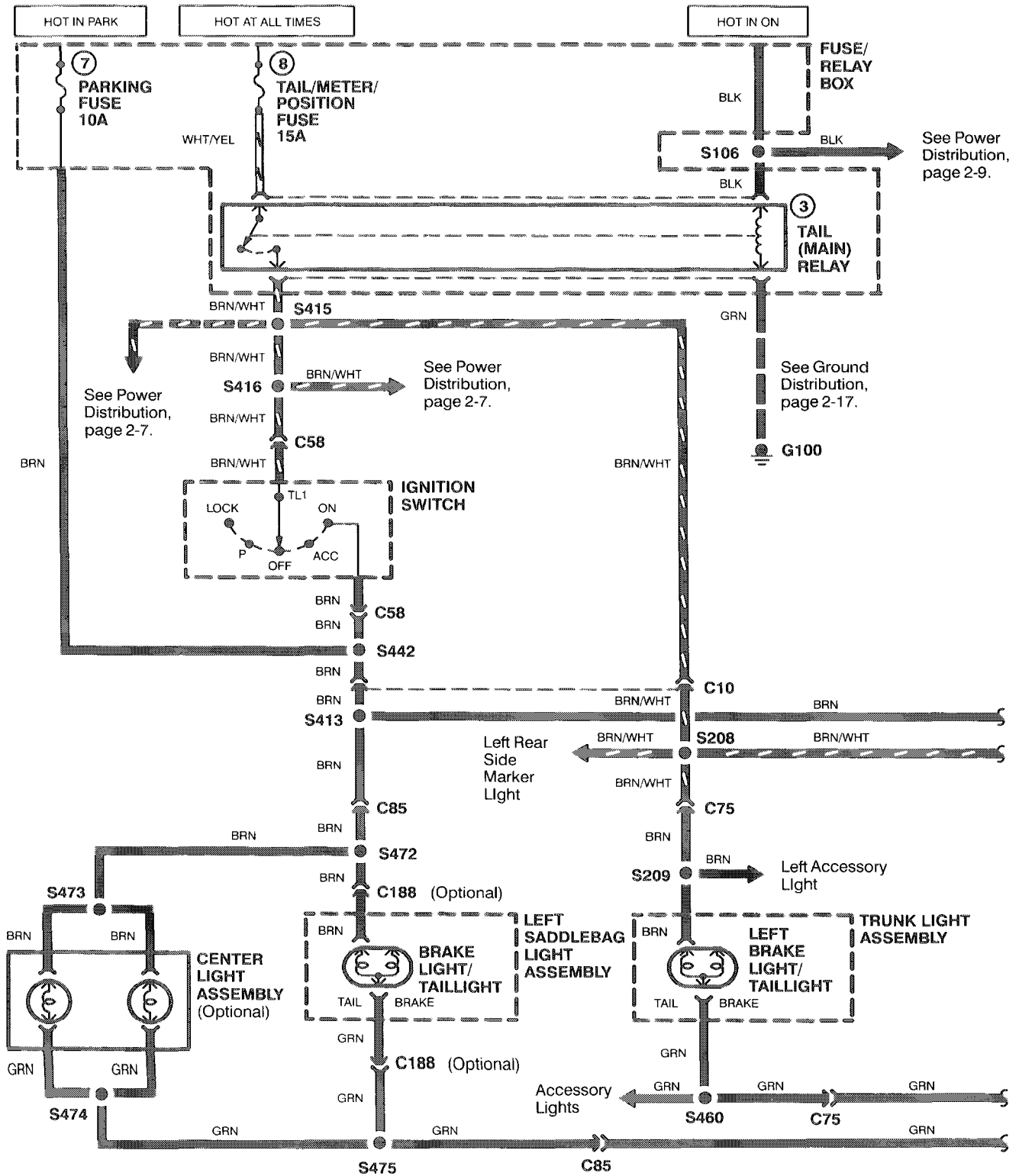


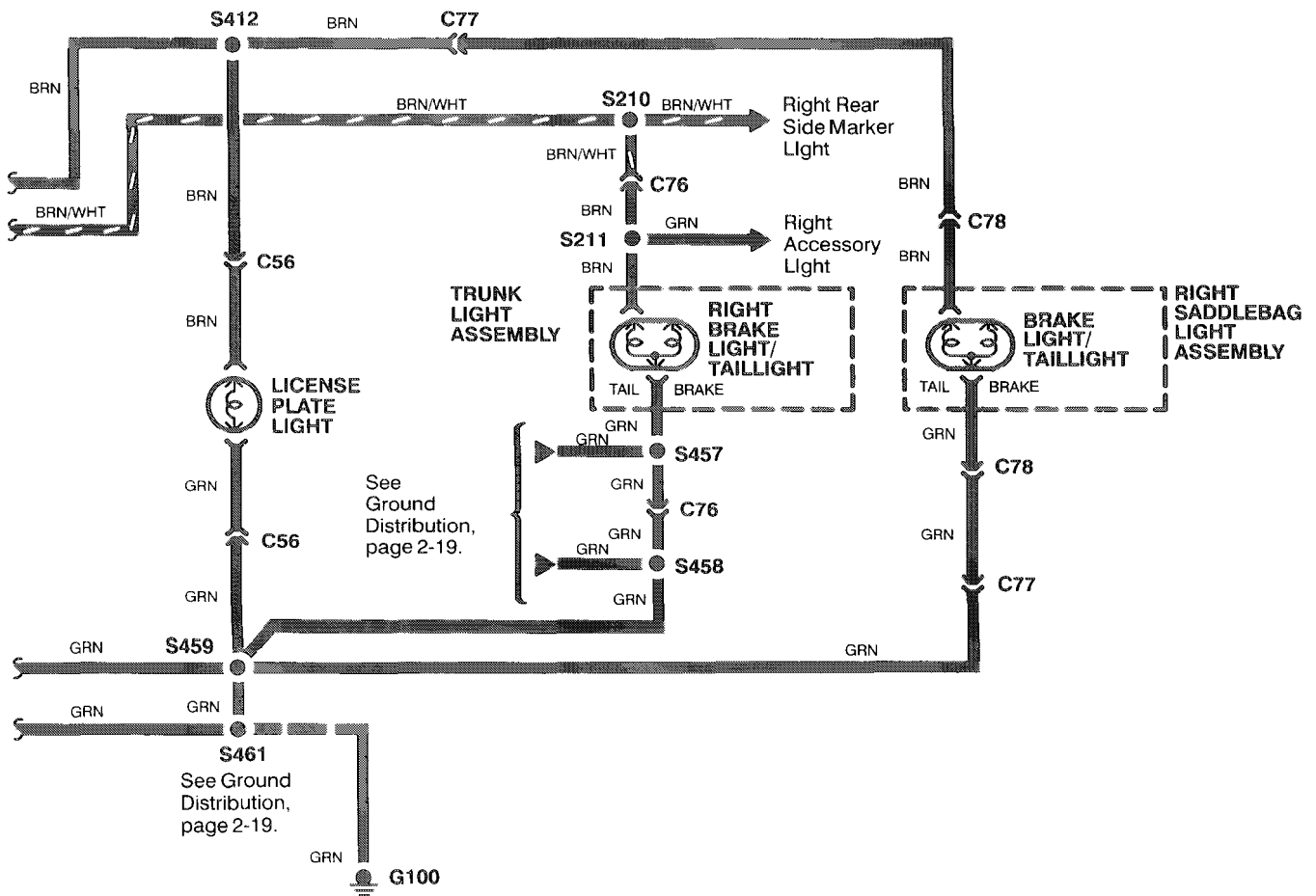




Tail, Parking, and License Plate Lights: Int

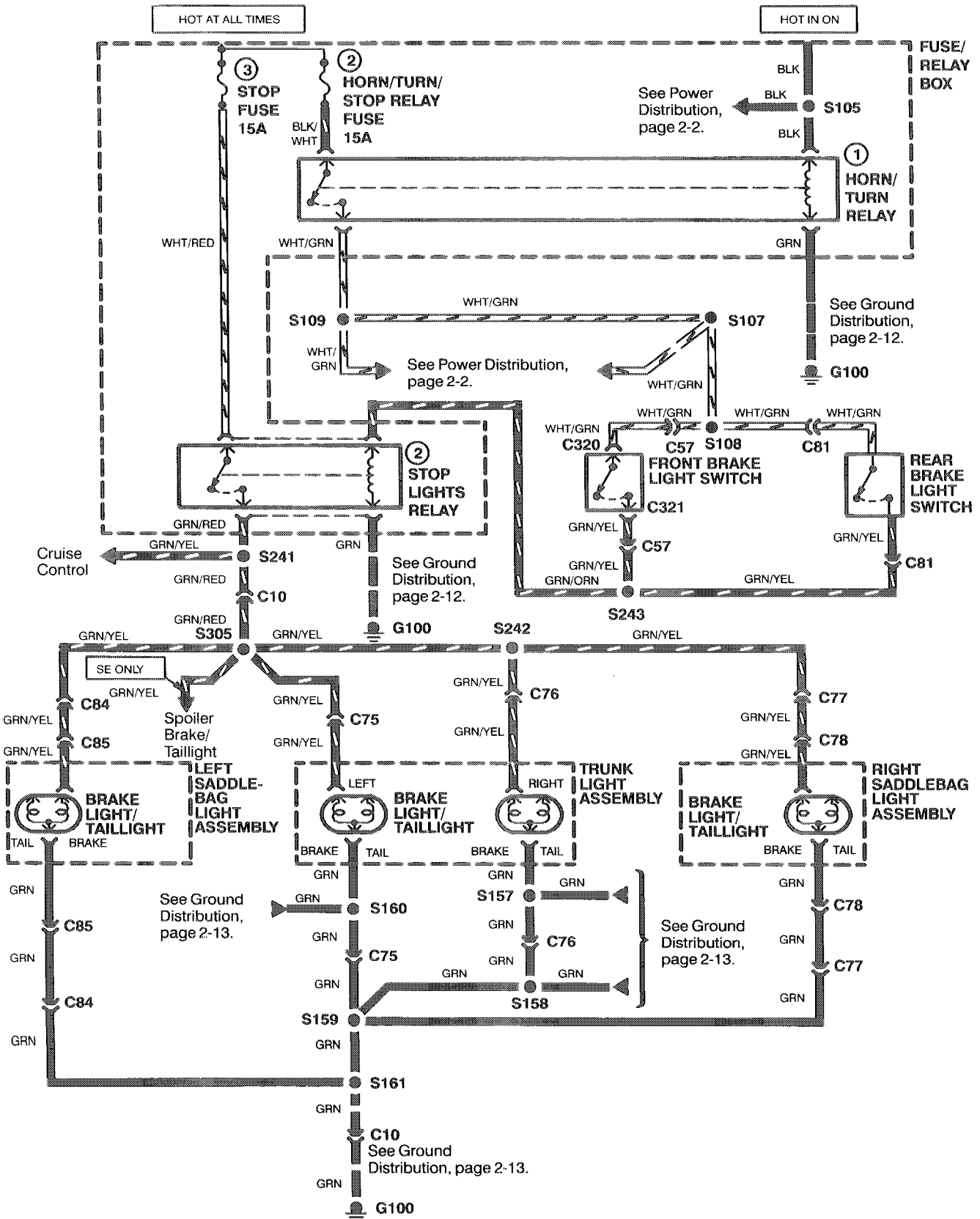
Circuit Schematic



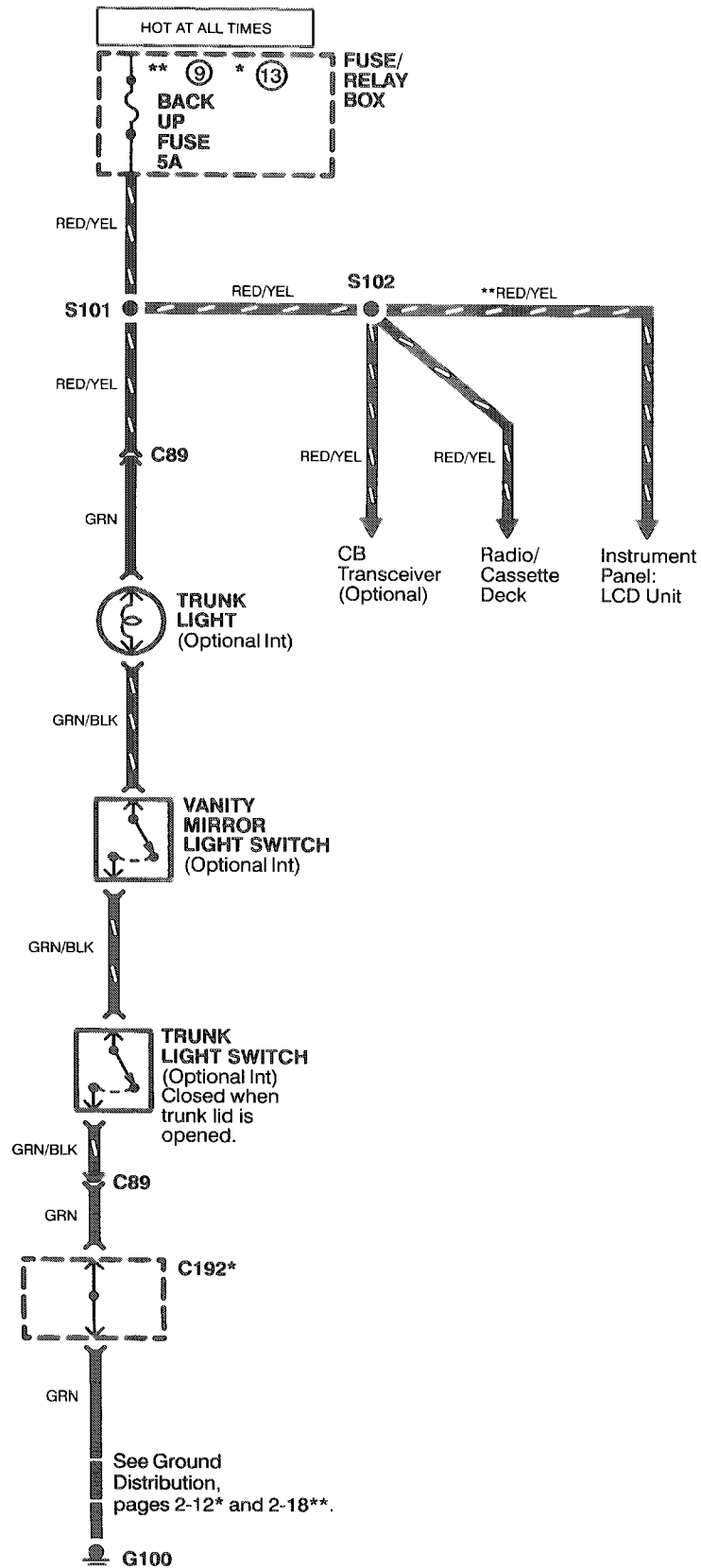


Brake Lights: Asp and SE

Circuit Schematic



Trunk Light Circuit Schematic

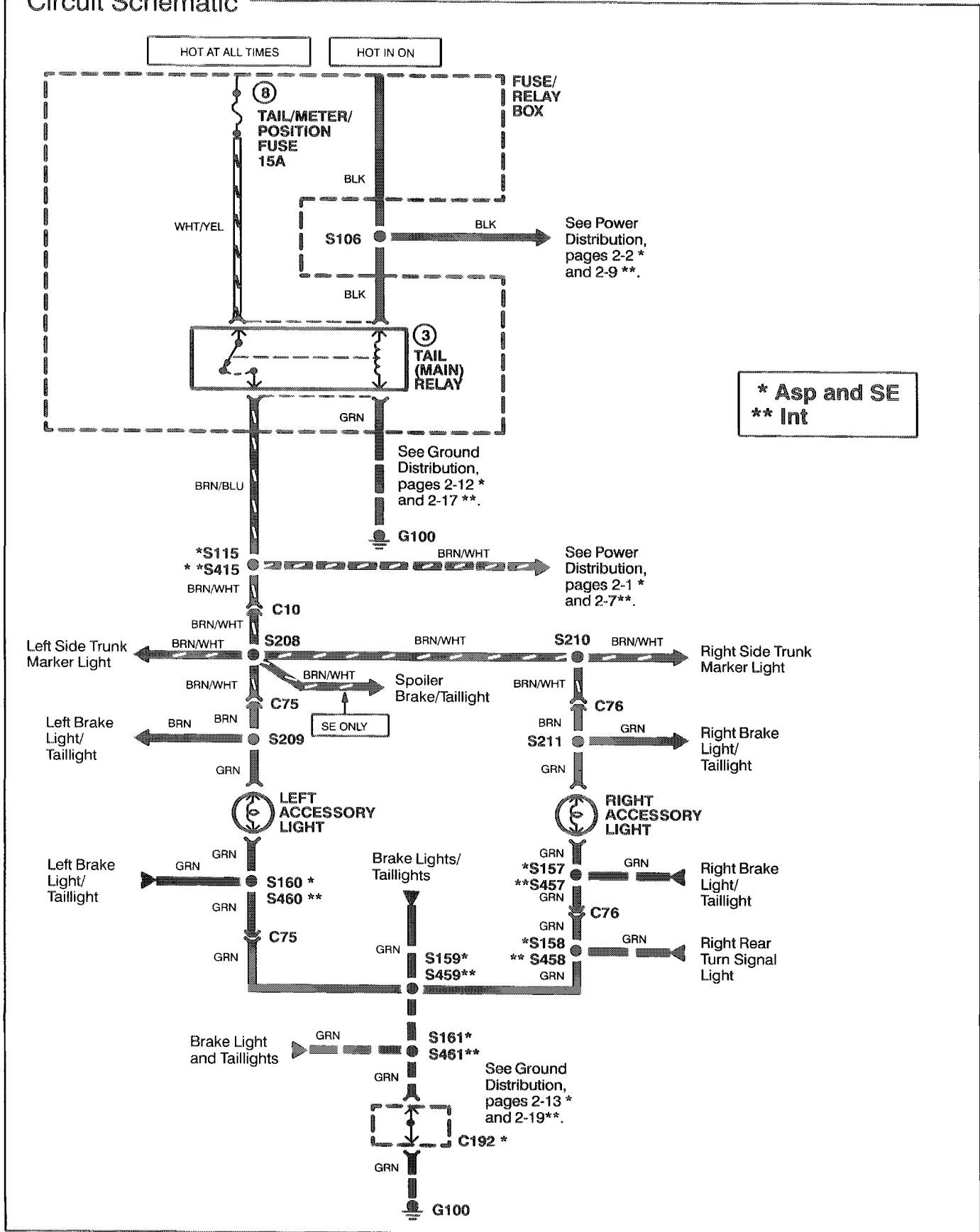


* Asp and SE
** Int

See Ground Distribution, pages 2-12* and 2-18**.

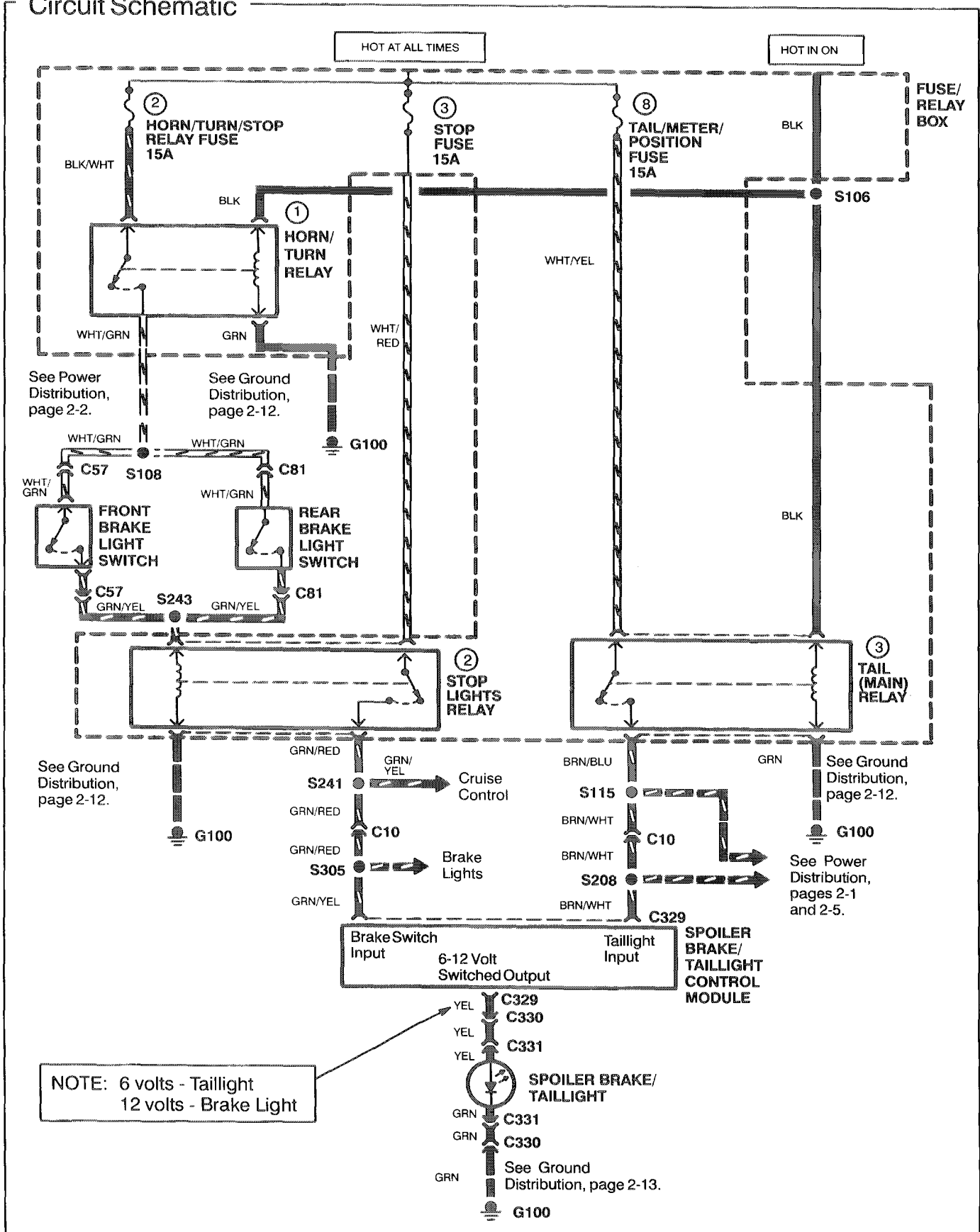
Accessory Lights

Circuit Schematic



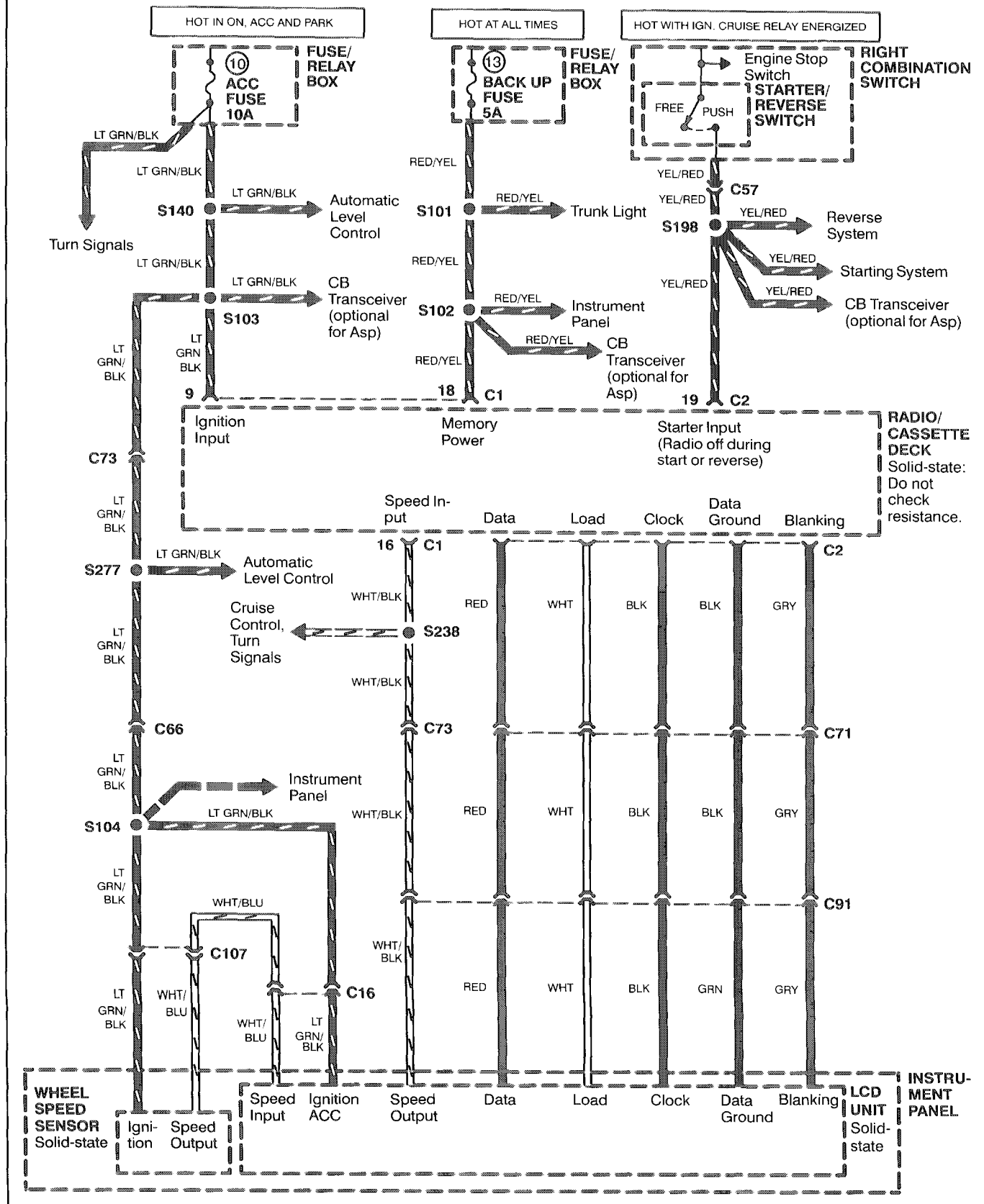
Spoiler Brake/Taillight: SE Only

Circuit Schematic

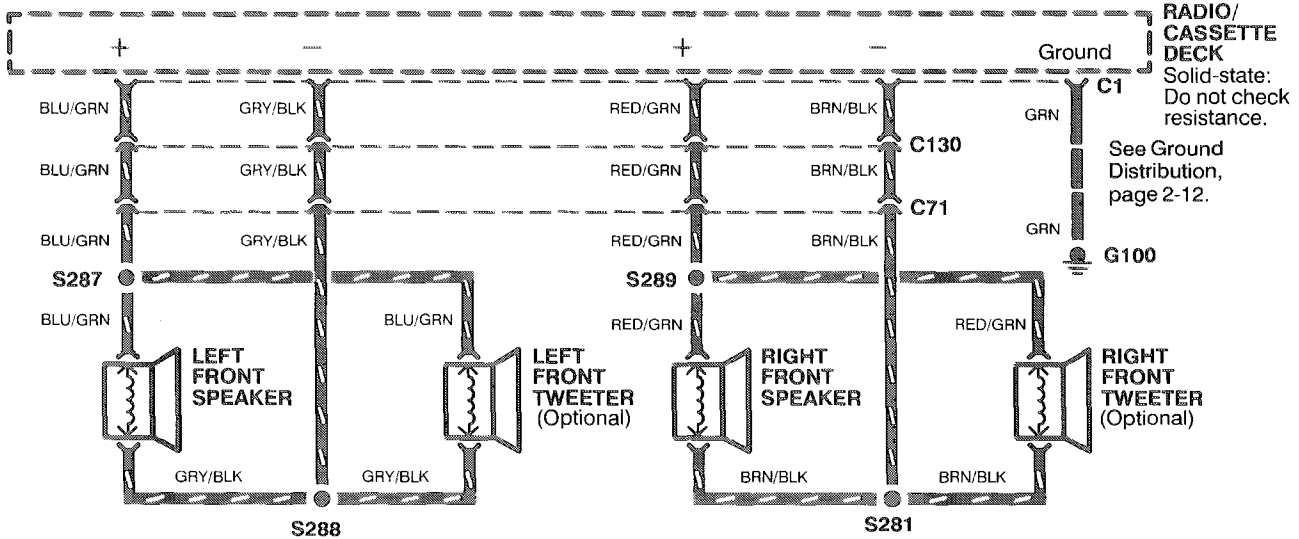


Radio and Cassette: Asp and SE

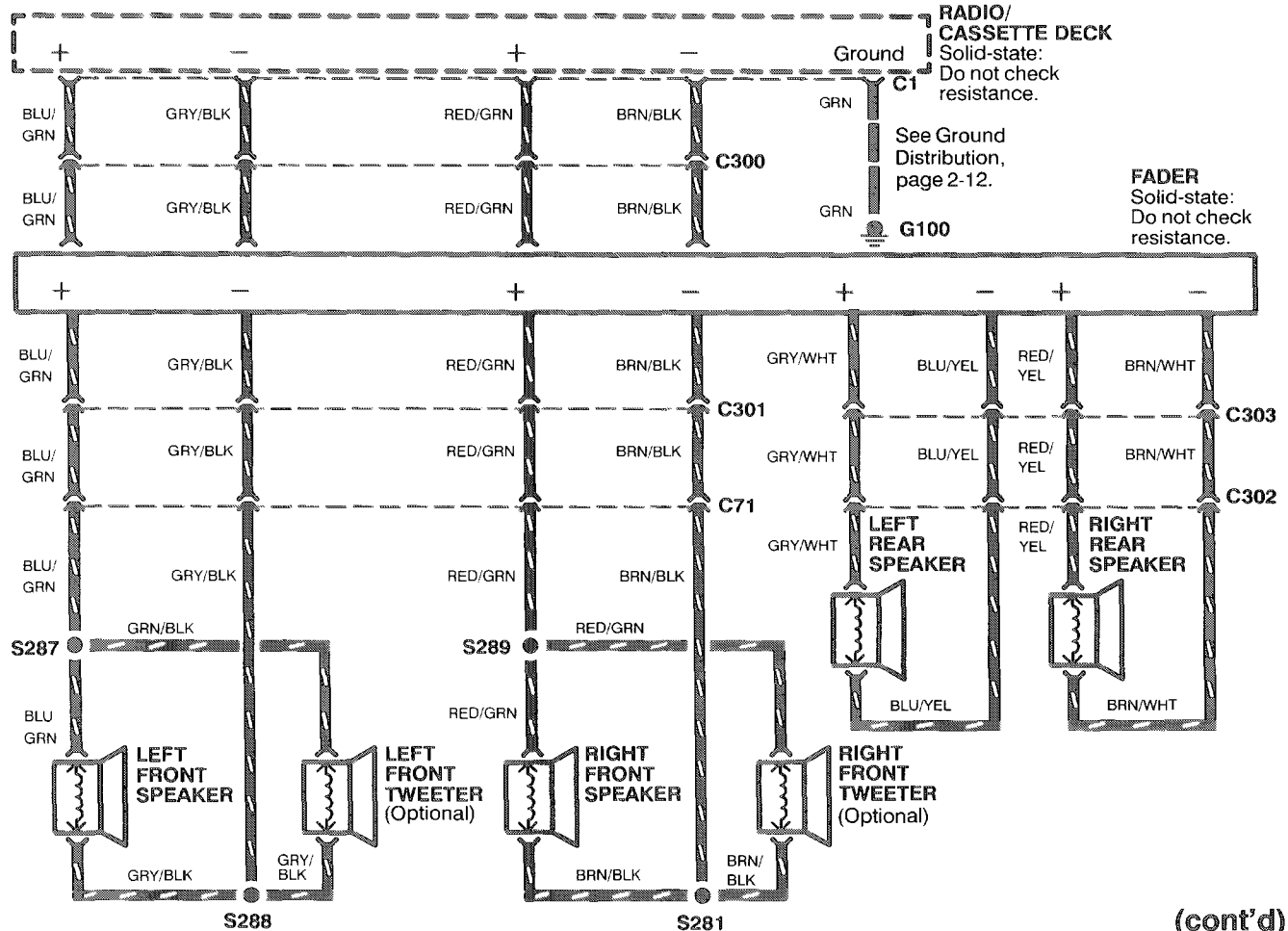
Circuit Schematic



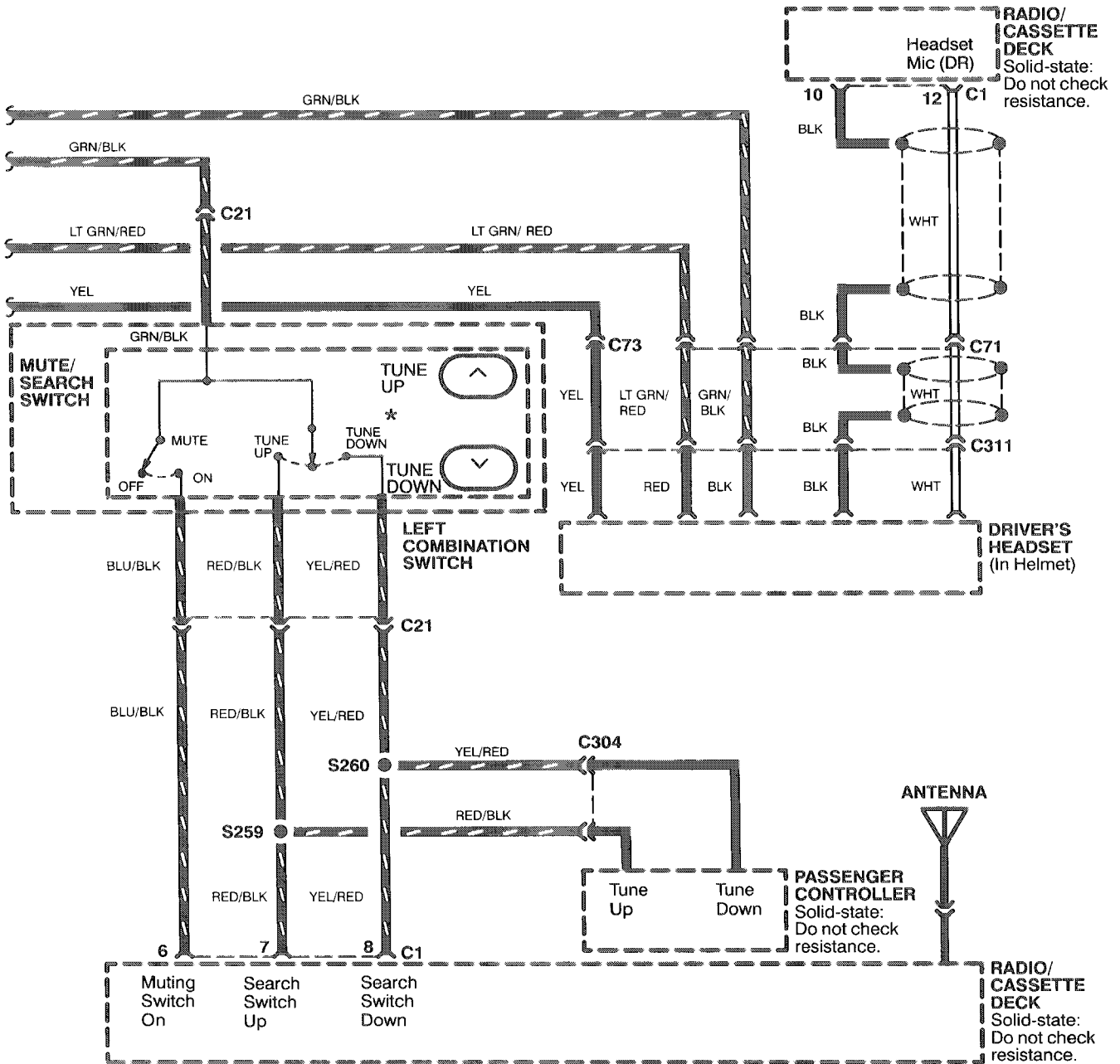
Without Rear Speakers (Asp)



With Rear Speakers (Asp)



(cont'd)

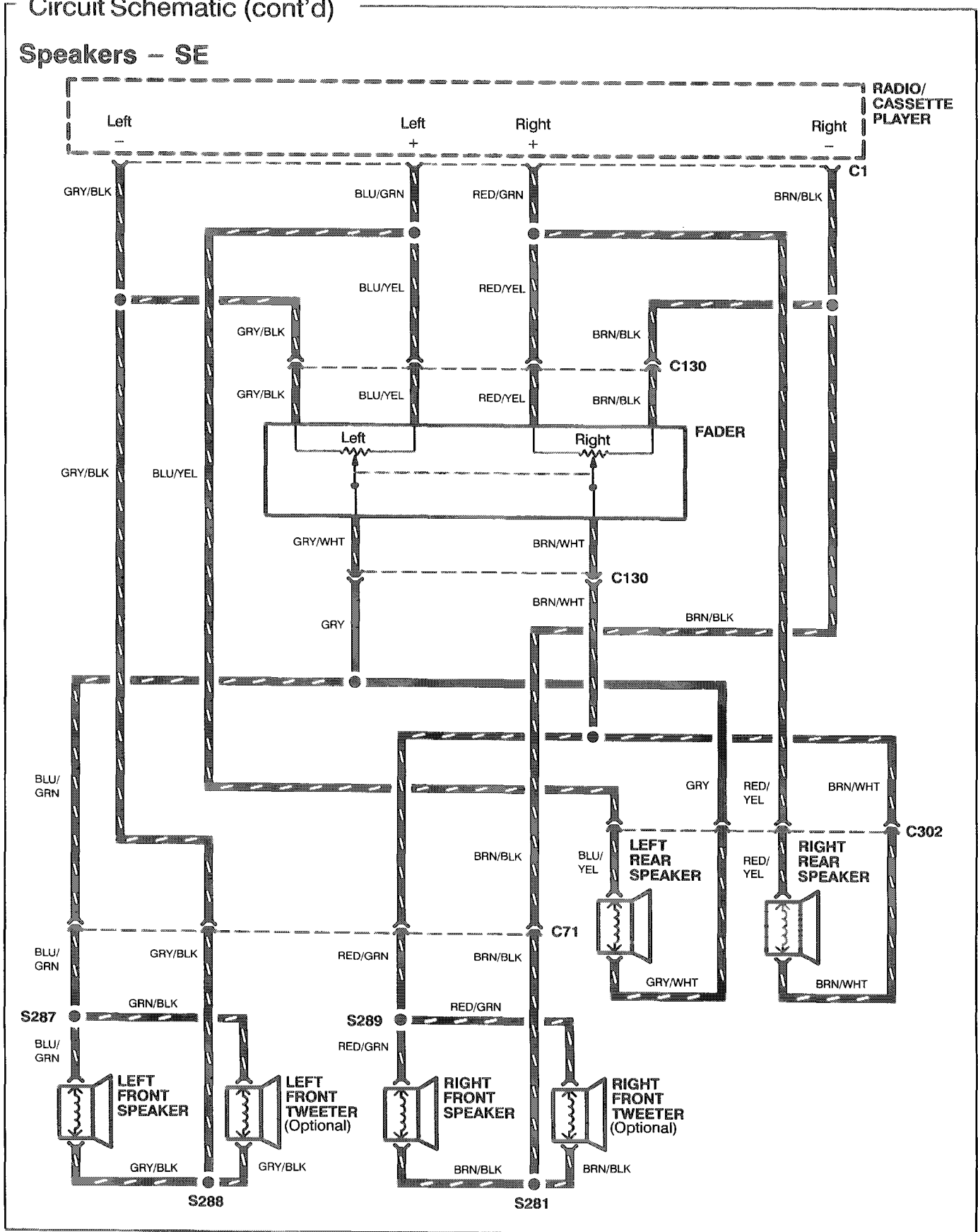


* SE Only

Radio and Cassette: Asp and SE

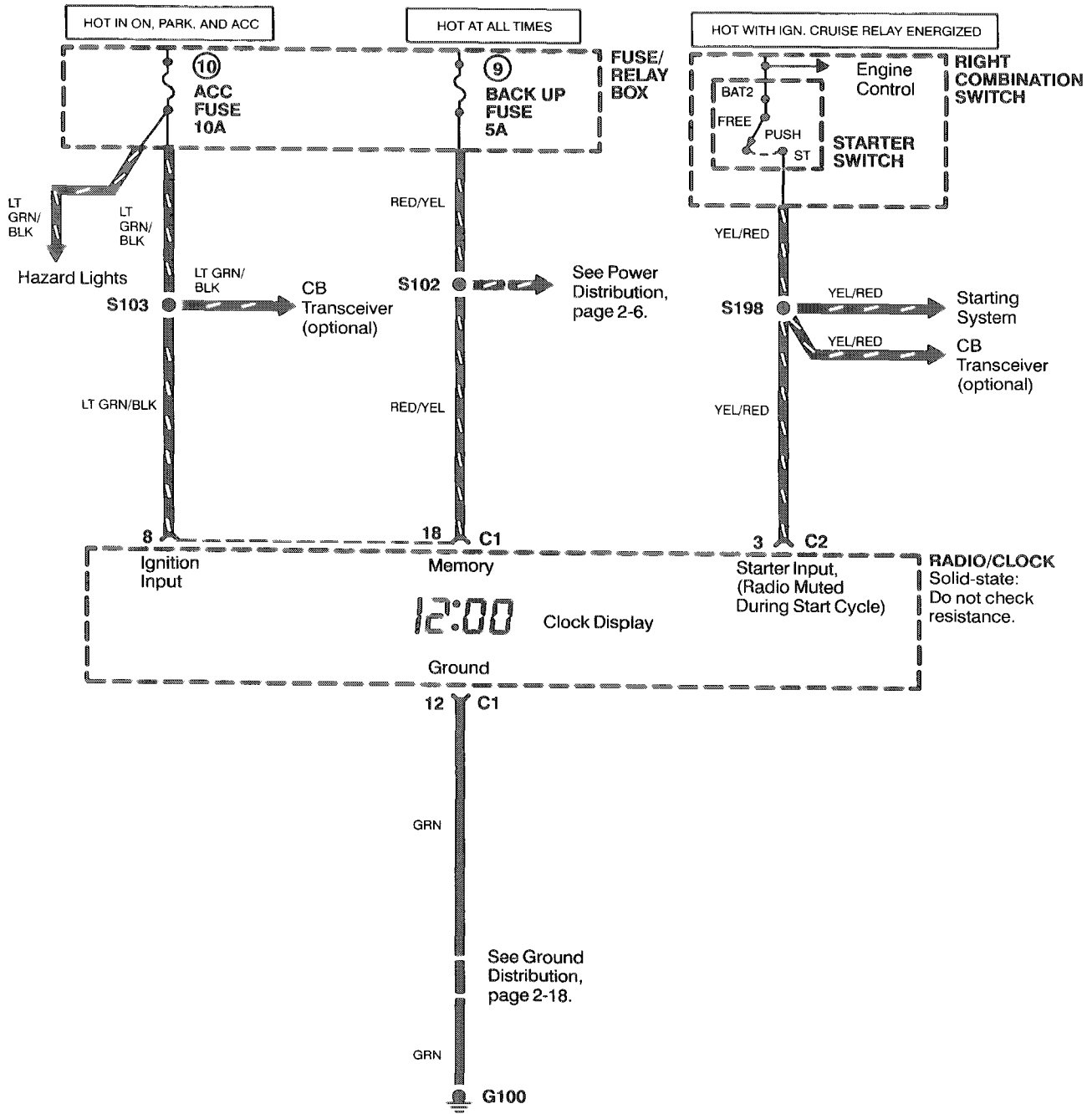
Circuit Schematic (cont'd)

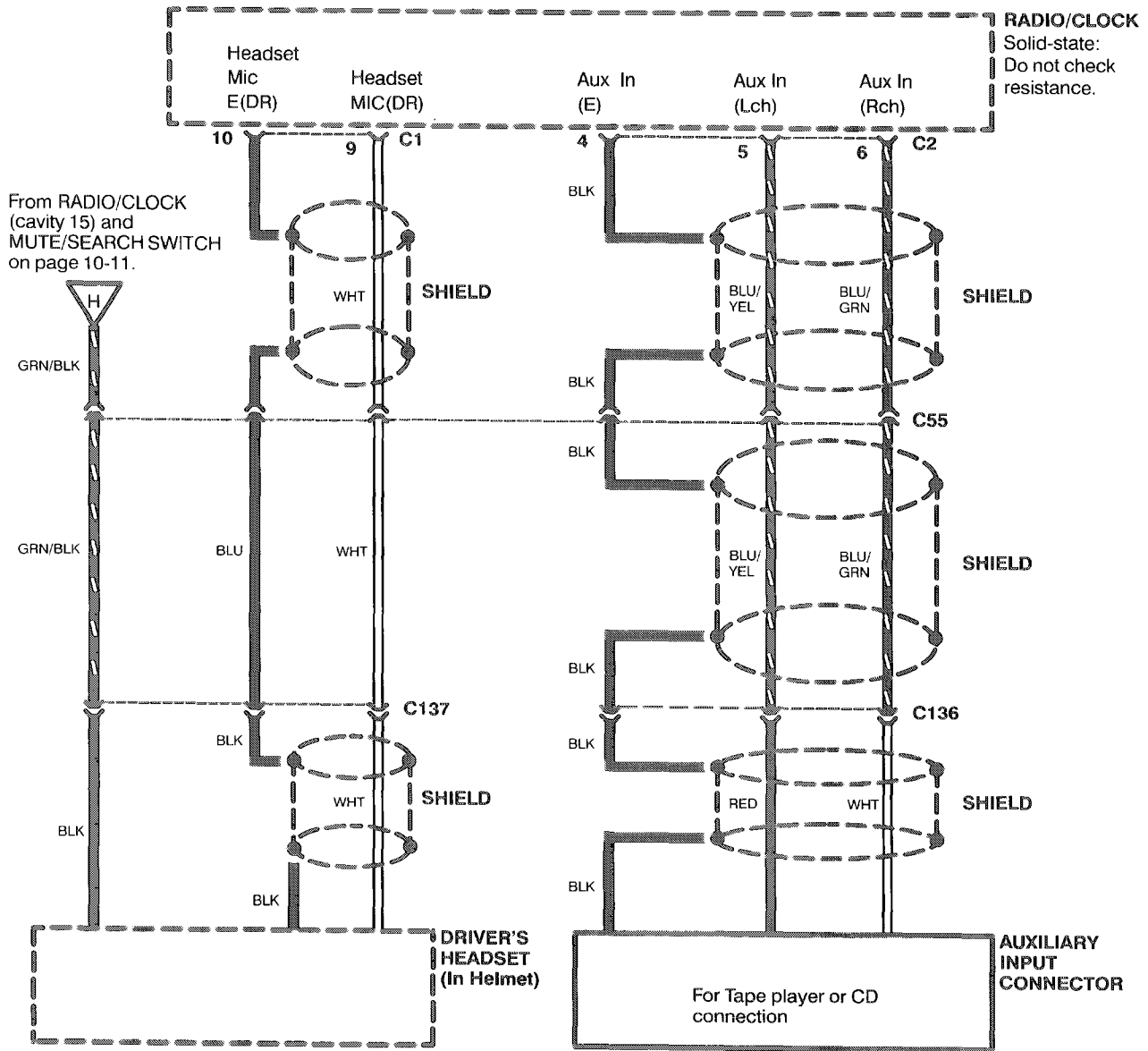
Speakers - SE



Radio/Clock: Int

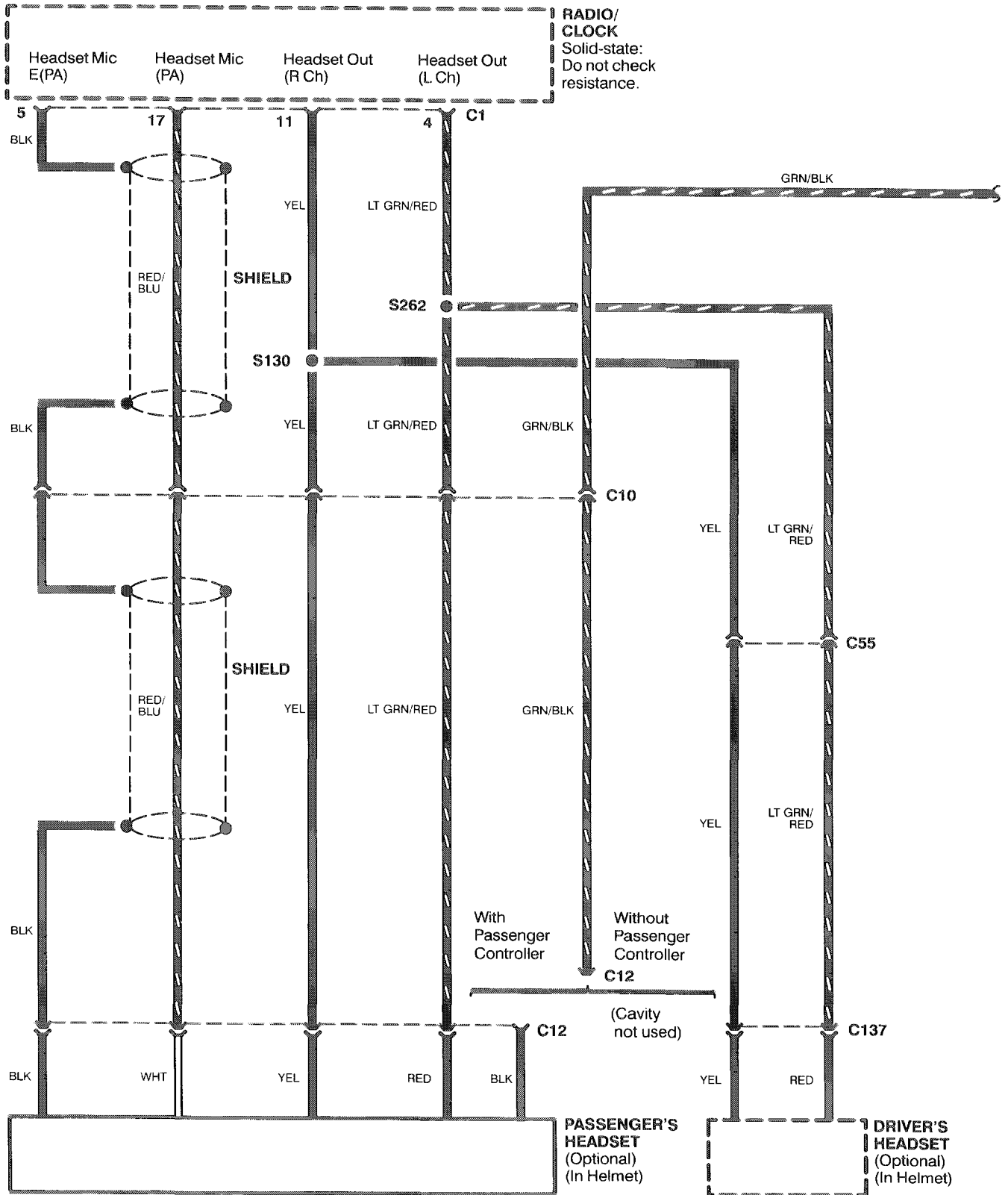
Circuit Schematic

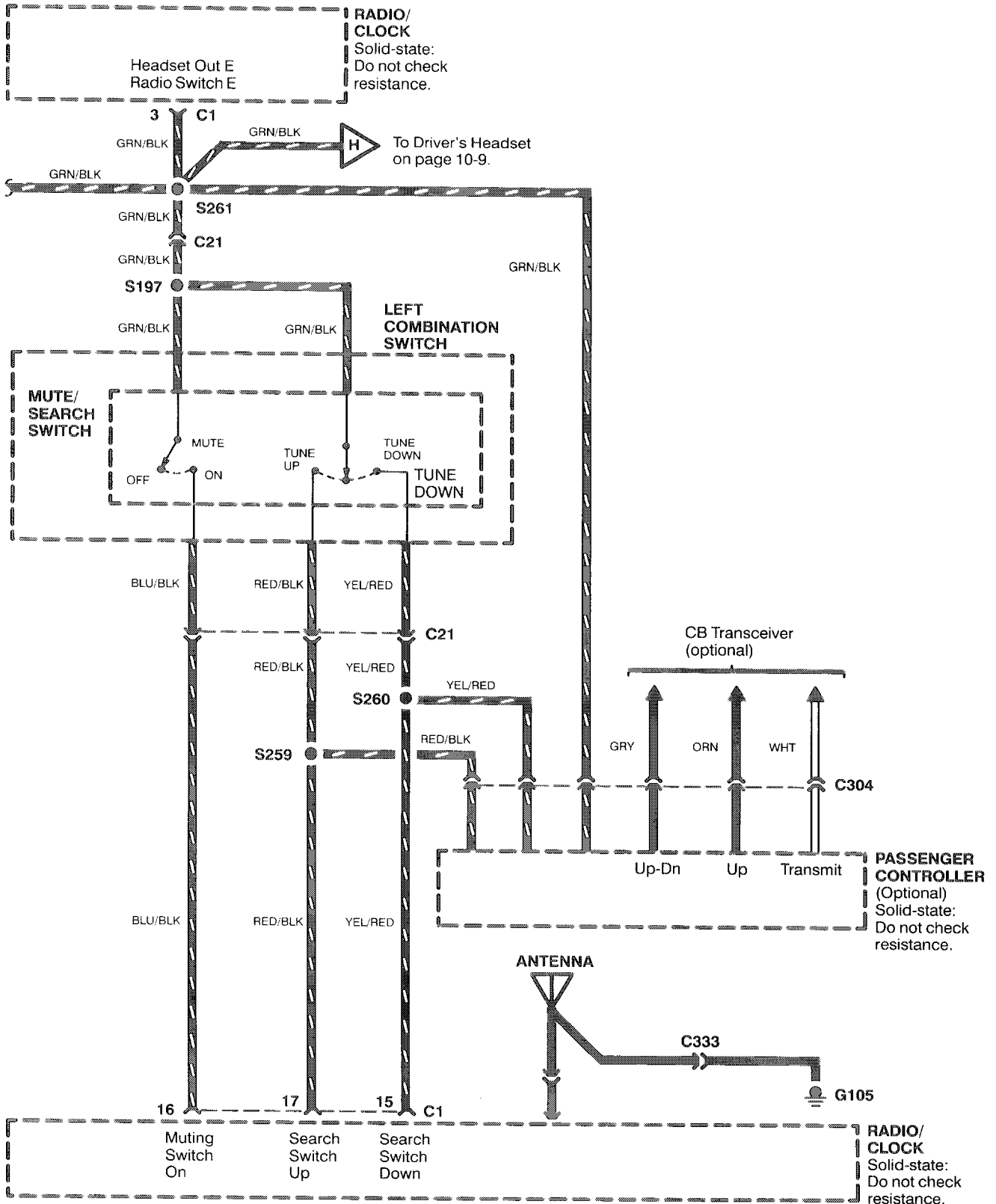




Radio/Clock: Int

Circuit Schematic (cont'd)

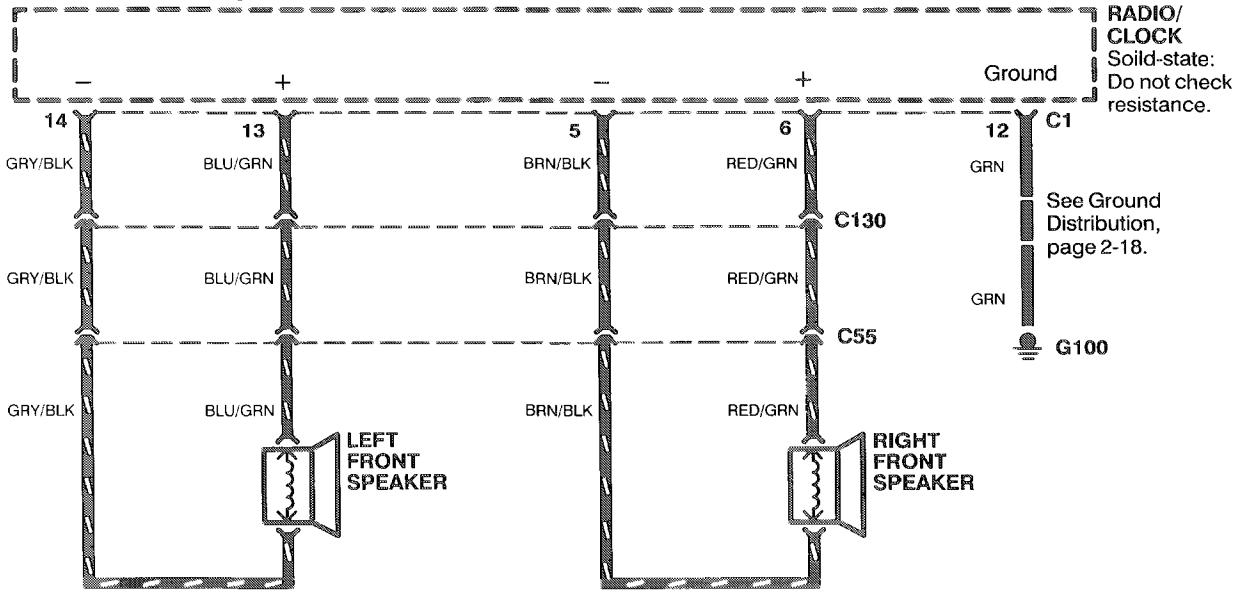




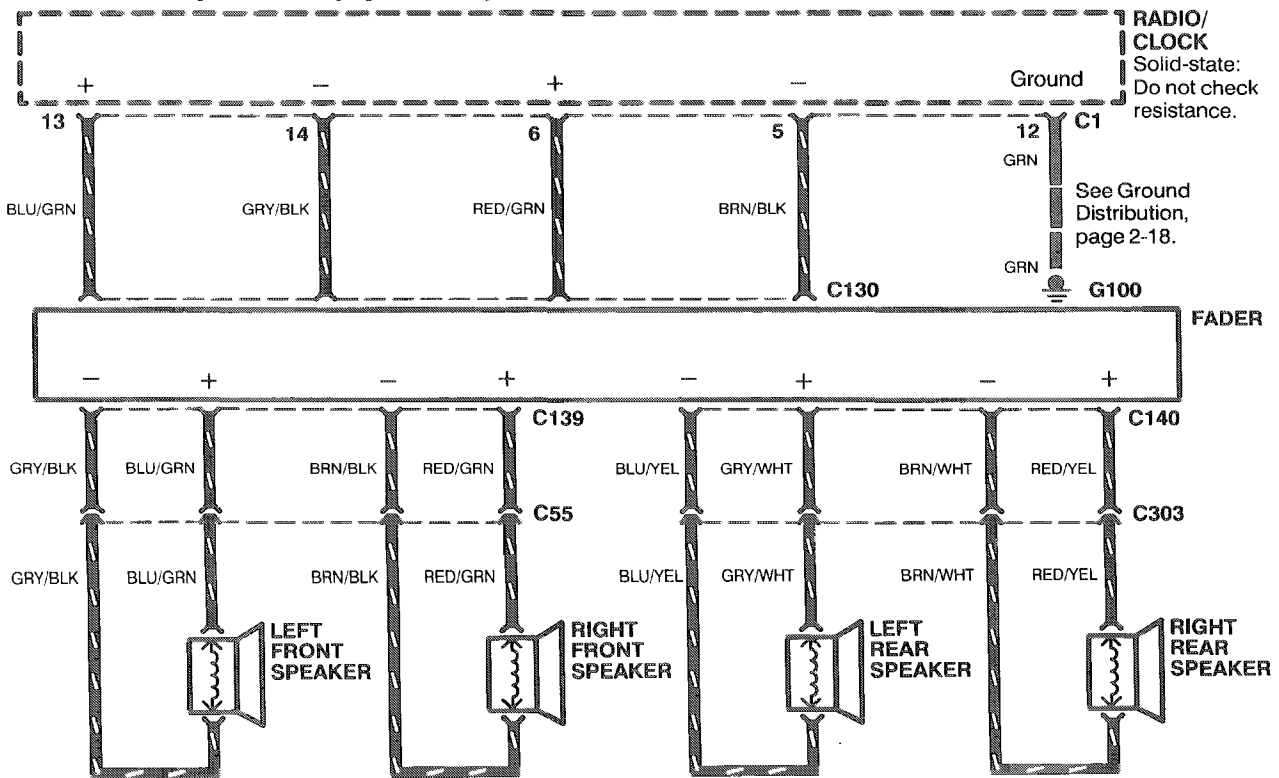
Radio/Clock: Int

Circuit Schematic (cont'd)

Without Rear Speaker



With Rear Speaker (optional)



How the Circuit Works

Asp and SE Models

The radio system is made up of the radio/cassette deck, driver and passenger headsets, left combination switch, instrument panel, and a passenger controller. The radio receives battery voltage from the ACC fuse with the ignition switch in ON, ACC, and PARK. The radio receives battery voltage from the Back Up fuse at all times to retain station preset memory. Radio information is transferred to the instrument panel LCD display through data, load, clock, and data ground circuits.

When the starter/reverse switch is pressed, battery voltage is applied to the radio. This signal turns the radio off during starter operation and forces the radio to blank the instrument panel LCD display through the blanking circuit. The left combination switch contains tune-up, tune-down, and radio mute controls. When the mute, tune-up, or tune-down function is requested by pushing the corresponding button, a ground signal from the GRN/BLK circuit is applied to the respective BLU/BLK, RED/BLK, or YEL/RED circuits to the radio. If equipped with a passenger controller, the tune-up and tune-down functions are available and work the same as the left combination switch.

Int Model

The radio system is made up of the radio/clock, driver and passenger headsets, left combination switch, and a passenger controller. The radio receives battery voltage from the ACC fuse with the ignition switch in ON, ACC, and PARK. The radio receives battery voltage from the Back Up fuse at all times to retain station preset memory.

When the starter/reverse switch is pressed, battery voltage is applied to the radio. This signal turns the radio off during starter operation. The left combination switch contains tune-up, tune-down, and radio mute controls. When the mute, tune-up, or tune-down function is requested by pushing the corresponding button, a ground signal from the GRN/BLK circuit is applied to the respective BLU/BLK, RED/BLK, or YEL/RED circuits to the radio. If equipped with a passenger controller, the tune-up and tune-down functions are available and work the same as the left combination switch. If equipped with an auxiliary CD or cassette player, the player is tied into the radio/clock through ground, left channel, and right channel inputs.

Headset Operation

The driver and passenger helmets may be equipped with headset units. These headsets contain speakers and a microphone to allow two-way communication between driver, passenger and CB radio. The driver and passenger headsets are tied to the radio through a microphone, left channel, right channel, and ground lines. If equipped with a passenger controller, the passenger circuits run through the passenger controller.

Speakers - SE Models

The radio in the SE model uses a fader made up of two potentiometers. Each one controls volume between the front and rear speaker on one side. The plus and minus signals from one side are tied to opposite sides of the potentiometer. The wiper is tied to the front and rear speakers' common circuit. The minus circuit is tied to the front speakers and the plus circuit is tied to the rear speakers. Moving the fader wiper varies the potential on the common circuit. Because the front and rear speakers are tied to opposite speaker outputs (plus or minus), the volume is shifted between the front and rear.

Speakers - Asp and Int Models

In models not equipped with rear speakers, the speakers are tied directly to the radio. The left and right sides are separated, with each side having separate plus and minus terminals. If equipped, the front tweeters are in parallel with the standard speakers.

In models equipped with rear speakers, the radio speaker outputs are tied to a fader. The fader has separate outputs for left front, right front, left rear, and right rear speakers.

Radio

Troubleshooting

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> Radio does not come on and radio information does not appear on display. 	<ul style="list-style-type: none"> Blown ACC fuse. Open LT GRN/BLK circuit or GRN circuit to radio/clock or radio/cassette deck; do test A.
<ul style="list-style-type: none"> Radio loses preset station memory. 	<ul style="list-style-type: none"> Blown Back Up fuse. Open RED/YEL circuit.
<ul style="list-style-type: none"> Radio does not turn off during starter cranking. 	<ul style="list-style-type: none"> Open YEL/RED circuit.
<ul style="list-style-type: none"> Radio volume does not vary with vehicle speed (Asp and SE models). 	<ul style="list-style-type: none"> Open WHT/BLK circuit or faulty radio/cassette deck; do test B.
<ul style="list-style-type: none"> Radio operates but radio information is missing, or does not display properly. 	<ul style="list-style-type: none"> Open or shorted data, load, clock, ground, or blanking circuits between instrument panel and radio/cassette deck; faulty radio or instrument panel; do test C.
<ul style="list-style-type: none"> One or more front speakers are inoperative (Asp model without rear speakers). 	<ul style="list-style-type: none"> Faulty speaker(s). Open or shorted speaker wires or faulty radio/cassette deck; do test D.
<ul style="list-style-type: none"> One or more speakers are inoperative (Asp model with rear speakers). 	<ul style="list-style-type: none"> Faulty speaker(s). Open or shorted speaker wires, faulty fader or radio/cassette deck; do test E.
<ul style="list-style-type: none"> One or more speakers do not operate (SE model). 	<ul style="list-style-type: none"> Faulty speaker(s). Open or shorted speaker wires, faulty fader or radio/cassette deck; do test F.
<ul style="list-style-type: none"> All speakers operate but fader is inoperative, or one side is much louder (SE model). 	<ul style="list-style-type: none"> Open speaker wires, faulty fader or radio/cassette deck; do test G.
<ul style="list-style-type: none"> Driver and passenger headsets, mute, tune up, and tune down functions are inoperative. 	<ul style="list-style-type: none"> Open GRN/BLK circuit at radio/cassette deck C1 pin 15. Faulty radio/cassette deck.
<ul style="list-style-type: none"> Passenger headset is inoperative (without passenger controller). 	<ul style="list-style-type: none"> Open GRN/BLK circuit at passenger headset or faulty passenger headset; do test H.
<ul style="list-style-type: none"> Passenger headset is inoperative (with passenger controller). 	<ul style="list-style-type: none"> Open GRN/BLK circuit at passenger controller; faulty passenger headset or controller; do test K.

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> Passenger microphone is inoperative, but headset speakers are OK (without controller). 	<ul style="list-style-type: none"> Open or shorted RED/BLU circuit. Faulty passenger headset or radio/cassette deck; do test H.
<ul style="list-style-type: none"> Passenger microphone is inoperative, but headset speakers are OK (with controller). 	<ul style="list-style-type: none"> Open or shorted RED/BLU circuit, faulty controller, passenger headset or radio/cassette deck; do test K.
<ul style="list-style-type: none"> Passenger LH and/or RH headset speakers don't operate (without passenger controller). 	<ul style="list-style-type: none"> Open YEL or LT GRN/RED circuits between headset and radio/cassette deck. Faulty headset or radio/cassette deck; do test H.
<ul style="list-style-type: none"> Passenger LH and/or RH headset speakers don't operate (with passenger controller). 	<ul style="list-style-type: none"> Open YEL or LT GRN/RED circuits between radio/cassette deck and passenger controller. Faulty headset, radio/cassette deck, or passenger controller; do test K.
<ul style="list-style-type: none"> Passenger and driver LH or RH headset speakers don't operate. 	<ul style="list-style-type: none"> Open or shorted YEL or LT GRN/RED circuits between passenger controller and radio/cassette deck. Faulty radio/cassette deck; do test J.
<ul style="list-style-type: none"> Driver's headset does not work but passenger headset is OK. 	<ul style="list-style-type: none"> Open GRN/BLK circuit, BLK circuit, or faulty driver's headset; do test I.
<ul style="list-style-type: none"> Driver's LH or RH headset channel does not work. 	<ul style="list-style-type: none"> Open YEL or LT GRN/BLK circuits, faulty driver's headset or radio/cassette deck; do test I.
<ul style="list-style-type: none"> Mute and/or tune up, tune down search functions do not operate from left combination switch, but headsets operate normally. 	<ul style="list-style-type: none"> Open or shorted left combination switch wires, faulty left combination switch or radio/cassette deck; do test L.
<ul style="list-style-type: none"> Tune up and/or tune down search functions do not work from passenger controller. 	<ul style="list-style-type: none"> Open YEL/RED, RED/BLK, or GRN/BLK circuits or faulty passenger controller; do test M.
<ul style="list-style-type: none"> Poor reception. 	<ul style="list-style-type: none"> Faulty antenna or antenna wire.
<ul style="list-style-type: none"> Driver's microphone is inoperative but headset speakers are OK. 	<ul style="list-style-type: none"> Open WHT circuit between driver's headset and radio/cassette deck. Faulty driver's headset or radio/cassette deck; do test I.
<ul style="list-style-type: none"> Auxiliary tape or CD player does not play (Int models). 	<ul style="list-style-type: none"> Open power or ground circuit. Faulty player or radio; do test N.

Radio

Troubleshooting (cont'd)

Test A: Radio Does Not Operate and Radio Information Does Not Appear On Display

Note: Go to step 3 for Int models. Go to step 1 for Asp and SE models.

1. Disconnect radio/cassette deck connector C1. Put ignition in ACC and check for battery voltage at pin 9 (LT GRN/BLK).
If yes, go to step 2.
If no, service LT GRN/BLK circuit for an open.
2. Check for continuity between the GRN circuit and ground.
If yes, go to step 5.
If no, service GRN circuit for an open.
3. Disconnect radio/clock connector C1. Put ignition in ACC and check for battery voltage at pin 8 (LT GRN/BLK).
If yes, go to step 4.
If no, service LT GRN/BLK circuit for an open.
4. Check for continuity between the GRN circuit and ground.
If yes, go to step 5.
If no, service LT GRN/BLK circuit for an open.
5. Check for battery voltage at pin 18 (RED/YEL) circuit.
If yes, repair or replace radio/cassette deck (Asp and SE) or radio/clock (Int).
If no, service RED/YEL circuit for an open.

Test B: Radio Volume Does Not Vary With Vehicle Speed (Asp and SE Models)

1. If speedometer does not operate, repair speedometer. If cruise control does not work, go to cruise control. If cruise and turn signals operate properly, disconnect radio/cassette deck connector C1 and connect voltmeter at C1 pin 16 (WHT/BLK). Turn ignition switch ON and slowly turn front wheel. Voltage should alternate between 10 and 0 volts as wheel is turned.
If yes, service radio/cassette deck.
If no, service WHT/BLK circuit for an open.

Test C: Radio Operates but Radio Information Does Not Display Properly (Asp and SE Models)

1. Check continuity at RED, WHT, GRY, and two BLK circuits between radio connector C2 and C91.
If yes, go to step 2.
If no, repair open circuits.
2. Replace the radio/cassette deck with a known good unit.
Operate radio to see if display operates normally.
If yes, replace the radio/cassette deck.
If no, replace instrument panel.

Test D: One or Both LH Front or RH Front Speakers Are Inoperative (Asp and Int Models Without Rear Speakers)

1. Disconnect suspect speaker(s) and momentarily connect a 1.5 volt battery across the suspect speaker terminals and listen for a "click" sound.
If yes, check suspect wires for an open and check connector terminal connections. If they are OK, replace the radio/cassette deck.
If no, replace the suspect speaker.

Test E: One or More Speakers Are Inoperative (Asp Model With Rear Speakers)

1. Operate the radio. Do any speakers operate?
If yes, go to step 2.
If no, go to step 5.
2. Adjust balance control toward LEFT. Does at least one LH speaker operate?
If yes, go to step 3.
If no, go to step 5.
3. Adjust balance control toward RIGHT. Does at least one RH speaker operate?
If yes, go to step 4.
If no, go to step 6.
4. Disconnect suspect speaker(s) and momentarily connect a 1.5 volt battery across the suspect speaker terminals and listen for a "click" sound.
If yes, check suspect wires for an open and check connector terminal connections. If they are OK, replace the fader control.
If no, replace suspect speaker.
5. Disconnect fader connector. With ignition in ACC, tune in a strong station. Adjust balance control towards LEFT and volume on high. Connect voltmeter across BLU/GRN and GRY/BLK circuits from radio. With voltmeter set on lowest scale, check that A/C voltage varies around 1 volt.
If yes, go to step 4.
If no, check BLU/GRN and GRY/BLK circuit for an open.
If the wires are OK, replace the radio/cassette deck.
6. Disconnect fader connector. With ignition in ACC, tune in a strong station. Adjust balance control towards RIGHT and volume on high. Connect voltmeter across RED/GRN and BRN/BLK circuits from radio. With voltmeter set on lowest scale, check that A/C voltage varies around 1 volt.
If yes, go to step 4.
If no, check RED/GRN and BRN/BLK circuit for an open.
If the wires are OK, replace the radio/cassette deck.

Test F: One or More Speakers Do Not Operate Normally (SE Model Only)

1. Operate the radio. Do any speakers operate?
If yes, go to step 2.
If no, go to step 5.
2. Adjust balance control toward LEFT. Does at least one LH speaker operate?
If yes, go to step 3.
If no, go to step 5.
3. Adjust fader control toward RIGHT. Does at least one RH speaker operate?
If yes, go to step 4.
If no, go to step 6.
4. Disconnect suspect speaker(s) and momentarily connect a 1.5 volt battery across the suspect speaker terminals and listen for a "click" sound.
If yes, check suspect speaker wires to fader or radio/cassette player for an open. If wires are OK, replace the fader control.
If no, replace the suspect speaker.

(cont'd)

Radio

Troubleshooting (cont'd)

5. Disconnect C130 (fader connector). With ignition in ACC, tune in a strong station. Adjust balance control towards LEFT and volume on high. Connect voltmeter across GRY/BLK and BLU/YEL circuits from the radio. With voltmeter set on lowest scale, check that A/C voltage varies around 1 volt.
If yes, go to step 4.
If no, check GRY/BLK, BLU/GRN, and BLU/YEL circuits for an open. If the wires are OK, replace the radio/cassette player.
6. Disconnect fader connector. With the ignition in ACC, tune in a strong station. Adjust balance control towards RIGHT and volume on high. Connect voltmeter across RED/YEL and BRN/BLK circuits from the radio. With voltmeter set on lowest scale, check that A/C voltage varies around 1 volt.
If yes, go to step 4.
If no, check RED/YEL, RED/GRN, and BRN/BLK circuits for an open. If the wires are OK, replace the radio/cassette player.

Test G: Fader Does Not Operate Normally or One Side Is Much Louder (SE Model Only)

1. Disconnect C130 (fader connector). With ignition in ACC, tune in a strong station. Connect voltmeter across GRY/BLK and BLU/YEL circuits from the radio. With voltmeter set on the lowest scale, check that A/C voltage varies around 1 volt.
If yes, go to step 2.
If no, check GRY/BLK and BLU/YEL circuits for an open. If the wires are OK, replace the radio/cassette player.
2. Connect voltmeter across RED/YEL and BRN/BLK circuits from the radio. With voltmeter set on the lowest scale, check that A/C voltage varies around 1 volt.
If yes, go to step 3.
If no, check GRY/BLK, BLU/GRN, and BLU/YEL circuits for an open. If the wires are OK, replace the radio/cassette player.
3. With C130 disconnected, jumper GRY circuit to BLU/YEL circuit. Put ignition switch in ACC and operate radio. Listen to all LH speakers. They should be equally audible.
If yes, go to step 4.
If no, service GRY circuit for an open.
4. With C130 disconnected, jumper BRN/WHT circuit to RED/YEL circuit. Put ignition switch in ACC and operate radio. Listen to all RH speakers. They should be equally audible.
If yes, replace fader.
If no, service BRN/WHT circuit for an open.

Test H: Passenger Headset Is Inoperative but Driver Headset Is OK (Without Passenger Controller)

1. Disconnect C12 and put ignition switch in ACC. Turn radio on. Check for 5 volts at GRN/BLK and LT GRN/RED circuits.
If yes, go to step 2.
If no, check suspect circuit for an open.
2. Check for 5 volts between GRN/BLK and BLK circuits, between GRN/BLK and YEL circuits, and between GRN/BLK and RED/BLK circuits.
If yes, go to step 3.
If no, check suspect circuit for an open. If wire is OK, replace radio/cassette deck.

3. Check RED/BLU and YEL circuits for a short to ground.
If OK, go to step 4.
If not OK, repair suspect circuit for a short to ground.
4. Check continuity of circuits in headset jumper cable.
If OK, go to step 5.
If not OK, replace headset jumper.
5. Connect a known good passenger headset. Does the substitute headset now operate?
If yes, replace the passenger headset.
If no, replace radio/cassette deck.

Test I: Driver Headset Is Inoperative but Passenger Headset Is OK

1. Disconnect C311 and put ignition switch in ACC. Turn radio on. Check for 5 volts at GRN/BLK and LT GRN/RED circuits.
If yes, go to step 2.
If no, check suspect circuit for an open.
2. Check for 5 volts between GRN/BLK and BLK circuits, between GRN/BLK and YEL circuits, and between GRN/BLK and WHT circuits.
If yes, go to step 3.
If no, check suspect circuit for an open. If wire is OK, replace radio/cassette deck.
3. Check WHT and YEL circuits for a short to ground.
If OK, go to step 4.
If not OK, repair suspect circuit for a short to ground.
4. Check continuity of circuits in headset jumper cable.
If OK, go to step 5.
If not OK, replace headset jumper.
5. Connect a known good driver headset. Does the substitute headset now operate?
If yes, replace the driver headset.
If no, check YEL, LT GRN/RED and WHT circuits for an open.

Test J: Driver and Passenger Headsets Are Inoperative

1. Disconnect C311. Put ignition switch in ACC and turn radio on. Check for 5 volts at GRN/BLK and LT GRN/BLK circuits.
If yes, go to step 2.
If no, check suspect circuit for an open or short to ground. If wires are OK, replace radio/cassette deck.
2. Check for 5 volts between GRN/BLK and BLK circuits, between GRN/BLK and YEL circuits, and between GRN/BLK and WHT circuits.
If OK, go to step 3.
If not OK, service suspect circuits for an open.
3. Disconnect radio connector C1. Check YEL, LT GRN/RED and WHT circuits for shorts to ground. Disconnect passenger headset connector. Check RED/BLU circuit for a short to ground.
If yes, service suspect wires for a short to ground.
If no, replace radio/cassette deck.

(cont'd)

Radio

Troubleshooting (cont'd)

Test K: Passenger Headset Is Inoperative but Driver Headset Is OK (With Passenger Controller)

1. Disconnect C304 and check for 5 volts at GRN/BLK circuit with radio on.
If yes, go to step 2.
If no, service GRN/BLK circuit for an open.
2. Disconnect C305 and check for 5 volts at GRN/BLK and LT GRN/RED circuits.
If yes, go to step 3.
If no, service GRN/BLK circuit for an open.
3. Check for 5 volts between GRN/BLK and YEL circuits, and between GRN/BLK and RED/BLU circuits.
If yes, go to step 4.
If no, service open in suspect circuit(s).
4. Check continuity of circuits in headset jumper harness.
If OK, go to step 5.
If not OK, replace jumper harness.
5. Reconnect connectors C304 and C305. Substitute a known good passenger headset and see if system operates.
If yes, replace passenger headset.
If no, replace passenger controller.

Test L: MUTE, TUNE-UP, TUNE-DOWN Search Functions Do Not Operate

1. Locate C21 and check for 5 volts at GRN/BLK circuit with radio on.
If yes, go to step 2.
If no, service GRN/BLK wire for an open.
2. Disconnect radio connector C1 and connect ohmmeter between GRN/BLK circuit and BLU/BLK circuit. Check for continuity with MUTE button pressed.
If yes, go to step 4.
If no, go to step 3.
3. At C21, connect ohmmeter between GRN/BLK and BLU/BLK switch pins with MUTE button pressed and check for continuity.
If yes, service BLU/BLK circuit for an open between radio/cassette deck and C21.
If no, replace left combination switch.
4. At radio connector C1, connect ohmmeter between GRN/BLK circuit and RED/BLK circuit. Check for continuity with TUNE-UP button pressed.
If yes, go to step 6.
If no, go to step 5.
5. At C21, connect ohmmeter between GRN/BLK and RED/BLK circuits. Check for continuity with TUNE-UP button pressed.
If yes, service BLU/BLK circuit for an open between radio/cassette deck and C21.
If no, replace left combination switch.
6. At radio connector C21, connect ohmmeter between GRN/BLK and YEL/RED circuits. Check for continuity with TUNE-DOWN button pressed.
If yes, replace radio.
If no, go to step 7.

7. At C21, connect ohmmeter between GRN/BLK and YEL/RED circuits. Check for continuity with TUNE-DOWN button pressed.
If yes, service YEL/RED circuit for an open between radio and C21.
If no, replace left combination switch.

Test M: TUNE-UP or TUNE-DOWN Functions Do Not Work From Passenger Controller

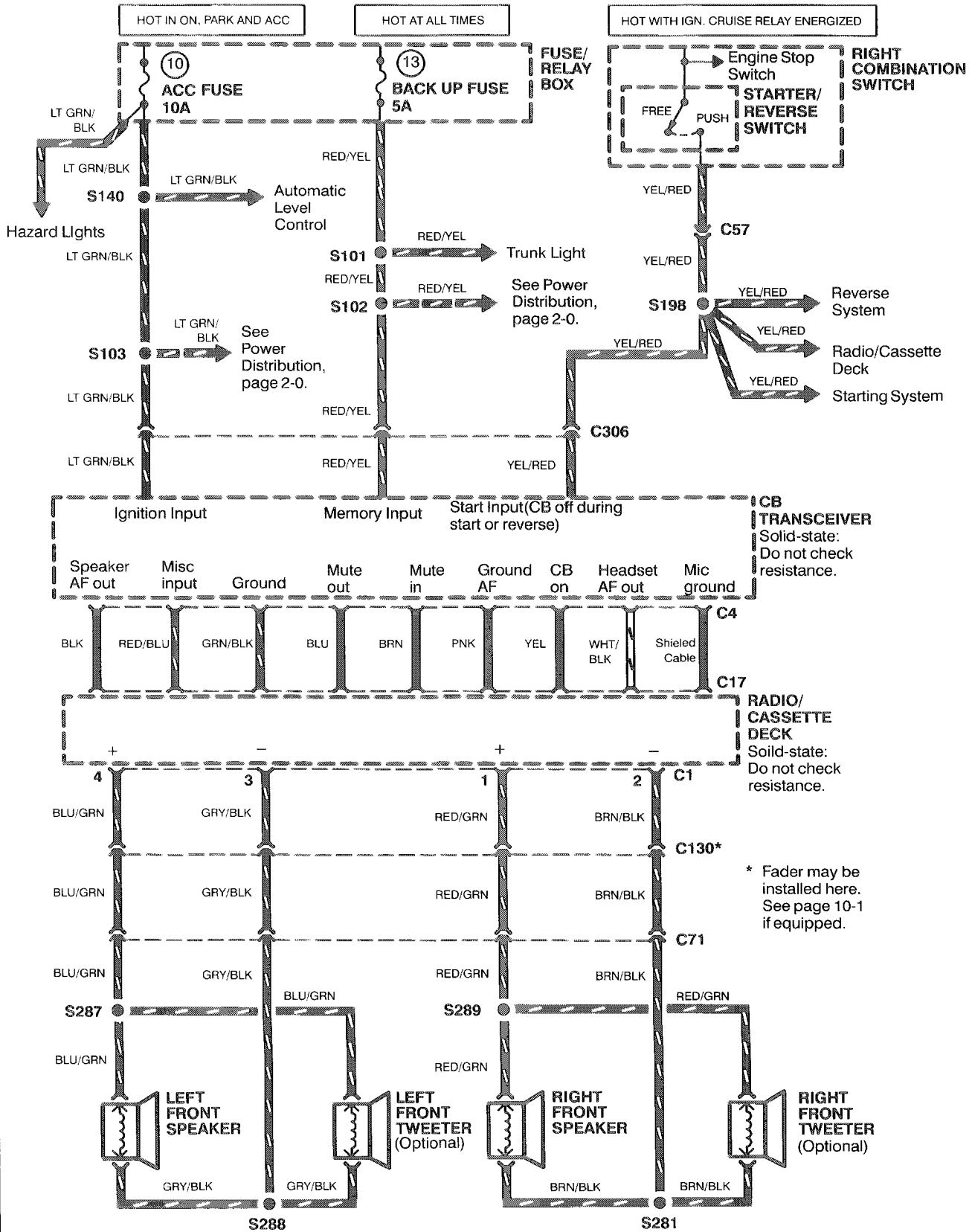
1. Disconnect C304 and check for 5 volts at GRN/BLK circuit with ignition in ACC and radio on.
If yes, go to step 2 (Asp or SE model) or step 3 (Int model).
If no, service GRN/BLK circuit for an open.
2. Disconnect C305 and check for 5 volts at GRN/BLK circuit with ignition in ACC and radio on.
If yes, go to step 3.
If no, service GRN/BLK circuit for an open.
3. With C304 disconnected, connect ohmmeter between RED/BLK circuit and ground. Turn radio on. Press left combination switch TUNE-UP button and check for 5 volts.
If yes, go to step 4.
If no, service RED/BLK circuit for an open.
4. Connect ohmmeter between YEL/RED circuit and ground. Press left combination switch TUNE-DOWN button and check for 5 volts.
If yes, replace passenger controller.
If no, service RED/BLK circuit for an open.

Test N: Auxiliary CD or Tape Player Does Not Operate (Int Model)

1. Check power and ground at auxiliary component.
If OK, go to step 2.
If not OK, service suspect circuit.
2. Replace auxiliary player with a known good unit and play a tape or CD.
If yes, replace auxiliary player.
If no, go to step 3.
3. Disconnect radio connector C2 and check auxiliary input lines to radio for continuity.
If yes, go to step 4.
If no, service suspect circuits.
4. Check auxiliary input BLU/YEL and BLU/GRN circuits for shorts to ground.
If OK, replace radio.
If not OK, service suspect circuits.

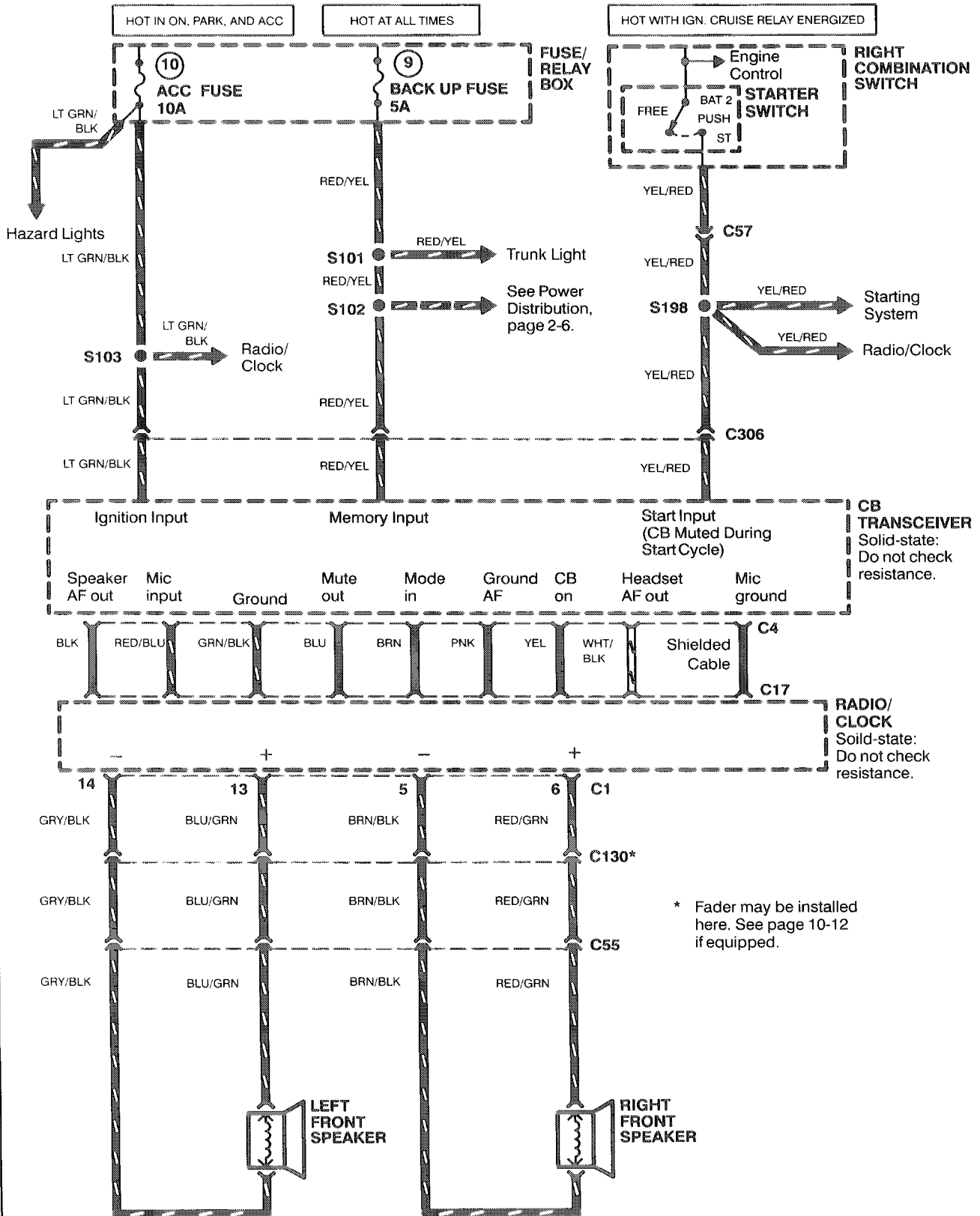
Citizen Band Radio: Asp

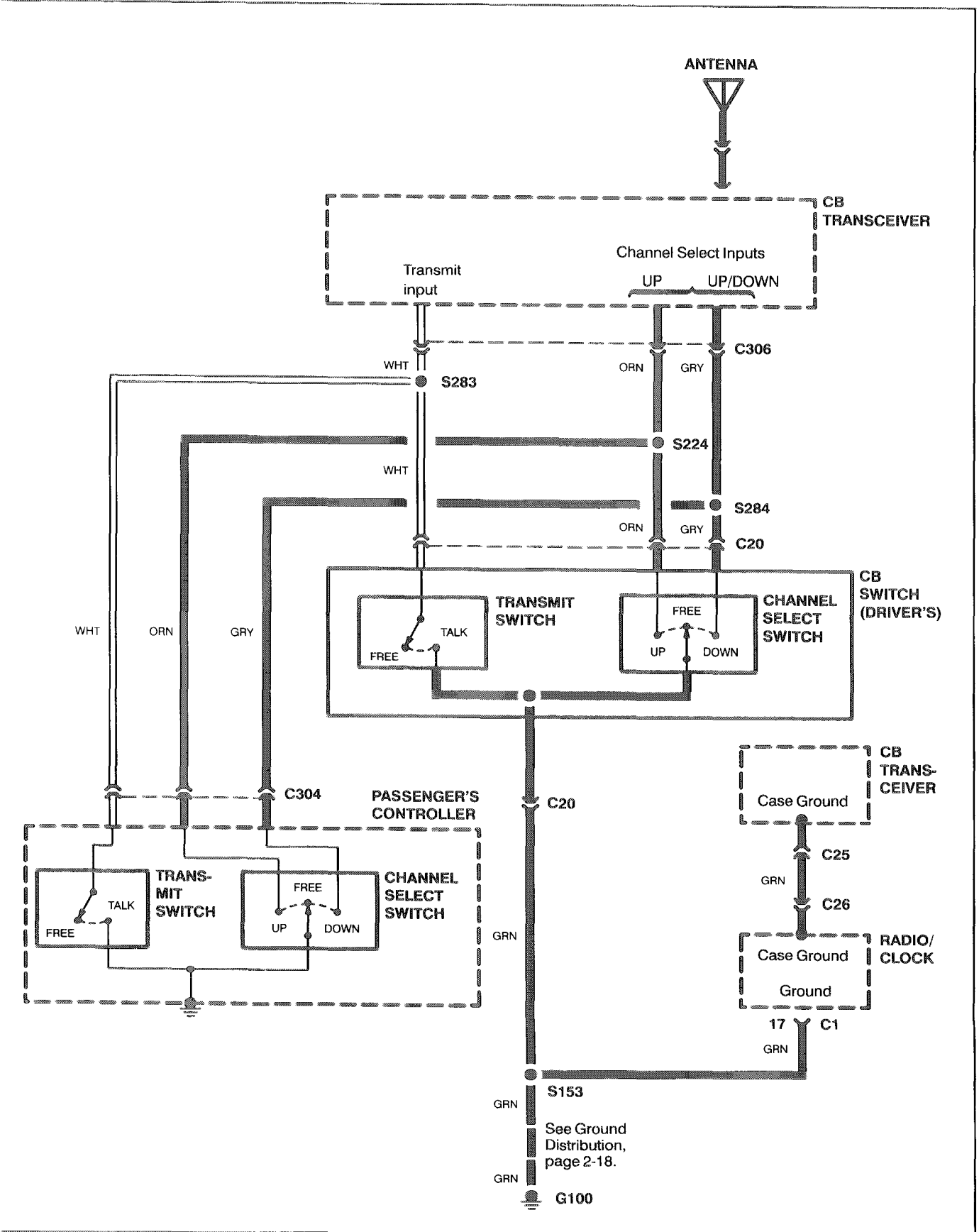
Circuit Schematic



Citizen Band Radio: Int

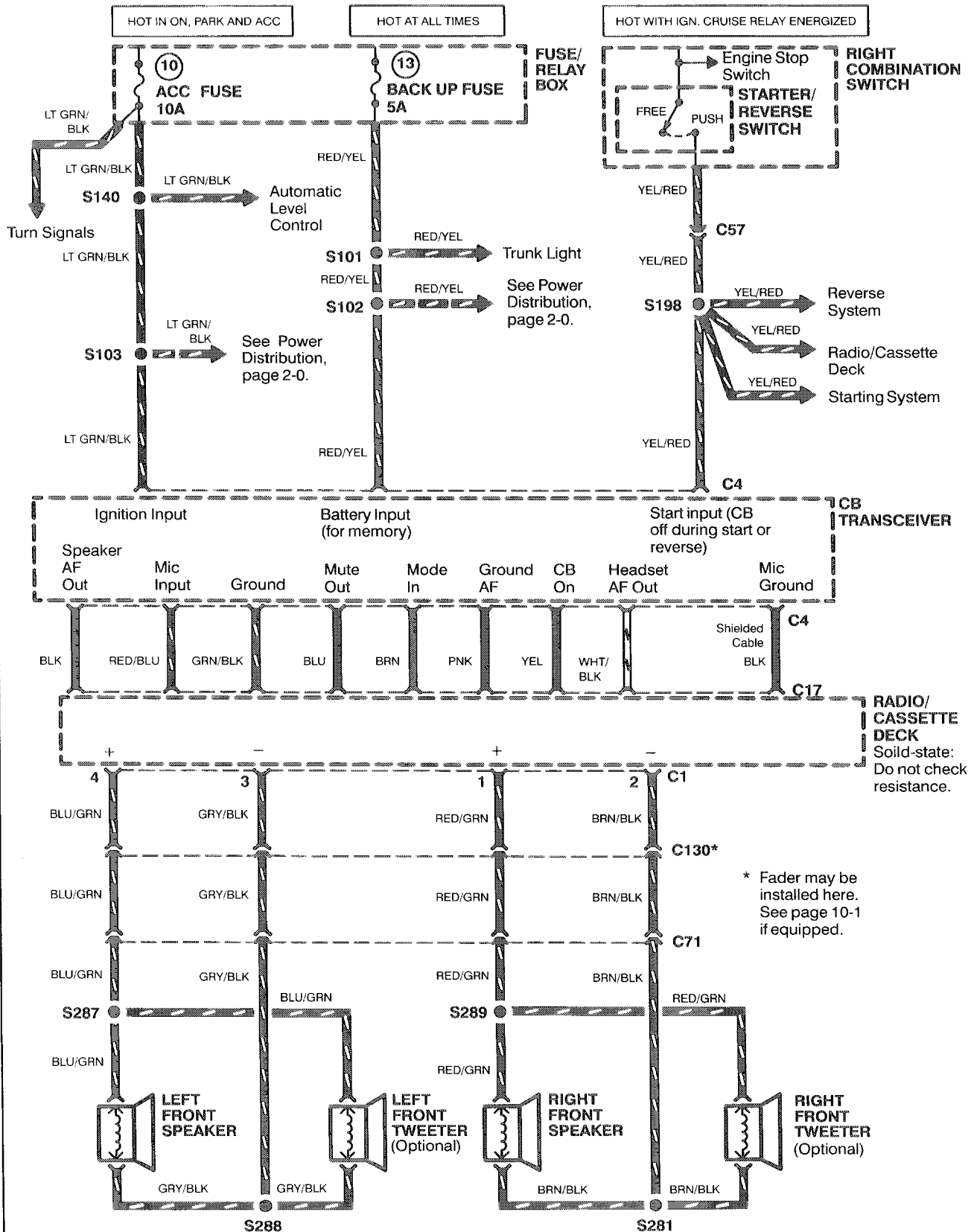
Circuit Schematic

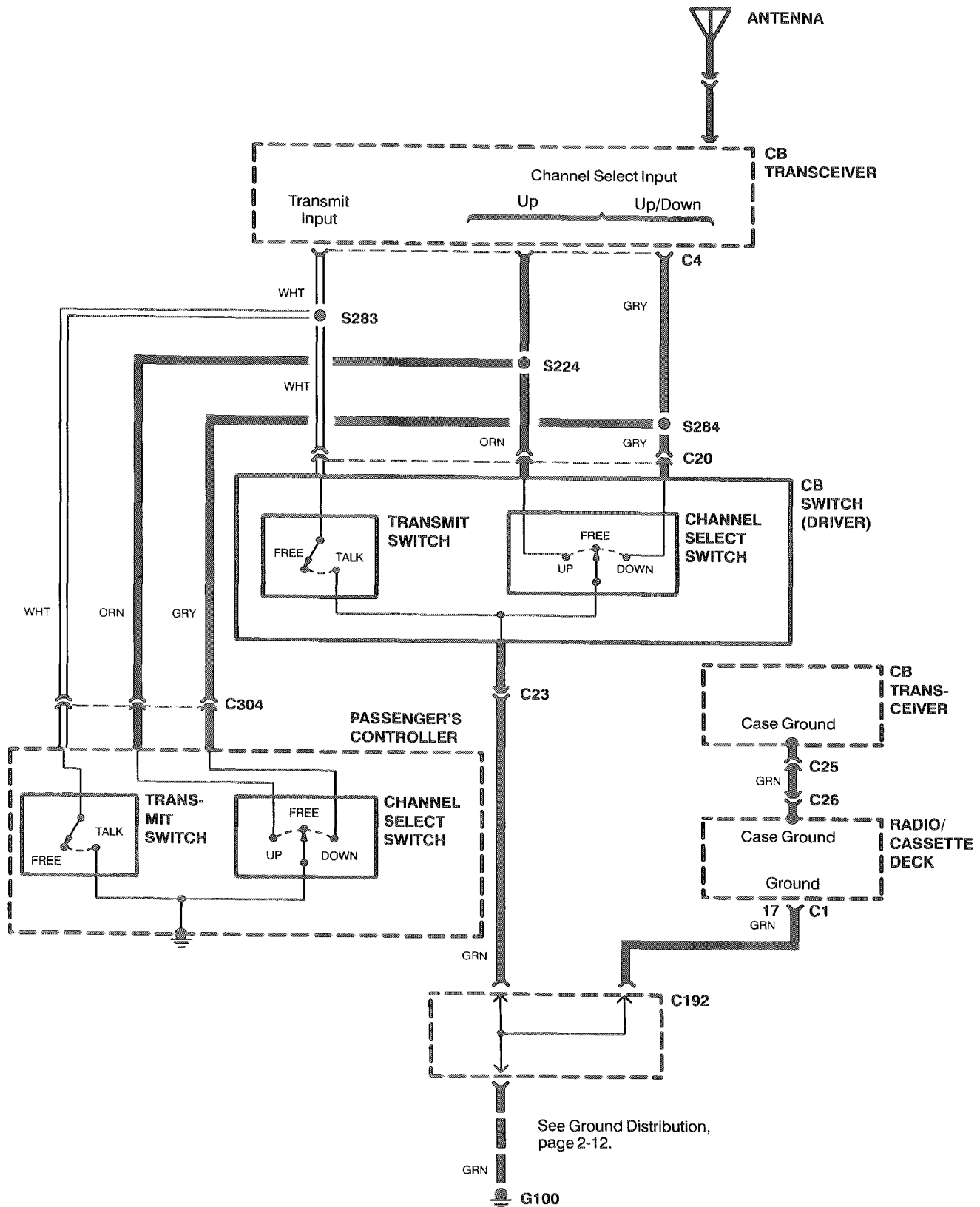




Citizen Band Radio: SE

Circuit Schematic





Citizen Band Radio

How the Circuit Works

The CB transceiver receives battery voltage from the ACC fuse with the ignition switch in ON, ACC, or PARK. The transceiver gets battery voltage from the Back Up fuse at all times. When the starter/reverse or starter motor is engaged, battery voltage is applied to the CB transceiver through the YEL/RED circuit to mute the audio. The CB sends and receives audio information through the radio through a series of control lines that run between the radio/clock and CB transceiver. These lines control radio and CB muting, audio input and output, and other functions.

Note: If the radio does not operate, perform the radio diagnostic tests described in the radio section before diagnosing any CB symptoms.

Troubleshooting

SYMPTOM	DIAGNOSIS
<ul style="list-style-type: none"> ● CB radio does not operate and display is blank. 	<ul style="list-style-type: none"> ● Open power or ground circuit; do test A.
<ul style="list-style-type: none"> ● CB transceiver loses memory. 	<ul style="list-style-type: none"> ● Open battery circuit to CB transceiver.
<ul style="list-style-type: none"> ● CB transceiver does not turn off while starter/reverse motor is cranking. 	<ul style="list-style-type: none"> ● Open starter input circuit to CB transceiver.
<ul style="list-style-type: none"> ● CB transceiver appears to come on but does not transmit or receive. 	<ul style="list-style-type: none"> ● Faulty antenna, coaxial cable, open or shorted control circuit between CB transceiver and radio; faulty CB transceiver or radio; do test C.
<ul style="list-style-type: none"> ● CB transceiver receives and transmits but does not operate properly. 	<ul style="list-style-type: none"> ● Open or shorted control circuit between transceiver and radio; faulty CB transceiver, or radio; do test C.
<ul style="list-style-type: none"> ● CB transceiver transmits but does not receive. 	<ul style="list-style-type: none"> ● Open or shorted control circuit between transceiver and radio; faulty CB transceiver, or radio; do test C.
<ul style="list-style-type: none"> ● CB transceiver receives but does not transmit. 	<ul style="list-style-type: none"> ● Faulty transmitter switch circuit or switch, open control circuit between CB and radio; do test B.
<ul style="list-style-type: none"> ● CB transceiver channel select does not operate from driver switch but the transmit function operates. 	<ul style="list-style-type: none"> ● Open channel select input circuit, switch, or faulty CB transceiver; do test E.
<ul style="list-style-type: none"> ● CB transceiver does not transmit and/or channel select operates from driver switch but not from passenger switch. 	<ul style="list-style-type: none"> ● Open circuit between passenger controller and CB transceiver or faulty passenger controller; do test D.

Troubleshooting

Test A: CB Radio Does Not Operate and Display Is Blank

1. Disconnect connector C306 (Asp or Int model) or C4 (SE model). Put the ignition switch in ACC. Check for battery voltage at LT GRN/BLK circuit.
If yes, go to step 2.
If no, service LT GRN/BLK wire for an open.
2. Check for voltage at RED/YEL circuit.
If yes, go to step 3.
If no, service RED/YEL circuit.
3. Disconnect CB connector C25 and check for a good ground at GRN circuit.
If yes, replace CB transceiver.
If no, service GRN circuit for an open.

Test B: CB Receives but Does Not Transmit

1. Does the channel select function operate from the driver's channel select switch?
If yes, go to step 3.
If no, go to step 2.
2. Disconnect C20 and C23 (SE model) and check for a ground at GRN circuit.
If yes, go to step 3.
If no, service GRN circuit for an open.
3. With C20 and C23 (SE model) disconnected, connect ohmmeter across WHT and GRN circuits at switch side of connector(s). Check for continuity with transmit switch held in TALK.
If yes, go to step 4.
If no, replace driver's CB switch.
4. Reconnect connector C20 and C23 (SE model) and disconnect C306 (Asp or Int model). Check continuity to ground at WHT circuit with driver's transmit switch pressed.
If yes, go to test C.
If no, service WHT circuit for an open between driver's CB switch and CB transceiver.

Test C: CB Transceiver Input/Output Test

1. Disconnect C4 (CB transceiver) and C17 (radio connector). Check continuity between the 9 circuits running between the CB transceiver and radio/cassette deck (Asp or SE model) or radio/clock (Int model). Also, check that connector terminals are not loose or dirty.
If OK, go to step 2.
If not OK, service suspect circuits for an open.
2. With connectors C4 and C17 still disconnected, check that these 9 circuits are not shorted to ground.
If OK, go to step 3.
If not OK, service suspect circuits for a short to ground.
3. Was the CB able to receive or transmit?
If yes, go to step 5.
If no, go to step 4.

(cont'd)

Citizen Band Radio

Troubleshooting (cont'd)

4. Temporarily substitute a known good CB antenna and coaxial cable. Reconnect disconnected connectors. Does the CB now operate normally?
If yes, replace suspect antenna or coaxial cable.
If no, go to step 5.
5. Temporarily substitute a known good CB transceiver. Reconnect disconnected connectors. Does the CB now operate normally?
If yes, replace CB transceiver.
If no, replace radio/cassette deck or radio/clock.

Test D: CB Does Not Transmit and/or Channel Select Does Not Operate From Passenger Switch

1. Disconnect C304. Connect an ohmmeter to the harness side of C304 at the WHT circuit. Check continuity to ground while holding the driver's transmit switch in TALK.
If yes, go to step 2.
If no, service WHT circuit for an open.
2. Connect an ohmmeter to the harness side of C304 at the ORN circuit. Check continuity to ground while holding the driver's channel select switch toward UP.
If yes, go to step 2.
If no, service ORN circuit for an open.
3. Connect an ohmmeter to the harness side of C304 at the GRY circuit. Check continuity to ground while holding the driver's channel select switch toward UP.
If yes, replace passenger's controller.
If no, service GRY circuit for an open.

Test E: CB Channel Select Does Not Operate but Transmit Function Operates

1. Disconnect C306 (Asp or Int model) or C4 (SE model). Connect an ohmmeter to switch side of C306 or C4 ORN circuit and check continuity to ground while holding the driver's channel select switch toward UP.
If yes, go to step 2.
If no, check ORN circuit for an open between CB transceiver and driver's channel select switch.
If circuit is OK, replace driver's CB switch.
2. Connect an ohmmeter to switch side of C306 or C4 GRY circuit and check continuity to ground while holding the driver's channel select switch toward DOWN.
If yes, replace CB transceiver.
If no, check GRY circuit for an open between CB transceiver and driver's channel select switch.
If circuit is OK, replace driver's CB switch.

Component Location Index

(Refer to Section 12 for photographs.)

<u>Component</u>	<u>Photo No.</u>		
Air Pressure Sensor	32		
Behind right saddlebag			
Air Pump Assembly	28		
Behind left saddlebag			
Alternator	3		
Left rear of engine			
Auxiliary Input Connector	55		
Behind left fairing pocket			
Bank Angle Sensor (Asp, SE)	32		
Below right rear of seat, on frame rail			
Bank Angle Sensor (Int)	22		
Below right rear of seat, on frame rail			
Battery	30		
Below right side cover			
Carburetor Air Jet (CAJ) Solenoid Valve #2 (Asp, SE)	23		
Behind right fairing pocket			
Carburetor Air Jet (CAJ) Solenoid Valve #2 (Int)	66		
Behind right fairing pocket			
Carburetor Air Jet (CAJ) Solenoid Valve #3 (Asp, SE)	23		
Behind right fairing pocket			
Carburetor Air Jet (CAJ) Solenoid Valve #3 (Int)	66		
Behind right fairing pocket			
CB Transceiver	65		
Below left fairing pocket			
Clutch Switch	49		
On left handlebar			
Clutch/Cruise Cancel Switch	49		
On left handlebar			
Cruise Control Actuator	6		
Behind left fairing inner cover			
Cruise Control Unit (20-BLK)	36		
Below center rear of trunk			
Cruise Control Valve Unit	5		
Behind left fairing inner cover, on left side of fuel tank			
Cruise Valve Relay	9		
Behind left fairing inner cover, near front of fuel tank			
Engine Control Module (ECM) (26-YEL)	24		
Behind right fairing inner cover			
Engine Coolant Temperature (ECT) Gauge Sender	62		
Top left side of engine			
Engine Coolant Temperature (ECT) Sensor (2-GRN)	61		
Behind left fairing cover, on thermostat housing			
Fader (Asp)			
On top center of handlebar cover			
Fader (SE)	49		
On left side of handlebar			
Front Brake Light Switch	48		
On right handlebar, in front of brake switch			
Front Brake Light/Cruise Cancel Switch	48		
On right handlebar, part of front brake switch			
Fuel Level Sender (Asp, SE)	7		
Behind left fairing inner cover, on fuel tank			
Fuel Level Sender (Int)	51		
Behind left fairing inner cover, on fuel tank			
Fuel Pump (1-GRN)	44		
Below seat, in fuel tank			
Fuel Reserve Sender (1-WHT)	44		
Below seat, in fuel tank			
Fuse/Relay Box	28		
Behind left rear side cover			
Gear Position Switch			
On right front of engine, above oil filter			
Hazard Flasher Relay (3-BLK) (Asp, SE)	37		
Below rear of trunk			
Hazard Flasher Relay (3-BLK) (Int)	47		
Below rear of trunk			
Ignition Coils	45		
Below reserve coolant tank			
Ignition Pulse Generators			
Behind timing belt covers			

Ignition Switch Center of instrument panel	
In-Line Capacitor A 4 On rear of alternator	
In-Line Capacitor B 3 Left rear of engine, on alternator	
In-Line Capacitor D (2-RED) (Int, Asp)(with CB) 43 Below seat, on top of fuel tank	
In-Line Capacitor D (SE) 67 Below seat, on top of fuel tank	
In-Line Diode A 56 In harness, right side of air cleaner housing	
In-Line Diode B (2-WHT) (Asp, SE) 37 Below left side of trunk	
In-Line Diode C 56 In harness, right side of air cleaner housing	
In-Line Fuse A (5A) 30 Behind right side cover	
In-Line Fuse B (5A) 30 Behind right side cover	
Intake Air Temperature (IAT) Sensor 16 Right front of air cleaner case cover	
Inverter 33 On rear of right saddlebag, behind cover	
Left Combination Switch 60 On top of left handlebar	
Left Cornering Light Relay (4-BLU) (Asp, Int) 15 Behind left side of fairing front cover	
Left Cornering Light Relay (4-BLU) (SE) 19 Behind right side of fairing lower cover	
Left Horn 15 Behind left fairing front cover	
Left Noise Filter On left fan shroud	
Left Radiator Fan Motor 58 Behind left radiator	
Main Fuse A (30A) 2 Behind right side cover, forward of battery	
Main Fuse B (55A) 2 Behind right side cover, forward of battery	
Oil Pressure Switch 17 On lower right front of engine	
Passenger Controller On right side of trunk	
Power Control Relay #1 (4-WHT) 30 Behind right side cover, rear of battery	
Power Control Relay #2 (4-WHT) 30 Behind right side cover, rear of battery	
Pulse Secondary Air Injection (PAIR) Solenoid Valve 8 Behind left fairing inner cover, near front of fuel tank	
Radiator Fan Temperature Switch 14 On underside of left radiator, next to cooling fan	
Radio Noise Filter Below rear seat	
Rear Brake Cruise Cancel Switch 68 Behind right front side cover, above heat shield	
Rear Brake Light Switch (Asp, SE) 26 Behind right front side cover	
Rear Brake Light Switch (Int) 53 Behind right front side cover	
Rear Suspension Solenoid Valve 32 Behind right saddlebag	
Relief Solenoid Valve 31 Behind right saddlebag	
Reverse Control Unit (14-WHT) 36 Below rear of trunk	
Reverse Diode Assembly 32 Below right side trunk, behind bank angle sensor	
Reverse Lever Switch 7 Behind left fairing inner cover, near left side of fuel tank	
Reverse Resistors 29 Behind right side cover, under battery box	
Reverse Switch 27 Right side of engine, near dipstick	

(cont'd)

Component Location Index

(Refer to Section 12 for photographs.)

<u>Component</u>	<u>Photo No.</u>
Reverse Switch Relay (4-BLK)	41
Below rear of seat	
Right Combination Switch	
On top of right handlebar	
Right Cornering Light Relay (4-BLU) (Asp, Int)	57
Behind right side of fairing front cover	
Right Cornering Light Relay (4-WHT) (SE) ...	19
Behind right side of fairing lower cover	
Right Horn	18
Behind right fairing front cover	
Right Noise Filter	
On right fan shroud	
Right Radiator Fan Motor	59
Behind right radiator	
Side Stand Switch	3
Left side, on side stand	
Speed Limiter Fuse (65A)	41
Below rear of seat	
Speed Limiter Relay (4-WHT)	30
Behind right saddlebag, ahead of shock absorber	
Spoiler Brake/Taillight Control Module (3-WHT)	1
Behind left saddlebag	
Starter Motor (Int)	
On lower right rear of engine	
Starter Relay A (4-RED)	2
Behind right side cover, forward of battery	
Starter Relay B (2-WHT)	26
Behind right side cover, on lower frame rail	
Starter Relay Regulator	1
Behind left saddlebag	
Starter/Reverse Motor (Asp, SE)	
On lower right rear of engine	
Throttle Cancel Switch	9
Near left side of air cleaner box, on frame rail	
Trunk Light Switch	
Inside trunk, near left hinge	

Turn Signal Cancel Control Unit	
Inside steering head	
Turn Signal Flasher Relay (3-WHT) (Asp, SE)	37
Below rear of trunk	
Turn Signal Flasher Relay (3-WHT) (Int)	47
Below rear of trunk	
C6 (3-BLK)	46
Behind instrument panel	
C10 (22-BLU) (SE)	39
Below left rear of seat	
C10 (22-WHT) (Asp)	39
Below left rear of seat	
C10 (22-YEL) (Int)	50
Below left rear of seat	
C11 (3-GRN) (Asp, SE)	38
Below rear of seat	
C11 (3-GRN) (Int)	22
Below rear of seat	
C12 (6-RED) (Asp, SE)	38
Below left rear corner of seat	
C12 (6-RED) (Int)	50
Below left rear corner of seat	
C16 (10-WHT)	46
Behind instrument panel	
C20 (4-BRN)	12
Behind left front side of fairing	
C21 (4-BLK)	12
Behind left front side of fairing	
C22 (6-RED)	21
Right side of fairing, behind marker light	
C23 (2-BLK)	12
Behind left side of fairing, below connector bracket	
C24 (4-WHT)	
Behind headlight assembly	
C25 (1-WHT) (SE)	65
Below left fairing pocket	

C26 (1-WHT) (SE) Above radio/cassette player connectors, taped in harness		C59 (6-BLK)	21
C28 (3-GRN) (Asp, SE)	5	Right side of fairing, behind marker light	
Behind left fairing inner cover, near left side of fuel tank		C60 (2-BLU)	21
C28 (3-GRN) (Int)	51	Behind right front side of fairing	
Behind left fairing inner cover, near left side of fuel tank		C63 (4-WHT)	21
C29 (2-BLU) (Asp, SE)	25	Right side of fairing, behind marker light	
On bracket, on right side of fuel tank		C66 (14-WHT) (Int)	63
C32 (22-RED)	39	Behind instrument panel	
Behind right saddlebag		C66 (20-WHT) (Asp, SE)	46
C33 (22-BLK)	39	Behind instrument panel	
Below right rear of seat		C67 (3-WHT)	20
C35 (4-RED)	1	Behind right fairing pocket	
Behind left saddlebag		C68 (2-GRN) (Asp, SE)	20
C43 (2-WHT) (Asp, SE)	5	Behind right fairing pocket	
Behind left fairing inner cover, near left side of fuel tank		C68 (2-GRN) (Int)	54
C43 (2-WHT) (Int)	51	Behind right fairing pocket	
Behind left fairing inner cover, near left side of fuel tank		C69 (2-WHT)	18
C44 (2-WHT)	4	Behind right front side of fairing	
On rear of alternator		C71 (16-WHT) (Asp)	10
C54 (4-WHT) (Asp, SE)	25	Behind left fairing pocket	
Behind right fairing inner cover, near ECM		C71 (16-WHT) (Int)	
C54 (4-WHT) (Int)	56	Behind left fairing pocket	
Behind right fairing inner cover, near ECM		C71 (16-WHT) (SE)	69
C55 (13-WHT) (Asp, SE)	23	Behind left fairing pocket	
Behind right fairing pocket		C72 (13-BLK) (Asp, SE)	23
C55 (16-GRY) (Int)	52	Behind right fairing pocket	
Behind left fairing pocket		C72 (16-WHT) (Int)	66
C56 (2-BRN)	34	Behind right fairing pocket	
Below left rear of trunk		C73 (14-BLK) (Asp)	10
C57 (9-RED)	21	Behind left fairing pocket	
Right side of fairing, behind marker light		C73 (14-BLK) (Int)	
C58 (8-BLK)	12	Behind left fairing pocket	
Behind left front side of fairing		C73 (14-BLK) (SE)	69
		Behind left fairing pocket	
		C75 (6-RED)	34
		Below left rear of trunk	
		C76 (6-RED)	34
		Below right rear of trunk	
		C77 (3-WHT)	38
		Below trunk	

(cont'd)

Component Location Index

(Refer to Section 12 for photographs.)

<u>Component</u>	<u>Photo No.</u>
C78 (3-WHT) Below trunk, near right saddlebag light assembly	
C81 (2-BLK) (Asp, SE)	25
On bracket, near right side of fuel tank	
C81 (2-BLU) (Int)	56
Behind right inner cover, on right side of fuel tank	
C82 (2-GRN)	34
Below right rear of trunk	
C84 (3-WHT)	38
Below trunk	
C85 (3-WHT) Below trunk, near left rear light assembly	
C86 (2-GRN)	34
Below left rear of trunk	
C89 (2-RED)	40
Below left rear side of seat	
C90 (6-BRN)	12
Behind left front side of fairing	
C91 (14-BLK)	46
Behind instrument panel	
C92 (3-RED)	5
Behind left fairing inner cover, near left side of fuel tank	
C93 (6-GRN)	12
Behind left front side of fairing	
C94 (9-BLK)	21
Right side of fairing, behind marker light	
C95 (2-BLK)	15
Behind left side of front fairing	
C97 (2-GRN) (Asp)	10
Behind left fairing pocket	
C97 (2-GRN) (Int)	55
Behind left fairing pocket	
C97 (2-GRN) (SE)	69
Behind left fairing pocket	
C98 (3-BLK)	13
Left front of fairing, behind turn signal light	
C99 (6-WHT) Inside steering head	
C103 (6-WHT) Right rear of fairing, behind air pressure control switch assembly	
C104 (3-RED)	38
Below trunk	
C105 (3-BLK)	38
Below trunk	
C106 (2-WHT)	38
Below trunk	
C107 (3-WHT)	46
Behind instrument panel	
C108 (4-WHT) (Int)	63
Behind instrument panel	
C108 (6-WHT) (Asp, SE)	46
Behind instrument panel	
C109 (2-BLK)	58
On left fan shroud	
C110 (2-BLK)	59
On right fan shroud	
C112 (2-BLK) (Asp, SE)	5
Behind fairing inner cover, on left side of fuel tank	
C112 (2-BLK) (Int)	51
Behind fairing inner cover	
C115 (1-CLR)	14
Below left radiator, near fan temperature switch	
C119 (2-RED) (Asp, SE)	20
Behind right fairing pocket	
C119 (2-RED) (Int)	54
Behind right fairing pocket	
C120 (2-GRN) (Asp, SE)	20
Behind right fairing pocket	
C120 (2-GRN) (Int)	54
Behind right fairing pocket	

C127 (1-GRN) (SE)	67	C184 (1-BLK) (without CB)	42
Below seat on fuel pump housing		Below seat, on top of fuel tank	
C127 (1-GRN) (Without CB)	42	C185 (1-WHT)	43
Below seat on fuel pump housing		Below seat, on top of fuel tank	
C130 (4-WHT) (Int)	52	C186 (1-WHT)	43
Below left fairing pocket		Below seat, on top of fuel tank	
C130 (4-BLK) (SE)	12	C188 (3-WHT)	
Behind left front side of fairing, on bracket		Rear of left saddlebag, behind cover	
C130 (Asp)	10	C189 (3-WHT)	33
Behind left front side of fairing, on bracket		Rear of right saddlebag, behind cover	
C131 (4-BLK)	5	C190 (1-BLK)	33
Behind fairing inner cover, on left side of fuel tank		Rear of right saddlebag, behind cover	
C132 (2-BLU)	5	C191 (14-ORN)	
Behind fairing inner cover, on left side of fuel tank		Taped to harness, near right side of fuel tank	
C133 (2-RED)	25	C192 (14-ORN)	
On bracket, near right side of fuel tank		Behind fairing inner cover, on left side of fuel tank	
C136 (3-WHT)	55	C193 (1-BLK)	33
Below left fairing pocket		Rear of right saddlebag, behind cover	
C137 (6-RED)	55	C194 (1-BLK)	33
Below left fairing pocket		Rear of right saddlebag, behind cover	
C138 (6-BRN)	21	C195 (1-BLK)	33
Right side of fairing, behind marker light		Rear of right saddlebag, behind cover	
C147 (1-WHT) (SE)	67	C300 (4-WHT)	10
Below seat, on top of fuel tank		Behind left fairing inner cover, near air cleaner housing	
C147 (1-WHT) (without CB)	42	C301 (4-WHT) (with CB)	10
Below seat, on top of fuel tank		Behind left fairing inner cover, near air cleaner housing	
C178 (4-WHT)	67	C301 (4-WHT) (without CB)	11
Below seat, on top of fuel tank		Near left side of air cleaner housing	
C181 (4-WHT)	12	C302 (4-BLK)	40
Behind left front side of fairing, on bracket		Below left rear side of seat	
C182 (4-WHT)	36	C303 (4-BLK)	11
Below rear seat		Near left side of air cleaner housing	
C183 (1-GRN)	43	C304 (6-BRN)	40
Below seat, on top of fuel tank		Below left rear side of seat	
C184 (1-BLK) (SE)	67	C305 (6-RED)	
Below seat, on top of fuel tank		Below left rear corner of seat	

(cont'd)

Component Location Index

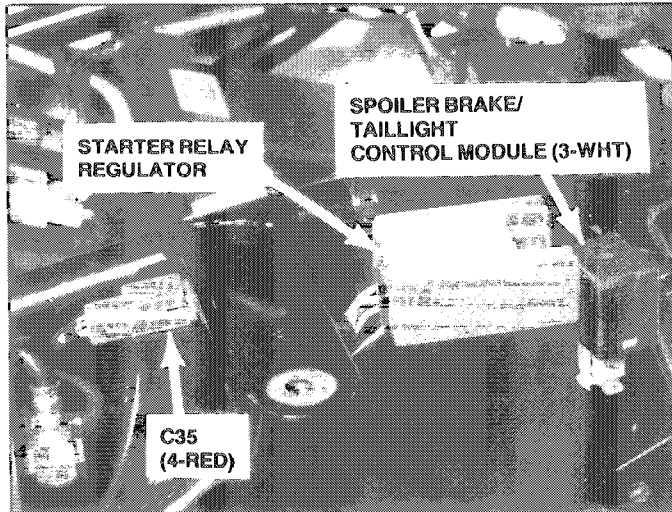
(Refer to Section 12 for photographs.)

Component	Photo No.
C306 (6-BRN) (Asp)	10
In rear of left side fairing pocket	
C306 (6-BRN) (Int)	52
In rear of left side fairing pocket	
C311 (6-RED) (Asp)	10
Behind left fairing pocket	
C311 (6-RED) (SE)	69
Behind left fairing pocket	
C312 (6-WHT)	39
Underneath right side of seat, in front of trunk support bracket	
C315 (2-YEL) (Asp, SE)	8
Behind left fairing inner cover, near front of fuel tank	
C315 (2-YEL) (Int)	51
Behind left fairing inner cover, near front of fuel tank	
C316 (3-BRN)	29
Behind right side cover, under battery box	
C330 (2-BLK)	39
Below left side of trunk	
C331 (2-BLK)	35
In left underside of trunk lid	
C333 (1-CLR)	50
Below center of seat	
C334 (5-BLK)	
On passenger helmet audio cord	
C335 (5-BLK)	
On driver helmet audio cord	
G100	27
On frame, above dipstick	
G102	14
On left radiator, near radiator fan temperature switch	
G103	
On engine, near coolant temperature sensor	

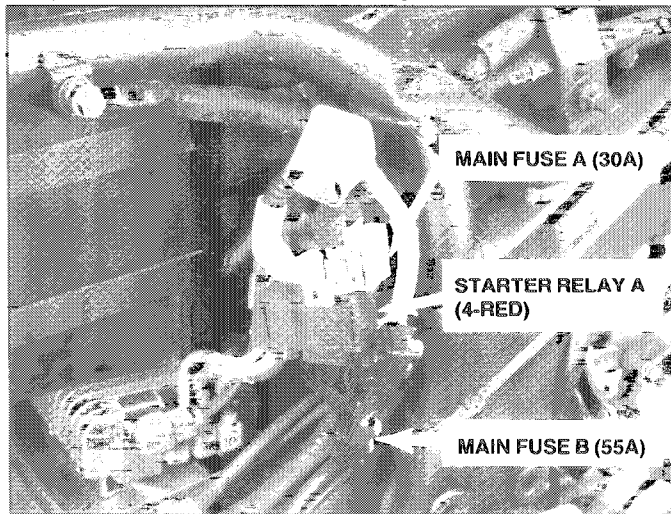
G104 (Asp, SE)	27
On right side of engine	
G104 (Int)	53
On right side of engine	
G105	50
Below center of seat	

Component Location Photographs

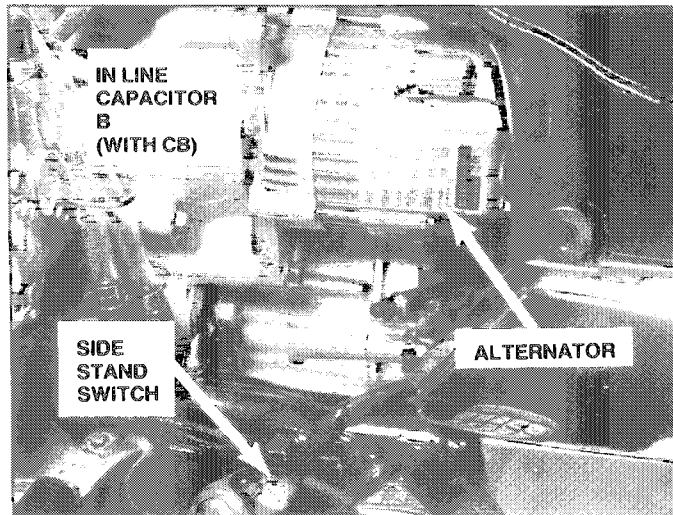
1. Left Side of Motorcycle (Saddlebag Removed)



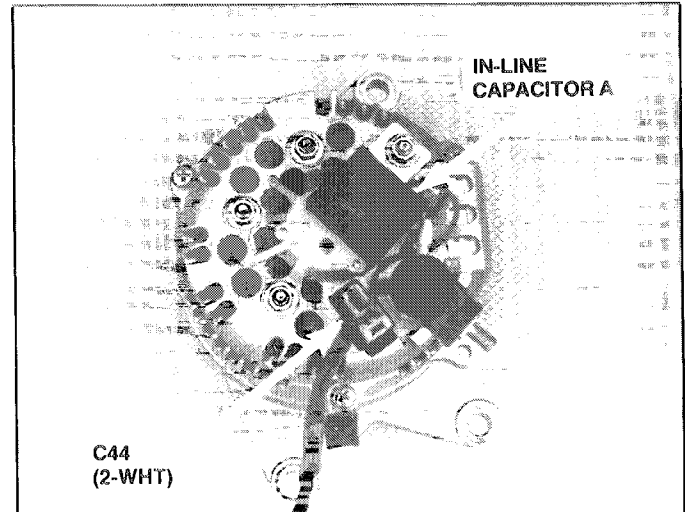
2. Right Side, Below Battery (Rear Side Cover and Battery Box Removed)



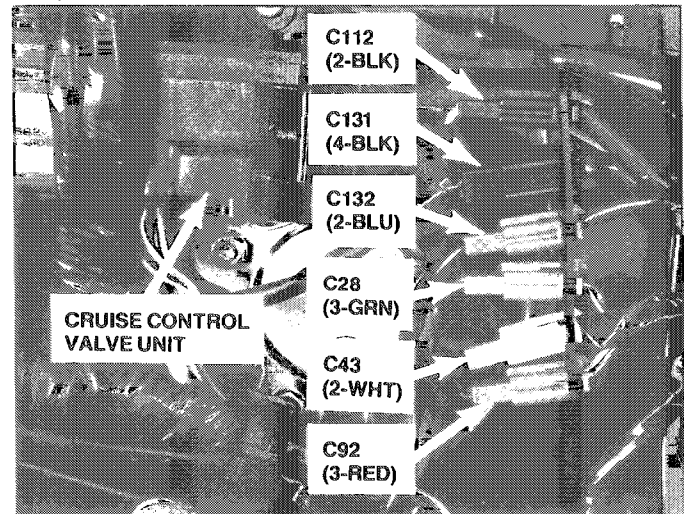
3. Left Rear of Engine (Front Side Cover Removed)



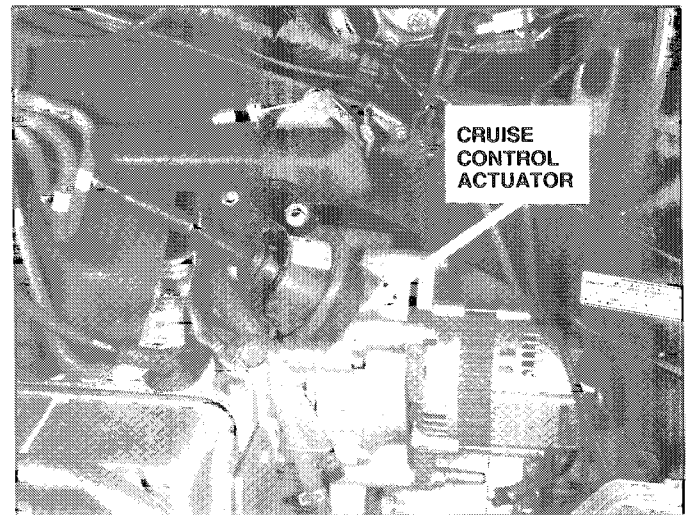
4. Rear of Alternator (Removed from Engine)



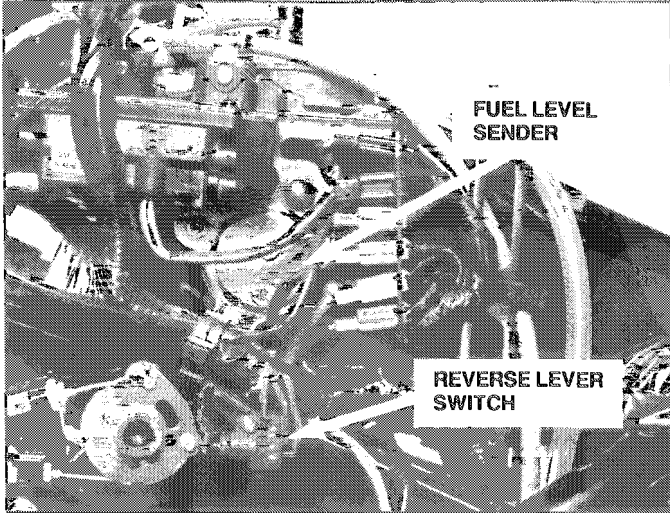
5. Left Side, Next to Fuel Tank (Inner Cover Removed)



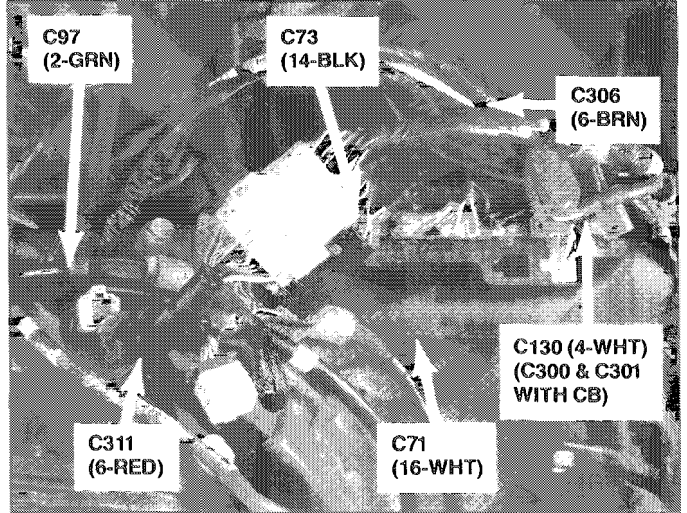
6. Below Reverse Lever (Inner Cover Removed)



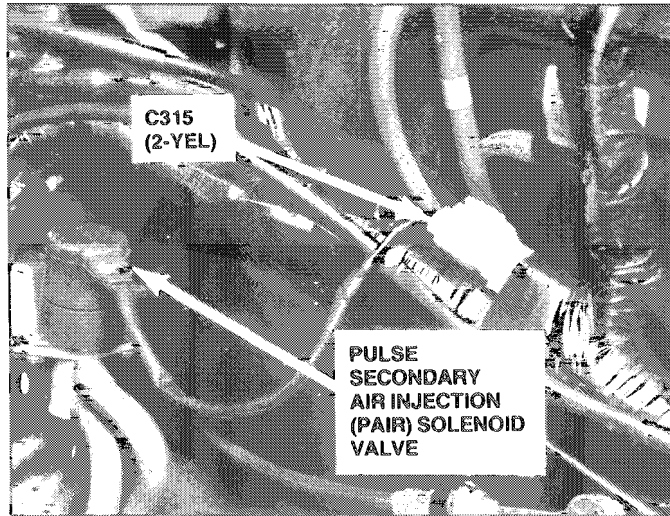
7. Left Side of Engine (Inner Cover Removed)



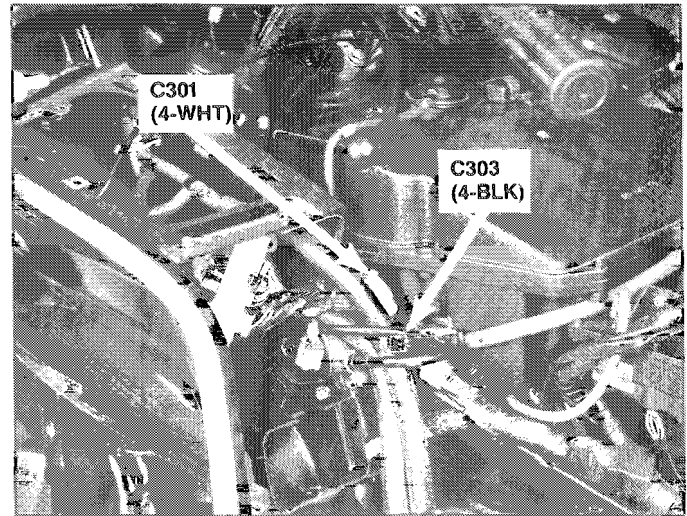
10. Left Rear of Fairing (Fairing Removed)



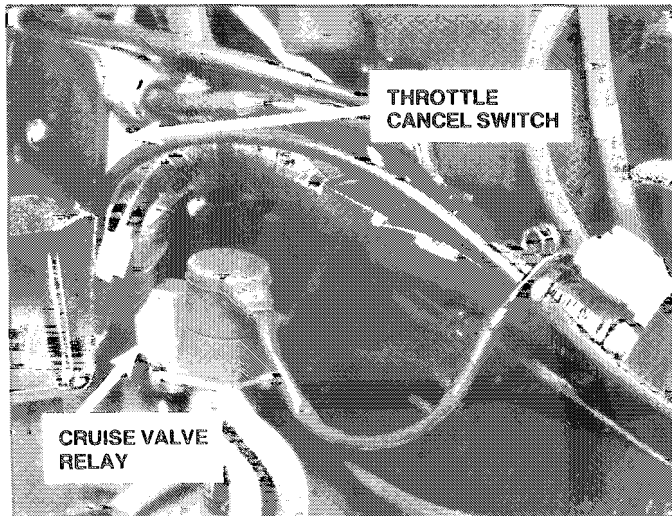
8. Behind Left Side of Fairing (Fairing Inner Cover Removed)



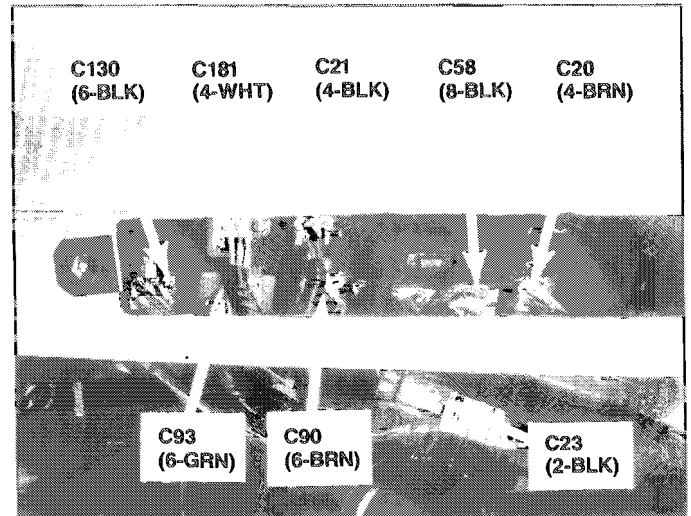
11. Left Rear of Fairing (Inner Cover Removed)



9. Behind Left Side of Fairing (Fairing Inner Cover Removed)



12. Behind Left Side of Fairing (Fairing Removed)

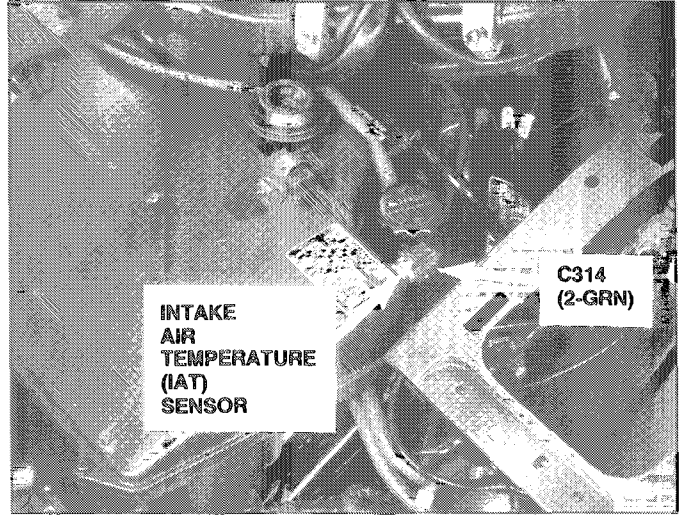


Component Location Photographs

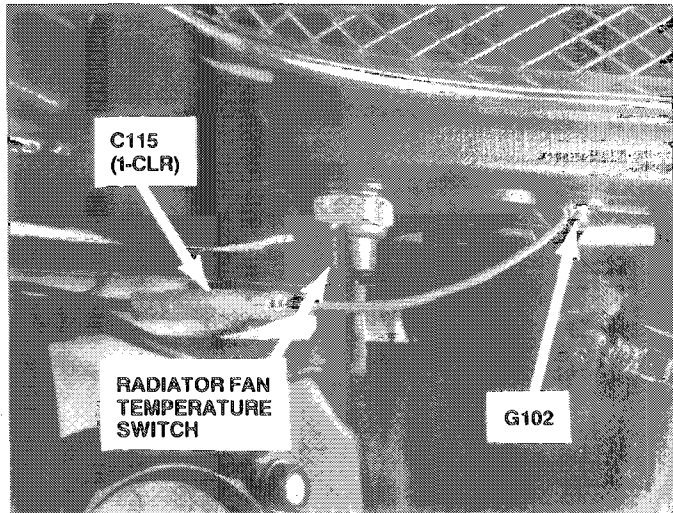
13. Front of Motorcycle, Behind Position Light



16. Right Air Cleaner Housing Area



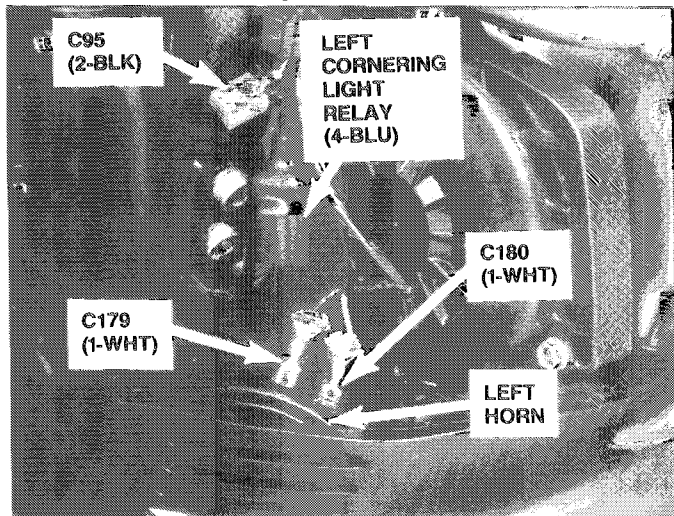
14. Below Left Radiator (Front Cover Removed)



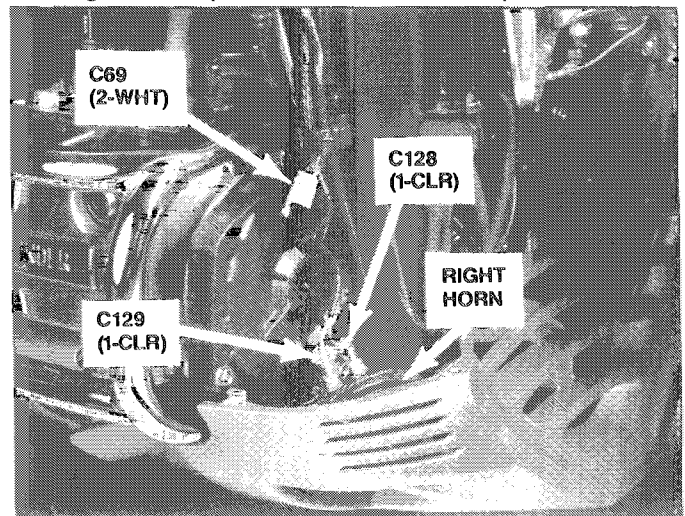
17. Lower Right Front of Engine (Under Cover Removed)



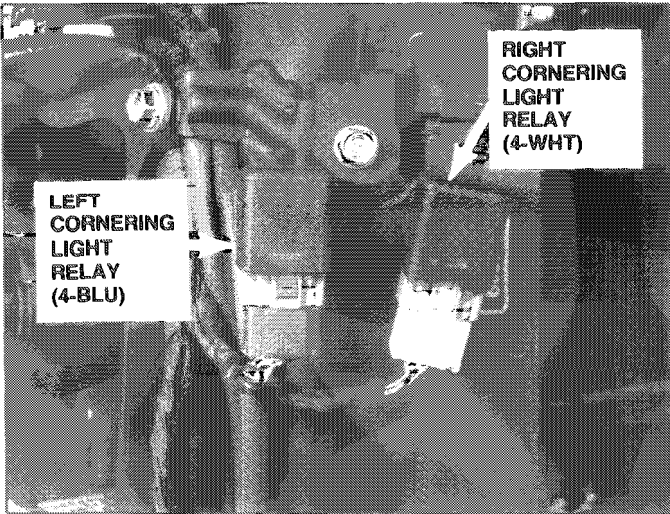
15. Behind Left Fairing Front Cover



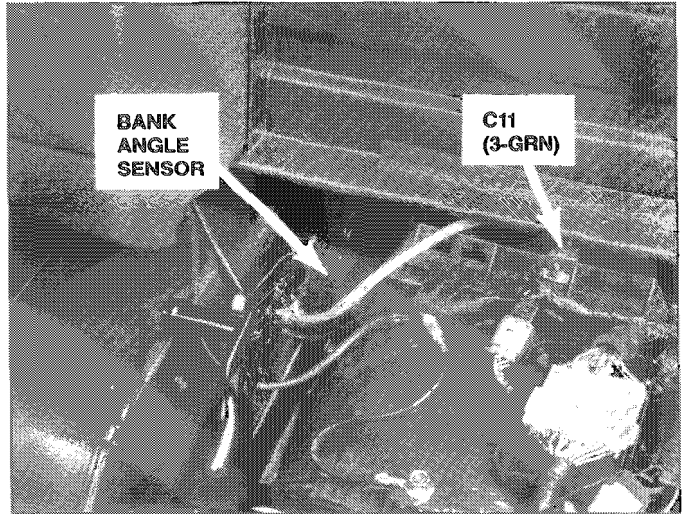
18. Right Front (Under Cover Removed)



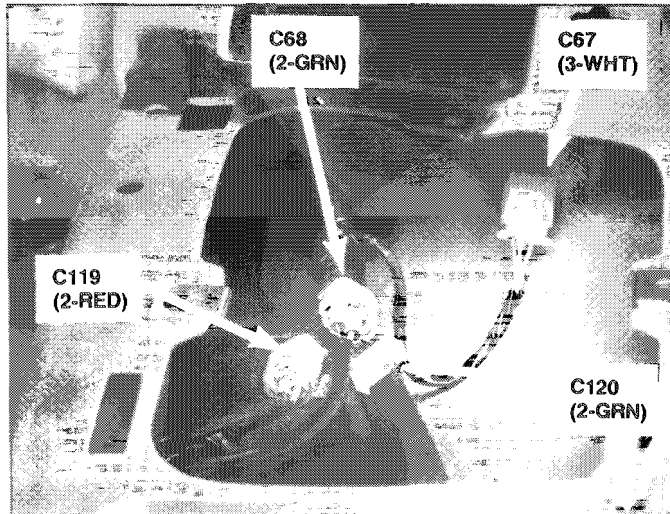
**19. Right Side of Fairing
(Lower Fairing Cover Removed)**



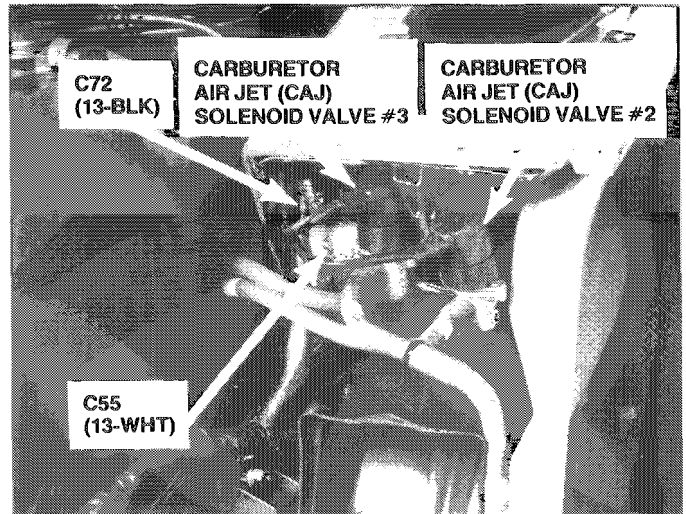
22. Below Rear of Seat



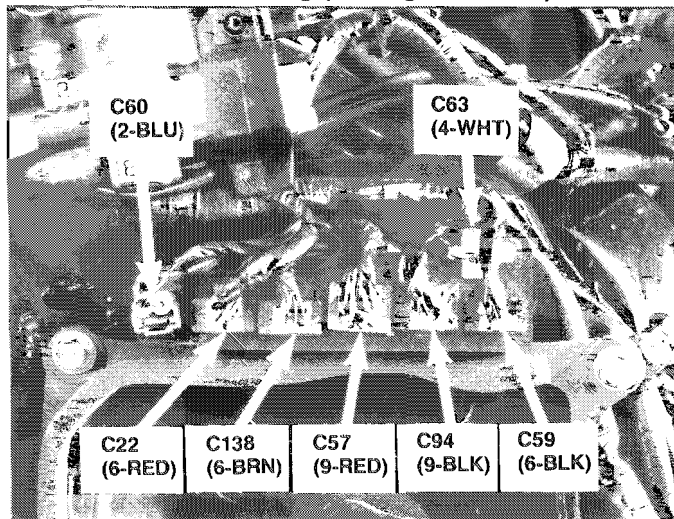
20. Below Right Fairing Pocket (Fairing Removed)



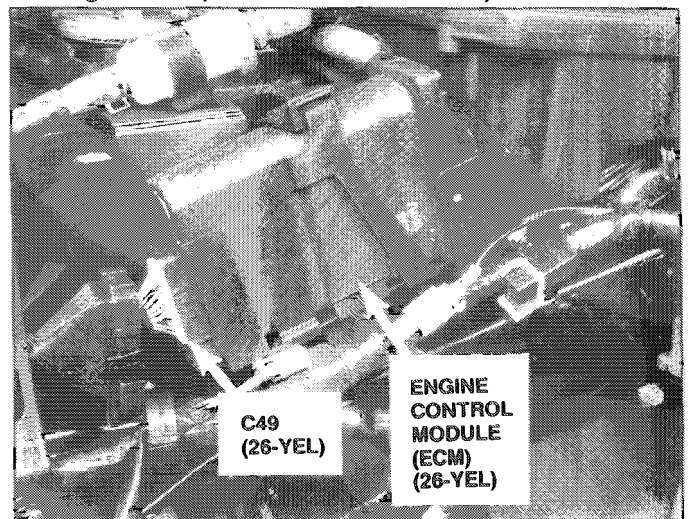
23. Rear of Right Fairing Pocket



21. Right Side of Fairing (Fairing Removed)

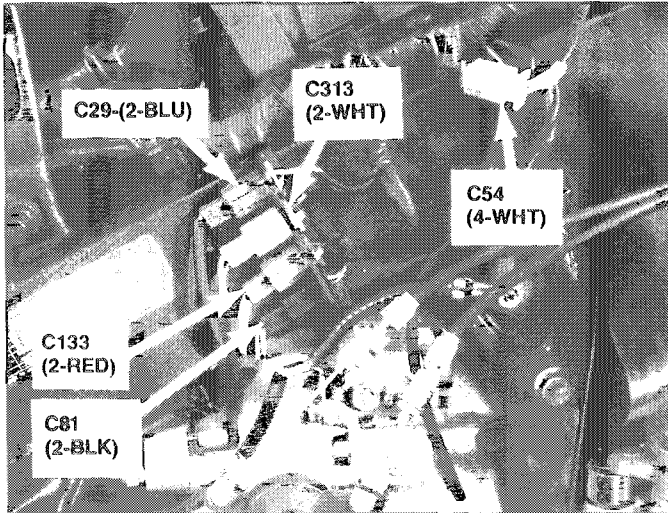


24. Right Side (Inner Cover Removed)

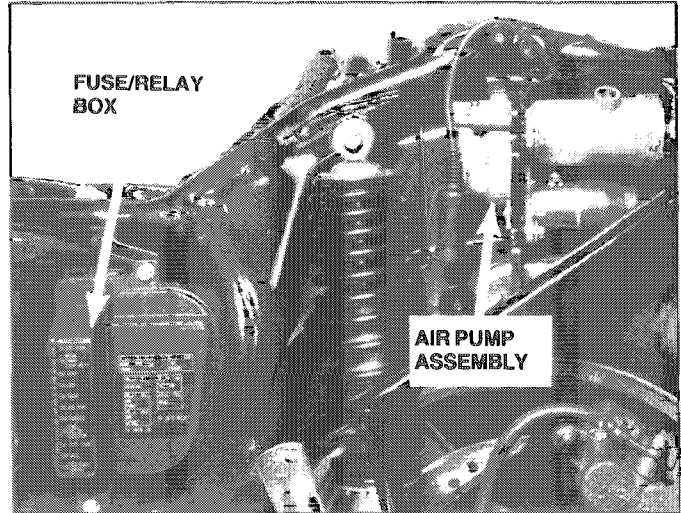


Component Location Photographs

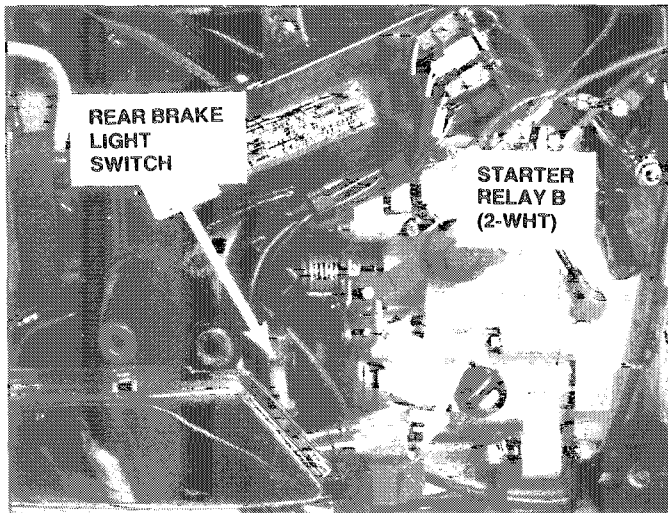
25. Right Side (Inner Cover Removed)



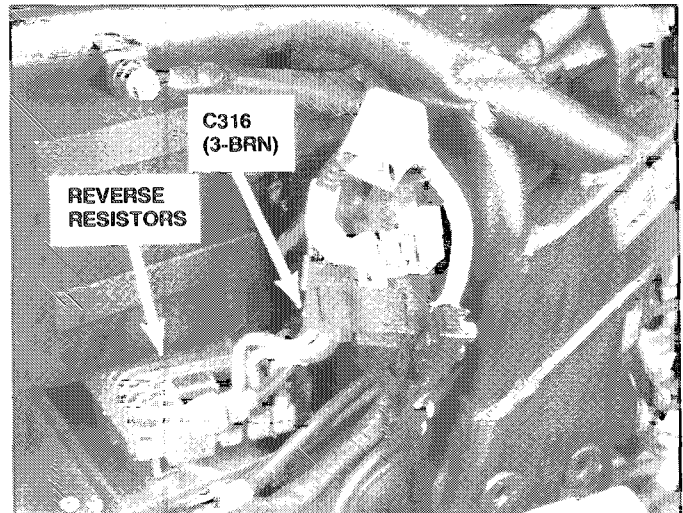
28. Left Side (Left Side Cover Removed)



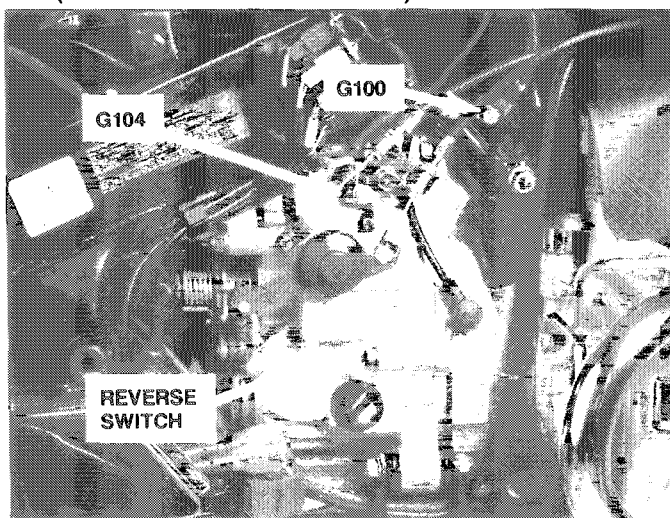
26. Right Rear of Engine
(Front Side Cover Removed)



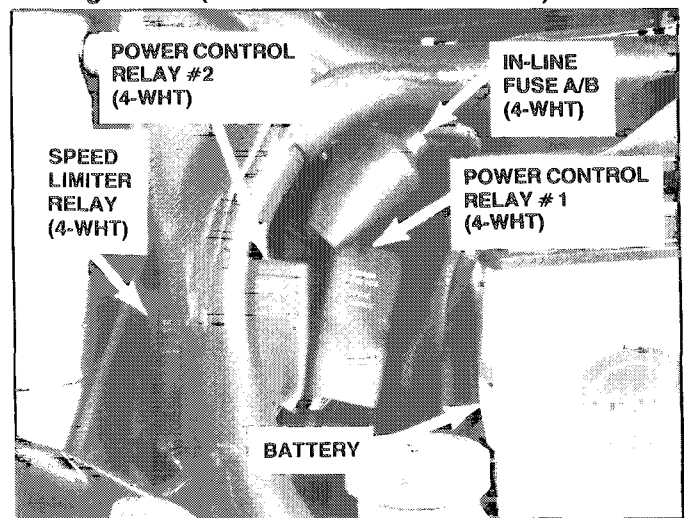
29. Right Side, Below Battery
(Rear Side Cover and Battery Box Removed)



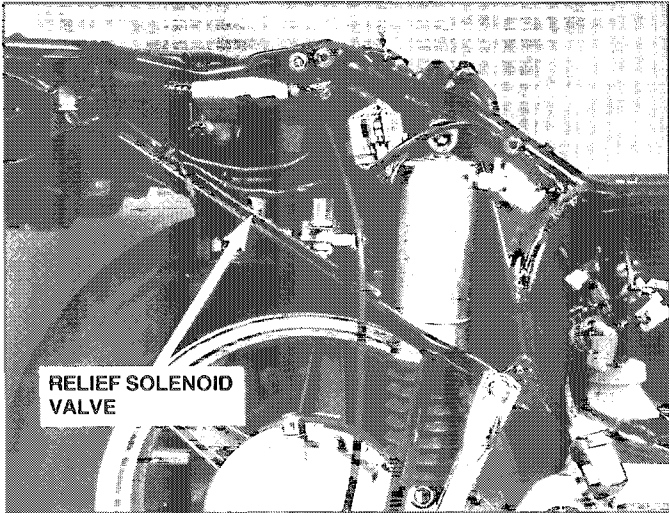
27. Right Rear of Engine
(Front Side Cover Removed)



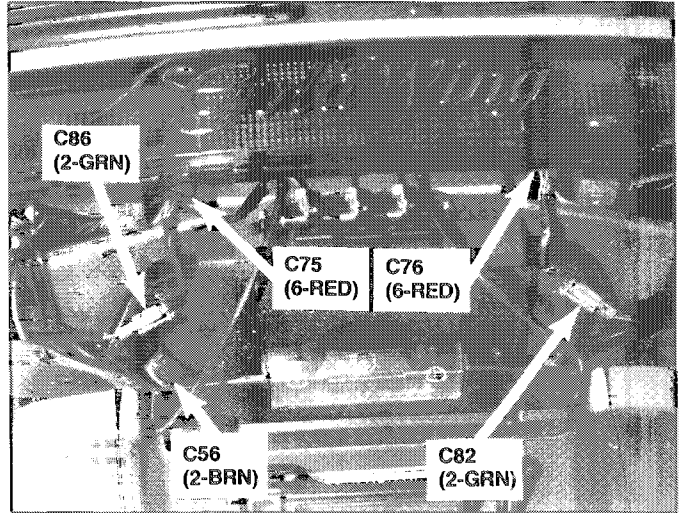
30. Right Side (Rear Side Cover Removed)



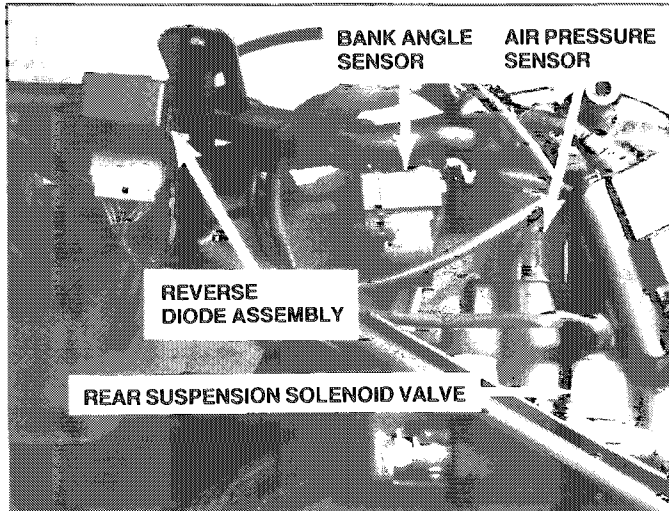
31. Right Side (Saddlebag Removed)



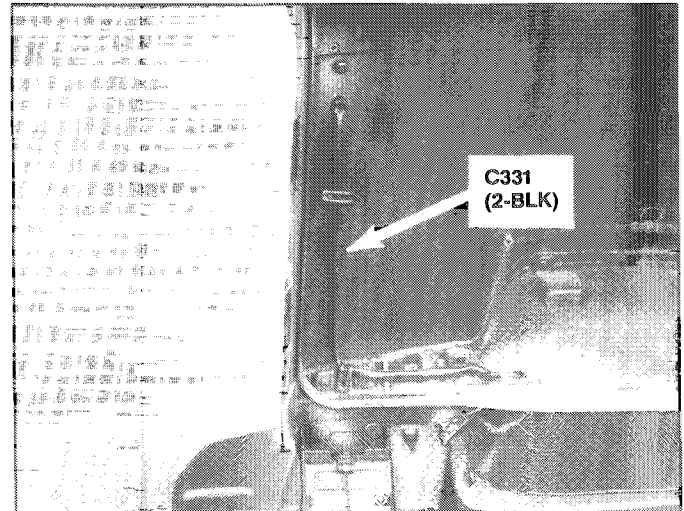
34. Below Rear of Trunk (Trunk Lower Cover Removed)



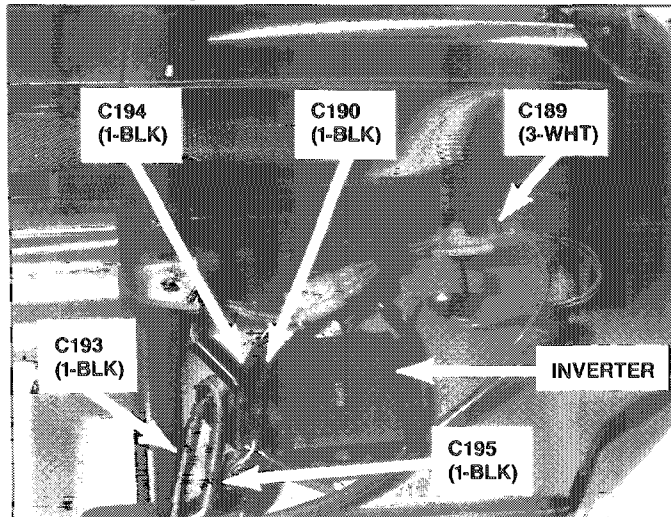
32. Right Side (Saddlebag Removed)



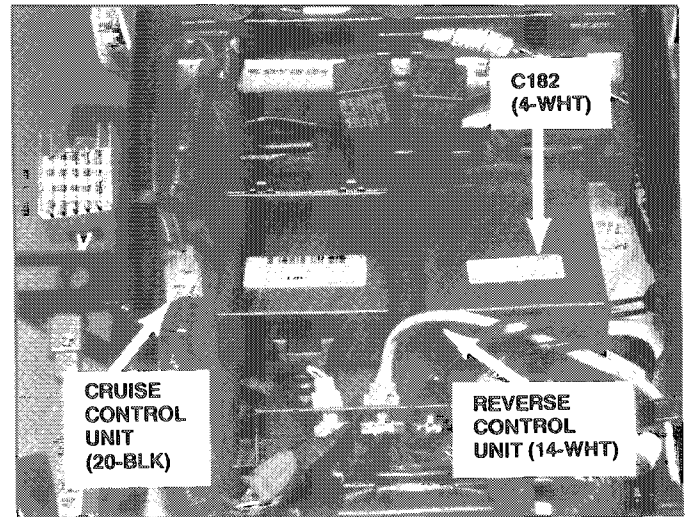
35. Inside Trunk, on Left Side of Lid



33. Lower Rear of Right Saddlebag (Saddlebag Lower Cover Removed)

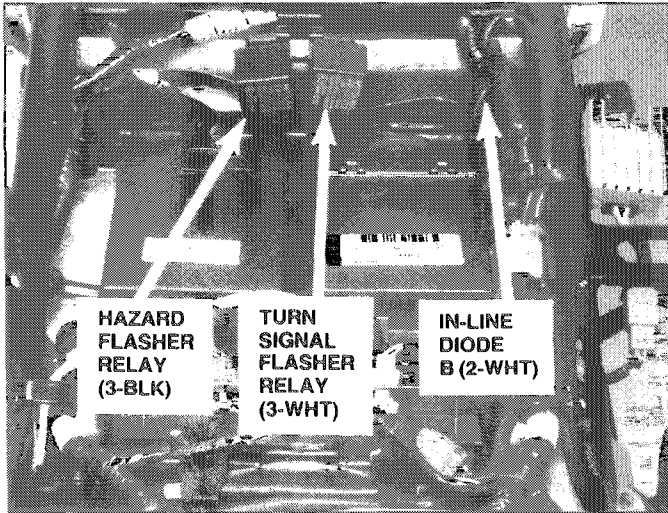


36. Top Rear, Under Trunk (Trunk Removed)

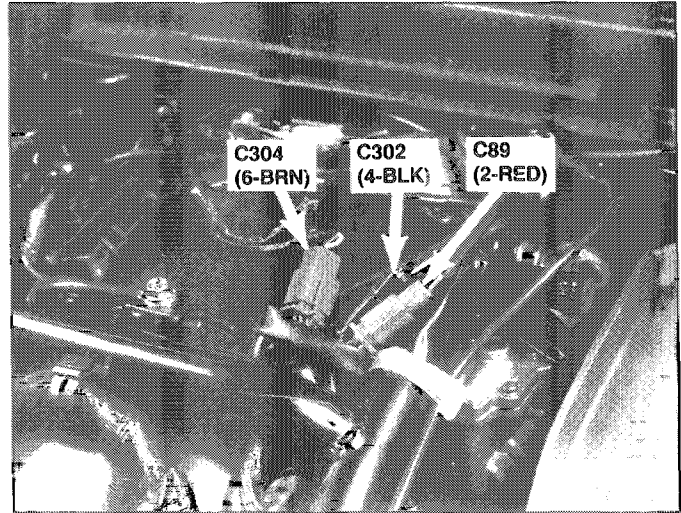


Component Location Photographs

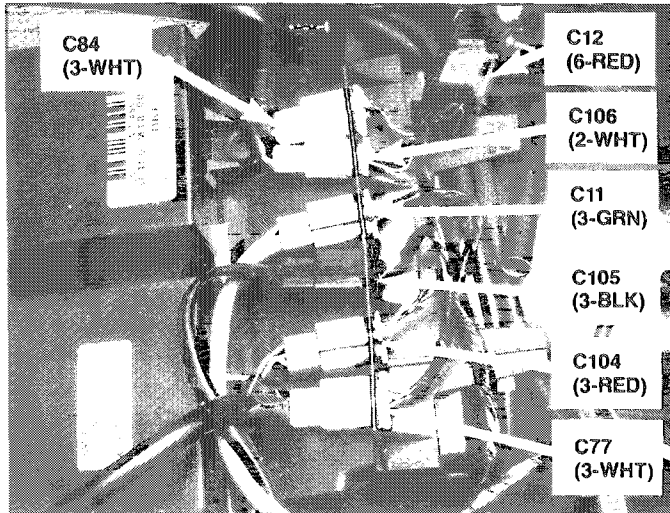
37. Top Rear, Under Trunk (Trunk Removed)



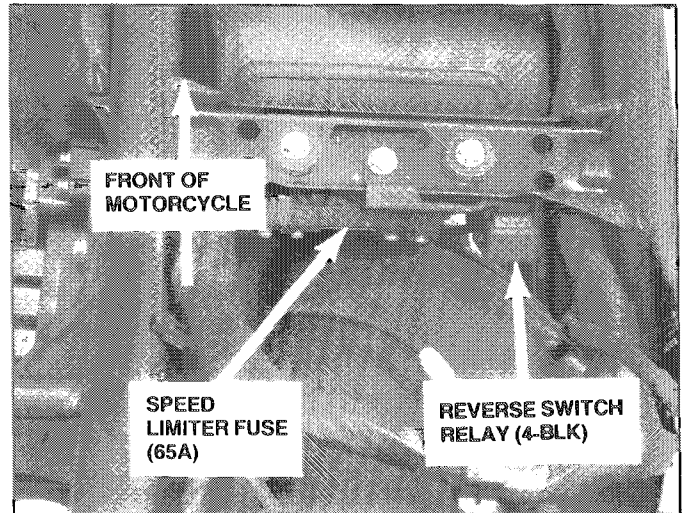
40. Under Rear of Seat (Seat Removed)



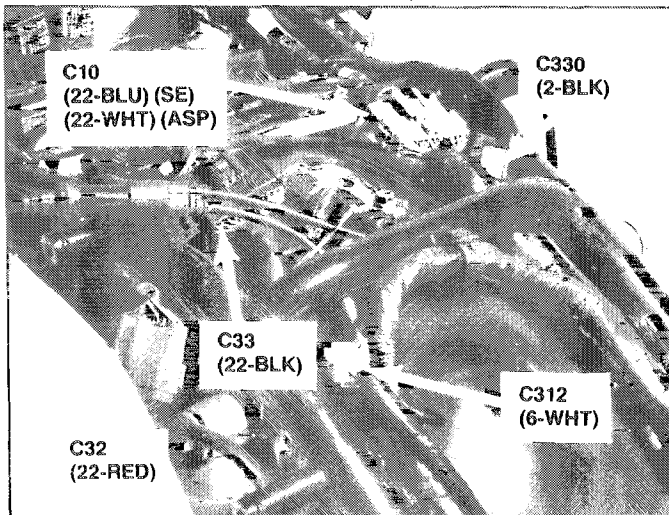
38. Top Rear, Under Trunk (Trunk Removed)



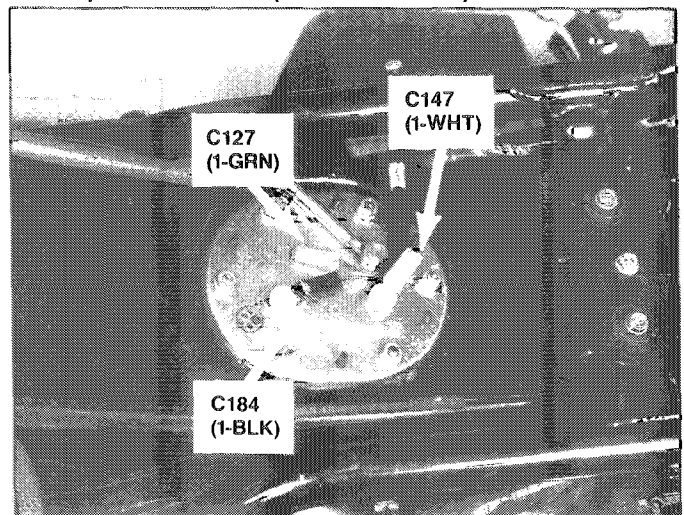
41. Under Front of Seat (Seat Removed)



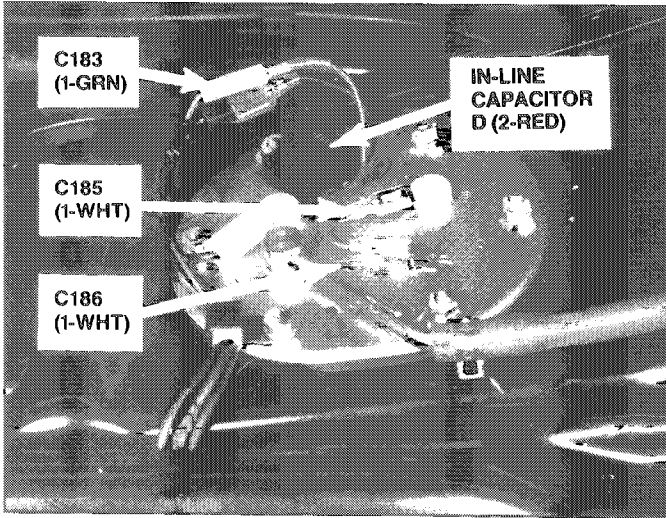
39. Under Seat (Trunk Removed)



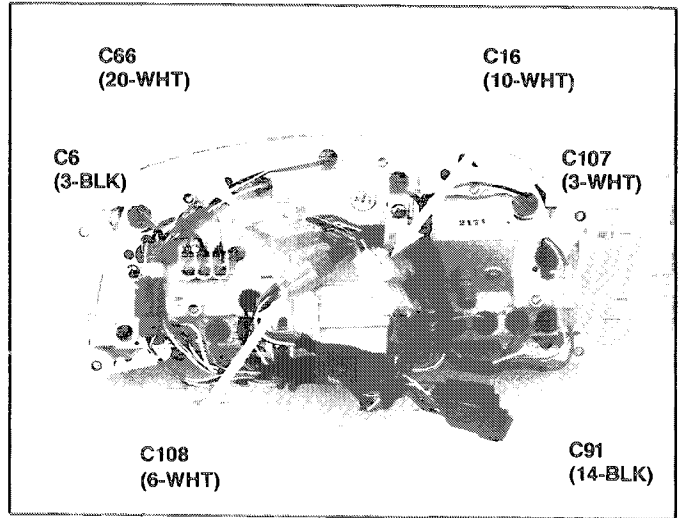
42. Top of Fuel Tank (Seat Removed)



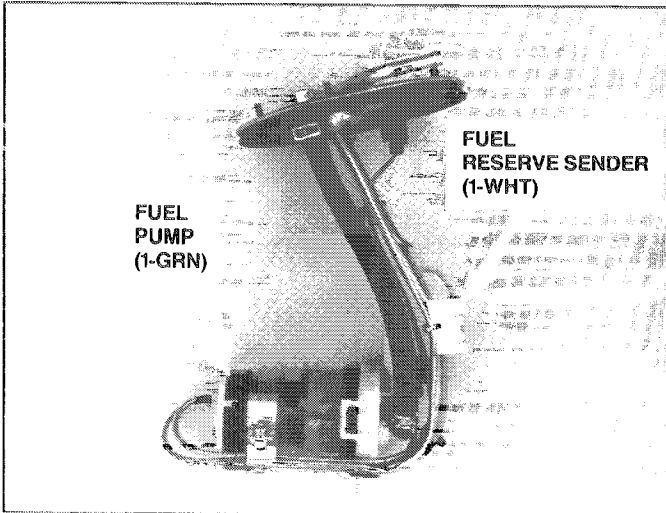
**43. Top of Fuel Tank (Seat Removed)
(With CB Radio)**



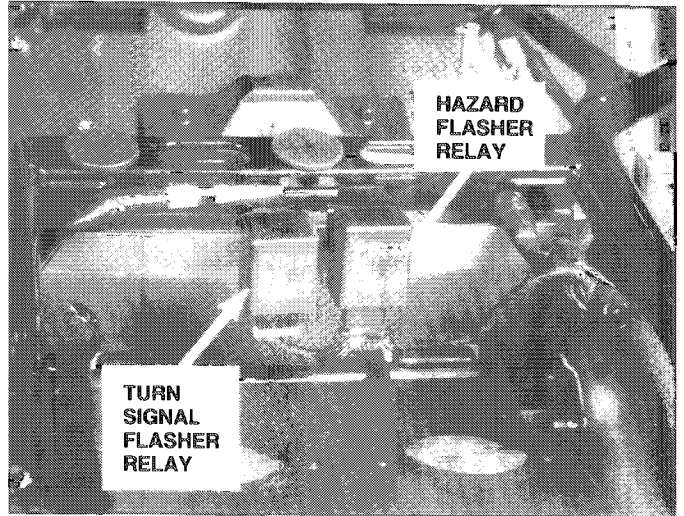
**46. Rear of Instrument Panel
(Removed from Fairing)**



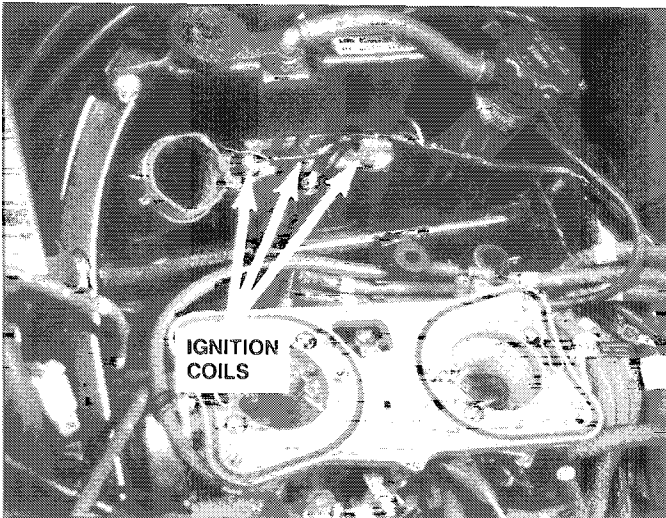
**44. Fuel Pump Assembly
(Removed from Fuel Tank)**



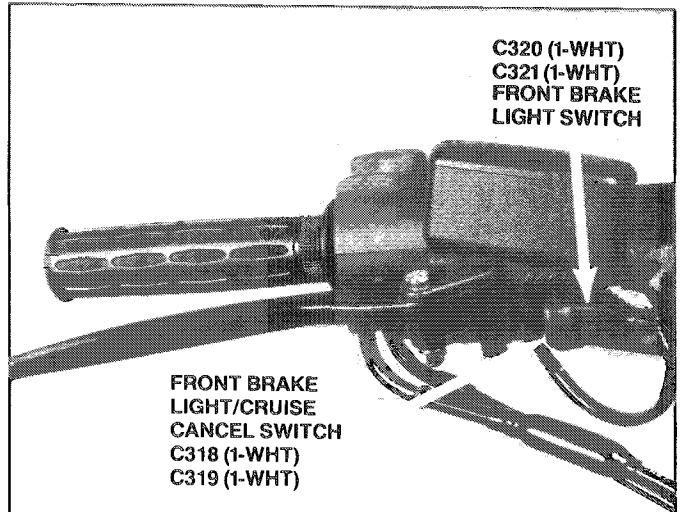
47. Below Trunk Assembly



45. Top of Engine (Top Compartment and Air Cleaner Housing Removed)

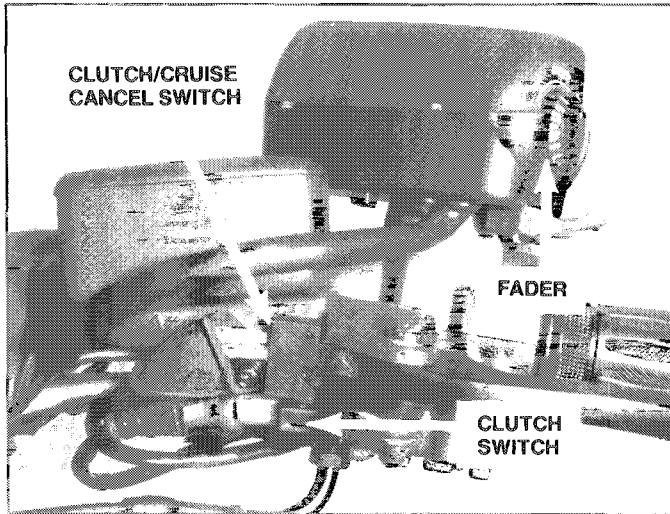


48. Right Side of Handlebar

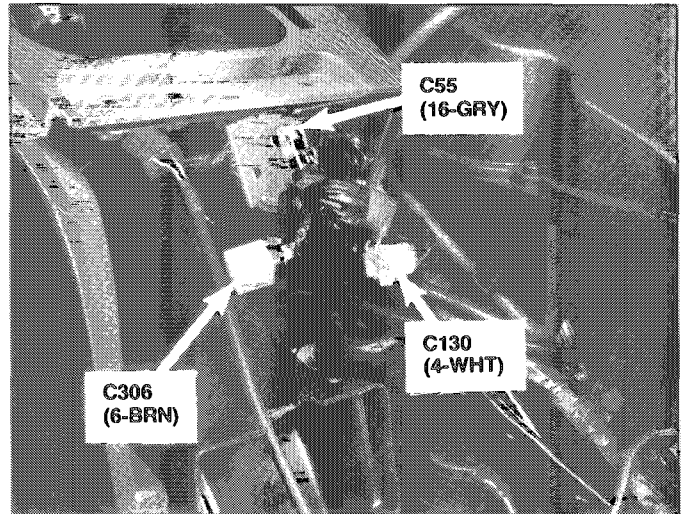


Component Location Photographs

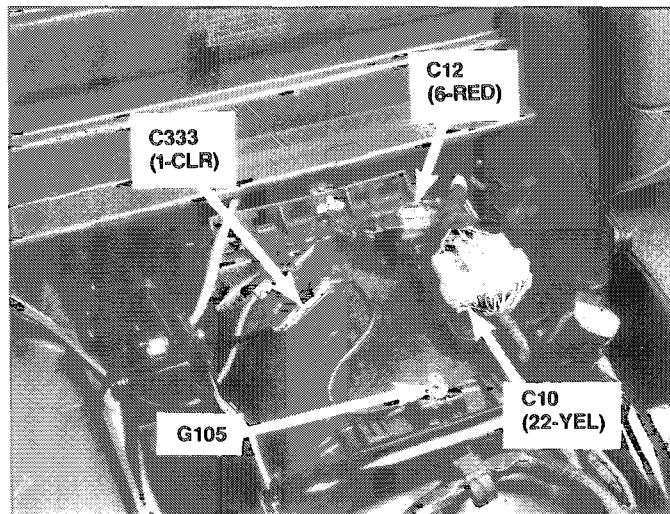
49. Left Side of Handlebar



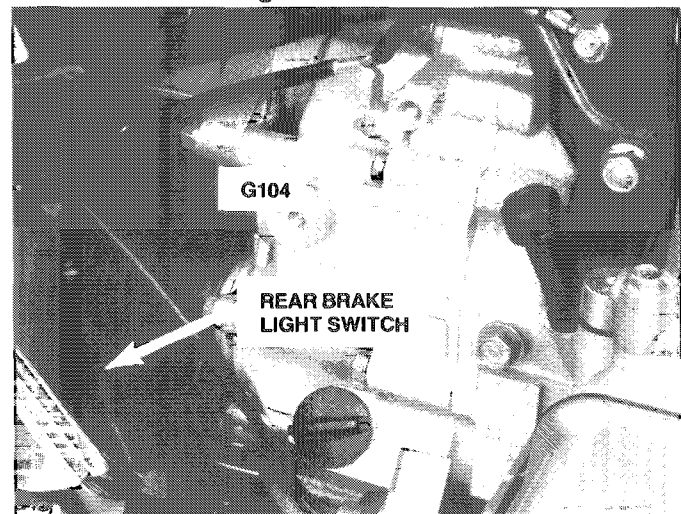
52. Below Left Fairing Pocket



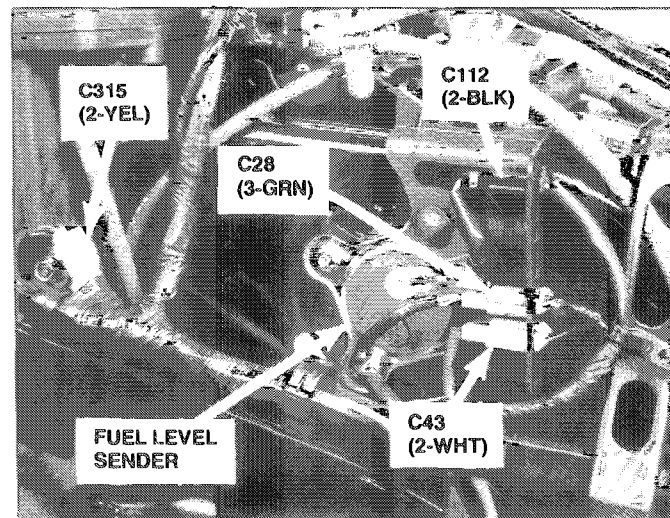
50. Below Rear of Seat



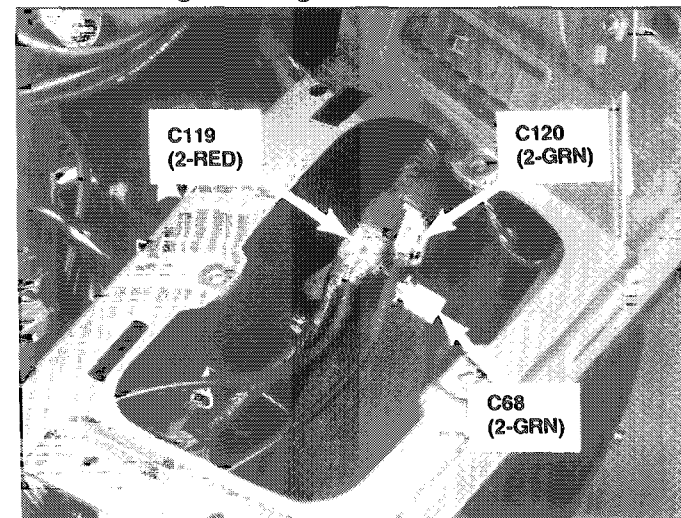
53. Behind Front Right Side Cover



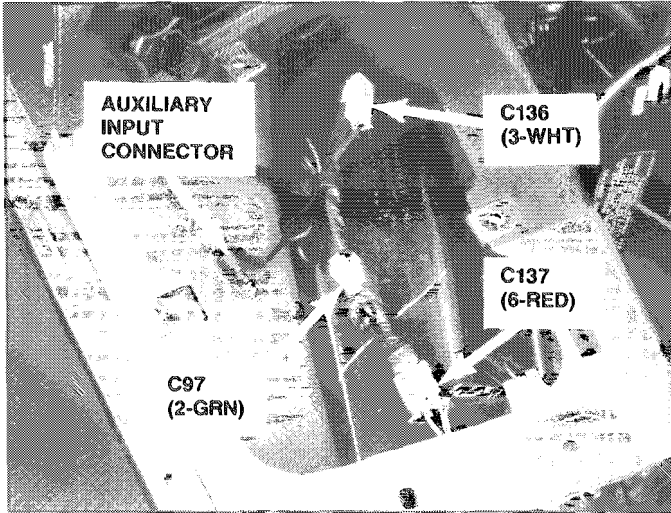
51. Left Side of Fuel Tank



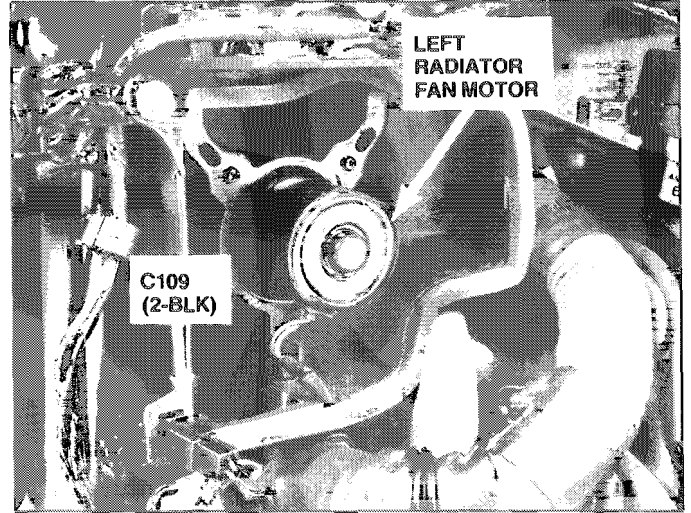
54. Inside Right Fairing Pocket



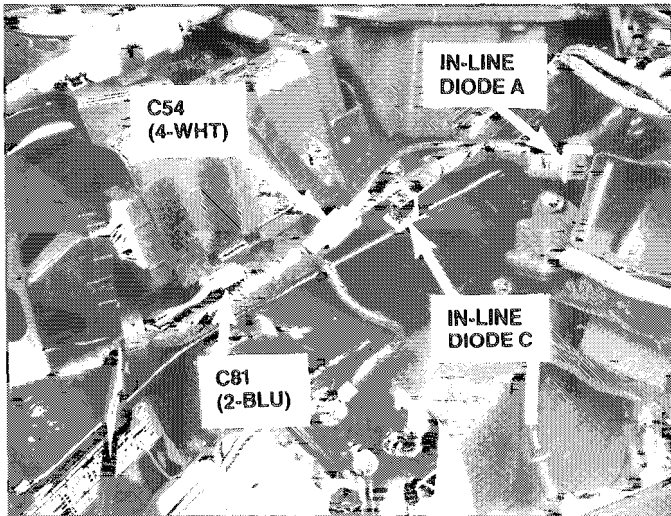
55. Below Left Fairing Pocket



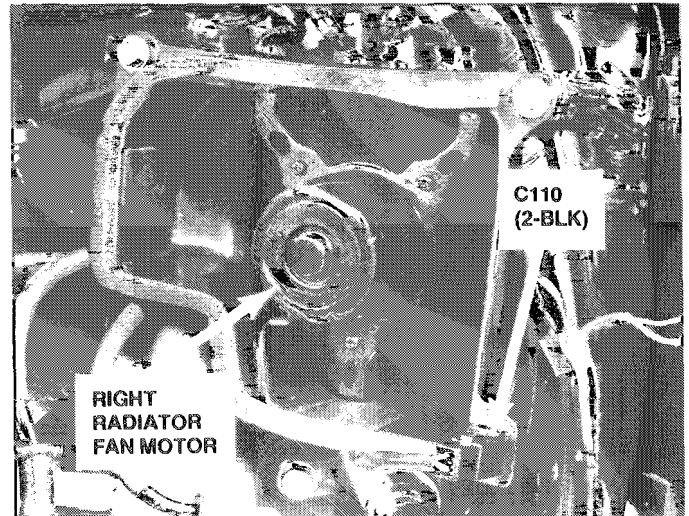
58. On Left Fan Shroud



56. Right Side (Inner Cover Removed)



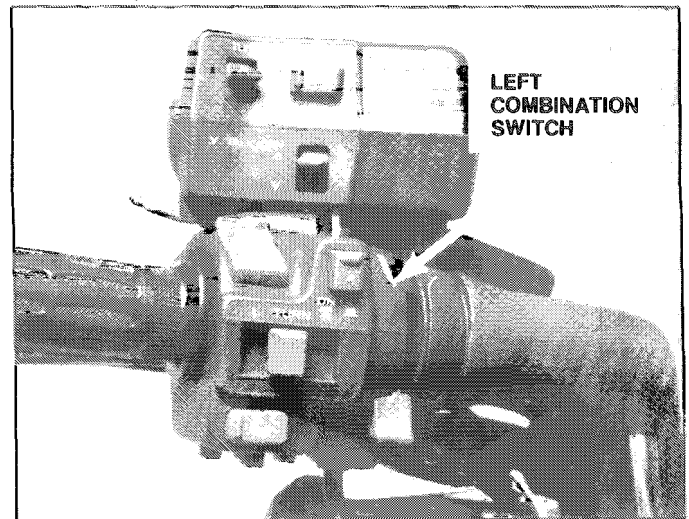
59. On Right Fan Shroud



57. Right Front (Fairing Lower Cover Removed)

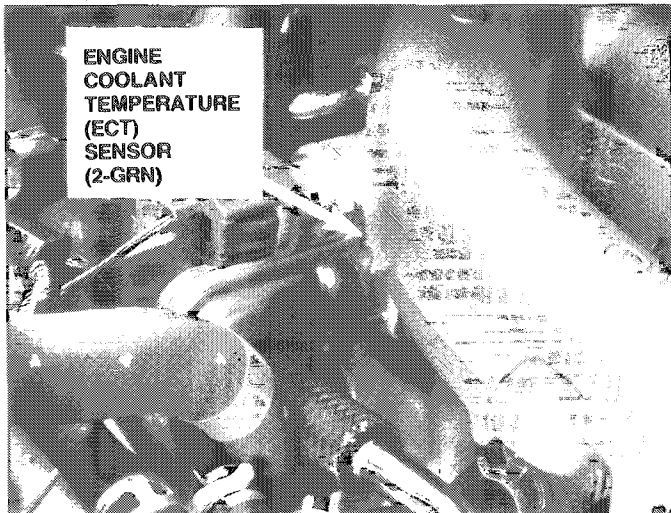


60. On Top of Left Handlebar

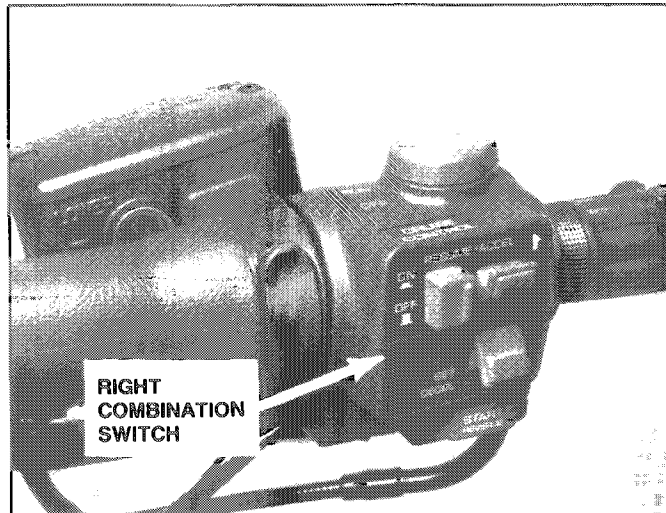


Component Location Photographs

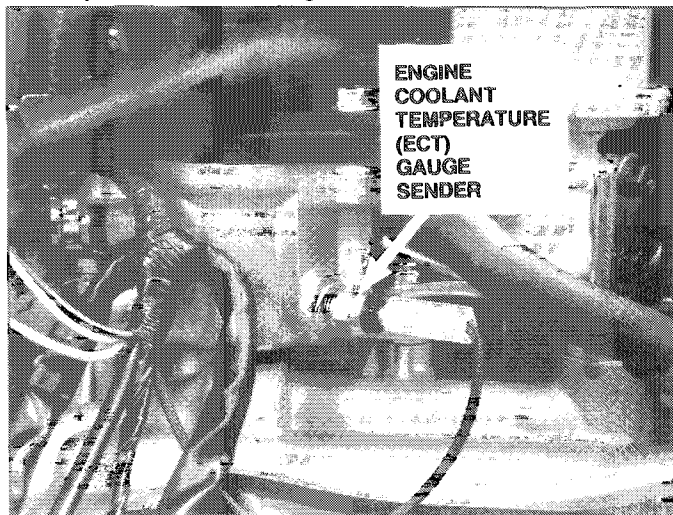
61. Top Right Front of Engine



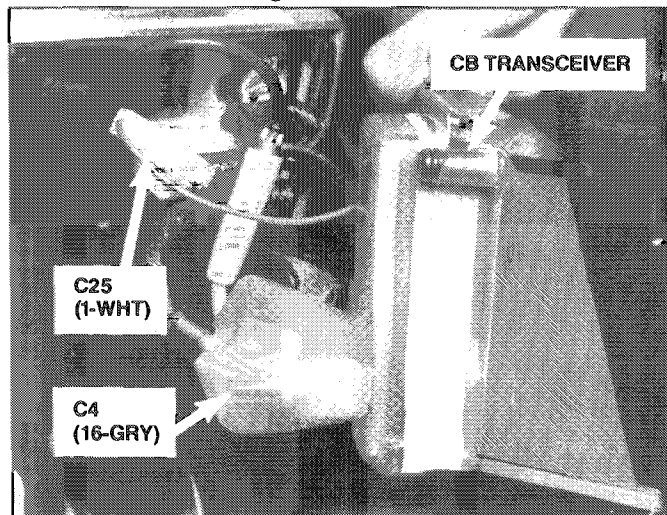
64. Top Right Handlebar



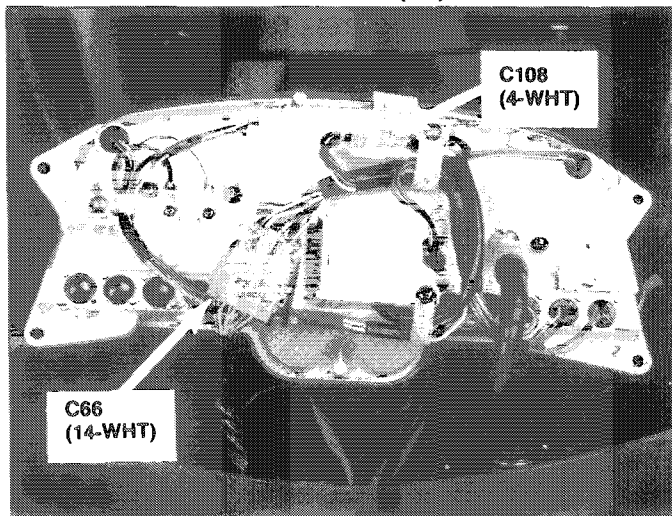
62. Top Left Front of Engine



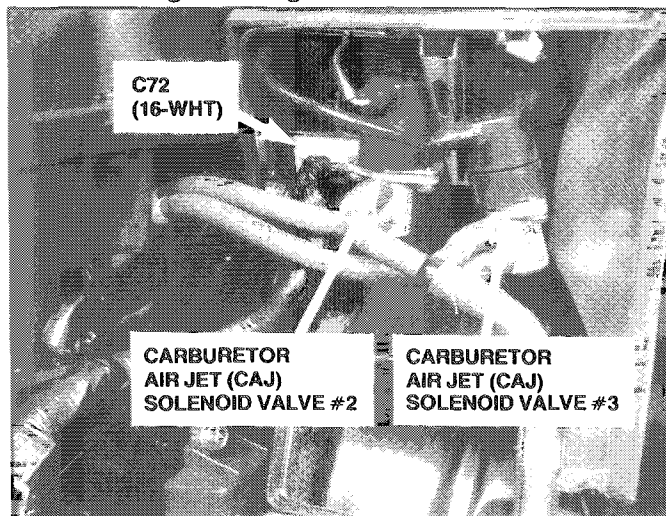
65. Below Left Fairing Pocket



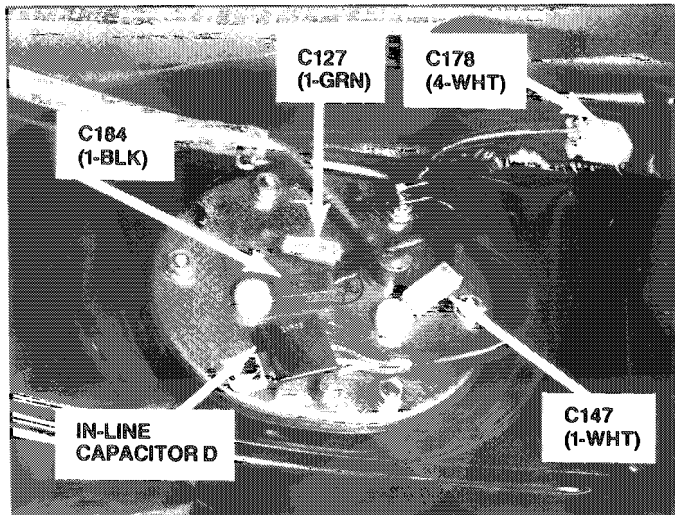
63. Rear of Instrument Cluster (Int)



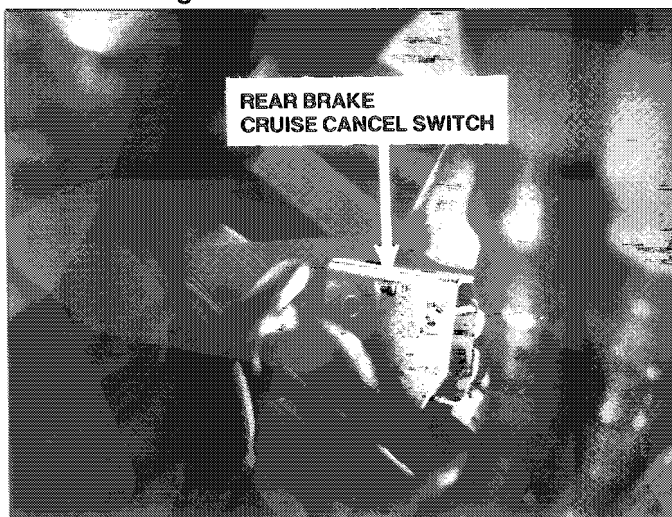
66. Below Right Fairing Pocket



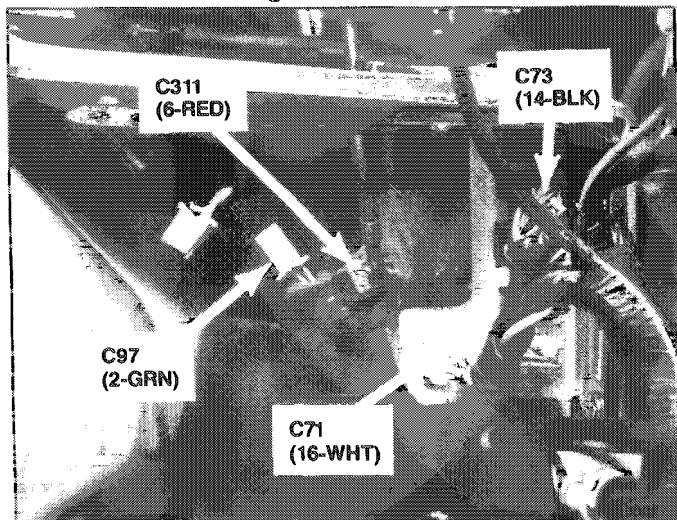
67. Below Seat, on Top of Fuel Tank



68. Behind Right Front Side Cover



69. Below Left Fairing Pocket



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