

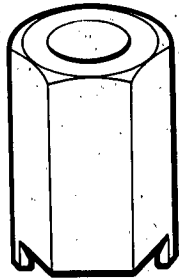
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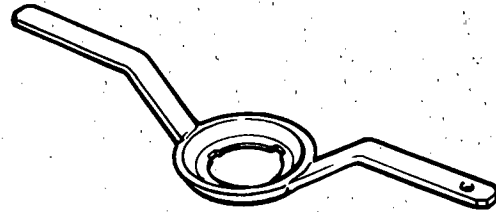
# Special Tools

## Special Tools

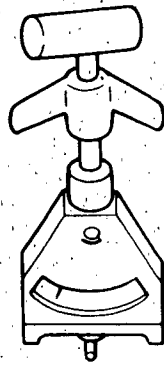
Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	07JAA-001000B	Antenna Nut Wrench	1	23-174, 175
②	07920-SB20000 or 07NAC-SR20100	Fuel Sender Wrench	1	23-119
③	07JGG-0010100A	Belt Tension Gauge	1	23-101



①



②



③

# Troubleshooting



## Tips and Precautions

### Before Troubleshooting

#### NOTE:

The radio may have a coded theft protection circuit.

Be sure to get the customer's code number before

- Disconnecting the battery.
- Removing the No. 14 (15 A) fuse.  
(in the under-dash fuse/relay box)
- Removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

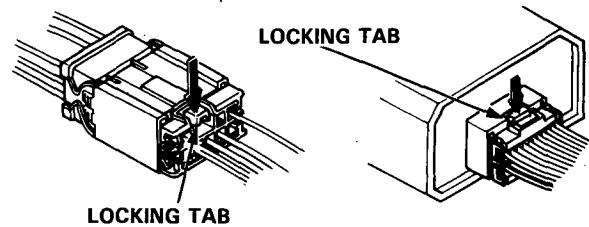
- Check applicable fuses in the appropriate fuse box.
- Check the battery for damage, state of charge, and clean and tight connections.
- Check the alternator belt tension.

#### CAUTION:

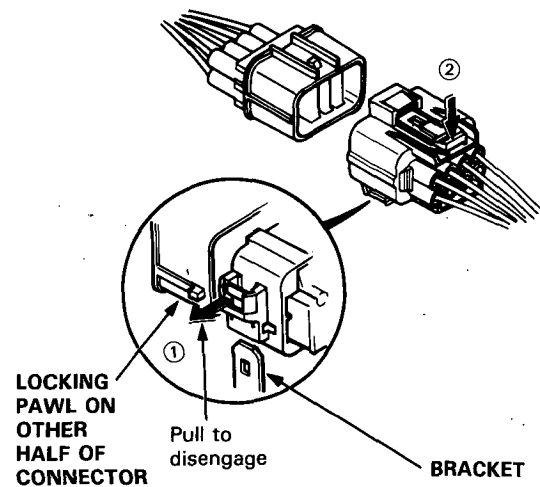
- Do not quick-charge a battery unless the battery ground cable has been disconnected. Otherwise you will damage the alternator diodes.
- Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.

### Handling Connectors

- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks.



- Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its bracket.

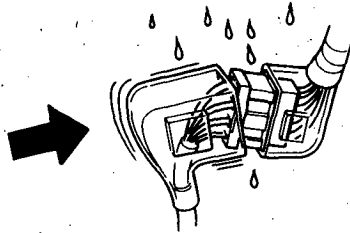


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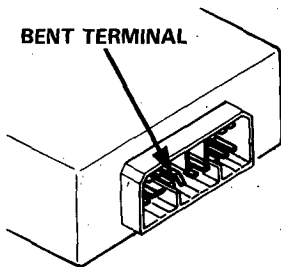
# Troubleshooting

## Tips and Precautions (cont'd)

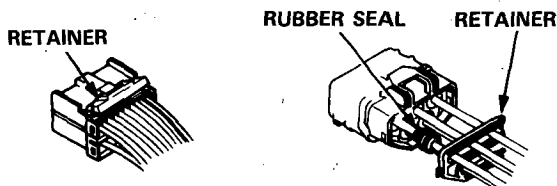
- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



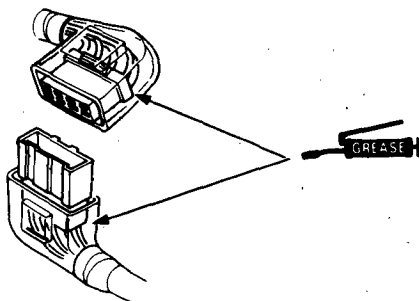
- Before connecting connectors, make sure the terminals are in place and not bent.



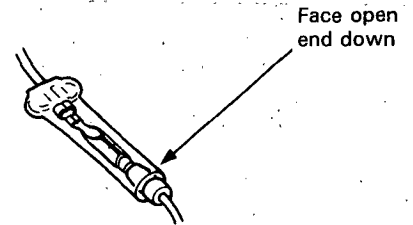
- Check for loose retainer and rubber seals.



- The backs of some connectors are packed with grease. Add grease if it's needed. If the grease is contaminated, replace it.

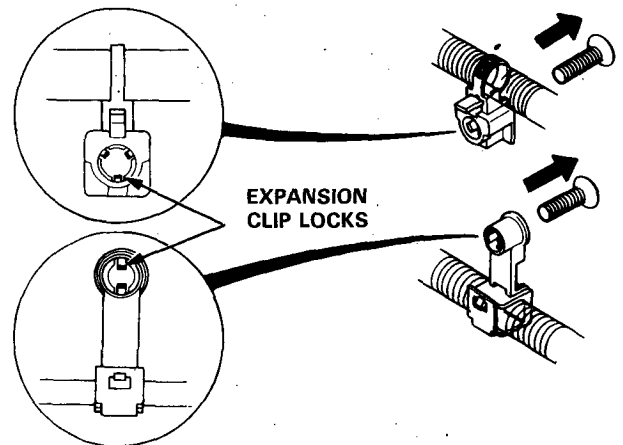


- Insert the connector all the way and make sure it is securely locked.
- Position wires so that the open end of the cover faces down.

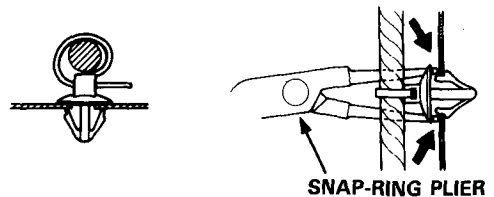


## Handling Wires and Harnesses

- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks.



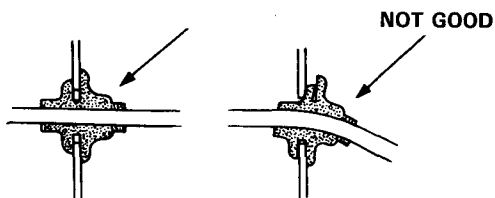
Slip pliers under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.



- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.

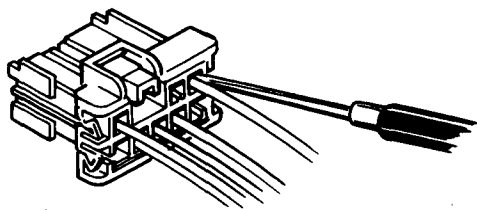


- Seat grommets in their grooves properly.

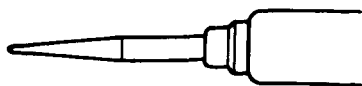


### Testing and Repairs

- Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- After installing parts, make sure that no wires are pinched under them.
- When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- If possible, insert the probe of the tester from the wire side (except waterproof connector).



- Use a probe with a tapered tip.



- Refer to the instructions in the Honda Terminal Kit for identification and replacement of connector terminals.

## Five-step Troubleshooting

### 1. Verify The Complaint

Turn on all the components in the problem circuit to verify 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 feed through the circuit components to ground. 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 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 original problem does not recur.

# Troubleshooting

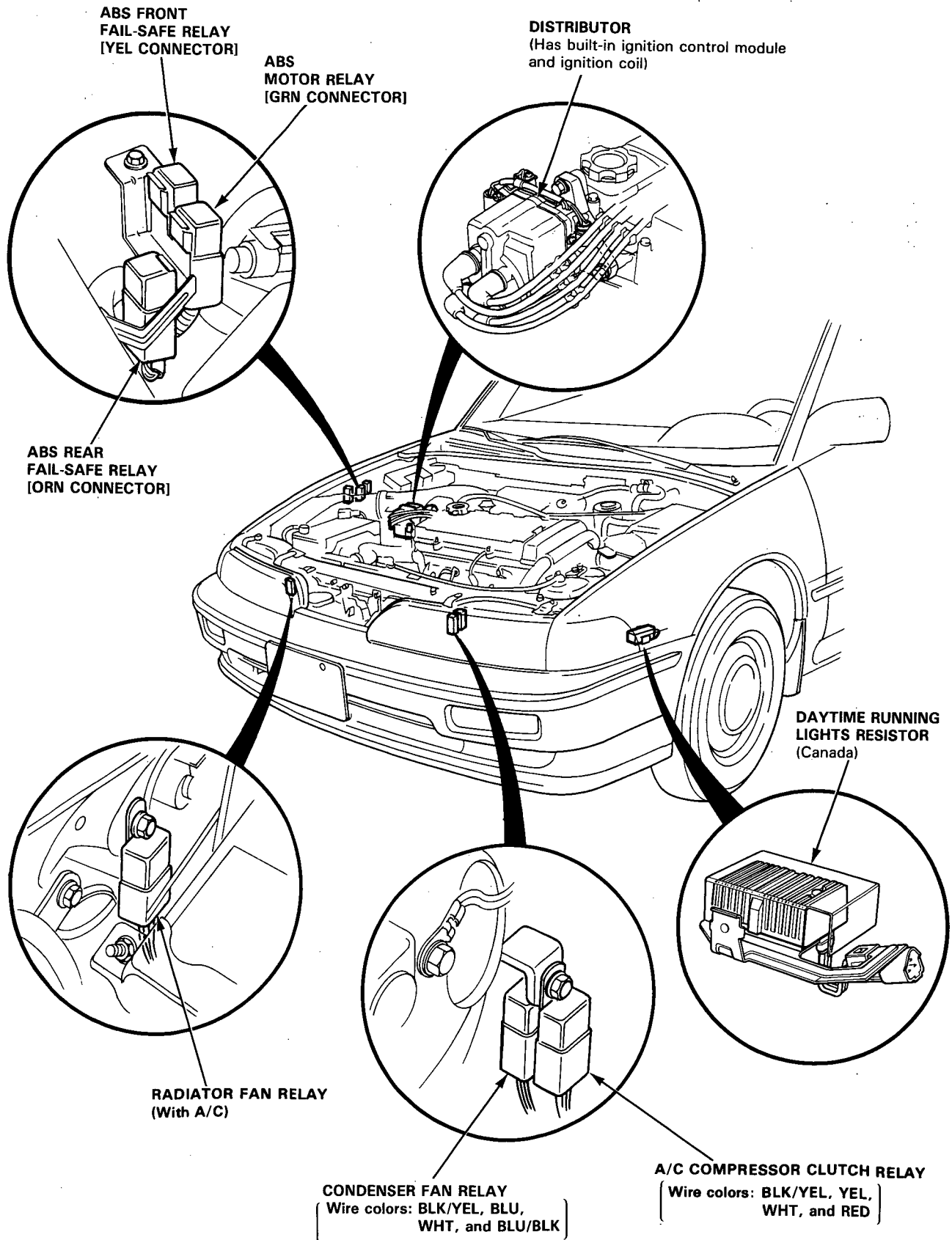
## Schematic Symbols

<p><b>BATTERY</b></p> <p>or</p>	<p><b>GROUND</b></p> <p>Ground terminal</p> <p>Component ground</p>		<p><b>FUSE</b></p>	<p><b>COIL, SOLENOID</b></p>	<p><b>CIGARETTE LIGHTER</b></p>
<p><b>RESISTOR</b></p>	<p><b>VARIABLE RESISTOR</b></p>	<p><b>THERMISTOR</b></p>	<p><b>IGNITION SWITCH</b></p>	<p><b>BULB</b></p>	<p><b>HEATER</b></p>
<p><b>MOTOR</b></p>	<p><b>PUMP</b></p>	<p><b>CIRCUIT BREAKER</b></p>	<p><b>HORN</b></p>	<p><b>DIODE</b></p>	<p><b>SPEAKER, BUZZER</b></p>
<p><b>ANTENNA</b></p> <p>Mast</p> <p>Window</p>		<p><b>TRANSISTOR (Tr)</b></p>		<p><b>Wire Color Codes</b></p> <p>The following abbreviations are used to identify wire colors in the circuit schematics.</p> <p>WHT ..... White          YEL ..... Yellow          BLK ..... Black          BLU ..... Blue          GRN ..... Green          RED ..... Red          ORN ..... Orange          PNK ..... Pink          BRN ..... Brown          GRY ..... Gray          PUR ..... Purple          LT BLU ..... Light Blue          LT GRN ..... Light Green</p> <p>The wire insulation has one color or one color with another color stripe. The second color is the stripe.</p>	
<p><b>RELAY (In normal position)</b></p> <p>Normally open relay</p> <p>Normally closed relay</p>		<p><b>CONDENSER</b></p>			
<p><b>SWITCH (In normal position)</b></p> <p>Normally open switch</p> <p>Normally closed switch</p>		<p><b>LIGHT EMITTING DIODE (LED)</b></p>			
<p><b>CONNECTION</b></p> <p>Input</p> <p>Output</p>		<p><b>CONNECTOR</b></p> <p>Male</p> <p>Female</p>			



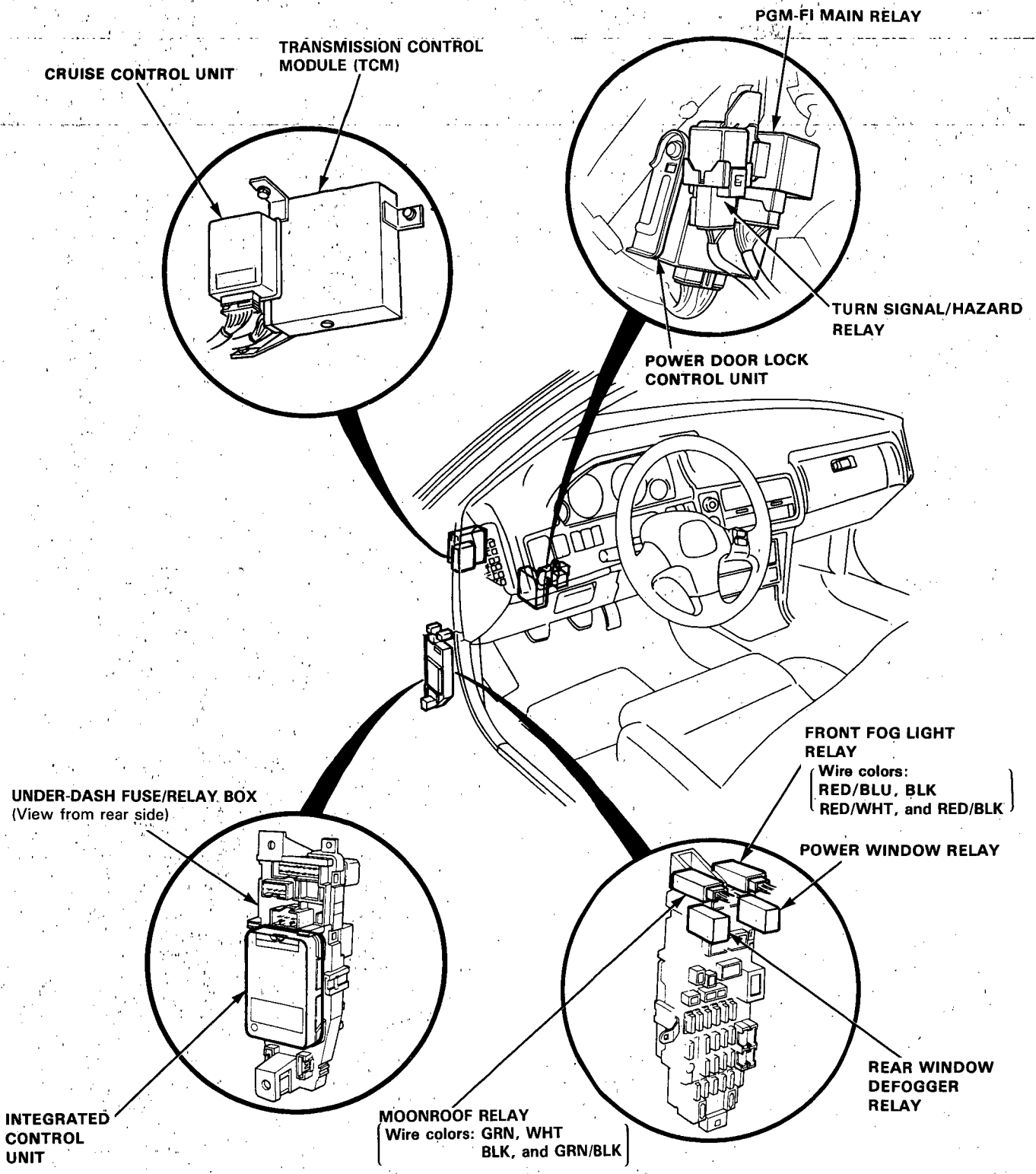
# Relay and Control Unit Locations

## Engine Compartment

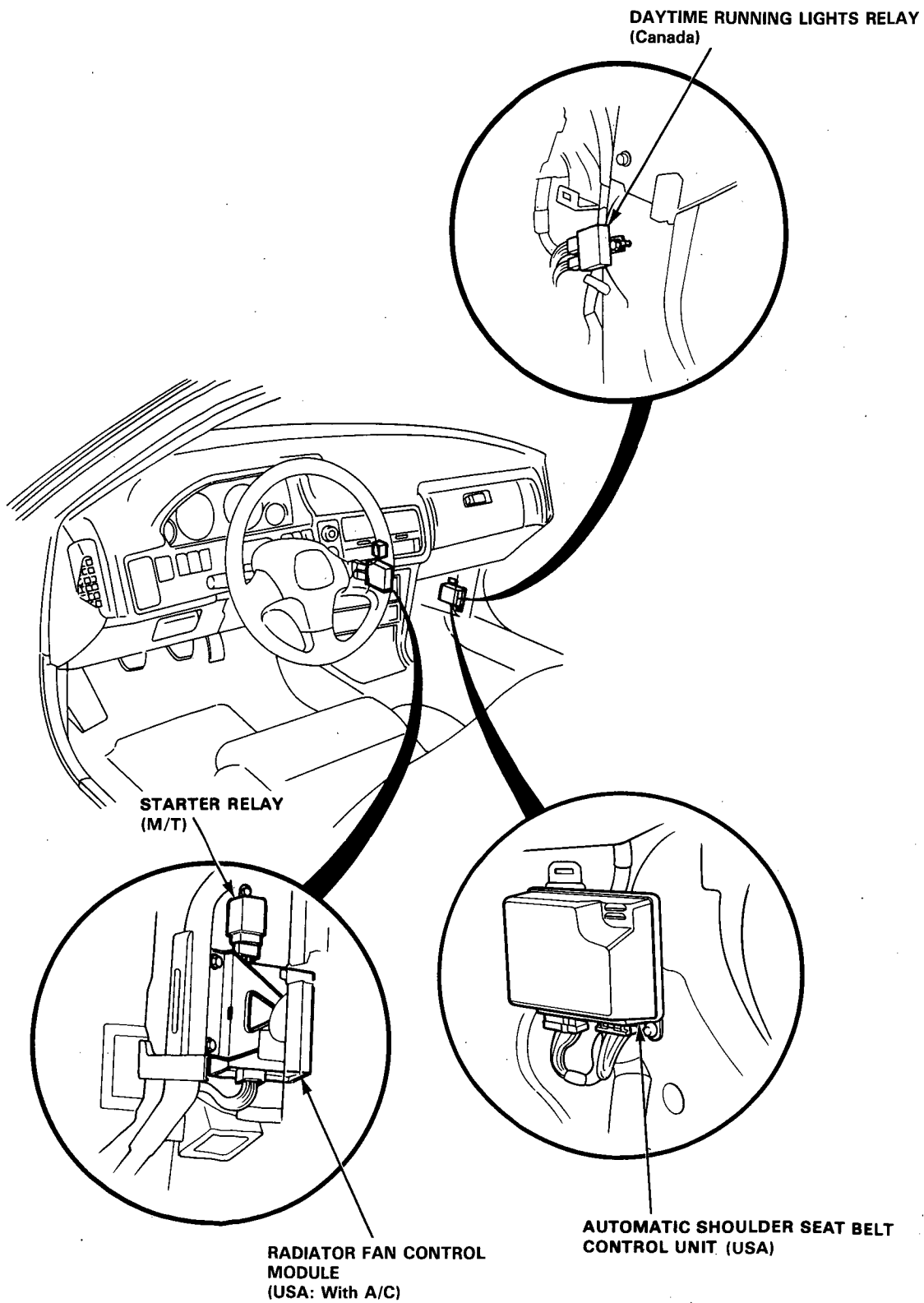


# Relay and Control Unit Locations

## Dashboard



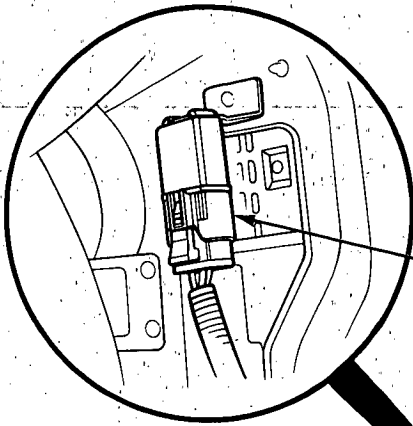




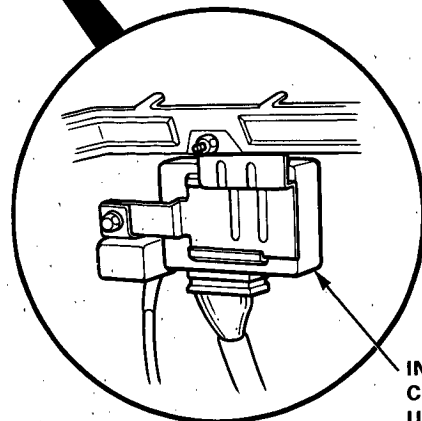
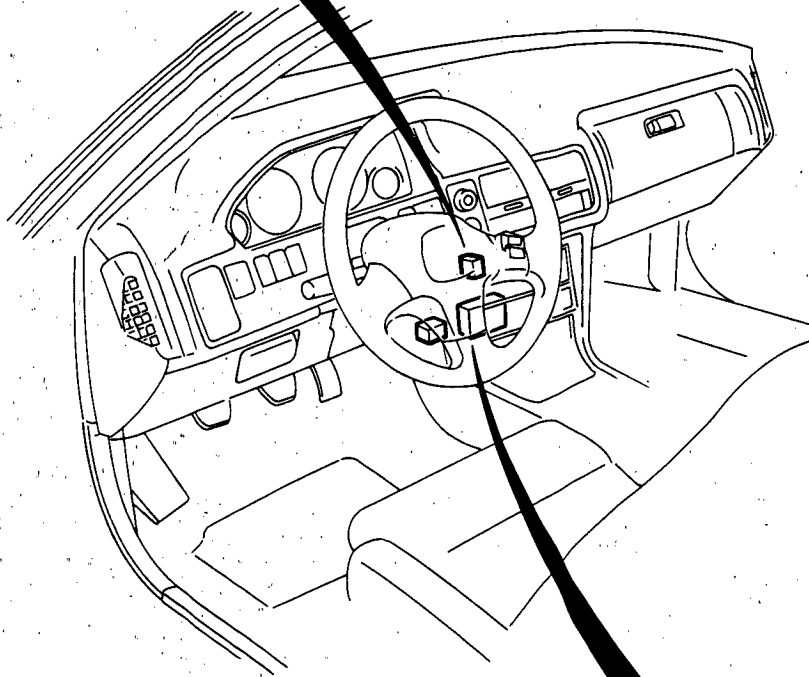
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# Relay and Control Unit Locations

Dashboard (cont'd)



CIGARETTE LIGHTER RELAY



INTERLOCK  
CONTROL  
UNIT (A/T)

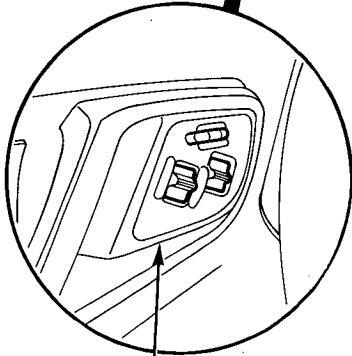
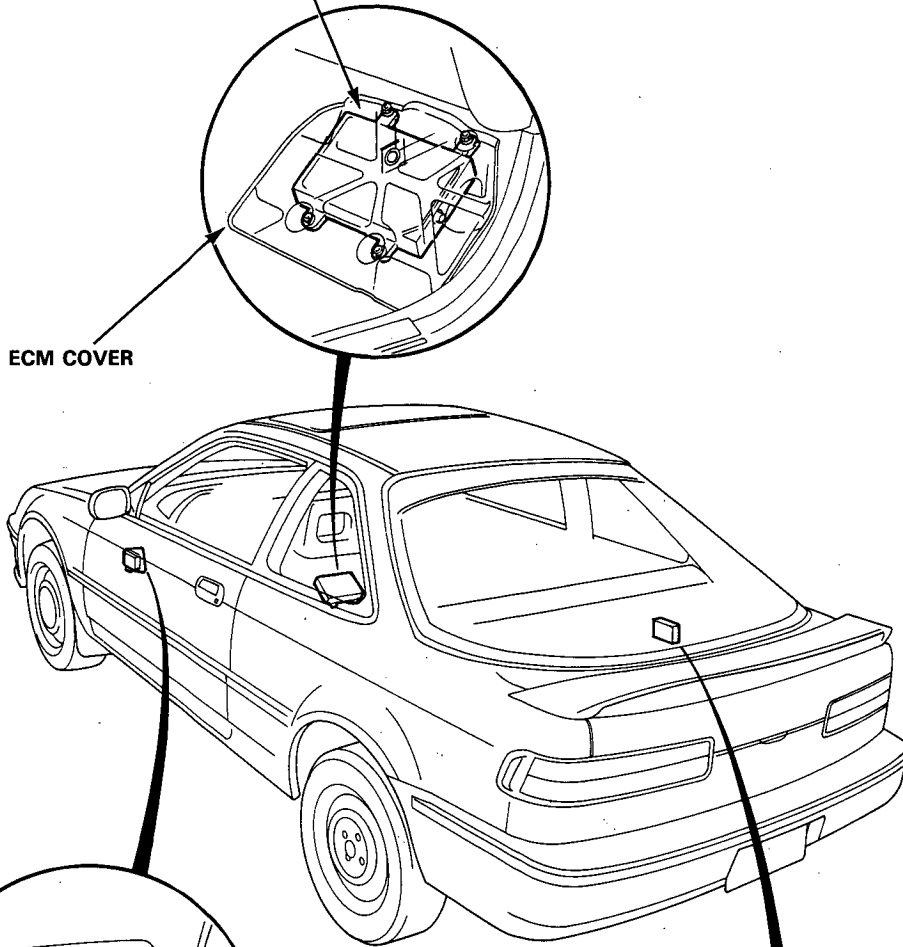


# Door, Floor and Quarter Panel

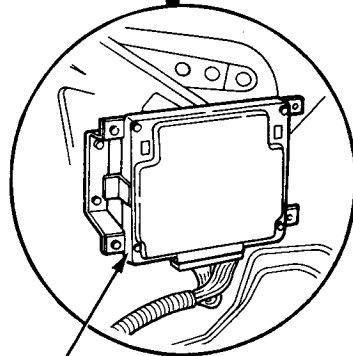
Hatchback:

ENGINE  
CONTROL MODULE  
(ECM)

ECM COVER



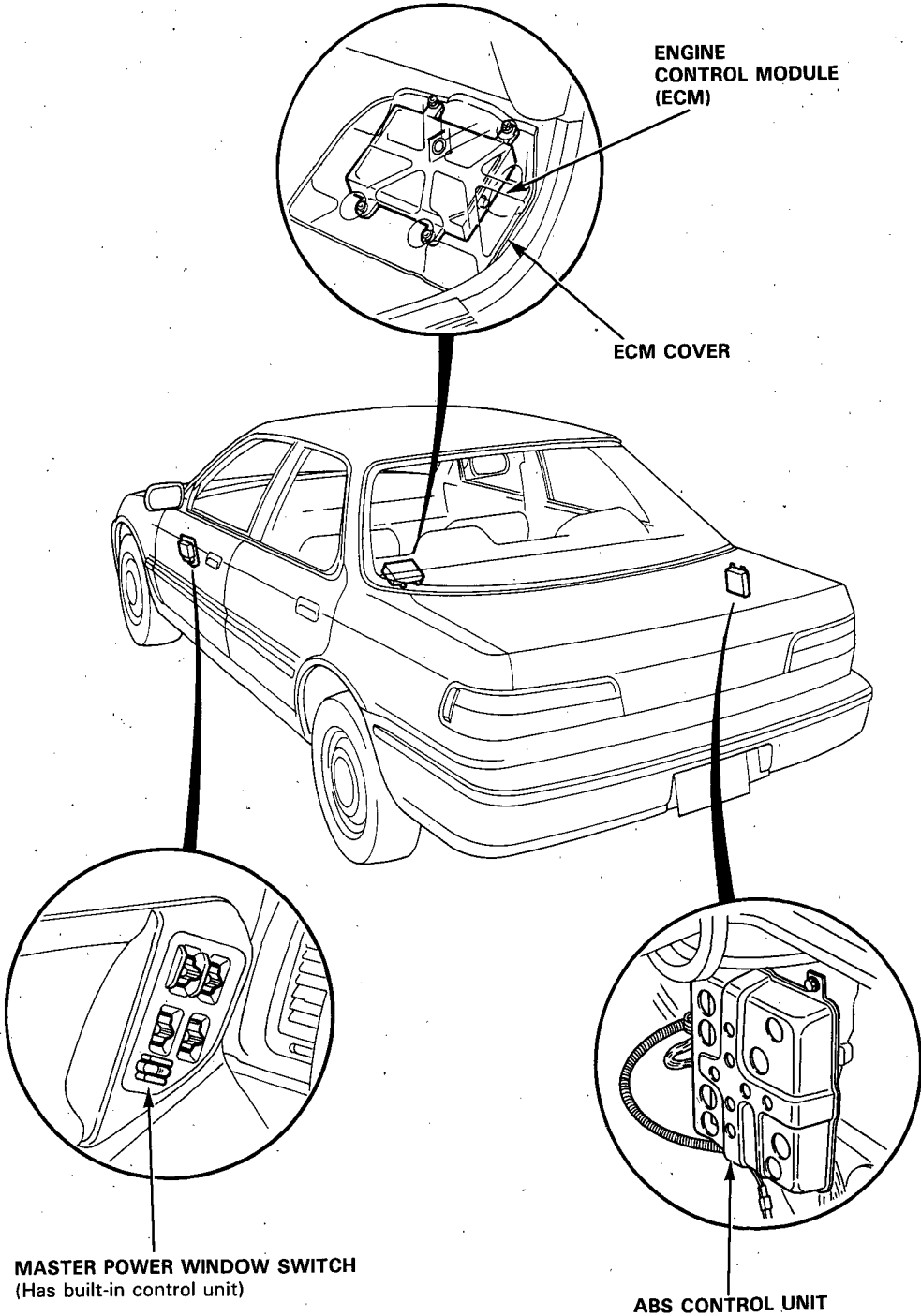
MASTER POWER WINDOW SWITCH  
(Has built-in control unit)



ABS CONTROL UNIT

# Relay and Control Unit Locations

Sedan:



# Connector Identification and Wire Harness Routing



## How to Identify Connectors:

Identification numbers have been assigned to all connectors. The number is preceded by the letter "C" for connectors, "G" for single ground terminals or "T" for single non-ground terminals.

Location		Engine Compartment	Dashboard	Others (Floor, Door, Trunk, Roof)
Harness				
Starter Cable		T1, T2 and ⊕		
Battery Ground Cable		T3 and ⊖ G1		
Engine Ground Cable		T4 and T5 G2		
Engine Wire Harness		C101 thru C131 T101 and T102 G101		
Main Wire Harness		C201 thru C228 C301 thru C319 T201 thru T203 G201 and G301	G401 thru C433 and C448 C439 thru C447 G401 and G402	C434 and C438
A/C Wire Harness		C281 thru C290 G281		
Rear Wire Harness	Hatchback		C501 thru C507 C516 thru C517 C510 thru C512 G501 and G502	C508, C509, C513 and C514 C521 thru C549 G521
	Sedan		C551 thru C558 C562 thru C564 G551 and G552	C559 thru C560 C565 thru C590
Hatch Wire Harness (Hatchback)				C601 thru C607 G601
Trunk Wire Harness (Sedan)				C621 thru C636 G621
Fuel Tank Sub-harness				C651 and C652 T651 and T652
ABS Rear Speed Sensor Sub-harness				C661 thru C663
License Plate Light Sub-harness				C671 thru C675
Dashboard Wire Harness			C701 thru C724 and C728 G701	C725 thru C727
Roof Wire Harness			C801 thru C804	C805 thru C807
Defogger Ground Wire				C821 G821
Driver's Door Wire Harness				C841 thru C850
Right Front Door Wire Harness				C861 thru C869
Left Rear Door Wire Harness (Sedan)				C881 thru C884
Right Rear Door Wire Harness (Sedan)				C891 thru C894
Under-hood Main Fuse Box		C901 thru C904		
Under-dash Fuse/Relay Box			C911 thru C928	

# Connector Identification and Wire Harness Routing

## Starter Cable

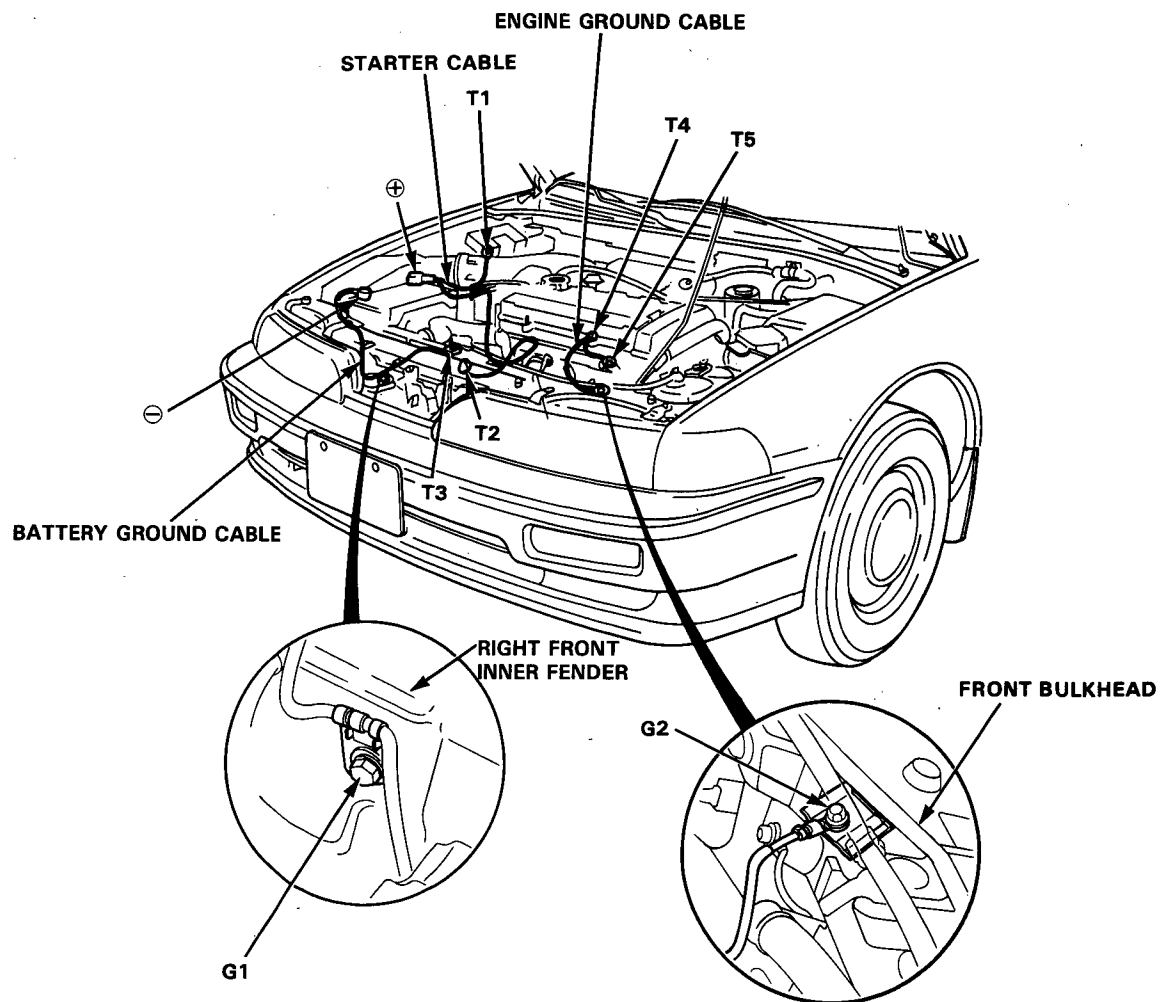
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T1 T2		Right side of engine compartment Middle of engine compartment	Under-hood main fuse box Starter motor	
⊕		Battery	Battery positive terminal	

## Battery Ground Cable

T3		Middle of engine compartment	Transmission	
G1		Right side of engine compartment	Body ground, via battery ground cable	
⊖		Battery	Battery negative terminal	

## Engine Ground Cable

T4 T5		Middle of engine compartment Middle of engine compartment	Cylinder head Cylinder head	
G2		Left side of engine compartment	Body ground, via engine ground cable	

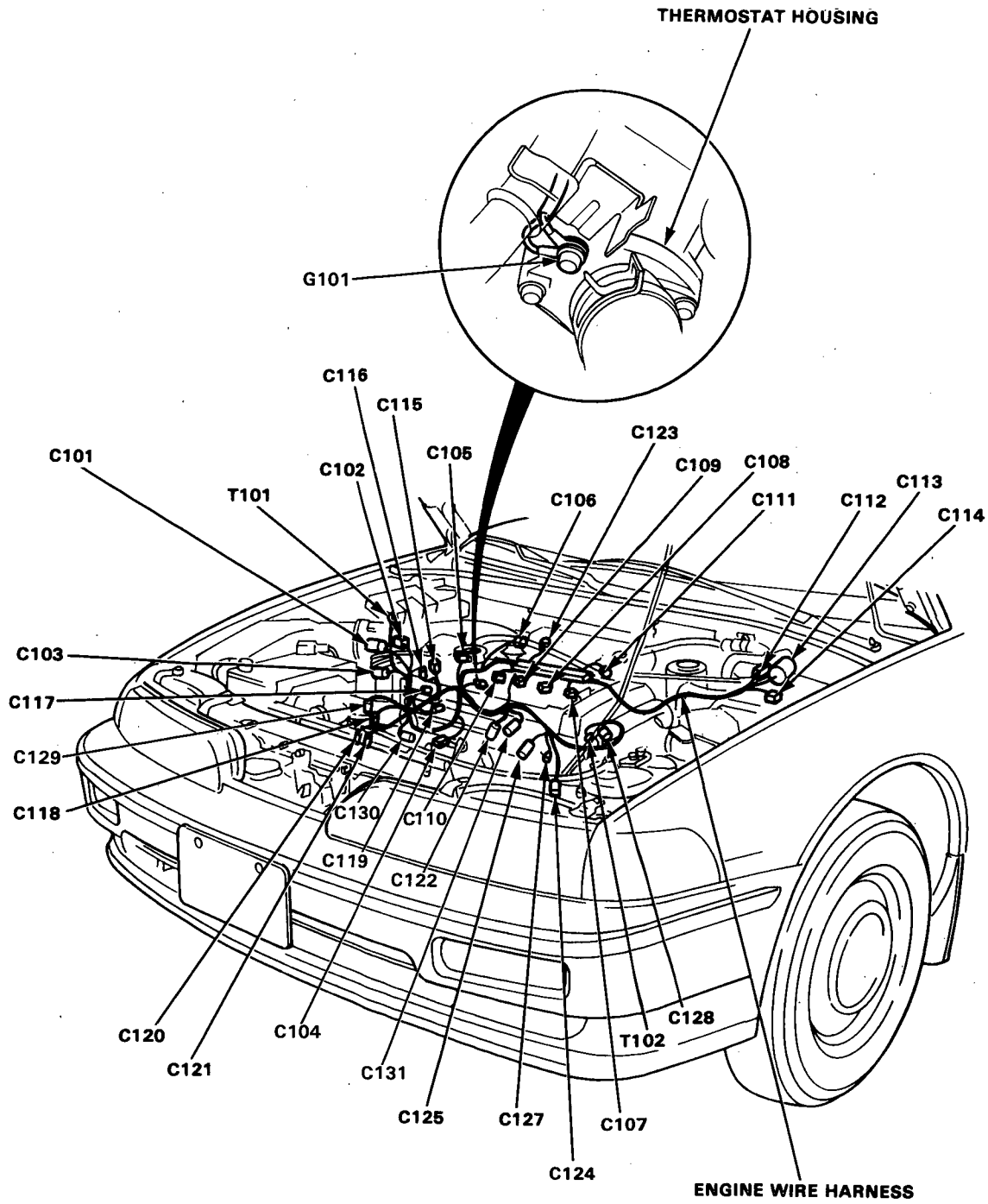


# Connector Identification and Wire Harness Routing

## Engine Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C101	14	Right side of engine compartment	Main wire harness (C216)	
C102	8	Right side of engine compartment	Main wire harness (C217)	A/T
C103	2	Right side of engine compartment	Main wire harness (C218)	
C104	2	Right side of engine compartment	A/T speed pulser	A/T
C105	3	Right side of engine	EGR valve lift sensor	A/T
C106	3	Middle of engine	Throttle position (TP) sensor	
C107	2	Middle of engine	No. 1 Fuel injector	
C108	2	Middle of engine	No. 2 Fuel injector	
C109	2	Middle of engine	No. 3 Fuel injector	
C110	2	Middle of engine	No. 4 Fuel injector	
C111	2	Middle of engine	Intake air temperature (IAT) sensor	
C112	6	Left side of engine compartment	Main wire harness (C317)	RS, LS, GS
C113	14	Left side of engine compartment	Main wire harness (C318)	
C114	8	Left side of engine compartment	Junction connector	
C115	8	Right side of engine	TDC/CKP/CYP sensor	
C116	2	Right side of engine	Ignition coil	
C117	2	Right side of engine	Engine coolant temperature (ECT) sensor	
C118	1	Right side of engine compartment	Starter solenoid	
C119	1	Right side of engine	ECT sending unit	
C120	1	Right side of engine compartment	Back-up light switch (IN)	M/T
C120	2	Right side of engine compartment	Shift control solenoid valve	A/T
C121	1	Right side of engine compartment	Back-up light switch (OUT)	M/T
C121	4	Right side of engine compartment	Lock-up control solenoid valve	A/T
C122	4	Right side of engine compartment	Heated oxygen sensor (HO2S)	
C123	2	Right side of engine compartment	Intake air control (IAC) valve	
C124	2	Right side of engine compartment	Engine oil temperature switch	(USA)
C125	2	Middle of engine	ECT switch	
C127	1	Middle of engine	Engine oil pressure switch	
C128	4	Left side of engine compartment	Voltage regulator	
C129	1	Right side of engine	VTEC valve	GSR
C130	2	Right side of engine	VTEC pressure switch	GSR
C131	2	Middle of engine	Knock sensor (KS)	GSR
T101		Right side of engine compartment	Under-hood main fuse box	
T102		Left side of engine compartment	Alternator	
G101		Middle of engine	Engine ground, via engine wire harness	



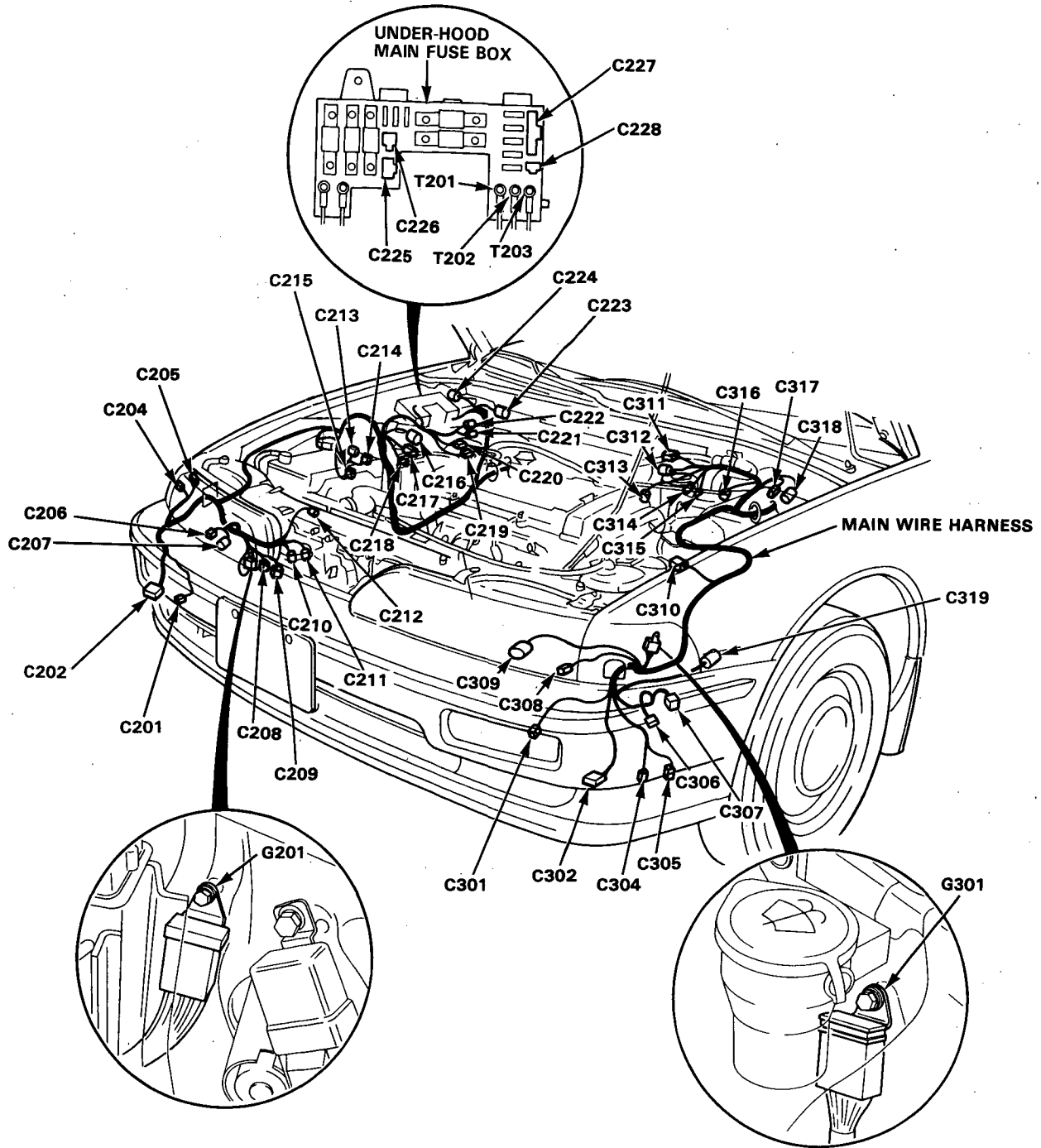


# Connector Identification and Wire Harness Routing

## Main Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C201	2	Behind right side of front bumper	Right front turn signal light	
C202	2	Behind right side of front bumper	Right horn	
C204	2	Right side of engine compartment	Right front parking light	
C205	2	Right side of engine compartment	Right front side marker light	
C206	2	Right side of engine compartment	Right front fog light	
C207	3	Right side of engine compartment	Right headlight	
C208	6	Right side of engine compartment	A/C wire harness (C290)	
C209	2	Right side of engine compartment	A/C wire harness (C289)	
C210	2	Right side of engine compartment	ABS pressure switch	GS, GSR
C211	2	Right side of engine compartment	ABS motor	GS, GSR
C212	2	Right side of engine compartment	Radiator fan motor	Without A/C
C212	2	Right side of engine compartment	A/C wire harness (C288)	With A/C
C213	4	Right side of engine compartment	ABS motor relay	*
C214	4	Right side of engine compartment	ABS front fail-safe relay	*
C215	4	Right side of engine compartment	ABS rear fail-safe relay	*
C216	14	Right side of engine compartment	Engine wire harness (C101)	
C217	8	Right side of engine compartment	Engine wire harness (C102)	A/T
C218	2	Right side of engine compartment	Engine wire harness (C103)	
C219	3	Right side of engine compartment	ABS left front solenoid	*
C220	3	Right side of engine compartment	ABS right front solenoid	*
C221	3	Right side of engine compartment	ABS rear solenoid	*
C222	2	Right side of engine compartment	ABS right front speed sensor	*
C223	4	Right side of engine compartment	Emission control box	A/T
C224	5	Right side of engine compartment	Windshield wiper motor	
C225	3	Right side of engine compartment	Under-hood main fuse box (C901)	
C226	2	Right side of engine compartment	Under-hood main fuse box (C902)	
C227	4	Right side of engine compartment	Under-hood main fuse box (C903)	
C228	1	Right side of engine compartment	Under-hood main fuse box (C904)	
T201		Right side of engine compartment	Under-hood main fuse box	
T202		Right side of engine compartment	Under-hood main fuse box	
T203		Right side of engine compartment	Under-hood main fuse box	Option (+)
G201		Right side of engine compartment	Body ground, via main harness	
C301	2	Behind Left side of front bumper	Left front turn signal light	
C302	2	Behind Left side of front bumper	Left horn	
C304	2	Behind Left side of front bumper	Windshield washer motor	
C305	2	Behind Left side of front bumper	Rear window washer motor	Hatchback
C306	2	Left side of engine compartment	Left front parking light	
C307	2	Left side of engine compartment	Left front side marker light	
C308	2	Left side of engine compartment	Left front fog light	
C309	3	Left side of engine compartment	Left headlight	
C310	4	Left side of engine compartment	Cruise control actuator	
C311	4	Left side of engine compartment	Emission control solenoid valves	RS, LS, GS
C311	2	Left side of engine compartment	Emission control solenoid valve	GSR
C312	3	Left side of engine compartment	MAP sensor	
C313	2	Left side of engine compartment	Power steering pressure (PSP) switch	
C314	1	Left side of engine compartment	Brake fluid level switch (+)	
C315	1	Left side of engine compartment	Brake fluid level switch (-)	
C316	2	Left side of engine compartment	ABS left front speed sensor	*
C317	6	Left side of engine compartment	Engine wire harness (C112)	
C318	14	Left side of engine compartment	Engine wire harness (C113)	
C319	3	Left side of engine compartment	Daytime running lights resistor	(Canada)
G301		Left side of engine compartment	Body ground, via main harness	

\*: USA (GS, GSR), Canada (LS, GS, GSR).

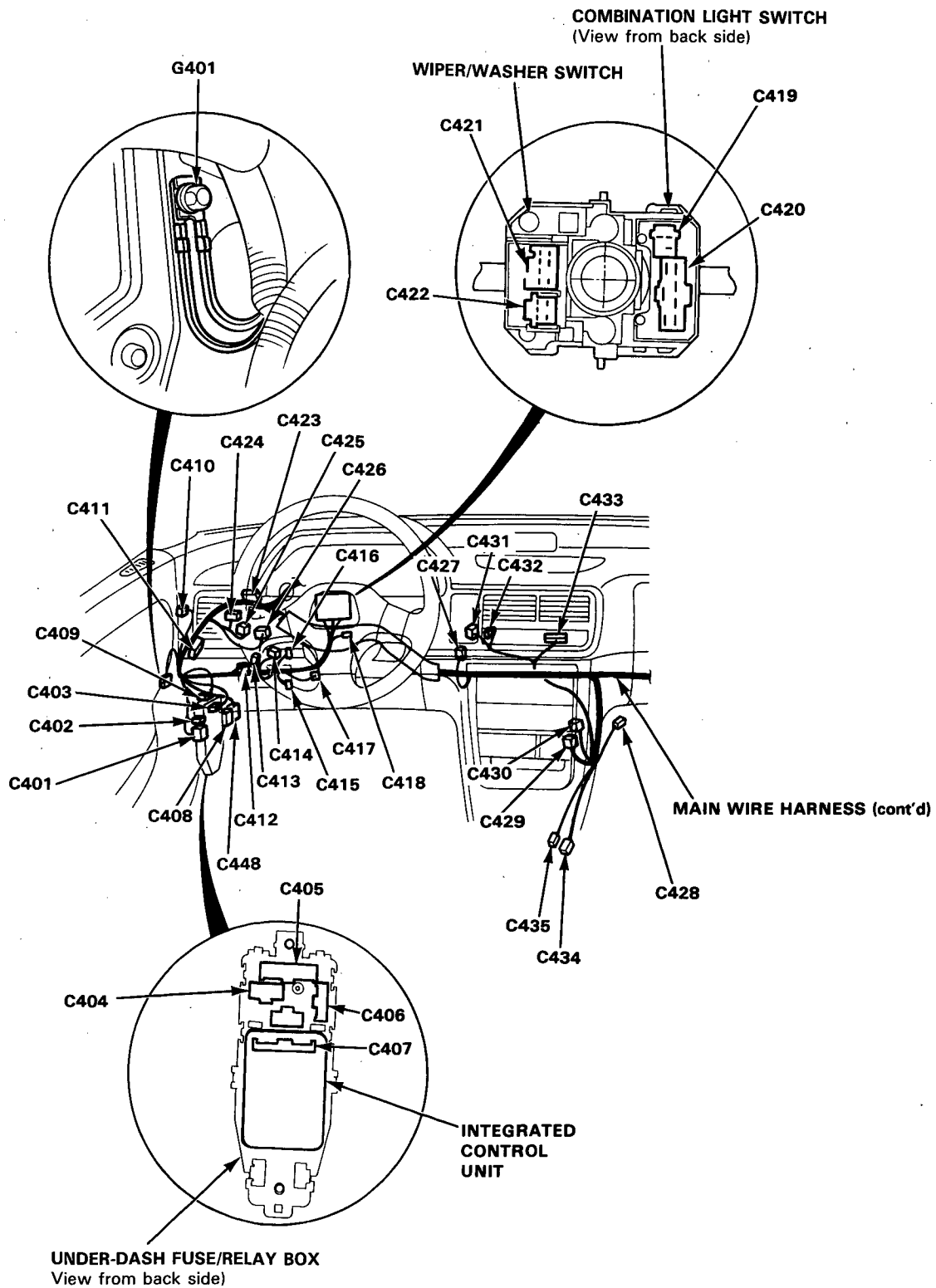


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# Connector Identification and Wire Harness Routing

## Main Wire Harness (cont'd)

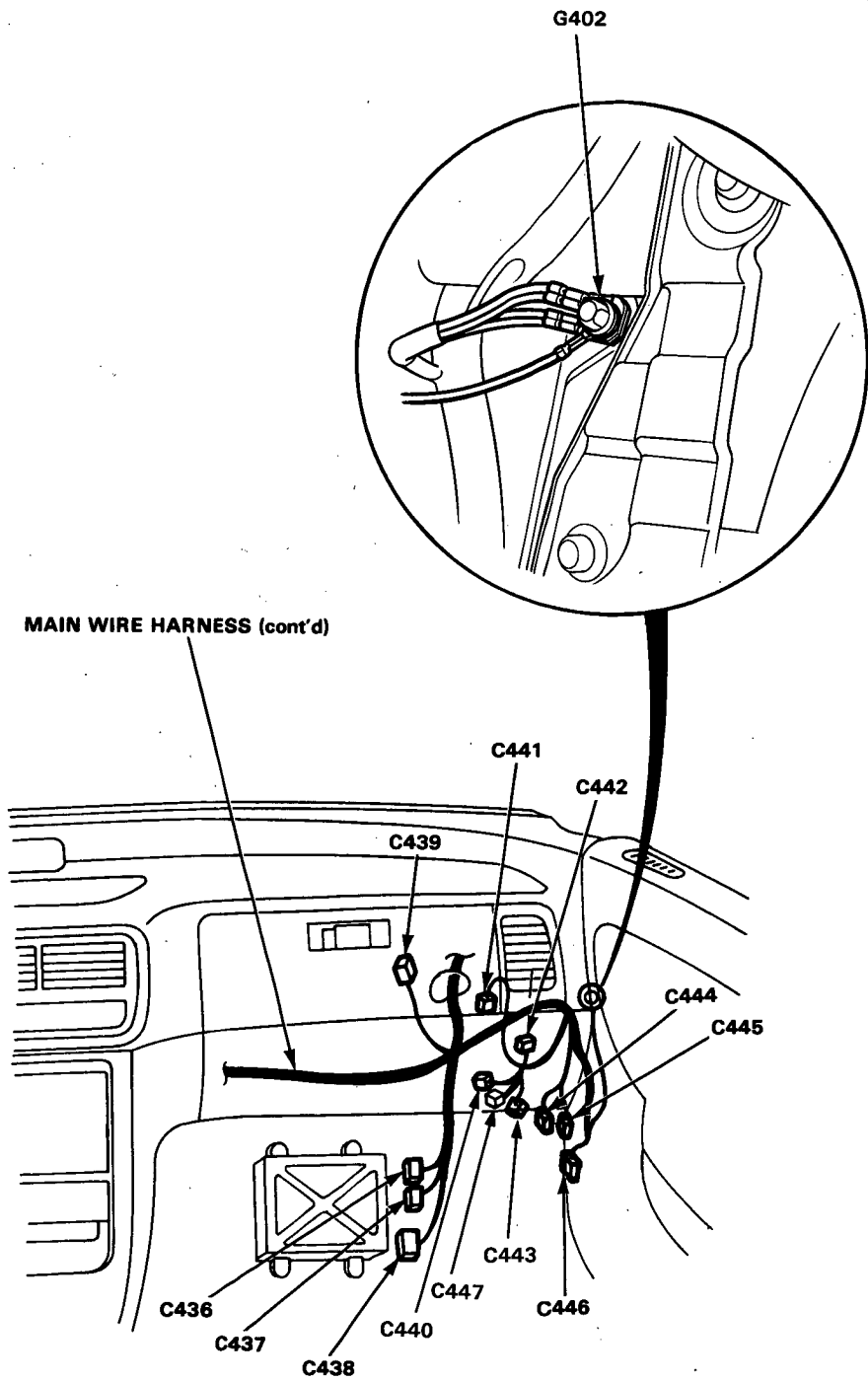
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C401	24	Behind left kick panel	Dashboard wire harness (C701)	A/T
C401	16	Behind left kick panel	Dashboard wire harness (C701)	M/T
C402	4	Behind left kick panel	Dashboard wire harness (C702)	
C403	1	Behind left kick panel	Under-dash fuse/relay box (C913)	
C404	6	Behind left kick panel	Under-dash fuse/relay box (C922)	
C405	22	Behind left kick panel	Under-dash fuse/relay box (C923)	
C406	3	Behind left kick panel	Under-dash fuse/relay box (C924)	
C407	12	Behind left kick panel	Integrated control unit	
C408	13	Behind left kick panel	Rear wire harness (Hatchback: C501, Sedan: C551)	
C448	2	Behind left kick panel	Rear wire harness (Hatchback: C517, Sedan: C568)	
C409	4	Behind left kick panel	Front fog light relay	
C410	2	Under left side of dash	Roof wire harness (C801)	
C411	20	Under left side of dash	Junction connector	
C412	5	Under left side of dash	Ignition switch	
C413	3	Under left side of dash	Turn signal/Hazard relay	
C414	8	Under left side of dash	PGM-FI main relay	
C415	2	Under left side of dash	Clutch switch	M/T
C416	2	Under left side of dash	Clutch interlock switch	M/T
C417	2	Under left side of dash	Brake switch	RS
C417	4	Under left side of dash	Brake switch	LS, GS, GSR
C418	3	Under left side of dash	Cruise control slip ring	LS, GS, GSR
C419	4	Under left side of dash	Turn signal switch	
C420	7	Under left side of dash	Combination light switch	
C421	8	Under left side of dash	Windshield wiper switch	
C422	6	Under left side of dash	Rear wiper switch	Hatchback
C423	20	Under left side of dash	Junction connector	
C424	18	Under left side of dash	Transmission control module (TCM)	A/T
C425	12	Under left side of dash	TCM	A/T
C426	14	Under left side of dash	Cruise control unit	LS, GS, GSR
C427	8	Under middle of dash	Heater mode control motor	LS, GS, GSR
C428	2	Under middle of dash	A/C thermo switch	
C429	4	Under middle of dash	Starter relay	M/T
C430	8	Under middle of dash	Radiator fan control module	(USA)
C431	6	Under middle of dash	Heater control panel (Fan switch)	
C432	6	Under middle of dash	Heater control panel (A/C switch)	
C433	14	Under middle of dash	Heater control panel (Mode switch)	LS, GS, GSR
C433	2	Under middle of dash	Heater control panel (Light)	RS
C434	2	Under middle of floor	S4 switch	A/T
C435	2	Under middle of floor	Neutral position switch	A/T
G401		Behind left kick panel	Body ground, via main harness	



# Connector Identification and Wire Harness Routing

## Main Wire Harness (cont'd)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C436 C437 C438	22 16 26	Right side of floor Right side of floor Right side of floor	ECM ECM ECM	
C439 C440 C441 C442 C443 C447	4 2 4 3 2 3	Under right side of dash Under right side of dash Under right side of dash Under right side of dash Under right side of dash Under right side of dash	Recirculation control motor Blower motor Blower motor resistor A/C diode Service check connector Data link connector (DLC)	LS, GS, GSR
C444 C445 C446 C446	8 4 24 6	Behind right kick panel Behind right kick panel Behind right kick panel Behind right kick panel	Daytime running lights relay Daytime running lights relay Rear wire harness (Hatchback: C510, Sedan: C562) Rear wire harness (Hatchback: C510, Sedan: C562)	(Canada) (Canada) With ABS (USA): Without ABS
G402		Behind right kick panel	Body ground, via main harness	



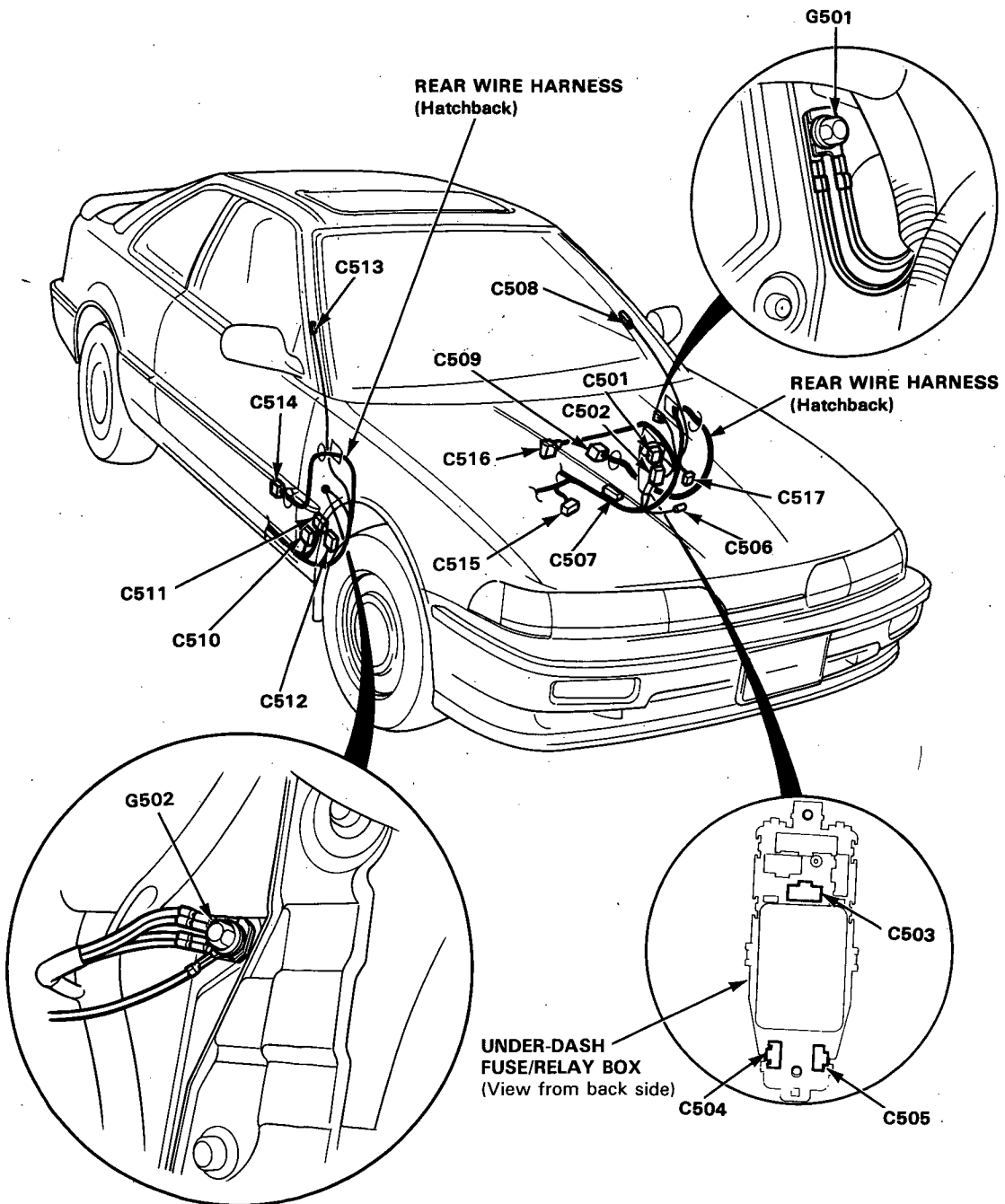
# Connector Identification and Wire Harness Routing

## Rear Wire Harness (Hatchback)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C501	13	Behind left kick panel	Main wire harness (C408)	
C502	23	Behind left kick panel	Dashboard wire harness (C705)	
C503	8	Behind left kick panel	Under-dash fuse/relay box (C925)	
C504	5	Behind left kick panel	Under-dash fuse/relay box (C927)	
C505	2	Behind left kick panel	Under-dash fuse/relay box (C928)	(Canada)
C506	1	Behind left kick panel	Condenser	
C507	20	Behind left kick panel	Junction connector	LS, GS, GSR
C508	2	Left A pillar area	Front position switch (For driver's shoulder seat belt buckle)	(USA)
C515	4	Behind left kick panel	Junction connector	*
C516	14	Under left side of dash	Power door lock control unit	*
C517	2	Under left side of dash	Main wire harness (C448)	
C509	6	Driver's door area	Driver's door wire harness (C841)	RS
C509	27	Driver's door area	Driver's door wire harness (C841)	*
C510	24	Behind right kick panel	Main wire harness (C446)	With ABS
C510	6	Behind right kick panel	Main wire harness (C446)	(USA):
C511	7	Behind right kick panel	Automatic shoulder seat belt control unit	Without ABS
C512	22	Behind right kick panel	Automatic shoulder seat belt control unit	(USA)
C513	2	Right A pillar area	Front position switch (For front passenger's shoulder seat belt buckle)	(USA)
C514	6	Right door area	Right door wire harness (C861)	RS
C514	27	Right door area	Right door wire harness (C861)	*4
G501		Behind left kick panel	Body ground, via rear harness	
G502		Behind right kick panel	Body ground, via rear harness	

\*: USA (GS, GSR), Canada (LS, GS, GSR)



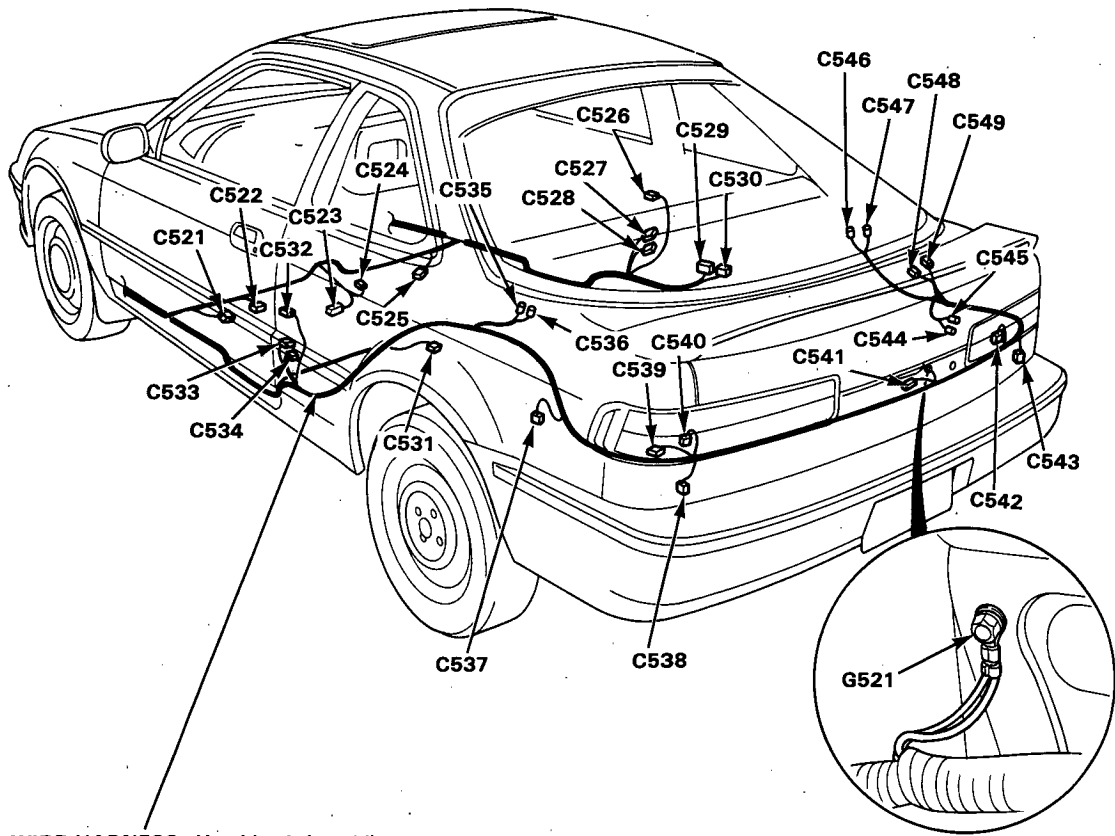


# Connector Identification and Wire Harness Routing

## Rear Wire Harness: Hatchback (cont'd)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C521	6	Left side of floor	Driver's shoulder seat belt retractor	(USA)
C522	6	Left side of floor	ABS inspection connector	*
C523	2	Left side of floor	Driver's seat belt switch	(Canada)
C524	1	Middle of floor	Parking brake switch	
C525	4	Right side of floor	Front passenger's shoulder seat belt retractor	(USA)
C526	1	Right B pillar area	Right door switch	
C527	2	Behind right quarter trim panel	Front passenger's shoulder seat belt buckle motor	(USA)
C528	4	Behind right quarter trim panel	Front passenger's rear lock position switch (For front passenger's shoulder seat belt buckle)	(USA)
C529	18	Behind right quarter trim panel	ABS control unit	*
C530	12	Behind right quarter trim panel	ABS control unit	*
C531	6	Under middle of rear seat	Fuel tank sub-harness (C651)	
C532	1	Left middle of pillar	Driver's door switch	(USA)
C533	2	Behind left quarter trim panel	Driver's shoulder seat belt buckle motor	
C534	4	Behind left quarter trim panel	Driver's rear lock position switch (For driver's shoulder seat belt buckle)	(USA)
C535	1	Left side of trunk	Left rear speaker (+)	
C536	1	Left side of trunk	Left rear speaker (-)	
C537	4	Left side of trunk	Power antenna motor	
C538	6	Left rear corner of trunk	ABS rear speed sensor sub-harness (C661)	*
C539	8	Left rear corner of trunk	(For connection to trailer lighting)	
C540	6	Left rear corner of trunk	Left taillight assembly	
C541	2	Center trunk area	Trunk latch switch	
C542	6	Right rear trunk area	Right taillight assembly	
C543	2	Right rear trunk area	License plate light sub-harness (C671)	
C544	1	Right side of trunk	Trunk light (+)	
C545	1	Right side of trunk	Trunk light (-)	
C546	1	Right side of trunk	Right rear speaker (+)	
C547	1	Right side of trunk	Right rear speaker (-)	
C548	4	Right side of trunk	Hatch wire harness (C601)	
C549	2	Right side of trunk	Hatch wire harness (C602)	
G521		Middle of rear trunk panel	Body ground, via rear harness	

\*: USA (GS, GSR), Canada (LS, GS, GSR)



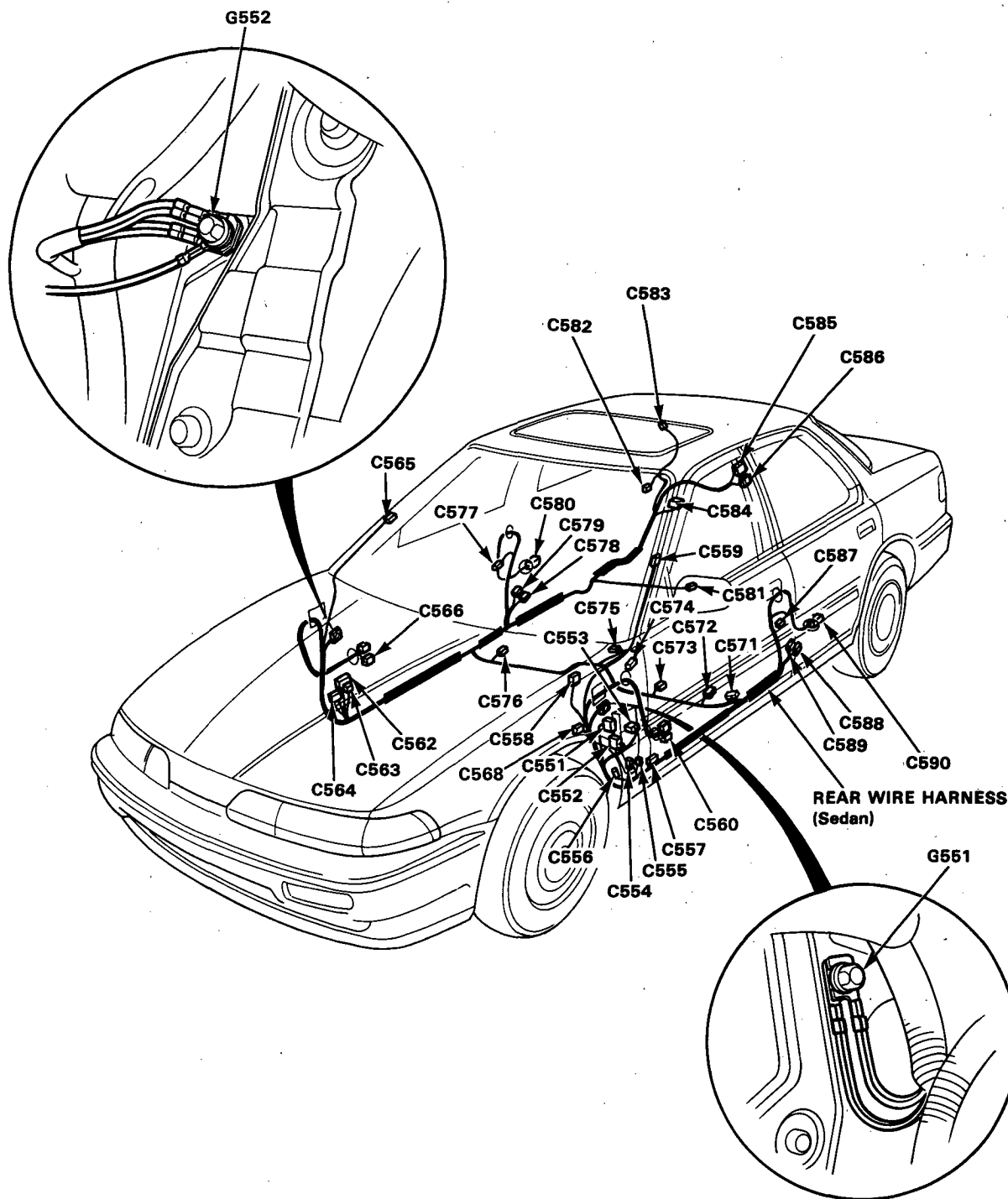
REAR WIRE HARNESS: Hatchback (cont'd)

# Connector Identification and Wire Harness Routing

## Rear Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C551	13	Behind left kick panel	Main wire harness (C408)	
C568	2	Behind left kick panel	Main wire harness (C448)	
C552	23	Behind left kick panel	Dashboard wire harness (C705)	
C553	8	Behind left kick panel	Under-dash fuse/relay box (C925)	
C554	5	Behind left kick panel	Under-dash fuse/relay box (C927)	
C555	2	Behind left kick panel	Under-dash fuse/relay box (C928)	
C556	1	Behind left kick panel	Condenser	
C557	20	Behind left kick panel	Junction connector	LS, GS
C558	14	Under left side of dash	Power door lock control unit	LS, GS
C559	2	Left A pillar	Front position switch (For front driver's shoulder seat belt buckle)	(USA)
C560	6	Driver's door area	Driver's door wire harness (C841)	RS
C560	27	Driver's door area	Driver's door wire harness (C841)	LS, GS
C562	24	Behind right kick panel	Main wire harness (C446)	With ABS
C562	6	Behind right kick panel	Main wire harness (C446)	(USA): Without ABS
C563	7	Behind right kick panel	Automatic shoulder seat belt control unit	(USA)
C564	22	Behind right kick panel	Automatic shoulder seat belt control unit	(USA)
C565	2	Right A pillar area	Front position switch (For front passenger's shoulder belt buckle)	(USA)
C566	6	Right front door area	Right front door wire harness (C861)	RS
C566	27	Right front door area	Right front door wire harness (C861)	LS, GS
C571	20	Left side of floor	Junction connector	
C571	4	Left side of floor	Junction connector	(USA): RS
C572	6	Left side of floor	Driver's shoulder seat belt retractor	(USA)
C573	6	Left side of floor	ABS inspection connector	*2
C574	2	Left side of floor	Driver's seat belt switch	(Canada)
C575	1	Middle of floor	Parking brake switch	
C576	4	Right side of floor	Front passenger's shoulder seat belt retractor	(USA)
C577	1	Right B pillar area	Right front door switch	
C578	2	Right B pillar area	Front passenger's shoulder seat belt buckle motor	(USA)
C579	4	Right B pillar area	Front passenger's rear lock position switch (For front passenger's shoulder seat belt buckle)	(USA)
C580	6	Right rear door area	Right rear door wires (C891)	LS, GS
C581	6	Under middle of rear seat	Fuel tank sub-harness (C651)	
C582	1	Right quarter panel	Right rear door switch	
C583	1	Rear window area	Rear window defogger	
C584	20	Right front corner of trunk	Trunk wire harness (C621)	
C585	18	Right side of trunk	ABS control unit	*2
C586	12	Right side of trunk	ABS control unit	*2
C587	1	Left B pillar area	Left front door switch	
C588	2	Left B pillar area	Driver's shoulder seat belt buckle motor	(USA)
C589	4	Left B pillar area	Driver's rear lock position switch (For driver's shoulder seat belt buckle)	(USA)
C590	6	Left rear door area	Left rear door wire harness (C881)	LS, GS
G551		Behind left kick panel	Body ground, via rear harness	
G552		Behind right kick panel	Body ground, via rear harness	

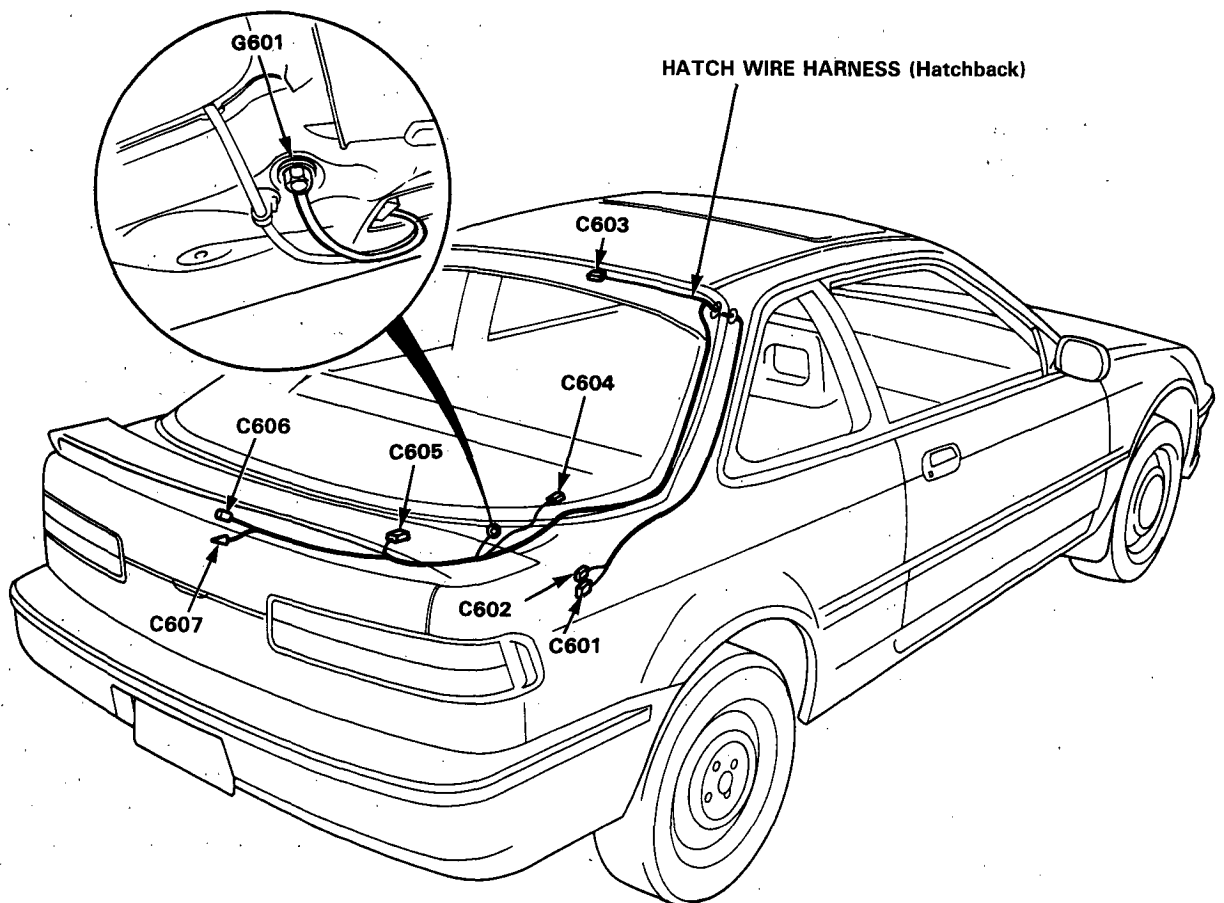
\*2: USA (GS), Canada (LS, GS)



# Connector Identification and Wire Harness Routing

## Hatch Wire Harness (Hatchback)

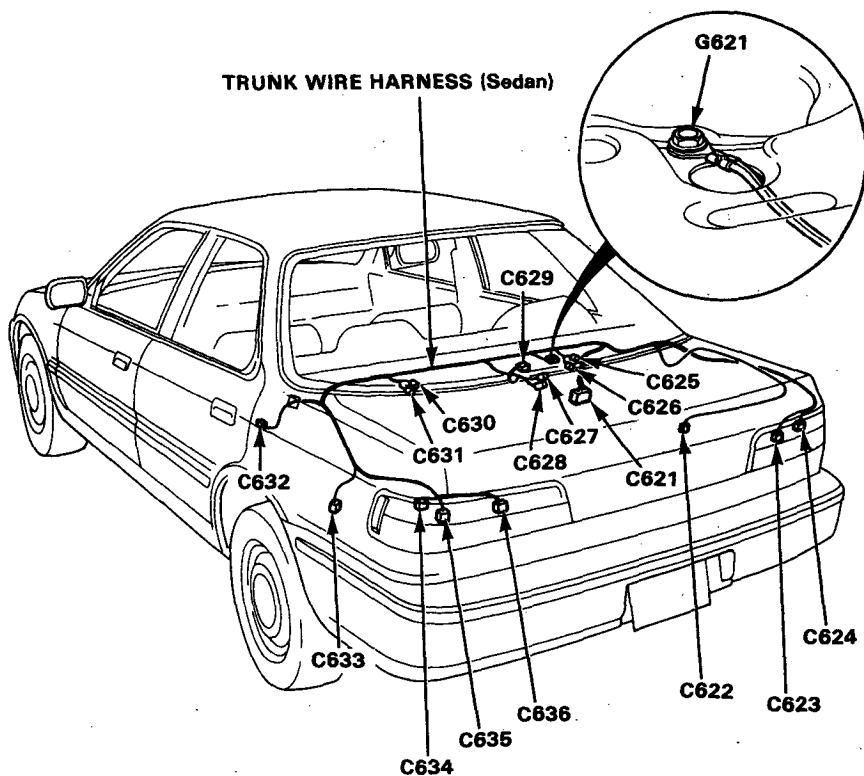
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C601 C602	4 2	Right side of trunk Right side of trunk	Rear wire harness (C548) Rear wire harness (C549)	
C603 C604 C605 C606 C607	2 1 4 1 1	Right side of hatch Right side of hatch Right side of hatch Right side of hatch Right side of hatch	High mount brake light Rear window defogger Rear window wiper motor High mount brake light (+) High mount brake light (-)	RS, LS, GS  GSR GSR
G601		Right side of hatch	Body ground, via hatch wire harness	





### Trunk Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C621	20	Right front trunk area	Rear wire harness (C584)	
C622	2	Inside rear of trunk lid	Trunk latch switch	
C623	6	Right rear corner of trunk	Right taillight assembly	
C624	2	Right rear corner of trunk	License plate light sub-harness (C671)	
C625	1	Above right trunk area	Right rear speaker (+)	
C626	1	Above right trunk area	Right rear speaker (-)	
C627	2	Above center trunk area	High mount brake light	
C628	1	Above center trunk area	Trunk light (+)	
C629	1	Above center trunk area	Trunk light (-)	
C630	1	Above left trunk area	Left rear speaker (+)	
C631	1	Above left trunk area	Left rear speaker (-)	
C632	1	Left quarter panel area	Left rear door switch	
C633	4	Left side of trunk	Power antenna motor	
C634	8	Left rear corner of trunk	(For connection to trailer lighting)	
C635	6	Left rear corner of trunk	ABS rear speed sensor sub-harness (C661)	
C636	6	Left rear corner of trunk	Left taillight assembly	
G621		On rear shelf	Body ground, via trunk harness	



# Connector Identification and Wire Harness Routing

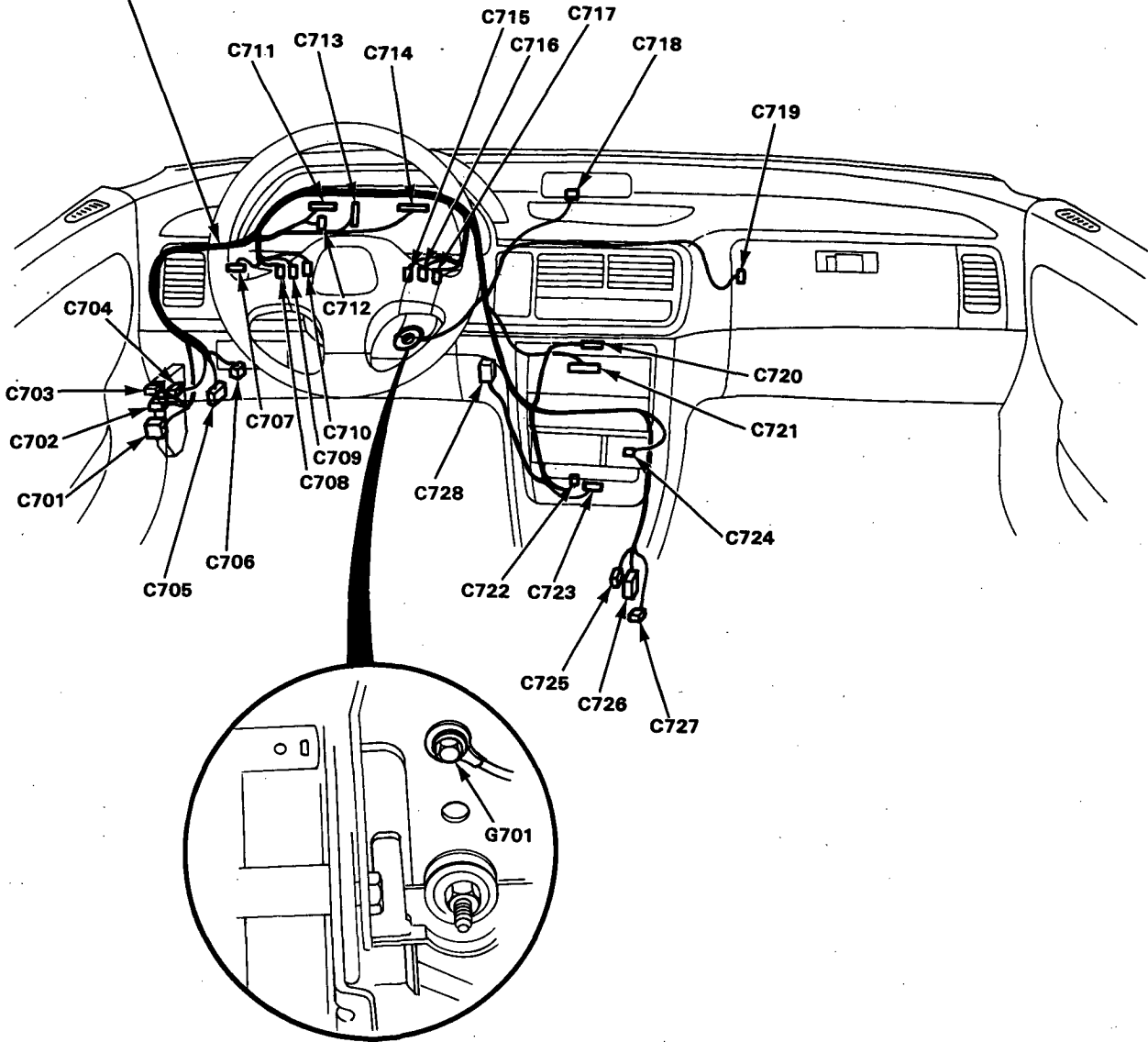
## Dashboard Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C701	24	Behind left kick panel	Main wire harness (C401)	A/T
C701	16	Behind left kick panel	Main wire harness (C401)	M/T
C702	4	Behind left kick panel	Main wire harness (C402)	
C703	4	Behind left kick panel	Roof wire harness (C804)	
C704	18	Behind left kick panel	Under-dash fuse/relay box (C915)	
C705	23	Behind left kick panel	Rear wire harness (Hatchback: C502, Sedan: C552)	
C706	4	Under left side of dash	Key interlock solenoid	A/T
C707	10	Behind instrument panel	Power mirror switch (With power mirror)	
C708	8	Behind instrument panel	Front fog light switch (Without moonroof)	
C708	4	Behind instrument panel	Moonroof switch (With moonroof)	
C709	6	Behind instrument panel	Cruise control main switch	LS, GS, GSR
C709	3	Behind instrument panel	Dash lights brightness controller	RS
C710	3	Behind instrument panel	Dash lights brightness controller	LS, GS, GSR
C711	12	Behind gauges	Gauge assembly	
C712	7	Behind gauges	Cruise control indicator	LS, GS, GSR
C713	14	Behind gauges	A/T gear position indicator	A/T
C714	10	Behind gauges	Gauge assembly	
C715	8	Behind instrument panel	Front fog light switch (With moonroof)	
C716	6	Behind instrument panel	Rear window defogger switch	
C717	10	Behind instrument panel	Hazard warning switch	
C718	4	Under middle of dash	Clock	
C719	2	Under right side of dash	Glove box light	LS, GS, GSR
C720	2	Under middle of dash	Radio panel light	
C721	16	Under middle of dash	Stereo radio/cassette player	
C722	2	Under middle of dash	Chime	
C723	8	Under middle of dash	Interlock control unit	A/T
C724	4	Under middle of dash	Cigarette lighter and ashtray light	
C728	4	Under middle of dash	Cigarette lighter relay	
C725	2	Middle of floor	A/T gear position console light	A/T
C726	10	Middle of floor	A/T gear position switch	A/T
C727	3	Middle of floor	Shift lock solenoid	A/T
G701		Under left side of dash	Body ground, via dashboard harness	





DASHBOARD WIRE HARNESS



# Connector Identification and Wire Harness Routing

## Fuel Tank Sub-harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C651	6	Under middle of rear seat	Rear wire harness (C531)	Hatchback Sedan
C651	6	Under middle of rear seat	Rear wire harness (C581)	
C652	3	Fuel tank area	Fuel gauge sending unit	
T651		Fuel tank area	Fuel pump (+)	
T652		Fuel tank area	Fuel pump (-)	

## ABS Rear Speed Sensor Sub-harness

C661	6	Left rear corner of trunk	Rear wire harness (C538)	Hatchback Sedan
C661	6	Left rear corner of trunk	Trunk wire harness (C635)	
C662	4	Under left side of trunk floor	ABS left rear speed sensor	
C663	2	Under left side of trunk floor	ABS right rear speed sensor	

## License Plate Light Sub-harness

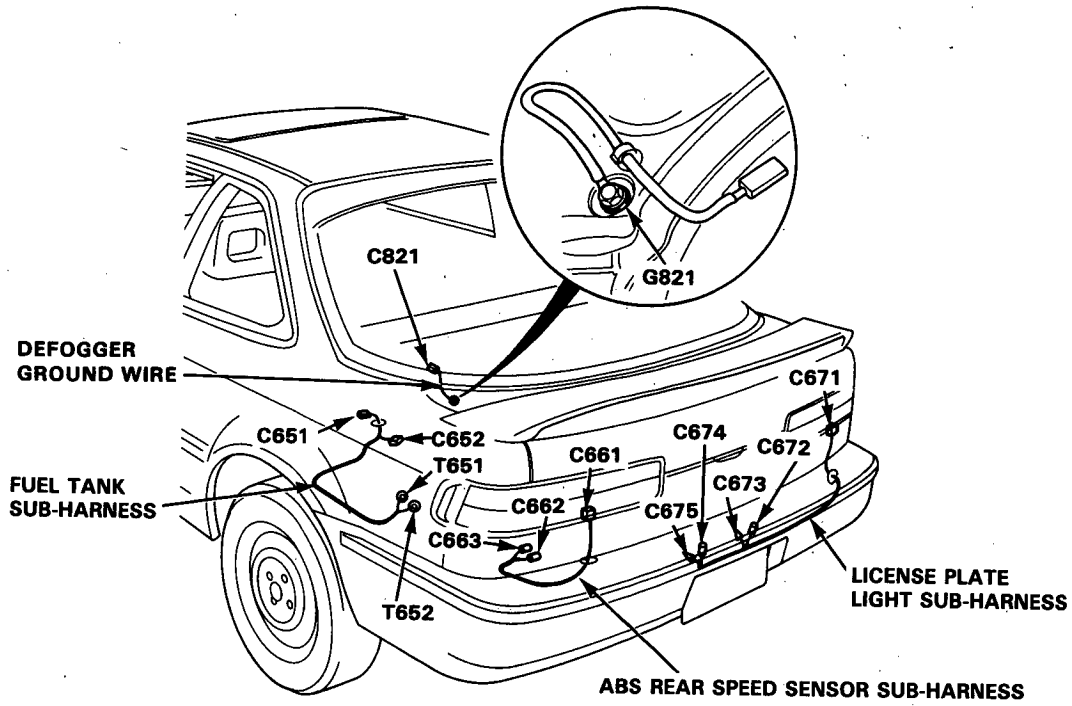
C671	2	Right rear corner of trunk	Rear wire harness (C543)	Hatchback Sedan
C671	2	Right rear corner of trunk	Trunk wire harness (C624)	
C672	1	Behind rear bumper	Right license plate light (+)	
C673	1	Behind rear bumper	Right license plate light (-)	
C674	1	Behind rear bumper	Left license plate light (+)	
C675	1	Behind rear bumper	Left license plate light (-)	

## Defogger Ground Wire

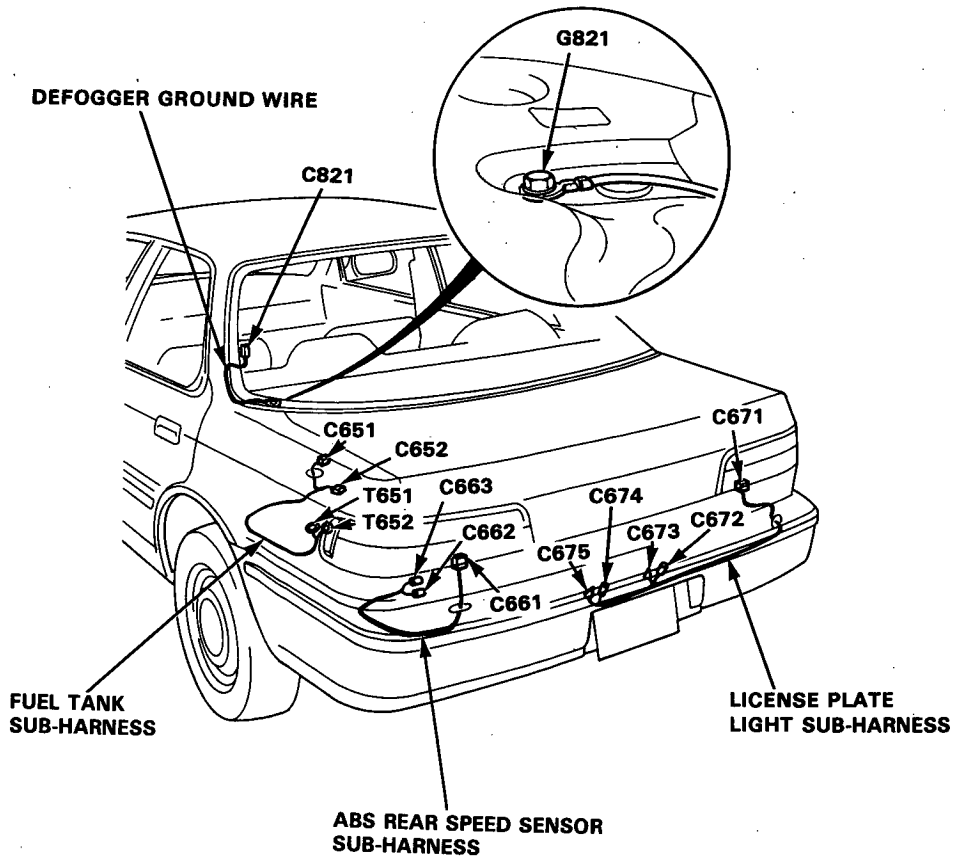
C821	1	Rear window area	Rear window defogger	
G821		Left side of hatch area	Body ground, via defogger ground wire	Hatchback Sedan
G821		On rear shelf	Body ground, via defogger ground wire	



**Hatchback:**



**Sedan:**



# Connector Identification and Wire Harness Routing

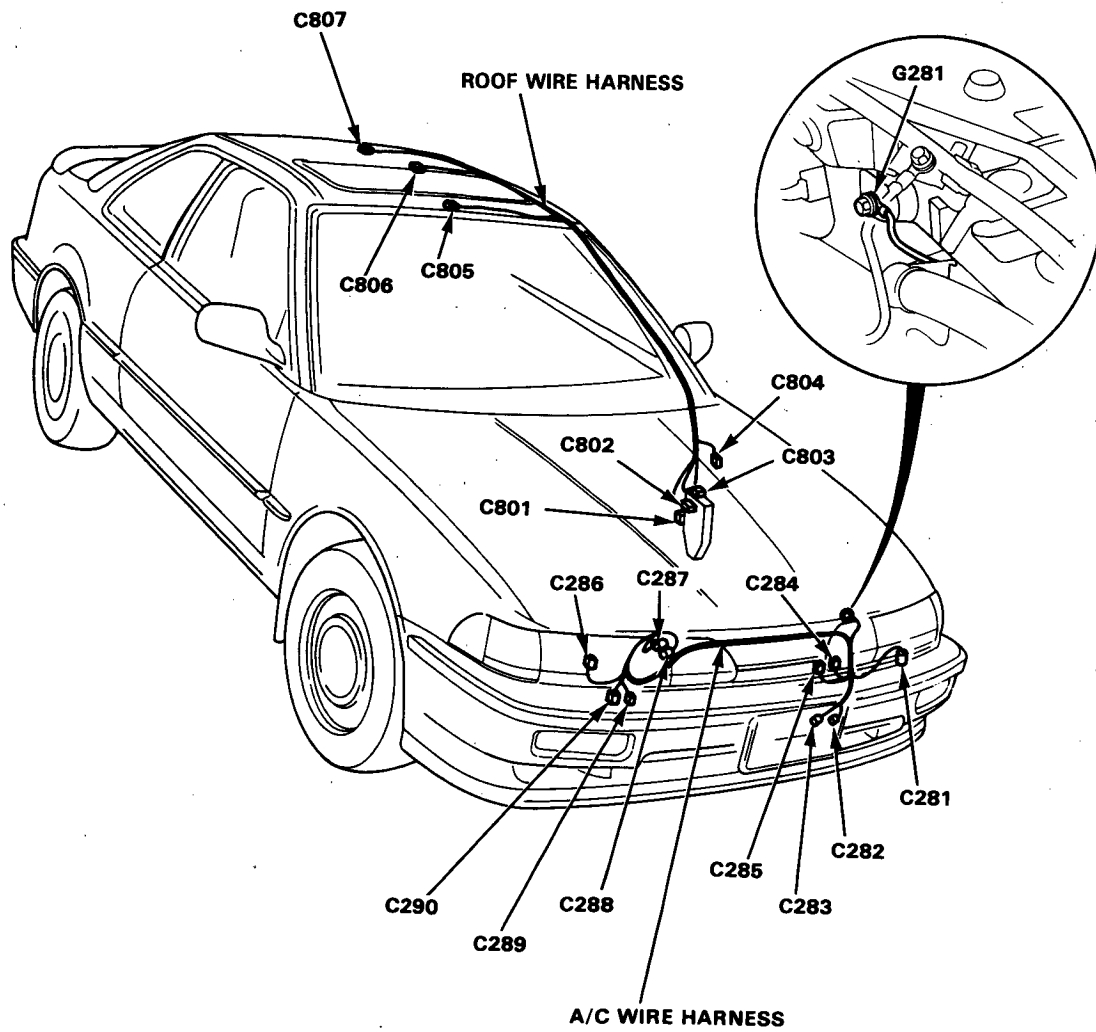
## A/C Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C281	2	Left side of engine compartment	A/C pressure switch	
C282	1	Left side of engine compartment	A/C compressor clutch	
C283	2	Left side of engine compartment	Condenser fan motor	
C284	4	Left side of engine compartment	A/C compressor clutch relay	
C285	4	Left side of engine compartment	Condenser fan relay	
C286	4	Right side of engine compartment	Radiator fan relay	
C287	2	Right side of engine compartment	Radiator fan motor	
C288	2	Right side of engine compartment	Main wire harness (C212)	
C289	2	Right side of engine compartment	Main wire harness (C209)	
C290	6	Right side of engine compartment	Main wire harness (C208)	
G281		Left side of engine compartment	Body ground, via A/C harness	

## Roof wire Harness

C801	2	Behind left kick panel	Main wire harness (C410)	
C802	3	Behind left kick panel	Under-dash fuse/relay box (C912)	*3
C803	4	Behind left kick panel	Moonroof relay	*3
C804	4	Behind left kick panel	Dashboard wire harness (C703)	*3
C805	2	Roof area	Front map light	*3
C806	3	Roof area	Ceiling light	
C807	2	Roof area	Moonroof motor	*3

\*3: With moonroof



# Connector Identification and Wire Harness Routing

## Driver's Door Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C841	6	Left front door area	Rear wire harness (Hatchback: C509)	RS
C841	27	Left front door area	Rear wire harness (Hatchback: C509)	LS, GS, GSR
C841	6	Left front door area	Rear wire harness (Sedan: C560)	RS
C841	27	Left front door area	Rear wire harness (Sedan: C560)	LS, GS
C842	1	Left front door area	Left front speaker (+)	
C843	1	Left front door area	Left front speaker (-)	
C844	4	Left front door area	Driver's power window motor	LS, GS, GSR
C845	3	Left front door area	Driver's door latch switch	(USA)
C846	4	Left front door area	Driver's door lock actuator (Sedan)	LS, GS
C846	4	Left front door area	Driver's door lock actuator (Hatchback)	*
C847	3	Left front door area	Left door lock switch	*4
C848	10	Left front door area	Master power window switch (Hatchback)	LS, GS, GSR
C848	14	Left front door area	Master power window switch (Sedan)	LS, GS
C849	1	Left front door area	Master power window switch (Sedan)	LS, GS
C850	3	Left front door area	Left power mirror	*5

## Right Front Door Wire Harness

C861	6	Right door area	Rear wire harness (Hatchback: C514)	RS
C861	27	Right door area	Rear wire harness (Hatchback: C514)	LS, GS, GSR
C861	6	Right front door area	Rear wire harness (Sedan: C566)	RS
C861	27	Right front door area	Rear wire harness (Sedan: C566)	LS, GS
C862	1	Right front door area	Right front speaker (+)	
C863	1	Right front door area	Right front speaker (-)	
C864	2	Right front door area	Right front power window motor	LS, GS
C865	3	Right front door area	Right front door latch switch	(USA)
C866	2	Right front door area	Right front door lock actuator (Sedan)	LS, GS
C866	2	Right front door area	Right front door lock actuator (Hatchback)	*
C867	3	Right front door area	Right door lock switch	*4
C868	5	Right front door area	Right front power window switch	LS, GS
C869	3	Right front door area	Right power mirror	*5

## Left Rear Door Wire Harness (Sedan: LS, GS)

C881	6	Left rear door area	Rear wire harness (C590)	
C882	2	Left rear door area	Left rear power window motor	
C883	5	Left rear door area	Left rear power window switch	
C884	2	Left rear door area	Left rear door lock actuator	

## Right Rear Door Wire Harness (Sedan: LS, GS)

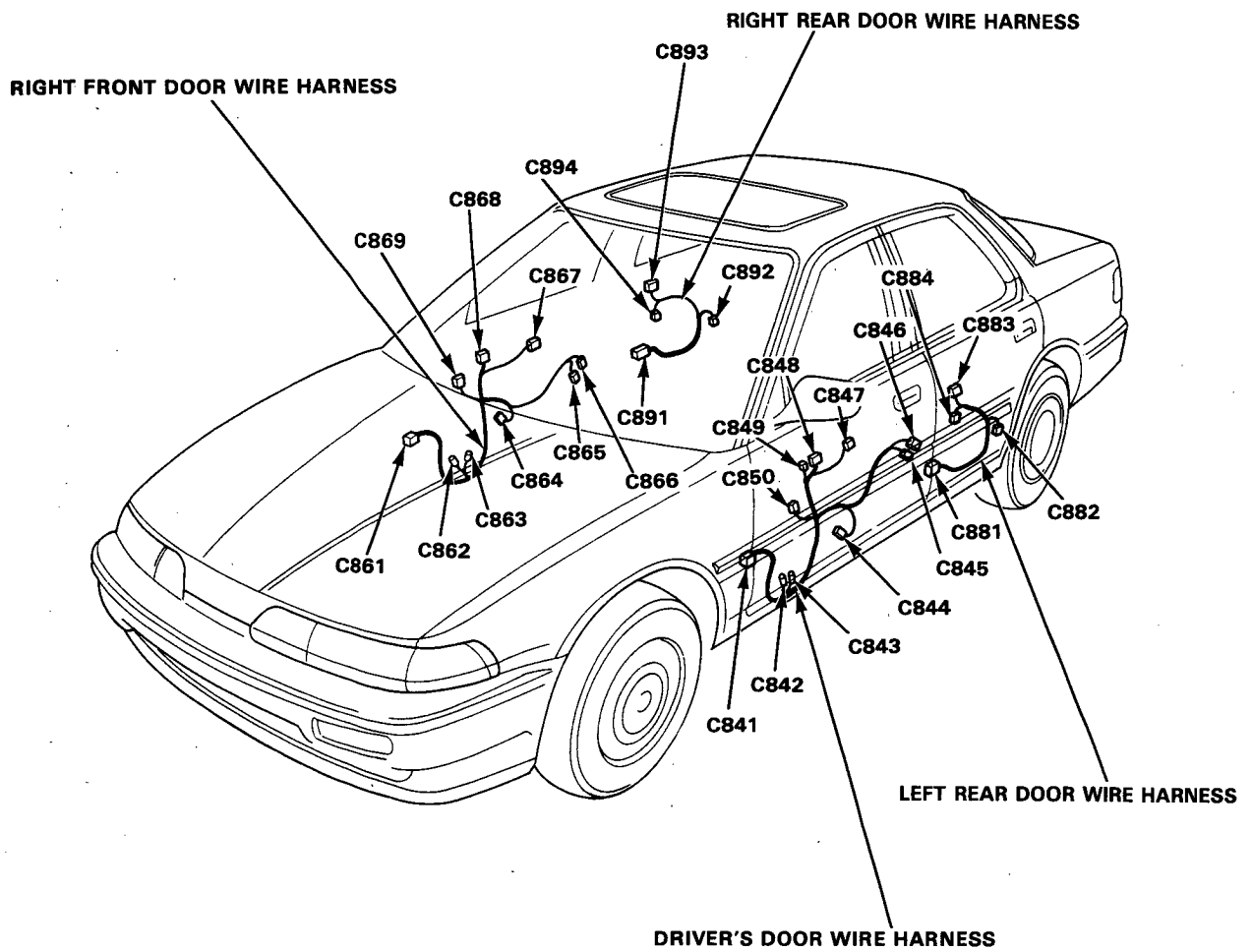
C891	6	Right rear door area	Rear wire harness (C580)	
C892	2	Right rear door area	Right rear power window motor	
C893	5	Right rear door area	Right rear power window switch	
C894	2	Right rear door area	Right rear door lock actuator	

\* : USA (GS, GSR), Canada (LS, GS, GSR)

\*4: Hatchback [USA (GS, GSR), Canada (LS, GS, GSR)], Sedan (LS, GS)

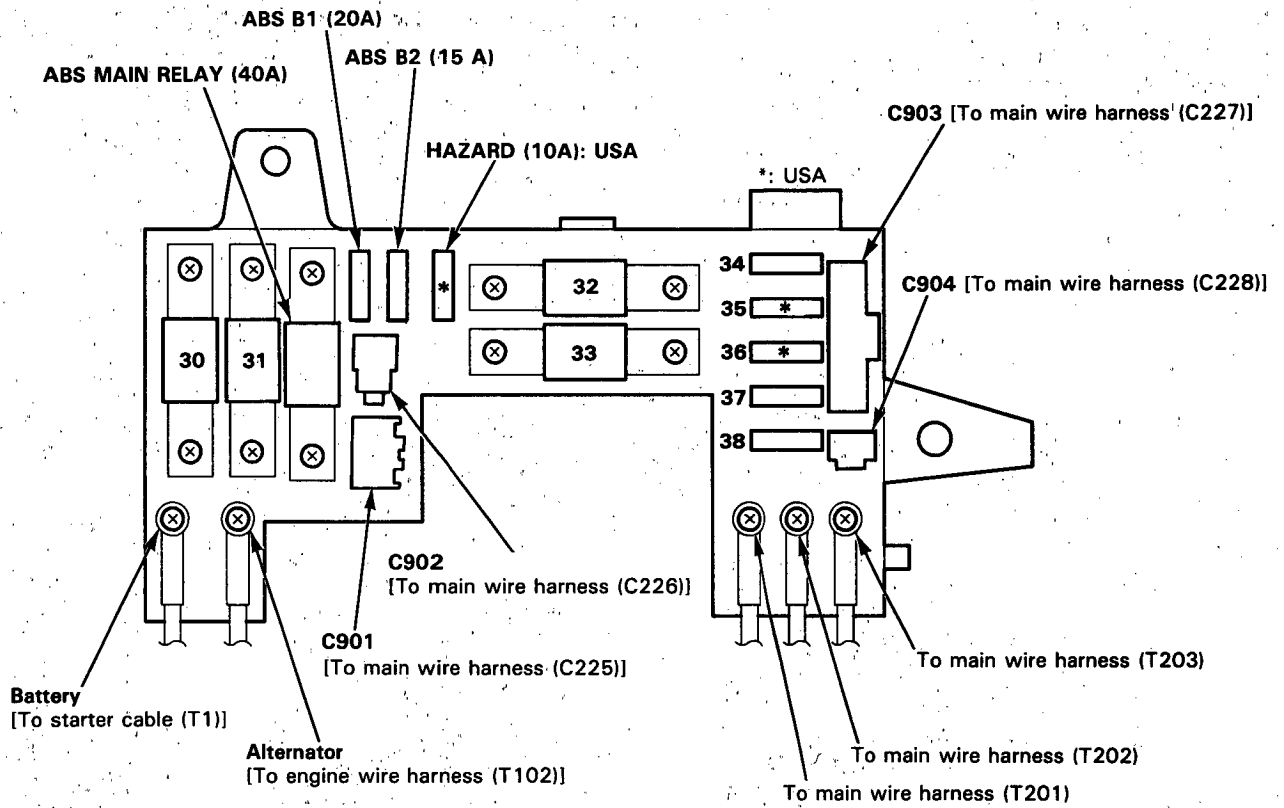
\*5: Hatchback (LS, GS, GSR),

Sedan [USA (LS, GS) Canada (RS, LS, GS)]



# Fuses

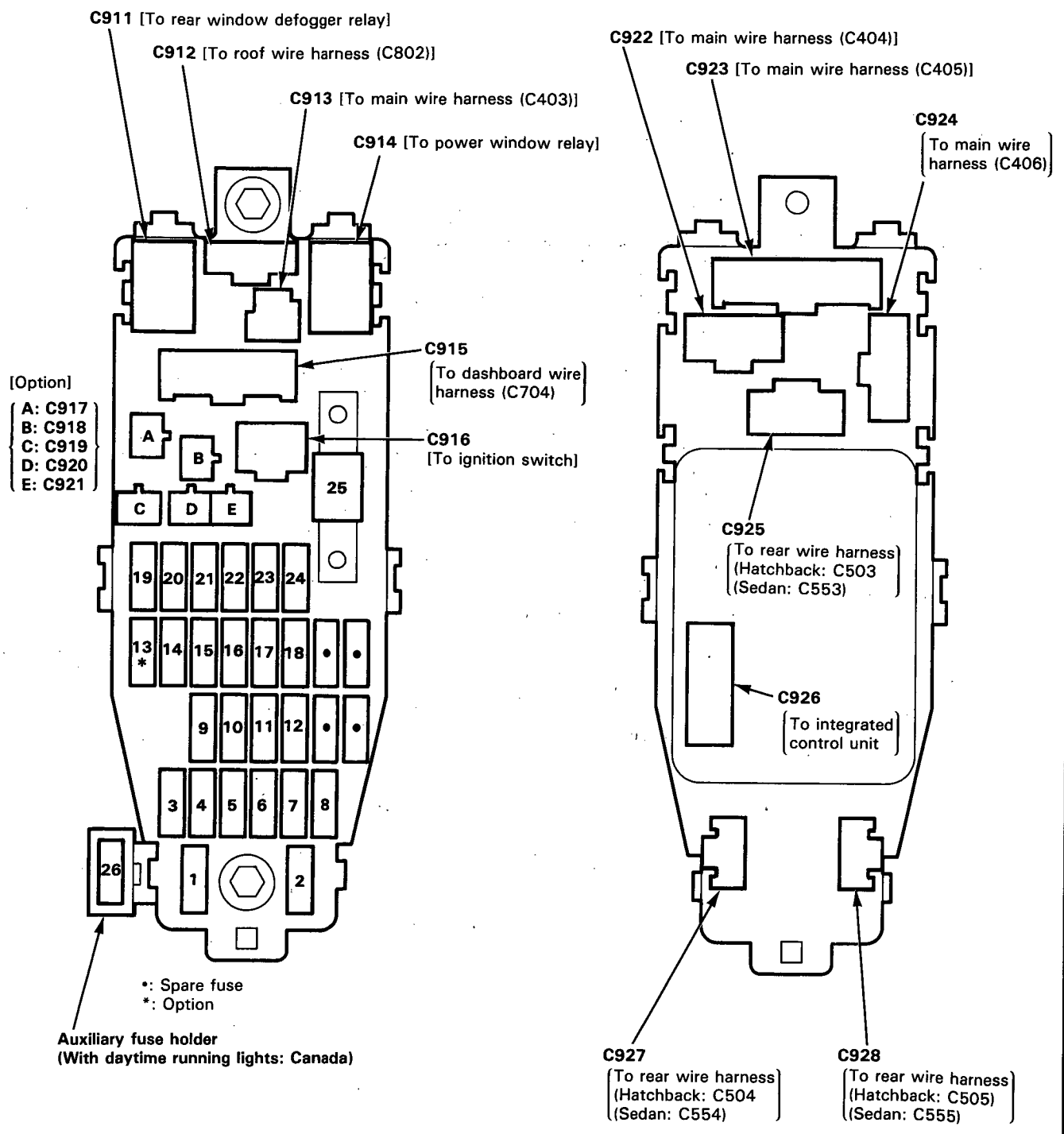
## Under-hood Main Fuse Box





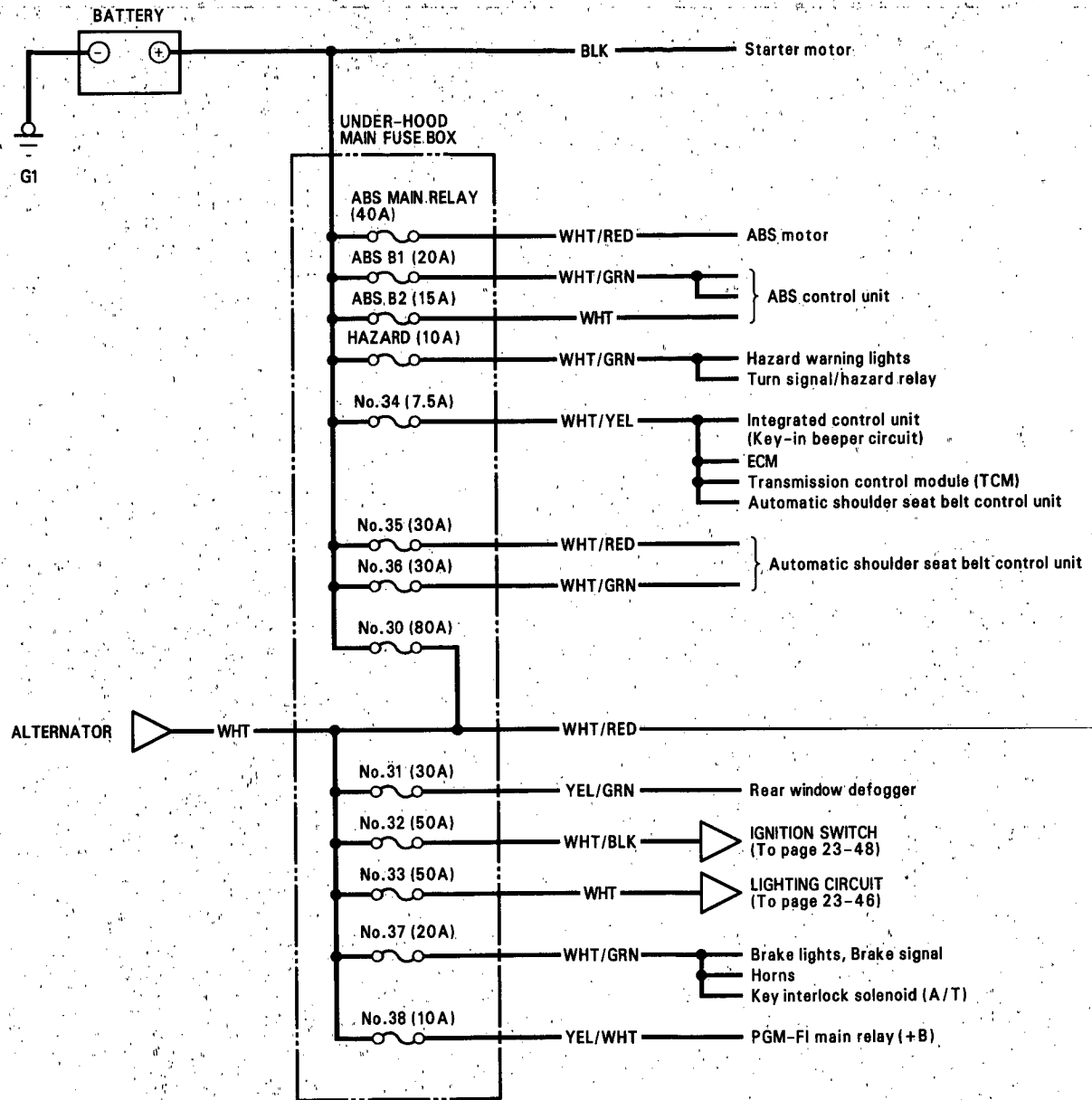


# Under-dash Fuse/Relay Box



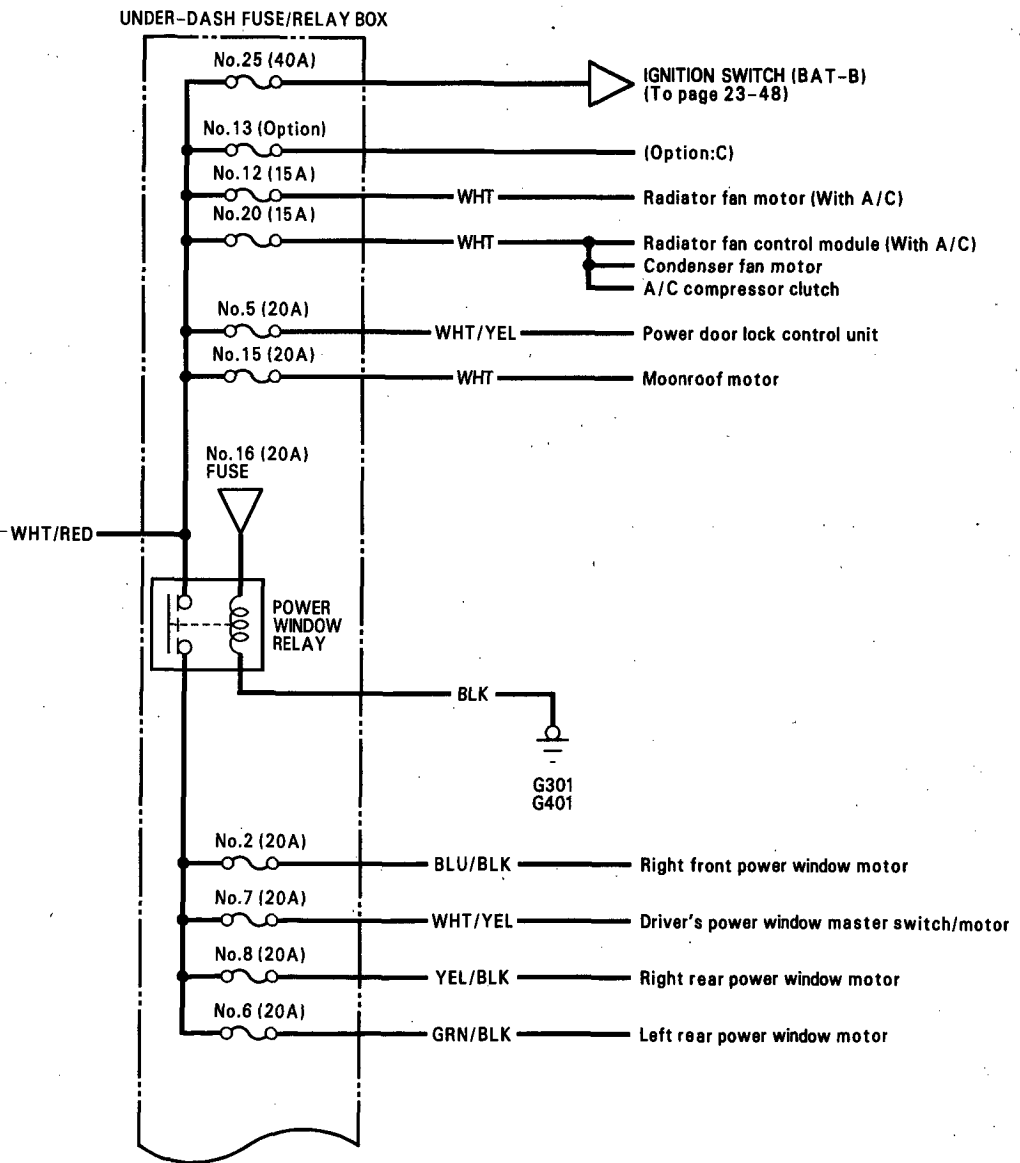
# Power Distribution Circuit Identification

USA:





USA:

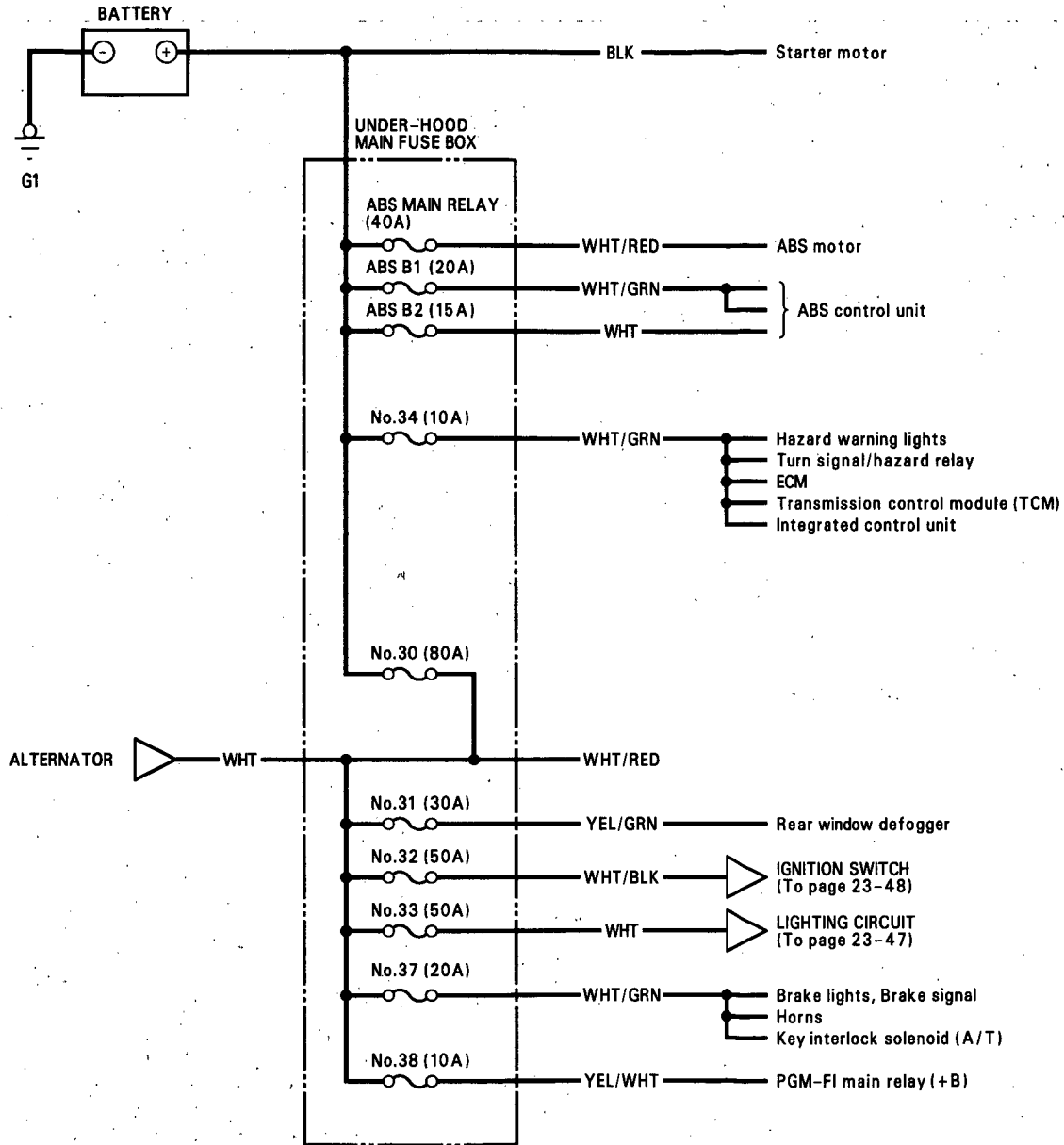


(cont'd)

# Power Distribution

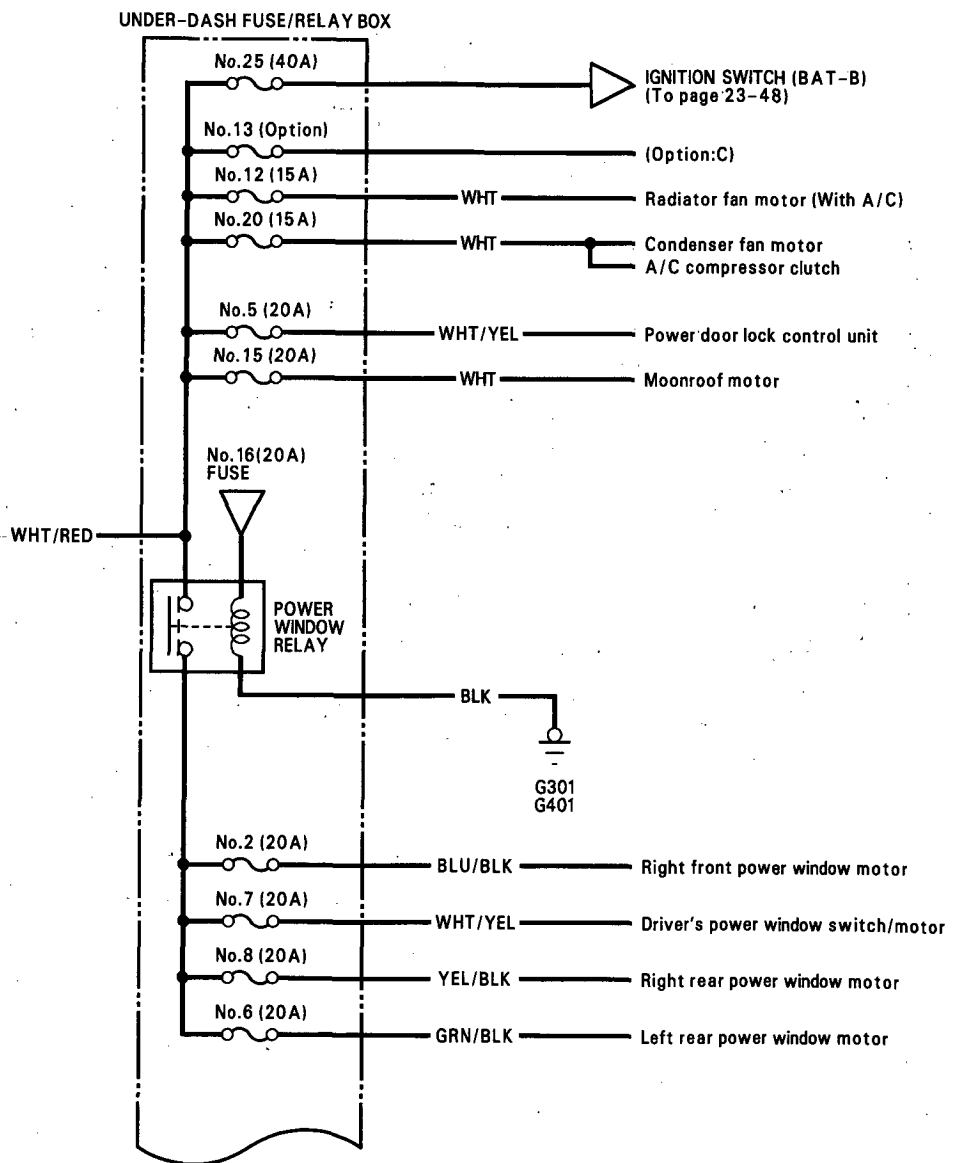
## Circuit Identification

Canada:





Canada:



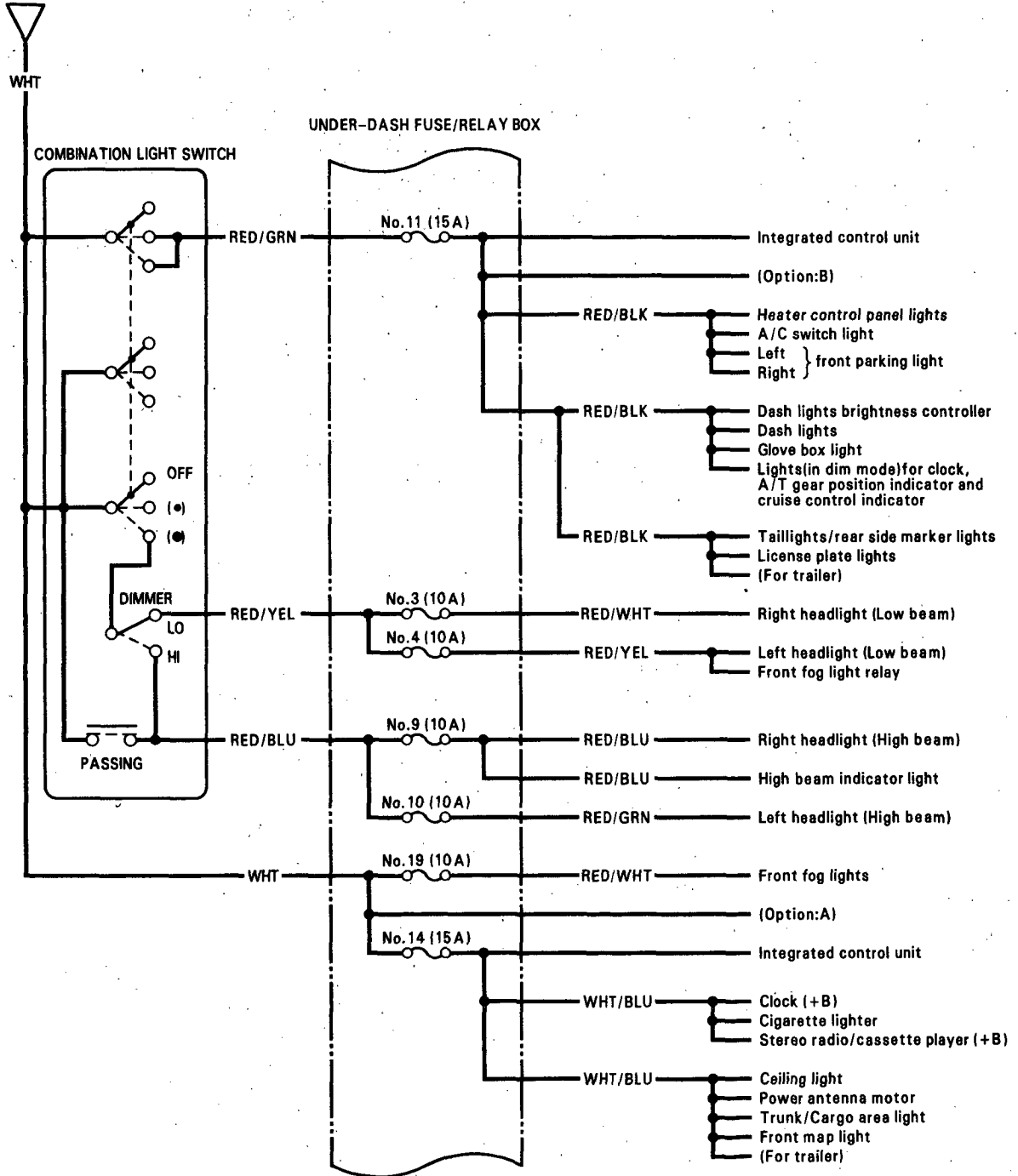
(cont'd)

# Power Distribution

## Circuit Identification (cont'd)

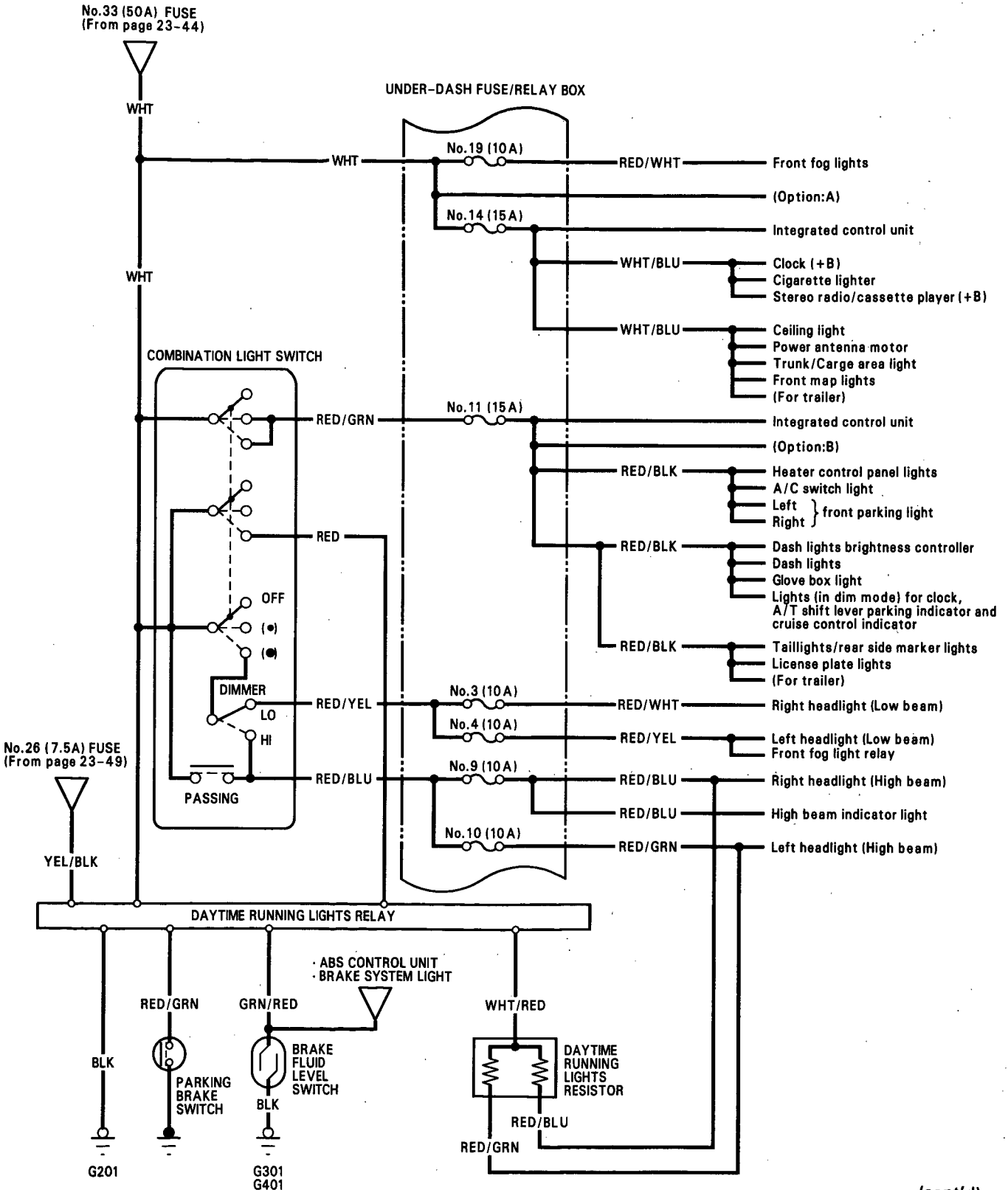
USA:

No.33 (50A) FUSE  
(From page 23-42)





Canada:



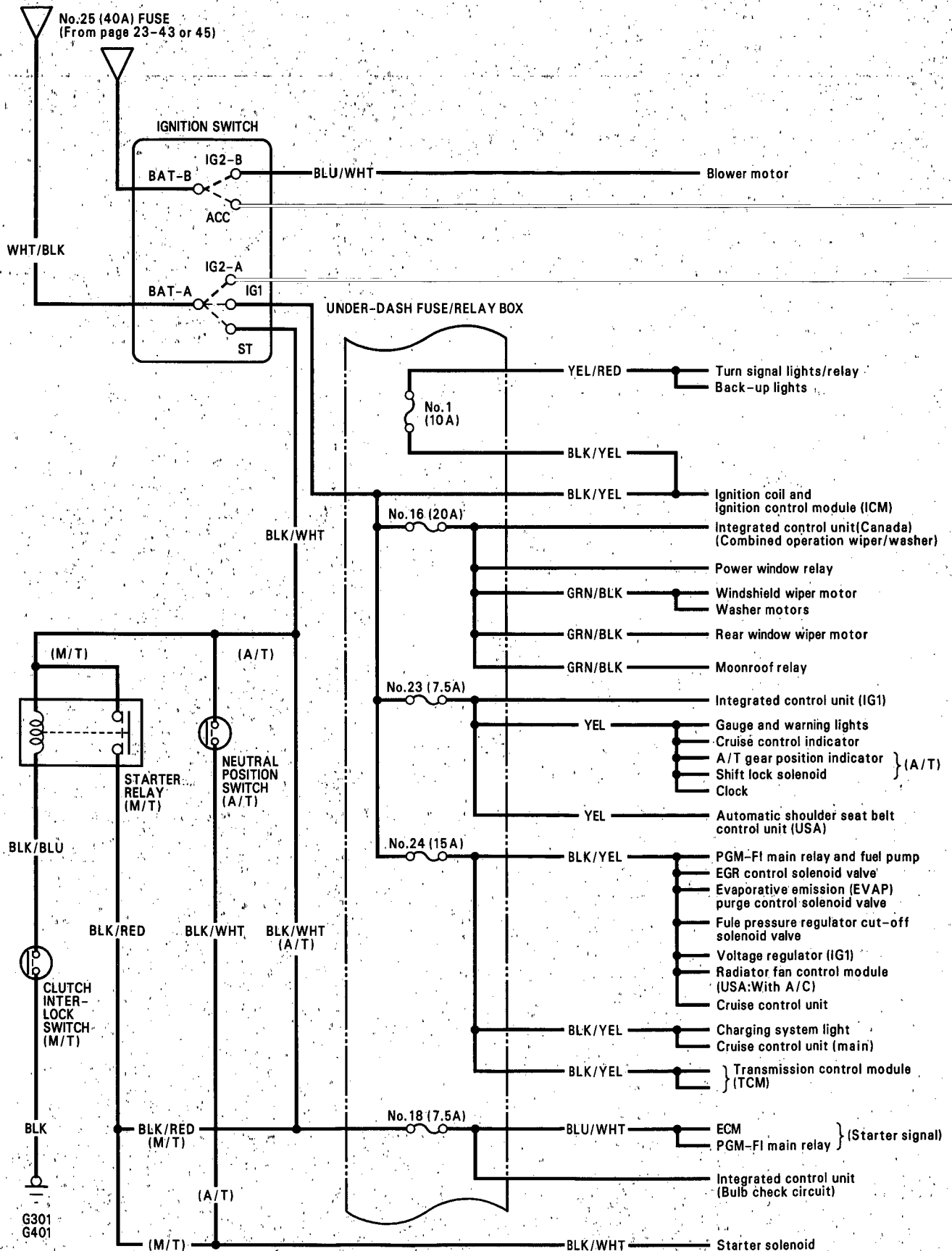
(cont'd)

# Power Distribution

## Circuit Identification (cont'd)

No. 32 (50A) FUSE  
(From page 23-42 or 44)

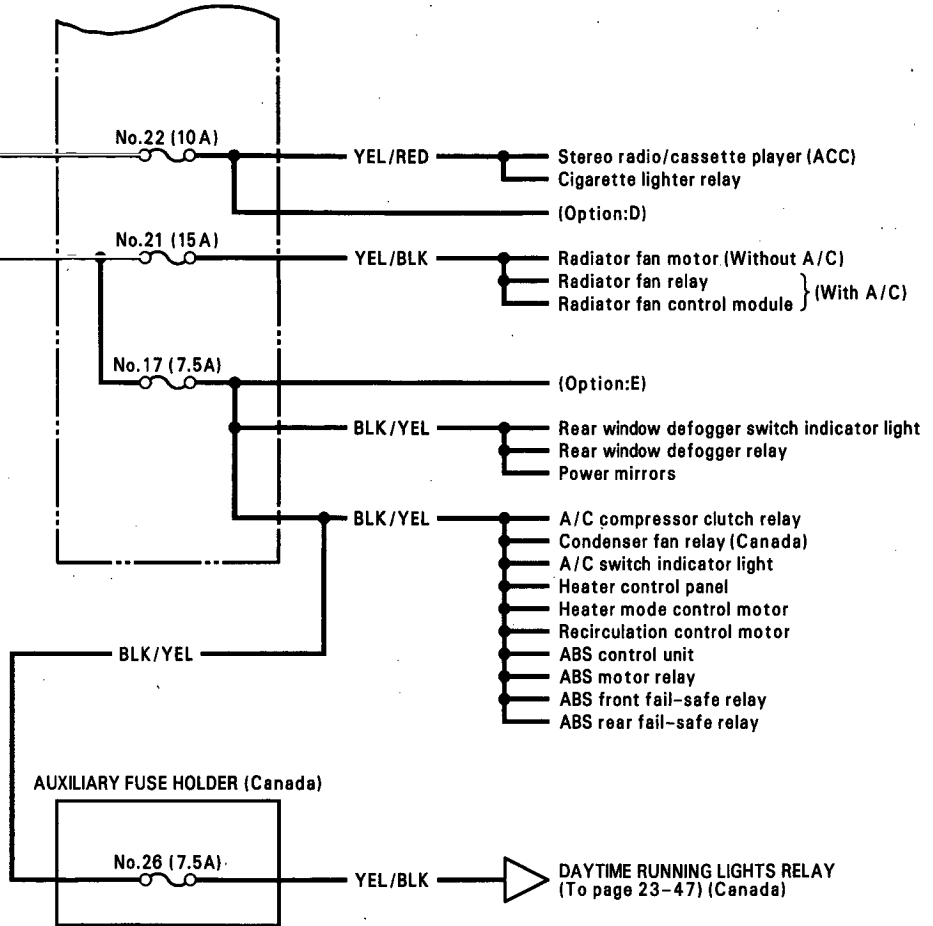
No. 25 (40A) FUSE  
(From page 23-43 or 45)





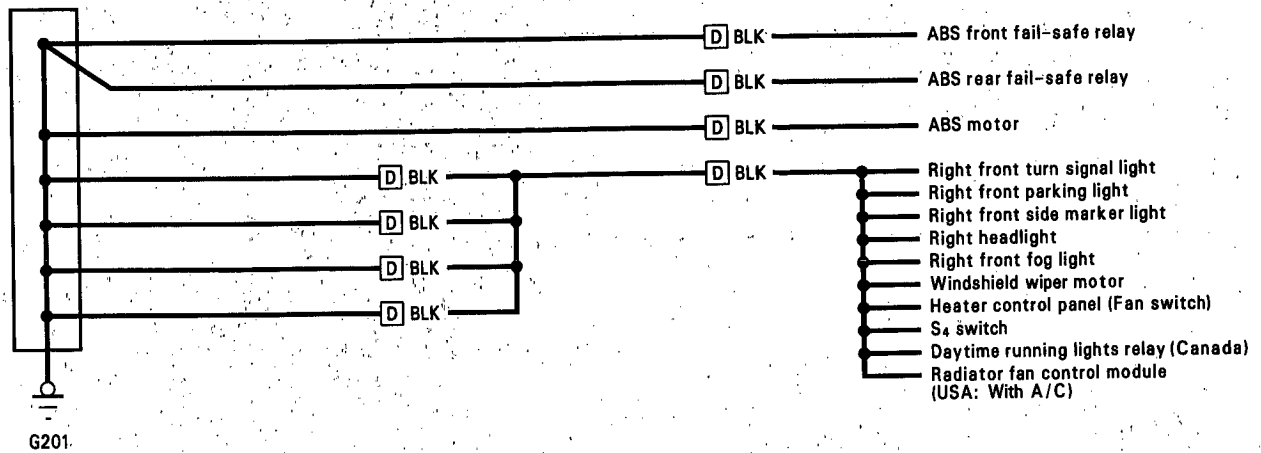
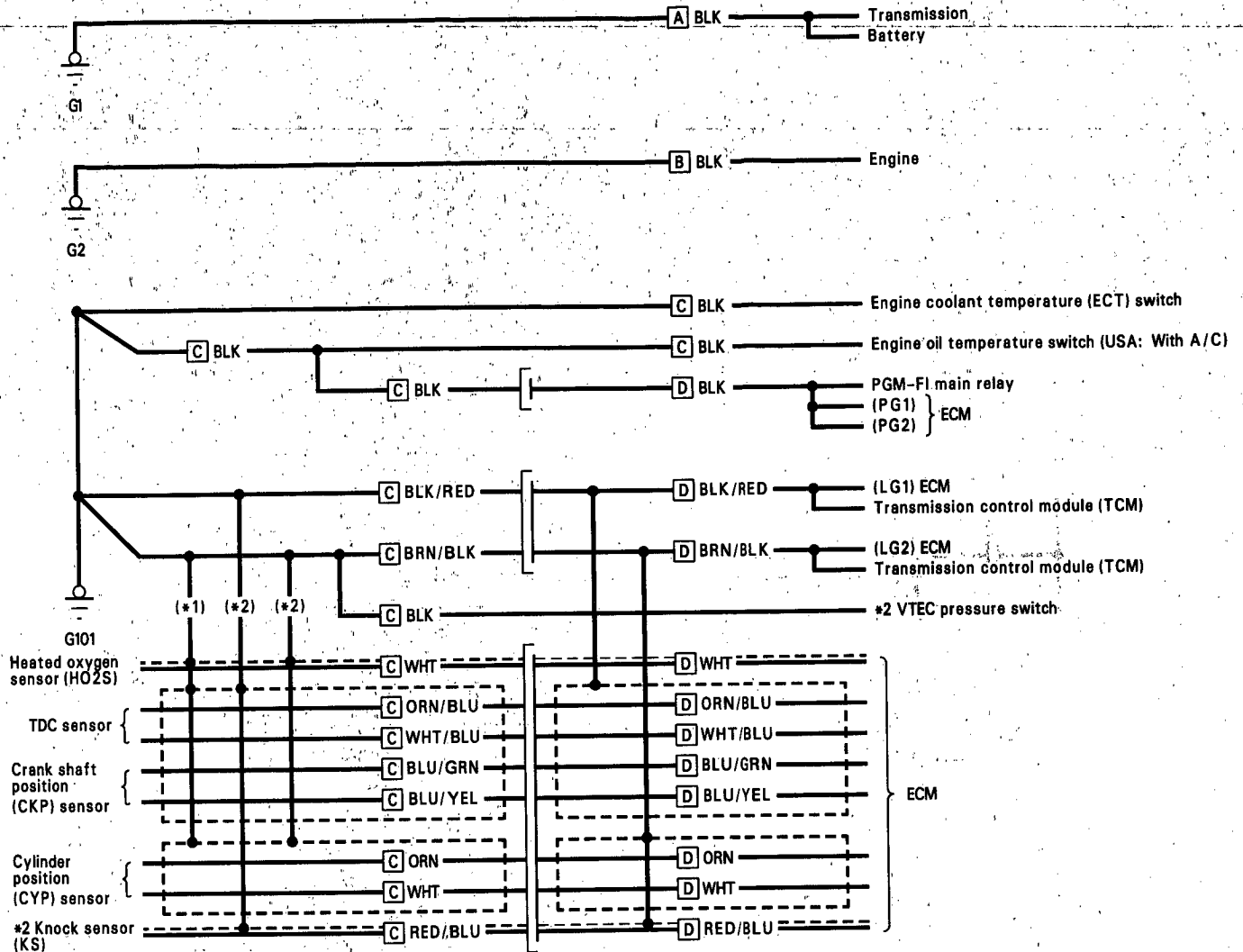


UNDER-DASH FUSE/RELAY BOX



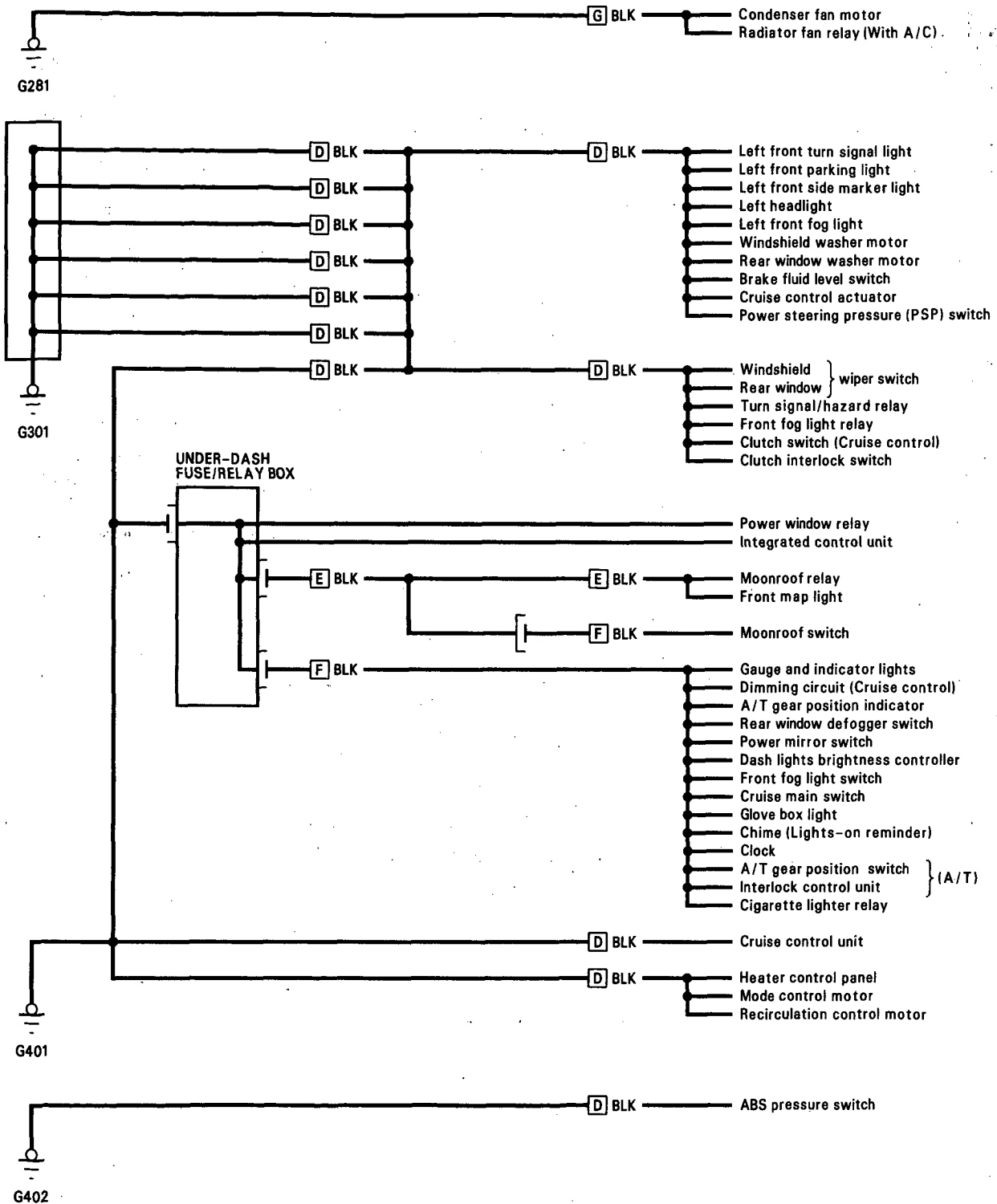
# Ground Distribution

## Circuit Identification



- A** : Battery ground cable
- B** : Engine ground cable
- C** : Engine wire harness
- D** : Main wire harness

- \*1: B18A1 engine
- \*2: B17A1 engine



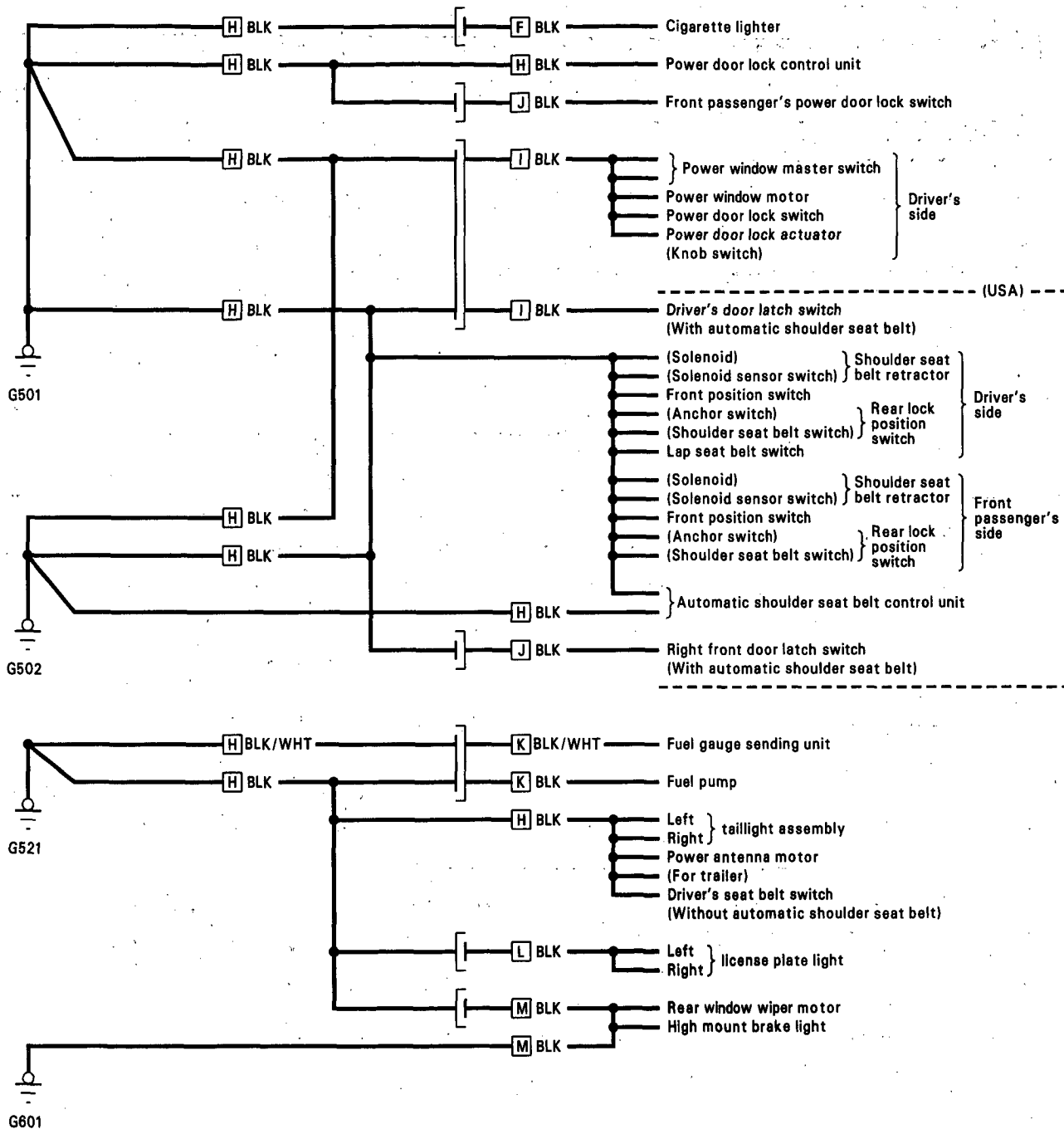
**D** : Main wire harness  
**E** : Roof wire harness  
**F** : Dashboard wire harness

(cont'd)

# Ground Distribution

## Circuit Identification (cont'd)

Hatchback:



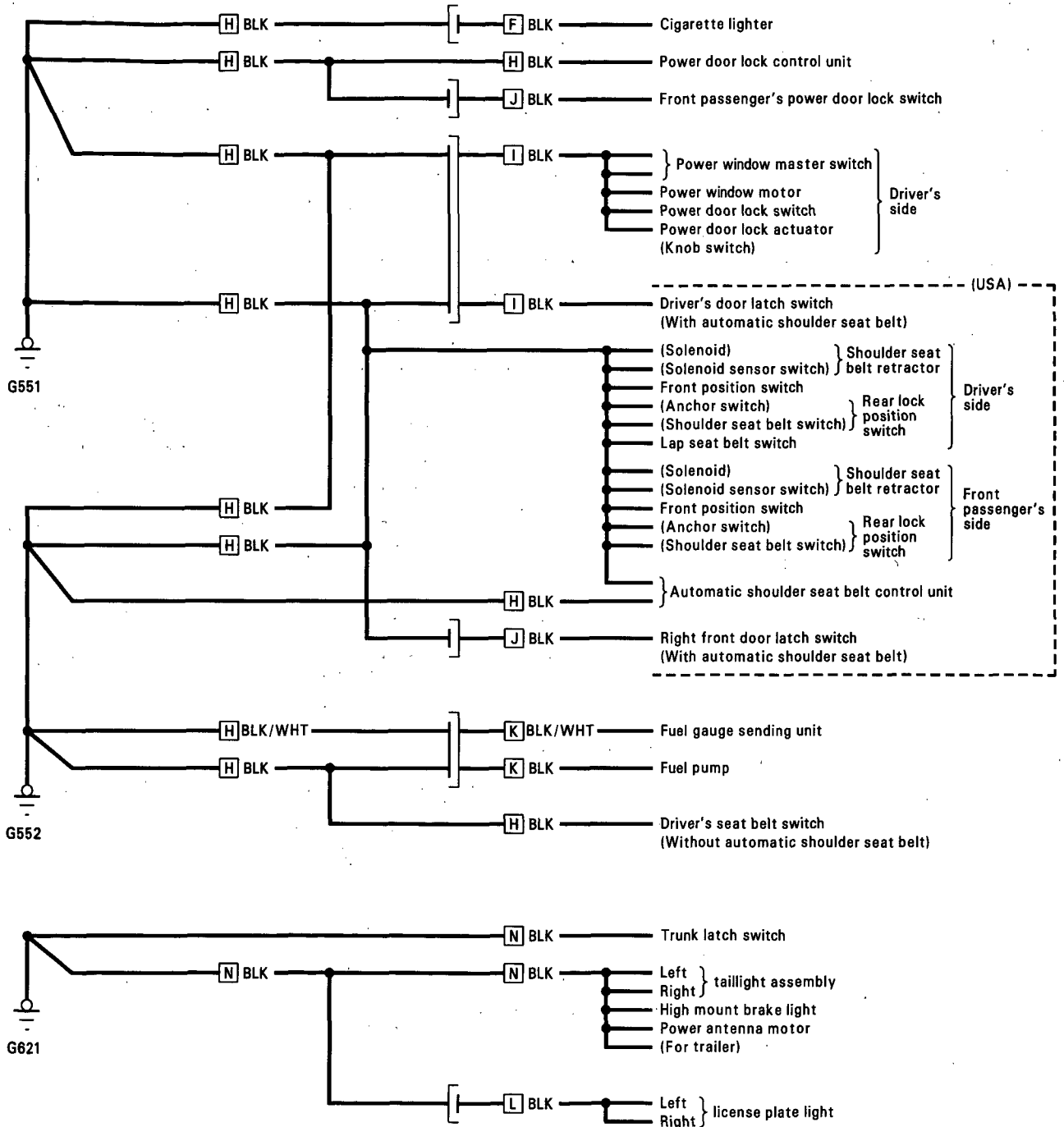
**F** : Dashboard wire harness  
**G** : A/C wire harness  
**H** : Rear wire harness

**I** : Driver's door wire harness  
**J** : Right front door wire harness  
**K** : Fuel tank sub-harness

**L** : License plate light sub-harness  
**M** : Hatch wire harness



**Sedan:**



**F** : Dashboard wire harness  
**H** : Rear wire harness  
**I** : Driver's door wire harness

**J** : Right front door wire harness  
**K** : Fuel tank sub-harness

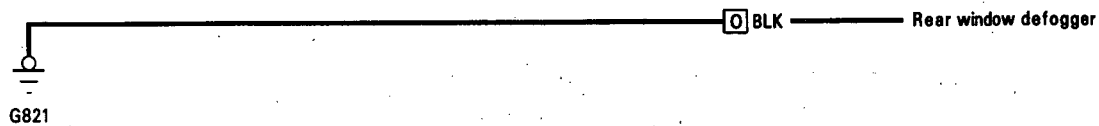
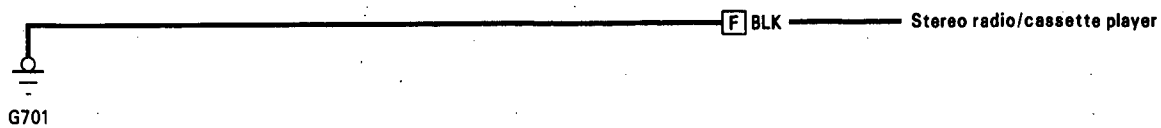
**L** : License plate light sub-harness  
**N** : Trunk wire harness

(cont'd)

# Ground Distribution

## Circuit Identification (cont'd)

---



**F** : Dashboard wire harness  
**O** : Defogger ground wire



# Battery

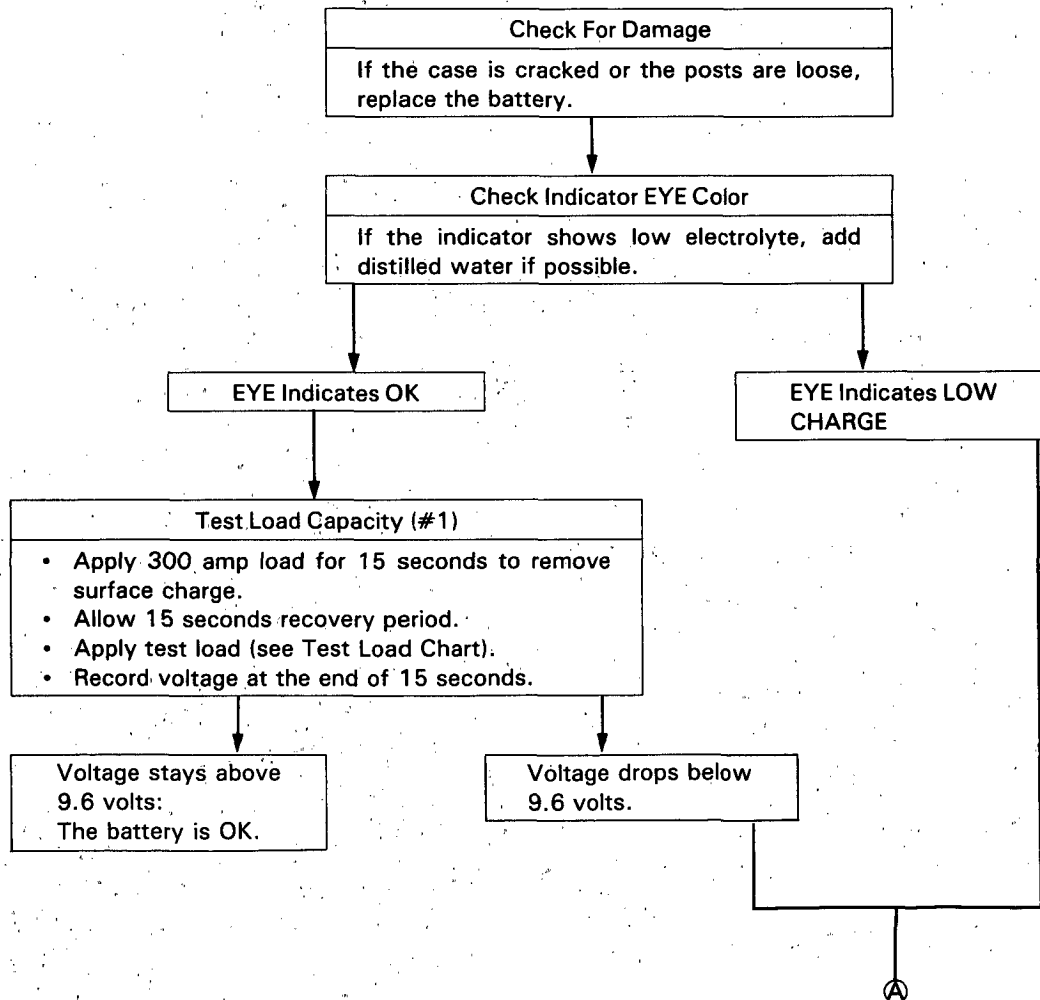
## Test

### ⚠ WARNING

- Battery fluid (electrolyte) contains sulphuric acid. It may cause severe burns if it gets on your skin or in your eyes. Wear protective clothing and a face shield.
  - If electrolyte gets on your skin or clothes, rinse it off with water immediately.
  - If electrolyte gets in your eyes, flush it out by splashing water in your eyes for at least 15 minutes; call a physician immediately.
- A battery gives off hydrogen gas. If ignited, the hydrogen will explode and could crack the battery case and splatter acid on you. Keep sparks, flames, and cigarettes away from the battery.
- Overcharging will raise the temperature of the electrolyte. This may force electrolyte to spray out of the battery vents. Follow the charger manufacturer's instructions and charge the battery at a proper rate.

Use either a JCI or Bear ARBST tester, and follow the manufacturer's procedures. If you don't have one of these computerized testers, follow this conventional test procedure:

To get accurate results, the temperature of the electrolyte must be between 70°F (21°C) and 100°F (38°C).







Ⓐ

**Charge on High Setting (40 amps)**

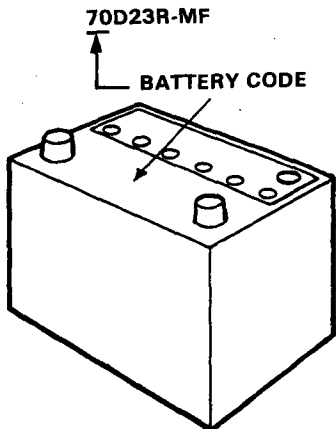
Charge until EYE shows charge is OK; plus an additional 30 minutes to assure full charge.  
 NOTE: If the battery charge is very low, it may be necessary to bypass the charger's polarity protection circuitry.  
 If the EYE does not show charge is OK, within three hours, the battery is no-good; replace it.  
 Write down how long the battery was charged.

**Test Load Capacity (#2)**

- Apply 300 amp load for 15 seconds to remove surface charge.
- Allow 15 seconds recovery period.
- Apply test load (see Test Load Chart).
- Record voltage at the end of 15 seconds.

Voltage stays above 9.6 volts: The battery is OK.

Voltage drops below 9.6 volts: The battery is no-good.



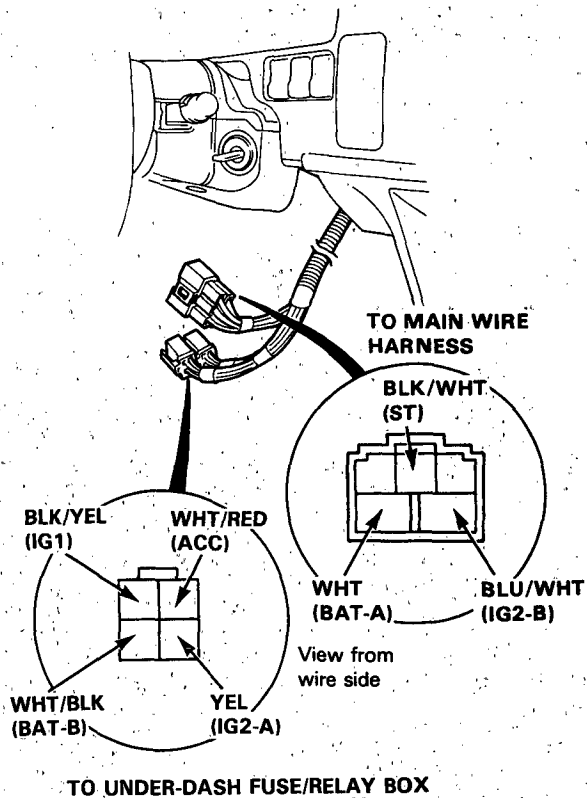
TEST LOAD CHART		
Use the test load or 1/2 the cold cranking amps (CCA) printed on the label on the top of the battery. If neither is indicated, use the information below:		
BATTERY CODE	COLD CRANKING AMPS (CCA)	LOAD (amps)
70	440	220

# Ignition Switch

## Test

1. Remove the dashboard lower cover, left knee bolster, and left kick panel (see page 23-60).
2. Disconnect the 4-P connector from the under-dash fuse/relay box and the 5-P connector from the main wire harness.
3. Check for continuity between the terminals in each switch position according to the table.

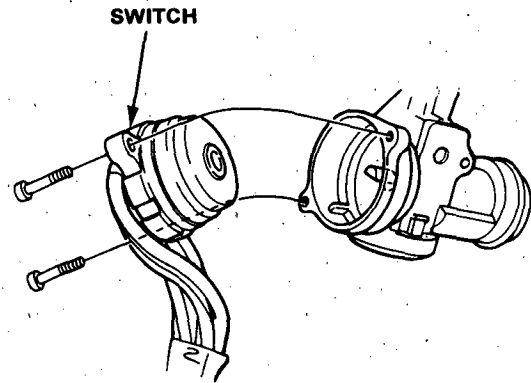
Terminal Position	WHT/RED (ACC)	WHT/BLK (BAT -B)	BLU/WHT (IG2 -B)	WHT (BAT -A)	BLK/YEL (IG1)	YEL (IG2 -A)	BLK/WHT (ST)
0							
I	○	○					
II	○	○	○	○	○	○	
III				○	○	○	○



## Electrical Switch Replacement

1. Remove the steering wheel, then remove the steering column covers (see page 23-60).
2. Remove the dashboard lower cover and left knee bolster (see page 23-60).
3. Disconnect the 4-P connector from the under-dash fuse/relay box and the 5-P connector from the main wire harness.
4. Insert the key and turn it to "0".
5. Remove the two screws and replace the switch.

NOTE: The illustration shows M/T.



6. Install in the reverse order of removal.

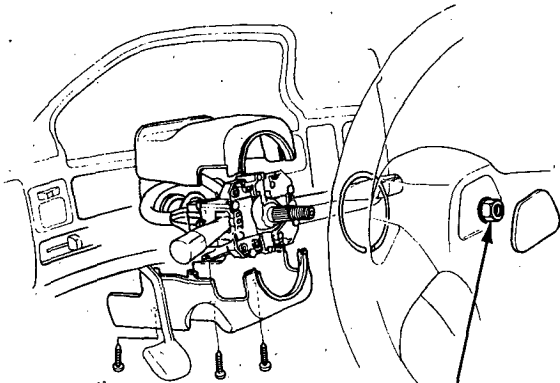


## Lock Cylinder Replacement (M/T)

### NOTE:

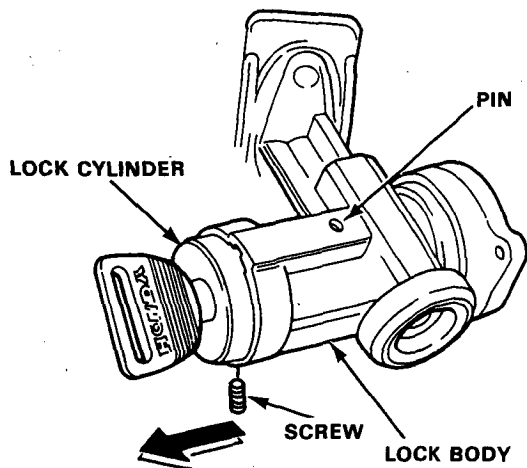
- Replace the steering lock assembly on cars with automatic transmission.
- Before replacement, disconnect the battery negative cable.

1. Remove the steering wheel, then remove the steering column covers.

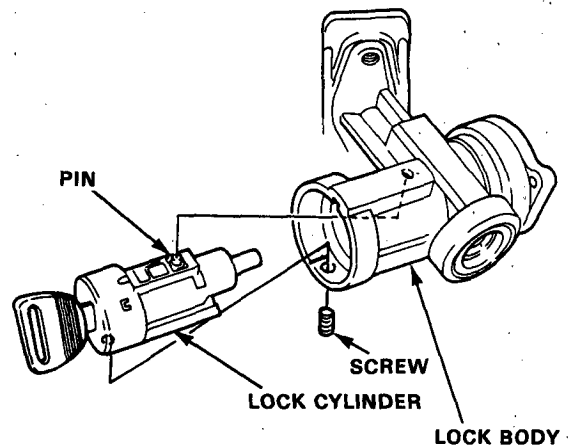


**SELF-LOCKING NUT** 50 N·m  
(5.0 kg-m, 36.2 lb-ft)  
Replace.

2. Turn the ignition key to "I" position.
3. Remove the screw from the lock body.
4. Push the pin in and remove the lock cylinder from the lock body.



5. Turn the key to "O" position and align the new lock cylinder with the lock body.
6. Turn the key almost to "I" position and insert the lock cylinder until the pin touches the body.
7. Turn the key to the "I" position, push the pin and insert the lock body cylinder into the lock until the pin clicks into place.
8. Install the screw to the lock body.



# Ignition Switch

## Steering Lock Replacement

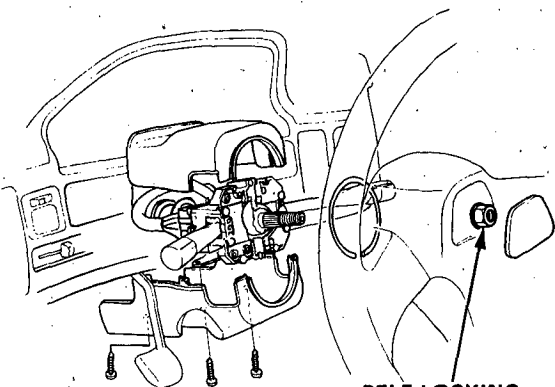
### NOTE:

The radio may have a coded theft protection circuit. Be sure to get the customer's code number before

- Disconnecting the battery.
- Removing the No. 14 (15 A) fuse (in the under-dash fuse/relay box)
- Removing the radio.

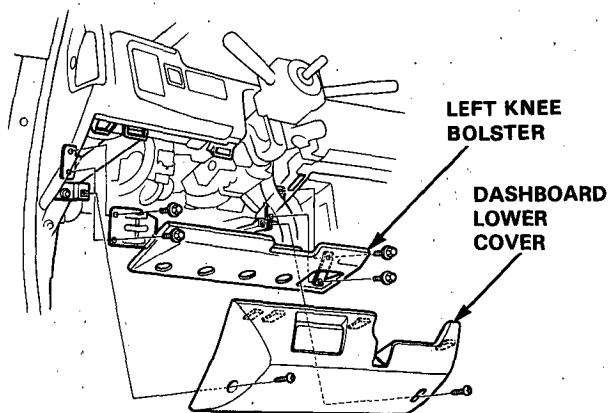
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the battery negative cable before replacement.
2. Remove the steering wheel, then remove the steering column covers.

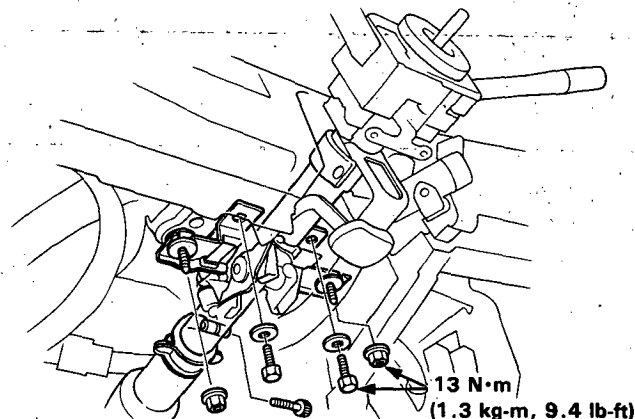


**SELF-LOCKING NUT 50 N·m (5.0 kg-m, 36 lb-ft)**  
Replace.

3. Remove the dashboard lower cover and the left knee bolster.



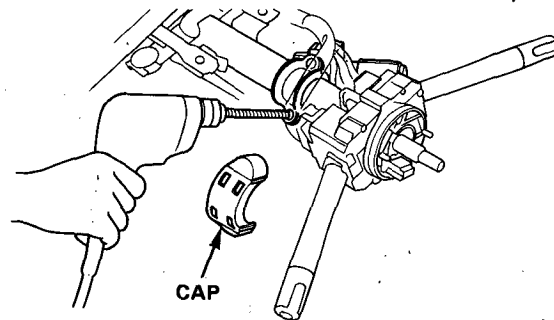
4. Remove the mounting bolts and nuts.



5. Lower the steering column assembly.
6. Center punch each of the two shear bolts and drill their heads off with a 5 mm (3/16 in) drill bit.

**CAUTION: Do not damage the switch body when removing the shear bolts**

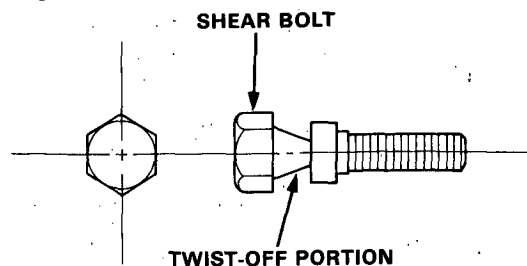
7. Remove the shear bolts from the switch body.



8. Install the new ignition switch without the key inserted.
9. Loosely tighten the new shear bolts.

**NOTE: Make sure the projection on the ignition switch is aligned with the hole in the steering column.**

10. Insert the ignition key and check for proper operation of the steering wheel lock and that the ignition key turns freely.
11. Tighten the shear bolts until the hex heads twist off.



# Starting System

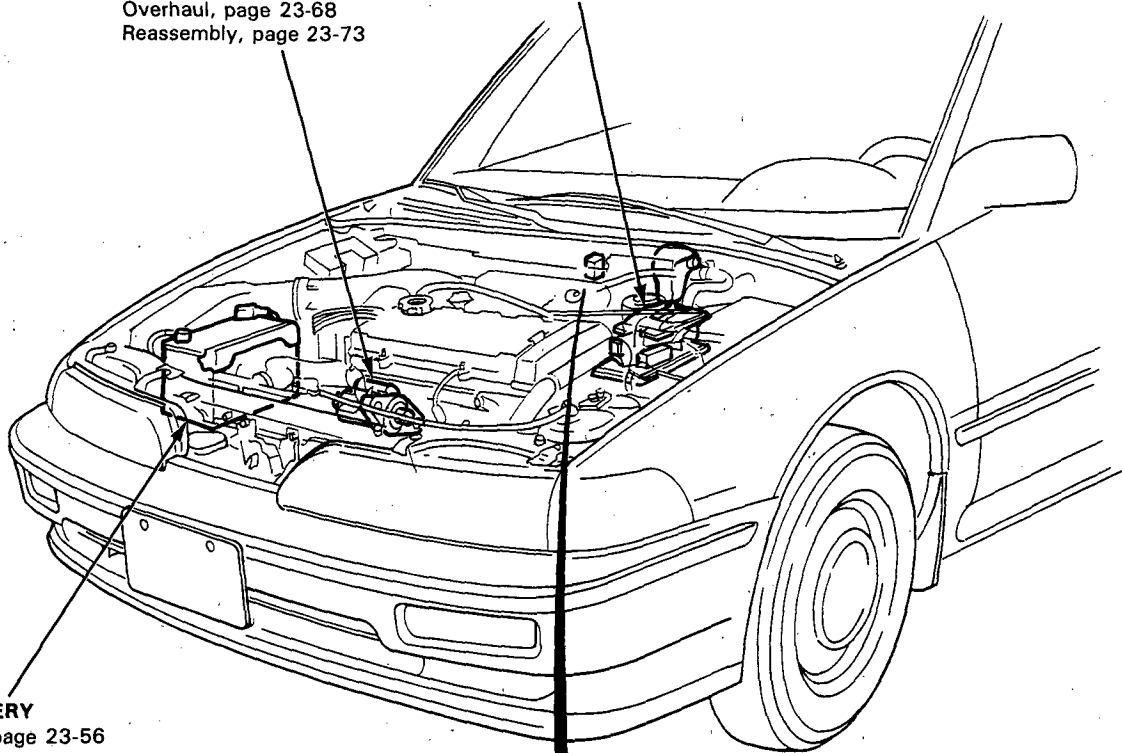


## Component Location Index

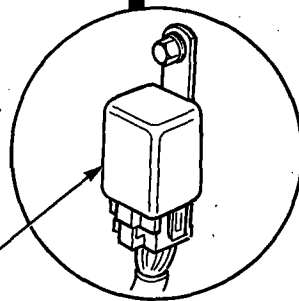
- **STARTER INTERLOCK SYSTEM (M/T)**  
Description, page 23-62
- **CLUTCH INTERLOCK SWITCH (M/T)**  
Test, page 23-66  
Switch Position Adjustment, section 12

**STARTER**  
Test, page 23-64  
Solenoid Test, page 23-67  
Replacement, page 23-67  
Overhaul, page 23-68  
Reassembly, page 23-73

**A/T GEAR POSITION SWITCH (NEUTRAL POSITION SWITCH) (A/T)**  
Test, page 23-128  
Replacement, page 23-129



**BATTERY**  
Test, page 23-56



**STARTER RELAY (M/T)**  
(Located at the right side of the heater unit)  
Test, page 23-66

# Starting System

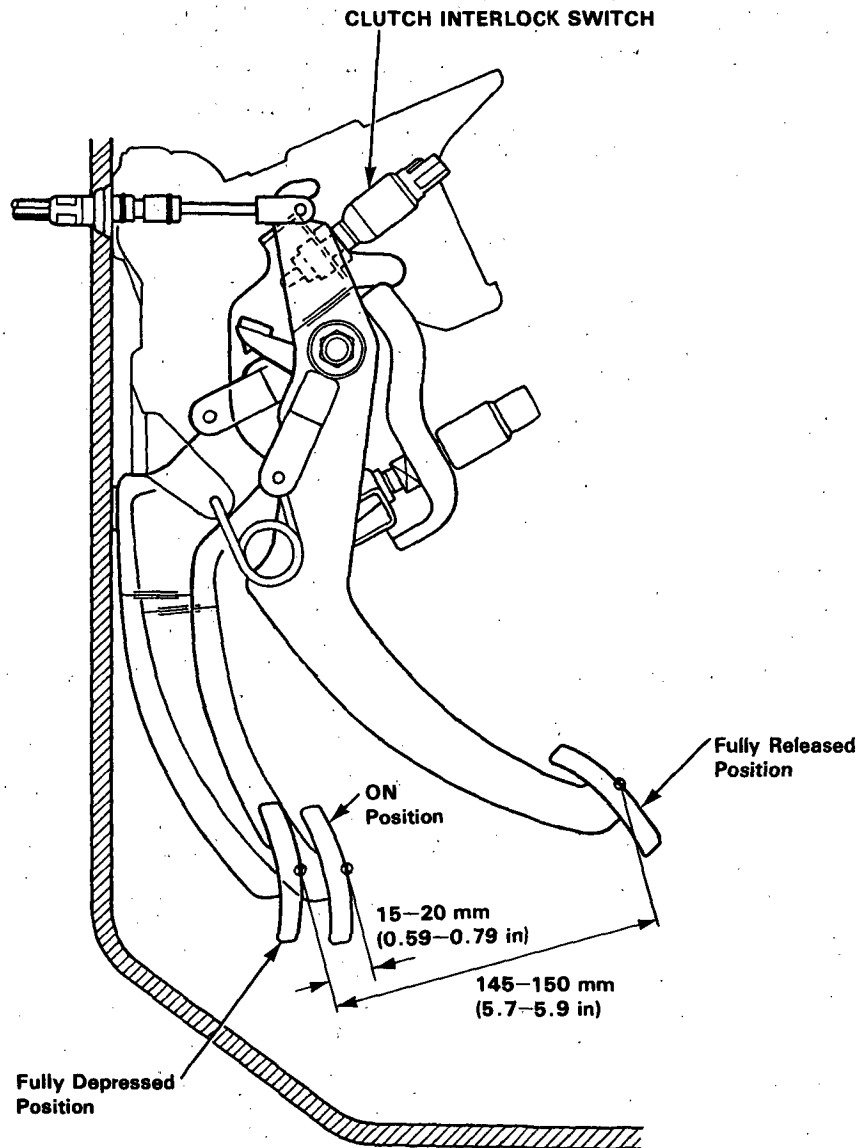
## Description

### Starter Interlock System (M/T):

The starter interlock system prevents the engine from starting unless the clutch pedal is fully depressed.

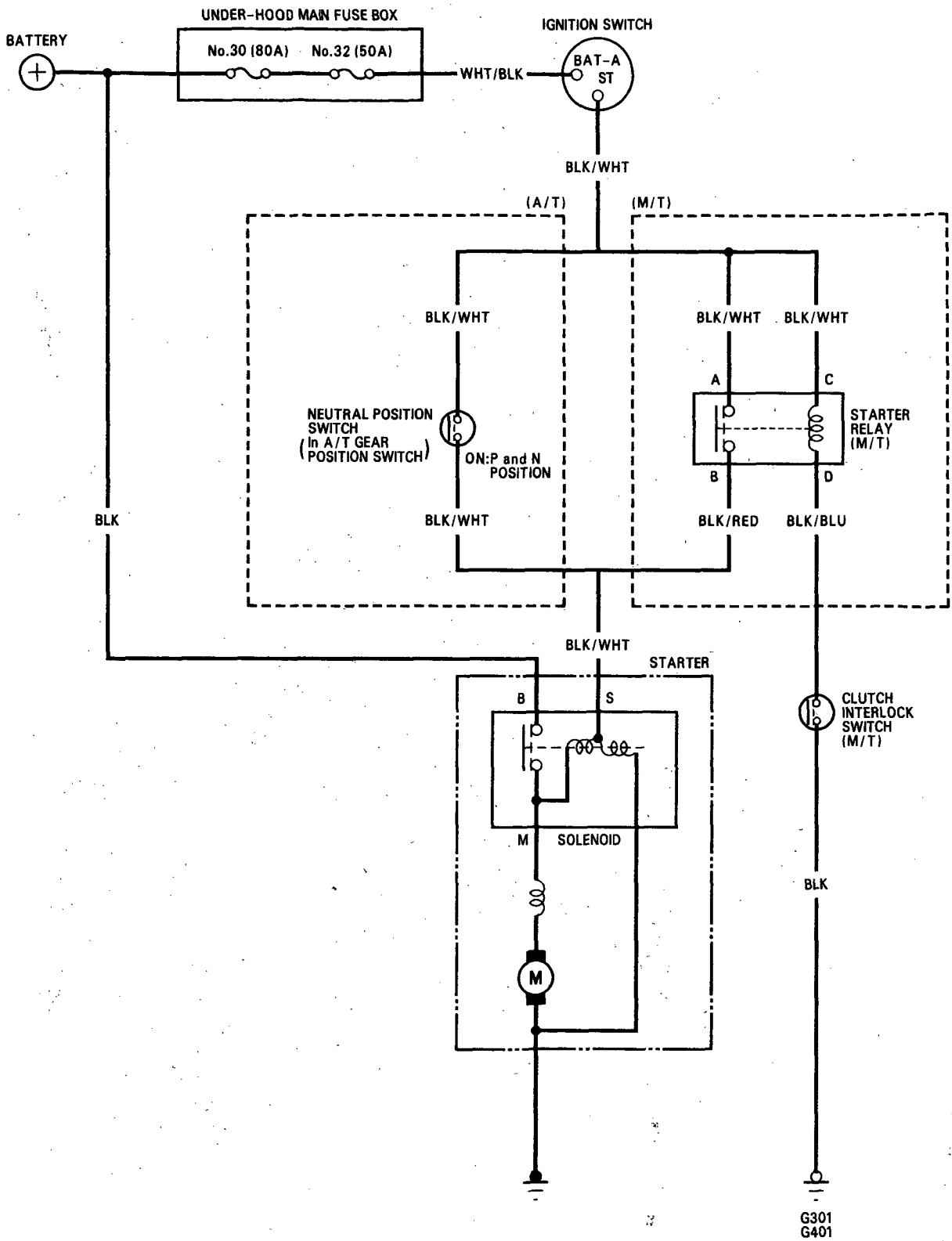
The clutch interlock switch turns on at the position where the clutch disengages: 15–20 mm (0.59–0.79 in) from the fully depressed position.

NOTE: Full stroke of the clutch pedal is 145–150 mm (5.7–5.9 in) from the fully released position.





# Circuit Diagram



# Starting System

## Starter Test

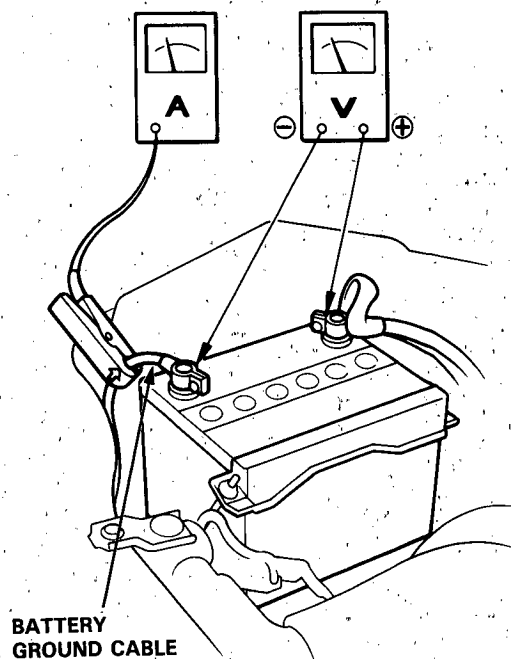
NOTE: The air temperature must be between 59 and 100°F (15 and 38°C) before testing.

### Recommended Procedure:

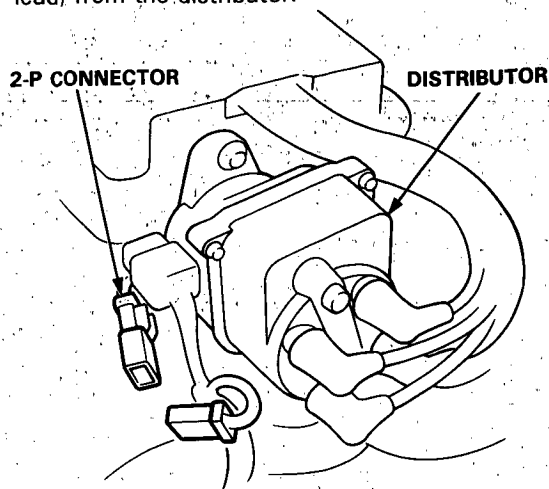
- Use a starter system tester.
- Connect and operate the equipment in accordance with manufacturer's instructions.
- Test and troubleshoot as described.

### Alternate Procedure:

- Use the following equipment:
  - Ammeter, 0–400 A
  - Voltmeter, 0–20 V (accurate within 0.1 volt)
  - Tachometer, 0–1200 rpm
- Hook up voltmeter and ammeter as shown.



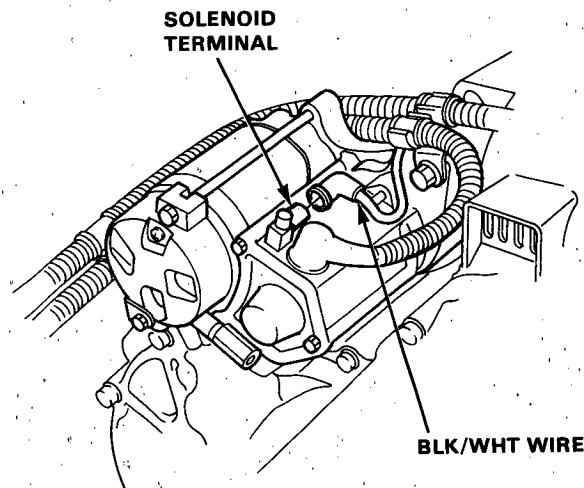
1. Disconnect the 2-P connector (ignition coil primary lead) from the distributor.



2. Check the starter engagement: Press the clutch pedal all the way in (M/T), and turn the ignition switch to "START". The starter should crank the engine.

NOTE: On cars equipped with manual transmission, the engine will not crank unless the clutch pedal is fully depressed.

- If the starter does not crank the engine, check the battery, battery positive cable, ground, and the wire connections for looseness and corrosion.
- Test again. If the starter still does not crank the engine, bypass the ignition switch circuit as follows (make sure the transmission is in neutral): Unplug the connector (BLK/WHT wire) from the starter. Connect a jumper wire from the battery positive (+) terminal to the solenoid terminal. The starter should crank the engine.







— If the starter still does not crank the engine, remove it and diagnose its internal problems.

— If the starter cranks the engine, check for an open in the BLK/WHT wire circuit between the starter and ignition switch, and connectors. Check the ignition switch.

On cars with automatic transmission, check the A/T gear position switch (neutral position switch) and connector.

On cars with manual transmission, check the starter relay, clutch interlock switch, and connectors.

NOTE: Check the No. 32 (50 A) fuse (in the underhood main fuse box) and the starter cut relay.

3. Check for wear or damage:

The starter should crank the engine smoothly and steadily.

If the starter engages, but cranks the engine erratically, remove the starter motor. Inspect the starter, drive gear, and flywheel ring gear for damage.

Check the drive gear overrunning clutch for binding or slipping when the armature is rotated with the drive gear held. Replace the gears if damaged.

4. Check cranking voltage and current draw,

Voltage should be no less than 8.0 volts.

Current should be no more than 350 amperes.

If voltage is too low, or current draw too high, check for:

- Low battery.
- Open circuit in starter armature commutator segments.
- Starter armature dragging.
- Shorted armature winding.
- Excessive drag in engine.

5. Check cranking rpm:

Engine speed, during cranking should be above 100 rpm. If it is not, check for:

- Loose battery or starter terminals.
- Excessively worn starter brushes.
- Open circuit in commutator segments.
- Dirty or damaged helical spline or drive gear.
- Defective drive gear overrunning clutch.

6. Check the starter disengagement:

Press the clutch pedal all the way in (M/T), turn the ignition switch to "III" position and release to "II" position. The starter drive gear should disengage from the flywheel ring gear.

If the drive gear hangs up on the flywheel ring gear, check for:

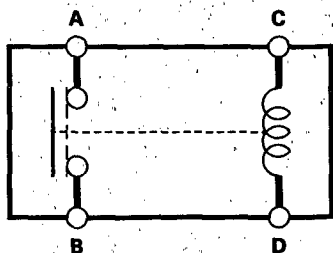
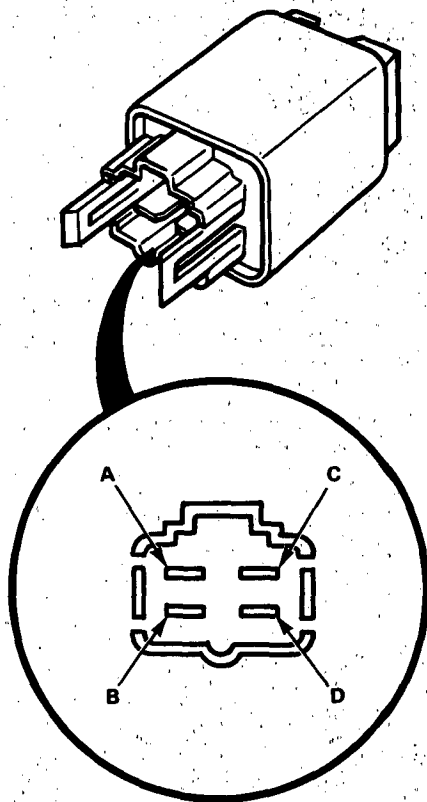
- Solenoid plunger and switch malfunction.
- Dirty drive gear assembly or damaged overrunning clutch.

# Starting System

## Starter Relay Test (M/T)

"Normally open" Type:

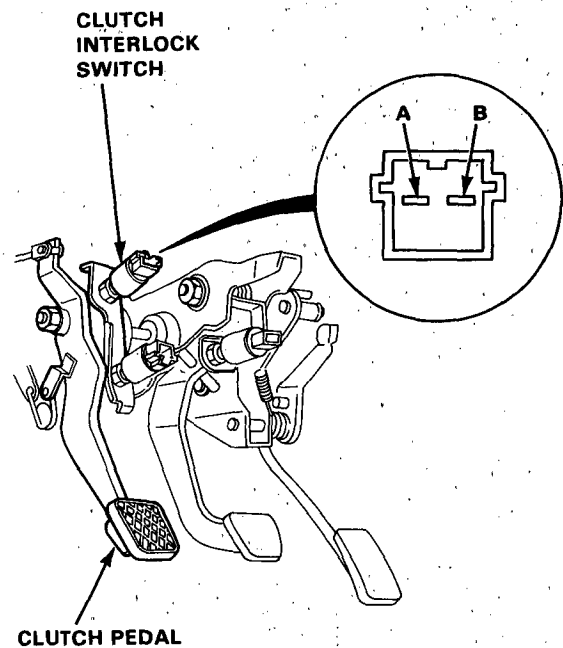
1. Remove the starter relay and disconnect it from the harness.
2. There should be continuity between the C and D terminals.
3. There should be continuity between the A and B terminals when battery power and ground are connected to the C and D terminals. There should be no continuity when power is disconnected.



## Clutch Interlock Switch Test (M/T)

1. Remove the dashboard lower cover and knee bolster, then disconnect the 2-P connector from the switch.
2. Check for continuity between the terminals according to the table.

Terminal	A	B
Clutch Pedal		
RELEASED		
PUSHED	○	○



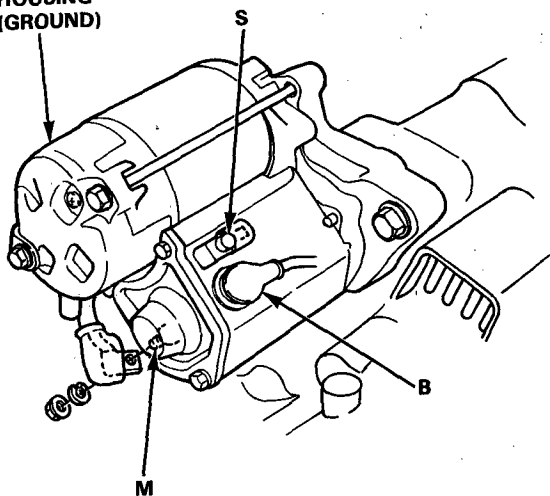
3. If necessary, replace the switch or adjust its position (see section 12).



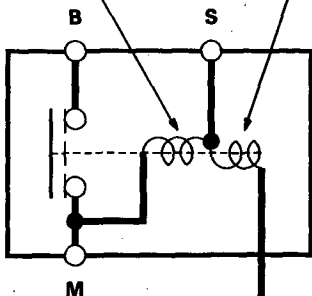
## Starter Solenoid Test

1. Check the hold-in coil for continuity between the S terminal and the armature housing (ground). If there is continuity, the coil is OK.
2. Check the pull-in coil for continuity between the S and M terminals. If there is continuity, the coil is OK.

ARMATURE HOUSING (GROUND)



PULL-IN COIL      HOLD-IN COIL



## Starter Replacement

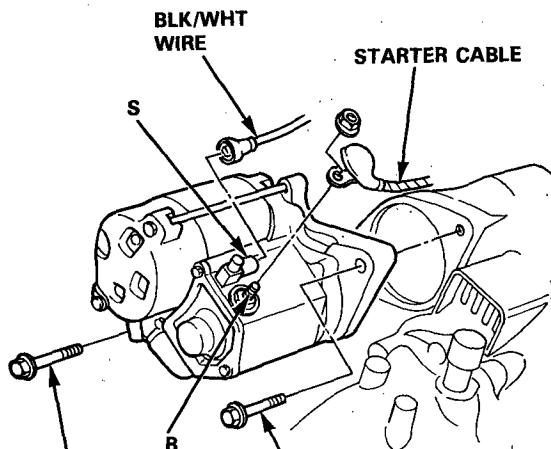
### NOTE:

The radio may have a coded theft protection circuit. Be sure to get the customer's code number before

- Disconnecting the battery.
- Removing the No. 14 (15 A) fuse. (in the under-dash fuse/relay box)
- Removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code restore radio operation.

1. Disconnect the negative cable from the battery.
2. Disconnect the starter cable from the B terminal on the solenoid, then the BLK/WHT wire from the S terminal.
3. Remove the two bolts holding the starter, and remove the starter.

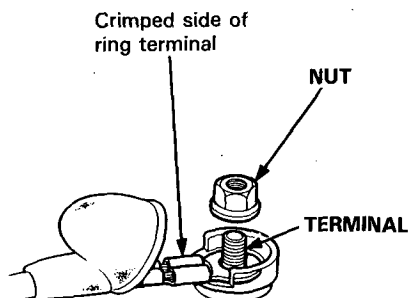


LOWER MOUNTING BOLT  
45 N·m (4.5 kg-m, 32 lb-ft)

UPPER MOUNTING BOLT  
45 N·m (4.5 kg-m, 32 lb-ft)

4. Install in the reverse order of removal.

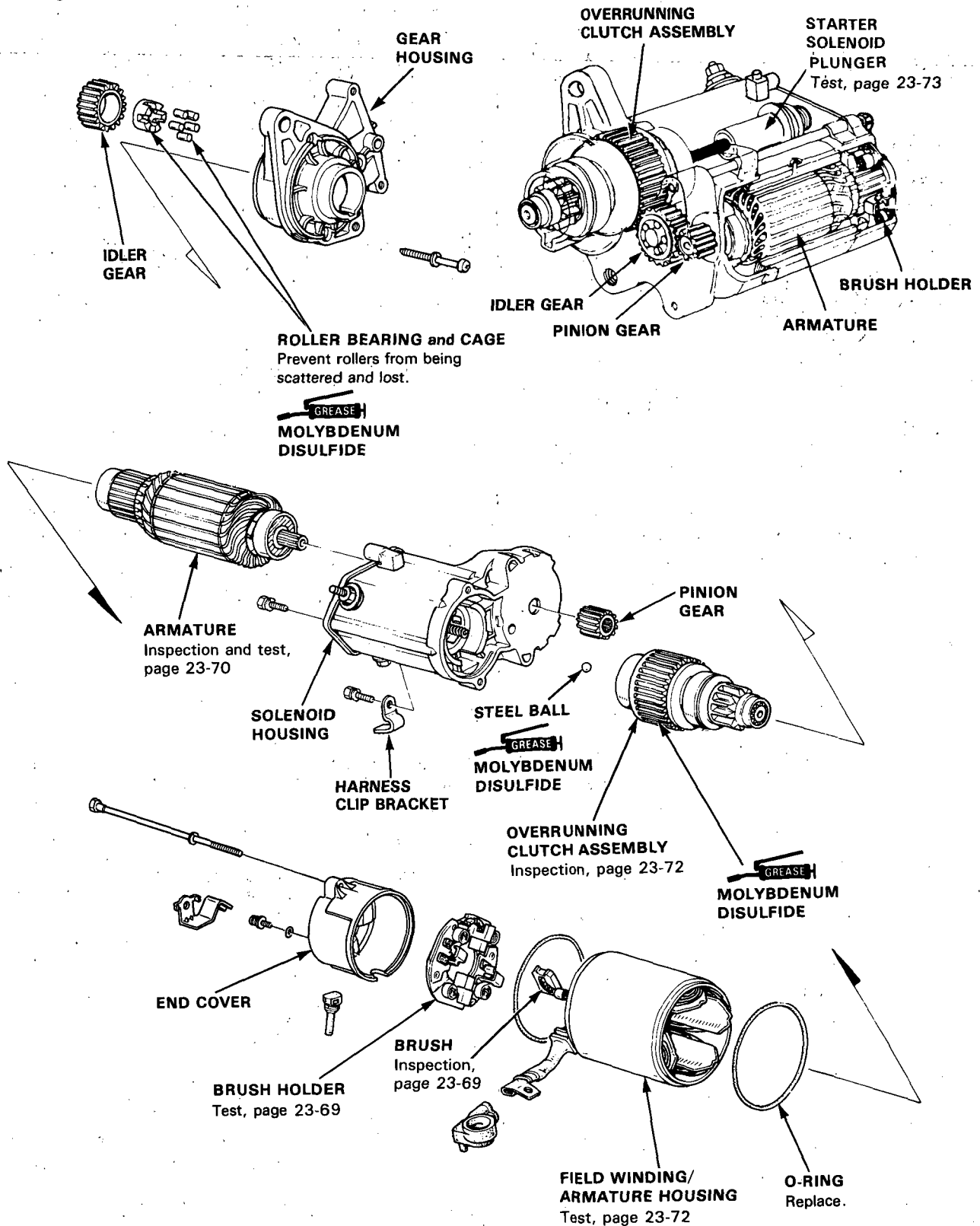
NOTE: When installing the starter cable, make sure that the crimped side of the ring terminal is facing out.



# Starting System

## Starter Overhaul

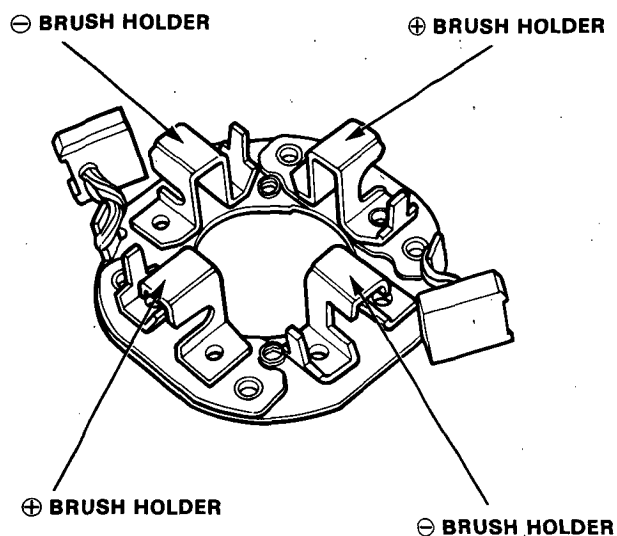
**CAUTION:** Disconnect the battery negative cable before removing the starter.





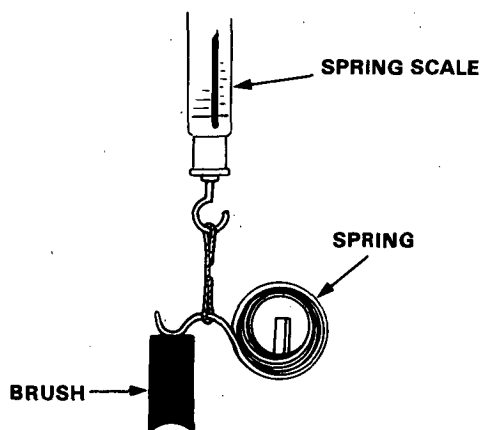
## Starter Brush Holder Test

1. Check that there is no continuity between the ⊕ and ⊖ brush holders. If continuity exists, replace the brush holder assembly.



2. Insert the brush into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale to the spring. Measure the spring tension at the moment the spring lifts off the brush.

**Spring Tension: 17–24 N (1.7–2.4 kg, 3.7–5.3 lbs)**



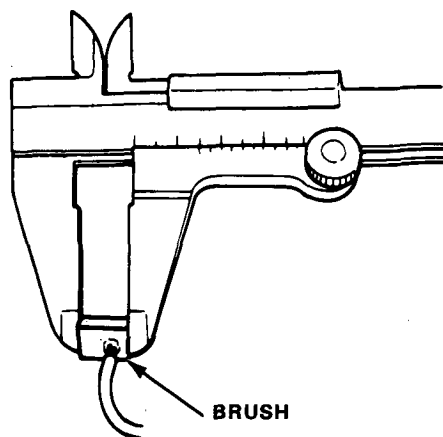
## Starter Brush Inspection

Measure the brush length. If it is not within service limit, replace the armature housing and brush holder assembly.

### Brush Length

**Standard (New): 15.0–15.5 mm (0.59–0.61 in.)**

**Service Limit: 10.0 mm (0.39 in.)**



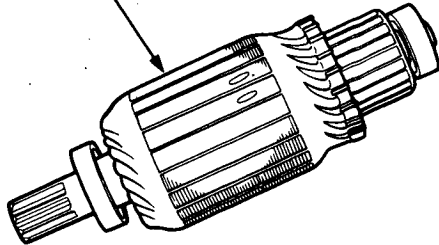
**NOTE:** To seat new brushes after installing them in their holders, slip a strip of #500 or #600 sandpaper, with the grit side up, over the commutator, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.

# Starting System

## Armature Inspection and Test

1. Inspect the armature for wear or damage due to contact with the field coil magnets.

Inspect for damage

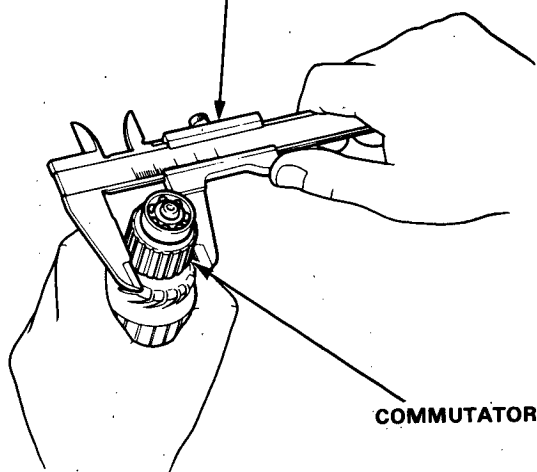


2. A dirty or burnt commutator surface may be resurfaced with emery cloth or a lathe within the following specifications.

### Commutator Diameter

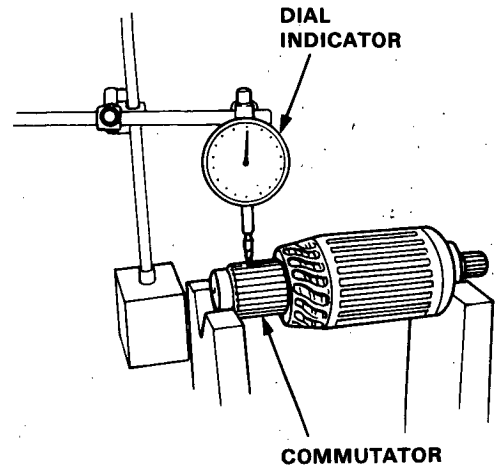
**Standard (New):** 29.9–30.0 mm (1.177–1.181 in.)  
**Service Limit:** 29.0 mm (1.14 in.)

VERNIER CALIPER



### Commutator Runout

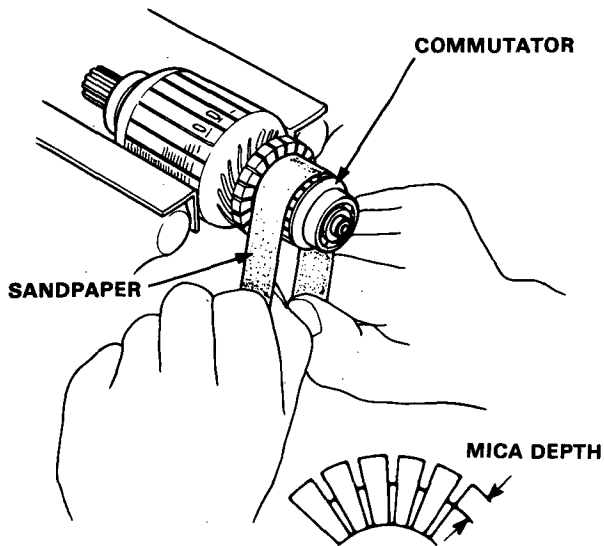
**Standard (New):** 0–0.02 mm (0–0.001 in.)  
**Service Limit:** 0.05 mm (0.002 in.)



3. If the commutator runout and diameter are within specifications, check the commutator for damage and for carbon dust or brass chips between the segments.



4. If the surface is dirty, recondition it with a # 500 or # 600 sandpaper. Then, check mica depth. If necessary, undercut the mica with a hacksaw blade to achieve proper depth.

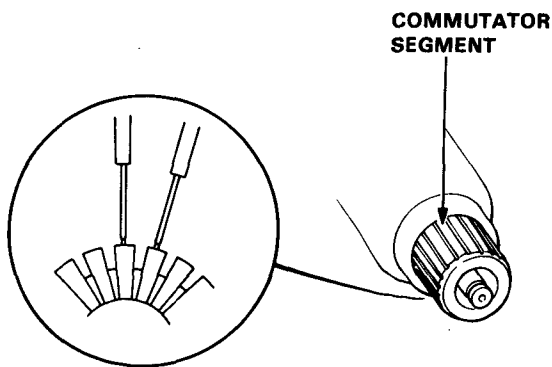


#### Commutator Mica Depth

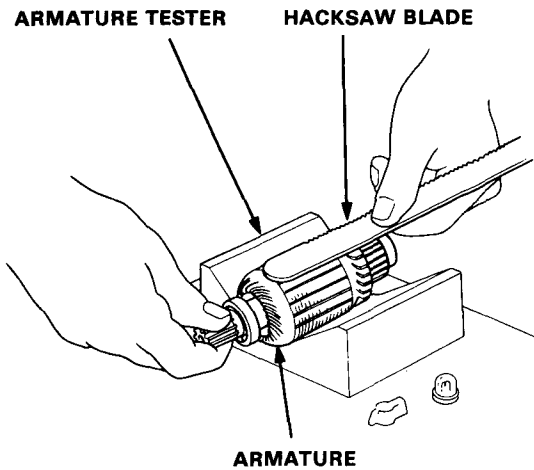
**Standard (New):** 0.5–0.8 mm (0.019–0.031 in.)

**Service Limit:** 0.2 mm (0.008 in.)

5. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.

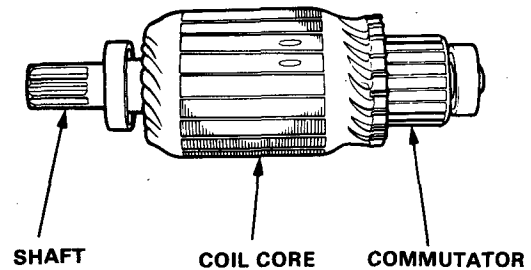


6. Place the armature on an armature tester. Hold a hacksaw blade on the armature core.



If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted; replace it.

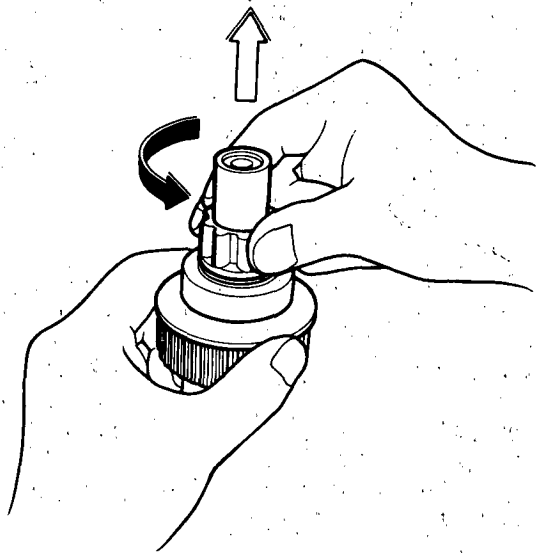
7. Check with an ohmmeter that no continuity exists between the commutator and the armature coil core, and between the commutator and the armature shaft. If continuity exists, replace the armature.



# Starting System

## Overrunning Clutch Inspection

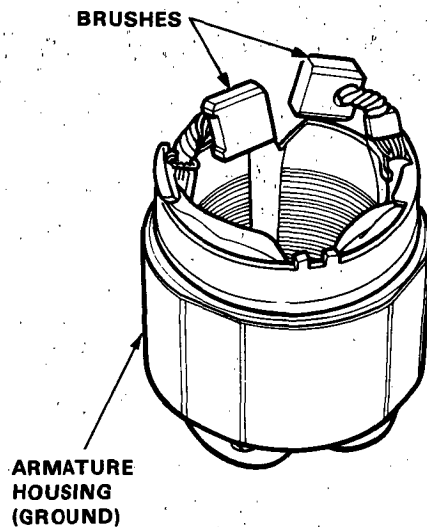
1. Slide the overrunning clutch along the shaft. Does it move freely? If not, replace it.
2. Rotate the overrunning clutch both ways. Does it lock in one direction and rotate smoothly in reverse? If it does not lock in either direction or it locks in both directions, replace it.



3. If the starter drive gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.
4. Check the condition of the flywheel or torque converter ring gear if the starter drive gear teeth are damaged.

## Starter Field Winding Test

1. Check for continuity between the brushes. If there is no continuity, replace the armature housing.
2. Check for continuity between each brush and the armature housing (ground). If continuity exists, replace the armature housing.

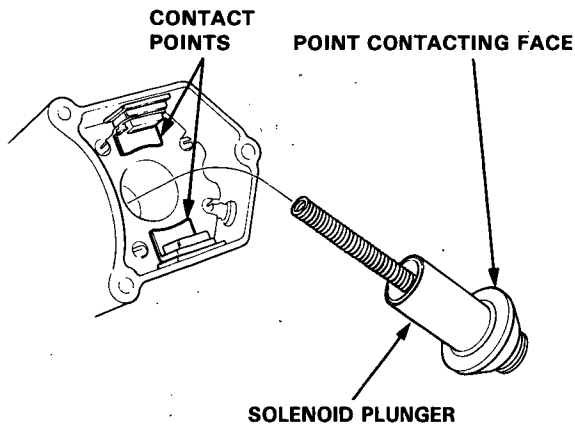






## Solenoid Plunger Inspection

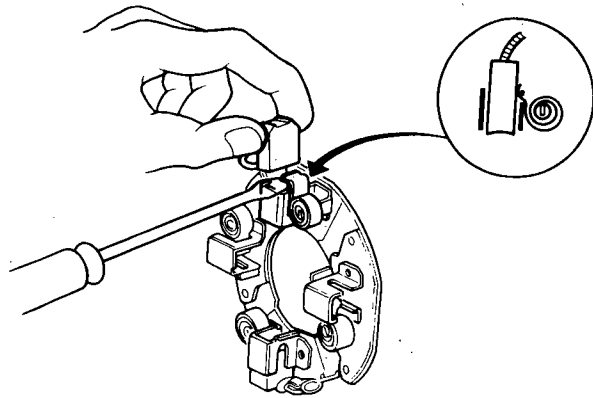
Check the contact points and face of the starter solenoid plunger for burning, pitting or any other defects. If surfaces are rough, recondition them with a strip of # 500 or # 600 sandpaper.



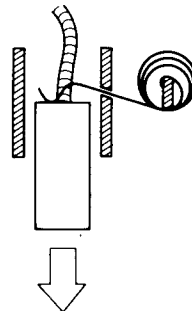
## Starter Reassembly

Reassemble the starter in the reverse order of disassembly.

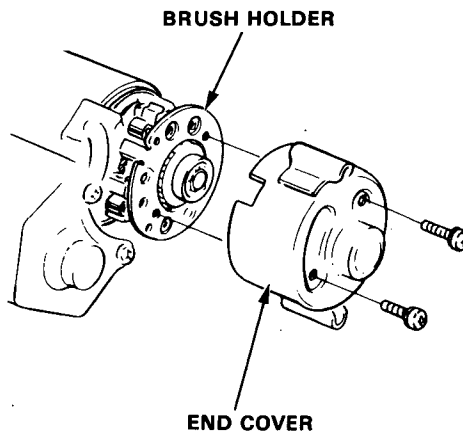
1. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.



2. Install the armature in the housing. Next pry back each brush spring again and push the brush down until it seats against the commutator, then release the spring against the end of the brush.



3. Install the end cover on the brush holder.



# Starting System

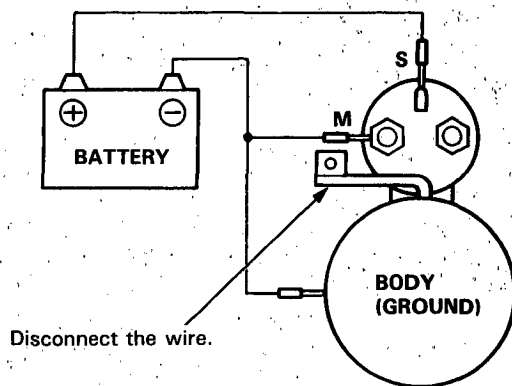
## Performance Test

**NOTE:** Before starting the following checks, disconnect the wire from terminal M, and make a connection as described below using as heavy a wire as possible (preferably equivalent to the wire used for the car).

### Pull-in Coil Test:

Connect the battery as shown. If the pinion protrudes, it is working properly.

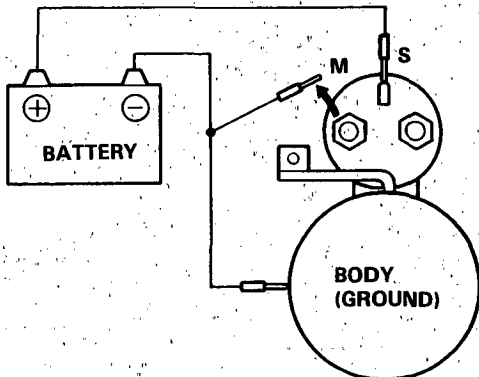
**NOTE:** Do not leave the battery connected for more than 10 seconds.



### Hold-in Coil Test:

Disconnect the battery from the M terminal. If the pinion does not snap back, the hold-in coil is working properly.

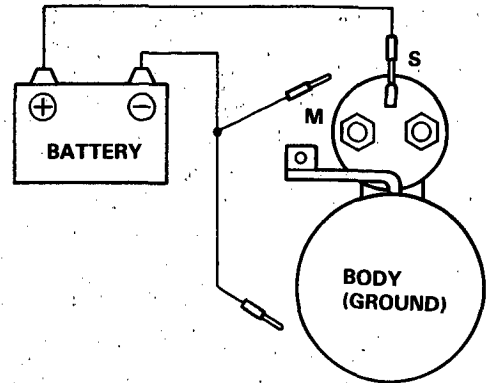
**NOTE:** Do not leave the battery connected for more than 10 seconds.



### Retracting Test:

Disconnect the battery also from the body. If the pinion retracts immediately, it is working properly.

**NOTE:** Do not leave the battery connected for more than 10 seconds.



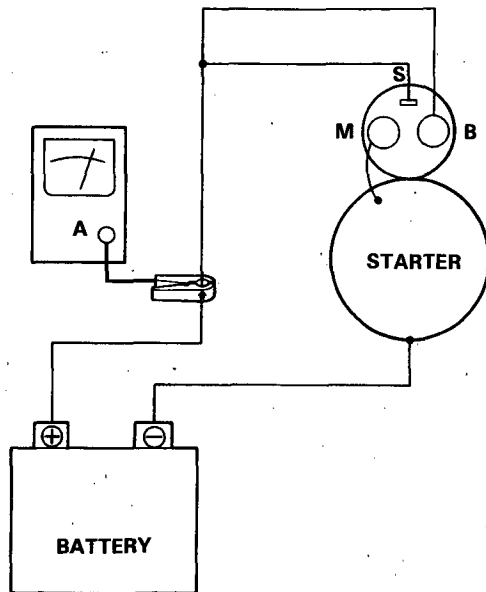


**Starter No-load Test:**

1. Clamp the starter firmly in a vise.
2. Connect the starter to the battery as described in the diagram below and confirm that the motor starts and keeps rotating.
3. If the electric current and motor speed meet the specifications when the battery voltage is at 11 V, the starter is working properly.

**Specifications:**

90 A or less (electric current),  
3000 rpm or more (motor speed)



# Ignition System

## Component Location Index

### IGNITION TIMING CONTROL SYSTEM

Description, page 23-77

Troubleshooting, section 11

Inspection and Setting, page 23-79

### DISTRIBUTOR

Top End Inspection, page 23-83

Removal/Installation, page 23-83 and 84

Overhaul, page 23-85

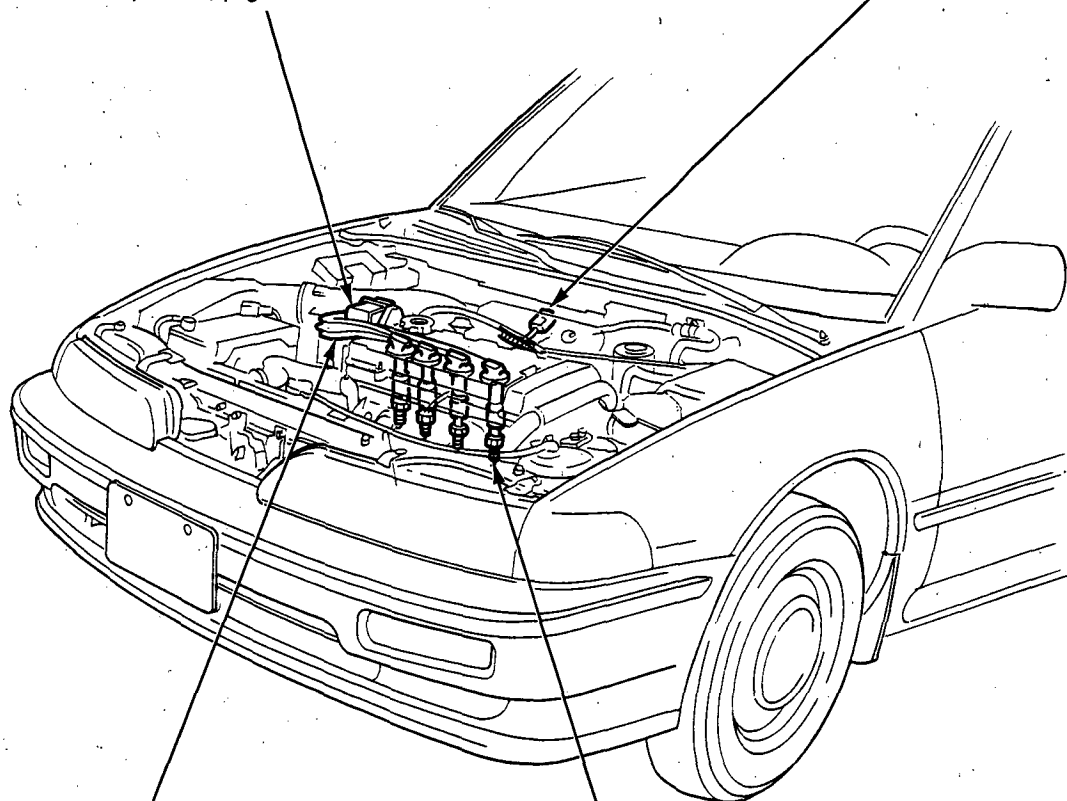
Ignition Coil Test/Replacement, page 23-81 and 82

Ignition Control Module (ICM) Troubleshooting; section 11

ICM Input test, page 23-80

### SERVICE CHECK CONNECTOR

(Located under the blower motor)



### IGNITION WIRES

Inspection and Test, page 23-86

### SPARK PLUG

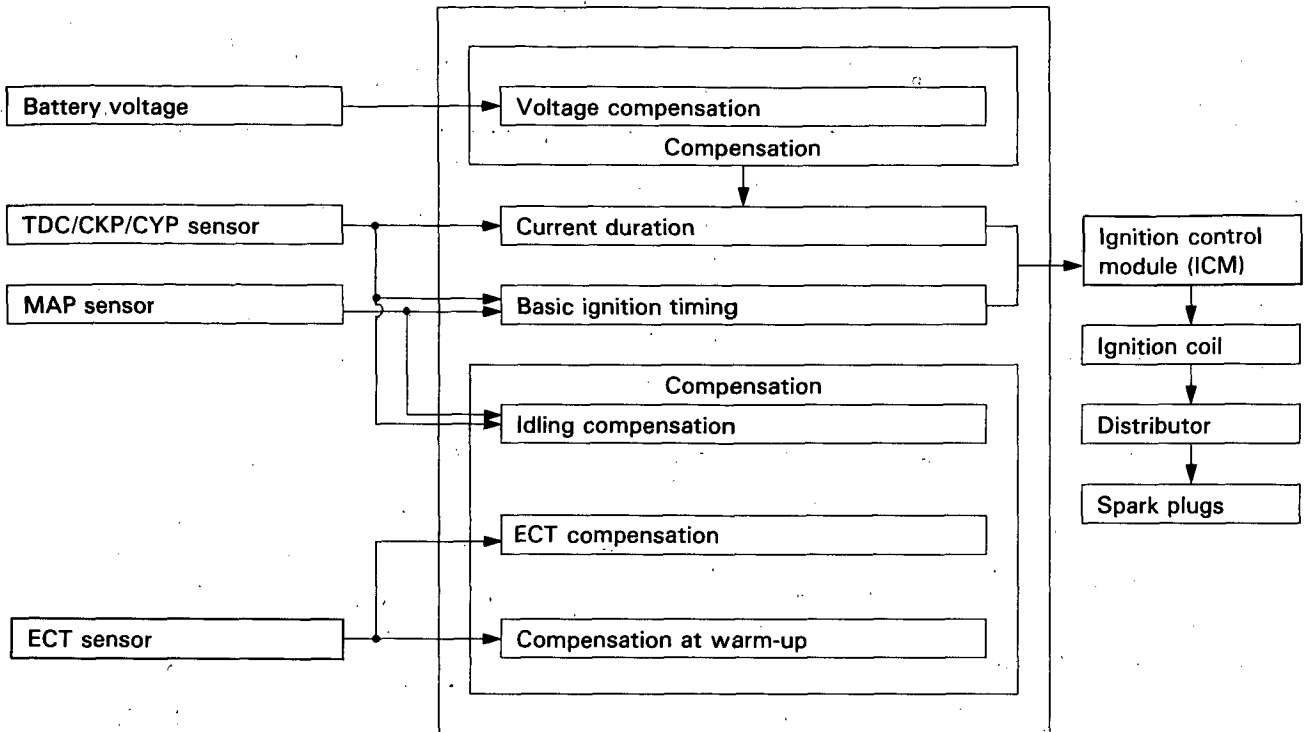
Inspection, page 23-87 and 88



## Description

### Ignition Timing Control:

The programmed ignition system (PGM-IG) on this engine provides optimum control of ignition timing. A microcomputer determines the timing based on information about engine speed and intake manifold vacuum, which is transmitted by signals from the TDC/CKP/CYP sensor, throttle position (TP) sensor, engine coolant temperature (ECT) sensor, and MAP sensor. This system, not dependent on a governor or vacuum diaphragm, is capable of setting lead angles with complicated characteristics which cannot be provided by conventional governors or diaphragms.



### Basic Control

Determination of ignition timing and current duration:

The control module has stored within it the optimum basic ignition timing for operating conditions based upon engine speed and intake manifold vacuum. With compensation by signals from sensors, the system determines optimum timing for ambient conditions and sends voltage pulses to the ICM.

Compensation of ignition timing:

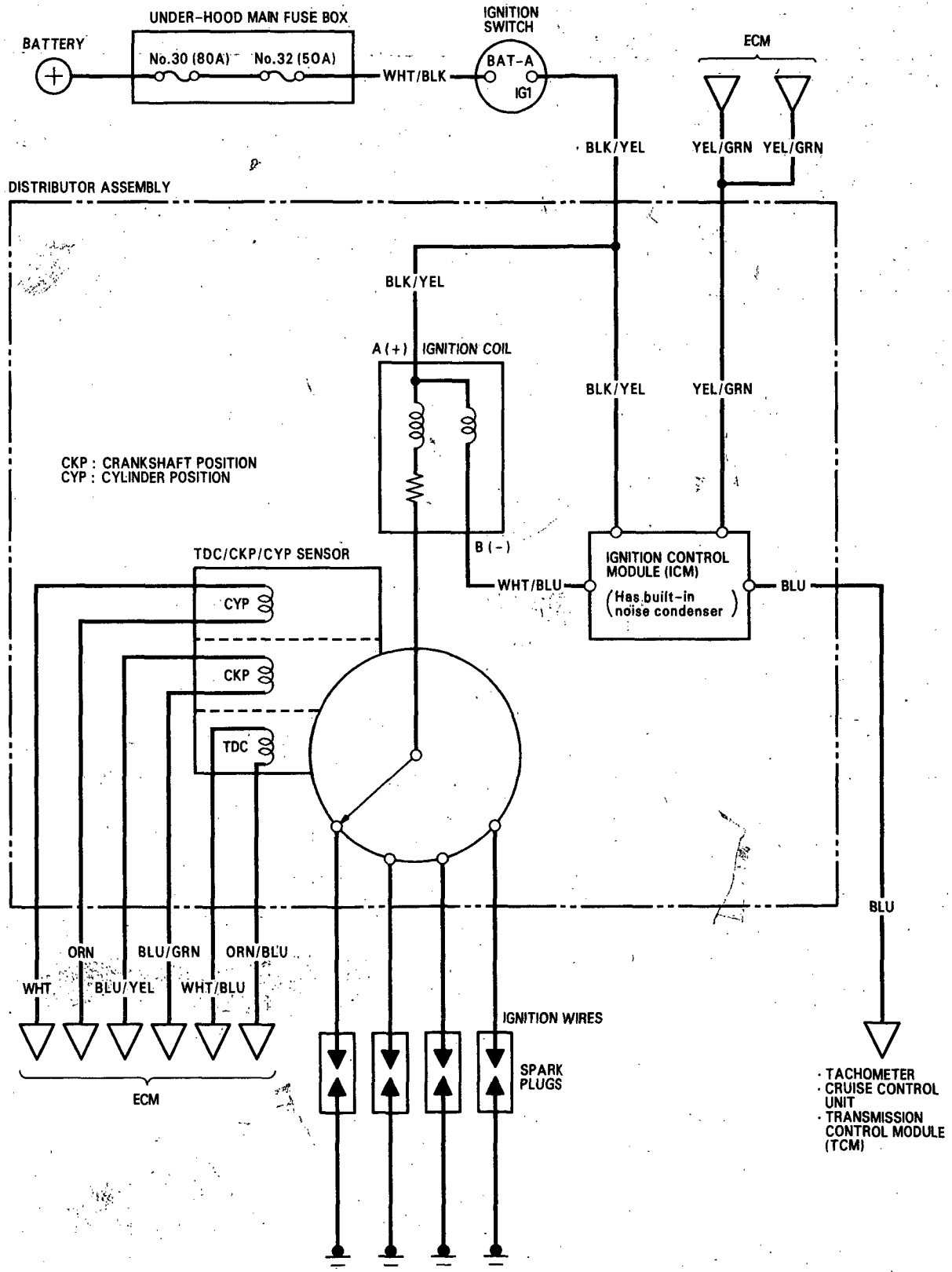
Compensation Item	Related Sensor and Information	Description
Idling	TDC/CKP/CYP sensor MAP sensor	Ignition timing is controlled to the target speed with compensation according to the idle speed.
Compensation at warm-up	ECT sensor	Lag angle is adjusted in accordance with warm-up conditions to bring about a good balance between operating performance and exhaust gas level.
ECT compensation	ECT sensor	Compensation for lead angle at a low ECT and lag angle at high ECT.

### Control at Start

Ignition timing is fixed at BTDC  $7^\circ$  for cranking. The cranking is detected by the TDC sensor (cranking revolution) and starter signal.

# Ignition System

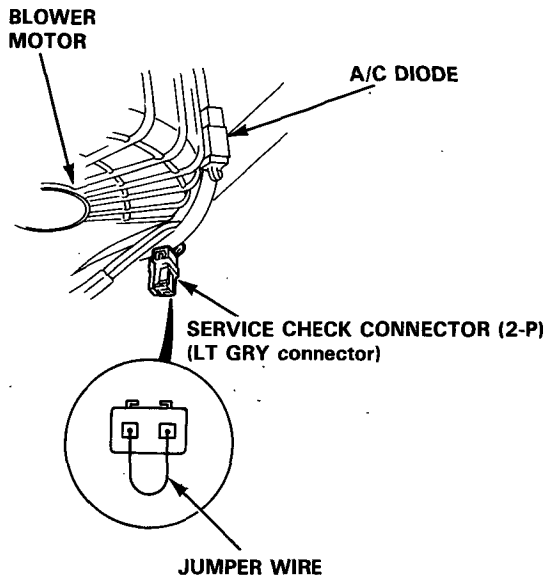
## Circuit Diagram



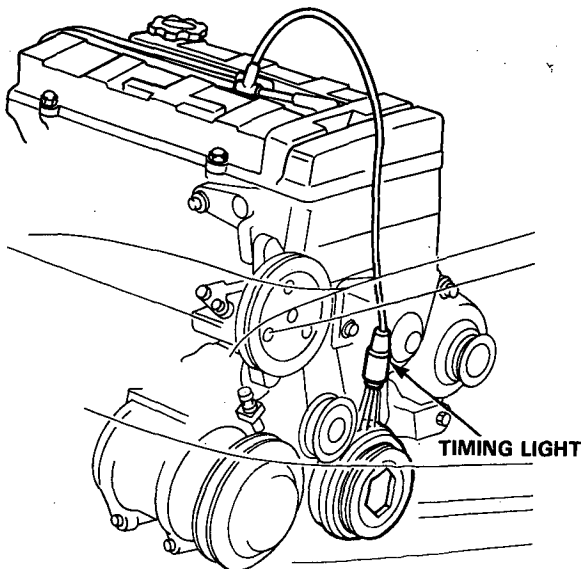


## Ignition Timing Inspection and Setting

1. Start the engine and allow it to warm up (the cooling fan comes on.)
2. Pull out the service check connector located under the right side of the dash. Connect the GRN/WHT and BRN terminals with a jumper wire.



3. Connect a timing light to the #1 ignition wire and point it toward the pointer on the timing belt cover.



4. Adjust ignition timing, if necessary, to the following specifications:

### Ignition Timing:

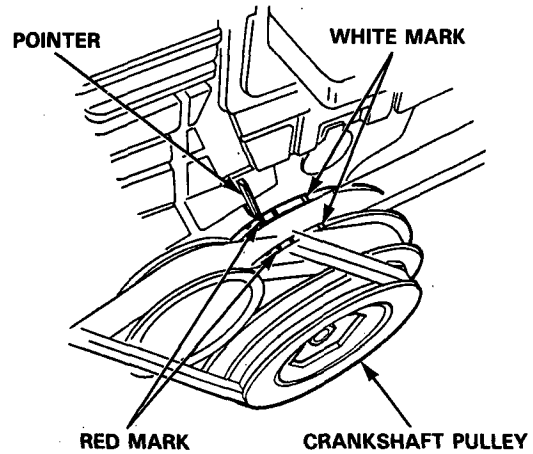
#### B18A1 Engine

16° ± 2° BTDC (RED) at 750 ± 50 rpm

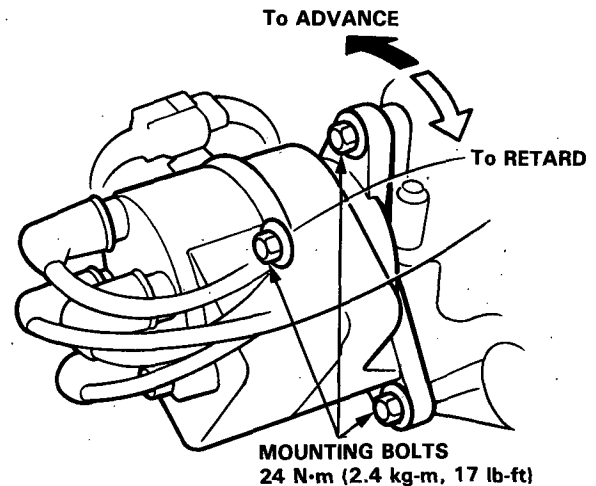
#### B17A1 Engine

16° ± 2° BTDC (RED) at 800 ± 50 rpm

NOTE: Shift lever in neutral position, all electrical systems turned OFF.



5. If it is necessary to adjust the ignition timing, loosen the distributor mounting bolts, and turn the distributor housing counter-clockwise to advance the timing, or clockwise to retard the timing.



6. Tighten the adjusting bolts and recheck the timing.
7. Remove the jumper wire from the service check connector.

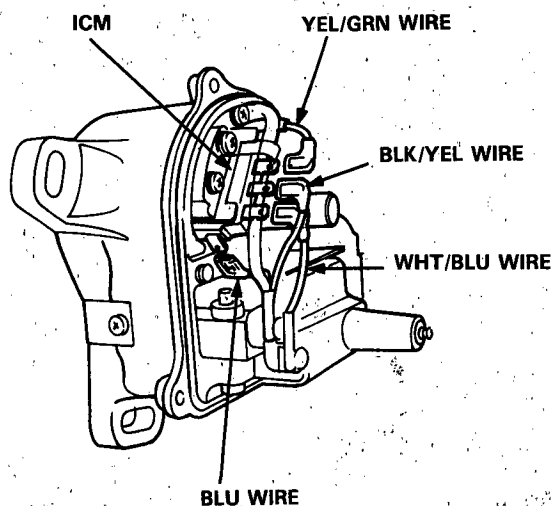
# Ignition System

## Ignition Control Module (ICM) Input Test

### NOTE:

- See section 11 when the malfunction indicator light (MIL).
- Perform an input test for the ignition control module (ICM) after finishing the fundamental tests for the ignition system and the fuel and emission system.
- The tachometer should operate normally.

1. Remove the distributor cap, the rotor, and the inner cover.
2. Disconnect the BLK/YEL, WHT/BLU, YEL/GRN, and BLU wires from the ICM.



3. Turn the ignition switch ON. Check for voltage between the BLK/YEL wire and body ground. There should be battery voltage.
  - If there is no battery voltage, check the BLK/YEL wire between the ignition switch and the ICM.
  - If there is battery voltage, go to step 4.
4. Turn the ignition switch ON. Check for voltage between the WHT/BLU wire and body ground. There should be battery voltage.
  - If there is no battery voltage, check the:
    - Ignition coil.
    - WHT/BLU wire between the ignition coil and the ICM.
  - If there is battery voltage, go to step 5.

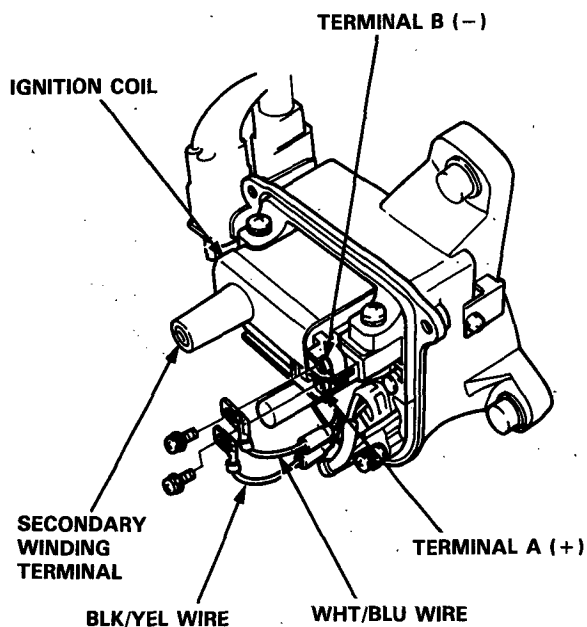
5. Check the YEL/GRN wire between the ECM and the ICM.
6. Check the BLU wire between the tachometer and the ICM.
7. If all tests are normal, replace the ICM.





## Ignition Coil Test

1. With the ignition switch OFF, remove the distributor cap.
2. Remove the two screws to disconnect the BLK/YEL and WHT/BLU wires from the terminals A (+) and B (-) respectively.

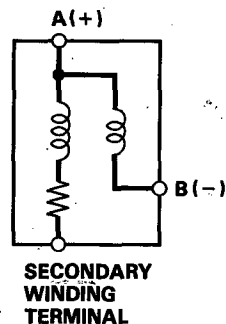


3. Using an ohmmeter, measure resistance between the terminals. Replace the coil if the resistance is not within specifications.

**NOTE:** Resistance will vary with the coil temperature; specifications are at 68°F (20°C).

**Primary Winding Resistance**  
(between the A and B terminals):  
0.6–0.8 ohms

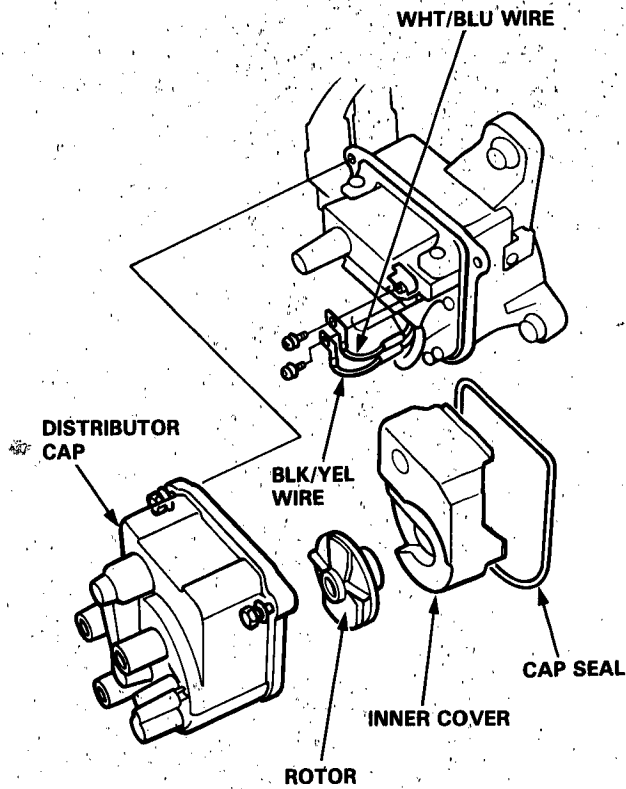
**Secondary Winding Resistance**  
(between the A and secondary winding terminals):  
12,800–19,200 ohms



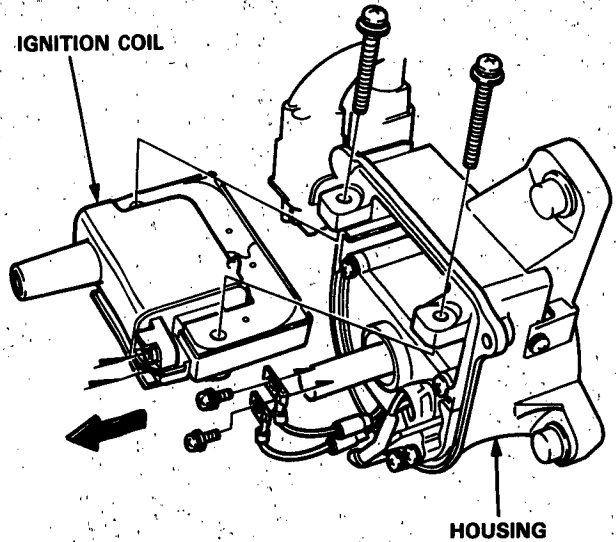
# Ignition System

## Ignition Coil Replacement

1. With the ignition switch OFF, remove the distributor cap, rotor, and cap seal, then remove the inner cover.



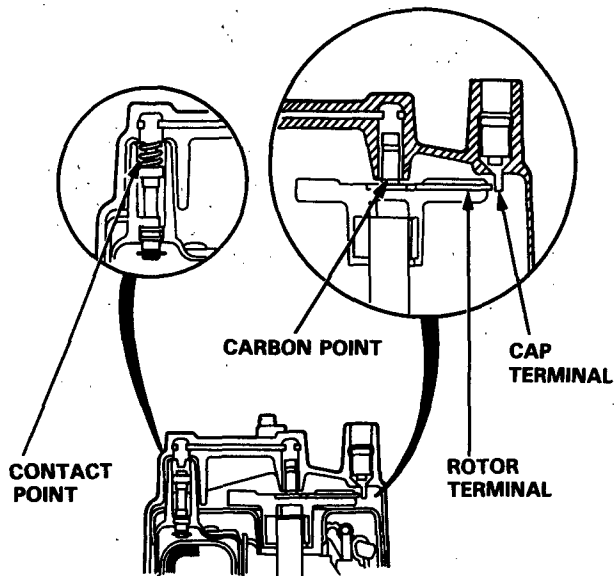
2. Remove the two screws to disconnect the BLK/YEL and WHT/BLU wires from the terminals.
3. Remove the two screws and slide the ignition coil out of the distributor housing.





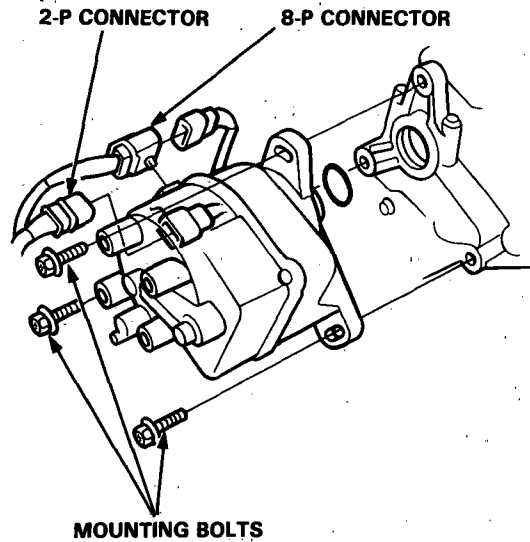
## Distributor Top End Inspection

1. Check for rough or pitted rotor and cap terminals.
2. Scrape or file off the carbon deposits. Smooth the rotor terminal with an oil stone or #600 sandpaper if rough.
3. Check the distributor cap for cracks, wear, and damage. If necessary, clean or replace it.



## Distributor Removal

1. Disconnect the 2-P and 8-P connectors from the distributor.
2. Disconnect the plug wires from the distributor cap.



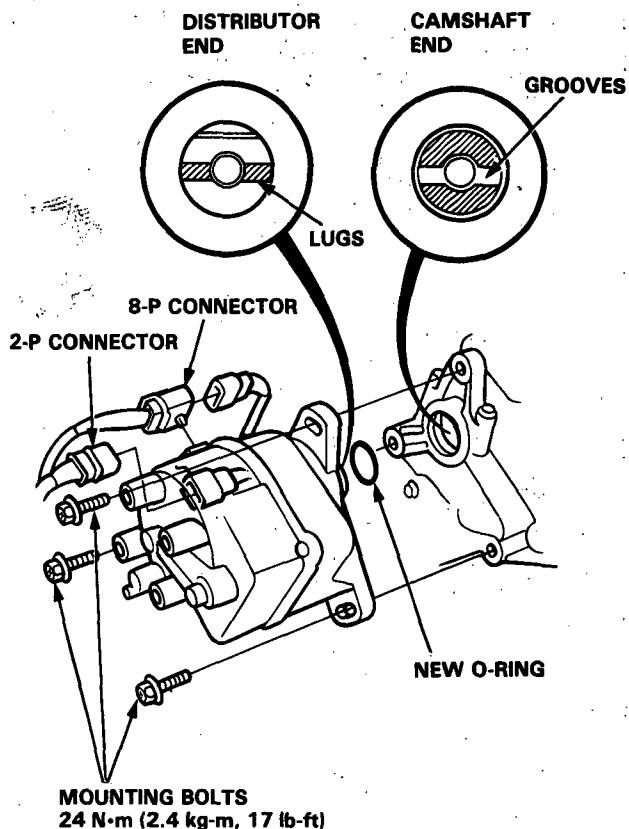
3. Remove the distributor mounting bolts, then remove the distributor from the cylinder head.

# Ignition System

## Distributor Installation

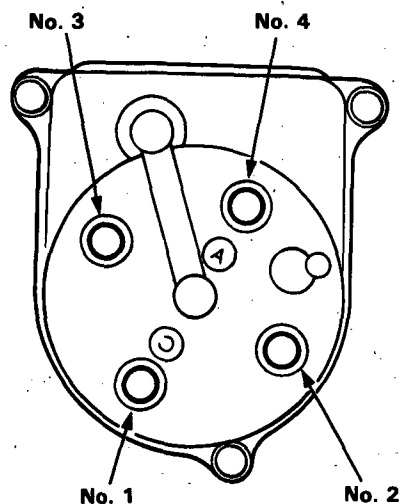
1. Coat a new O-ring with engine oil, then install it.
2. Slip the distributor into position.

**NOTE:** The lugs on the end of the distributor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.



3. Install the mounting bolts and tighten them temporarily.
4. Connect the 2-P and 8-P connectors to the distributor.

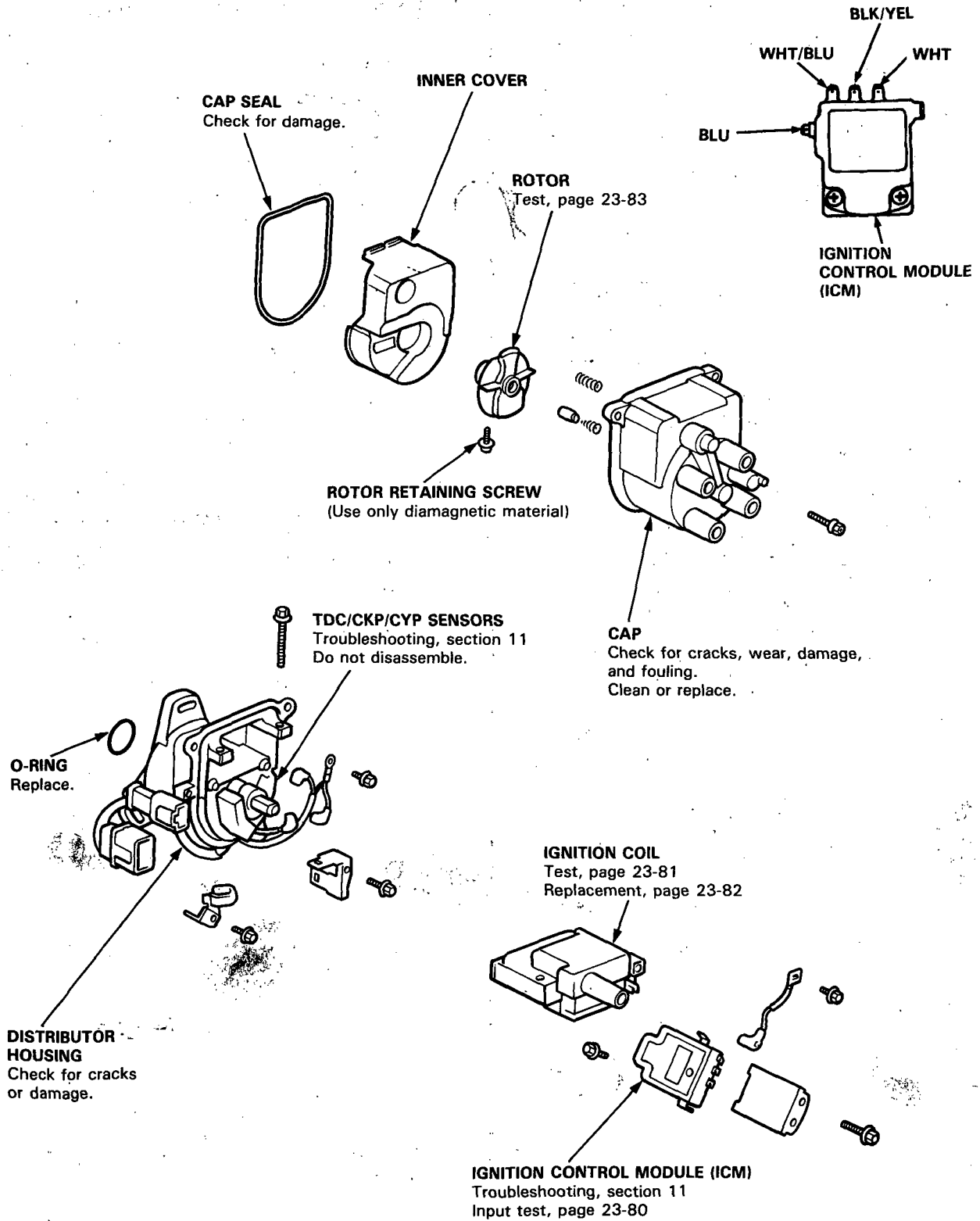
5. Connect the ignition wires as shown.



6. Set the timing with a timing light (see page 23-79).
7. After setting the timing, tighten the mounting bolts.



# Distributor Overhaul

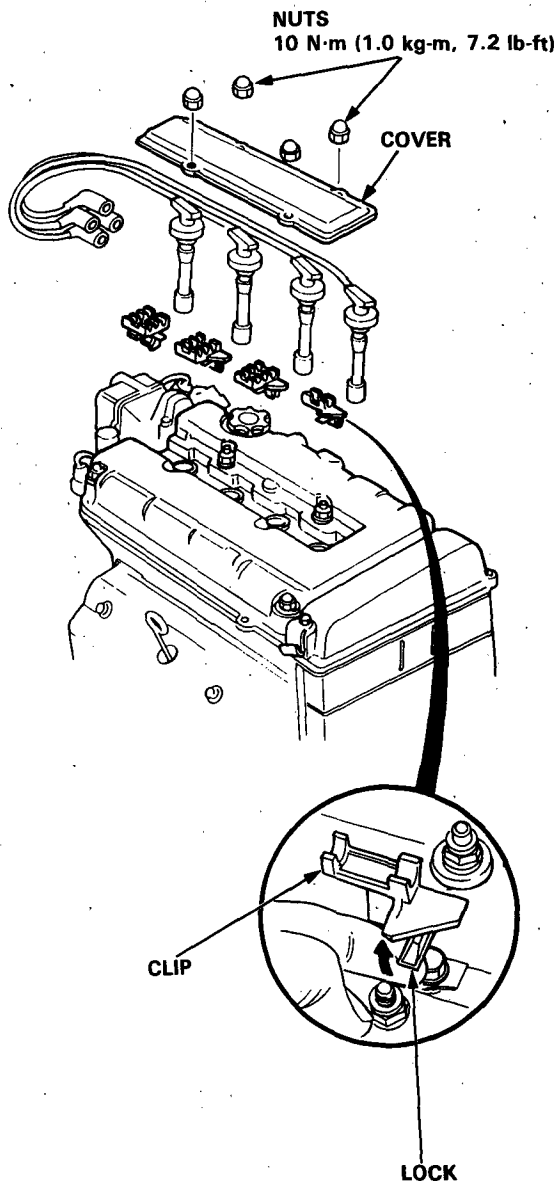


# Ignition System

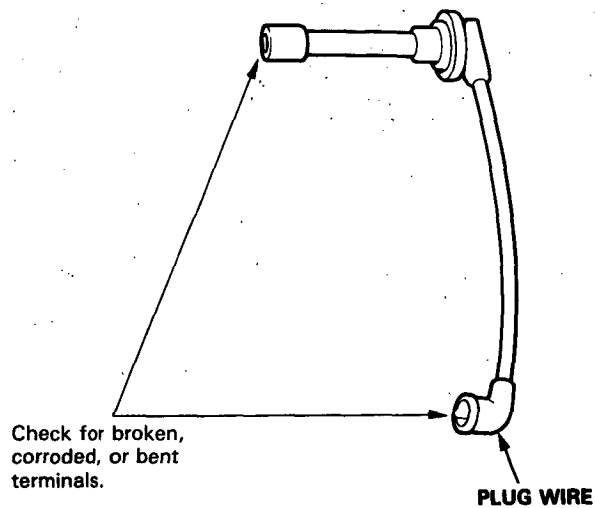
## Ignition Wire Inspection and Test

**CAUTION:** Carefully remove the ignition wires by pulling on the rubber boots. Do not bend the wires as you might break them inside.

1. Remove the four nuts, then remove the cover (B17A1 engine).

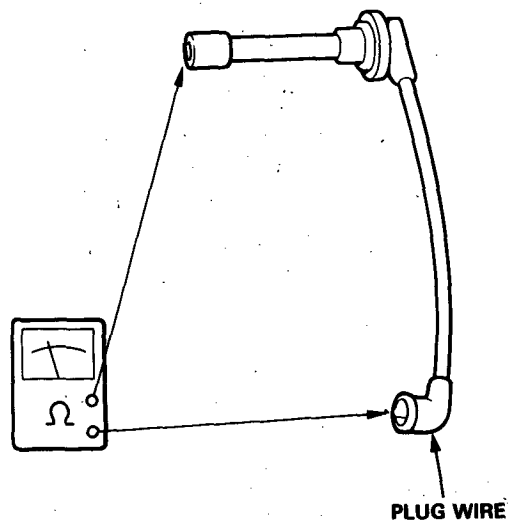


2. Check the condition of the wire terminals. If any of them is corroded, clean it, and if it is broken or distorted, replace the wire.



3. Connect ohmmeter probes and measure resistance.

**Ignition Wire Resistance:**  
25,000 ohms max. at 68°F (20°C)

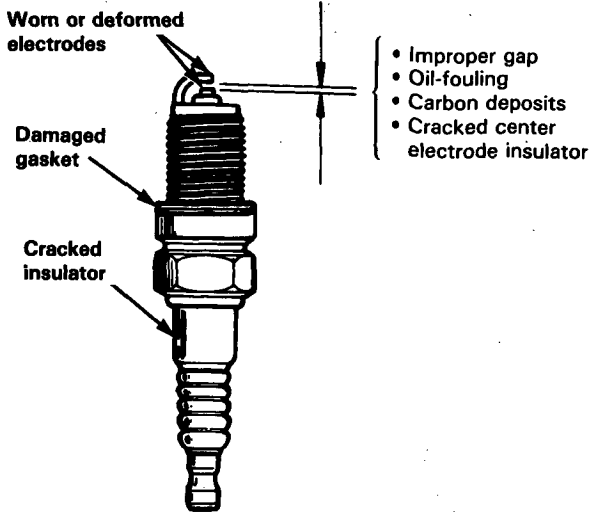


4. If resistance exceeds 25,000 ohms, replace the ignition wire.



## Spark Plug Inspection (B18A1 Engine)

1. Inspect the electrodes and ceramic insulator for:



**Burned or worn electrodes may be caused by:**

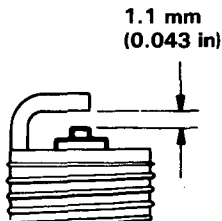
- Advanced ignition timing
- Loose spark plug
- Too low plug heat range
- Insufficient cooling

**Fouled plug may be caused by:**

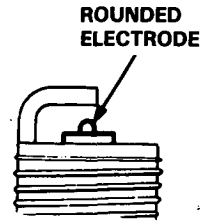
- Retarded ignition timing
- Oil in combustion chamber
- Incorrect spark plug gap
- Too high plug heat range
- Excessive idling/low speed running
- Clogged air cleaner element
- Deteriorated ignition coil or ignition wires

2. Adjust the gap with a suitable gapping tool.

**Electrode Gap: 1.1 mm (0.043 in)**



3. Replace the plug if the center electrode is rounded as shown below:



**Spark Plug:**

ZFR5F-11 (NGK) KJ16CR-L11 (Nippondenso)	For all normal driving.
ZFR6F-11 (NGK) KJ20CR-L11 (Nippondenso)	For hot climates or continuous high speed driving.

4. Apply a small quantity of anti-seize compound to the plug threads before installing the plugs.
5. Screw the plugs into the cylinder head finger-tight, then torque them to 18 N·m (1.8 kg-m, 13 lb-ft).

# Ignition System

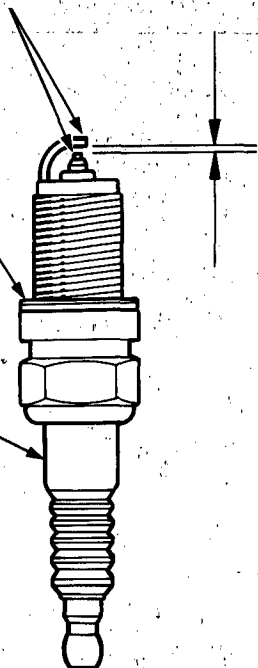
## Spark Plug Inspection (B17A1 Engine)

1. Inspect the electrodes and ceramic insulator for:

Worn or deformed electrodes

Damaged gasket

Cracked insulator



- Improper gap
- Oil-fouling
- Carbon deposits
- Cracked center electrode insulator

**Burned or worn electrodes may be caused by:**

- Advanced ignition timing
- Loose spark plug
- Plug heat range too low
- Insufficient cooling

**Fouled plug may be caused by:**

- Retarded ignition timing
- Oil in combustion chamber
- Incorrect spark plug gap
- Excessive idling/low speed running
- Clogged air cleaner element
- Deteriorated ignition coil

2. Replace the plug if it is fouled or worn.

**NOTE:** Do not use spark plugs other than those listed below.

**Spark Plug:**

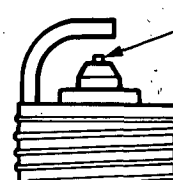
PFR6G-13 (NGK)  
PK20PR-L13  
(Nippondenso)

For all normal driving.

3. Make sure that the 1.3 mm (0.051 in) plug gauge does not go into the gap for the platinum tip plug. If the gauge goes into the gap, do not attempt to adjust the side electrode; replace the plug with a new one.

**Electrode Gap:**

Standard	1.0 mm—1.1 mm (0.039 in—0.043 in)
Service Limit	1.3 mm (0.051 in)



**Platinum tip plug:**  
Check and confirm that the 1.3 mm (0.051 in) plug gauge does not fit into the gap.

Anti-seize compound applied to threads

4. Screw the plugs into the cylinder head fingertight, then torque them to 18 N·m (1.8 kg·m, 13 lb-ft).

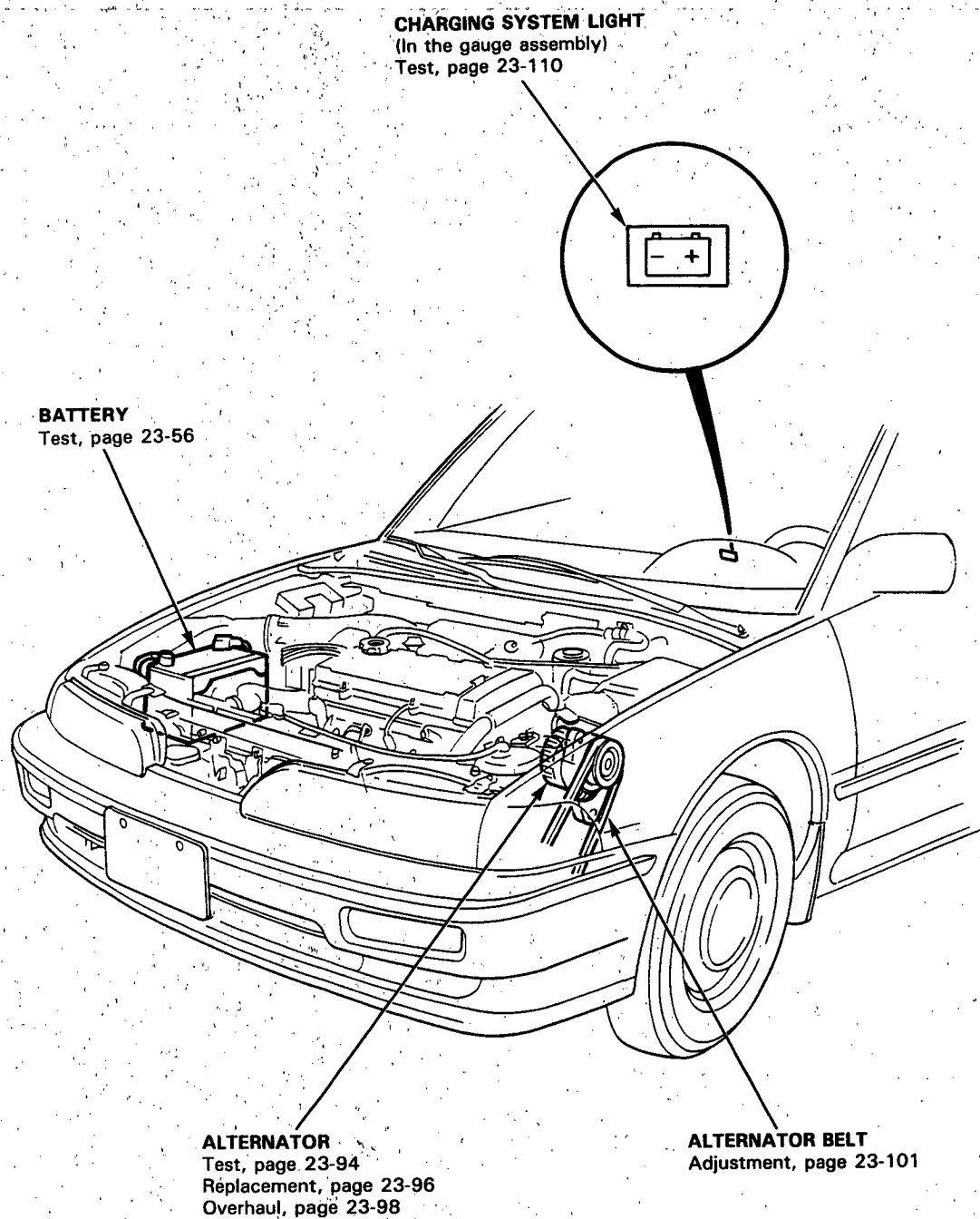
**NOTE:** Apply a small quantity of anti-seize compound to the plug threads before installing each plug.





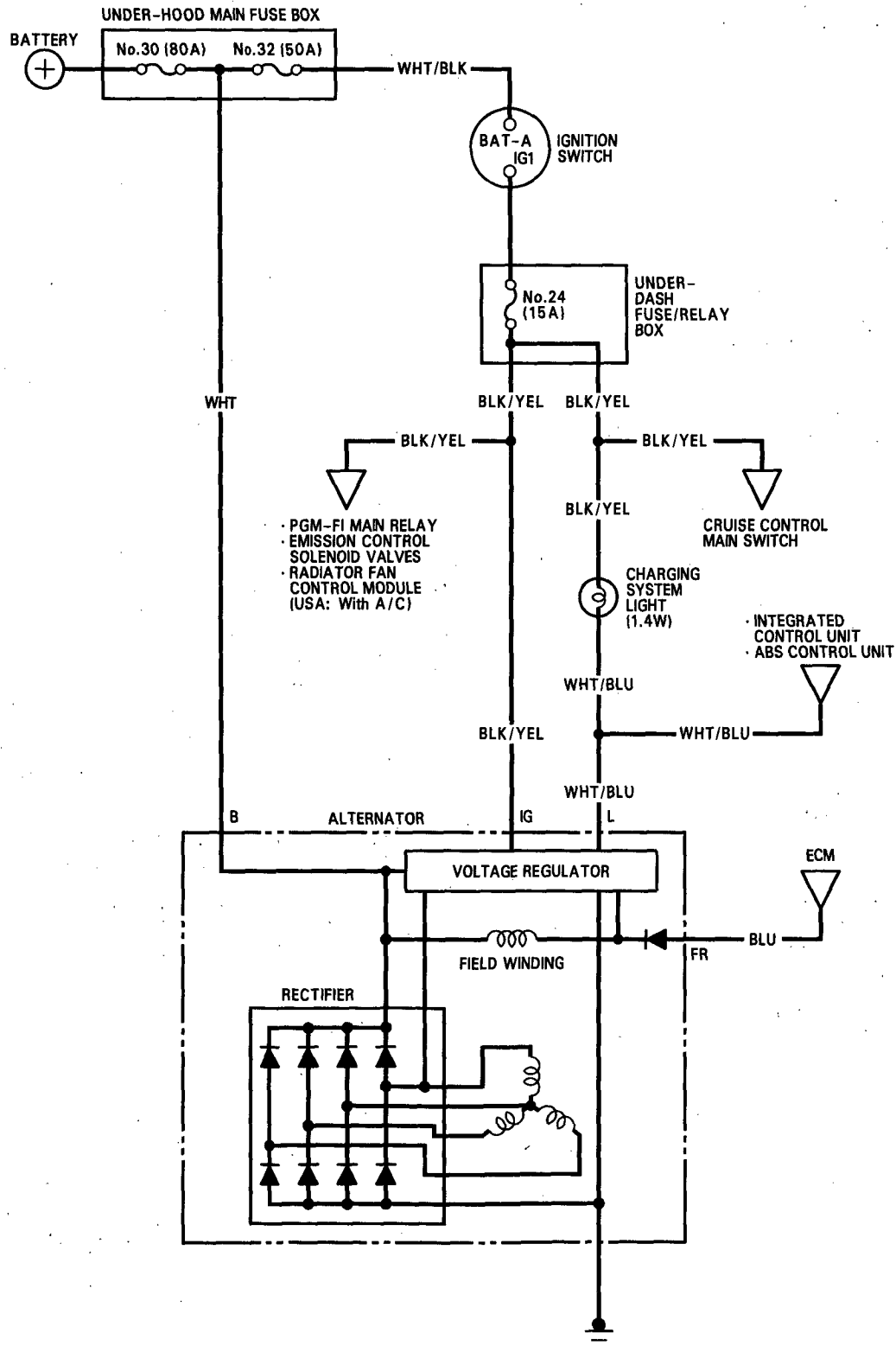
# Charging System

## Component Location Index





# Circuit Diagram



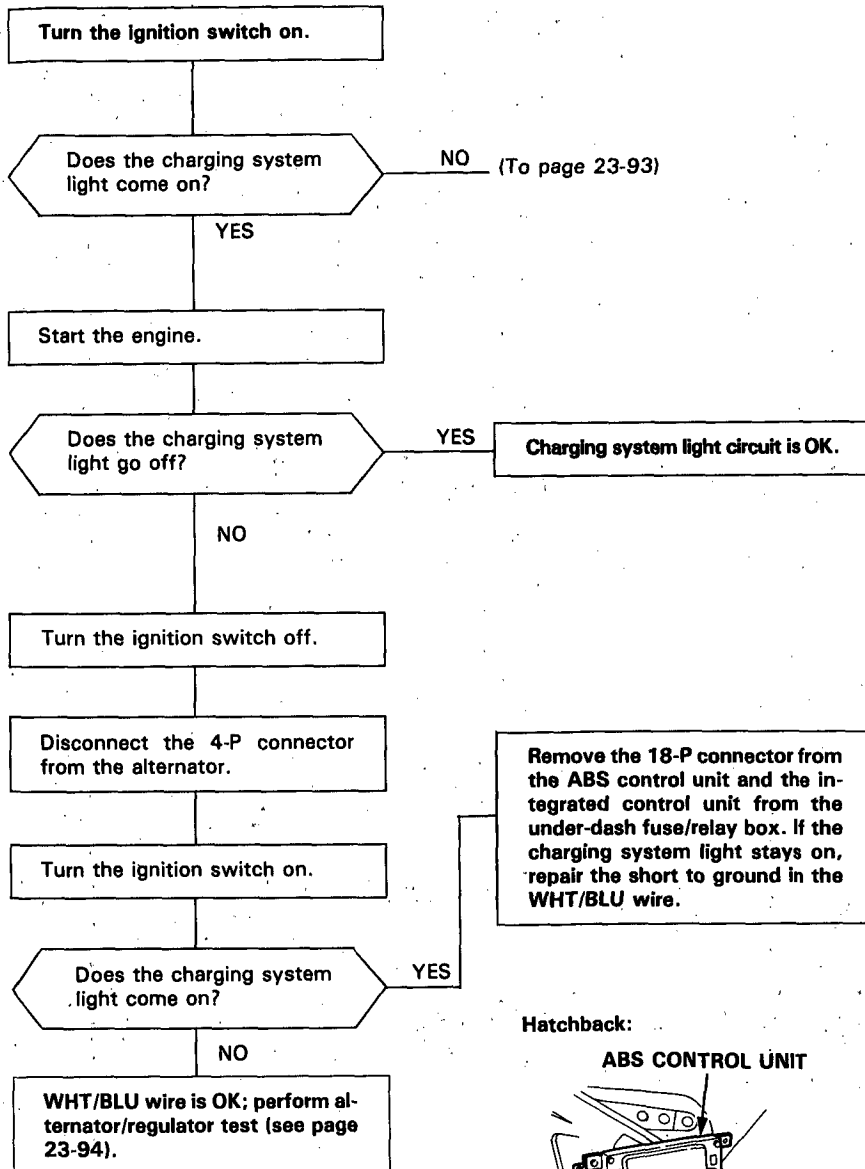
# Charging System

## Troubleshooting

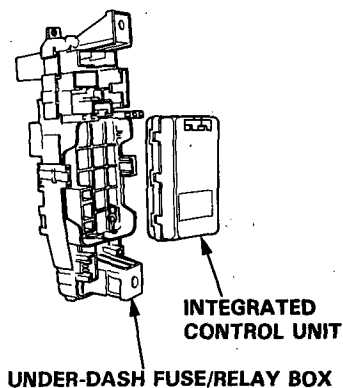
If the charging system light is on, or the battery is dead or low, perform the following tests in the order listed below:

1. Battery Test (see page 23-56)
2. Charging System Light Operation Test
3. Alternator/Regulator Test

### Charging System Light Operation Test

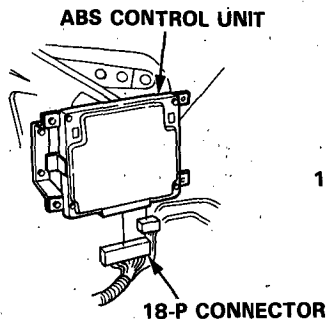


NOTE: Do not disconnect all of the connectors on the under-dash fuse/relay box.

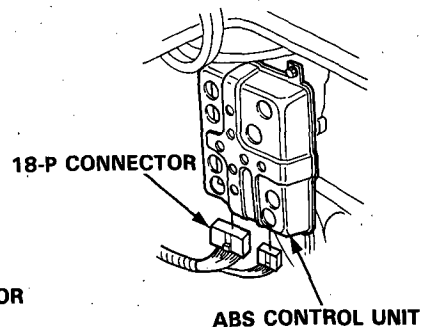


NOTE: After this test or related repairs, reconnect the control unit connectors, then reset the ECM to clear any codes.

Hatchback:



Sedan:





(From page 23-92)

Turn the ignition switch off.

Check fuse No. 24 (15 A) in the under-dash fuse/relay box.

Is the fuse OK?

NO

Replace the fuse.

YES

Disconnect the 4-P connector from the alternator.

Turn the ignition switch on.

Check for voltage at the IG terminal (BLK/YEL wire) of the 4-P connector.

Is there battery voltage?

NO

Repair open in the BLK/YEL wire.

YES

Ground the WHT/BLU wire at the L terminal of the 4-P connector.

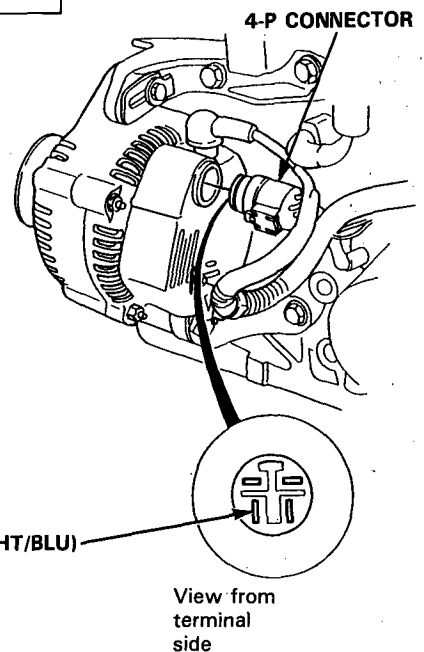
Does the charging system light come on?

NO

Check for a blown charging system light bulb. If the bulb is OK, repair open in the WHT/BLU wire.

YES

Replace the voltage regulator.



(cont'd)

# Charging System

## Troubleshooting (cont'd)

### Alternator/Regulator Test

NOTE: Be sure the battery is sufficiently charged (see page 23-56).

Connect the Sun VAT-40 (or equivalent) and turn the selector switch to position 1 (starting).

Start the engine and let it idle until it reaches normal operating temperature.

Raise the engine speed to 2000 rpm and hold it there.

Is the voltage over 15.1V?

NO

Release the accelerator pedal and let the engine idle.

Make sure all accessories are turned off. Turn the selector switch to position 2 (charging).

Remove the inductive pick-up and zero the ammeter.

Place the inductive pick-up over the B terminal wire of the alternator so that the arrow points away from the alternator.

Raise the engine speed to 2000 rpm and hold it there.

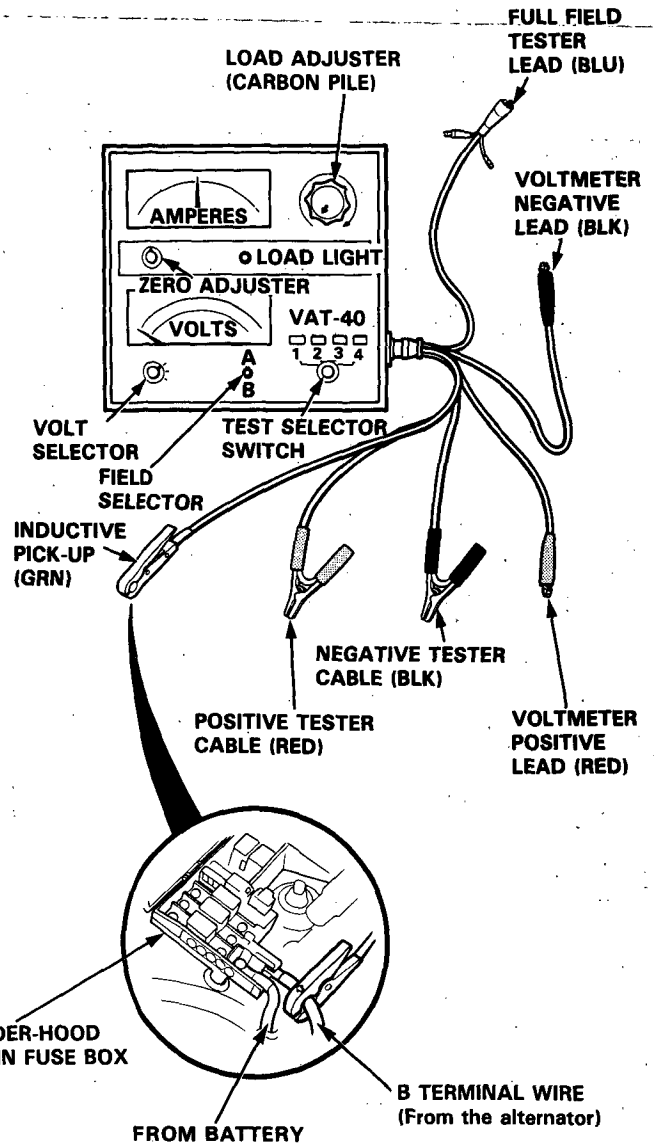
Is the voltage less than 13.9V?

NO

(To page 23-95)

Replace the voltage regulator.

Test the battery (see page 23-56).





(From page 23-94)

Apply a load with the VAT-40 until the battery voltage drops to between 12–13.5 V.

Is the amperage 40 A or more?

YES

Charging system is OK.

NO

With the engine speed still at 2000 rpm, full-field the alternator.

Is the alternator output 40 A or more?

NO

Test and repair the alternator components (see pages 23-96 to 23-100).

YES

Turn the ignition switch off.

Turn the ignition switch on.

Disconnect the 4-P connector from the alternator.

Check for voltage at the IG terminal (BLK/YEL) of the 4-P connector.

Is there battery voltage?

NO

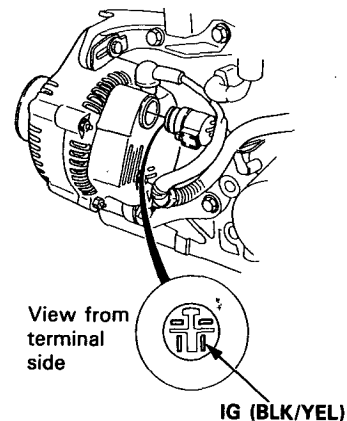
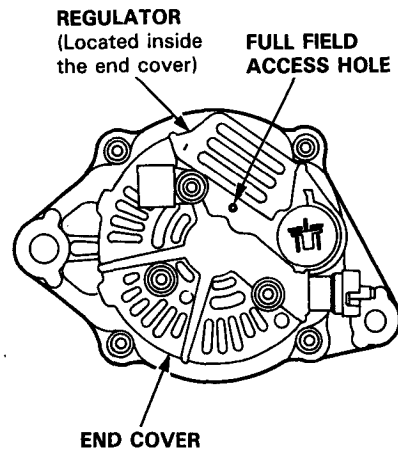
Repair open in the BLK/YEL wire.

YES

Replace the voltage regulator.

NOTE: Attach a probe to the VAT-40 full field test lead and insert the probe into the full field access hole at the back of the alternator. Switch the field selector to the "A (Ground)" position momentarily and check amperage reading.

CAUTION: The voltage will rise quickly when the alternator is full-fielded. Do not allow the voltage to exceed 18V or it may damage the electrical system.



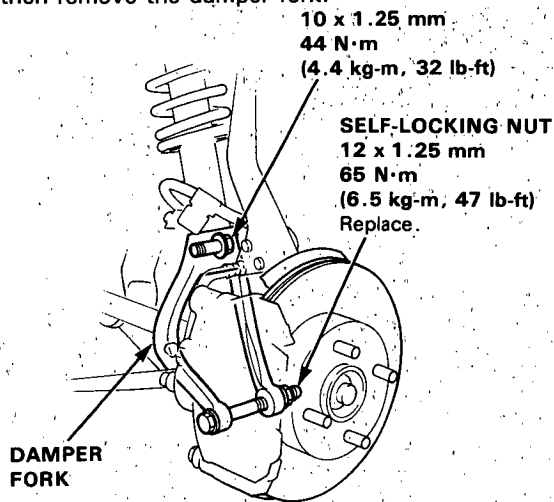
# Charging System

## Alternator Replacement

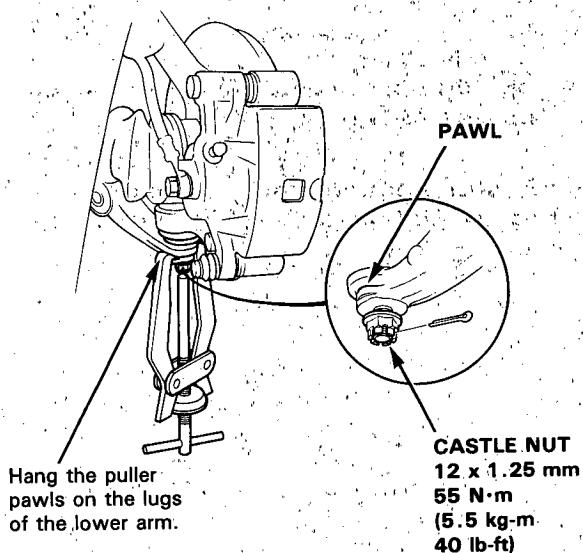
**NOTE:** To remove the alternator, first it is necessary to remove the left driveshaft.

### Driveshaft Removal:

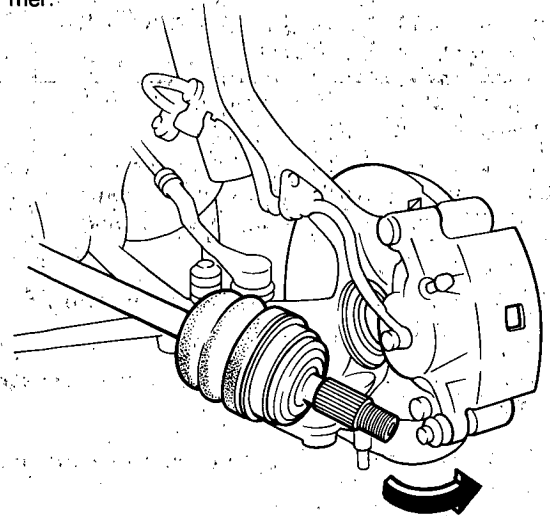
1. Loosen the left front wheel lug nuts.
2. Raise the front end of the car and place safety stands under the proper locations. Remove the left front wheel.
3. Raise the locking tab on the spindle nut and remove it with a 36 mm (1-7/16 in) socket wrench.
4. Remove the damper fork nut and damper pinch bolt, then remove the damper fork.



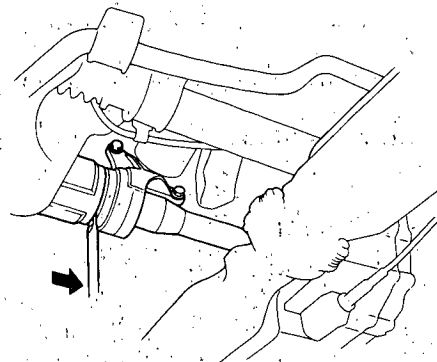
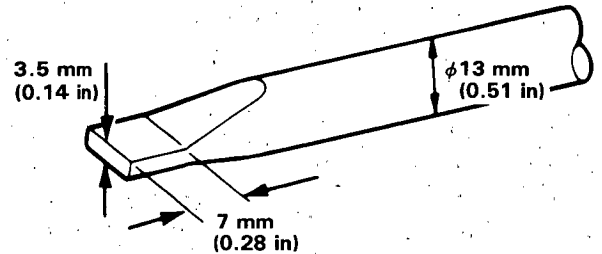
5. Remove the knuckle-to-lower arm castle nut, and separate the lower arm from the knuckle using a puller with the pawls applied to the lower arm.



6. Pull the knuckle outward and remove the driveshaft outboard joint from the knuckle using a plastic hammer.



7. Pry the driveshaft assembly with a screwdriver as shown to force the set ring at the driveshaft end past the groove.
8. Pull the inboard joint and remove the driveshaft and CV joint out of the intermediate shaft.



### CAUTION:

- Do not pull on the driveshaft, as the CV joint may come apart.
- Be careful when prying out the assembly and pull it straight to avoid damaging the intermediate shaft seals.





**NOTE:**

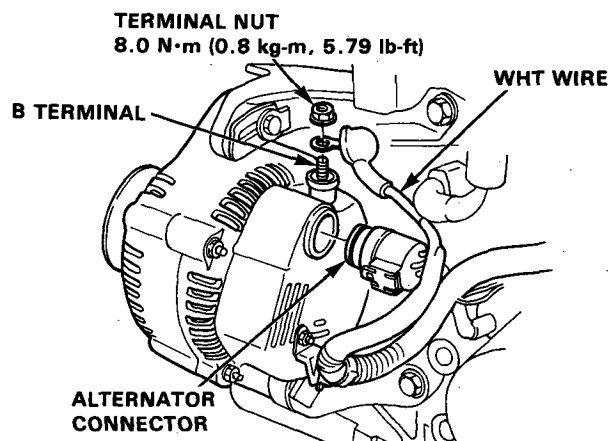
The radio may have a coded theft protection circuit. Be sure to get the customer's code number before

- Disconnecting the battery.
- Removing the No. 14 (15 A) fuse. (in the under-dash fuse/relay box)
- Removing the radio.

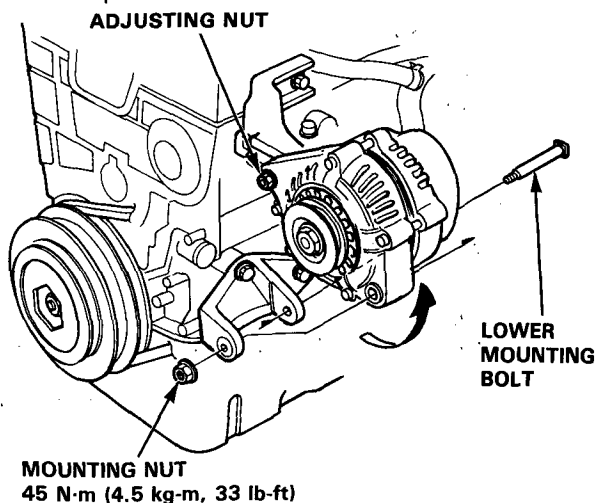
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

**Alternator Removal:**

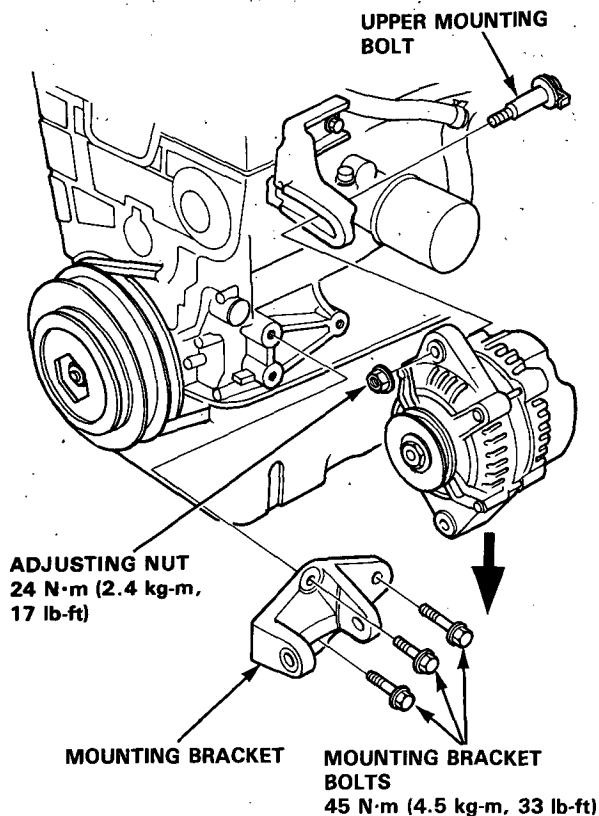
9. Disconnect the ground cable from the battery negative (-) terminal.
10. Disconnect the alternator connector from the alternator.
11. Remove the terminal nut and the WHT wire from the B terminal.



12. Loosen the adjusting nut, then remove the mounting nut.
13. Remove the alternator belt from the alternator pulley.
14. Remove the lower mounting bolt, then lift the alternator upward.



15. Remove the three mounting bracket bolts and mounting bracket.
16. Remove the adjusting nut and upper mounting bolt, then pull out the alternator.



17. Install the alternator in the reverse order of removal (driveshaft installation, see section 16).

**CAUTION:**

- Always use a new set ring whenever the driveshaft is being installed.
- Adjust the alternator belt tension after installation (see page 23-101).

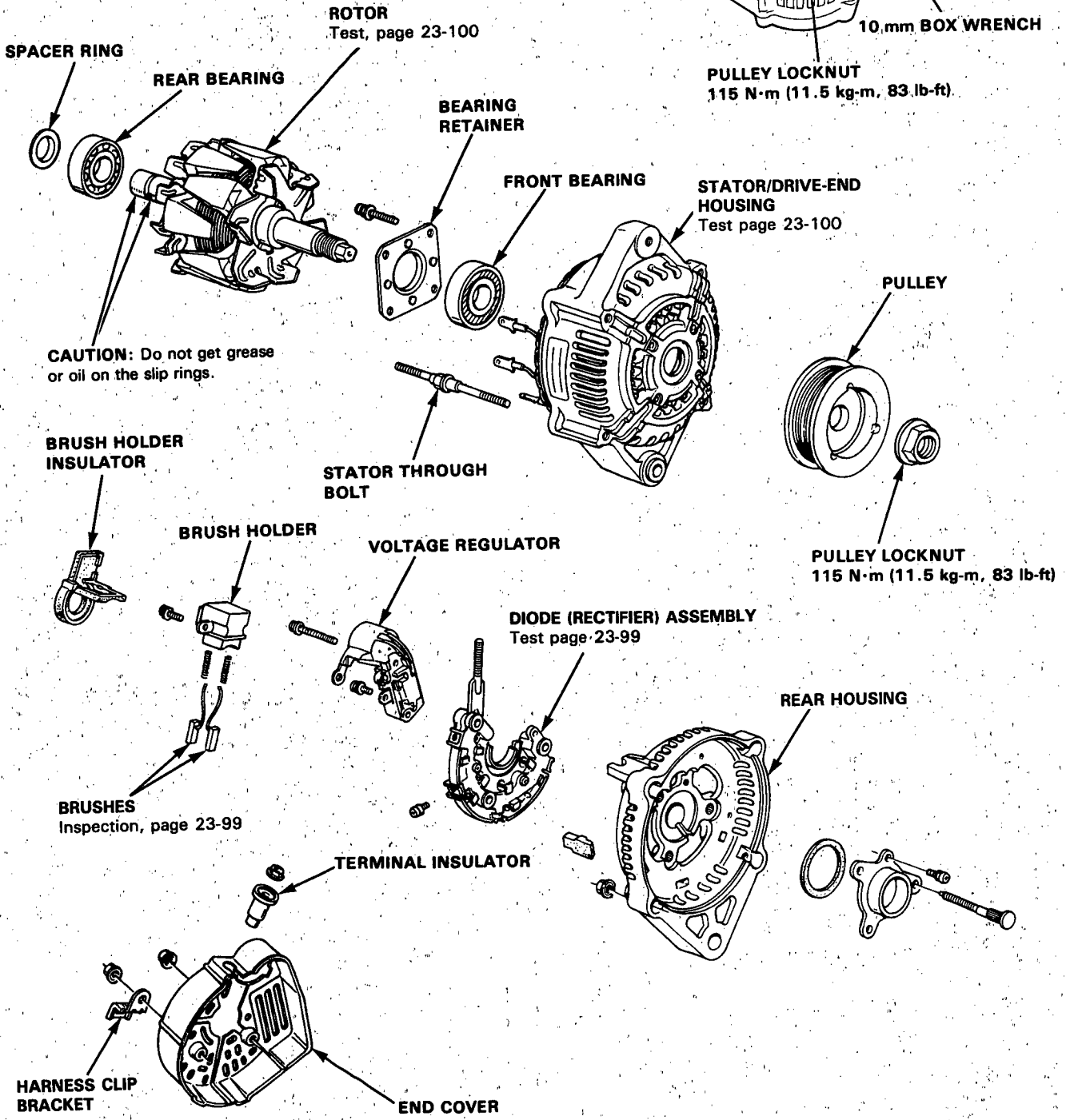
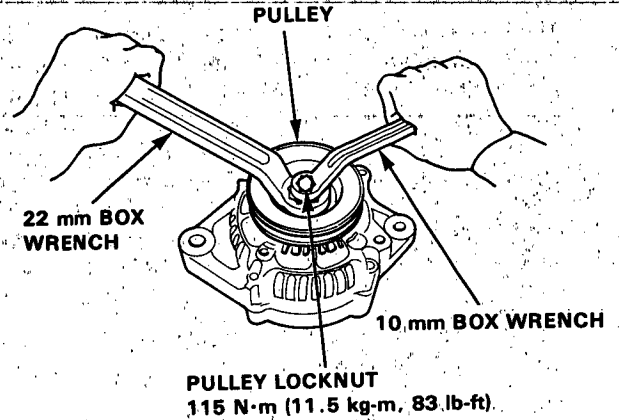
**NOTE:** After reconnecting battery ground cable and turning the radio ON, the word "CODE" will be displayed. Then enter the code.

# Charging System

## Alternator Overhaul

**NOTE:** Only if the front bearing needs replacement, it is necessary to separate the pulley, drive end housing, and rotor.

To loosen the pulley locknut, use 10 mm and 22 mm wrenches. If necessary, use an impact wrench.



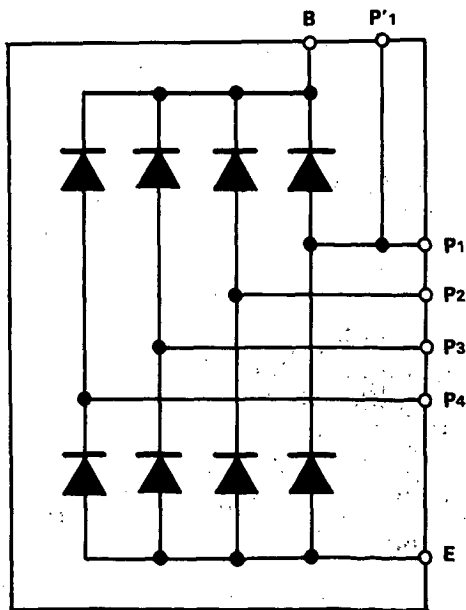
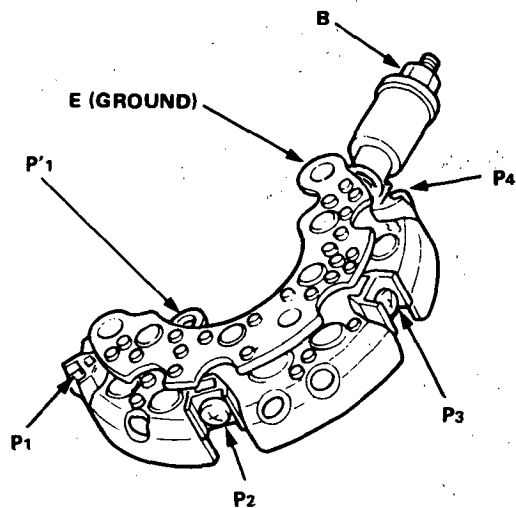


## Rectifier Test

### NOTE:

- The diodes are designed to allow current to pass in one direction while blocking it in the opposite direction. Each diode must be tested for continuity in both directions. Since the alternator rectifier is made up of eight diodes (four pairs), there are a total of 16 checks.
- Use an ohmmeter capable of checking diodes.

1. Check for continuity in each direction between the B and P terminals, and between the E (ground) and P terminals of each diode pair. All diodes should have continuity in only one direction.



2. If any of the eight diodes tests bad, replace the rectifier assembly (diodes are not available separately).

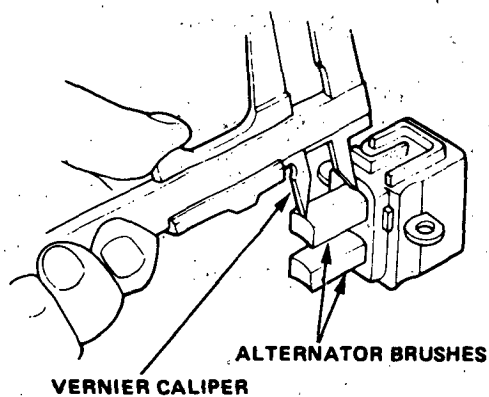
## Alternator Brush Inspection

1. Remove the end cover, then take out the brush holder by removing its two screws.
2. Measure the length of the brushes with a vernier caliper.

### Alternator Brush Length:

Standard: 10.5 mm (0.41 in)

Service Limit: 5.5 mm (0.22 in)

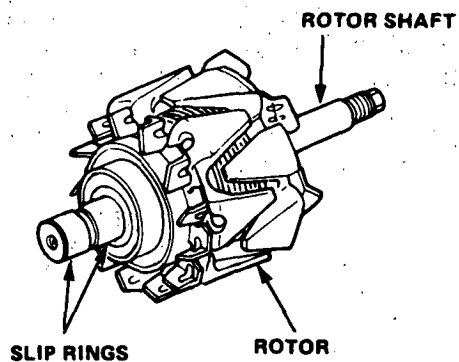


If the brushes are not within the service limit, replace the brush holder assembly.

# Charging System

## Rotor Slip Ring Test

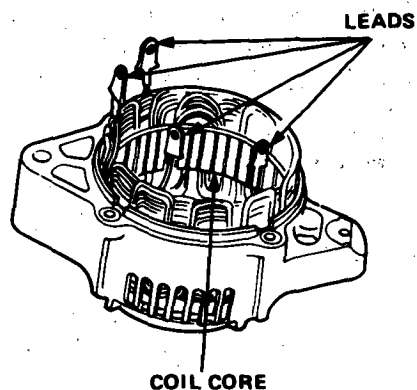
1. Check that there is continuity between the slip rings.
2. Check that there is no continuity between the rings and the rotor or rotor shaft.



3. If the rotor fails either continuity check, replace it.

## Stator Test

1. Check that there is continuity between each pair of leads.
2. Check that there is no continuity between each lead and the coil core.



3. If the coil fails either continuity check, replace the stator.



## Alternator Belt Adjustment

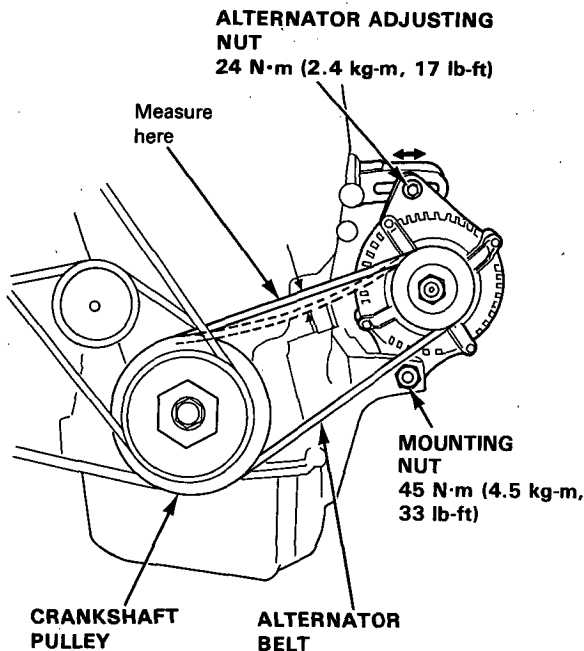
### Deflection method:

Apply a force of 100N (10 kg, 22 lb) and measure the deflection between the alternator and crankshaft pulley.

Deflection: 7.0–10.5 mm (0.28–0.41 in)

### NOTE:

- On a brand-new belt (one that has been run for less than five minutes), the deflection should be 5.0–7.0 mm (0.20–0.27 in) when first measured.
- If there are cracks or any damage evident in the belt, replace it with a new one.



### If adjustment is necessary:

1. Loosen the alternator adjusting nut and mounting nut.
2. Move the alternator to obtain the proper belt tension, then retighten the adjusting nut and mounting nut to the specified torques.
3. Recheck the deflection or tension of the belt.

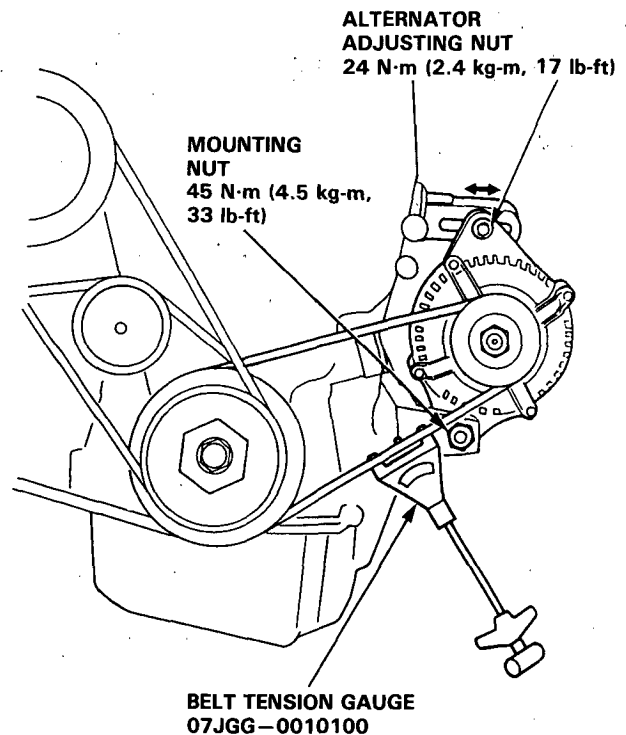
### Tension gauge method:

Attach the belt tension gauge to the belt and measure the tension. Follow the gauge manufacturer's instructions.

Tension: 350–500 N (35–50 kg, 77–110 lbs)

### NOTE:

- On a brand-new belt (one that has been run for less than five minutes), the tension should be 700–900 N (70–90 kg, 154–198 lbs) when first measured.
- If there are cracks or any damage evident in the belt, replace it with a new one.

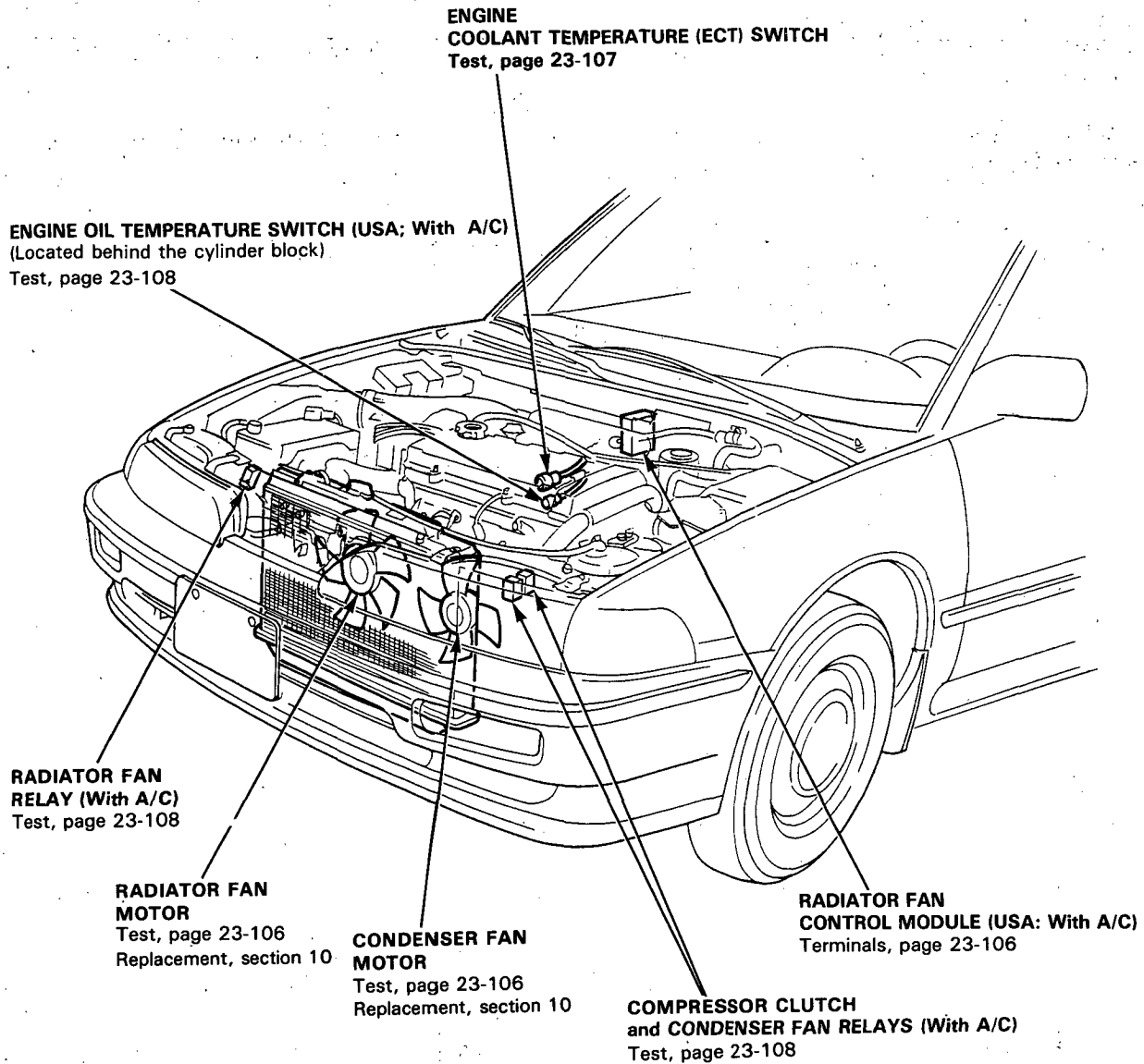


### If adjustment is necessary:

1. Loosen the alternator adjusting nut and mounting nut.
2. Move the alternator to obtain the proper belt tension, then retighten the adjusting nut and mounting nut to the specified torques.
3. Recheck the deflection or tension of the belt.
4. After adjusting, if necessary, adjust the P/S pump belt (see section 17) and A/C compressor belt (see section 22).

# Radiator and Condenser Fan Controls

## Component Location Index





## Circuit Diagram (USA)

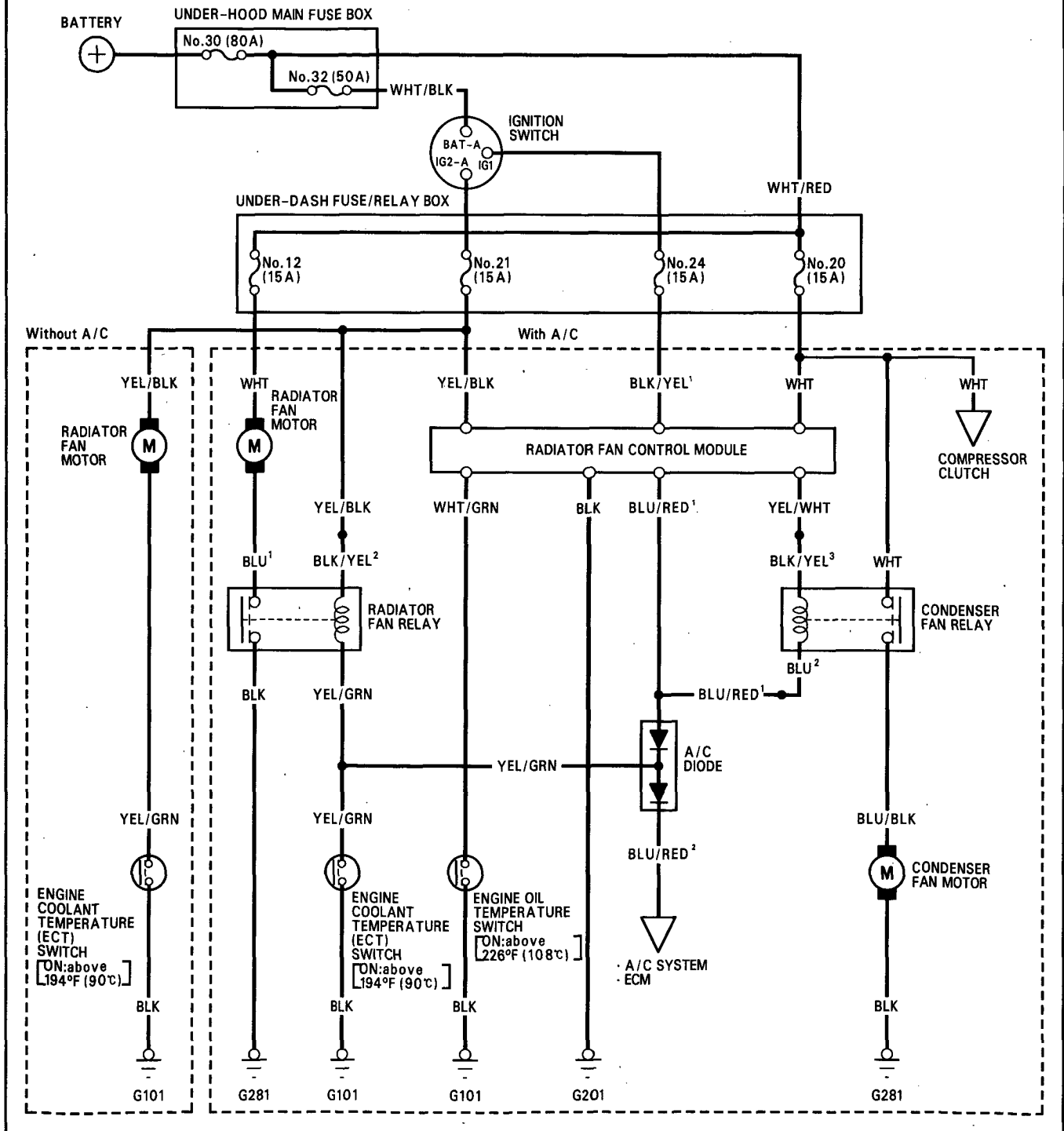
### Description

#### Fan Control system

When the engine oil temperature is above approximately 226°F (103°C) after the engine is stopped, the condenser fan starts running to cool the engine for 15 minutes.

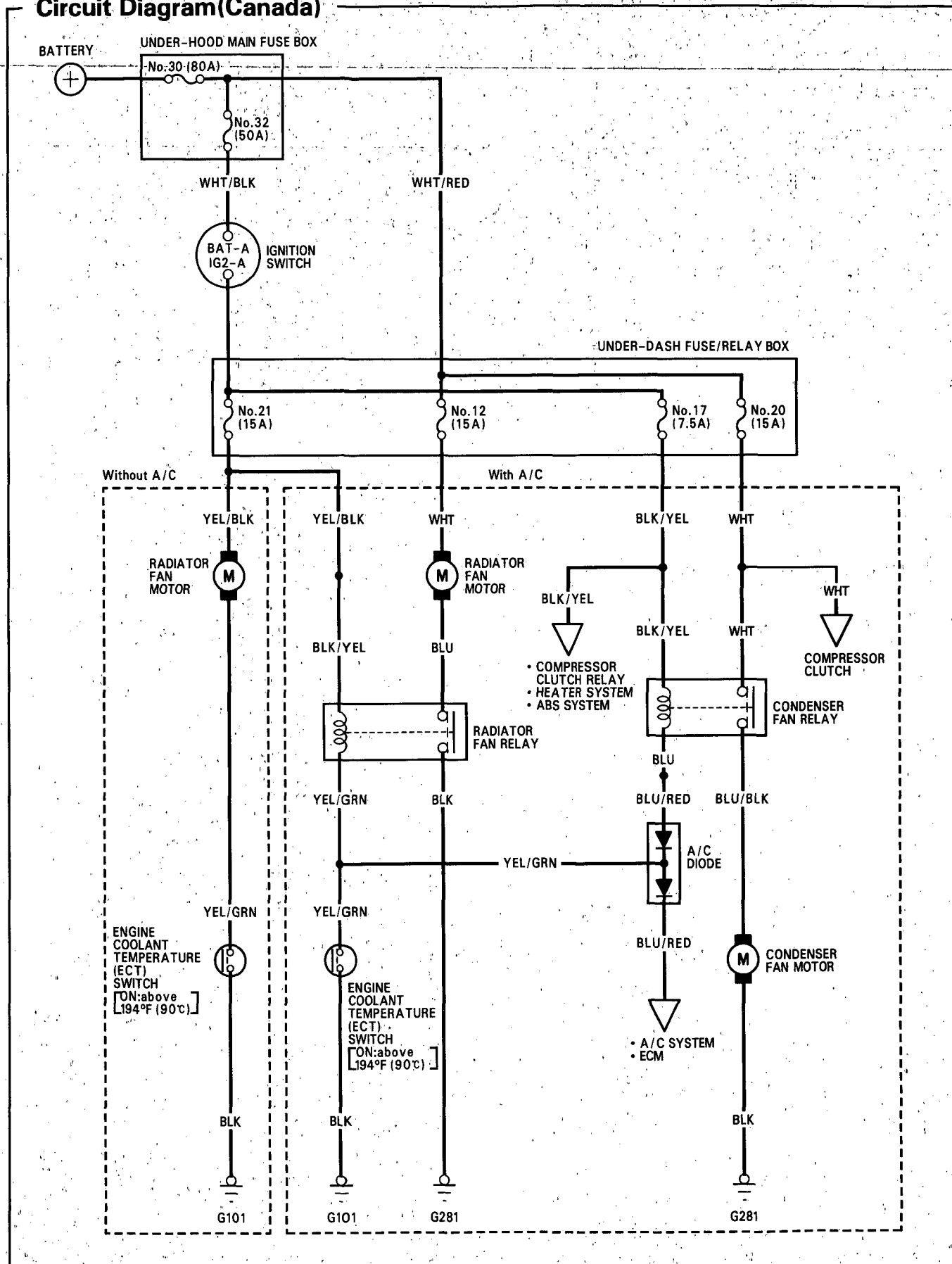
The oil temperature switch is located behind the cylinder block and the radiator fan control module is located at the right side of the heater unit.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, BLU/RED<sup>1</sup> and BLU/RED<sup>2</sup> are not the same).



# Radiator and Condenser Fan Controls

## Circuit Diagram(Canada)







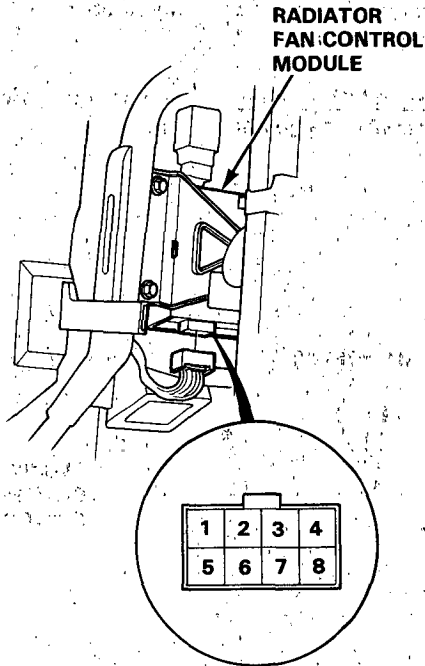
## Troubleshooting (USA: With A/C)

NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected		Blown No.12 (15A) or No.20 (15A) fuse (In the under-dash fuse/relay box)	Radiator fan or condenser fan relay	Radiator fan or condenser fan motor	A/C diode	Blown No.21 (15A) fuse (In the under-dash fuse/relay box)	Engine coolant temperature (ECT) switch	Faulty radiator fan control module	Engine oil temperature switch	A/C system	Poor ground	Open circuit, loose or disconnected terminals
		Symptom										
Only one fan runs (with engine and A/C ON).		1	2	3	4			5			G281	BLU <sup>1</sup> , BLU/BLK, YEL/BLK BLK/YEL <sup>2</sup> YEL/WHT, BLK/YEL <sup>3</sup> or BLU/RED <sup>2</sup>
Fans do not rotate.	Under all conditions.					1	2	3			G101	YEL/BLK or YEL/GRN
	A/C ON									1		
Radiator fan control module fails to function properly.								2	1		G201	WHT, WHT/GRN, BLU <sup>2</sup> or BLU/RED <sup>1</sup>

# Radiator and Condenser Fan Controls

## Radiator Fan Control Module Terminals (USA: With A/C)

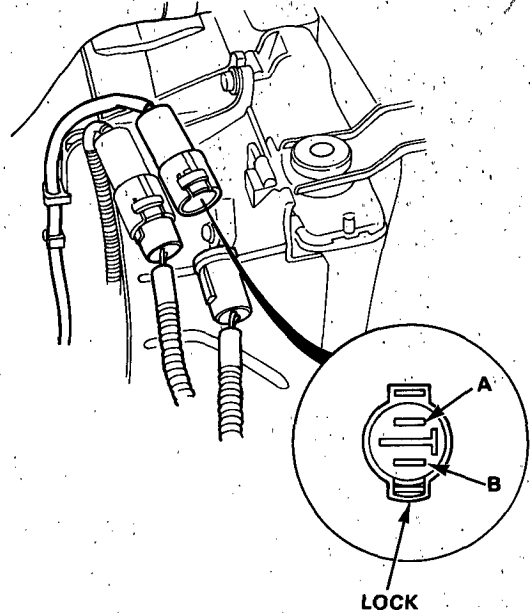


Terminal	Wire	Connects to
1	YEL/ WHT	Condenser fan relay ⊕
2	YEL/ BLK	Power supply (For condenser fan relay by way of timer unit with ignition switch ON)
3	—	(Not used)
4	BLK	Ground
5	WHT/ GRN	Engine oil temperature switch
6	WHT	Constant power (For condenser fan motor relay by way of radiator fan control module)
7	BLK/ YEL	IG1 (Timer reset signal)
8	BLU/ RED	Condenser fan relay ⊖

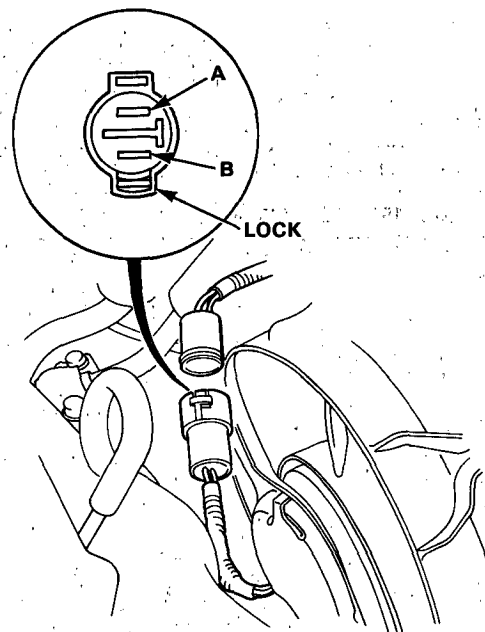
## Fan Motor Test

1. Disconnect the 2-P connector from the fan motor.
2. Test motor operation by connecting battery power to the A terminal, and ground to the B terminal.
3. If the motor fails to run smoothly, replace it.

### Radiator Fan Motor:



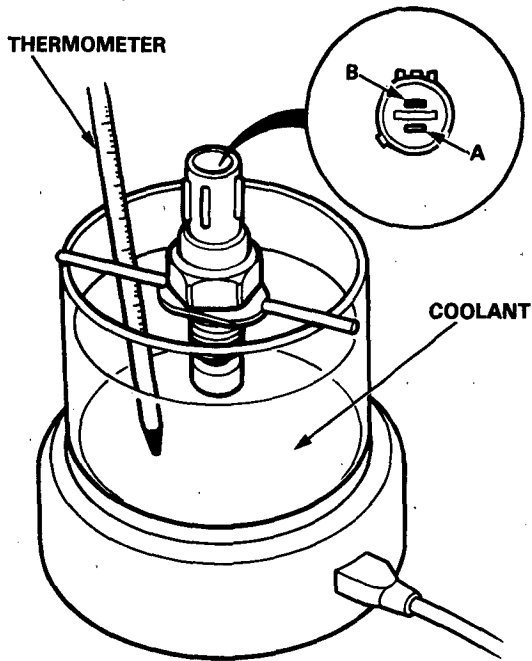
### Condenser Fan Motor:





### Engine Coolant Temperature (ECT) Switch Test

1. Remove the engine coolant temperature (ECT) switch from the rear of the engine cylinder block.
2. Suspend the ECT switch in a container of coolant as shown.

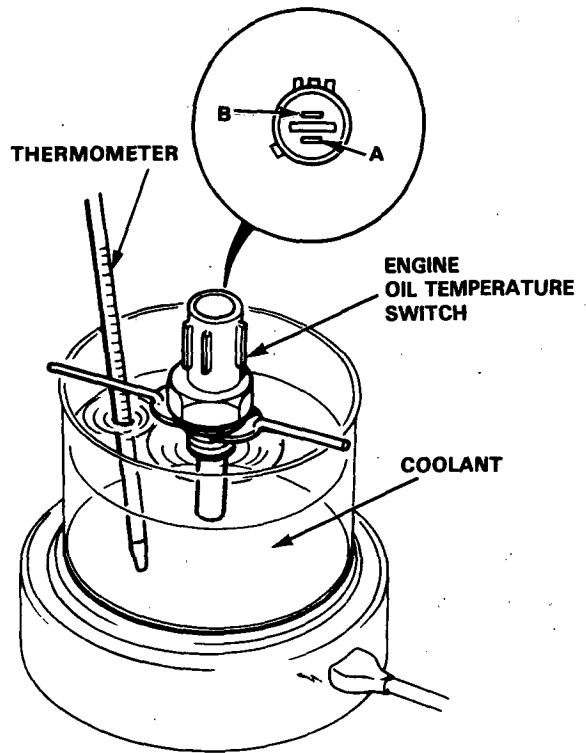


3. Heat the coolant and check coolant temperature with a thermometer (see table below).
4. Check for continuity between the A and B terminals according to the table.

		Terminal	
Temperature		A	B
Switch	Above 196-203°F (91-95°C)	○—○	
	Below 181-189°F (83-87°C)		

### Engine Oil Temperature Switch Test (USA: With A/C)

1. Remove the engine oil temperature switch from the cylinder head.
2. Suspend the engine oil temperature switch in a container of coolant as shown.



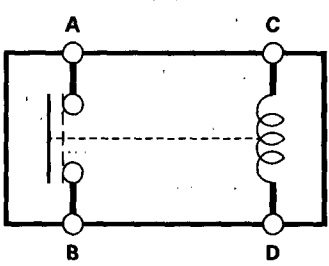
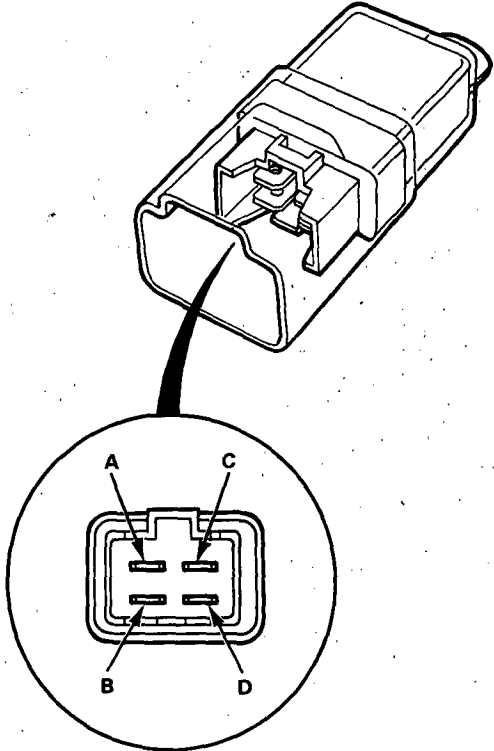
3. Heat the coolant and check coolant temperature with a thermometer (see table below).
4. Check for continuity between the A and B terminals according to the table.

		Terminal	
Temperature		A	B
Switch	Above 221-232°F (105-111°C)	○—○	
	Below 208-228°F (98-109°C)		

# Radiator and Condenser Fan Controls

## Relay Test (With A/C)

1. There should be continuity between the C and D terminals.
2. There should be continuity between the A and B terminals when battery power and ground are connected to the C and D terminals. There should be no continuity when power is disconnected.





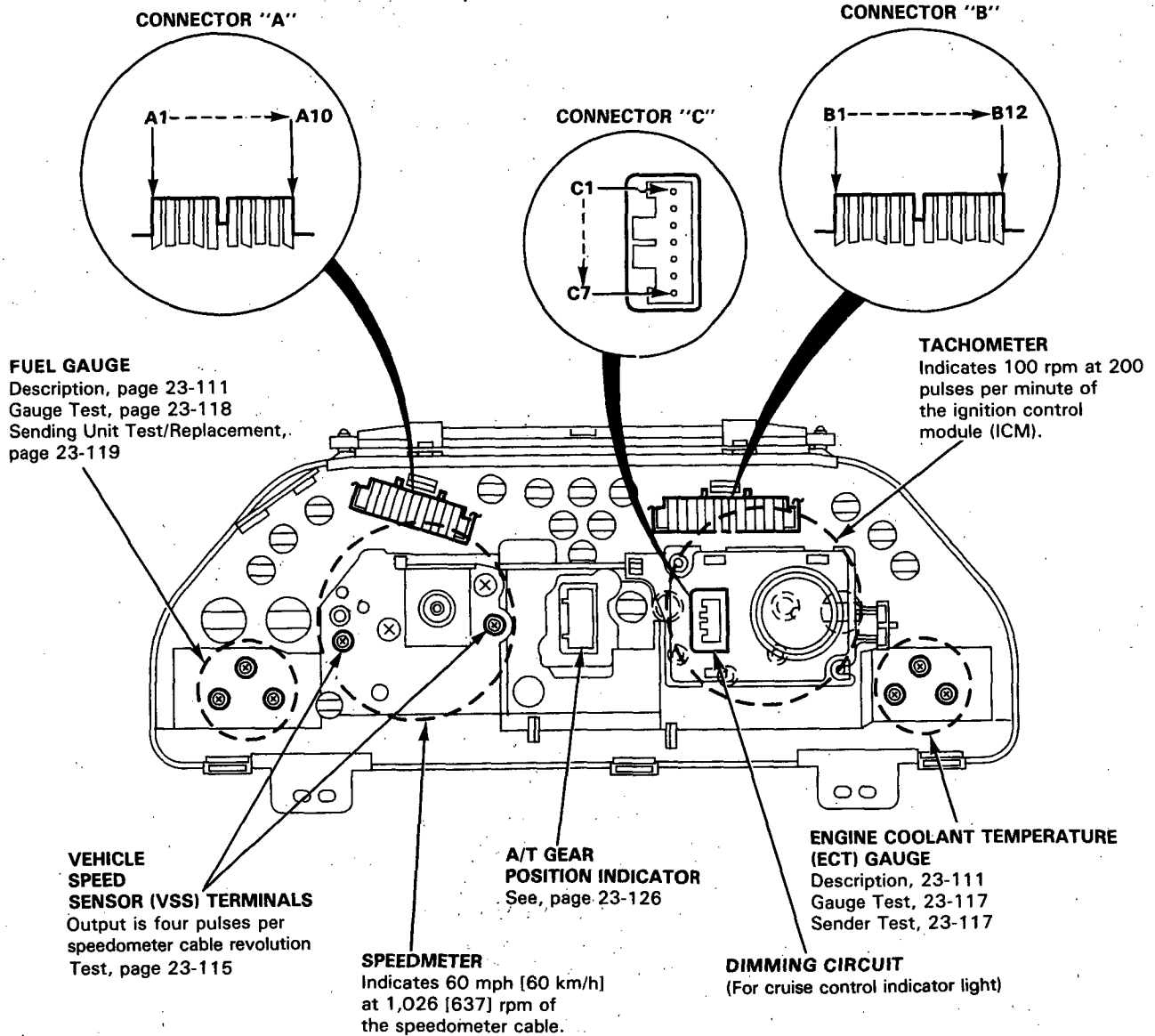
# Gauge Assembly

## Gauge/Indicator Location Index

### GAUGE ASSEMBLY

Removal, page 23-115

Disassembly, page 23-116



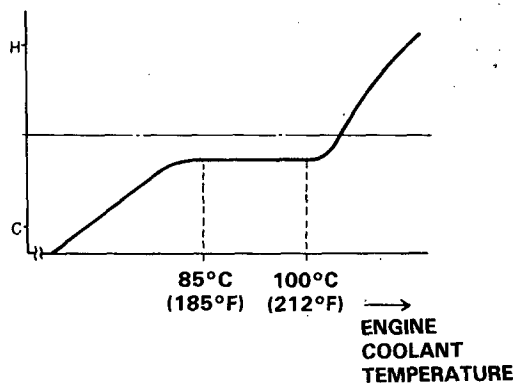


## Description

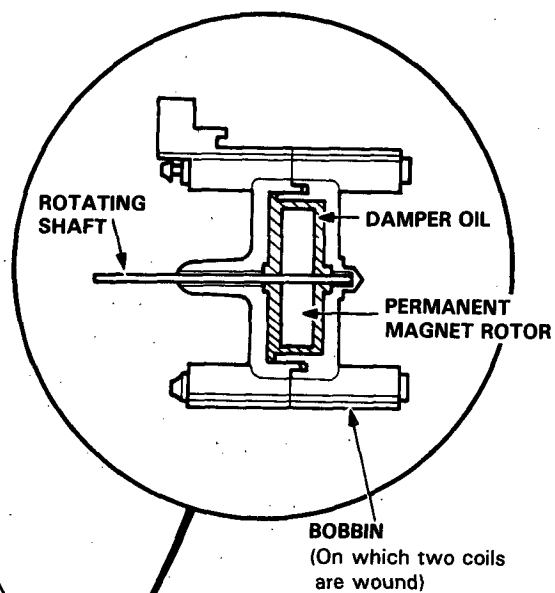
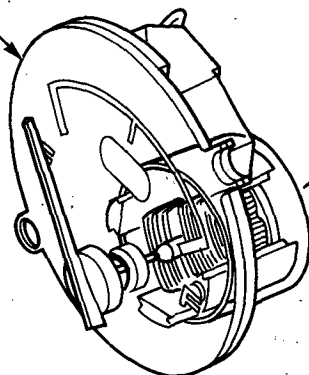
### Bobbin Type (Cross Coil Type) Gauge:

- A bobbin type gauge is an electromagnetic instrument in which two intersecting coils are wound around the permanent magnet rotor. A change in the resistance of the sending unit entails a change of the current which flows through the coil; the magnetic force energized by the coil will vary, causing the rotor (pointer) to move. A sliding resistance is employed in the fuel gauge just as in a bimetal type gauge, and a thermistor is used in the temperature gauge.
- The rotor of the fuel gauge is immersed in damper oil and its center of gravity lies roughly along the rotating shaft, hence the fuel level is indicated continuously even when the ignition switch is OFF.
- The engine coolant temperature (ECT) gauge is a center point stable small indicating angle type which indicates the temperature of the engine coolant between about 185°F (85°C) and 212°F (100°C).

POINTER  
ANGLE

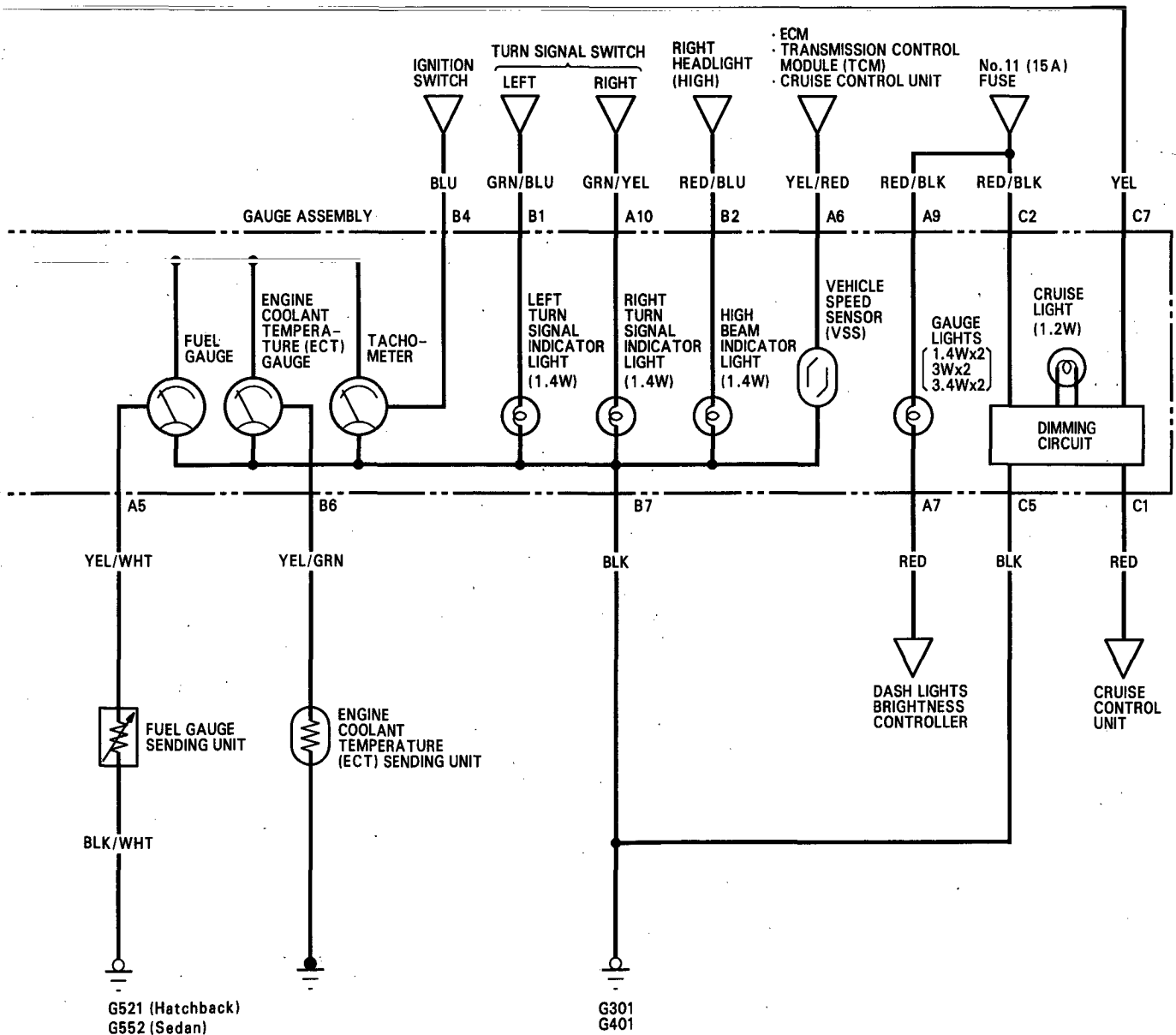


GAUGE (FUEL GAUGE)



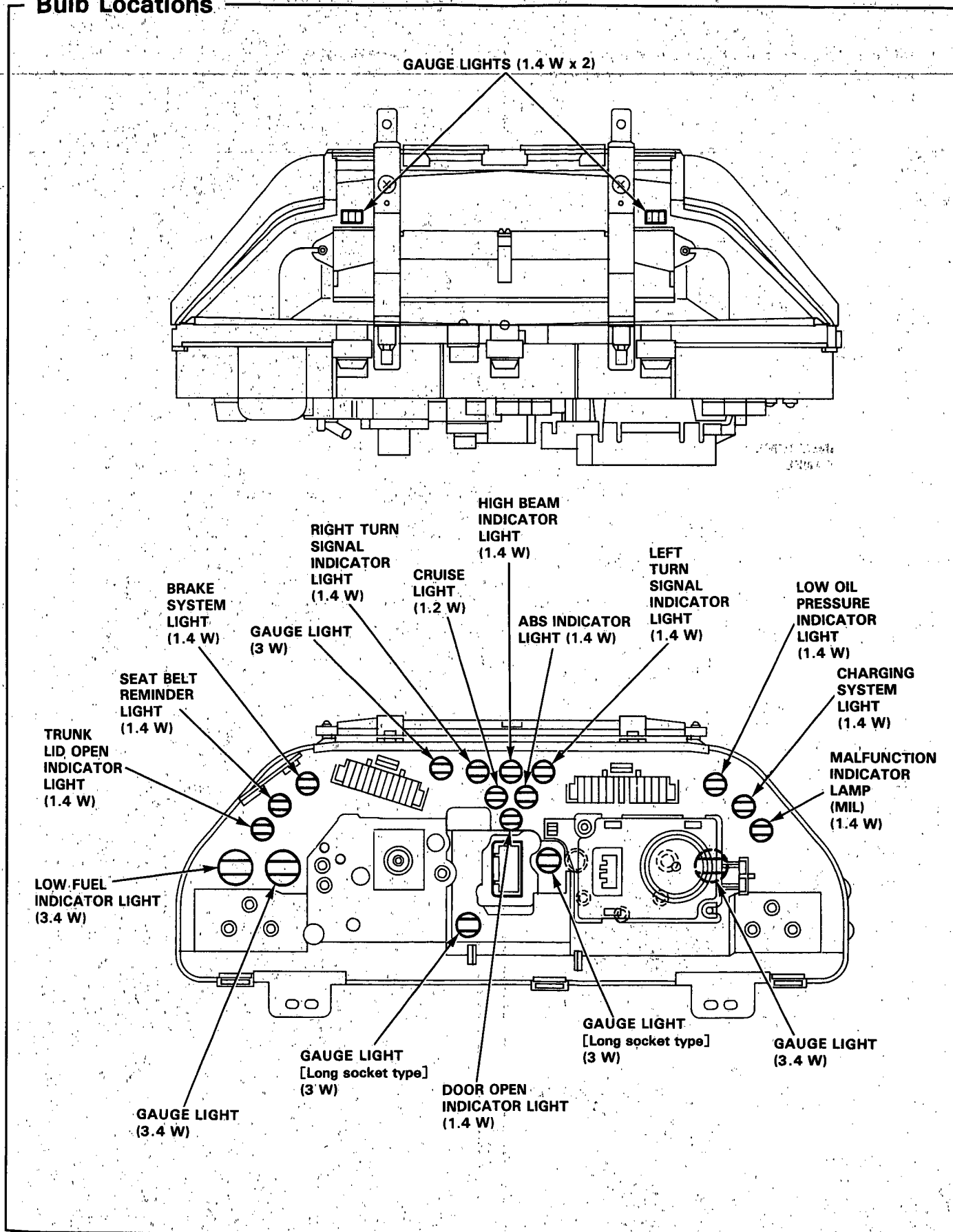






# Gauge Assembly

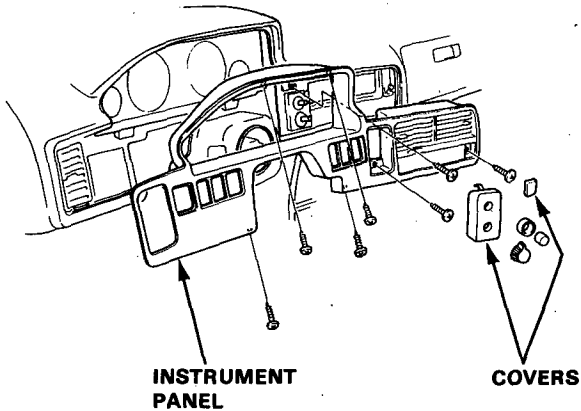
## Bulb Locations



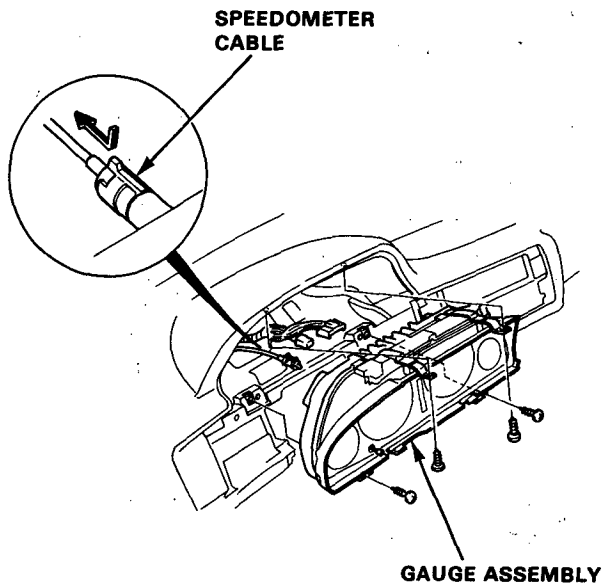


## Removal

1. Remove the screws and the instrument panel from the dashboard, then disconnect each switch connector.

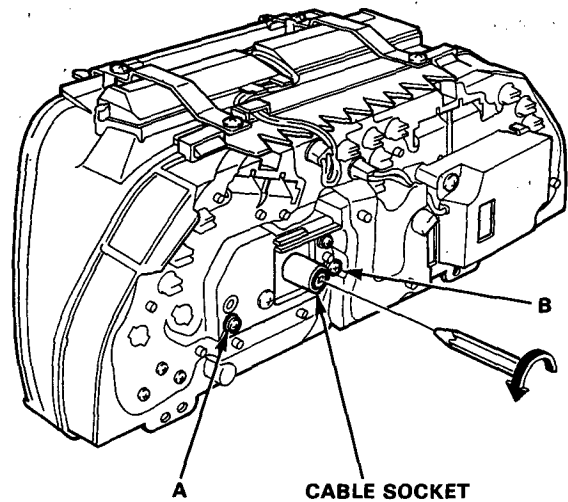


2. Remove the four screws, then remove the gauge assembly half-way, and disconnect the speedometer cable and connectors.



## Vehicle Speed Sensor (VSS) Test

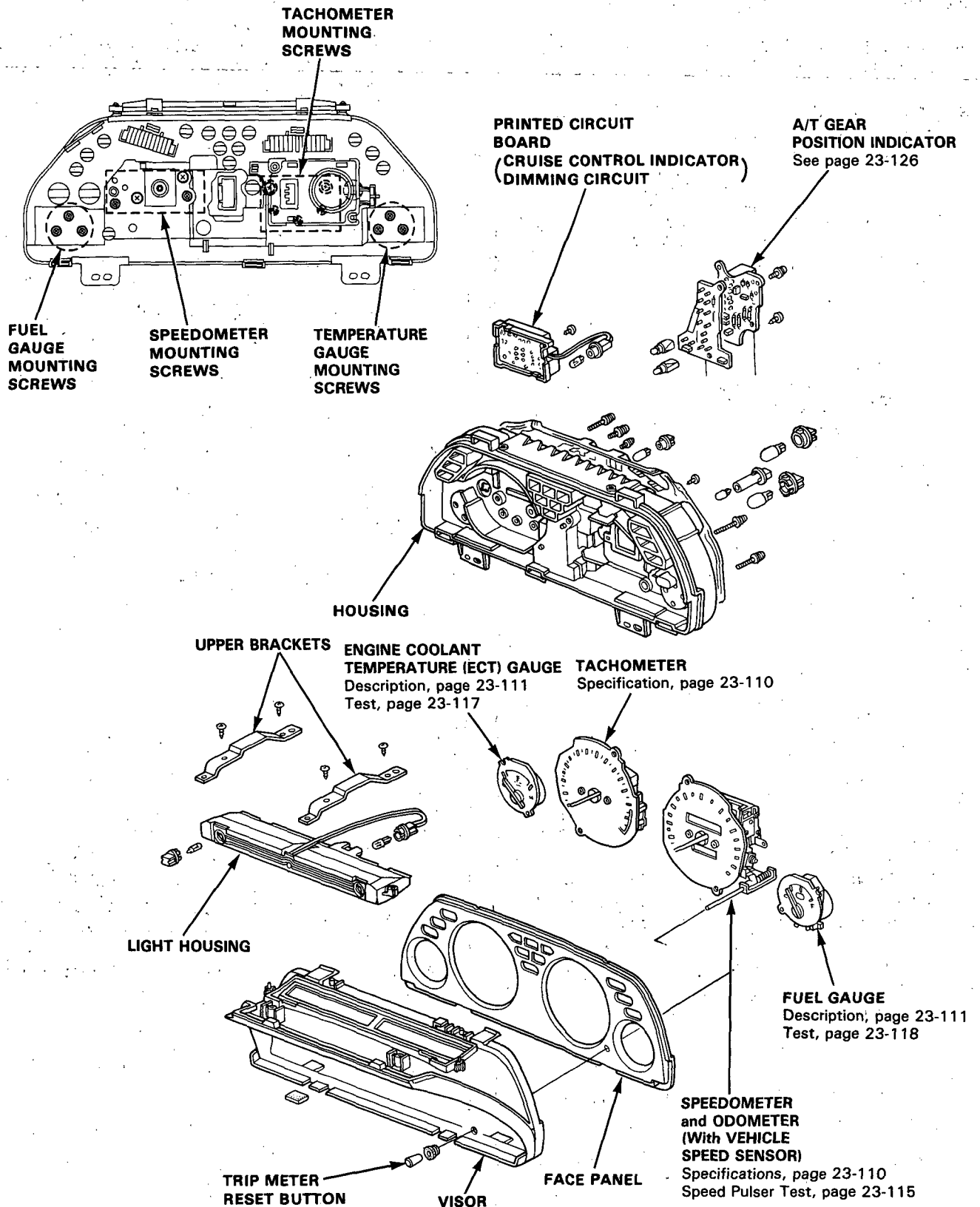
1. Remove the gauge assembly from the dashboard, then turn it over.
2. Break the lead off a pencil tip, then insert the pencil into the speedometer cable socket and turn it. Connect an ohmmeter between the A and B terminals. There should be continuity between the A and B terminals four times per revolution.



# Gauge Assembly

## Disassembly

NOTE: Handle the terminals and printed circuit boards carefully to avoid damaging them.



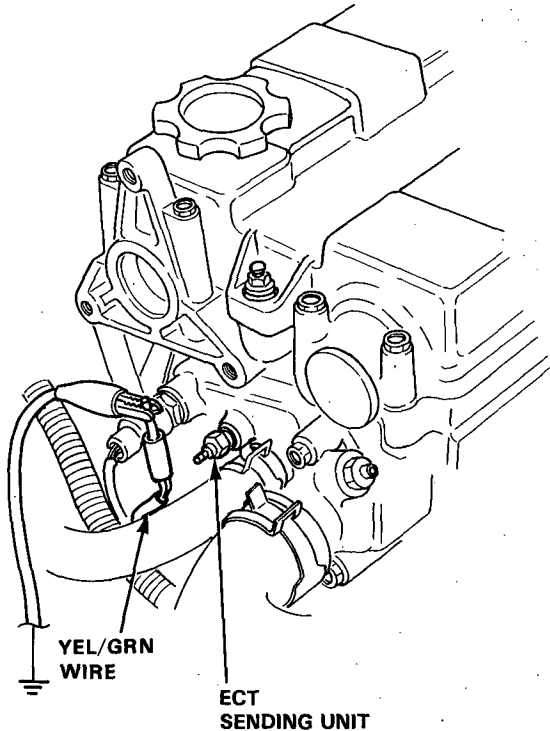
# Engine Coolant Temperature (ECT) Gauge



## Gauge Test

NOTE: Refer to page 23-113 for the circuit diagram of the engine coolant temperature (ECT) gauge.

1. Check the No. 23 (7.5 A) fuse in the under-dash fuse/relay box before testing.
2. Make sure the ignition switch is OFF, the disconnect the YEL/GRN wire from the ECT sending unit and ground it with a jumper wire.



3. Turn the ignition switch ON. Check that the pointer of the ECT gauge starts moving toward the "H" mark.

**CAUTION:** Turn the ignition switch OFF before the pointer reaches the "H" mark on the gauge dial. Failure to do so may damage the gauge.

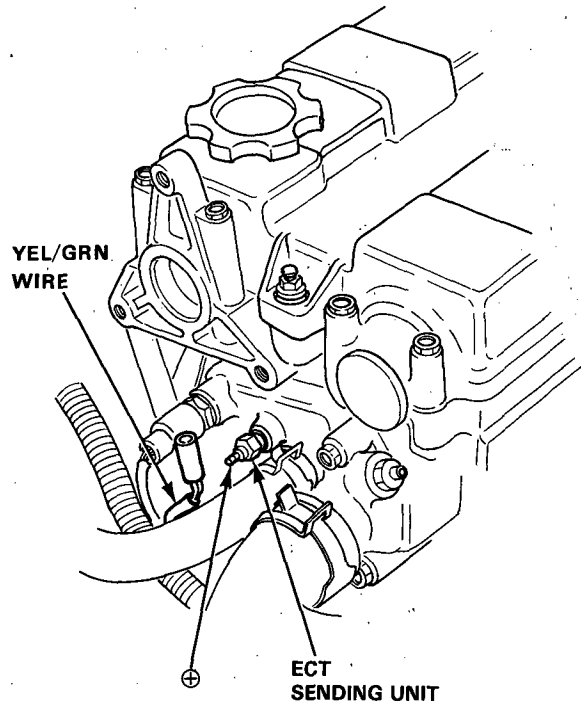
- If the pointer of the gauge does not swing at all, check for:
  - Blown No. 23 (7.5 A) fuse in the under-dash fuse/relay box.
  - An open in the YEL or YEL/GRN wire.

Replace the ECT gauge if the fuse and wiring are normal.

- If the gauge works normally, inspect the sending unit.

## Sending unit

1. Disconnect the YEL/GRN wire from the sending unit.
2. With the engine cold, use an ohmmeter to measure resistance between the positive terminal and the engine (ground).



3. Check the temperature of the coolant.
4. Run the engine and measure the change in resistance with the engine at operating temperature (radiator and condenser fans come on).

Temperature	133°F (56°C)	185°F (85°C) — ["C" mark]
Resistance (Ω)	142	49—32

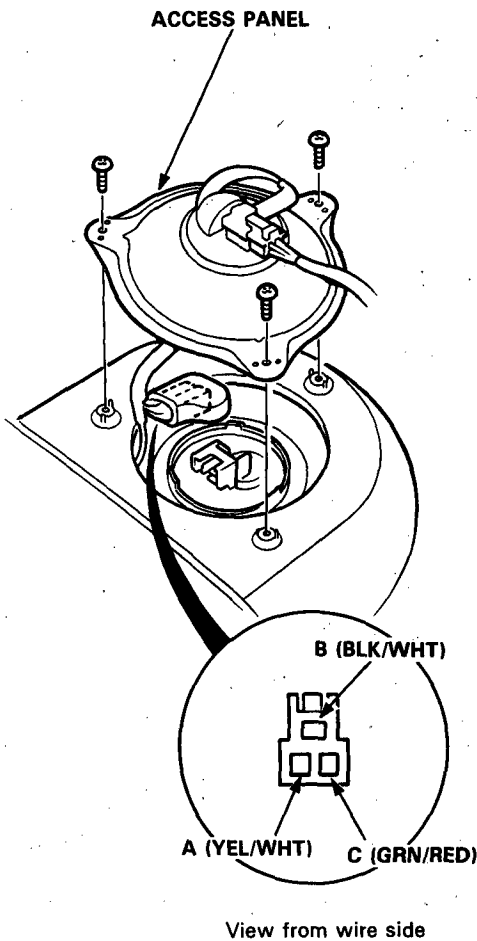
5. If your readings are substantially different from the specifications above, replace the sending unit.

# Fuel Gauge

## Gauge Test

NOTE: Refer to page 23-113 for the circuit diagram of the fuel gauge.

1. Check the No. 23 (7.5 A) fuse in the under-dash fuse/relay box before testing.
2. Remove the rear seat (see section 20), then remove the access panel.
3. Disconnect the 3-P connector from the fuel gauge sending unit.



4. Connect the voltmeter positive probe to the A (YEL/WHT) terminal and the negative probe to the B (BLK/WHT) terminal, then turn the ignition switch ON.

There should be between 5 and 8V.

- If the voltage is as specified, go to step 4.
- If the voltage is not as specified, check for:
  - Blown No. 23 (7.5 A) fuse in the under-dash fuse/relay box.
  - An open in the YEL, YEL/WHT or BLK/WHT wire.
  - Poor ground (G521 or G552)

5. Turn the ignition switch OFF. Attach a jumper wire between the A (YEL/WHT) and B (BLK/WHT) terminals.

Turn the ignition switch ON.

Check that the pointer of the fuel gauge starts moving toward the "F" mark.

**CAUTION:** Turn the ignition switch OFF before the pointer reaches the "F" mark on the gauge dial. Failure to do so may damage the fuel gauge.

NOTE: The fuel gauge is a bobbin (cross coil) type, hence the fuel level is continuously indicated even when the ignition switch is OFF, and the pointer moves slower than that of a bimetal type.

- If the pointer of the fuel gauge does not swing at all, replace the gauge.
- If the gauge is OK, inspect the fuel gauge sending unit.

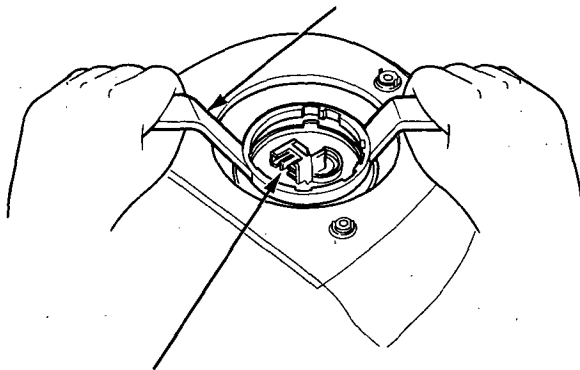


## Sending Unit Test/Replacement

**⚠ WARNING** Do not smoke while working on the fuel system. Keep open flame away from the work area.

1. Remove the rear seat (see section 20), then remove the access panel.
2. With the ignition switch OFF, disconnect the 3-P connector from the fuel gauge sending unit.
3. Remove the fuel gauge sending unit.

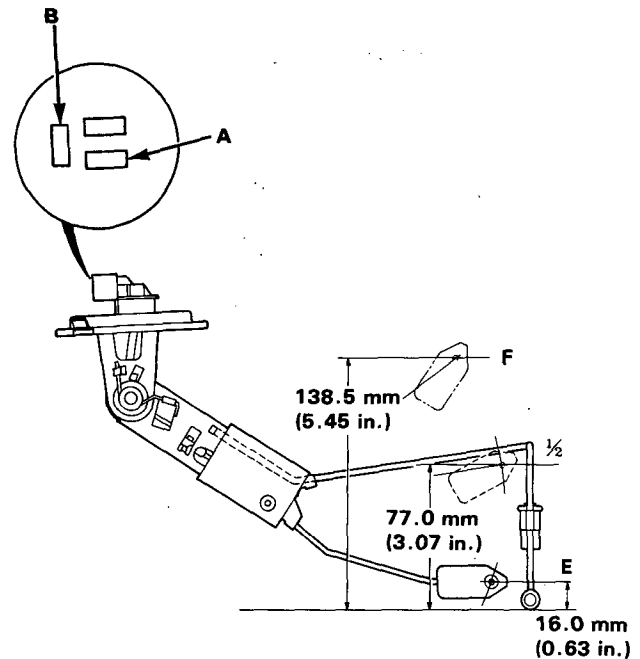
FUEL SENDER WRENCH  
07920-SB20000  
or  
07NAC-SR20100



FUEL GAUGE  
SENDING UNIT

4. Measure the resistance between the A and B terminals at E (EMPTY), 1/2 (HALF FULL), and F (FULL) by moving the float.

Float Position	E	1/2	F
Resistance ( $\Omega$ )	105-110	25.0-39.0	2-5



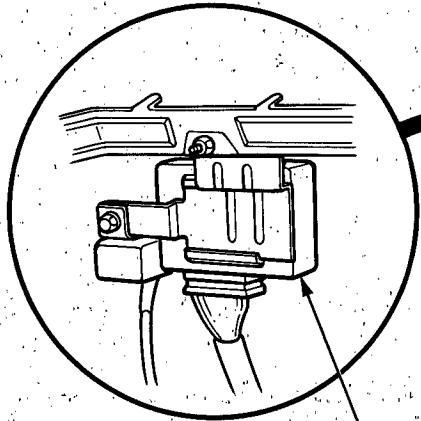
5. If you don't obtain the above readings, replace the fuel gauge sending unit.

# Interlock System

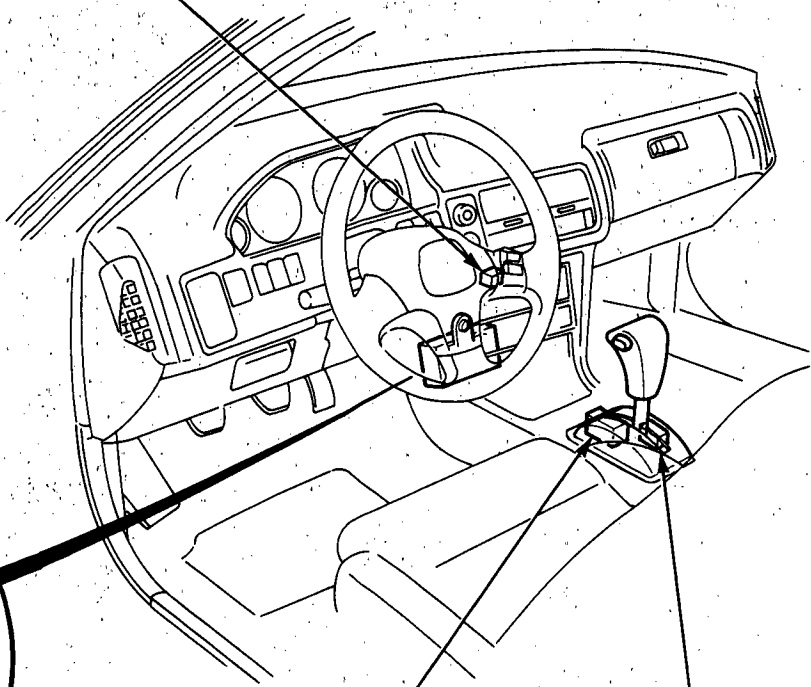
## Component Location Index

• A/T GEAR POSITION INDICATOR  
See page 23-126

KEY INTERLOCK SOLENOID  
and KEY INTERLOCK SWITCH  
(In the steering lock assembly)  
Test, page 23-124



INTERLOCK  
CONTROL  
UNIT  
Input Test, page 23-123



SHIFT LOCK SOLENOID  
Test, page 23-125  
Replacement, page 23-125

A/T GEAR  
POSITION SWITCH  
Test, page 23-130  
Replacement, page 23-131





## Description

The car is equipped with the following devices to prevent inadvertent shifting:

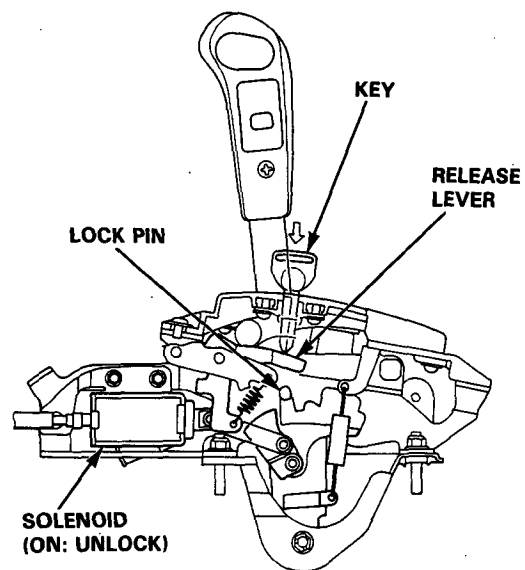
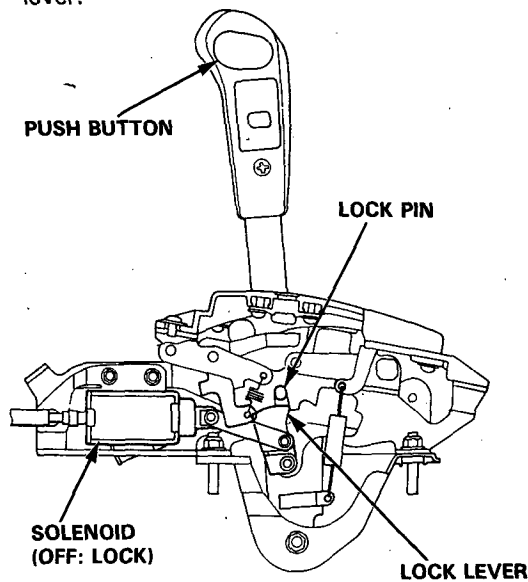
- A/T shift lever assembly with shift lock.
- Ignition key cylinder with interlock mechanism.

### Shift Lock System

The shift lock system prevents the shift lever from moving to **R** or **D** from the **P** position unless the brake pedal is depressed and the accelerator is in its rest position.

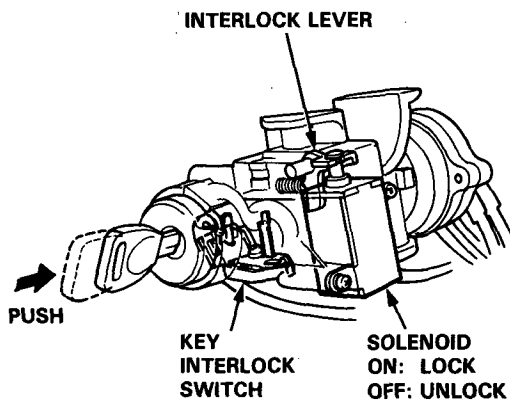
#### NOTE:

- The shift lever cannot be shifted when the brake pedal and the accelerator are stepped on at the same time.
- In case of system malfunction, the shift lever can be released by pushing a key into the release slot near the shift lever.

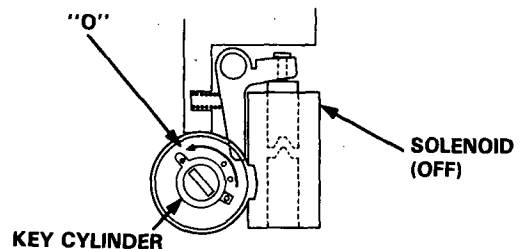


### Key Interlock System:

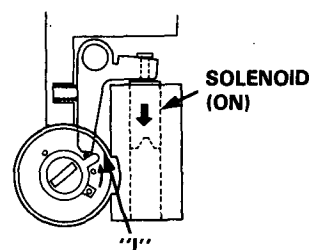
The ignition key cannot be removed from the ignition switch unless the shift lever is in the **P** position. When the shift lever is in any position other than **P** position, a solenoid is activated, making it impossible for the key to be removed until the lever is moved to the **P** position.



The shift lever is in the **P** position.



The shift lever is in any position except **P**.



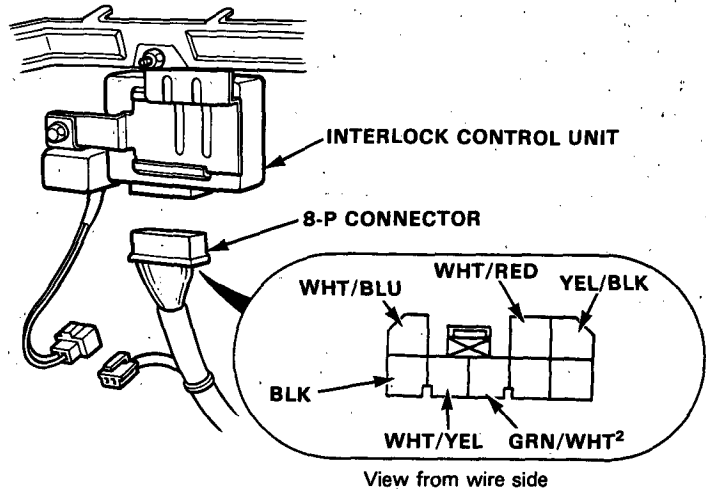




## Control Unit Input Test

Disconnect the 8-P connector from the control unit. Check for good contact between the connector and socket terminals. If the terminals are OK, make following input tests at the connector. If all input tests are OK, but the problem remains, replace the control unit.

**NOTE:** If the shift lock solenoid clicks when the ignition switch is ON and the brake pedal is pushed (shift lever is in **P** position, accelerator is in rest position), the shift lock system is electronically normal; test the A/T gear position switch as described on page 23-130.



### Shift Lock System:

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	WHT/RED	Ignition switch ON. Brake pedal pushed.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 37 (20A) fuse. (in the under-hood main fuse box)</li> <li>• Faulty brake switch.</li> <li>• Faulty throttle position (TP) sensor</li> <li>• Faulty transmission control module (TCM).</li> <li>• An open in the wire.</li> </ul>
		Ignition switch ON. Step on the brake pedal and the accelerator at the same time.	Check for voltage to ground: There should not be battery voltage.	
2	GRN/WHT <sup>2</sup>	Shift lever in position <b>P</b> .	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Faulty A/T gear position switch.</li> <li>• Poor ground (G301, G401).</li> <li>• An open in the wire.</li> </ul>
3	YEL/BLK	Ignition switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No.23 (7.5A) fuse. (in the under-dash fuse/relay box)</li> <li>• Faulty shift lock solenoid.</li> <li>• An open in the wire.</li> </ul>

### Key Interlock System:

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G301, G401).</li> <li>• An open in the wire.</li> </ul>
2	GRN/WHT <sup>2</sup>	Shift lever in position <b>P</b> .	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Faulty A/T gear position switch.</li> <li>• Poor ground (G301, G401).</li> <li>• An open in the wire.</li> </ul>
3	WHT/BLU	Ignition switch turned to ACC (1) and the key pushed in.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No.37 (20A) fuse. (in the under-hood main fuse box)</li> <li>• Faulty steering lock assembly (key interlock solenoid).</li> <li>• An open in the wire.</li> </ul>
	WHT/YEL			

# Interlock System

## Key Interlock Solenoid Test

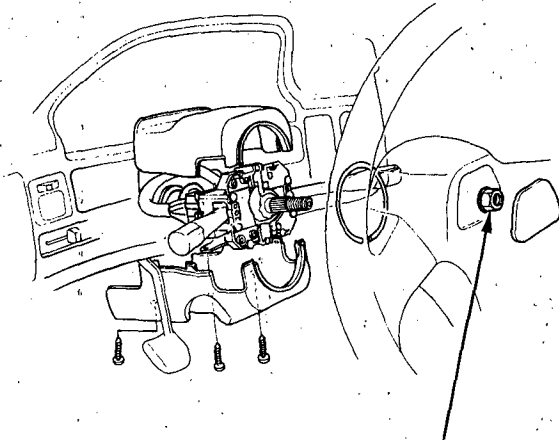
### NOTE:

The radio may have a coded theft protection circuit. Be sure to get the customer's code number before

- Disconnecting the battery.
- Removing the No. 14 (15 A) fuse (in the under-dash fuse/relay box).
- Removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the battery negative terminal before replacement.
2. Remove the steering wheel, then remove the steering column covers.



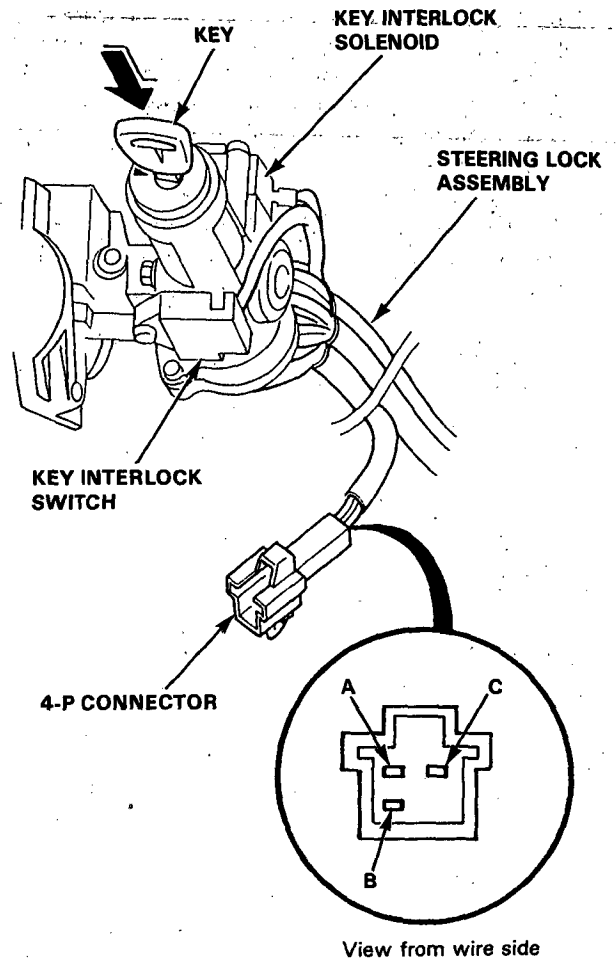
**SELF-LOCKING NUT 50 N·m (5.0 kg-m, 36.2 lb-ft)**  
Replace.

3. Disconnect the 4-P connector from the dashboard wire harness.
4. Check for continuity between the terminals in each switch position according to the table.

Terminal		Position			
		A	B		C
Ignition switch ACC (I)	Key pushed in.	○	○	—	○
	Key released.		○	—	○

5. Check that the key cannot be removed when battery power and ground are connected to the A and C terminals.

- If the key cannot be removed, the key interlock solenoid is OK.
- If the key can be removed, replace the steering lock assembly (key interlock solenoid is not available separately).



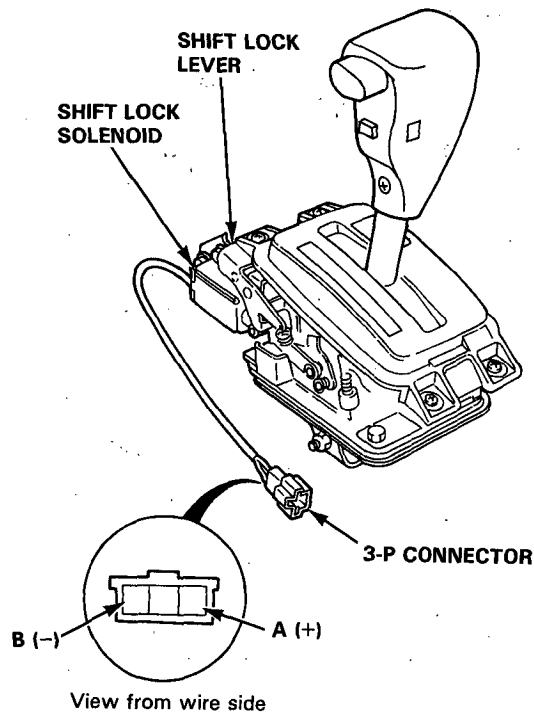


## Shift Lock Solenoid Test

1. Remove the console, then disconnect the 3-P connector of the shift lock solenoid from the main wire harness.

NOTE: Do not connect power to the B (-) terminal (reverse polarity) or you will damage the diode inside the solenoid.

2. Connect battery power to the A terminal, ground the B terminal momentarily, and check solenoid operation.

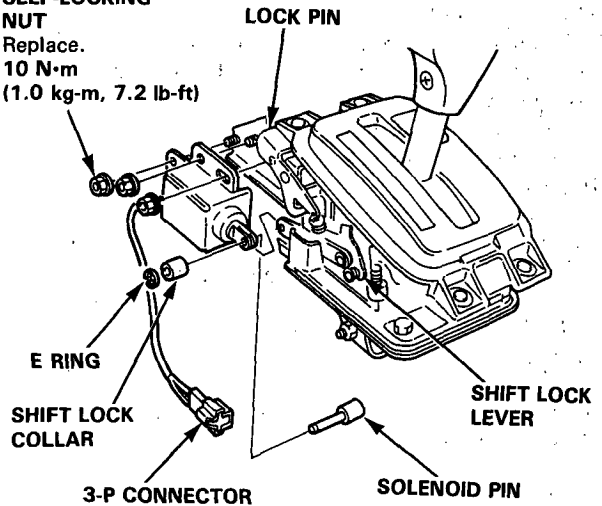


- If the solenoid does not operate, replace it as described in steps 3, 4, and 5.
- If the solenoid operates, check and, if necessary, adjust its two positions as shown in step 5.

3. Remove the E ring and the solenoid pin.
4. Remove the self-locking nuts and shift lock solenoid, then install the new solenoid in the reverse order of removal.

### SELF-LOCKING NUT

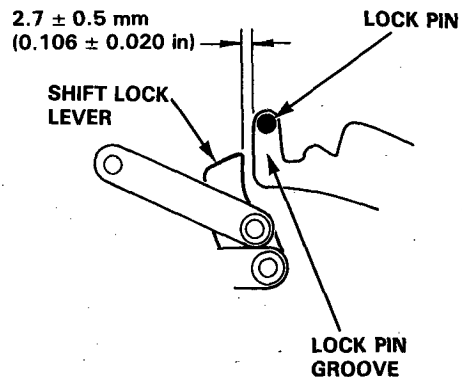
Replace.  
10 N·m  
(1.0 kg·m, 7.2 lb-ft)



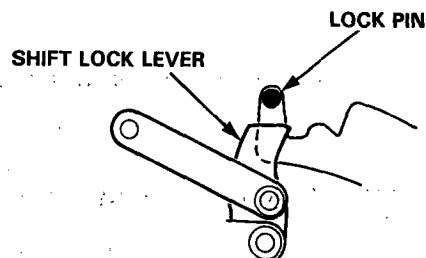
5. Check and, if necessary, adjust the solenoid's position.

- When the shift lock solenoid is ON, check that there is a clearance of  $2.7 \pm 0.5$  mm ( $0.106 \pm 0.020$  in) between the top rear corner of the shift lock lever and the lock pin groove, then tighten the self-locking nuts.

NOTE: Use new self-locking nuts.



- When the shift lock solenoid is OFF, make sure that the lock pin is blocked by the shift lock lever.



# A/T Gear Position Indicator

## Component Location Index

- **GAUGE ASSEMBLY**

- Removal, page 23-115
- Disassembly, page 23-116

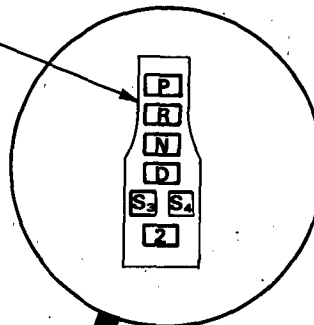
- **INTERLOCK SYSTEM**

- See page 23-120

- **A/T CONTROL SYSTEM**

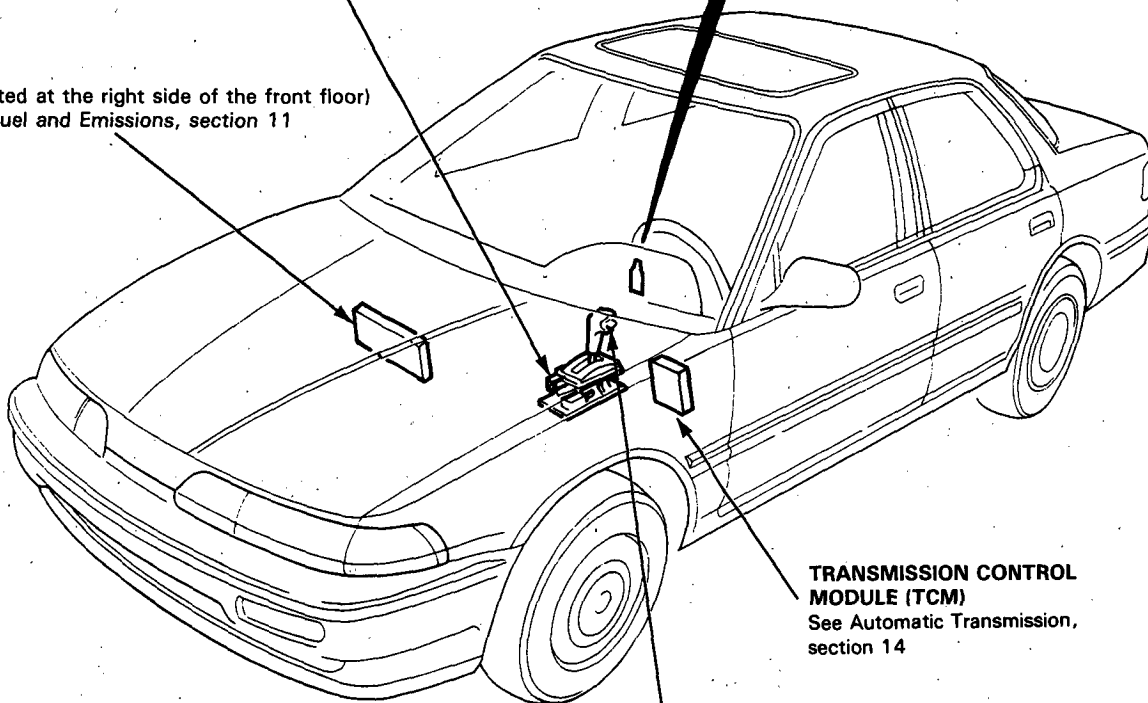
- See Automatic Transmission, section 14

**A/T GEAR POSITION INDICATOR**  
Input Test, page 23-129



**A/T GEAR POSITION SWITCH**  
Test, page 23-130  
Replacement, page 23-131

**ECM**  
(Located at the right side of the front floor)  
See Fuel and Emissions, section 11



**TRANSMISSION CONTROL MODULE (TCM)**  
See Automatic Transmission, section 14

**S<sub>4</sub> SWITCH**  
See Automatic Transmission, section 14



## Description

### **S<sub>3</sub>/S<sub>4</sub> indicator:**

The **S<sub>3</sub>** indicator light will remain on for about two seconds after the ignition switch has been turned on to show that the system circuit is functioning.

The A/T gear position indicator is dimmed by the dimming circuit with the combination light switch on, and is also controlled by the dash lights brightness controller.

In the **S<sub>3</sub>** mode, the transmission control module (TCM) applies voltage to the "D10" terminal of the A/T gear position indicator to light up the **S<sub>3</sub>** indicator.

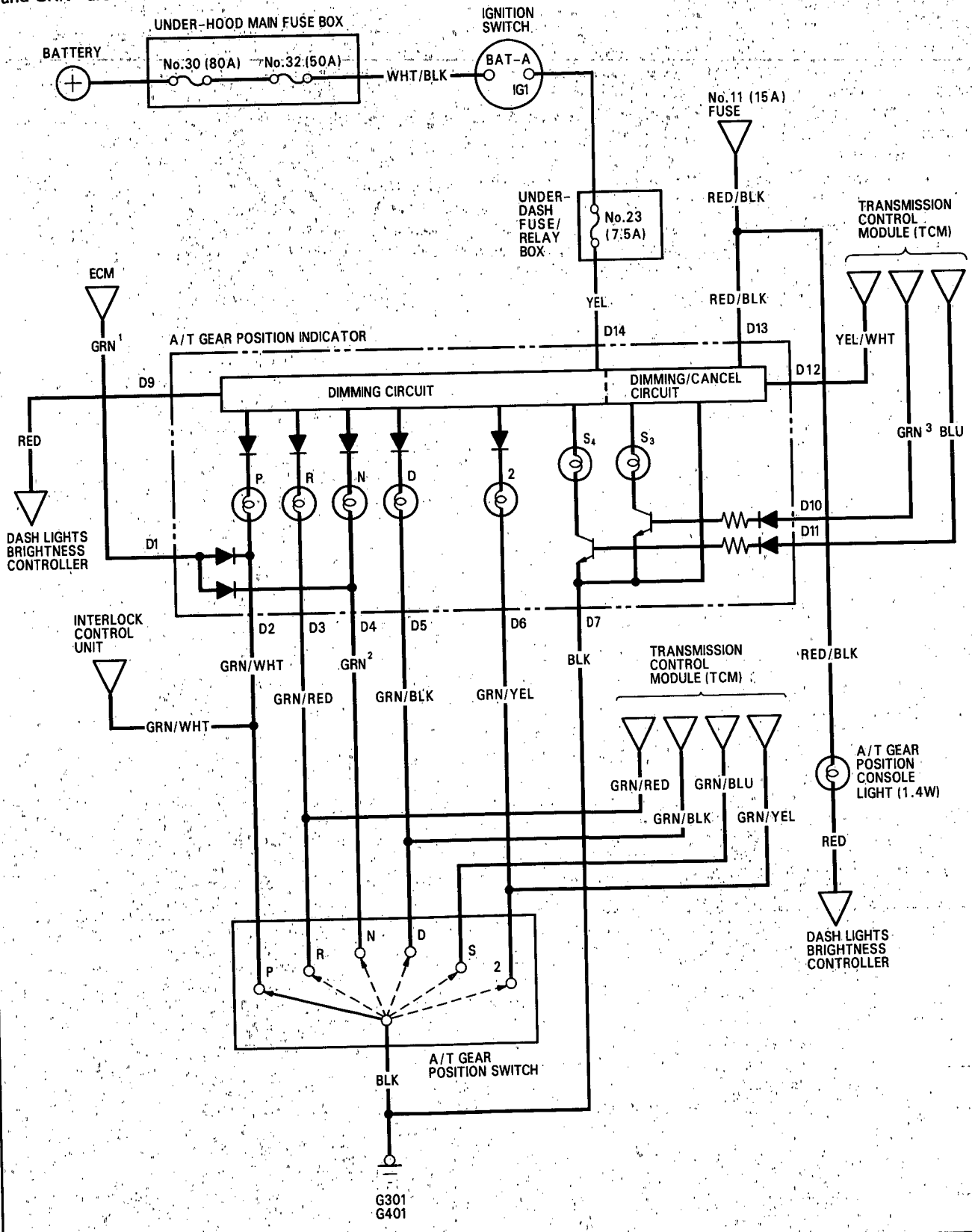
In the **S<sub>4</sub>** mode, which can be selected by the **S<sub>4</sub>** switch, the TCM applies voltage to the "D11" terminal of the A/T gear position indicator to light up the **S<sub>4</sub>** indicator.

The **S<sub>3</sub>** indicator also functions as the warning indicator for the A/T control system. If some malfunction occurs in the A/T control system, the TCM applies voltage to the "D10" terminal of the A/T gear position indicator to make the **S<sub>3</sub>** indicator flash. The flashing **S<sub>3</sub>** indicator informs the driver of some malfunction in the A/T control system. When the **S<sub>3</sub>** indicator functions as the warning indicator, the TCM sends a canceling signal to the "D12" terminal of the A/T gear position indicator so that the **S<sub>3</sub>** indicator light is not dimmed.

# A/T Gear Position Indicator

## Circuit Diagram

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN<sup>1</sup> and GRN<sup>2</sup> are not the same).





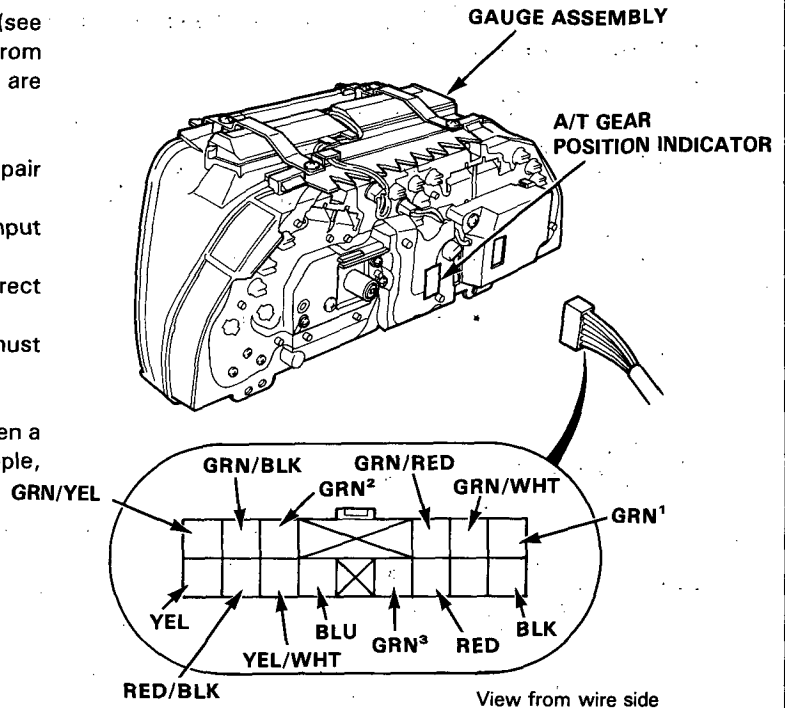


## Indicator Input Test

Remove the gauge assembly from the dashboard (see page 23-115), and disconnect the 14-P connector from it. Inspect the connector terminals to be sure they are all making good contact.

- If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, make the following input tests at the connector.
  - If any test indicates a problem, find and correct the cause, then recheck the system.
  - If all the input tests prove OK, the indicator must be faulty; replace the gauge assembly.

NOTE: Wires with the same color have been given a number suffix to distinguish them (for example, GRN<sup>1</sup> and GRN<sup>2</sup> are not same).



No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G301, G401).</li> <li>• An open in the wire.</li> </ul>
2	YEL	Ignition switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No.23 (7.5A) fuse. (in the under-dash fuse box)</li> <li>• An open in the wire.</li> </ul>
3	GRN/WHT	Shift lever in position <b>P</b> . NOTE: Don't push the brake pedal.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Faulty A/T gear position switch.</li> <li>• Poor ground (G301, G401).</li> <li>• An open in the wire.</li> </ul>
	GRN/RED	Shift lever in position <b>R</b> .		
	GRN <sup>2</sup>	Shift lever in position <b>N</b> .		
	GRN/BLK	Shift lever in position <b>D</b> .		
	GRN/YEL	Shift lever in position <b>2</b> .		
4	RED/BLK and RED	Combination Light switch ON and dash lights brightness control dial on full bright.	Check for voltage between RED/BLK and RED terminals: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Faulty dash lights brightness control system.</li> <li>• An open in the wire.</li> </ul>
5	GRN <sup>1</sup>	Ignition switch ON.	Check for voltage to ground: There should be about 10 V.	<ul style="list-style-type: none"> <li>• Faulty ECM.</li> <li>• An open in the wire.</li> </ul>
6	BLU or GRN <sup>3</sup>	Ignition switch ON and shift lever in position <b>S</b> .	Check for voltage to ground: There should be battery voltage or no voltage alternately between the BLU or GRN <sup>3</sup> terminal and ground when the S <sub>4</sub> switch is pressed repeatedly.	<ul style="list-style-type: none"> <li>• Faulty transmission control module (TCM).</li> <li>• Faulty S<sub>4</sub> switch.</li> <li>• An open in the wire.</li> </ul>
7	YEL/WHT	Ignition switch ON.	Check for voltage between the YEL ⊕ and YEL/WHT ⊖ terminals: There should be less than 1 V for two seconds after the ignition has been switched ON, and more than 10 V after these two seconds.	<ul style="list-style-type: none"> <li>• Faulty TCM.</li> <li>• An open in the wire.</li> </ul>

# A/T Gear Position Indicator

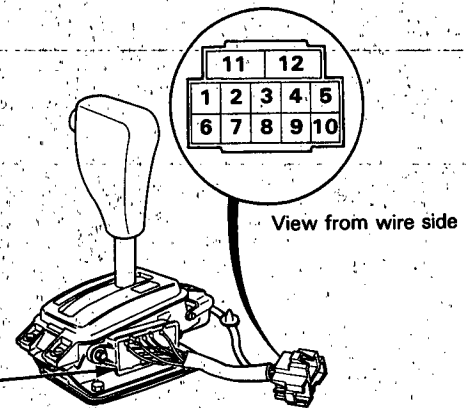
## A/T Gear Position Switch Test

1. Remove the console, then disconnect the 10-P and 2-P connectors from the switch.
2. Check for continuity between the terminals in each position according to the table.

**NOTE:**

- Move the lever back and forth without touching the push button at each switch position, and check for continuity within the range of free play of the shift lever.
- If there is no continuity, adjust the installation position of the switch.

A/T GEAR POSITION SWITCH



A/T Gear Position Switch

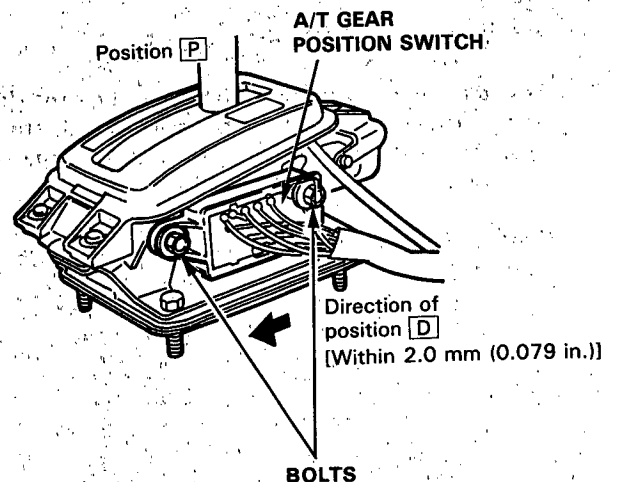
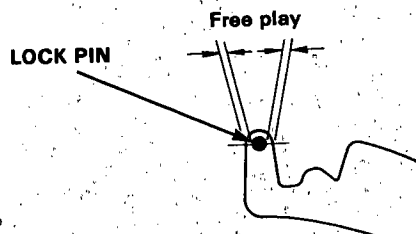
Terminal	1	7	8	9	10	5	4	6	2	3	11	12
Position												
2	○	○	○									
S	○	○		○								
D	○	○			○							
N		○				○					○	○
R		○					○		○	○		
P		○						○			○	○

**Adjustment:**

1. Shift to position **P**, and loosen the bolts.
2. Slide the switch in the direction of position **D** [within 2.0 mm (0.079 in.)] so that there is continuity between No. 6 and No. 7 terminals in the range of free play of the shift lever.
3. Recheck for continuity between each of the terminals.

**NOTE:**

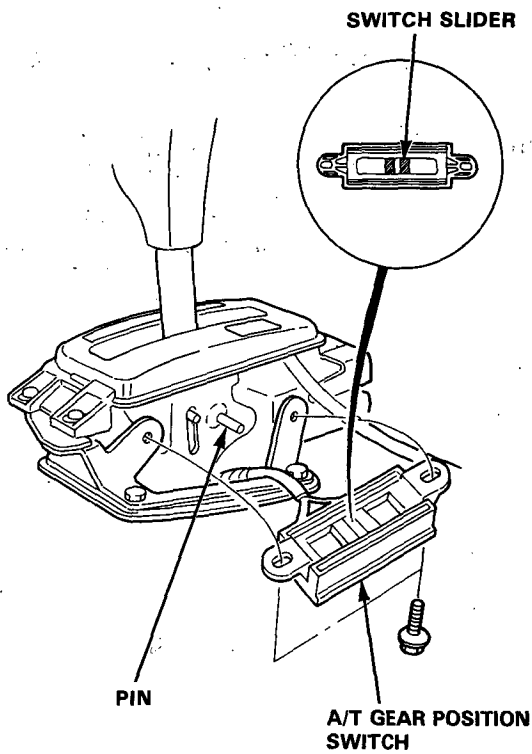
- If adjustment is not possible, check for damage to the shift lever detent and/or the bracket. If there is no damage, replace the switch.
- The engine should start when the shift lever is in position **P** in the range of free play.





## A/T Gear Position Switch Replacement

1. Remove the console, then disconnect the 10-P and 2-P connectors from the switch.
2. Remove the two switch mounting bolts.



3. Position the switch slider to "Neutral" as shown above.
4. Shift the lever to "Neutral", then slip the switch into position.
5. Attach the switch with the two bolts.
6. Test the switch with the shift lever in position **P** and **N** (see page 23-130). The engine should start when the shift lever is in position **N** in the range of free play.
7. Connect the 10-P and 2-P connectors, clamp the harness, and install the console.

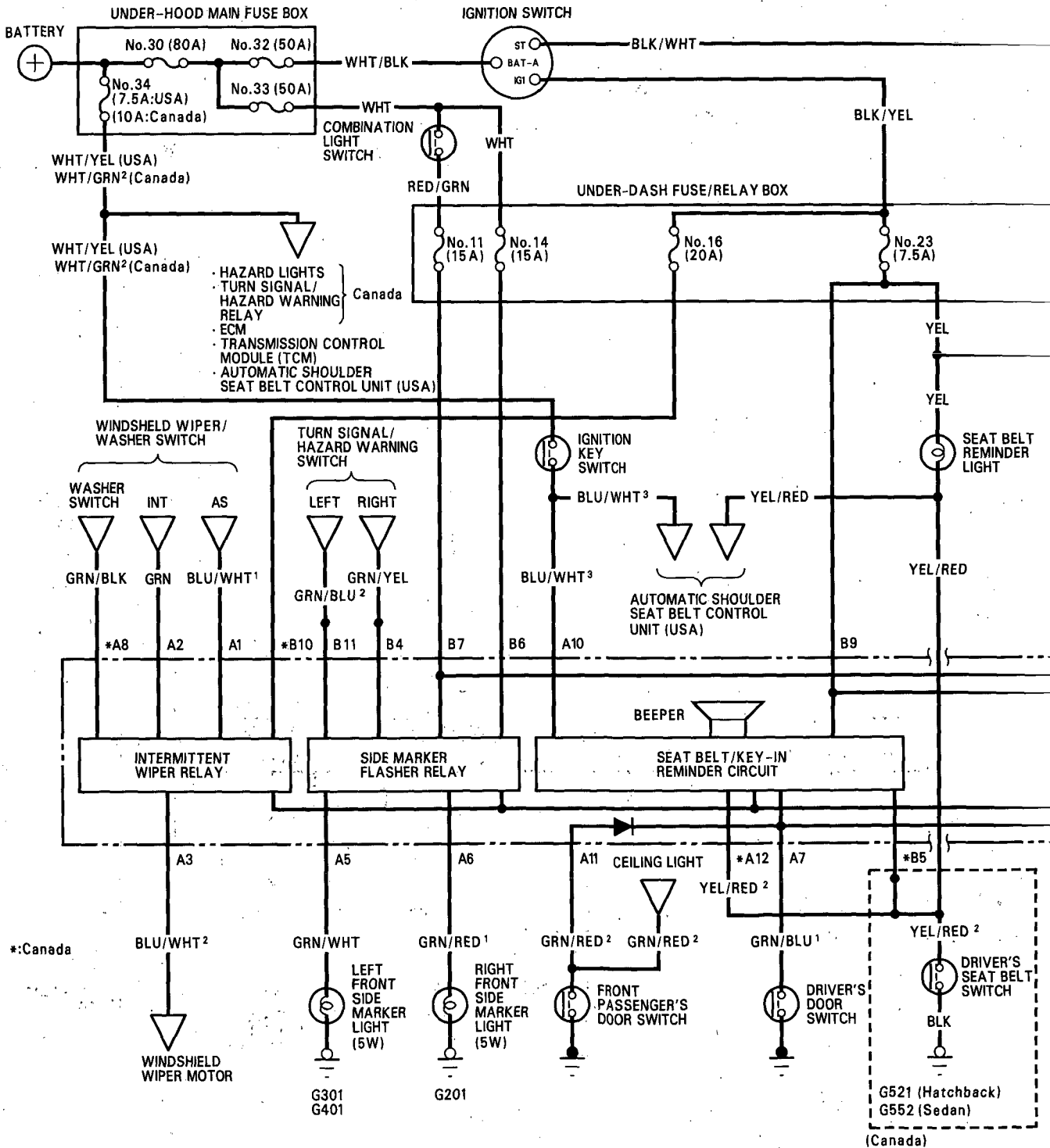
# Integrated Control Unit

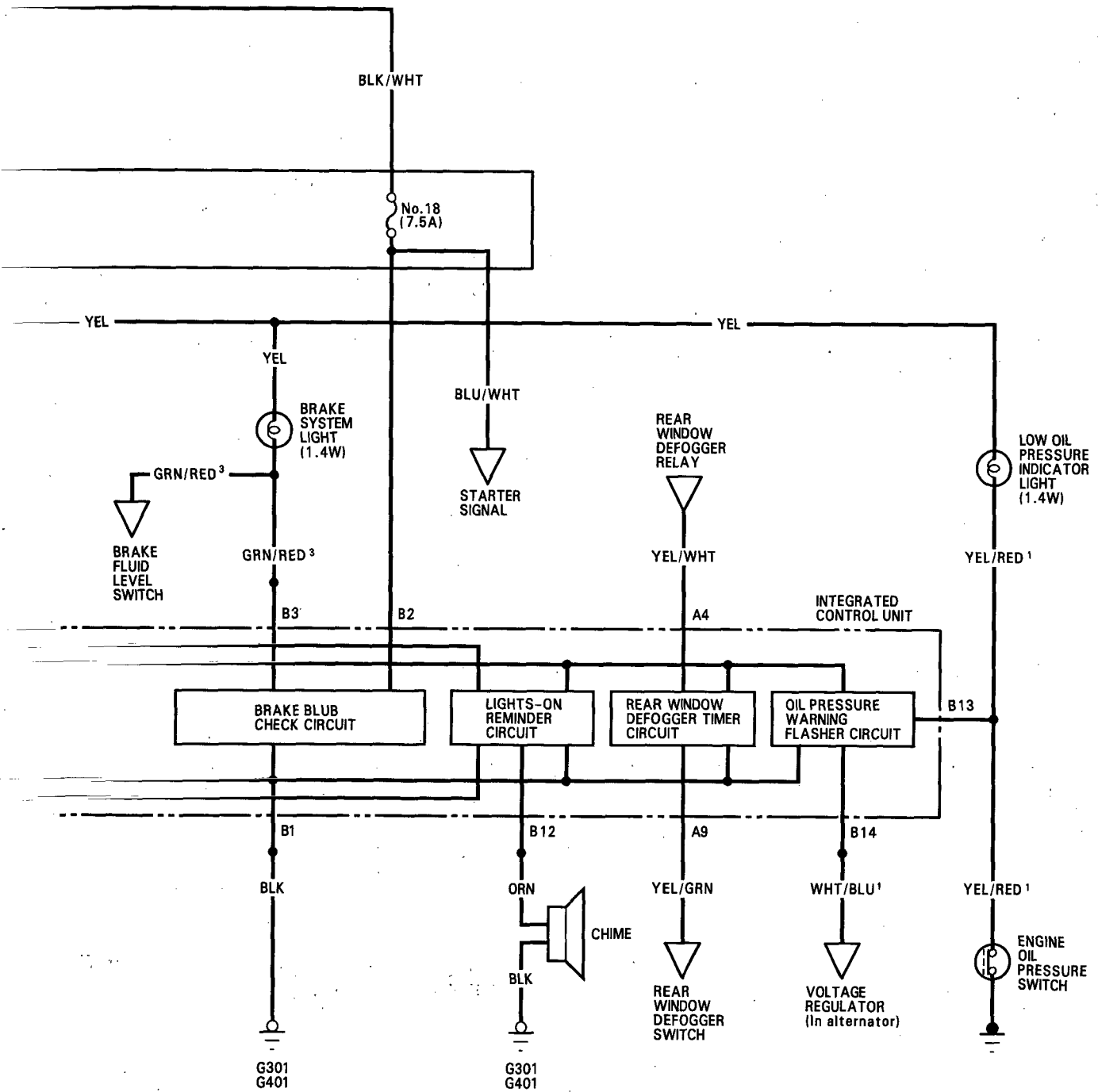
## Circuit Diagram

### Description

An integrated control unit, located on the left kick panel, integrates the functions of the brake bulb check (brake system light), seat belt and key-in reminder, side marker light flasher, intermittent wiper relay, lights-on reminder, rear window defogger timer, and oil pressure warning flasher circuits onto one circuit board, sharing common circuit functions.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/RED<sup>1</sup> and GRN/RED<sup>2</sup> are not the same).





# Integrated Control Unit

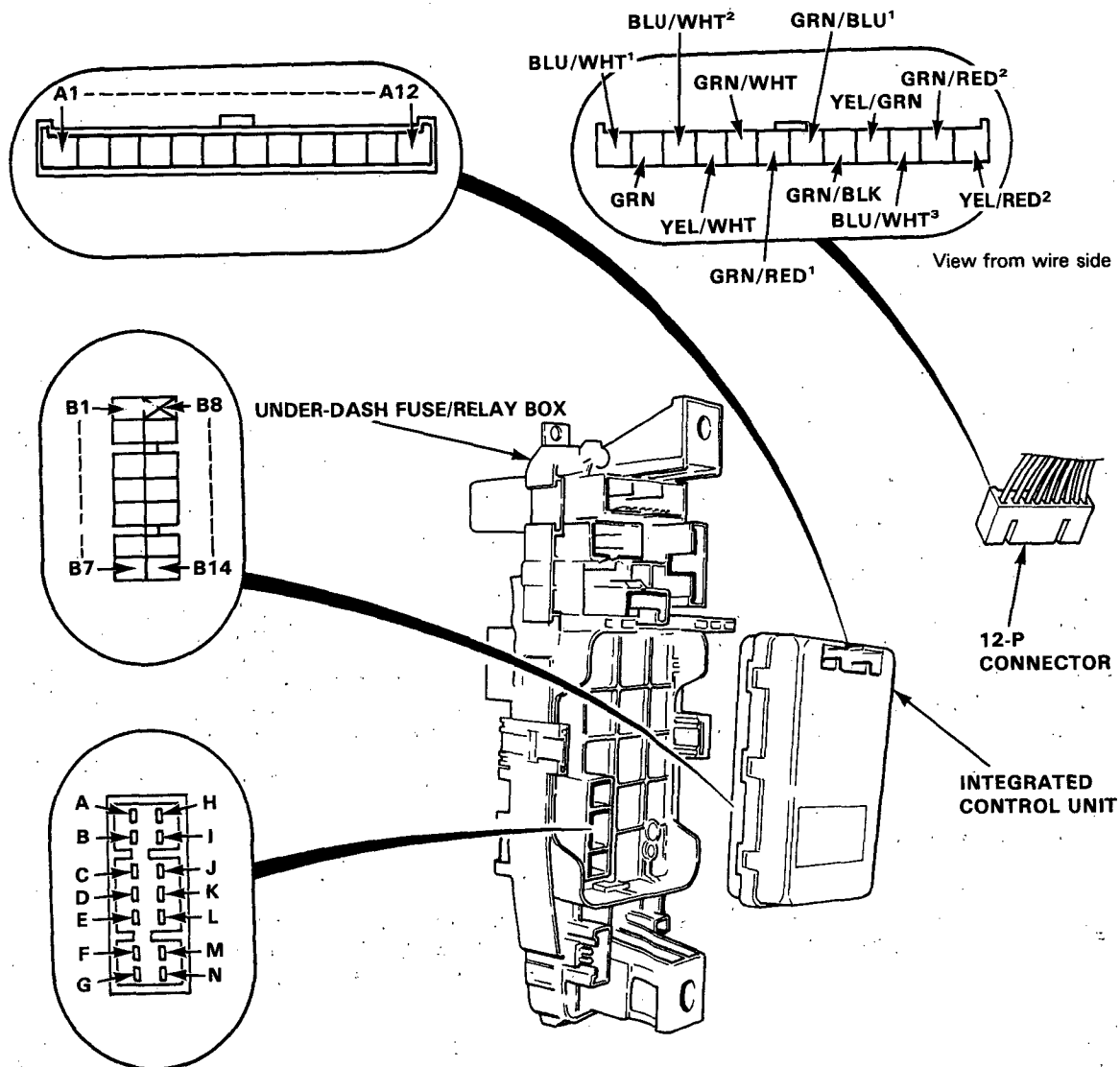
## Input Test

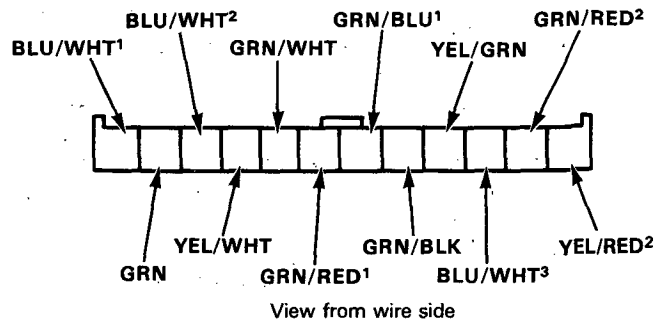
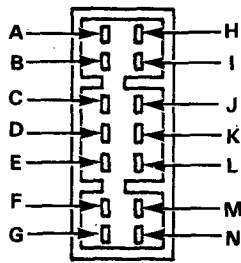
Remove the left kick panel, then disconnect the 12-P connector from the integrated control unit. Next, remove the integrated control unit from the under-dash fuse/relay box. Inspect the connector and socket terminals to be sure they are all making good contact.

- If any terminals are bent, loose or corroded, repair as necessary, and recheck the system.
- If the terminals look OK, make the following input tests at the connector and socket.
  - If any test indicates a problem, find and correct the cause, then recheck the system.
  - If all the input tests prove OK, the control unit must be faulty; replace it.

### NOTE:

- Different wires the same color have been given a number suffix to distinguish them (for example, BLU/WHT<sup>1</sup> and BLU/WHT<sup>2</sup> are not the same).
- Do not disconnect any connectors from the under-dash fuse/relay box except the one on the integrated control unit.





**Intermittent Wiper Relay Circuit:**

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	H	Under all conditions.	Check for continuity to ground: There should be continuity.	• Poor ground (G301, G401).
2	BLU/WHT <sup>1</sup> and BLU/WHT <sup>2</sup>	Windshield wiper switch at OFF or INT and wiper blades in park position.	Check for continuity between the BLU/WHT <sup>1</sup> and BLU/WHT <sup>2</sup> terminals: There should be continuity.	• Faulty windshield wiper switch. • Faulty windshield wiper motor. • An open in the wire.
3	GRN	Ignition switch ON and windshield wiper switch at INT.	Check for voltage to ground: There should be battery voltage.	• Blown No. 16 (20A) fuse. (in the under-dash fuse/relay box) • Faulty windshield switch. • An open in the wire.
*4	GRN/BLK	Ignition switch ON and washer switch ON.	Check for voltage to ground: There should be battery voltage.	• Blown No. 16 (20A) fuse. • Faulty washer switch. • An open in the wire.
*5	C	Ignition switch ON.	Check for voltage to ground: There should be battery voltage.	• Blown No. 16 (20A) fuse. • An open in the wire.

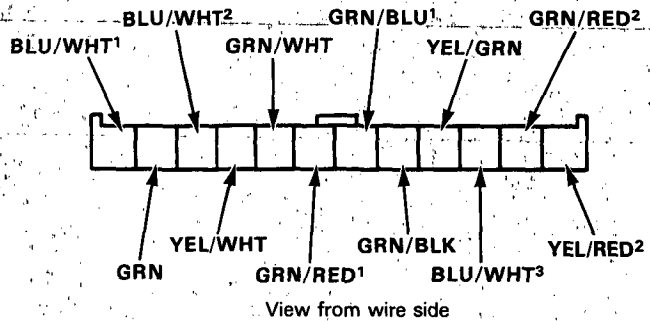
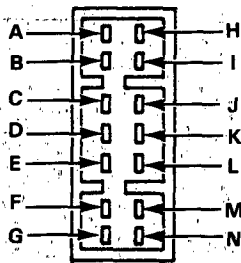
**Side Marker Light Flasher System:**

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	H	Under all conditions.	Check for continuity to ground: There should be continuity.	• Poor ground (G301, G401). • An open in the wire.
2	M	Under all conditions.	Check for voltage to ground: There should be battery voltage.	• Blown No. 14 (15A) fuse. (in the under-dash fuse/relay box) • An open in the wire.
3	N	Headlight switch ON.	Check for voltage to ground: There should be battery voltage:	• Blown No. 11 (15A) fuse. (in the under-dash fuse/relay box) • Faulty combination light switch. • An open in the wire.
4	D	Ignition switch ON and turn signal switch in left position.	Check for voltage to ground: It should be 0-12-0-12 repeatedly.	• Blown No. 1 (10 A) fuse (in the under-dash fuse/relay box) • Faulty turn signal system. • An open in the wire.
5	K	Ignition switch ON and turn signal switch in right position.		
6	GRN/WHT	Connect the M terminal to the GRN/WHT (or GRN/RED <sup>1</sup> ) terminal.	Check marker light operation: The left (or right) front side marker light should come on as the battery is connected.	• Blown bulb. • Poor ground (G201), (G301, G401) • An open in the wire.
7	GRN/RED <sup>1</sup>			

\*: Canada (With combined operation wiper/washer)

# Integrated Control Unit

## Input Test (cont'd)



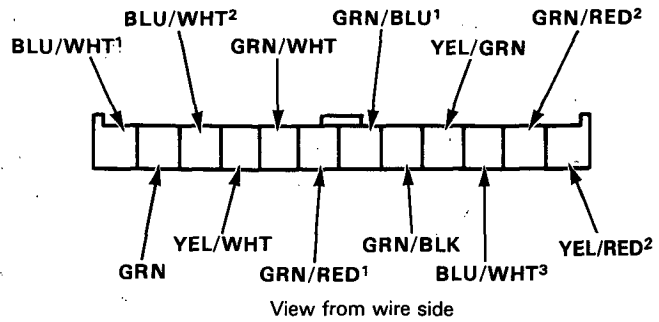
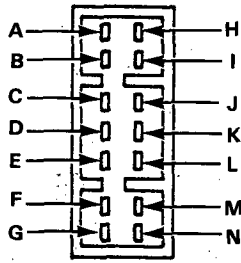
### Seat Belt Reminder (Canada) and Key-in Remainder:

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	H	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>Poor ground (G301, G401).</li> <li>An open in the wire.</li> </ul>
2	B	Ignition switch to ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>Blown No. 23 (7.5 A) fuse. (in the under-dash fuse/relay box)</li> <li>An open in the wire.</li> </ul>
3	GRN/BLU <sup>1</sup> or GRN/RED <sup>2</sup>	Right or left door open.	Check for continuity to ground: There should be continuity. NOTE: Before testing, remove No. 14 (15 A) fuse (on GS and GSR models: get the anti-theft radio code first).	<ul style="list-style-type: none"> <li>Faulty right or left door switch.</li> <li>An open in the wire.</li> </ul>
4	BLU/WHT <sup>3</sup>	Ignition switch turned from "II" to "O" position.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>Faulty ignition key switch.</li> <li>An open in the wire.</li> </ul>
*5	YEL/RED <sup>2</sup>	Driver's seat belt is not buckled.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>Faulty seat belt switch.</li> <li>Poor ground (Hatchback: G521, Sedan G552).</li> <li>An open in the wire.</li> </ul>
*6	L			

### Brake Bulb Check System:

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	H	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>Poor ground (G301, G401).</li> <li>An open in the wire.</li> </ul>
2	I	Ignition switch to "III" position.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>Blown No. 18 (7.5 A) fuse. (in the under-dash fuse/relay box)</li> <li>An open in the wire.</li> </ul>
3	J	Ignition switch to ON, brake fluid reservoir full, and parking brake lever down.	Connect to ground: Brake system light should come on.	<ul style="list-style-type: none"> <li>Blown No. 23 (7.5 A) fuse.</li> <li>Blown brake system light.</li> <li>An open in the wire.</li> </ul>





**Lights-on Reminder**

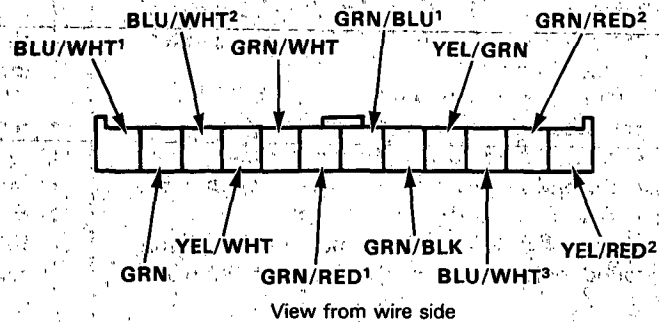
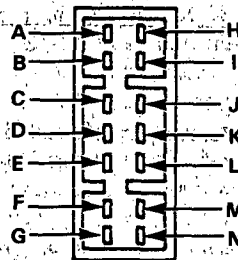
No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	H	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G301, G401).</li> </ul>
2	N	Headlight switch to On.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 11 (15 A) fuse. (in the under-dash fuse/relay box)</li> <li>• Faulty combination light switch.</li> <li>• An open in the wire.</li> </ul>
3	B	Ignition switch to ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 23 (7.5 A) fuse. (in the under-dash fuse/relay box)</li> <li>• An open in the wire.</li> </ul>
4	GRN/BLU <sup>1</sup> or GRN/RED <sup>2</sup>	Right or left door open.	Check for continuity to ground: There should be continuity. NOTE: Before testing, remove No. 14 (15 A) fuse (on GS and GSR models: get the anti theft radio code first).	<ul style="list-style-type: none"> <li>• Faulty right or left door switch.</li> <li>• An open in the wire.</li> </ul>
5	E	Ignition switch to ON and the B terminal connected to the E terminal.	Check chime operation: The chime should activate each time the battery is connected.	<ul style="list-style-type: none"> <li>• Faulty chime.</li> <li>• An open in the wire.</li> </ul>

**Rear Window Defogger Timer Circuit:**

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	H	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G301, G401).</li> </ul>
2	YEL/GRN	Defogger switch pushed.	Check for continuity to ground: There should be continuity as the switch is pushed.	<ul style="list-style-type: none"> <li>• Faulty defogger switch.</li> <li>• Poor ground (G301, G401).</li> <li>• An open in the wire.</li> </ul>
3	YEL/GRN	Ignition switch to ON.	Connect to ground: The rear window defogger should work and the defogger switch indicator light should come on.	<ul style="list-style-type: none"> <li>• Blown No. 17 (7.5 A) fuse. (in the under-dash fuse/relay box)</li> <li>• Faulty defogger relay.</li> <li>• Blown bulb.</li> <li>• An open in the wire.</li> </ul>
4	B	Ignition switch to ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 23 (7.5 A) fuse.</li> <li>• An open in the wire.</li> </ul>

# Integrated Control Unit

## Input Test (cont'd)



### Oil Pressure Indicator Flasher System:

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	H	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G301, G401).</li> </ul>
2	B	Ignition switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No.23 (7.5A) fuse. (in the under-dash fuse/relay box)</li> <li>• An open in the wire.</li> </ul>
3	G	Engine running.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Faulty charging system.</li> <li>• An open in the wire.</li> </ul>
4	F	Ignition switch OFF.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Faulty engine oil pressure switch.</li> <li>• An open in the wire.</li> </ul>
		Ignition switch ON.	Check light operation. If the light does not come on, connect the YEL/RED terminal to ground: Light should come on as the ignition switch is turned ON.	<ul style="list-style-type: none"> <li>• Blown bulb.</li> <li>• An open in the wire.</li> </ul>
		Start the engine.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Insufficient oil.</li> <li>• Improper lubrication.</li> <li>• Faulty engine oil pressure switch.</li> </ul>

# Key-in Reminder

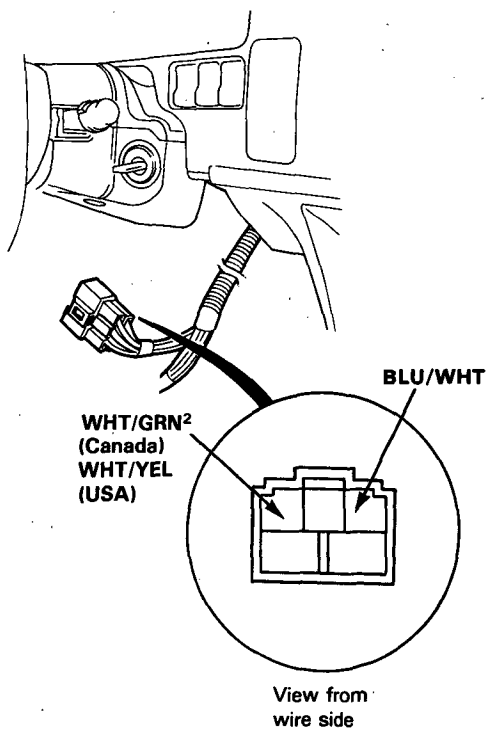
## Ignition Key Switch Test

NOTE: Refer to page 23-132 for the circuit diagram of the key-in reminder, and page 23-136 for the input test of the reminder circuit.

When the ignition key is turned from "II" to "O" position but not removed, voltage is applied through the No. 34 (7.5 A: USA, 10 A: Canada) fuse in the under-hood main fuse box and the closed ignition key switch to the key-in reminder in the integrated control unit.

When you open the driver's door, the reminder circuit senses ground through the closed door switch. With voltage at the "A10" terminal and ground at the "A7" terminal, the beeper sounds.

1. Remove the dashboard lower cover and left knee bolster, then disconnect the 5-P connector from the main wire harness.
2. There should be continuity between the BLU/WHT and WHT/GRN terminals when the ignition switch is turned from "II" to "O" position. There should be no continuity when the ignition key is removed.



# Lights-on Reminder

## Chime Test

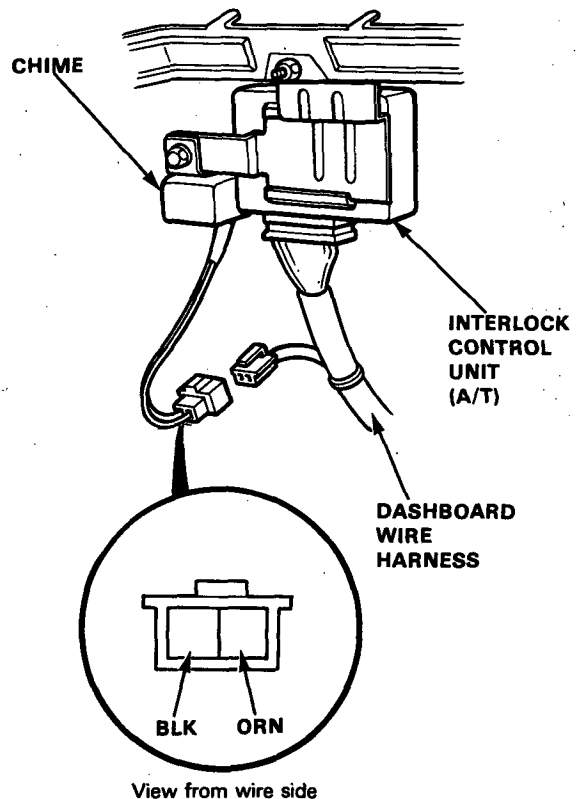


NOTE: Refer to page 23-133 for the circuit diagram of the lights-on reminder circuit, and page 23-137 for the input test of the reminder circuit.

When the ignition key is turned to the "O" position and removed, with the lights on, voltage is applied to the reminder circuit on the integrated control unit. When you open the driver's door, the warning circuit senses ground through the closed door switch.

With voltage at the "B7" terminal, ground at the "A7" terminal and no voltage at the "B9" terminal, the chime is activated to remind the driver to turn off the lights.

1. Remove the front console to disconnect the 2-P connector from the dashboard wire harness.
2. Test chime operation by connecting battery power to the ORN terminal, and ground to the BLK terminal, and cycling the power on-off repeatedly.
3. If the chime fails to sound every time power is cycled, replace it.



# Engine Oil Pressure Indicator System

## Description

**NOTE:** Refer to page 23-133 for the circuit diagram of the oil pressure indicator flasher, and page 23-138 for the input test of the flasher circuit.

The low oil pressure indicator light works in two ways. It will flash continuously following a momentary loss of oil pressure, or it will go on and stay on with a complete loss of oil pressure.

When the engine first starts, before oil pressure rises above 30 kPa (0.3 kg/cm<sup>2</sup>, 4.3 psi), current flows through the low oil pressure indicator light and the engine oil pressure switch to ground.

With the engine running, voltage is applied to the flasher circuit of the integrated control unit. With normal oil pressure, the engine oil pressure switch is open and the low oil pressure indicator light does not operate. If the oil pressure switch closes momentarily (more than 0.5 seconds), but then opens again, terminal "B13" will sense ground through the switch. The integrated control unit will then provide and remove ground for the low oil pressure indicator light through terminal "B13". The light will flash on and off until the ignition switch is turned to "Off".

If engine oil pressure falls below 30 kPa (0.3 kg/cm<sup>2</sup>, 4.3 psi) and does not increase, the engine oil pressure switch will stay closed. The low oil pressure indicator light will go on and stay on.

## Engine Oil Pressure Switch Test

1. Remove the YEL/RED wire from the engine oil pressure switch.
2. There should be continuity between the positive terminal and the engine (ground) with the engine stopped. There should be no continuity when the engine runs.

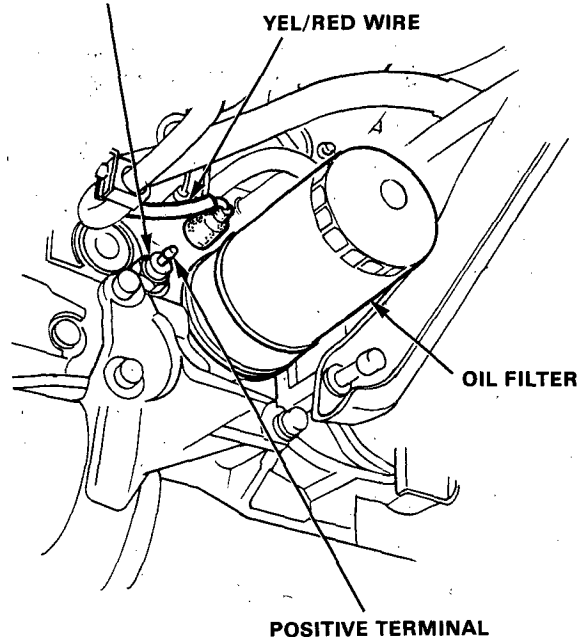
### ENGINE OIL PRESSURE SWITCH

18 N·m (1.8 kg·m, 13 lb·ft)

1/8 in. BSP (British Standard

Pipe Taper) 28 Threads/inch.

Use proper liquid sealant.



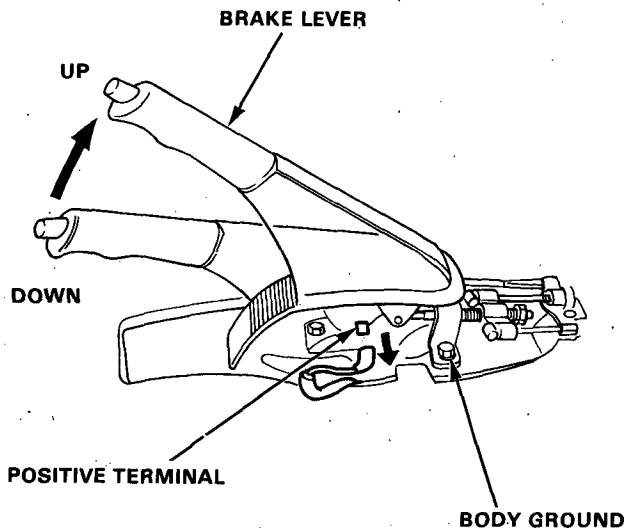
3. If the switch fails to operate, check the engine oil level. If the engine oil level is correct, check the engine oil pump pressure (see section 8).

# Brake Warning System



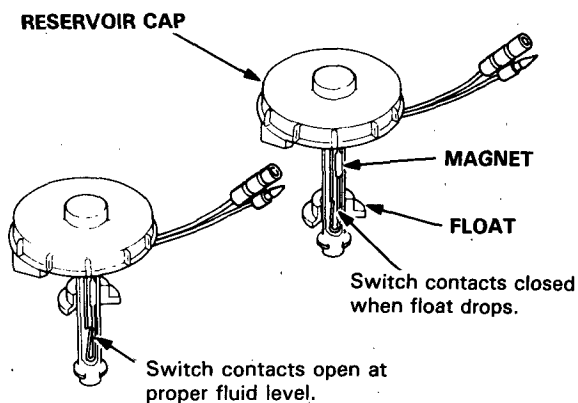
## Parking Brake Switch Test

1. Remove the center console and disconnect the connector from the switch.
2. There should be continuity between the positive terminal and body ground with the brake lever up. There should be no continuity with the brake lever down.



## Brake Fluid Level Switch Test

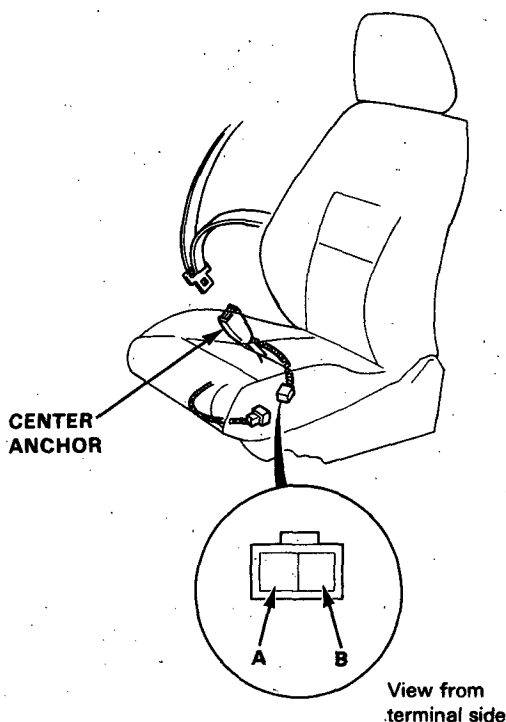
1. Remove the reservoir cap. Check that the float moves up and down freely. Replace the reservoir cap assembly if the float does not move freely.
2. Check for continuity between the terminals with the float up and down. There should be continuity with the float down and no continuity with the float up. Replace the reservoir cap assembly if necessary.



# Seat Belt Reminder

## Seat Belt Switch Test

1. Slide the drivers seat forward until the seat belt center anchor bolt is accessible, then disconnect the 2-P connector from the seat belt switch.
2. There should be continuity between the A and B terminals when the driver's seat belt is not buckled. There should be no continuity when the driver's seat belt is buckled.



# Low Fuel Indicator System

## Indicator Light Test

NOTE: Refer to page 23-112 for the diagram of the low fuel indicator circuit.

1. Park the car on level ground.

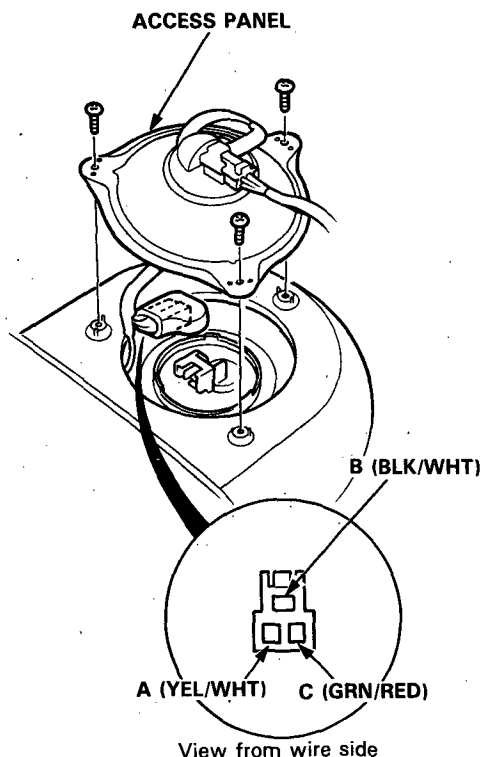
**⚠ WARNING** Do not smoke while working on the fuel system. Keep open flame away from the work area. Drain fuel only into an approved container.

2. Drain the fuel tank into an approved container. Then install the drain bolt with a new washer.
3. Add less than 11 ℓ (2.9 U.S. Gal, 2.4 Imp. Gal) of fuel and turn the ignition switch on. The low fuel indicator light should come on within four minutes.
4. Then add approx. 4ℓ (1.1 U.S. Gal, 0.9 Imp. Gal) of fuel.

- The light should go off within four minutes.

- If the light did not come on in step 3, remove the access panel and disconnect the 3-P connector from the fuel gauge sending unit. Connect the C (GRN/RED) terminal to the B (BLK/WHT) terminal with a jumper wire.

- If the light comes on, the problem is either the sending unit or its ground.
- If the light does not come on, the problem is an open in the GRN/RED wire to the gauge assembly, no power to the gauge, or a bad bulb.

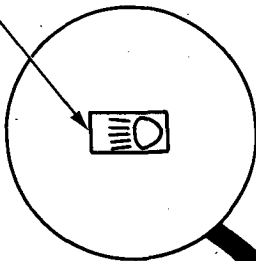


# Lighting System



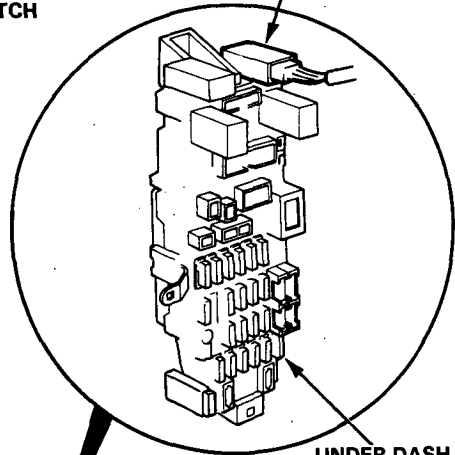
## Component Location Index

**HIGH BEAM INDICATOR LIGHT**  
(In the gauge assembly)  
Gauge Assembly, page 23-110



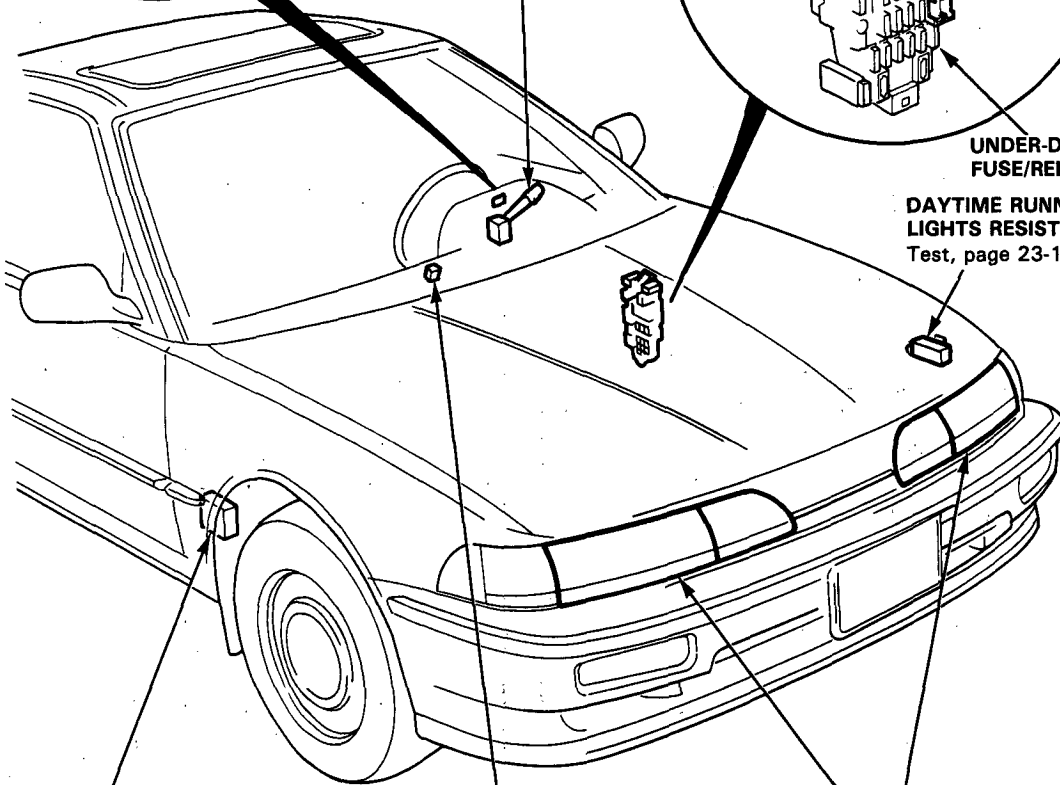
**COMBINATION LIGHT SWITCH**  
Test, page 23-147  
Replacement, page 23-148

**FRONT FOG LIGHT RELAY**  
Test, page 23-149



**UNDER-DASH FUSE/RELAY BOX**

**DAYTIME RUNNING LIGHTS RESISTOR (Canada)**  
Test, page 23-149



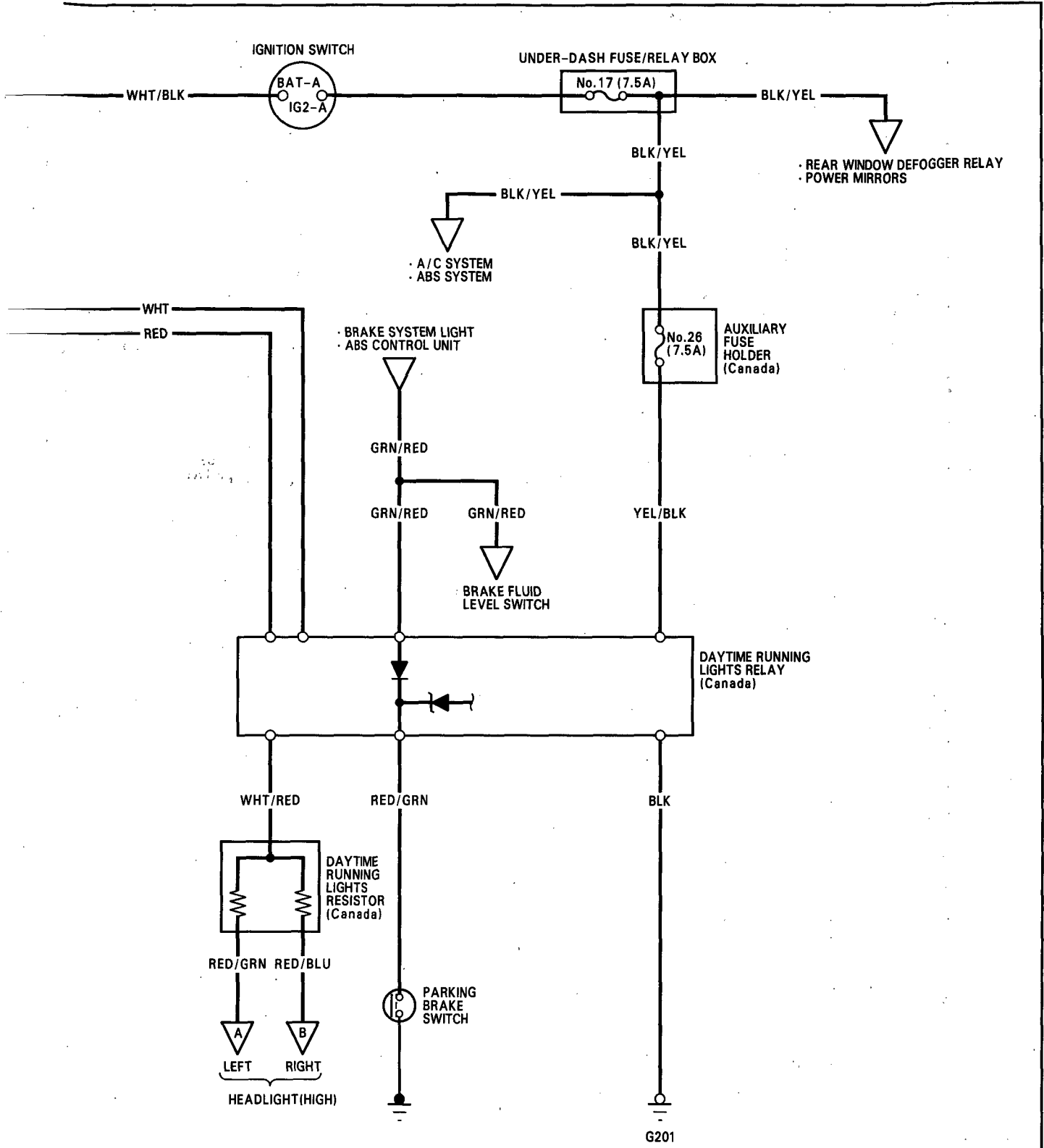
**DAYTIME RUNNING LIGHTS RELAY (Canada)**  
Test, page 23-146

**FRONT FOG LIGHT SWITCH**  
Replacement, page 23-115  
Test, page 23-148

**HEADLIGHTS/FRONT FOG LIGHTS**  
Adjustment, page 23-150  
Replacement, page 23-150, 151



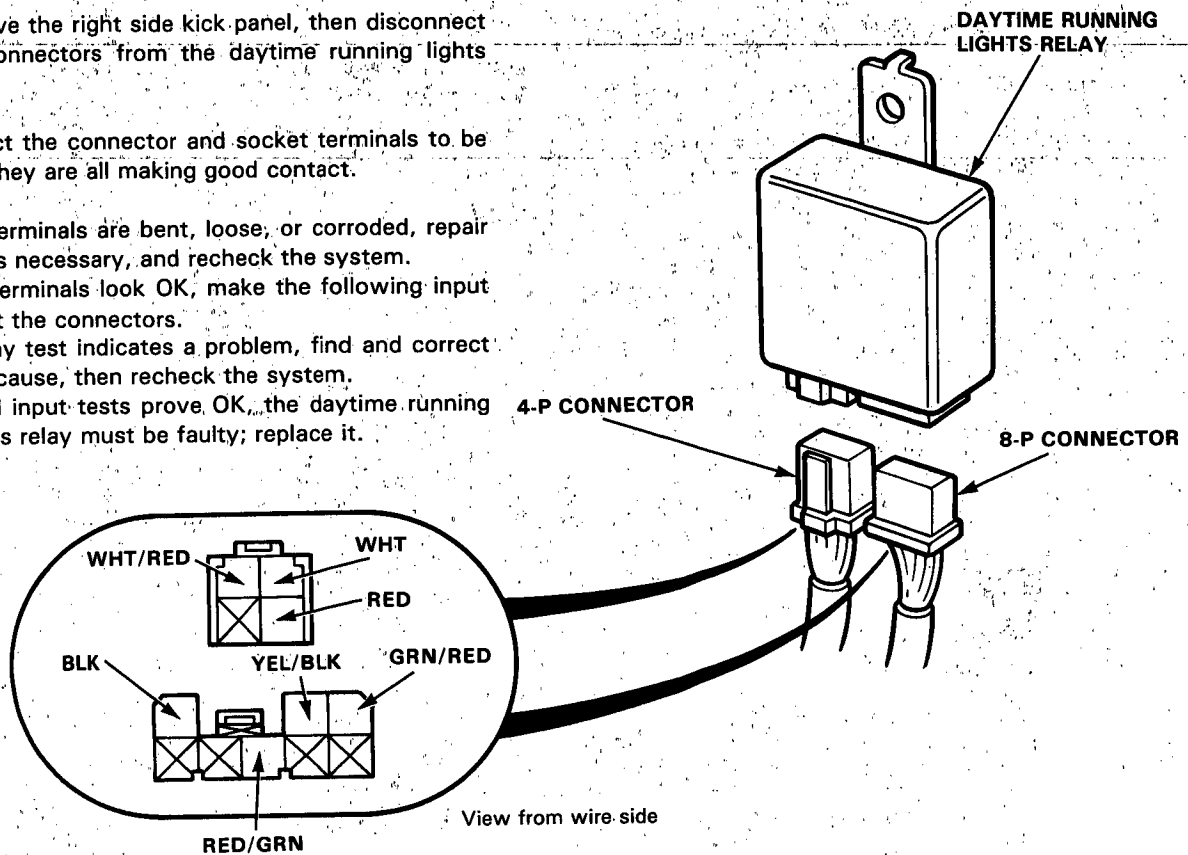




# Lighting System

## Daytime Running Lights Relay Input Test (Canada)

1. Remove the right side kick panel, then disconnect the connectors from the daytime running lights relay.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the connectors.
    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all input tests prove OK, the daytime running lights relay must be faulty; replace it.



No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G201)</li> <li>• An open in the wire.</li> </ul>
2	YEL/BLK	Ignition switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 26 (7.5A) fuse. (in the auxiliary fuse holder)</li> <li>• An open in the wire.</li> <li>• Faulty ignition switch.</li> </ul>
3	WHT	Under all conditions.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 33 (50A) fuse. (in the under-hood main fuse box)</li> <li>• An open in the wire.</li> </ul>
4	RED	Headlight switch in "●" and dimmer switch in HI position.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 33 (50A) fuse.</li> <li>• An open in the wire.</li> </ul>
5	WHT/RED	Connect a jumper wire between the YEL/BLK and the WHT/RED terminals, then turn the ignition switch ON.	Right headlight (High) and high beam indicator light should come on.	<ul style="list-style-type: none"> <li>• Blown No. 33 (50A) fuse.</li> <li>• An open in the wire.</li> <li>• Faulty combination light switch.</li> <li>• Faulty daytime running lights relay.</li> </ul>
6	GRN/RED	Ignition switch is ON, brake fluid reservoir is full, and parking brake lever down.	Connect to ground: The brake system light should come on.	<ul style="list-style-type: none"> <li>• Blown No. 23 (7.5A) fuse. (in the under-dash fuse/relay box)</li> <li>• An open in the wire.</li> <li>• Blown brake system light.</li> </ul>
7	RED/GRN	Parking lever up.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Faulty parking brake switch.</li> <li>• An open in the wire.</li> </ul>

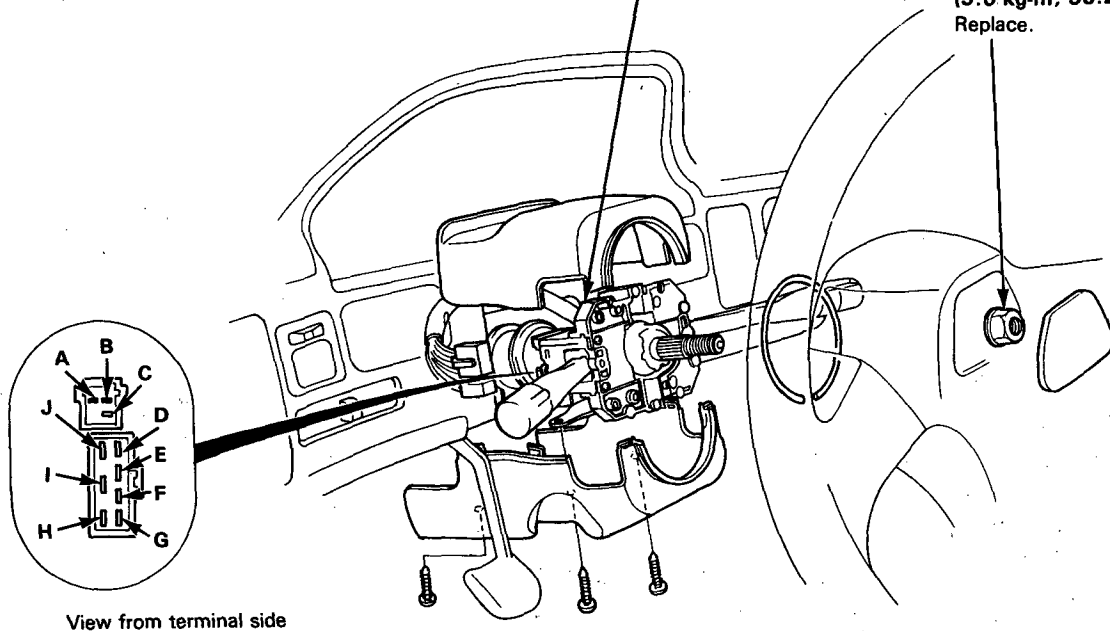


## Lighting / Turn Signal Switch Test

1. Remove the steering wheel and the steering column covers.
2. Disconnect the 7-P and 4-P connectors from the switch.
3. Check for continuity between the terminals in each switch position according to the tables.

LIGHTING/DIMMER/PASSING  
TURN SIGNAL SWITCH

SELF-LOCKING  
NUT 50 N·m  
(5.0 kg-m, 36.2 lb-ft)  
Replace.



View from terminal side

### Lighting/Dimmer/Passing Switch

		Terminal	D	E	F	G	I	J
Head-light switch	Position	OFF						
		•	○	○				
		LOW	○	○	○		○	
		HIGH	○	○		○	○	○
Passing switch	Position	OFF						
		ON					○	○

----- : (Canada)

### Turn Signal Switch

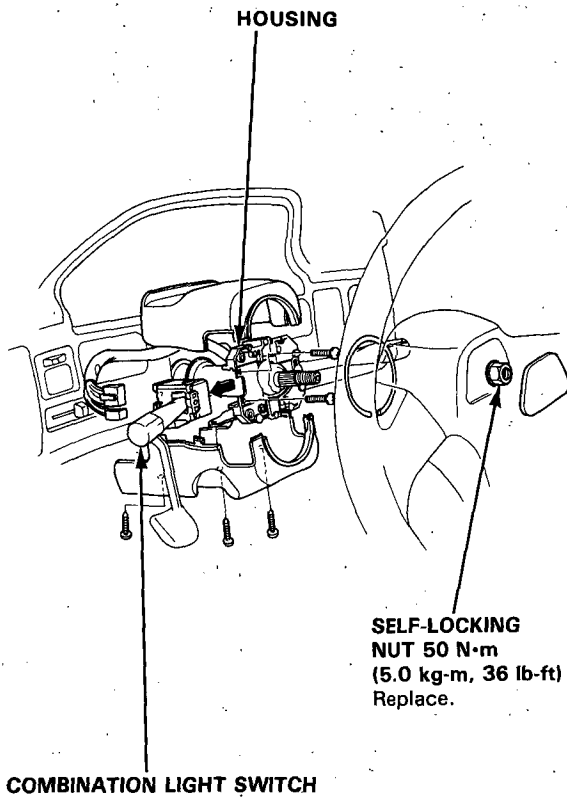
		Terminal	A	B	C
Position	RIGHT		○		○
	NEUTRAL				
	LEFT		○	○	

# Lighting System

## Combination Light Switch Replacement

1. Remove the steering wheel and the steering column covers.
2. Disconnect the 7-P and 4-P connectors.
3. Remove the two screws and slide the combination light switch out of the housing as shown.

NOTE: Be careful not to damage the steering wheel cover.

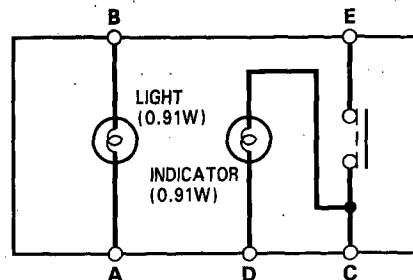
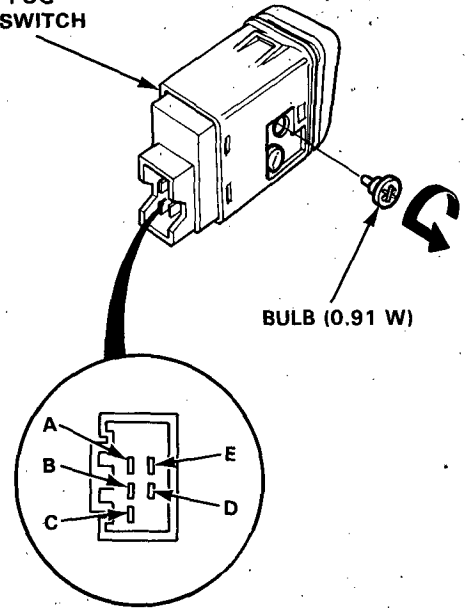


## Front Fog Light Switch Test

1. Remove the instrument panel (see page 23-116).
2. Remove the fog light switch.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A	B	C	D	E
OFF	○	○	○	○	○
ON	○	○	○	○	○

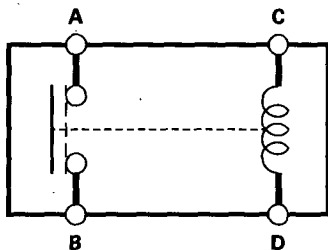
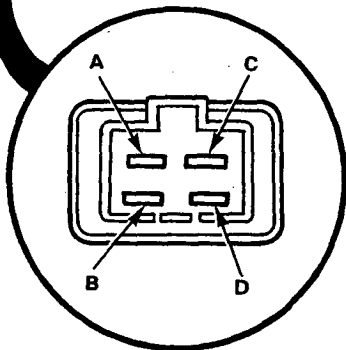
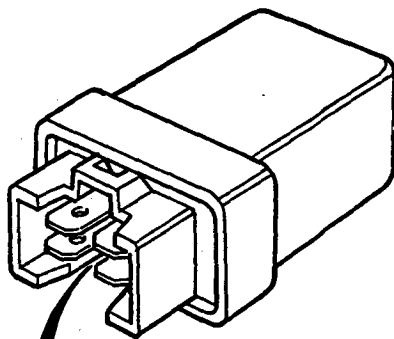
FRONT FOG LIGHT SWITCH





## Front Fog Light Relay Test

1. Remove the relay and disconnect it from the harness.
2. There should be continuity between the C and D terminals.
3. There should be continuity between the A and B terminals when battery power and ground are connected to the C and D terminals. There should be no continuity when power is disconnected.



## Daytime Running Lights Resistor Test (Canada)

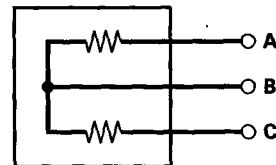
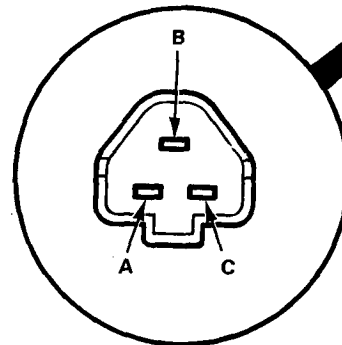
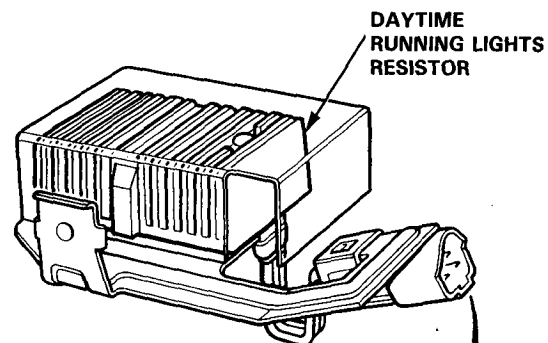
**CAUTION:** The daytime running lights resistor becomes very hot when the daytime running lights are on; do not touch it or the attaching hardware immediately after the lights have been turned off.

1. Disconnect the 3-P connector from the resistor.
2. Using an ohmmeter, measure the resistance between the terminals.

**Headlight Resistance:  $1.0 \pm 0.05 \Omega$**

**Between the B and C terminals = Left headlight**

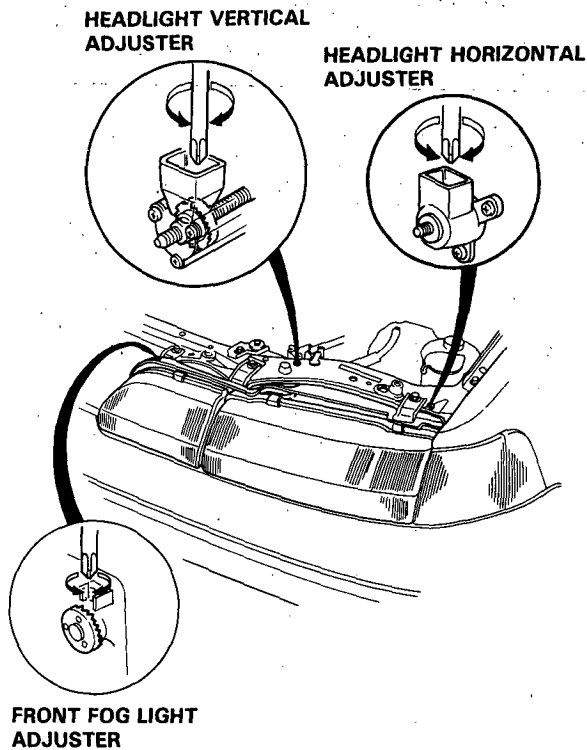
**Between the B and A terminals = Right headlight**



3. Replace the resistor if the resistance is not within specifications.

# Headlights/Front Fog Lights

## Adjustment

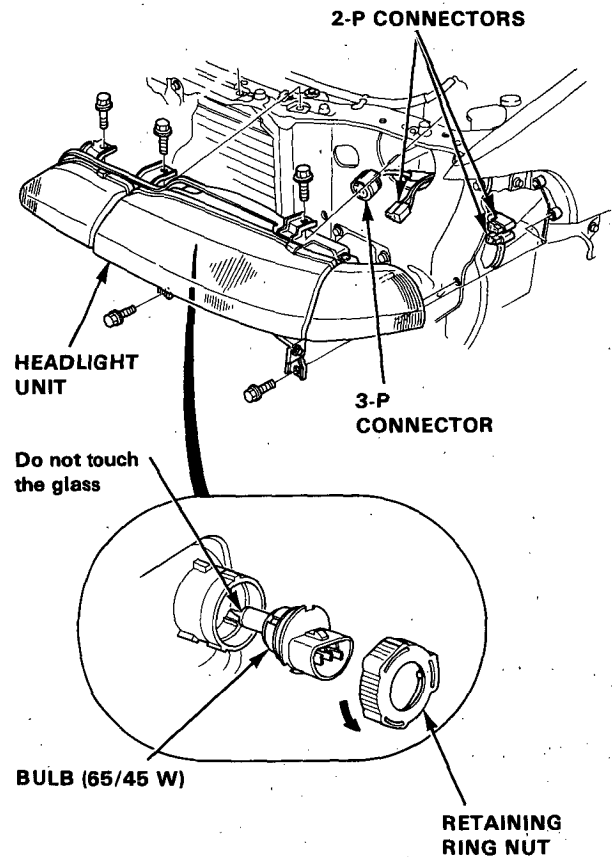


NOTE: Adjust the headlights and front fog lights to local requirements.

## Headlights Replacement

### CAUTION:

- Halogen headlights can become very-hot in-use; do not touch them or the attaching hardware immediately after they have been turned off.
  - Do not try to replace or clean the headlights with the lights on.
1. Disconnect the 3-P connector and 2-P connectors from each bulb. Before disconnecting the right side connectors, remove the air cleaner case.
  2. Turn the retaining ring nut to the OPEN position, then remove the bulb.
  3. Remove the front bumper, air intake tube, and five mounting bolts, then remove the unit.



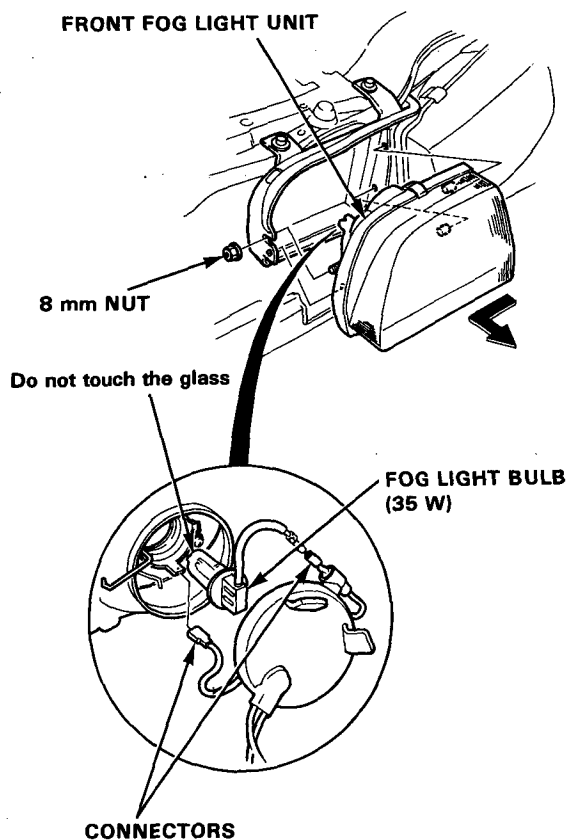
4. After installing the unit, adjust the headlights to local requirements.

## Front Fog Lights Replacement

### CAUTION:

- Halogen bulbs can become very hot in use; do not touch them or the attaching hardware immediately after they have been turned off.
- Do not try to replace or clean the headlights with the lights on.

1. Remove the 8 mm nut and pull out the front fog light unit from the headlight unit.
2. Disconnect the connectors and remove the bulb.



3. After installing the unit, adjust the front fog lights to local requirements.

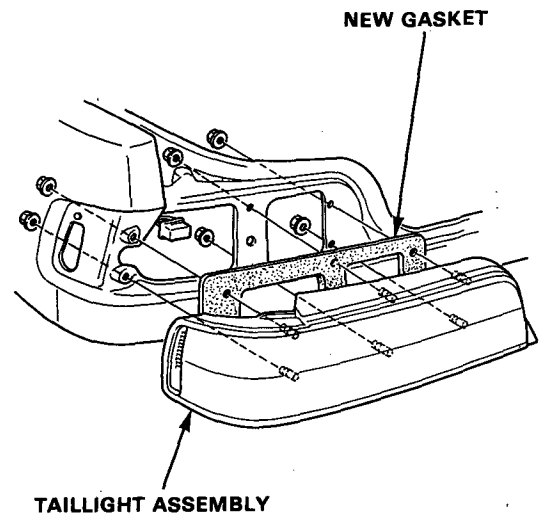
**NOTE:** If the bumper seal interferes with the front fog light when installing the light, push the bumper downward to maintain the bumper seal.

## Taillight Assembly



## Replacement

1. Open the trunk lid or hatch and tailgate, then remove the access panel.
2. Disconnect the 6-P connector from behind the taillight.
3. Remove the six mounting nuts and the taillight assembly.

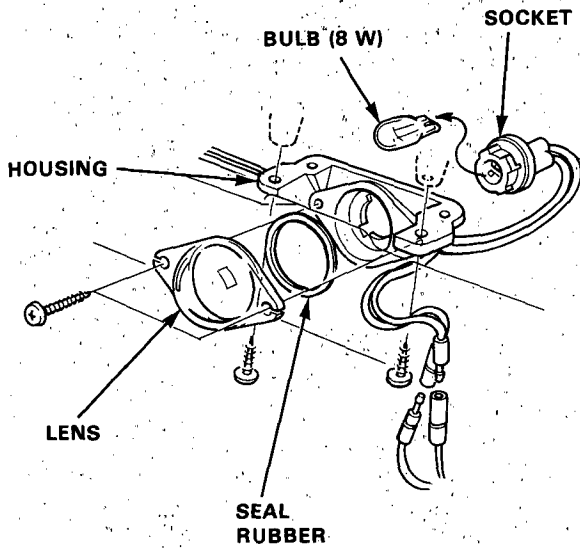


4. Inspect the gasket; replace it if it is distorted or overly compressed.
5. After installing, make sure that there is no water leakage in the taillight assembly.

## License Plate Lights

### Replacement

1. Remove the two screws and disconnect the connectors, then separate the lens from the housing by removing its two mounting screws.

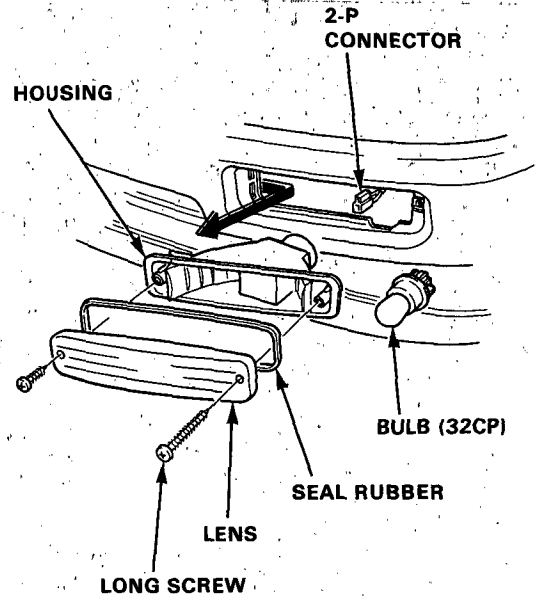


2. Turn the bulb socket 45° counterclockwise to remove it from the housing.

## Front Turn Signal Lights

### Replacement

1. Remove the two screws and the front turn signal lights, then disconnect the 2-P connector.



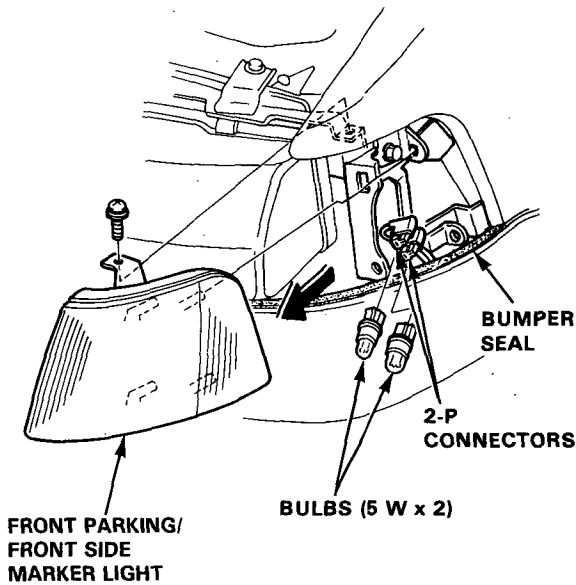
2. Turn the bulb socket 45° counterclockwise to remove it from the housing.



# Front Parking/ Front Side Marker Light

## Replacement

1. Remove the screw and pull out the front side marker light from the bracket, then disconnect the 2-P connectors.



2. Turn the bulb socket 45° counterclockwise to remove it from the front side marker light.

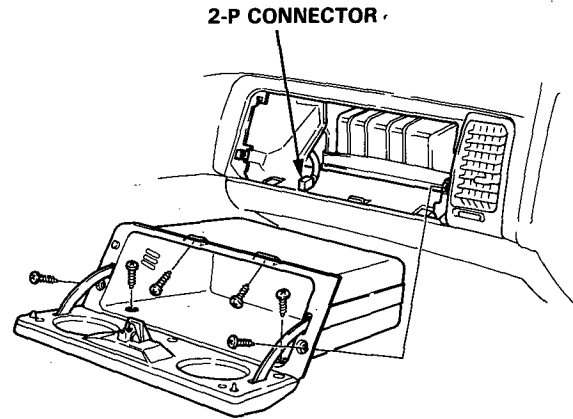
**NOTE:** If the bumper seal interferes with the front side marker light when installing the light, push the bumper downward to maintain the bumper seal.

# Glove Box Light

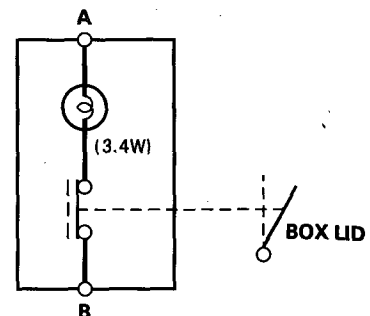
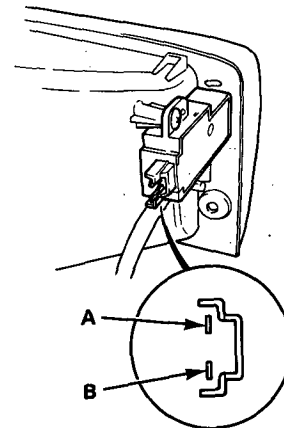


## Test

1. Remove the six screws and pull out the glove box, then disconnect the 2-P connector.



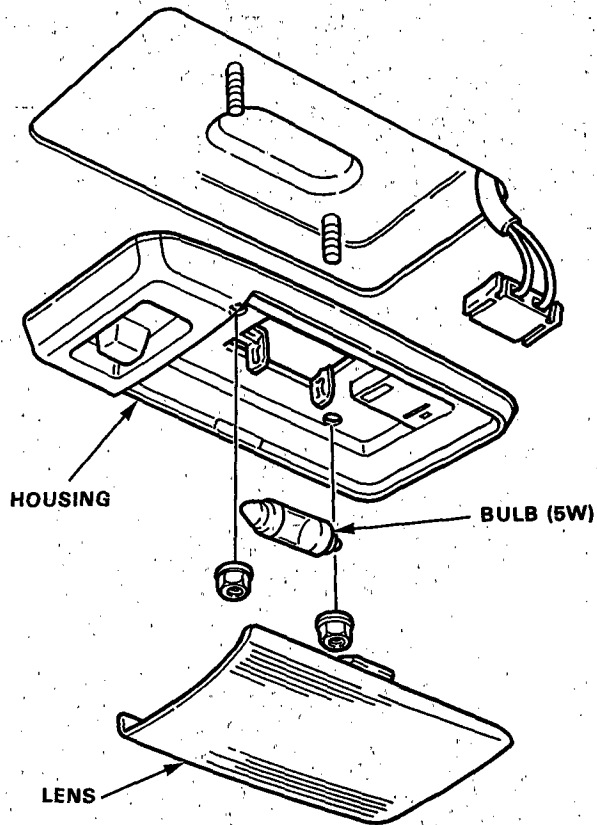
2. There should be continuity between the A and B terminals when the glove box lid is open. There should be no continuity when the glove box lid is closed.



# Ceiling Light

## Test

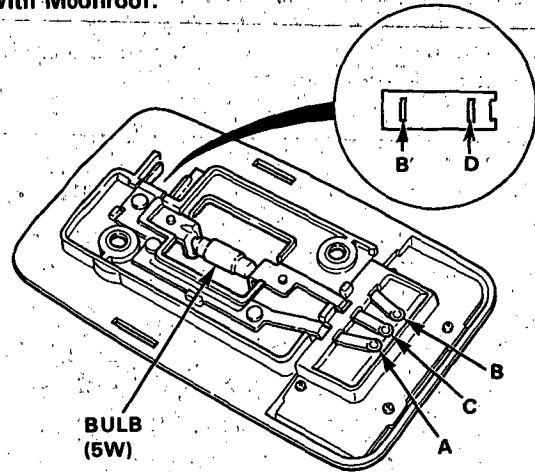
1. Turn the light switch OFF.
2. Pry off the lens.
3. Remove the two nuts and the housing.
4. Disconnect the 2-P connector from the housing.



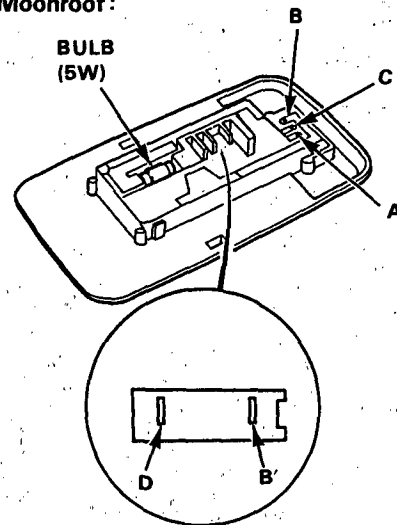
5. Remove the ceiling light.
6. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A	B or B'	C		D
OFF			○	⊖	○
MIDDLE		○	○	⊖	○
ON	○		○	⊖	○

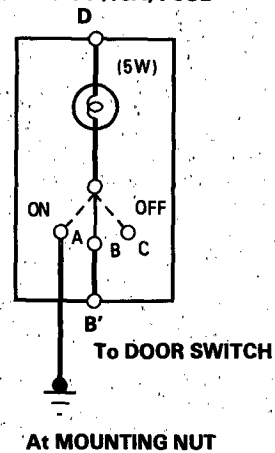
### With Moonroof:



### Without Moonroof:



### From No. 14 (15A) FUSE

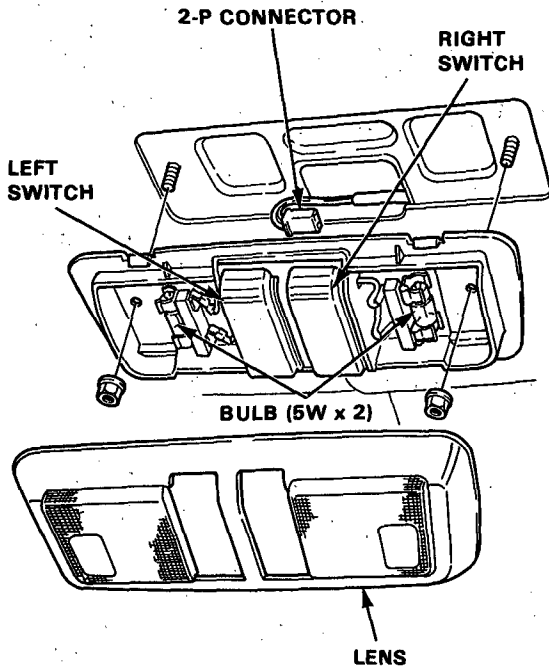


# Front Map Light



## Test

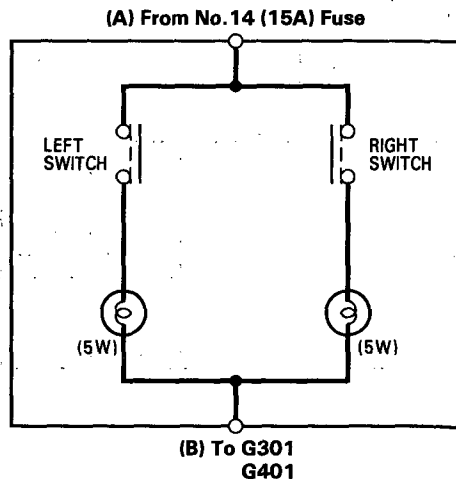
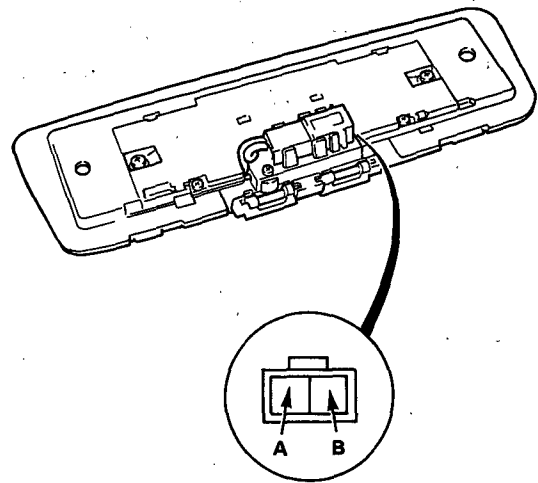
1. Turn the map light switch OFF and pry off the lens...
2. Remove the two nuts and the map light, then disconnect the 2-P connector.



3. Check for continuity between the terminals in each switch position according to the table.

Terminal		A		B	
		Position			
RIGHT SWITCH	ON	○	⊕	○	○
	OFF				
LEFT SWITCH	ON	○	⊕	○	○
	OFF				

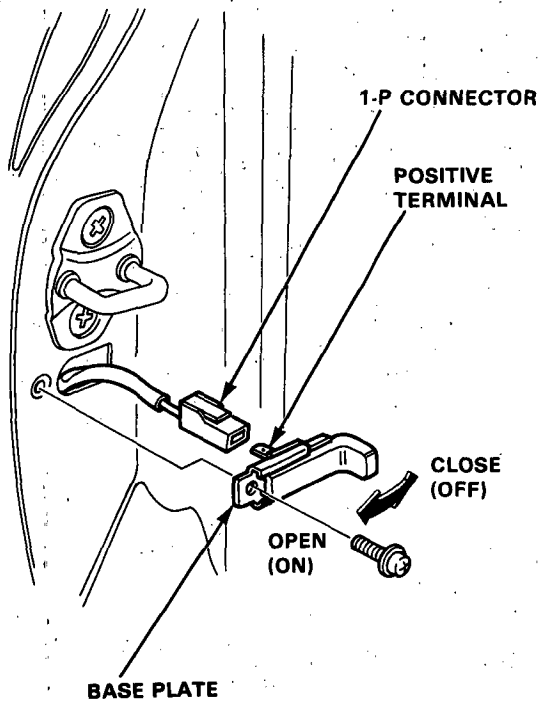
NOTE: Set either switch OFF when testing the other switch.



# Door Switches

## Test

1. Open the door.
2. Remove the screw and pull out the door switch.
3. Disconnect the 1-P connector from the switch:

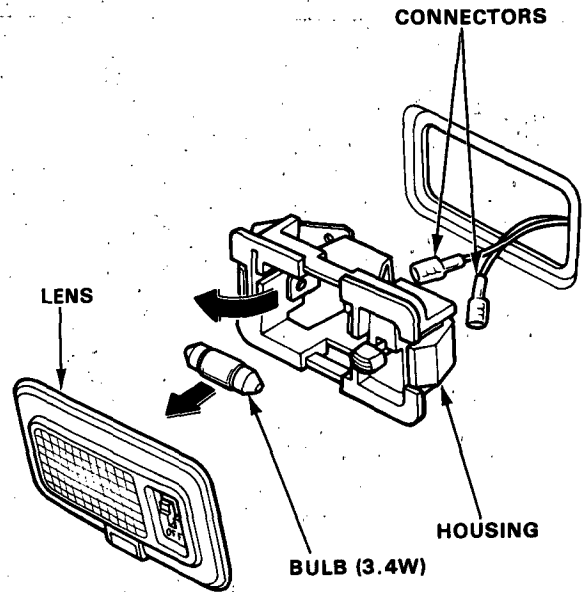


4. There should be continuity between the positive terminal and base plate (ground) with the switch released (door opened). There should be no continuity with the switch pushed (door closed).

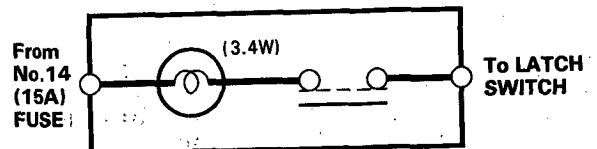
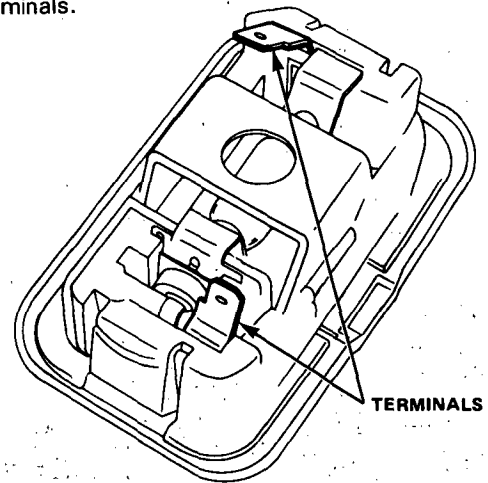
# Trunk/Cargo Area Light

## Test

1. Pry the trunk/cargo area light lens out of its housing.
2. Pry out the light assembly.
3. Disconnect the connectors from the housing.



4. Make sure that the bulb is in good condition. Set the trunk/cargo area light switch in the ON position and check for continuity between the terminals.



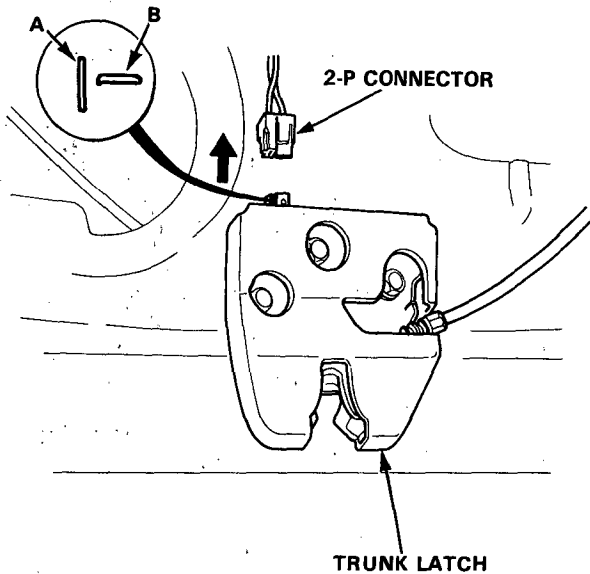
# Latch Switch



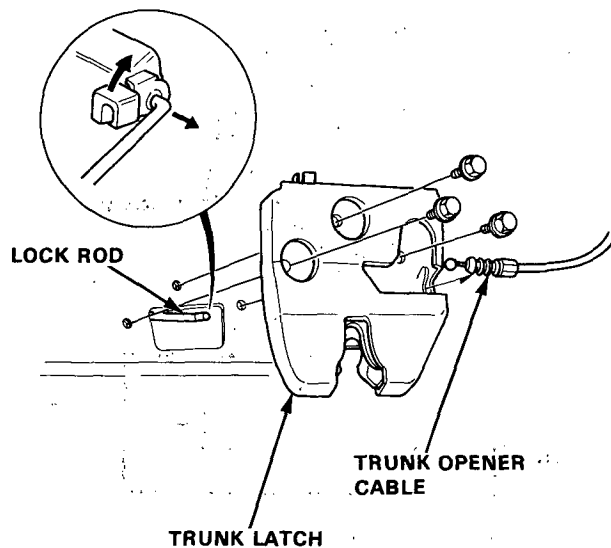
## Test/Replacement

### Sedan:

1. Open the trunk lid and disconnect the 2-P connector from the trunk latch.
2. There should be continuity between the A and B terminals.

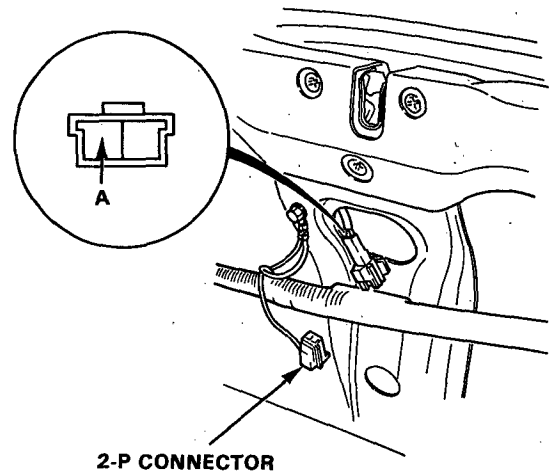


3. If necessary, remove the three bolts to pull out the latch from the trunk lid, then disconnect the lock rod from the latch.
4. Disconnect the trunk opener cable from the latch.

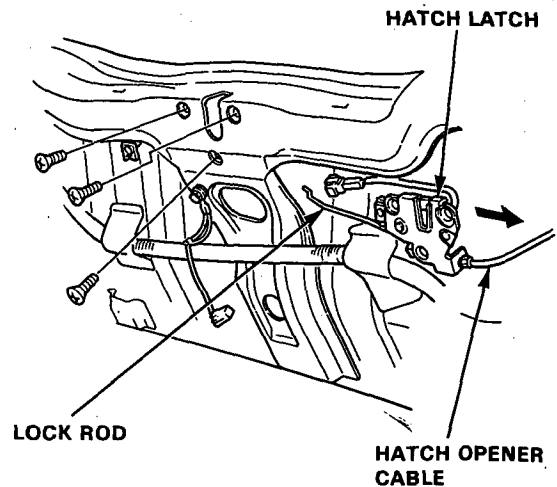


### Hatchback:

1. Open the hatch and disconnect the 2-P connector from the hatch latch.
2. There should be continuity between the A terminal and body ground.

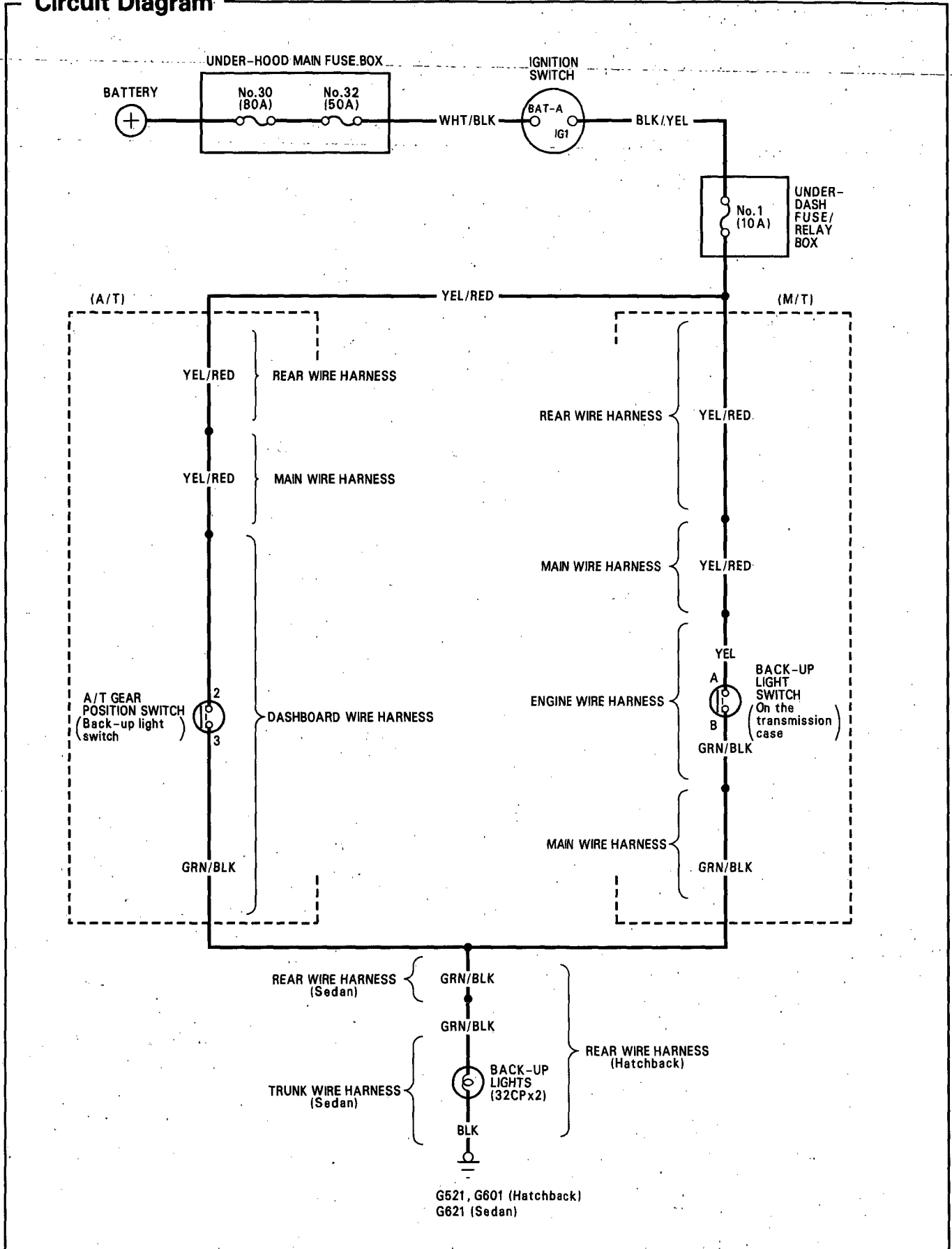


3. If necessary, remove the three bolts to pull out the latch from the trunk, then disconnect the lock rod from the latch.
4. Disconnect the hatch opener cable from the latch.



# Back – up Lights

## Circuit Diagram

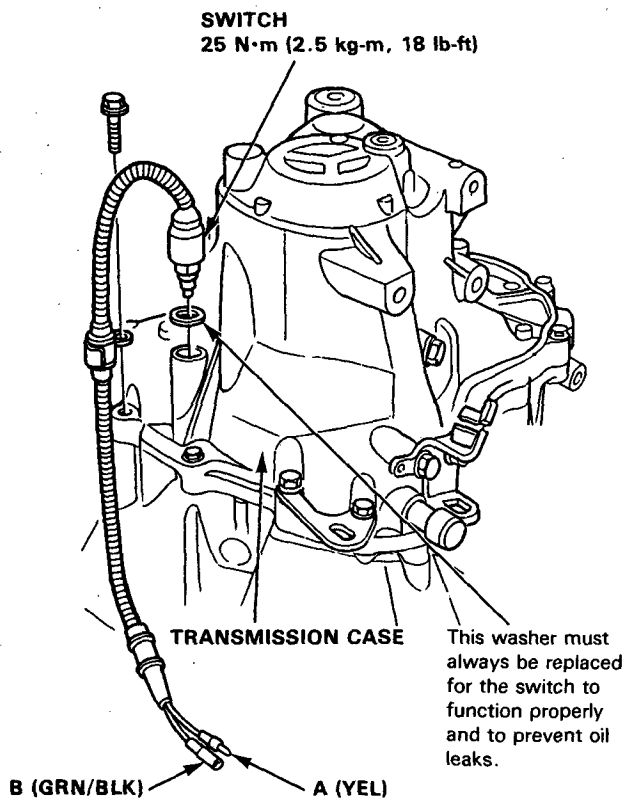




## Switch Test

### Manual Transmission:

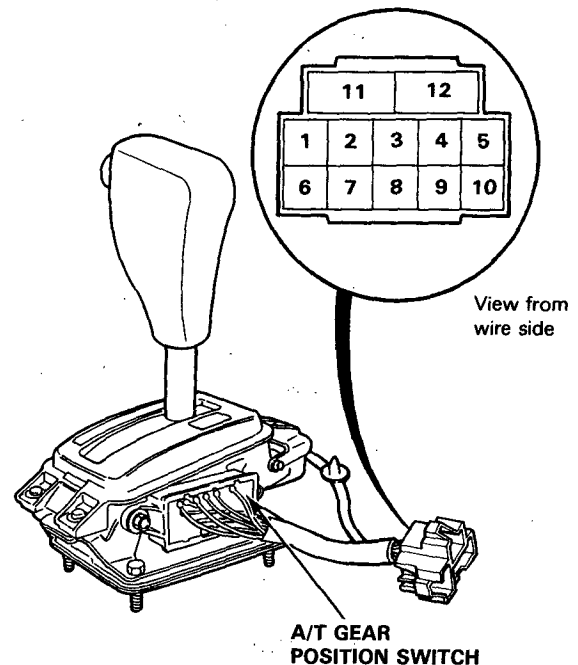
- Turn the ignition switch on and move the shift lever to **R** position. The back-up lights should come on.
  - If one back-up light does not go on, check for a blown bulb in the taillight assembly.
  - If both back-up lights do not go on, check for a blown No. 1 (10 A) fuse in the under-dash fuse/relay box.
  - If the fuse and bulbs are OK, go to step 2.
- Disconnect the connectors from the back-up light switch.



- With the shift lever in **R**, check for continuity between the A and B terminals. There should be continuity.
  - If there is no continuity, replace the switch (see section 13).
  - If there is continuity, but the back-up lights do not go on, check for:
    - An open in the YEL or GRN/BLK wire.
    - Poor ground. (Hatchback: G521, G601)  
(Sedan : G621)

### Automatic Transmission:

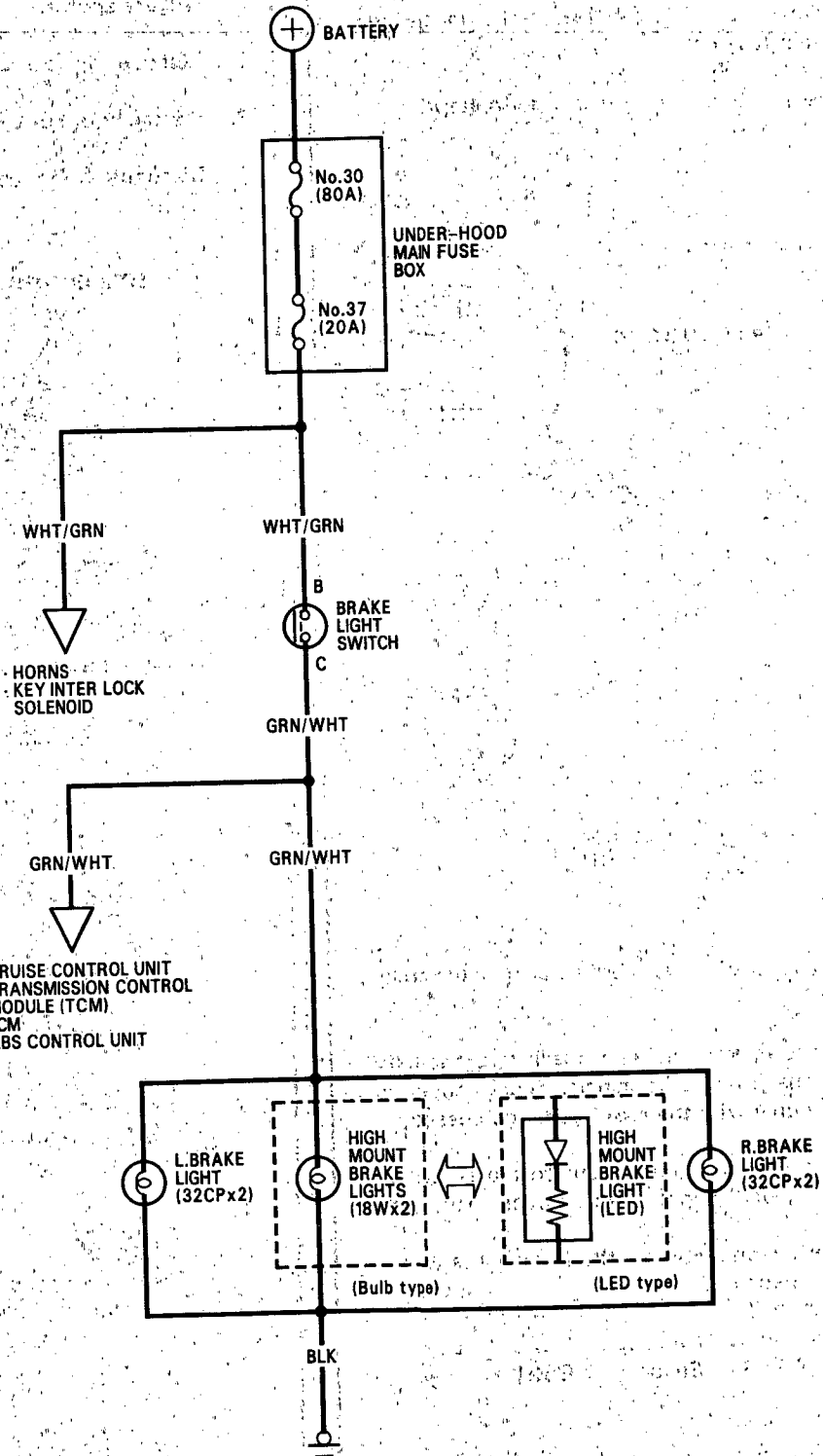
- Turn the ignition switch on and move the shift lever to **R**. The back-up lights should come on.
  - If one back-up light does not go on, check for a blown bulb in the taillight assembly.
  - If both back-up lights do not go on, check for a blown No. 1 (10 A) fuse in the under-dash fuse/relay box.
  - If the fuse and bulbs are OK, go to step 2.
- Disconnect the 10-P connector from the A/T gear position switch (back-up light switch).



- Move the shift lever back and forth in **R** position without touching the push button and check for continuity between No. 2 and No. 3 terminals. There should be continuity within the range of free play of the shift lever.
  - If there is no continuity within the range of free play, adjust the position of the A/T gear position switch (see page 23-131).
  - If there is continuity, but the back-up lights do not go on, check for:
    - An open in the YEL or GRN/BLK wire.
    - Poor ground. (Hatchback: G521, G601)  
(Sedan : G621)

# Brake/High Mount Brake Lights

## Circuit Diagram



G521, G601(Hatchback)  
G621(Sedan)

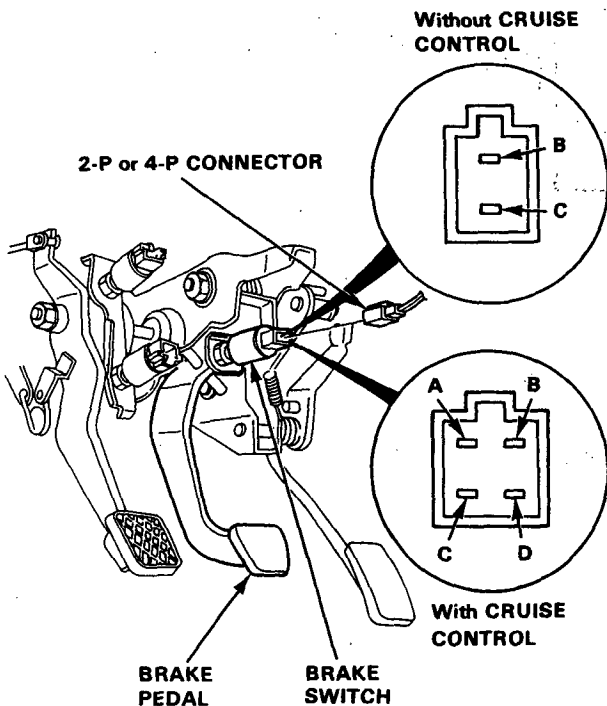


# Brake/High Mount Brake Lights



## Brake Switch Test

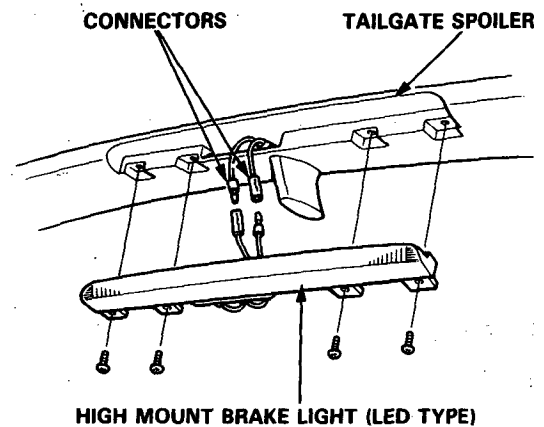
1. Check the brake lights with the brake pedal depressed.
  - If one or both lights do not go on, check for:
    - Blown No. 37 (20 A) fuse in the under-hood main fuse box.
    - Blown bulb.
  - If the fuse and bulbs are OK, go to step 2.



2. Disconnect the 2-P or 4-P connector from the brake switch.
3. Depress the brake pedal and check for continuity between the B and C terminals. There should be continuity only with the brake pedal depressed.
  - If there is no continuity, replace the switch or adjust pedal height (see section 19), and recheck.
  - If there is continuity, but the brake lights do not go on, check for:
    - An open in the WHT/GRN or GRN/WHT wire.
    - Poor ground. (Hatchback: G521, G601)  
(Sedan : G621)

## High Mount Brake Light Replacement (LED type)

1. Carefully remove the high mount brake light without damaging the tailgate trim panel and tailgate spoiler.
2. Remove the four screws from the light.
3. Pry the light out of the tailgate spoiler.
4. Disconnect the connectors from the light, and replace it.

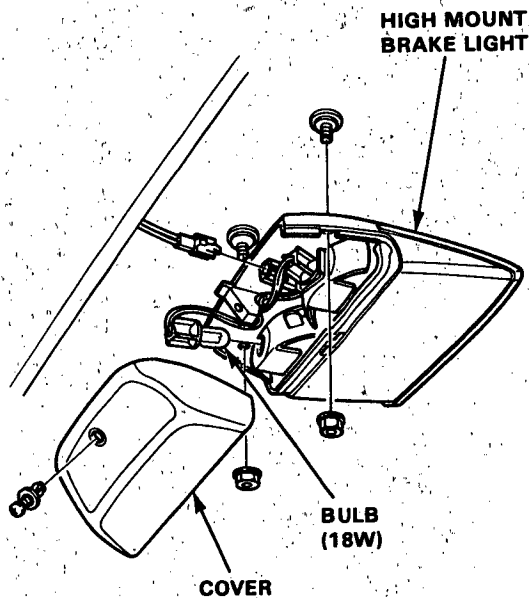


# High Mount Brake Light

## Replacement (Bulb type)

### Hatchback:

1. Open the hatch.
2. Remove the screw and the cover.
3. Remove the two nuts and the high mount brake light, then disconnect the 2-P connector.

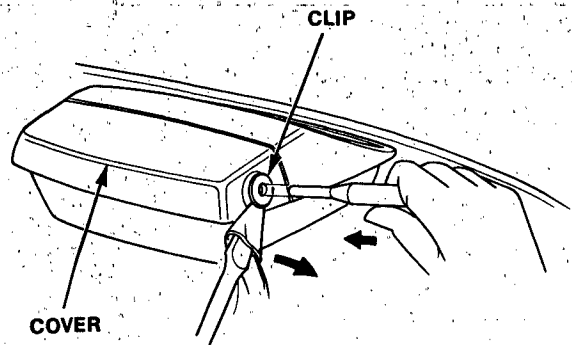


4. Turn the socket 45° counterclockwise to remove the bulb.
5. Install the high mount brake light in the reverse order of removal, and clean the rear window glass before installing.

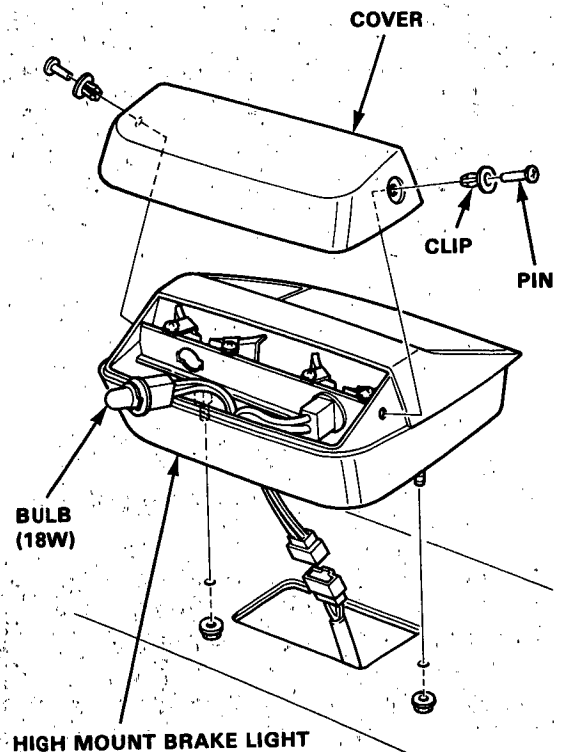
**CAUTION:** When installing the high mount brake light, make sure the mount rubber is sealed evenly to the rear window glass.

### Sedan:

1. Open the trunk lid.
2. Push the pin into the cover, then remove the clip.



3. Remove the two nuts and the high mount brake light, then disconnect the 2-P connector.



4. Turn the socket 45° counterclockwise to remove the bulb.
5. Install the high mount brake light in the reverse order of removal.

### NOTE:

- Clean the rear window glass before installing.
- When attaching the clip to the cover, put the pin into the clip first, then push it into the cover.

# Side Marker/Turn Signal/Hazard Flasher System

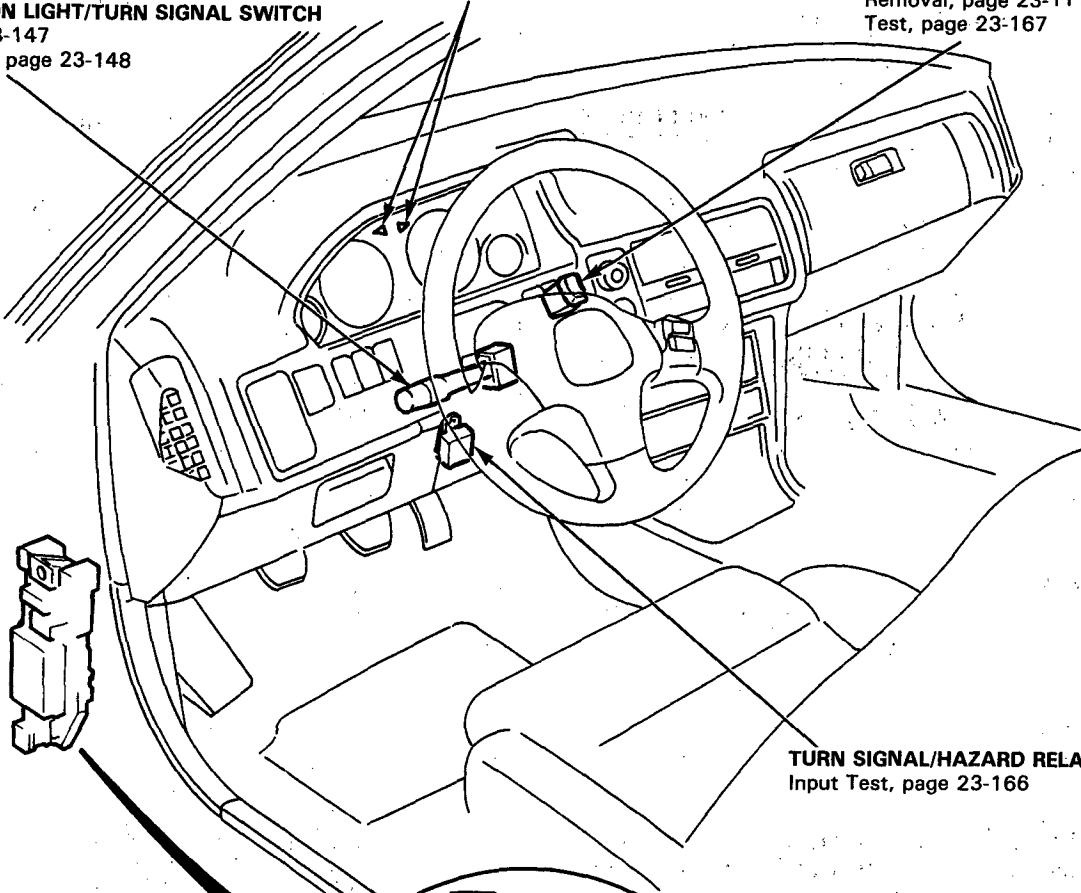


## Component Location Index

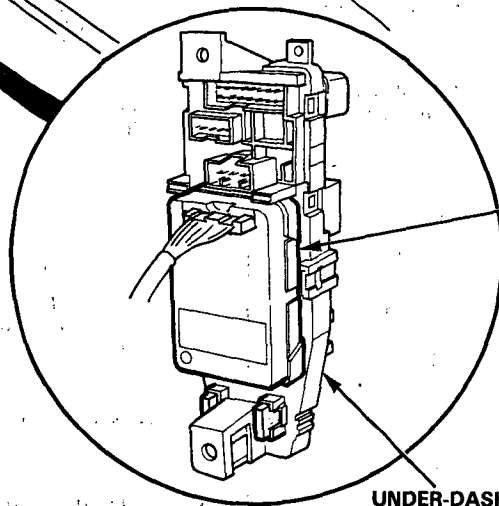
**COMBINATION LIGHT/TURN SIGNAL SWITCH**  
Test, page 23-147  
Replacement, page 23-148

**TURN SIGNAL INDICATOR LIGHTS**  
(In the gauge assembly)  
Gauge Assembly, page 23-110

**HAZARD WARNING SWITCH**  
Removal, page 23-111  
Test, page 23-167



**TURN SIGNAL/HAZARD RELAY**  
Input Test, page 23-166



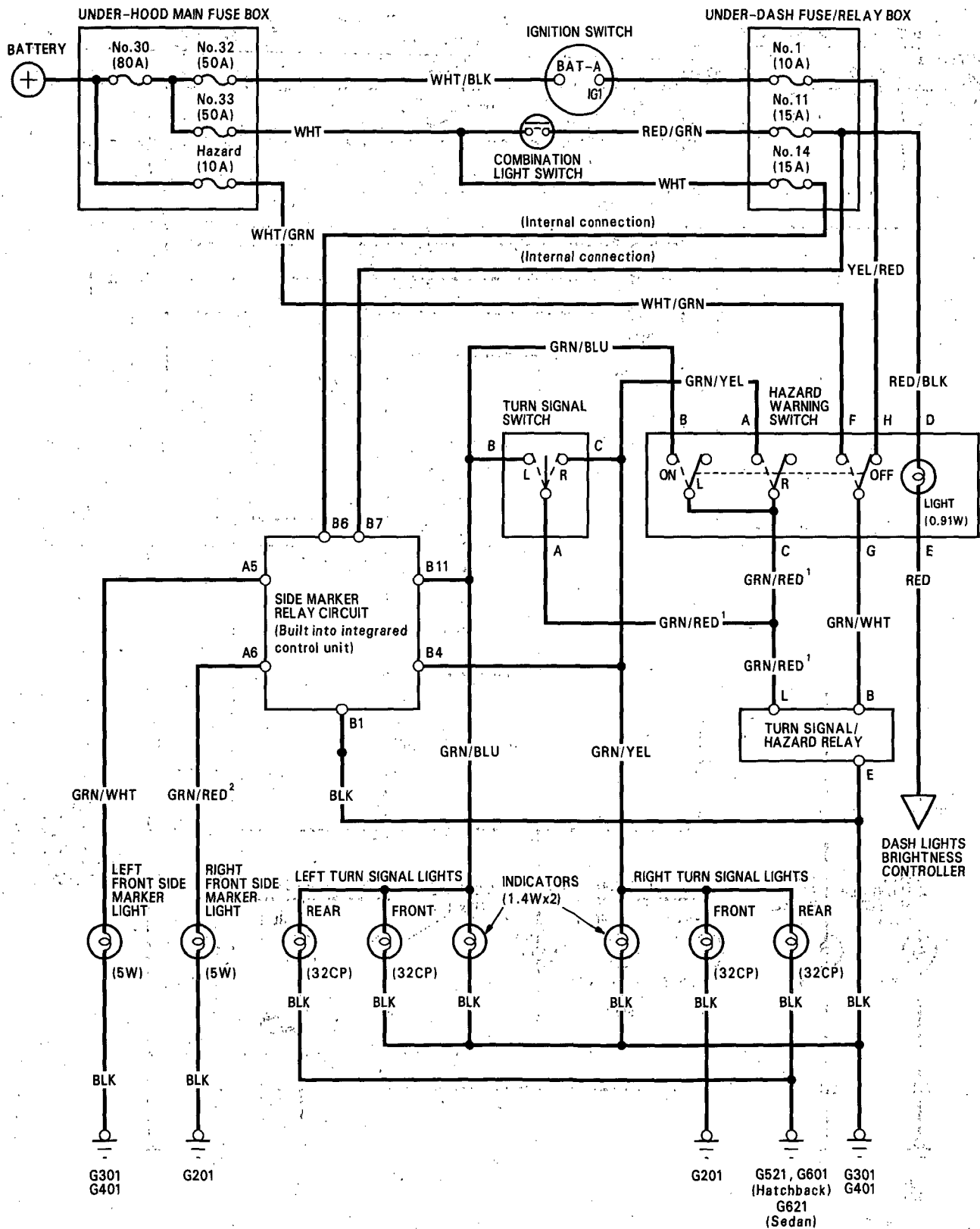
**SIDE MARKER FLASHER CIRCUIT**  
(Built into the integrated control unit)  
Input Test, page 23-134

**UNDER-DASH FUSE/RELAY BOX**  
(View from rear side)

# Side Marker/Turn Signal/Hazard Flasher System

## Circuit Diagram (USA)

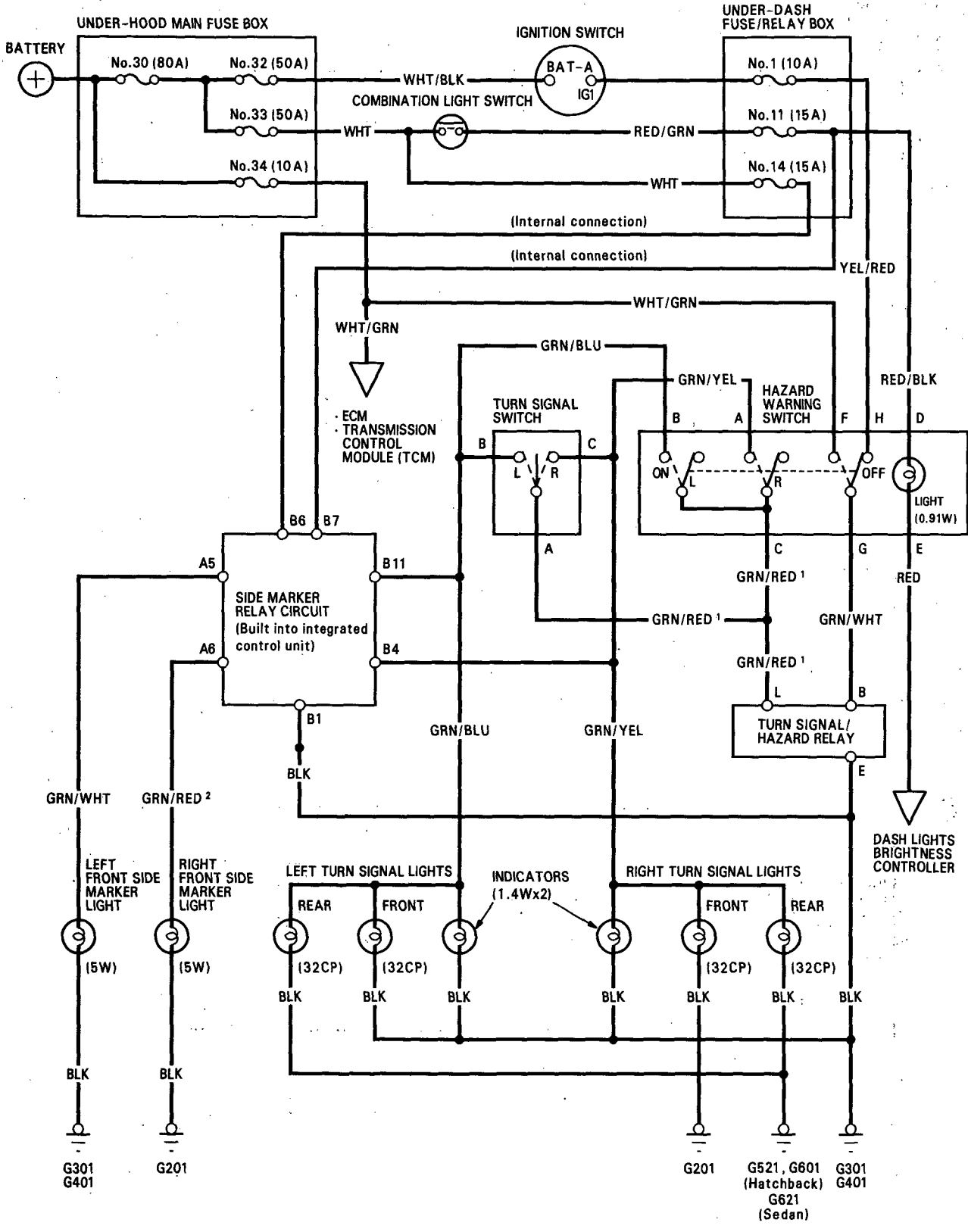
NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/RED<sup>1</sup> and GRN/RED<sup>2</sup> are not the same).





# Circuit Diagram (Canada)

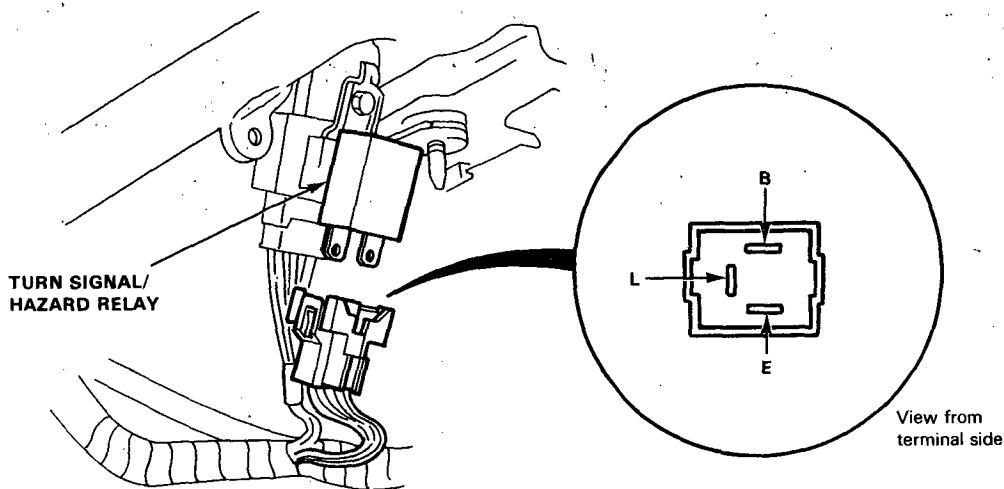
NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/RED<sup>1</sup> and GRN/RED<sup>2</sup> are not the same).



# Side Marker/Turn Signal/Hazard Flasher System

## Turn Signal/Hazard Relay Input Test

1. Remove the driver's side kick-panel, then disconnect the 3-P. connector from the turn signal/hazard relay.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the connector.
    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all input tests prove OK, the turn signal/hazard relay must be faulty; replace it.



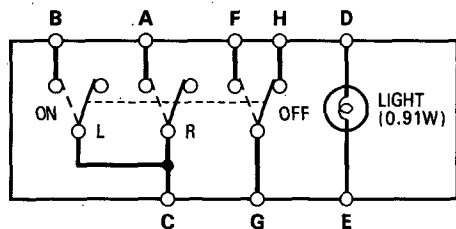
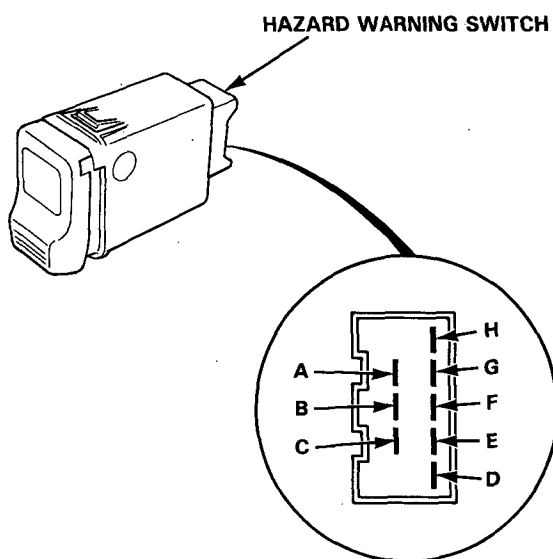
No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	E	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G301, G401)</li> <li>• An open in the BLK wire.</li> </ul>
2	B	Ignition switch ON:	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 1 (7.5A) fuse. (in the under-dash fuse/relay box)</li> <li>• An open in the YEL/RED or GRN/WHT wire.</li> <li>• Faulty hazard warning switch.</li> </ul>
3	B and L	Turn the hazard warning switch ON and connect the B terminal to the L terminal.	Hazard warning lights should come on.	<ul style="list-style-type: none"> <li>• Blown HAZARD (10A) fuse (USA).</li> <li>• Blown No. 34 (10A) fuse (in the under-hood main fuse box) (Canada).</li> <li>• Blown bulb.</li> <li>• Poor ground (G201, G301, G401 and: G521, G601 [Hatchback] G621 [Sedan]).</li> <li>• Faulty hazard warning switch.</li> <li>• Faulty side marker relay circuit.</li> <li>• An open in the WHT/GRN, GRN/ RED<sup>1</sup>, GRN/YEL or GRN/BLU wire.</li> </ul>
		Turn the ignition switch ON and the turn signal switch to Right or Left, and connect the B terminal to the L terminal.	Right or left side turn lights should come on.	<ul style="list-style-type: none"> <li>• Faulty turn signal switch.</li> </ul>



## Hazard Warning Switch Test

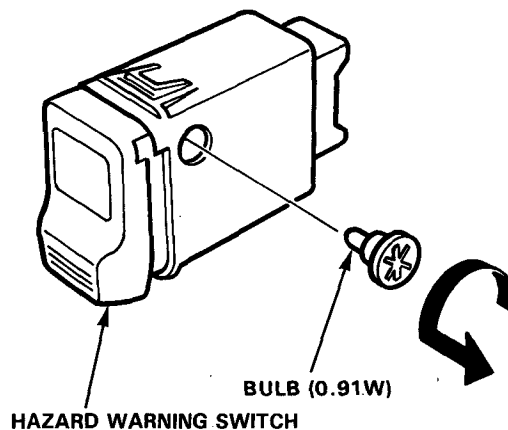
1. Remove the instrument panel (see page 23-115).
2. Remove the hazard warning switch from the instrument panel.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal	A	B	C	D	E	F	G	H
Position								
OFF				○	⊕	○		○
ON	○	○	○	○	⊕	○	○	



## Bulb Replacement

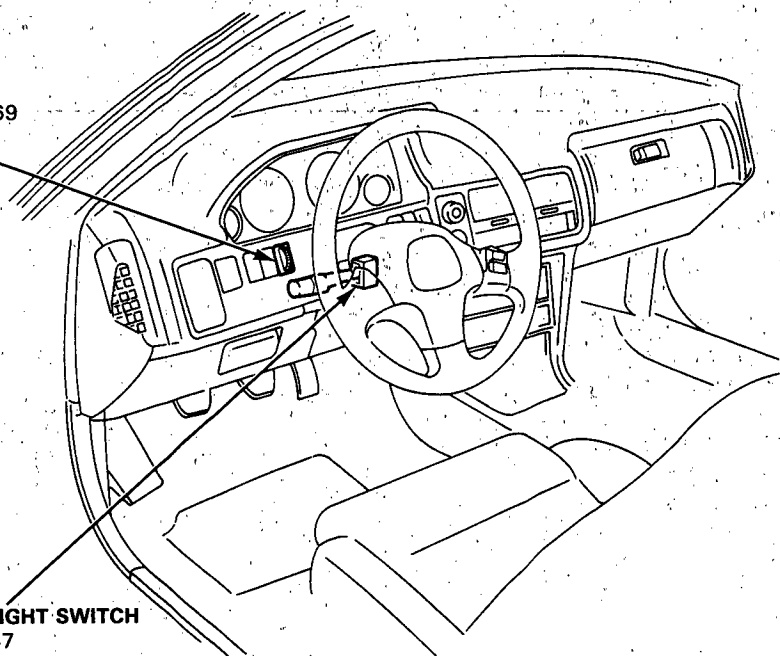
1. Remove the instrument panel (see page 23-115).
2. Remove the hazard warning switch from the instrument panel.
3. Turn the socket 45° counterclockwise to remove the bulb.



# Dash Lights Brightness Control

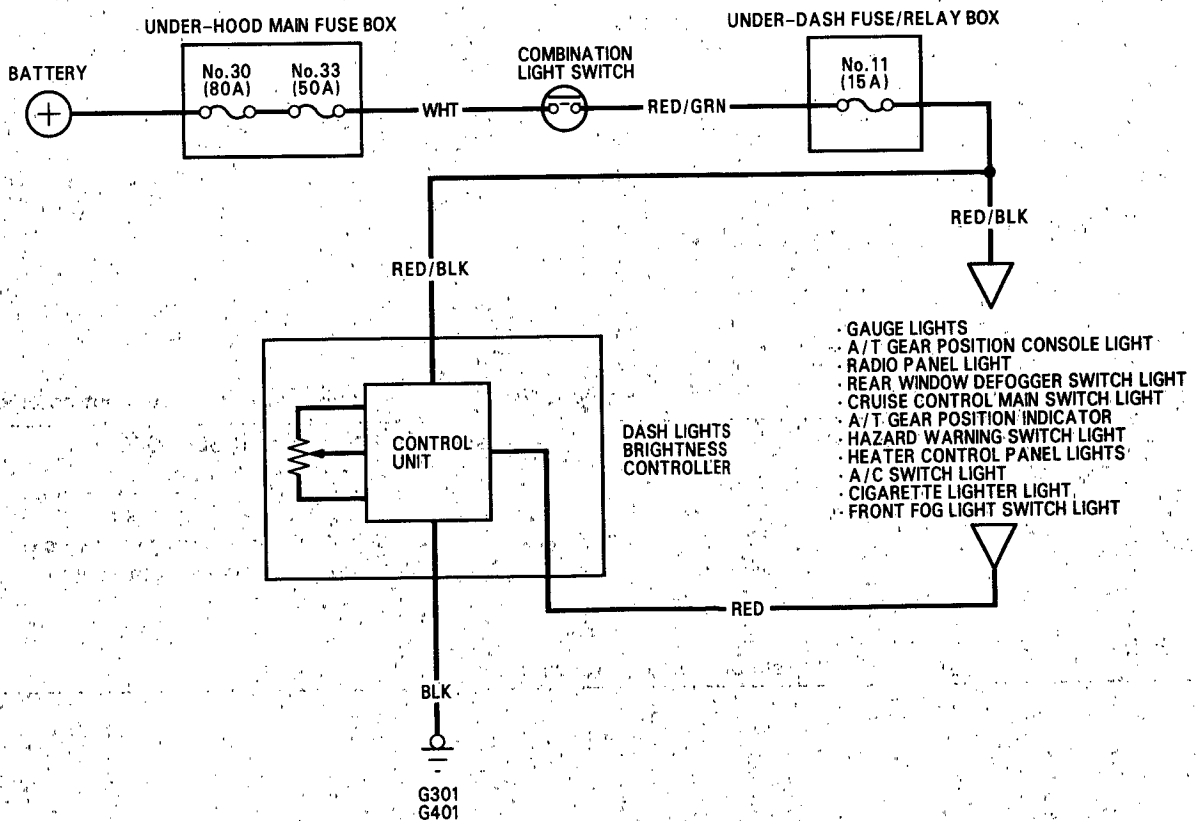
## Component Location Index

**DASH LIGHTS BRIGHTNESS CONTROLLER**  
 Removal, page 23-115  
 Input Test, page 23-169



**COMBINATION LIGHT SWITCH**  
 Test, page 23-147  
 Replacement, page 23-148

## Circuit Diagram





# Dash Lights Brightness Controller

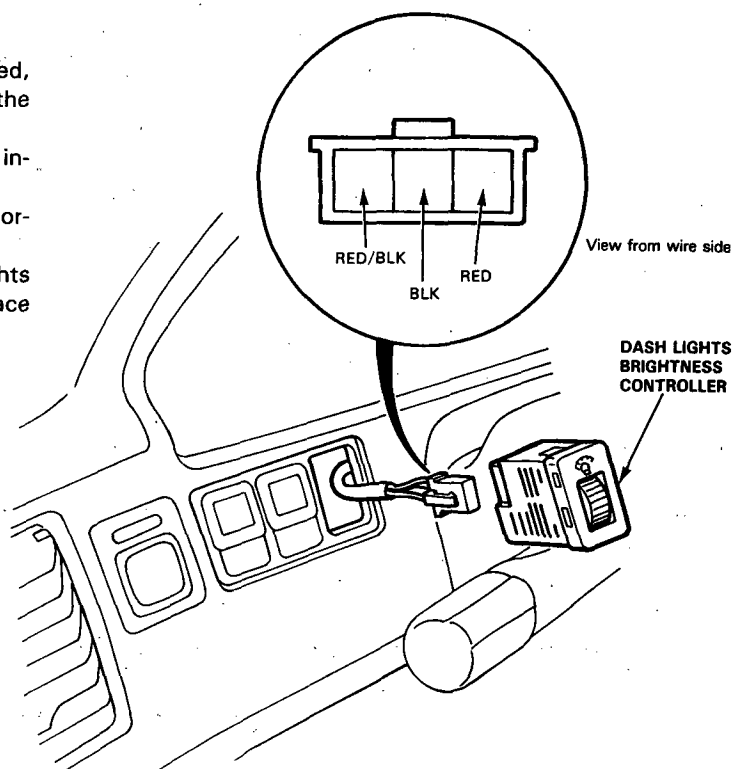


## Controller Input Test

NOTE: The control unit is built into the dash lights brightness controller.

1. Remove the dashboard lower cover, then push out the dash lights brightness controller from behind the instrument panel.
2. Disconnect the 3-P connector from the dash lights brightness controller.
3. Inspect the connector terminals to be sure they are all making good contact.

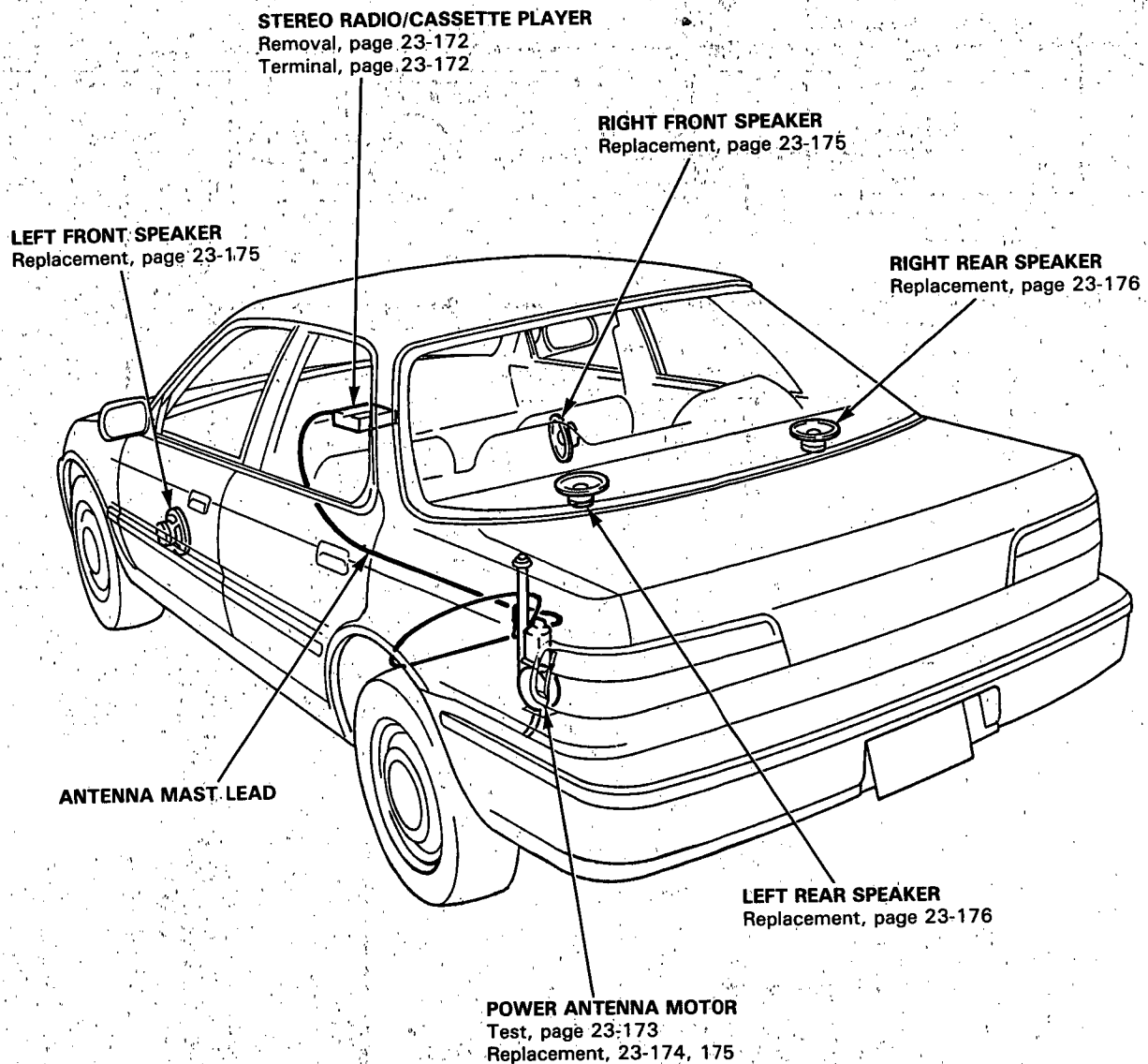
- If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, make the following input tests at the connector.
  - If any test indicates a problem, find and correct the cause, then recheck the system.
  - If all input tests prove OK, the dash lights brightness controller must be faulty; replace it.



No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G301, G401).</li> <li>• An open in the wire.</li> </ul>
2	RED/BLK	Headlight switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 11 (15A) fuse. (in the under-dash fuse/relay box)</li> <li>• Faulty combination light switch.</li> <li>• An open in the wire.</li> </ul>
3	RED	Headlight switch ON.	Attach to ground: Dash lights should come on full bright.	<ul style="list-style-type: none"> <li>• An open in the wire.</li> </ul>

# Stereo Sound System

## Component Location Index

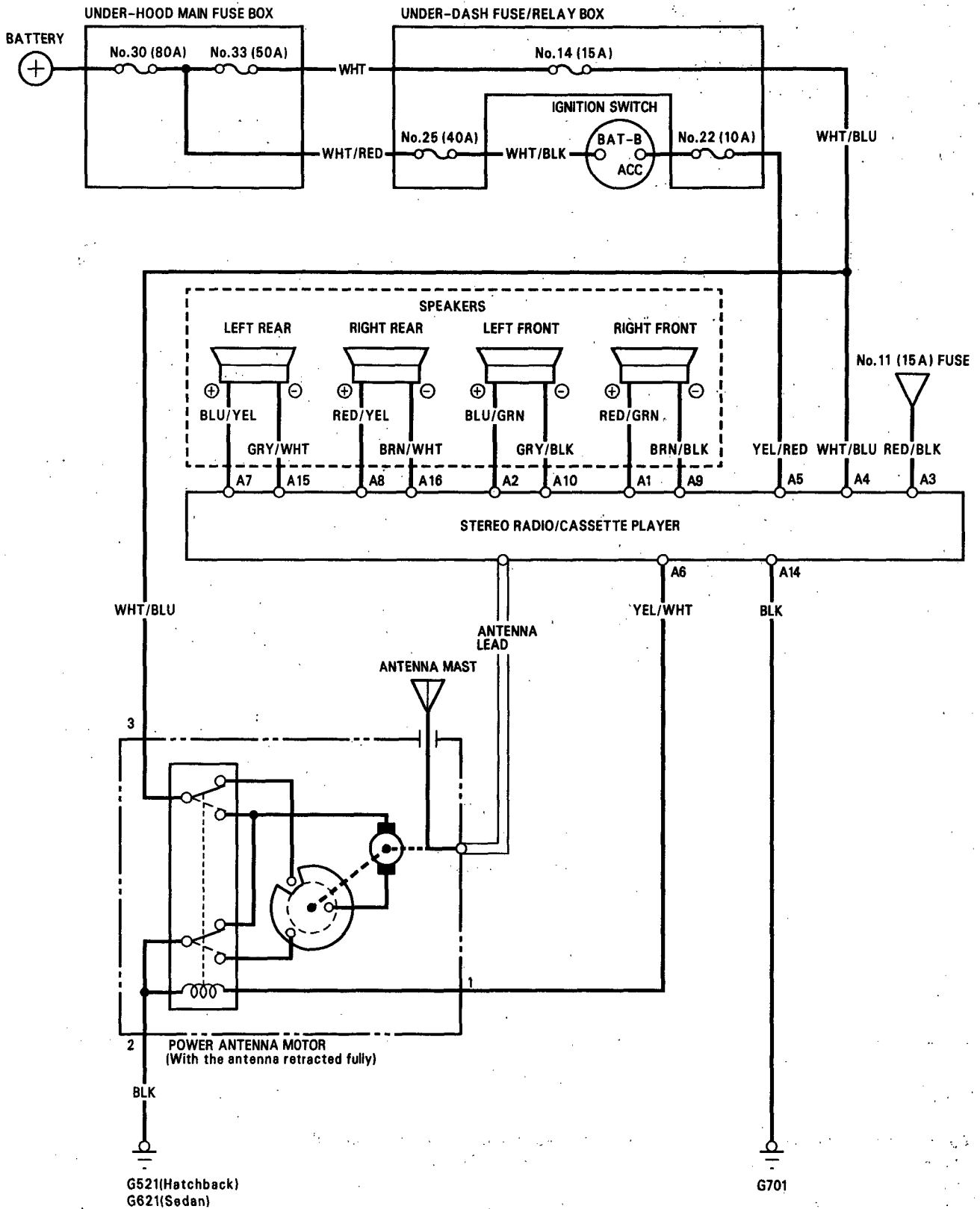


## Description

For the stereo radio/cassette player description, please see the owner's manual. The power antenna mast is controlled entirely by the radio ON/OFF switch. It will extend fully any time the radio and the ignition switches are on. When the radio or the ignition is shut off, it retracts fully. The power antenna motor has a built-in relay together with a limit switch for this function.



# Circuit Diagram



# Stereo Sound System

## Unit Removal

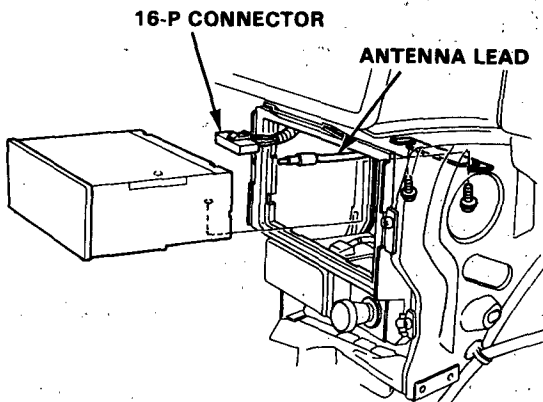
### NOTE:

The radio may have a coded theft protection circuit. Be sure to get the customer's code number before

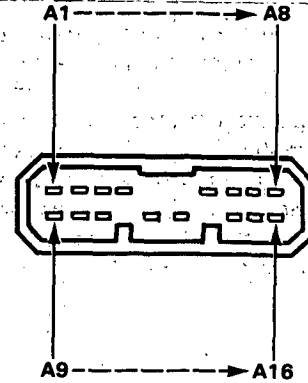
- Disconnecting the battery.
- Removing the No. 14 (15A) fuse. (in the under-dash fuse/relay box)
- Removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Remove the front console.
2. Remove the two screws, then pull the stereo radio/cassette player out of the center instrument panel.
3. Disconnect the 16-P connector and the antenna lead.



## Radio/Cassette Unit Terminals



### Terminal (Wire color)

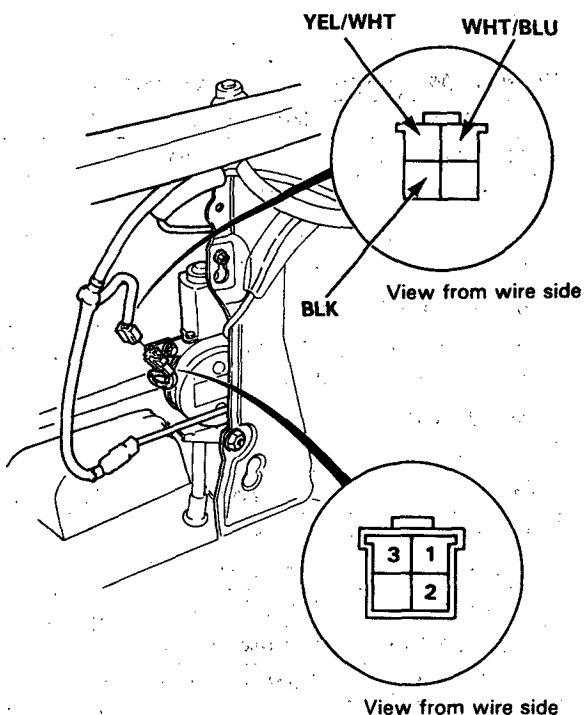
### Connects to

Terminal (Wire color)	Connects to
A1 (RED/GRN)	Right front speaker ⊕
A2 (BLU/GRN)	Left front speaker ⊕
A3 (RED/BLK)	Lights-on signal
A4 (WHT/BLU)	Constant power (Tuning memory)
A5 (YEL/RED)	ACC (Main stereo power supply)
A6 (YEL/WHT)	Power to antenna with radio switch ON
A7 (BLU/YEL)	Left rear speaker ⊕
A8 (RED/YEL)	Right rear speaker ⊕
A9 (BRN/BLK)	Right front speaker ⊖
A10 (GRY/BLK)	Left front speaker ⊖
A11 (—)	(Not used)
A12 (—)	(Not used)
A13 (—)	(Not used)
A14 (BLK)	Ground (G701)
A15 (GRY/WHT)	Left rear speaker ⊖
A16 (BRN/WHT)	Right rear speaker ⊖



## Power Antenna Motor Test

1. Remove the trunk left side trim panel.
2. Disconnect the 4-P connector from the motor and remove the connector from its clamp.
3. First check power to the motor at the connector terminals: There should be battery voltage between the WHT/BLU (+) and BLK (-) terminals all the time. There should be battery voltage between the YEL/WHT (+) and BLK (-) terminals only with the ignition and radio switched ON.

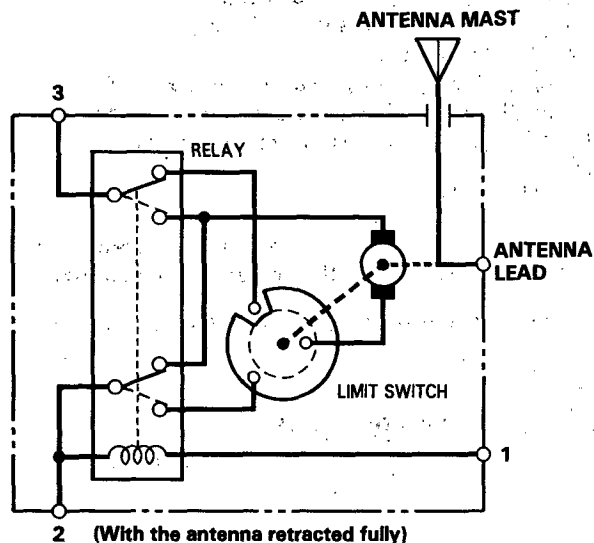


4. Test motor operation:

**FULL EXTEND:** Connect battery power to the No.3 and No.1 terminals and ground to the No.2 terminal.

**RETRACTED:** Then disconnect battery power from the No.1 terminal.

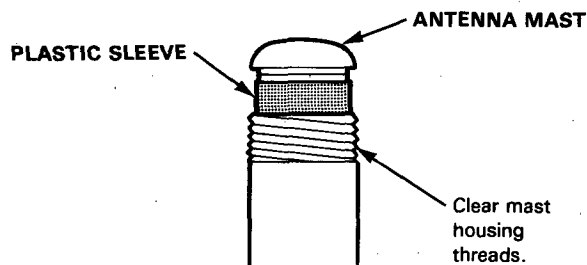
5. If the motor fails to operate properly, replace it.



### Sticking Antenna:

The antenna sticks in either the up or down position.

1. Using the antenna nut wrench, remove the special nut, spacer, and bushing (see page 23-174).
2. Clean the antenna mast housing threads and reinstall the spacer and bushing.



3. Use the antenna nut wrench and torque the special nut to 2.3 N·m (0.23 kg·m, 1.7 lb·ft). If the special nut is over-torqued, the antenna may stick. If sticking occurs, back the nut off until the antenna moves freely.

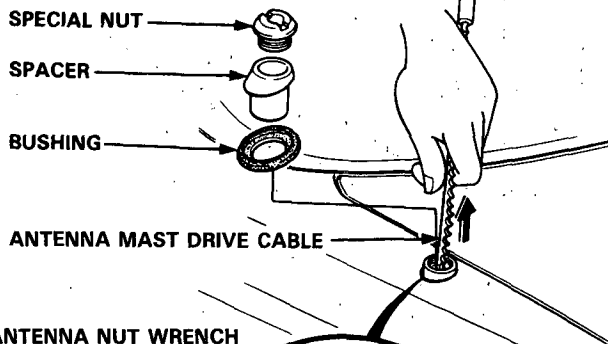
# Stereo Sound System

## Antenna Mast Replacement

### Removal:

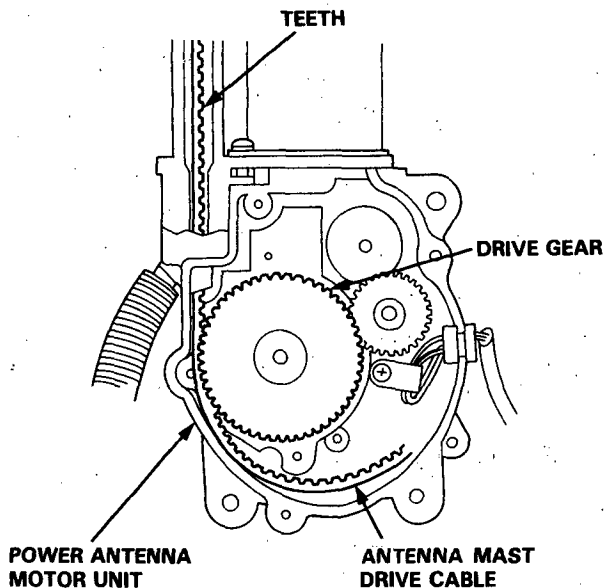
NOTE: The antenna mast alone can be replaced without removing the power antenna motor unit.

1. Remove the special nut, spacer, and bushing.
2. Carefully withdraw the antenna mast while extending it by turning the radio switch "ON".



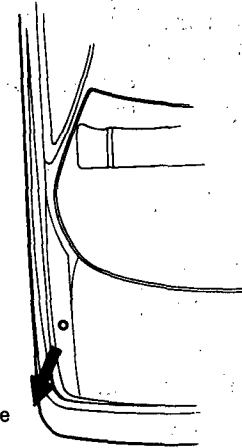
ANTENNA NUT WRENCH  
07JAA-001000B

SPECIAL NUT  
2.3 N·m (0.23 kg-m, 1.7 lb-ft)



### Installation:

1. Hold the antenna so the teeth on the drive cable face in the direction shown, and insert the drive cable into the antenna housing.



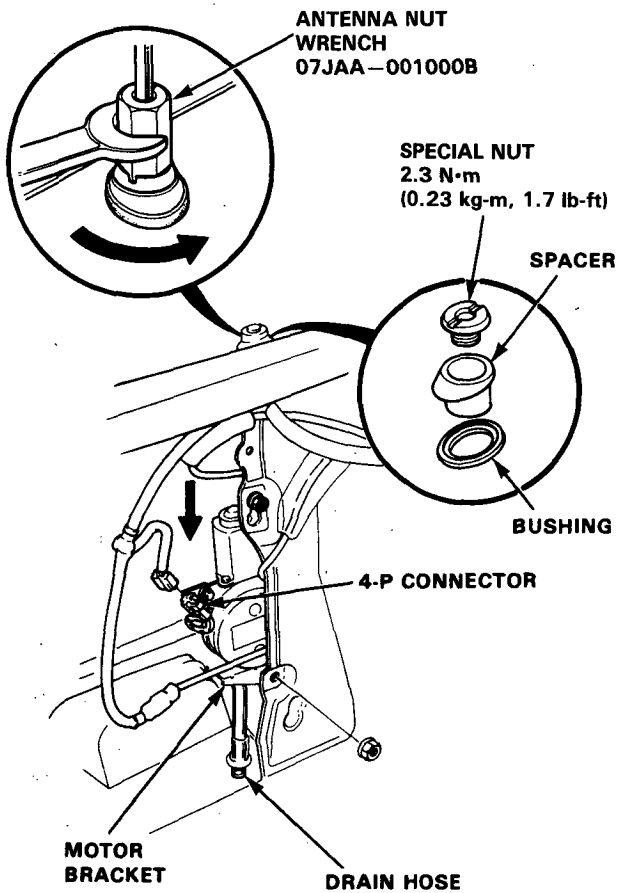
Direction of the teeth.

2. Check for engagement of the cable teeth to the drive gear by carefully moving the cable up and down.
  3. Turn the radio switch "OFF", and let the motor pull the drive cable inside the antenna housing.
  4. Clean the antenna mast housing threads, insert the antenna mast into the antenna housing, install the bushing and spacer, and torque the special nut to 2.3 N·m (0.23 kg-m, 1.7 lb-ft).
- NOTE: If the special nut is over-torqued, the antenna may stick. If sticking occurs, back the nut off until the antenna moves freely.
5. Check that the antenna mast retracts and extends fully when the radio switch is turned ON and OFF repeatedly.



## Power Antenna Motor Replacement

1. Remove the trunk left side trim panel.
2. Disconnect the 4-P connector and the antenna lead from the motor, then remove the special nut and the two mounting nuts to take out the motor with the antenna mast.

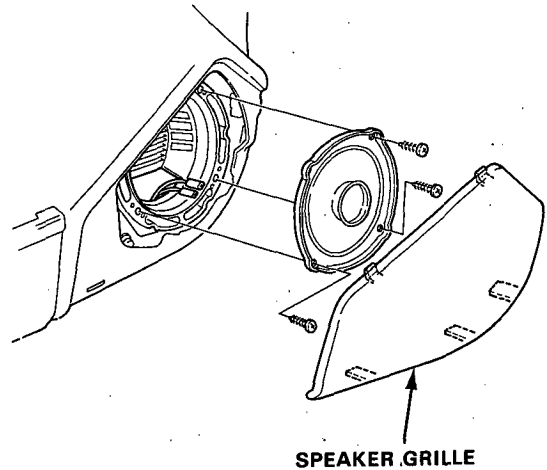


3. Install in reverse order of removal.

**NOTE:** First tighten the special nut, then tighten the two mounting nuts to the motor bracket.

## Front Speaker Replacement

1. Remove the speaker grille from the door panel.
2. Remove the three screws, then disconnect the wires from the speaker.

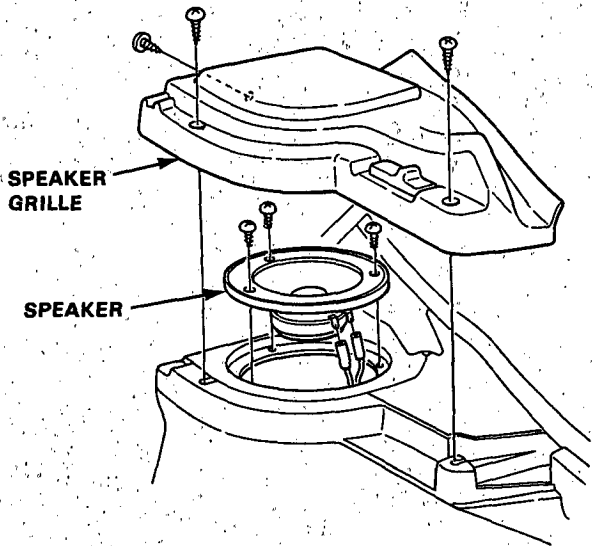


# Stereo Sound System

## Rear Speaker Replacement

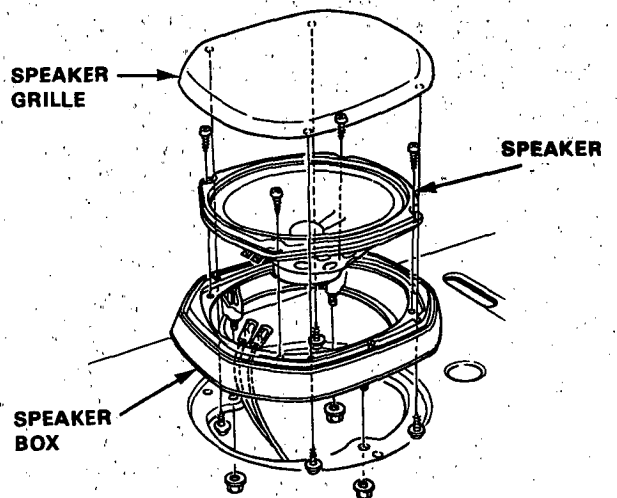
### Hatchback:

1. Remove the three screws and the speaker grille.
2. Remove the three screws, then disconnect the wires from the speaker.



### Sedan:

1. Open the trunk lid, remove the three nuts and disconnect the wires from the speaker assembly.
2. Remove the speaker grille and the speaker from the speaker box.

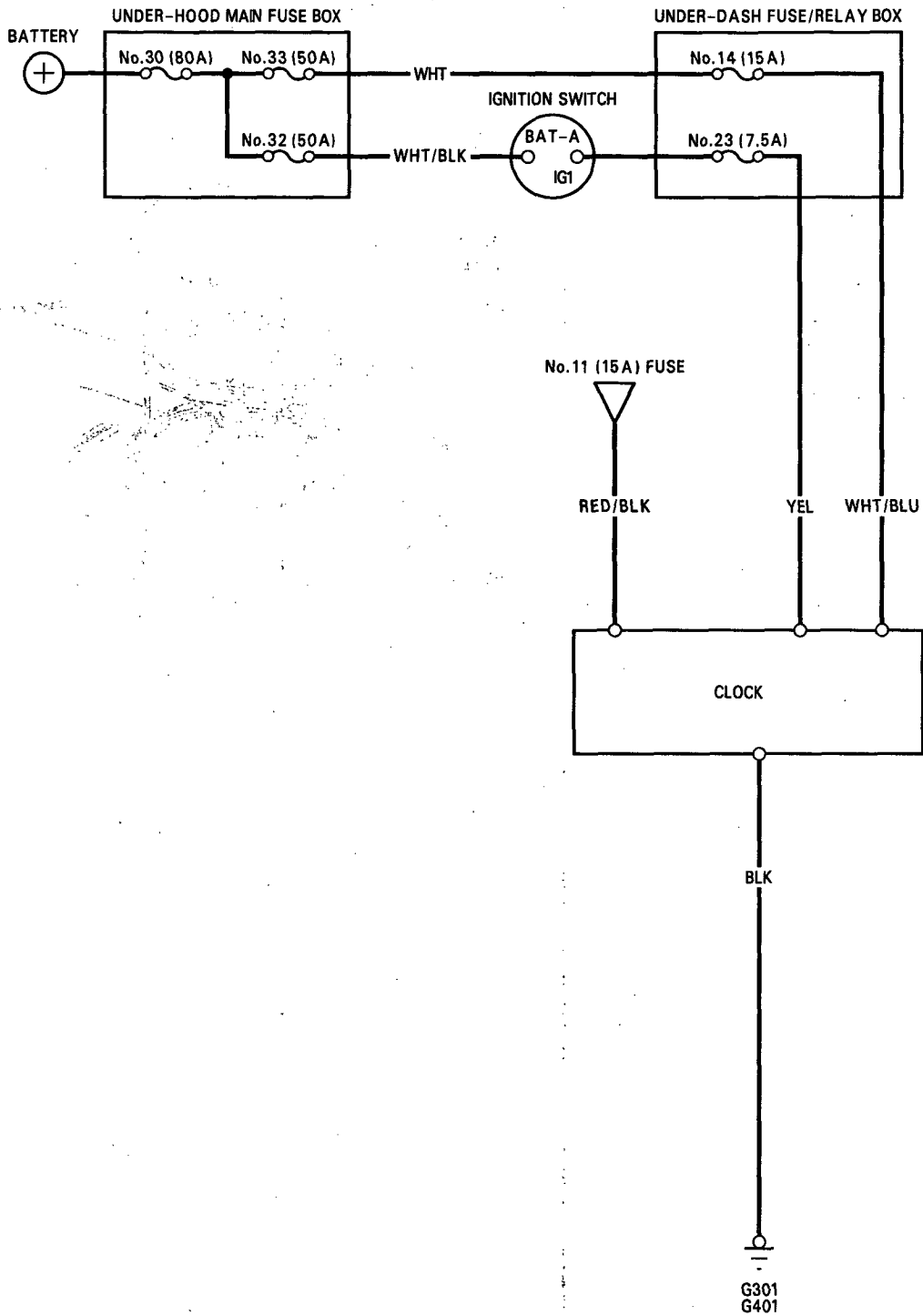






# Clock

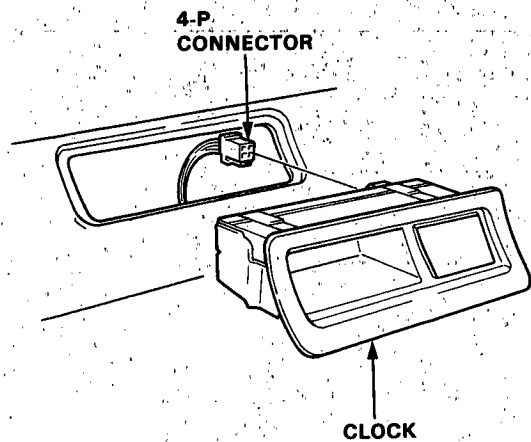
## Circuit Diagram



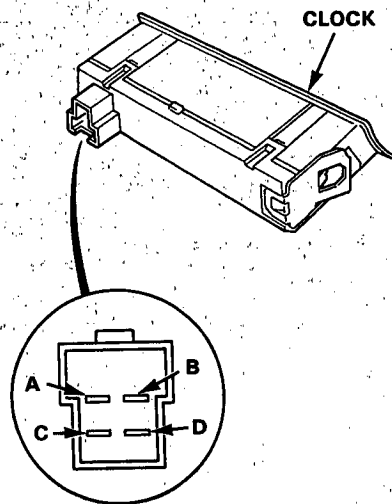
# Clock

## Removal

1. Pull the clock out of the dashboard, then disconnect the 4-P connector.



## Terminals:

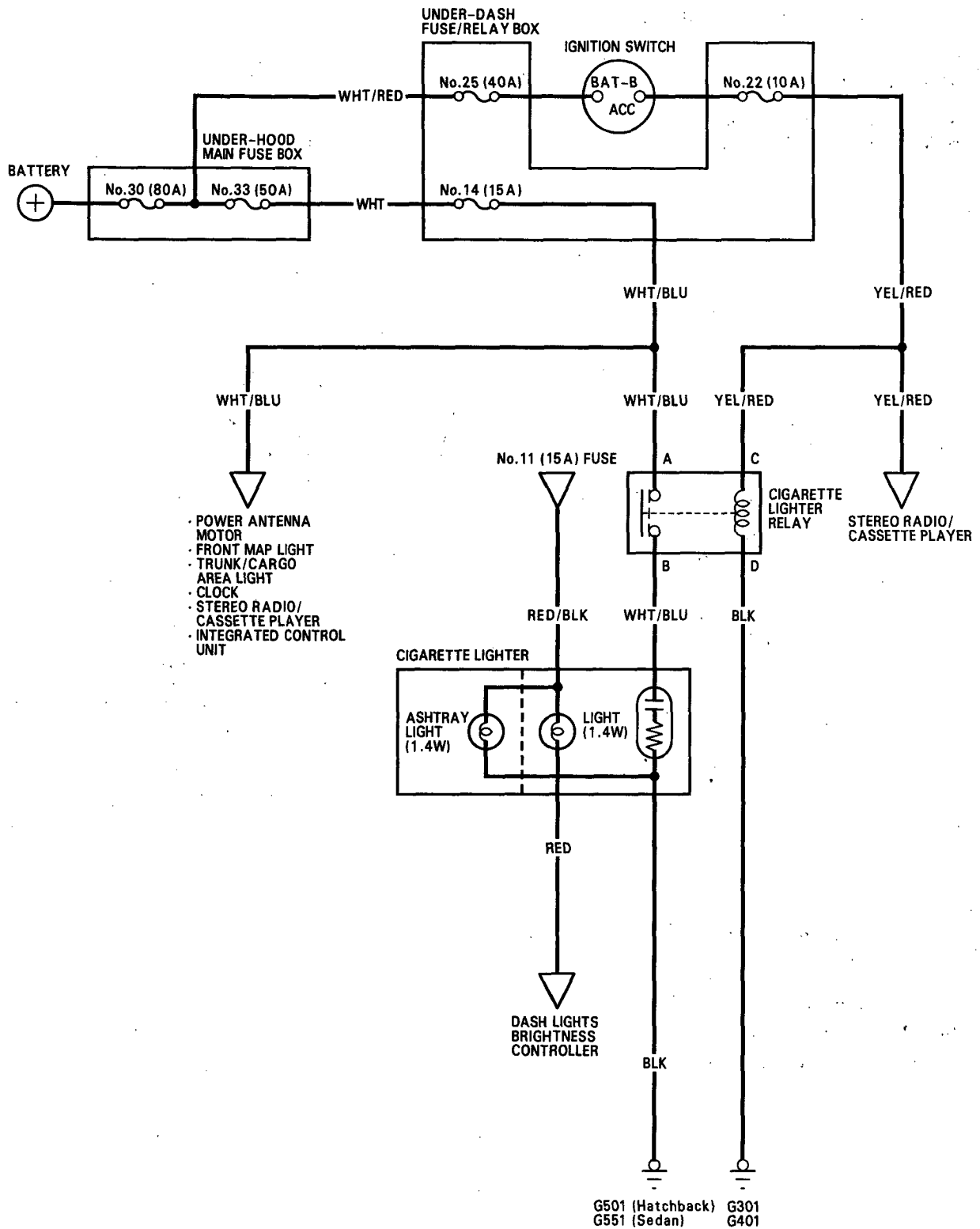


Terminal	Wire	Connects to
A	RED/BLK	Lights-on signal
B	BLK	Ground
C	YEL	IG1 (Main clock power supply)
D	WHT/BLU	Constant power (Time memory)



# Cigarette Lighter

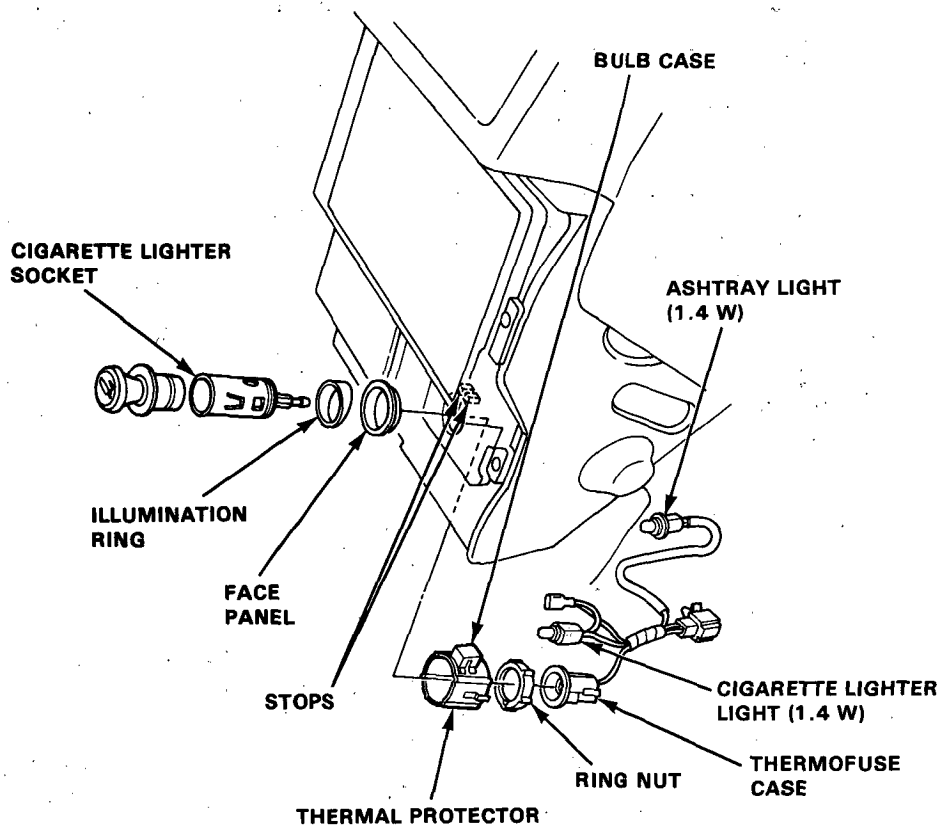
## Circuit Diagram



# Cigarette Lighter

## Replacement

1. Remove the front console and center instrument panel.
2. Disconnect the 4-P connector and remove the ashtray light.
3. Disconnect the thermofuse case from the socket end.
4. Remove the ring nut and separate the cigarette lighter socket from the thermal protector.

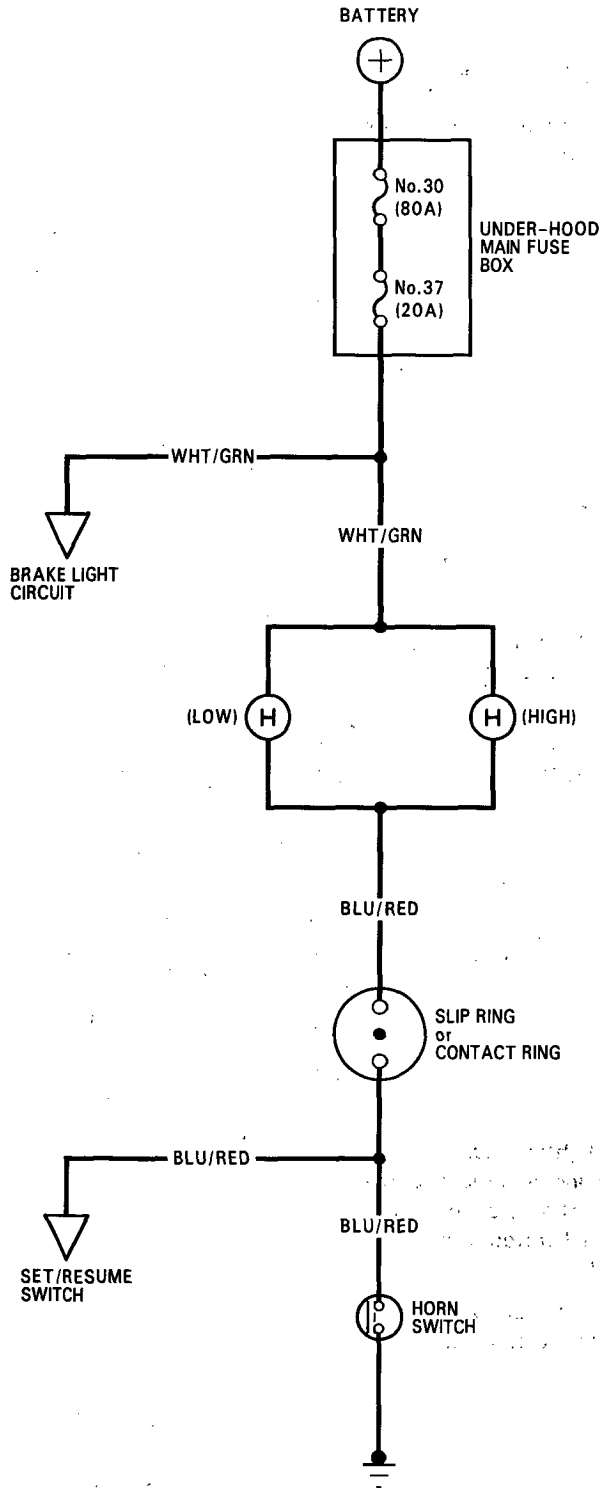


5. When installing the cigarette lighter, align each lug on the face panel, illumination ring, and the cigarette lighter socket with the slot in the hole, then position the bulb case on the thermal protector between the stops of the center panel.
6. Make sure that the ground wire, bulb socket, and thermofuse case are seated to the cigarette lighter assembly.

# Horns



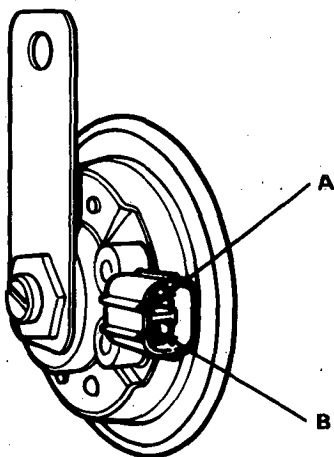
## Circuit Diagram



# Horns

## Test

1. Remove the front bumper.
2. Disconnect the 2-P connector from the horn.
3. Remove the low and high horns.
4. Test the horn by connecting battery power to one terminal and grounding the other. The horn should sound.



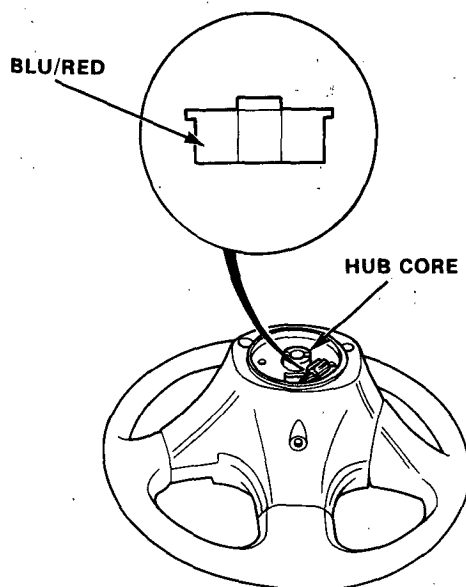
5. Replace the horn if it fails to sound.

## Switch Test

1. Remove the steering wheel, then turn it over.
2. Check for continuity between the hub core and the contact ring (or the hub core and the BLU/RED lead for cars equipped with cruise control) according to the table.

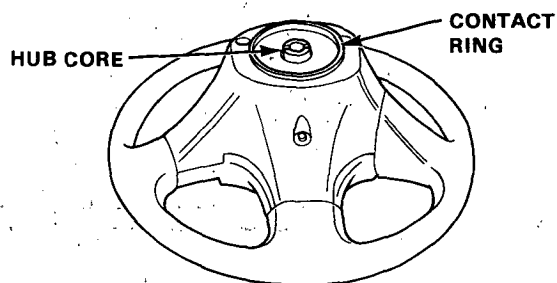
### With Cruise Control :

Terminal Position	HUB CORE	BLU/RED
PRESS	○	○
FREE		



### Without Cruise Control :

Terminal Position	HUB CORE	BLU/RED
PRESS	○	○
FREE		

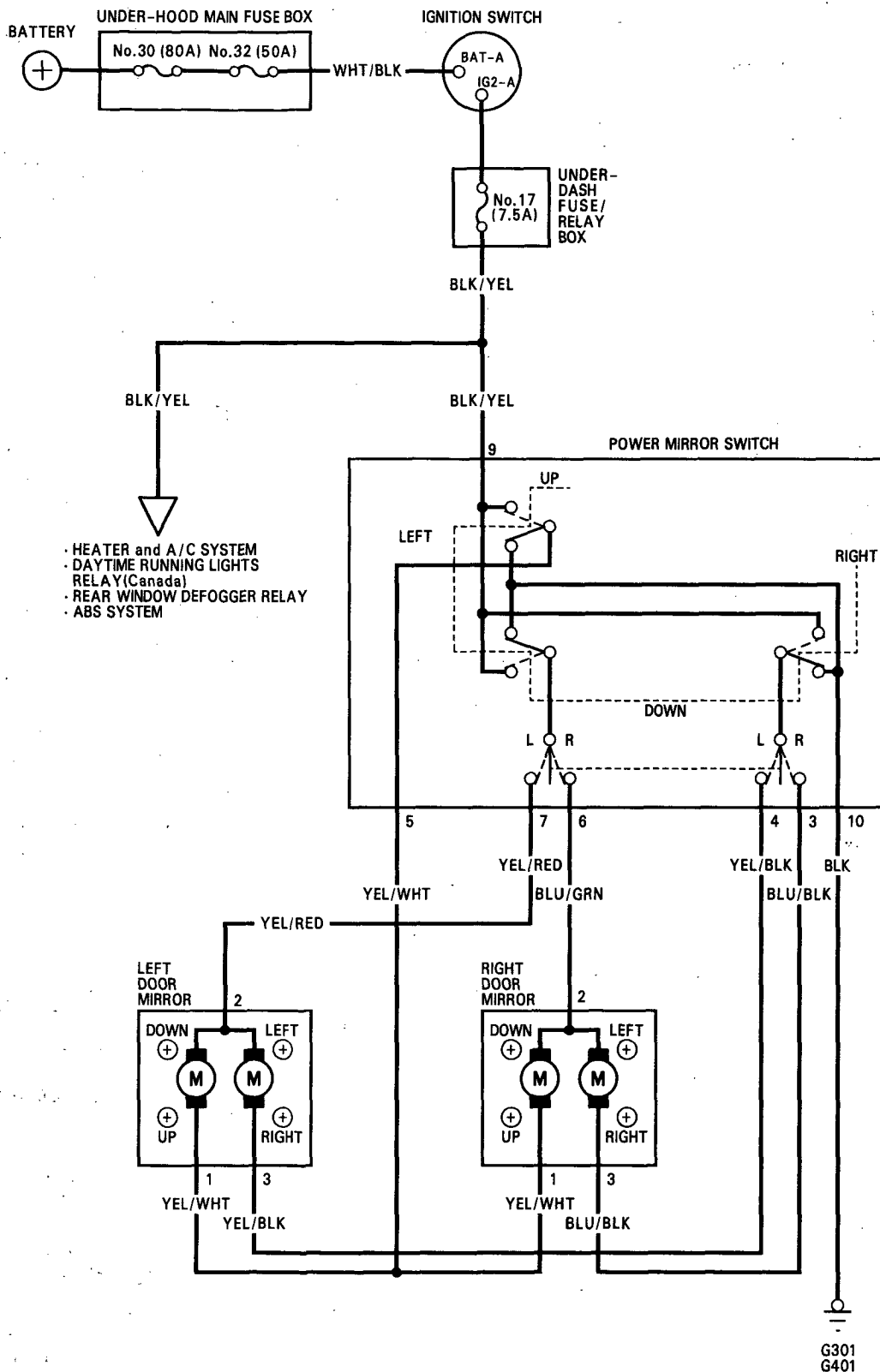


3. If OK, reinstall the steering wheel, then test the switch.



# Power Mirrors

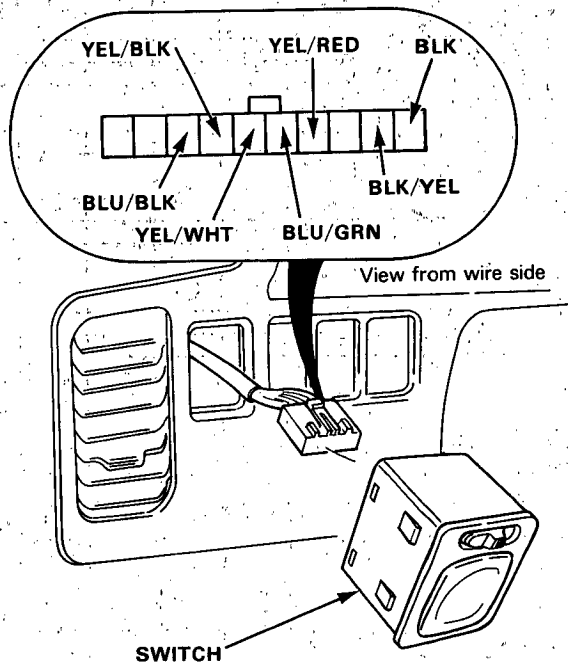
## Circuit Diagram



# Power Mirrors

## Mirror Function Test

1. Remove the dashboard lower cover and push out the switch from behind the instrument panel.
2. Disconnect the 10-P connector to remove the switch:



### One or both mirrors inoperative:

1. Check for voltage between the BLK/YEL terminal and body ground with the ignition switch ON. There should be battery voltage.
  - If there is no voltage, check for:
    - Blown No. 17 (7.5A) fuse in the under-dash fuse/relay box.
    - An open in the BLK/YEL wire.
  - If there is battery voltage, go to step 2.

2. Check for continuity between the BLK terminal and body ground. There should be continuity. If there is no continuity, check for:
  - An open in the BLK wire.
  - Poor ground (G301, G401).

### Left mirror inoperative:

Connect the BLK/YEL terminal to the YEL/RED terminal and the YEL/WHT or YEL/BLK terminal to the body ground with jumper wires.

The left mirror should tilt down (or swing left) with the ignition switch ON.

- If the mirror does not tilt down (or swing left), remove the left door panel and check for an open in the wires between the left mirror and the switch (YEL/WHT, YEL/BLK). If the wire is OK, check the left mirror actuator.
- If the mirror neither tilts down nor swings left, repair the YEL/RED wire between the switch and the left mirror.
- If the mirror operates properly, check the mirror switch.

### Right mirror inoperative:

Connect the BLK/YEL terminal to the BLU/GRN terminal and the YEL/WHT or BLU/BLK terminal to the body ground with jumper wires.

The right mirror should tilt down (or swing left) with the ignition switch ON.

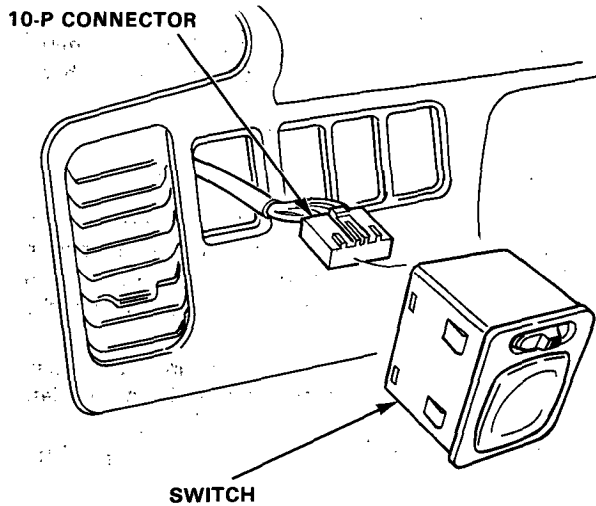
- If the mirror does not tilt down (or swing left), remove the right door panel and check for an open in the wires between the right mirror and the switch (YEL/WHT, BLU/BLK). If the wire is OK, check the right mirror actuator.
- If the mirror neither tilts down nor swings left, repair the BLU/GRN wire between the switch and the right mirror.
- If the mirror operates properly, check the mirror switch.





## Switch Removal

1. Remove the dashboard lower cover.
2. Push out the switch from behind the instrument panel, then disconnect the 10-P connector to remove the switch.

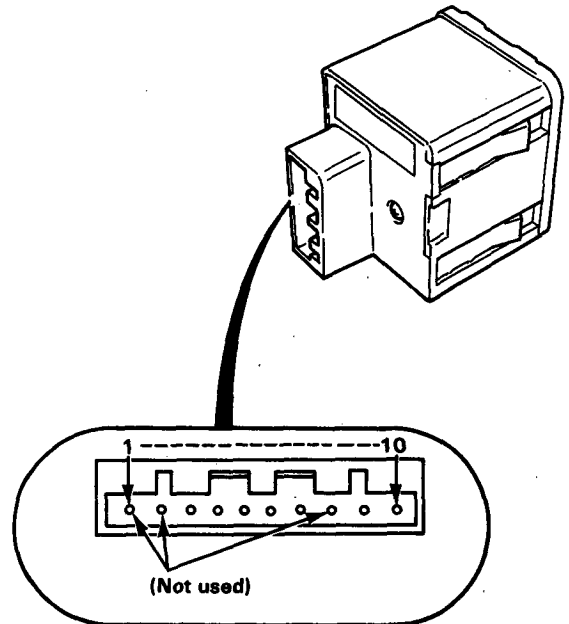


## Switch Test

1. Remove the power mirror switch from the instrument panel.
2. Check for continuity between the terminals in each switch position according to the table.

### Mirror Switch

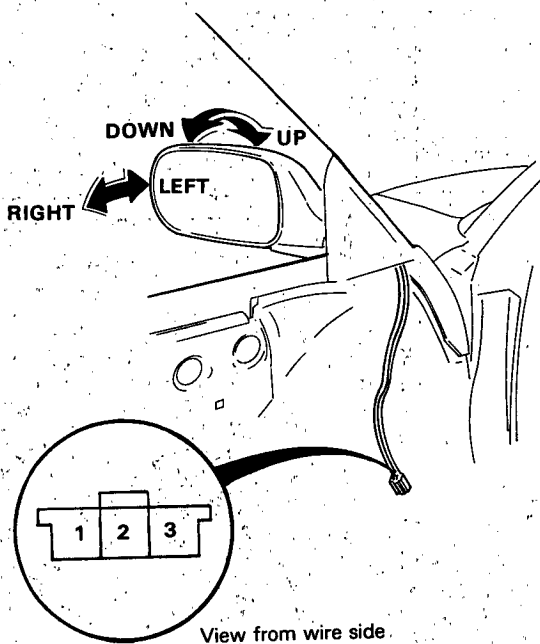
Terminal Position		3	4	5	6	7	9	10
Right	OFF	○		○	○			○
	UP			○			○	
	DOWN	○					○	
	LEFT			○			○	
	RIGHT	○			○		○	
Left	OFF		○	○		○		○
	UP			○			○	
	DOWN		○			○	○	
	LEFT			○			○	
	RIGHT		○			○	○	



# Power Mirrors

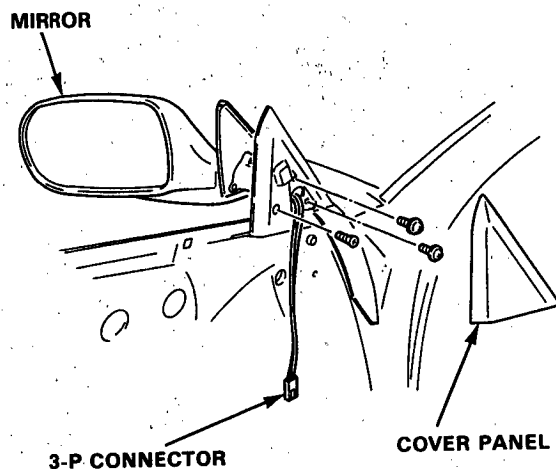
## Mirror Actuator Test

1. Remove the door panel, then disconnect the 3-P connector from the mirror actuator.
2. Test actuator operation:  
TILP UP: Connect battery power to the No.1 terminal and ground to the No.2 terminal:  
TILT DOWN: Connect battery power to the No.2 terminal and ground to the No.1 terminal:  
SWING LEFT: Connect battery power to the No.2 terminal and ground to the No.3 terminal.  
SWING RIGHT: Connect battery power to the No.3 terminal and ground to the No.2 terminal.
3. If the mirror fails to operate properly, replace it.



## Mirror Replacement

1. Remove the door panel, then disconnect the 3-P connector from the mirror.
2. Carefully pry out the cover panel with a flat tip screwdriver.
3. While holding the mirror with one hand, remove its mounting screws with the other.



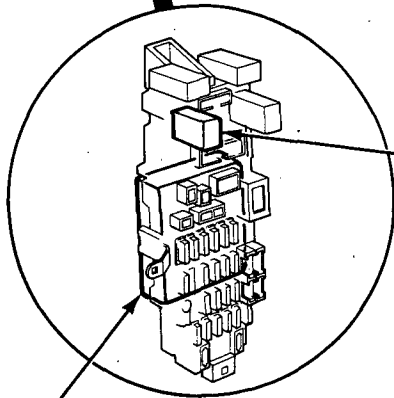
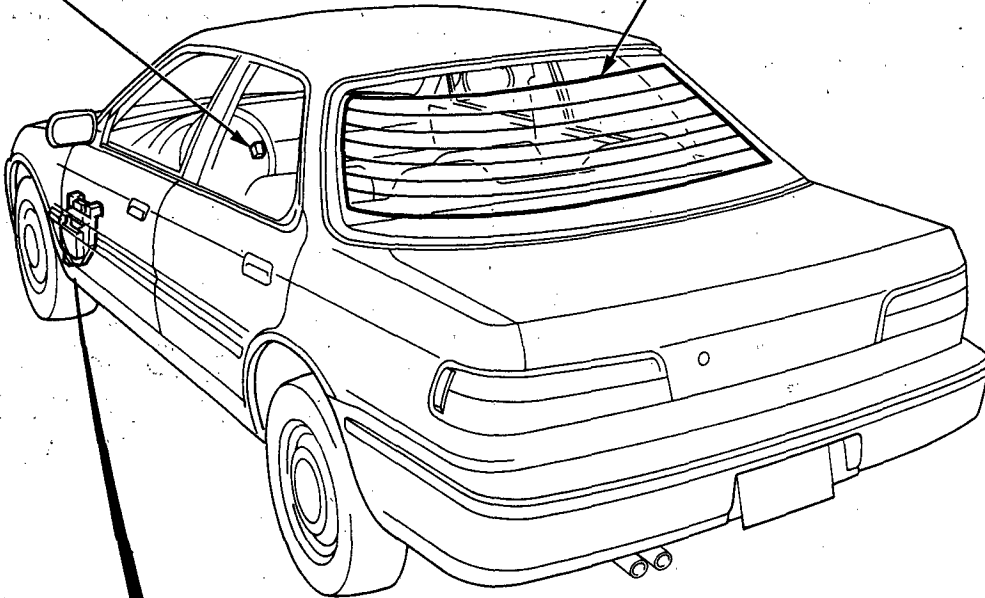
# Rear Window Defogger



## Component Location Index

**REAR WINDOW  
DEFOGGER SWITCH**  
Test, page 23-190

**REAR WINDOW DEFOGGER**  
Function Test, page 23-191



**REAR WINDOW  
DEFOGGER RELAY**  
Test, page 23-190

**REAR WINDOW  
DEFOGGER TIMER CIRCUIT**  
(Built into the integrated control unit)  
Input Test, page 23-134

## Description

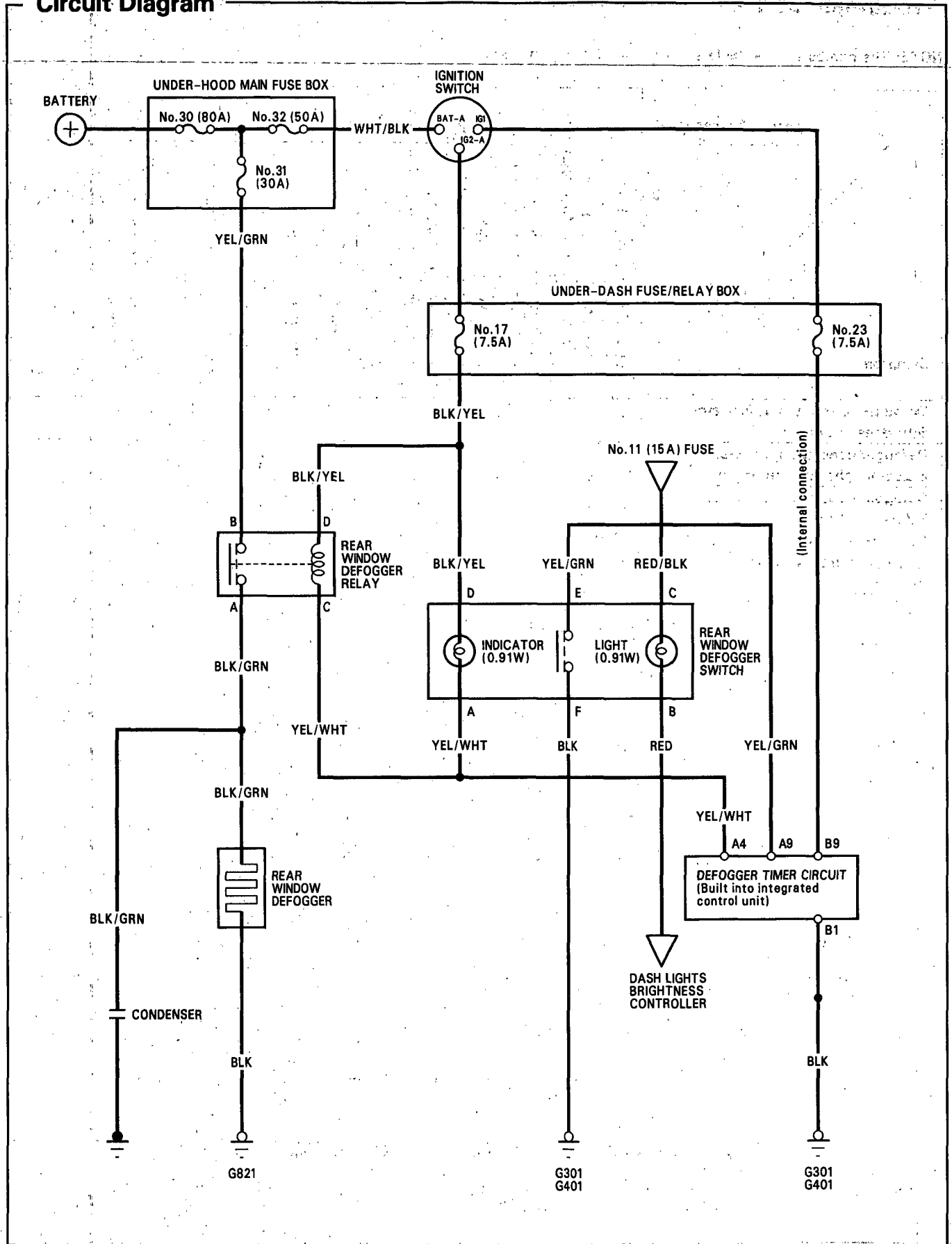
### Function:

The rear window defogger is controlled by the integrated control unit. When the defogger switch in the instrument panel is pushed, it sends a signal to the defogger timer in the integrated control unit and the defogger stays on for about 25 minutes or until the ignition is switched off.

The indicator light in the switch glows when the defogger is operating.

# Rear Window Defogger

## Circuit Diagram





## troubleshooting

JTE: The numbers in the table show the troubleshooting sequence.

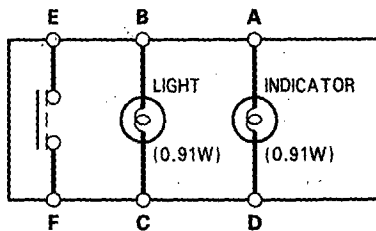
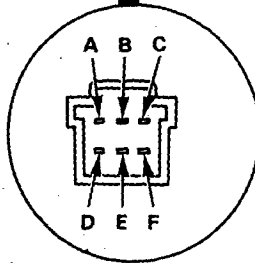
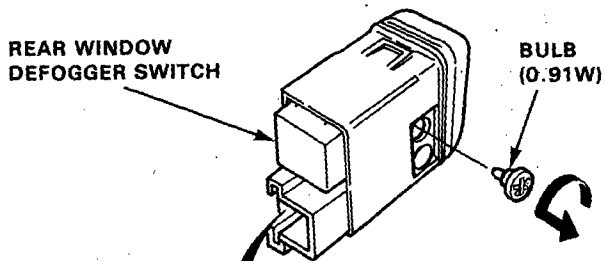
Symptom	Blown indicator light bulb	Blown No.17 (7.5A) fuse (in the under-dash fuse/relay box)	Defogger timer circuit input (in the integrated control unit)	Blown No.23 (7.5A) fuse (in the under-dash fuse/relay box)	Blown No.31 (30A) fuse (in the under-hood main fuse box)	Function test	Defogger relay	Broken defogger wire	Poor ground	Open circuit, loose or disconnected terminals
Defogger operates, but indicator light does not go on.	1									BLK/YEL or YEL/WHT
Defogger does not operate and indicator light does not go on.		1	3	2					G301 G401	YEL/WHT
Defogger does not operate, but indicator light goes on.					1	2	3	4	G821	YEL/WHT or BLK/GRN
Operation time is too long or too short. (normal operation time is about 25 minutes).			1							YEL/GRN or BLK

# Rear Window Defogger

## Switch Test

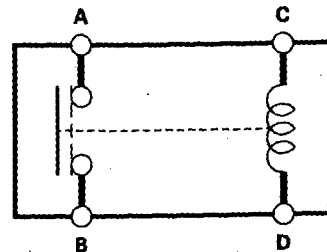
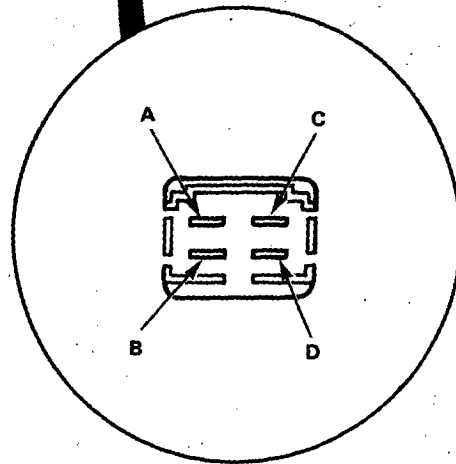
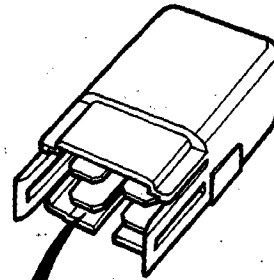
1. Remove the switch from the instrument panel (see page 23-115).
2. Check for continuity between the terminals according to the table.

Terminal	E	F	A	D	B	C
Position						
PUSHED	○	○	○	○	○	○
RELEASED			○	○	○	○



## Relay Test

1. Remove the relay from the under-dash fuse/relay box.
2. There should be continuity between the C and D terminals.
3. There should be continuity between the A and B terminals when battery power and ground are connected to the C and D terminals. There should be no continuity when power is disconnected.

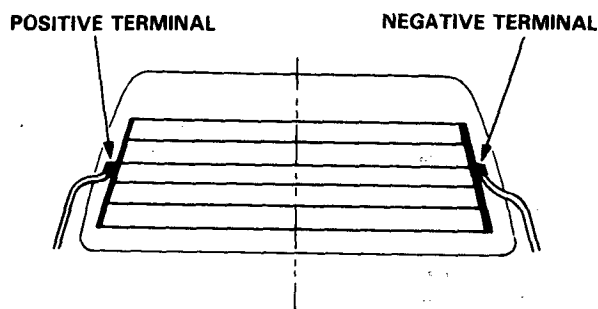




## Function Test

**CAUTION:** Be careful not to scratch or damage the defogger wires with the tester probe end.

1. Check for voltage between the positive terminal and body ground with the ignition switch and the defogger switch ON.  
There should be battery voltage.
  - If there is no voltage, check for:
    - Faulty defogger relay.
    - An open in the BLK/GRN or YEL/GRN wire.
  - If there is battery voltage, go to step 2.

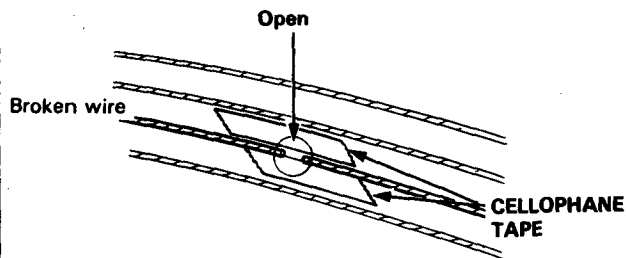


2. Check for continuity between the negative terminal and body ground.  
If there is no continuity, check for an open in the defogger ground wire.
3. Connect the voltmeter positive probe to the center of each defogger wire, and the negative probe to the negative terminal.  
There should be approximately 6 V with the ignition switch and the defogger switch ON.
  - If the voltage is as specified, the defogger wire is OK.
  - If there is battery voltage, the defogger wire is broken in the negative side of the center.
  - If there is no voltage the defogger wire is broken in the positive side of the center.

## Defogger Wire Repair

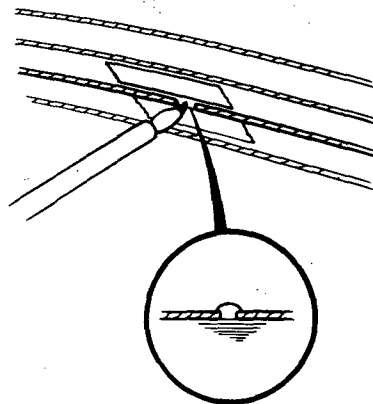
**NOTE:** The repair section must be no longer than 25 mm (1.0 in).

1. Lightly scour the area around the break with fine steel wool, then clean it with alcohol.
2. Carefully mask above and below the broken portion of the defogger wire with cellophane tape.



3. Using a small brush, apply heavy coat of silver conductive paint extending about 3 mm (0.125 in) on both sides of the break. Allow 30 minutes to dry.

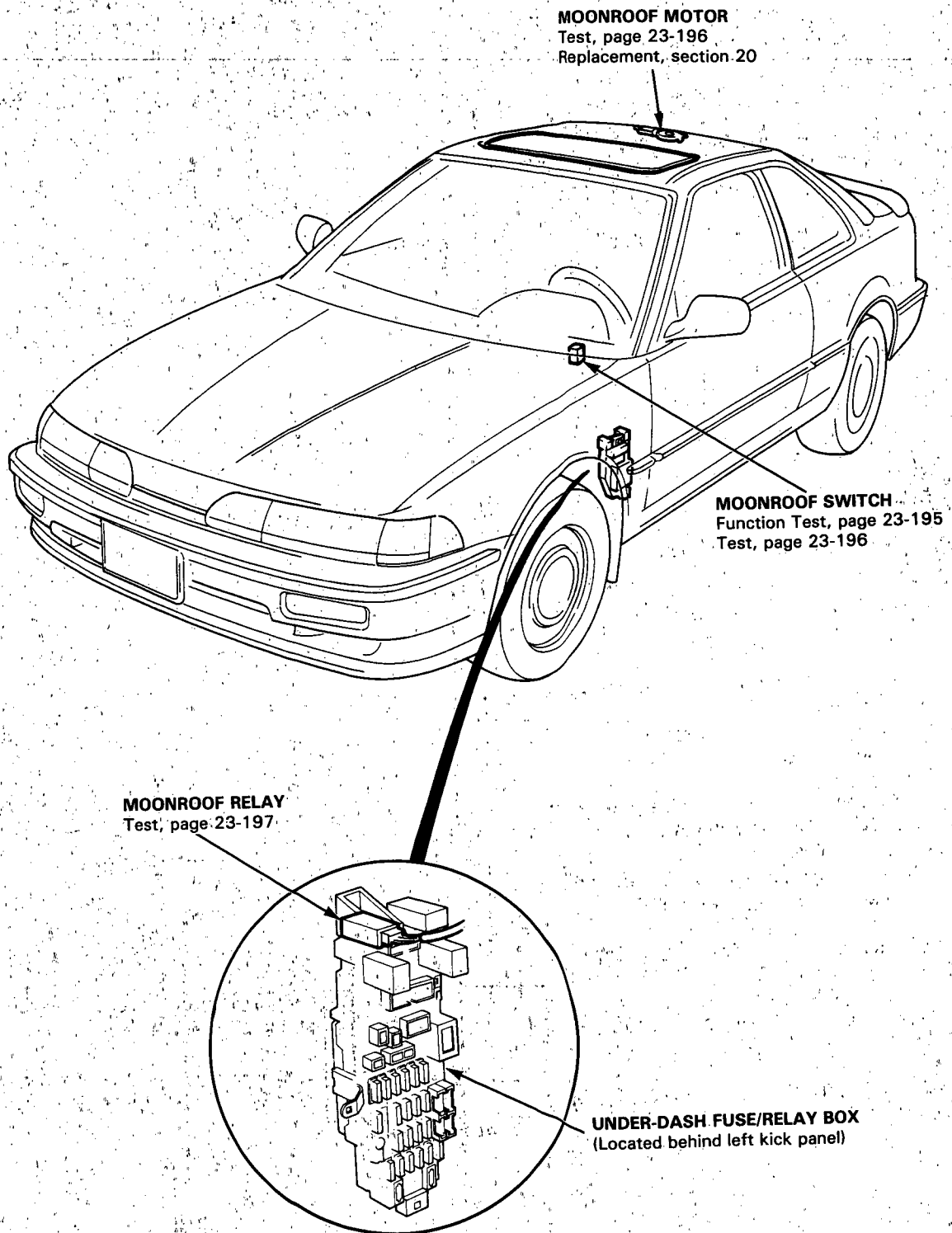
**NOTE:** Thoroughly mix paint before use.



4. Check for proper operation with a voltmeter (half of battery voltage at the halfway-point).
5. Apply a second coat of paint in the same way. Let it dry three hours before removing the tape.

# Moonroof

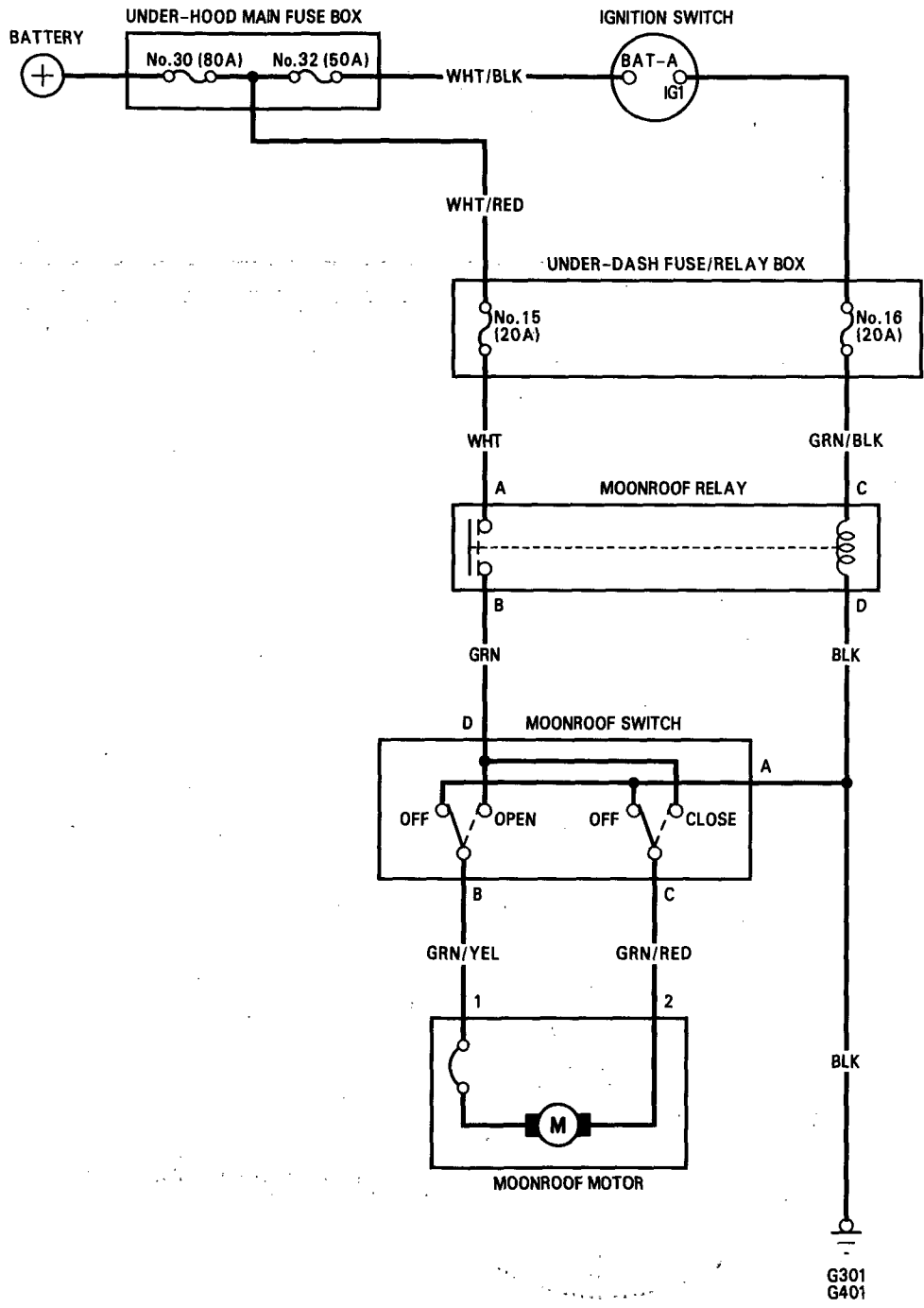
## Component Location Index







# Circuit Diagram



# Moonroof

## Electrical Troubleshooting

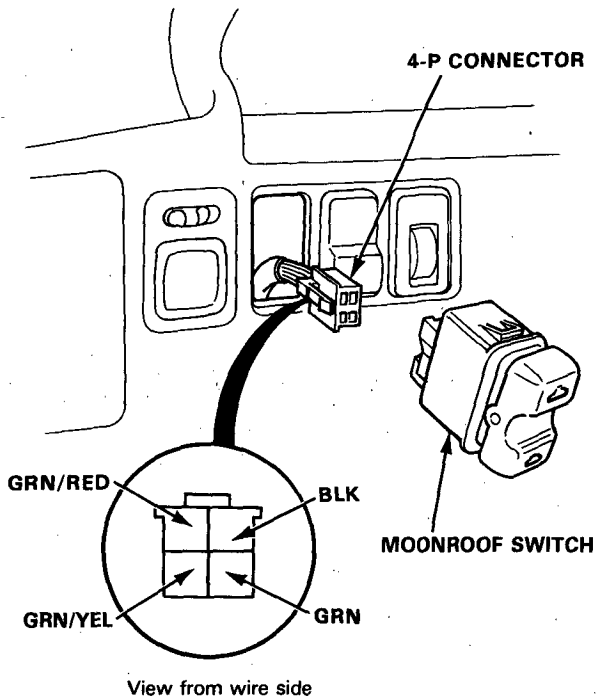
NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected		Clutch out of adjustment, foreign matter stuck between guide rail and moonroof, or outer cable not attached properly	Blown No. 15 (20A) fuse (In the under-dash fuse/relay box)	Blown No. 16 (20A) fuse (In the under-dash fuse/relay box)	Function test	Moonroof relay	Moonroof motor	Moonroof switch	Poor ground	Open circuit, loose or disconnected terminals.
Symptom										
Moonroof does not move, but motor runs.		1								
Moonroof does not move and motor does not run (moonroof can be moved with moonroof wrench).	In all switch positions.		1	2	3	4	5		G301 G401	WHT, GRN/BLK, GRN, BLK
	With OPEN switch.					2		1		GRN/YEL.
	With CLOSE switch.					2		1		GRN/RED



## Function test

1. Remove the dashboard lower cover.
2. Push out the switch from behind the instrument panel, then disconnect the 4-P connector to remove the switch.



3. Check for continuity between the BLK terminal and body ground.
  - If there is no continuity, check for:
    - An open in the BLK wire.
    - Poor ground (G301, G401).
  - If there is continuity, go to step 4.

4. Check for voltage between the GRN terminal and BLK terminal with ignition switch ON. There should be battery voltage.

- If there is no battery voltage, check for:
  - Blown No. 16 (20A) or No. 15 (20A) fuse.
  - An open in the wires (GRN/BLK, GRN, WHT) or loose terminals.
  - Faulty moonroof relay.

- If there is battery voltage, go to step 5.

5. Connect the GRN terminal to the GRN/YEL terminal, and the GRN/RED terminal to the BLK terminal with jumper wires. The moonroof should open when the ignition switch is turned ON.

- If the moonroof opens, check the moonroof switch.
- If it doesn't open, remove the headlining and check the motor.

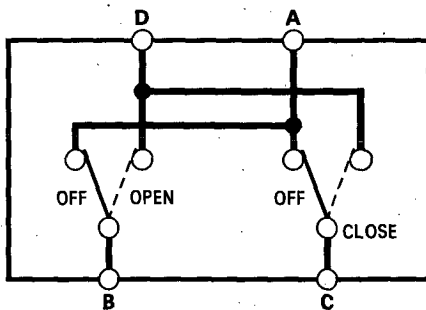
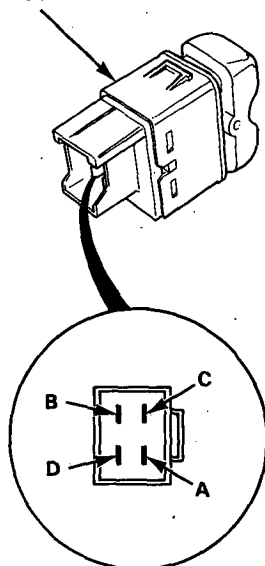
# Moonroof

## Switch Test

1. Remove the dashboard lower cover.
2. Push out the switch from behind the instrument panel, then disconnect the 4-P connector to remove the switch.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal	A	B	C	D
Position				
OFF	○	○	○	
OPEN		○		○
CLOSE			○	○

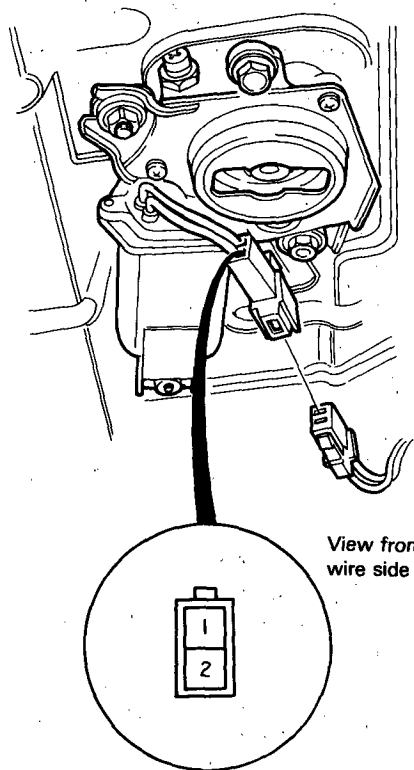
MOONROOF SWITCH



## Motor Test

1. Remove the headlining.
2. Disconnect the 2-P connector from the moonroof motor.
3. Test the motor by connecting battery power and ground to the No. 1 and No. 2 terminals: Test the motor in each direction by switching the leads from the battery.

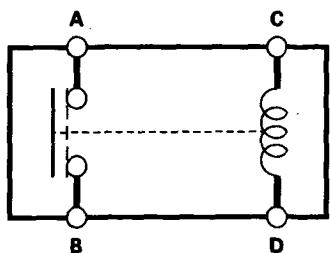
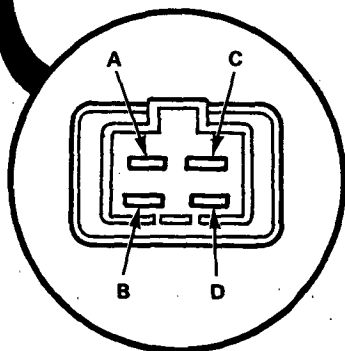
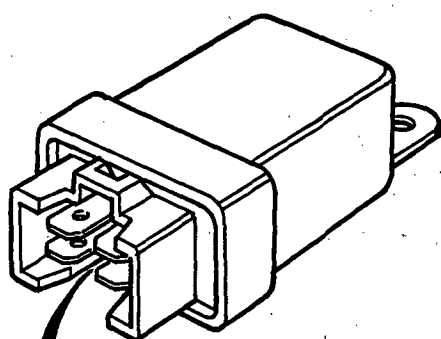
NOTE: See closing force check in section 20 for motor clutch test.





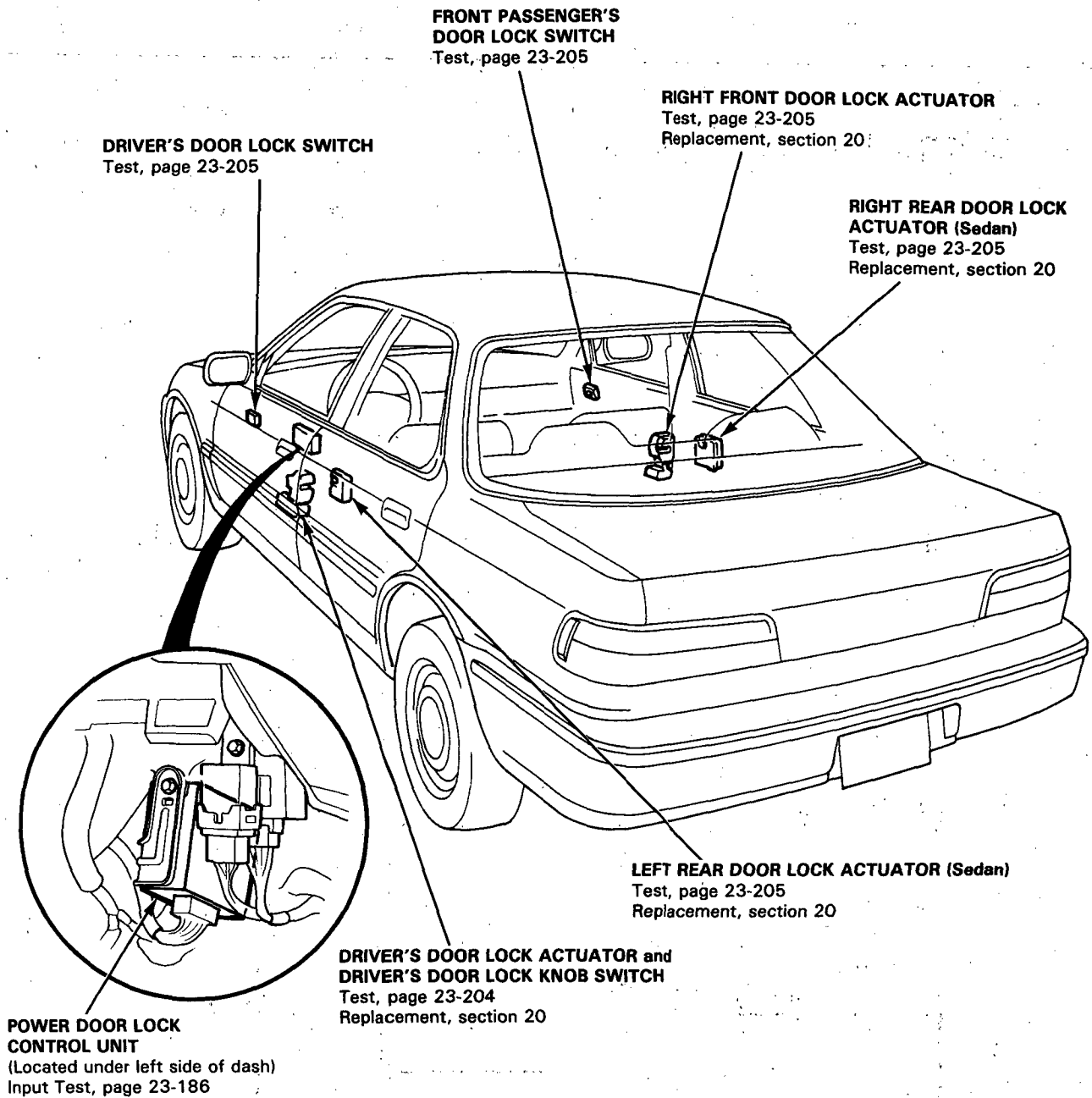
## Relay Test

1. Remove the relay from the under-dash fuse/relay box.
2. There should be continuity between the C and D terminals.
3. There should be continuity between the A and B terminals when battery power and ground are connected to the C and D terminals. There should be no continuity when power is disconnected.



# Power Door Locks

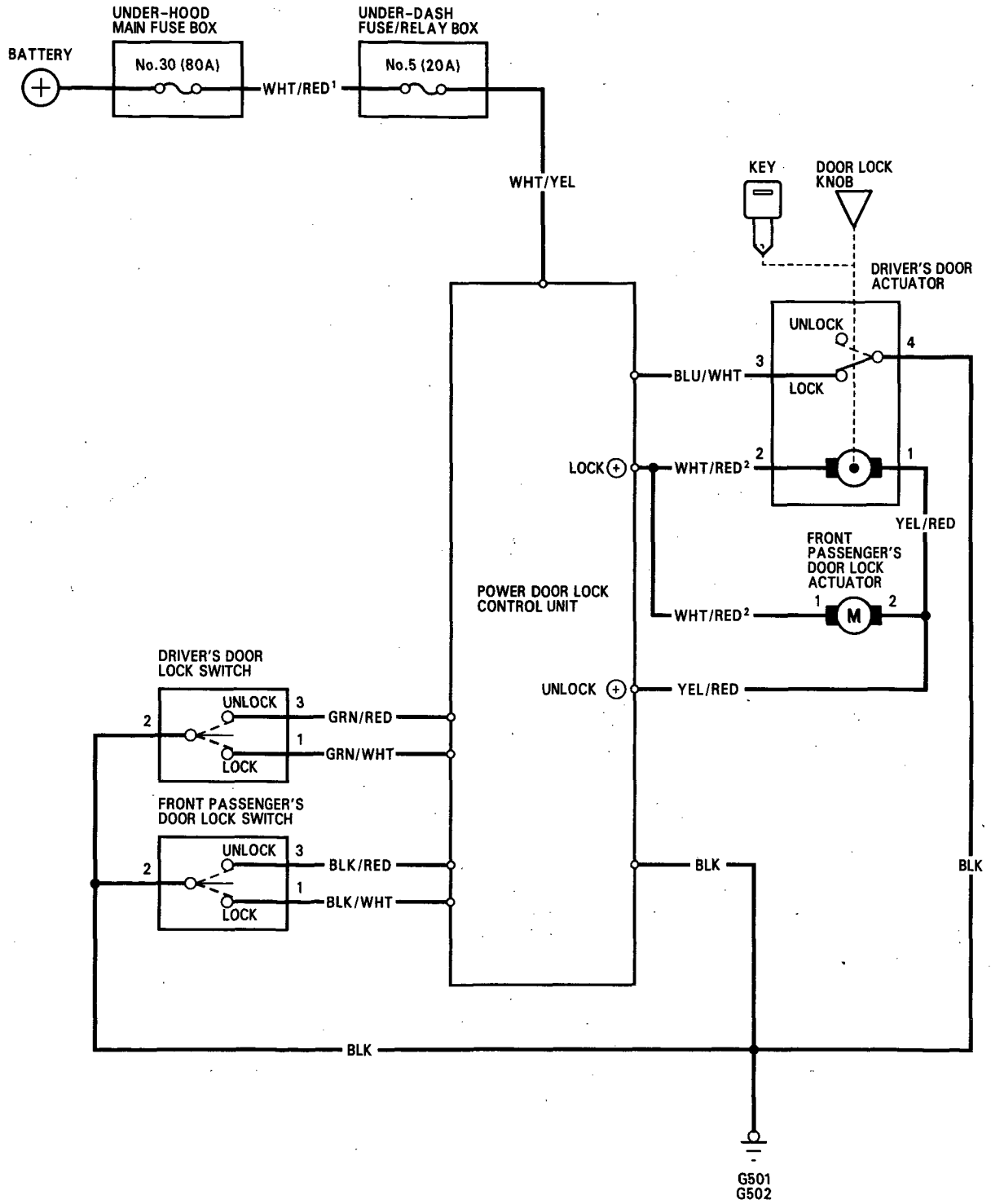
## Component Location Index





# Circuit Diagram (Hatchback)

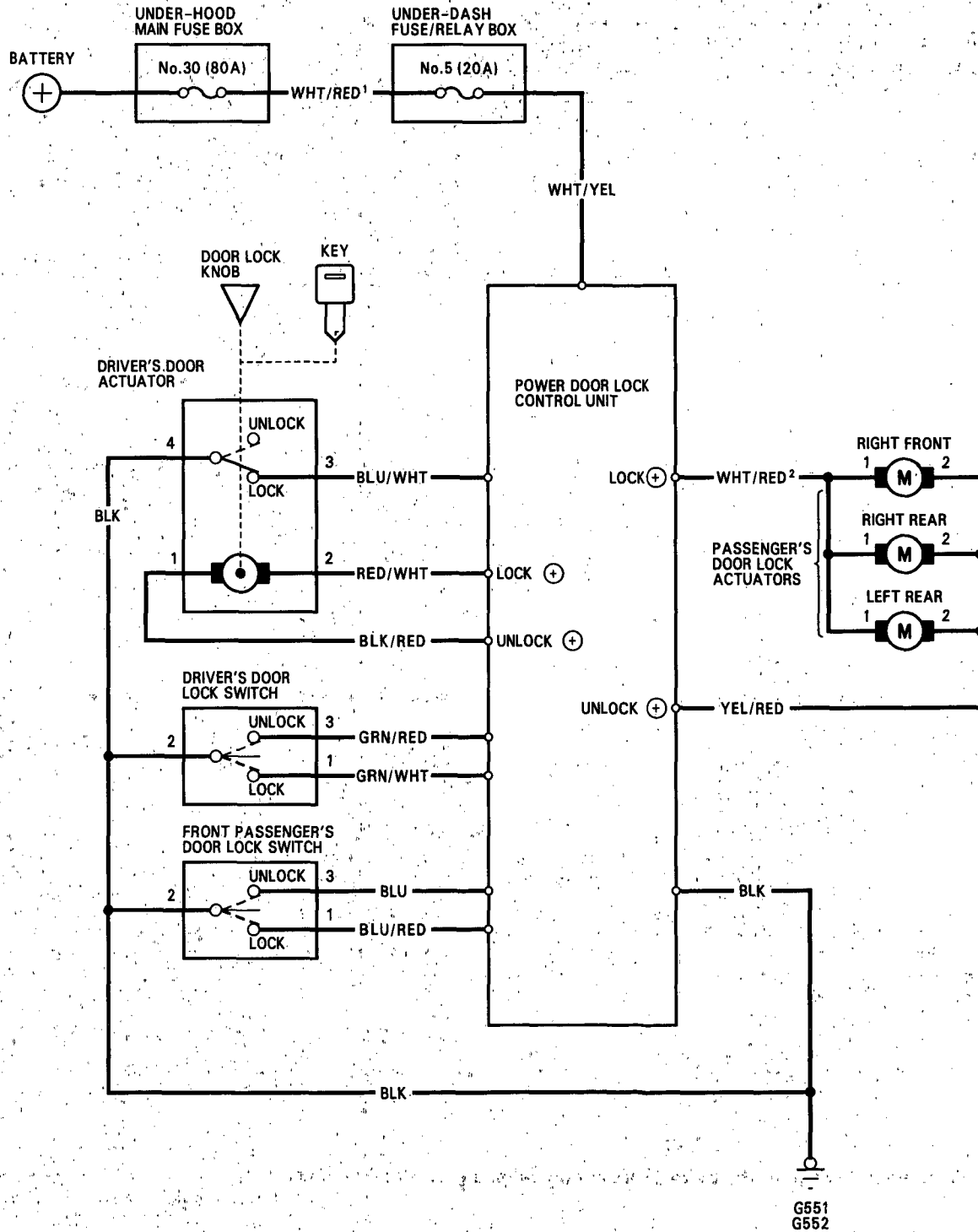
**NOTE:** Different wires with the same color have been given a number suffix to distinguish them (for example, WHT/RED<sup>1</sup> and WHT/RED<sup>2</sup> are not the same).



# Power Door Locks

## Circuit Diagram (Sedan)

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, WHT/RED<sup>1</sup> and WHT/RED<sup>2</sup> are not the same).







# Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom		Item to be inspected								
		Blown No.5 (20A) fuse (In the under-dash fuse/relay box)	Door lock knob switch (In the driver's door actuator)	Control unit input	Passenger door actuator	Disconnected or obstructed door lock rod/linkage	Driver's door lock switch	Passenger's door lock switch	Poor ground	Open circuit, loose or disconnected terminals
Power door lock system does not operate at all.		1		2					*1	WHT/RED <sup>1</sup> or WHT/YEL
Doors do not lock with driver's door lock knob switch.	All passenger doors.	1	2	3		4			*1	BLU/WHT, YEL/RED or WHT/RED <sup>2</sup>
	One or more passenger doors.				1	2				YEL/RED or WHT/RED <sup>2</sup>
Doors do not lock or unlock with driver's door lock switch.	All doors.	1		3		4	2		*1	GRN/RED, GRN/WHT, YEL/RED, WHT/RED <sup>2</sup> , BLK/RED (*2) or RED/WHT (*2)
	One or more doors.				1	2				YEL/RED, WHT/RED <sup>2</sup> , BLK/RED (*2) or RED/WHT (*2)
Doors do not lock or unlock with front passenger's door lock switch.	All doors.	1		3		4		2	*1	BLU(*2), BLU/RED(*2), BLK/RED (*3), BLK/WHT (*3), YEL/RED, WHT/RED <sup>2</sup> , BLK/RED (*2) or RED/WHT (*2)
	One or more doors.				1					YEL/RED, WHT/RED <sup>2</sup> , BLK/RED (*2) or RED/WHT (*2)

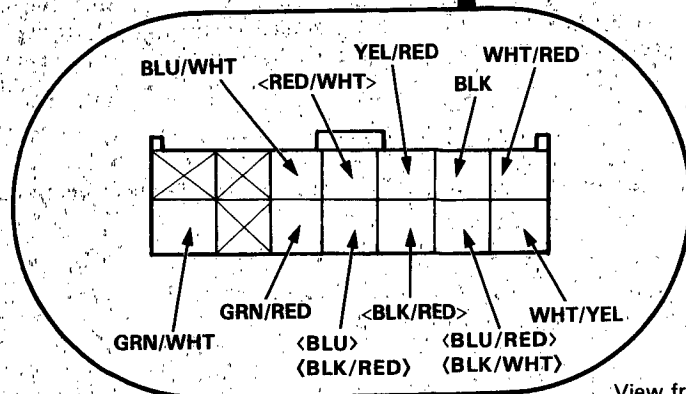
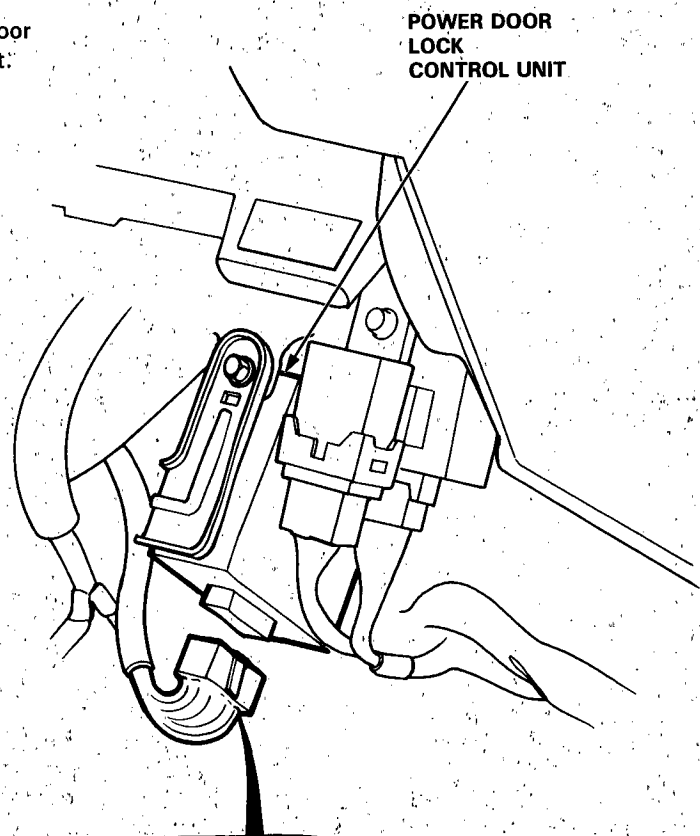
**CAUTION:** To prevent damage to the motor, connect power and ground only momentarily.

- \*1: G501, G502 (Hatchback)  
G551, G552 (Sedan)
- \*2: Sedan
- \*3: Hatchback

# Power Door Locks

## Control Unit Input Test

1. Remove the dashboard lower cover and left knee bolster, then disconnect the 14-P connector from the power door lock control unit.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
  - If the terminals lock OK, make the following input tests at the connector.
    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all input tests prove OK, the power door lock control unit must be faulty; replace it.



< >: Sedan  
< >: Hatchback

View from wire side



No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (※2).</li> <li>• An open in the wire.</li> </ul>
2	WHT/YEL	Under all conditions.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No.5 (20A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	GRN/WHT	Driver's door lock switch in LOCK.	Check for continuity to ground: It should go from battery voltage to 1V or less as the switch is turned.	<ul style="list-style-type: none"> <li>• Faulty driver's door lock switch.</li> <li>• Poor ground (※2).</li> <li>• An open in the wire.</li> </ul>
4	GRN/RED	Driver's door lock switch in UNLOCK.		
5	BLU/RED <BLK/WHT>	Front passenger's door lock switch in LOCK.	Check for continuity to ground: It should go from battery voltage to 1V or less as the switch is turned.	<ul style="list-style-type: none"> <li>• Faulty front passenger's door lock switch.</li> <li>• Poor ground (※2).</li> <li>• An open in the wire.</li> </ul>
6	BLU <BLK/RED>	Front passenger's door lock switch in UNLOCK.		
7	BLU/WHT	Driver's door lock knob in LOCK.	Check for continuity to ground: It should go from battery voltage to 1V or less.	<ul style="list-style-type: none"> <li>• Faulty driver's door actuator.</li> <li>• Poor ground (※2).</li> <li>• An open in the wire.</li> </ul>
8 ※1	RED/WHT and BLK/RED	Connect the WHT/YEL terminal to the RED/WHT terminal, and the BLK/RED terminal to the BLK terminal momentarily.	Check door lock operation: Driver's door should lock as the wires are connected momentarily.	<ul style="list-style-type: none"> <li>• Faulty driver's door actuator.</li> <li>• An open in the wire.</li> </ul>
		Connect the WHT/YEL terminal to the BLK/RED terminal, and the RED/WHT terminal to the BLK terminal momentarily.	Check door lock operation: Driver's door should unlock as the wires are connected momentarily.	
9	WHT/RED <sup>2</sup> and YEL/RED	Connect the WHT/YEL terminal to the WHT/RED <sup>2</sup> terminal, and the YEL/RED terminal to the BLK terminal momentarily.	Check door lock operation: Passenger doors should lock as the wires are connected momentarily.	<Sedan> <ul style="list-style-type: none"> <li>• Faulty passenger's door actuator.</li> <li>• An open in the wire.</li> </ul>
		Connect the WHT/YEL terminal to the YEL/RED terminal, and the WHT/RED <sup>2</sup> terminal to the BLK terminal momentarily.	Check door lock operation: Passenger doors should unlock as the wires are connected momentarily.	<Hachback> <ul style="list-style-type: none"> <li>• Faulty driver's door actuator.</li> <li>• Faulty passenger's door actuator.</li> <li>• An open in the wire.</li> </ul>

**CAUTION:** To prevent damage to the motor, connect power and ground only momentarily.

※1: Sedan

※2: G501, G502 (Hatchback)  
G551, G552 (Sedan)

< >: Hatchback

# Power Door Locks

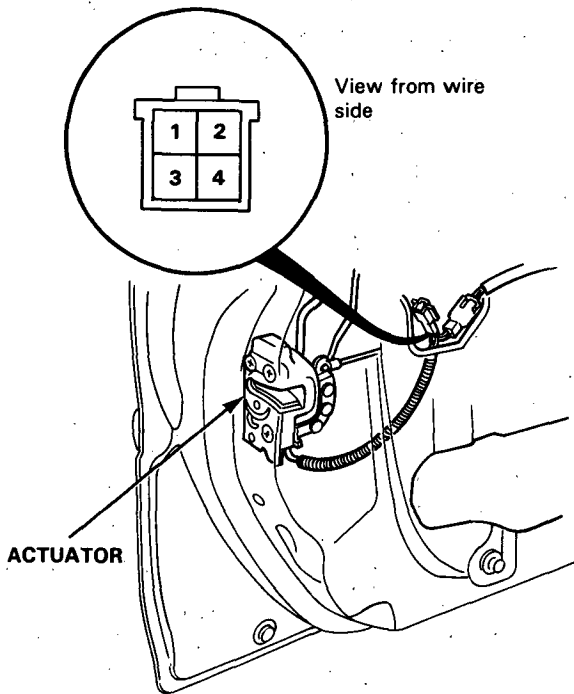
## Driver's Door Actuator Test

1. Remove the door panel.
2. Disconnect the actuator 4-P connector.
3. Test actuator operation:

**LOCK:** With battery power connected to the No. 2 terminal, connect ground to the No. 1 terminal momentarily.

**UNLOCK:** With battery power connected to the No. 1 terminal, connect ground to the No. 2 terminal momentarily.

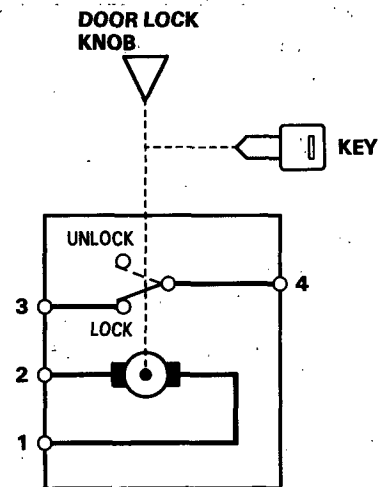
**CAUTION:** To prevent damage to the motor, connect power and ground only momentarily.



4. If the actuator fails to operate properly, replace it.

5. Check for continuity between the terminals in each switch position according to the table:

Terminal	3	4
Position		
LOCK	○	○
UNLOCK		





## Passenger Door Actuator Test

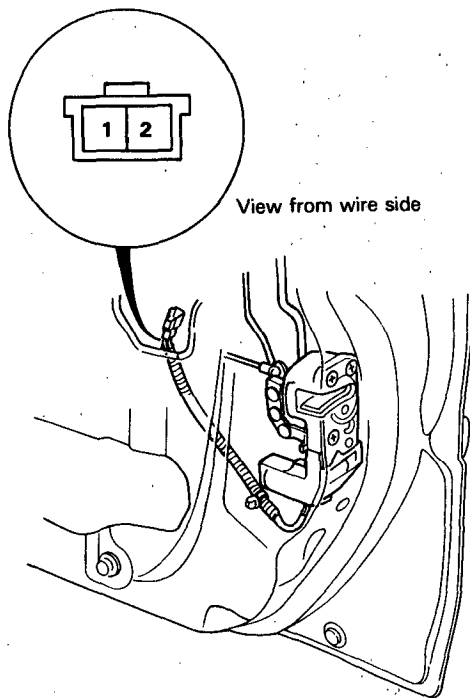
1. Remove the door panel.
2. Disconnect the actuator 2-P connector.
3. Test actuator operation:

**LOCK:** With battery power connected to the No. 1 terminal, connect ground to the No. 2 terminal momentarily.

**UNLOCK:** With battery power connected to the No. 2 terminal, connect ground to the No. 1 terminal momentarily.

**CAUTION:** To prevent damage to the motor, connect power and ground only momentarily.

**NOTE:** Right front actuator is shown; rear actuators are similar.

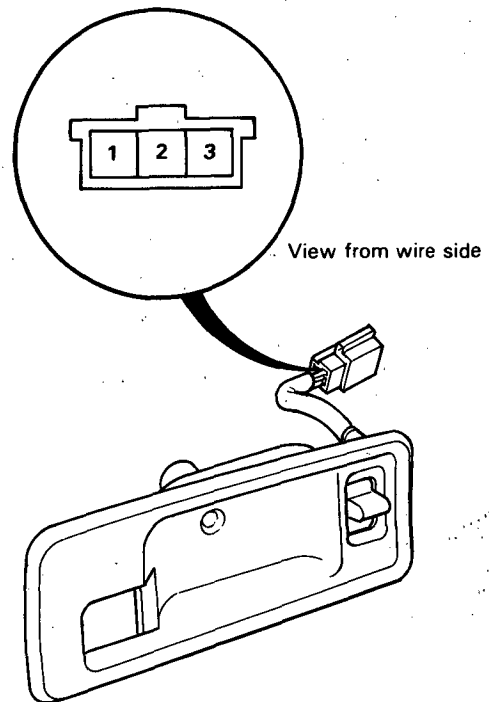


4. If the actuator fails to operate properly, replace it.

## Door Lock Switch Test

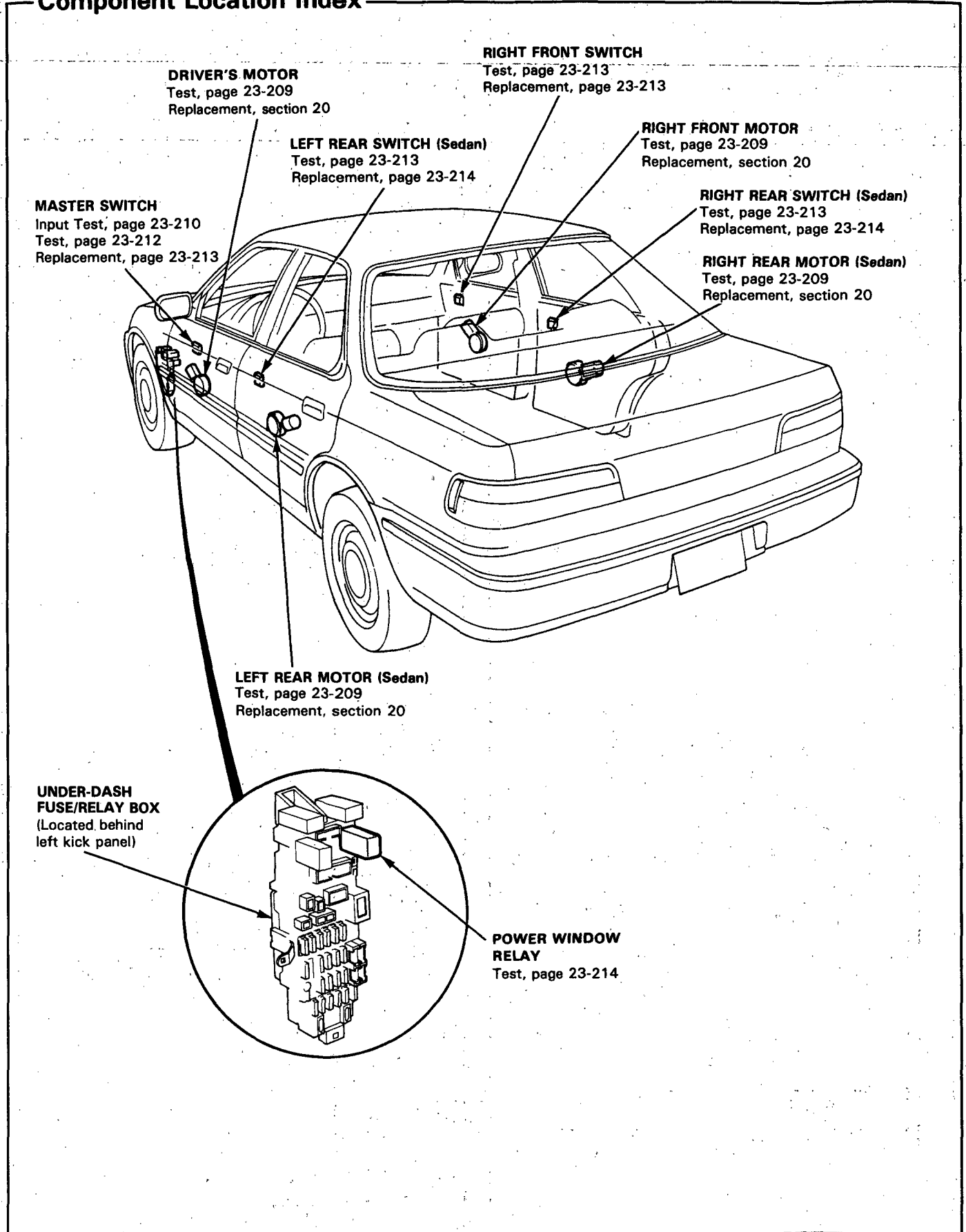
1. Remove the inside handle trim plate with the switch.
2. Disconnect the switch 3-P connector.
3. Check for continuity between the terminals in each switch position according to the tables.

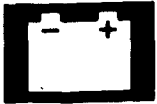
Terminal Position	1	2	3
UNLOCK		○—○	○
OFF			
LOCK	○—○		



# Power Windows

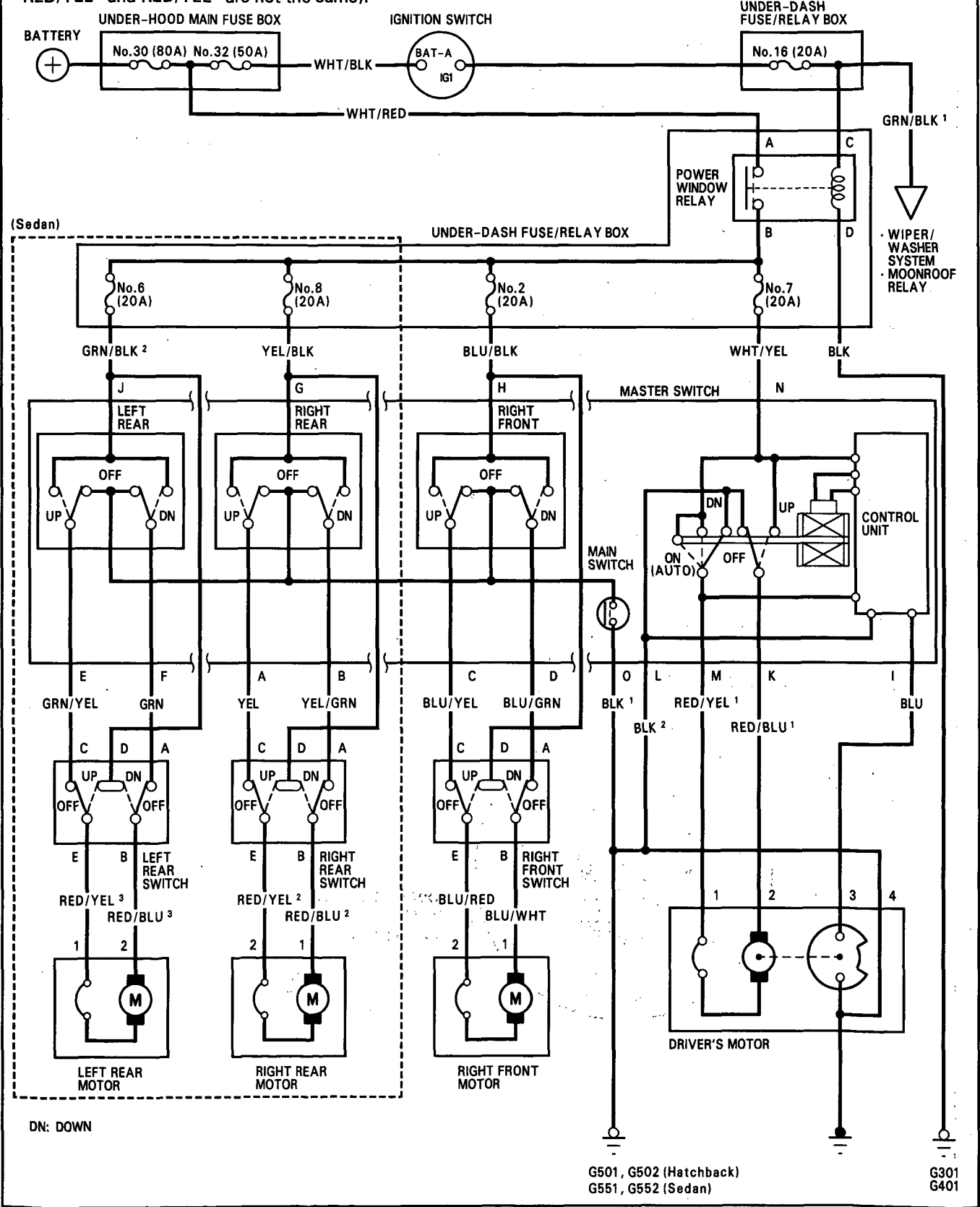
## Component Location Index





# Circuit Diagram

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, RED/YEL<sup>1</sup> and RED/YEL<sup>2</sup> are not the same).



# Power Windows

## Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected	Blown No. 16 (20A) fuse (In the under-dash fuse/relay box)		In the under-dash fuse/relay box				Driver's switch	Passenger's switch	Driver's motor	Pulser (In driver's motor)	Passenger's motor	Window regulator	Master switch input	Poor ground	Open circuit, loose or disconnected terminals
	Power window relay	Blown No. 7 (20A) fuse	Blown No. 2 (20A) fuse	Blown No. 8 (20A) fuse	Blown No. 6 (20A) fuse										
All windows do not operate.	1	2												*	WHT/RED, GRN/BLK <sup>1</sup>
Driver's window does not operate.			1					2				3	4		WHT/YEL
Driver's window does not operate in AUTO.						1			2				3		BLU
Passenger's windows do not operate.	Right front			1		2	3				4	5			BLU/BLK
	Left rear				1	2	3				4	5			GRN/BLK <sup>2</sup>
	Right rear				1	2	3				4	5			YEL/BLK

\* : G301, G401  
 G501, G502 (Hatchback)  
 G551, G552 (Sedan)

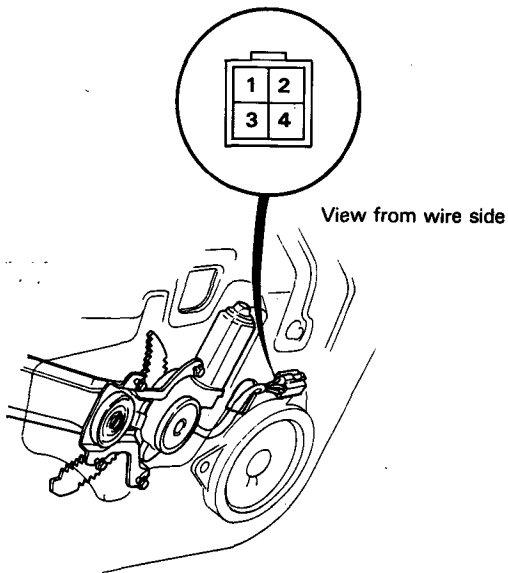




## Driver's Motor Test

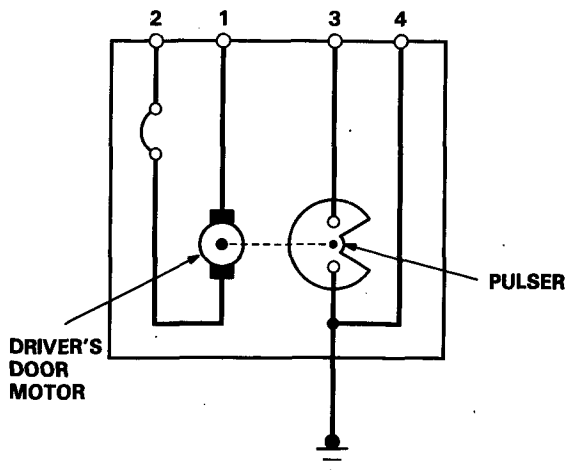
### Motor Test:

1. Remove the door panel (see section 20).
2. Disconnect the 4-P connector from the door wire harness.
3. Test the motor by connecting battery power and ground to the No. 1 and No. 2 terminals. Test the motor in each direction by switching the leads.
4. If the motor does not run, replace it.



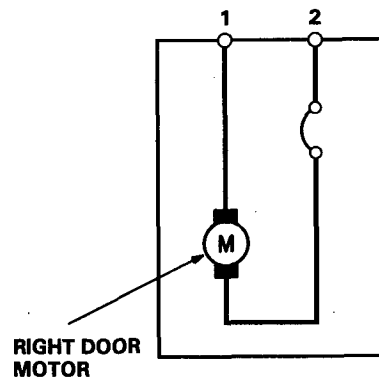
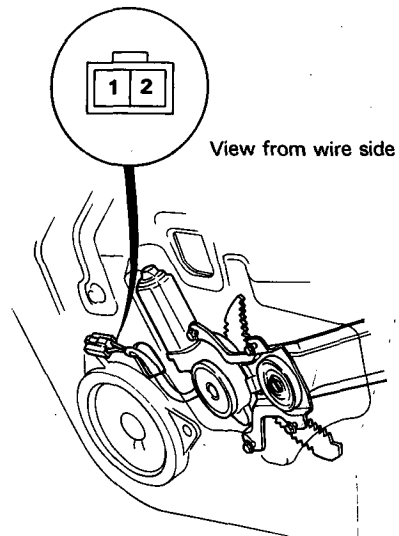
### Pulser Test:

Measure resistance between the No.3 and No.4 terminals when running the motor by connecting battery power and ground the No. 1 and No. 2 terminals. The ohmmeter should indicate between 20-50 ohms as the motor runs.



## Passenger's Motor Test

1. Remove the door panel (see section 20).
2. Disconnect the 2-P connector from the motor.
3. Test motor operation by connecting battery power and ground to the No. 1 and No. 2 terminals. Test the motor in each direction by switching the leads.
4. If the motor does not run, replace it.



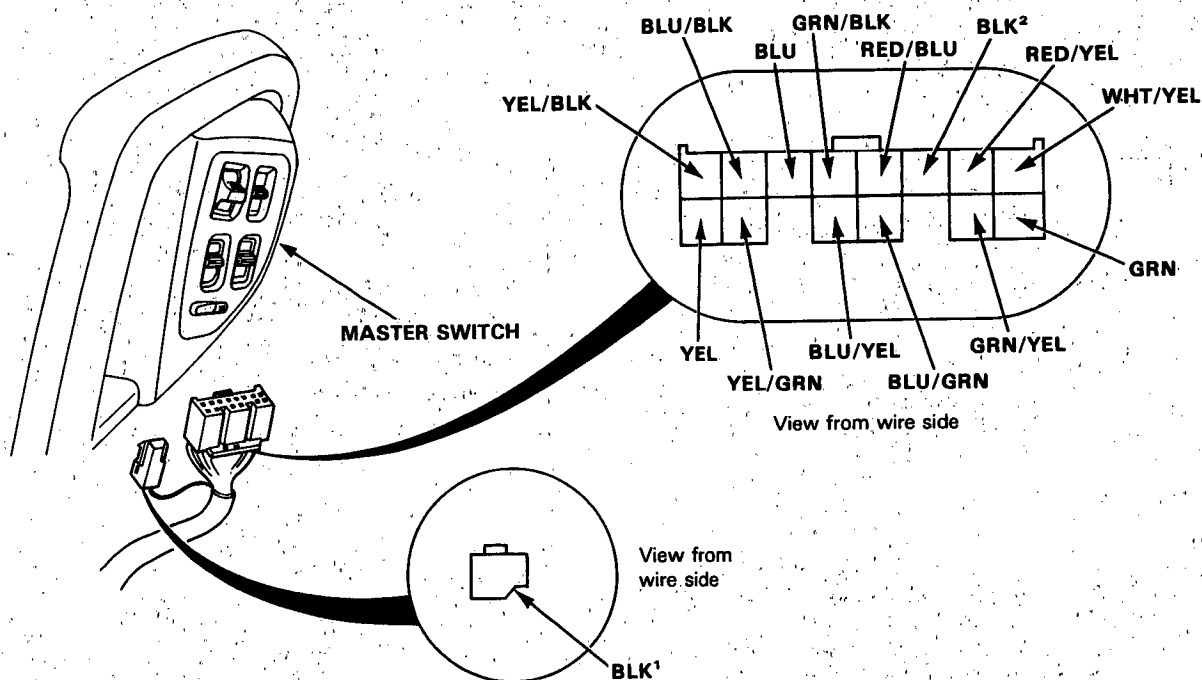
# Power Windows

## Master Switch Input Test

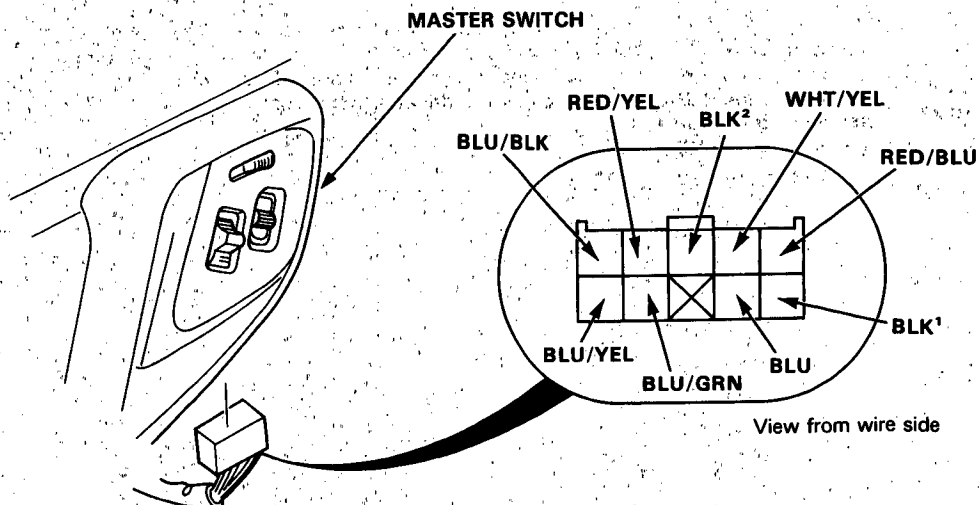
NOTE: The control unit is built into the master switch, and only controls the driver's door window operation.

1. Remove the driver's door panel, then disconnect the 14-P and 1-P connectors (Sedan), or 10-P connector (Hatchback) from the master switch.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the connectors.
    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all input tests prove OK, the master switch must be faulty; replace it.

Sedan:



Hatchback:





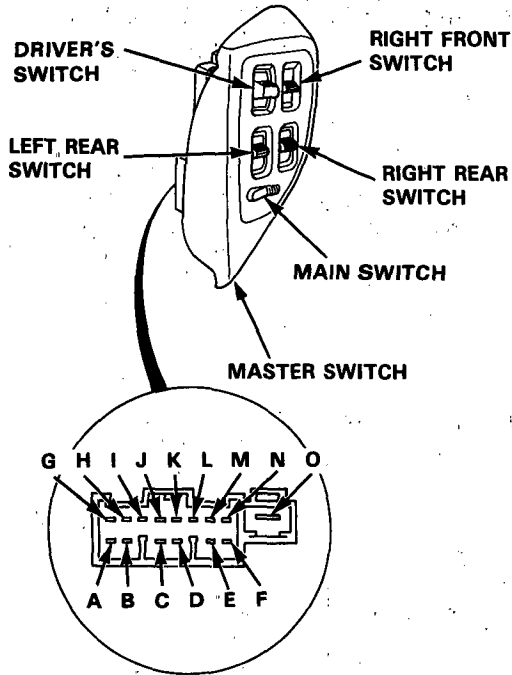
No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK <sup>1</sup>	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground G501, G502 (Hatch-back) or G551, G552 (Sedan).</li> <li>• An open in the wire.</li> </ul>
2	WHT/YEL	Ignition switch is ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No.2, 6, 7 or 8 (20A) fuse.</li> <li>• Faulty power window relay.</li> <li>• An open in the wire.</li> </ul>
	BLU/BLK			
	YEL/BLK			
	GRN/BLK			
3	RED/BLU and RED/YEL	Connect the WHT/YEL terminal to the RED/BLU terminal, and the RED/YEL terminal to the BLK terminal, then turn the ignition switch ON.	Check the driver's motor operation: It should run.	<ul style="list-style-type: none"> <li>• Faulty driver's motor.</li> <li>• An open in the wire.</li> </ul>
4	BLU/YEL and BLU/GRN	Connect the BLU/BLK terminal to the BLU/YEL terminal, and the BLU/GRN terminal to the BLK terminal, then turn the ignition switch ON.	Check the right front motor operation: It should run.	<ul style="list-style-type: none"> <li>• Faulty right front motor.</li> <li>• Faulty right front switch.</li> <li>• An open in the wire.</li> </ul>
5	YEL and YEL/GRN	Connect the YEL/BLK terminal to the YEL terminal, and the YEL/GRN terminal to the BLK terminal, then turn the ignition switch ON.	Check the right rear motor operation: It should run.	<ul style="list-style-type: none"> <li>• Faulty right rear motor.</li> <li>• Faulty right rear switch.</li> <li>• An open in the wire.</li> </ul>
6	GRN/YEL and GRN	Connect the GRN/BLK terminal to the GRN/YEL terminal, and the GRN terminal to the BLK terminal, then turn the ignition switch ON.	Check the left rear motor operation: It should run.	<ul style="list-style-type: none"> <li>• Faulty left rear motor.</li> <li>• Faulty left rear switch.</li> <li>• An open in the wire.</li> </ul>
7	BLU and BLK <sup>2</sup>	Connect the WHT/YEL terminal to the RED/YEL terminal, and the BLK terminal to the RED/BLU terminal, then turn the ignition switch ON.	Check for resistance between the BLU and BLK terminals: Between 20—50 ohms should be indicated as the driver's motor runs.	<ul style="list-style-type: none"> <li>• Faulty pulser.</li> <li>• Faulty driver's motor.</li> <li>• An open in the wire.</li> </ul>

# Power Windows

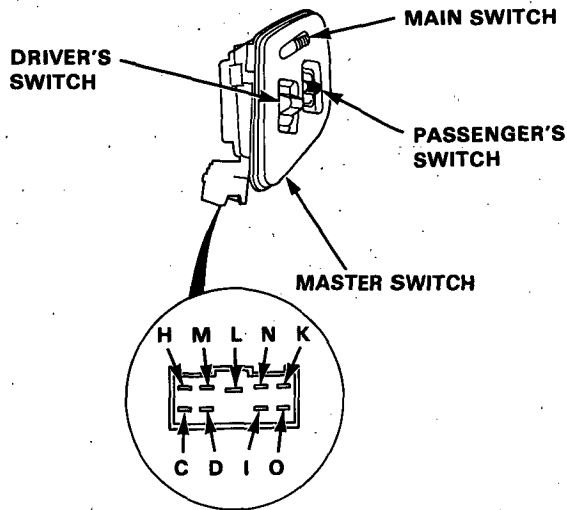
## Master Switch Test

1. Remove the door panel (see section 20).
2. Check for continuity between the terminals in each switch position according to the tables.

Sedan:



Hatchback:



### Driver's Switch

Terminal		N	L	M	K
Position					
OFF			○	○	○
UP		○			○
DOWN		○		○	
DOWN (AUTO)		○		○	

### Right Front Switch (Passenger's Switch)

Terminal		H	C	D	O
Position	Main switch				
OFF	ON		○	○	○
	OFF		○	○	
UP	ON	○	○		
	OFF	○	○		
DOWN	ON	○		○	
	OFF	○		○	

### Left Rear Switch (Sedan)

Terminal		G	A	B	O
Position	Main switch				
OFF	ON		○	○	○
	OFF		○	○	
UP	ON	○	○		
	OFF	○	○		
DOWN	ON	○		○	
	OFF	○		○	

### Right Rear Switch (Sedan)

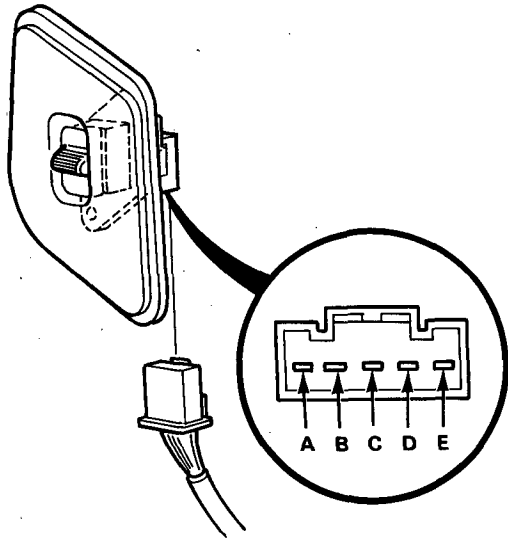
Terminal		J	F	E	O
Position	Main switch				
OFF	ON		○	○	○
	OFF		○	○	
UP	ON	○		○	
	OFF	○		○	
DOWN	ON	○	○		
	OFF	○	○		



## Passenger's Switch Test

1. Remove the door panel, then disconnect the 5-P connector.
2. Check for continuity between the terminals in each switch position according to the table.

NOTE: Right front switch is shown, rear switches are similar.

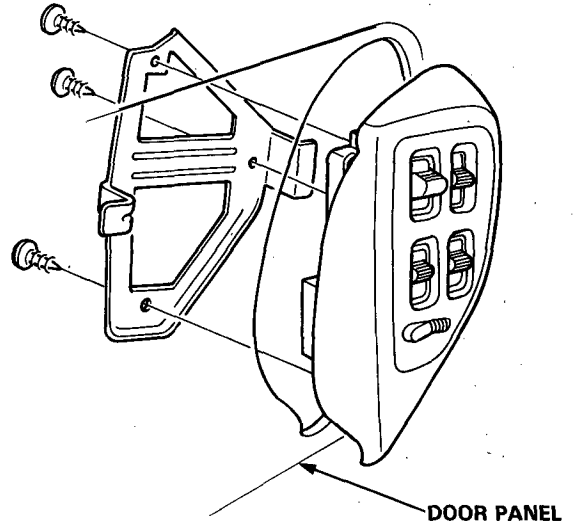


Terminal	A	B	C	D	E
Position					
UP	○—○			○—○	
OFF	○—○		○—○		○—○
DOWN		○—○		○—○	

## Switch Replacement

### Master Switch:

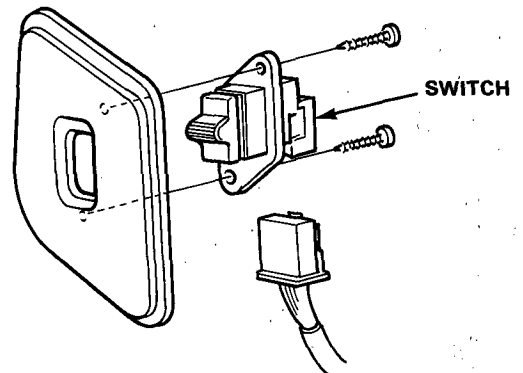
1. Remove the door panel, then disconnect the 14-P and 1-P connectors (Sedan) or 10-P connector (Hatchback).
2. Remove the switch from the door panel by removing the three mounting screws.



### Right Front Switch:

1. Remove the door panel, then disconnect the 5-P connector.
2. Remove the switch from the switch assembly by removing the two mounting screws.

NOTE: Right front switch of the hatchback is shown, sedan is similar.



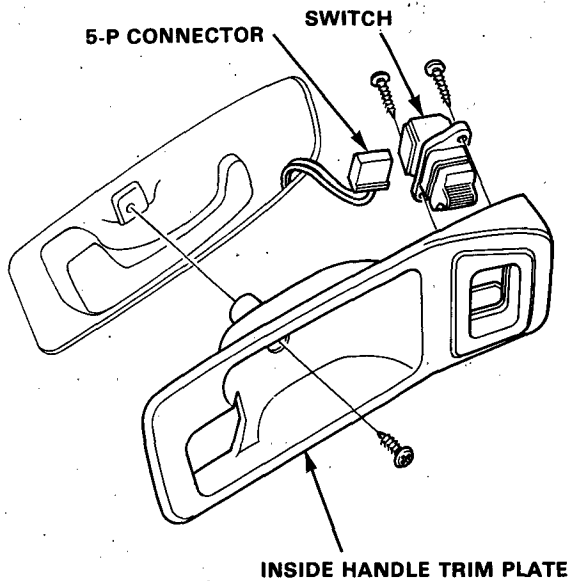
(cont'd)

# Power Windows

## Switch Replacement (cont'd)

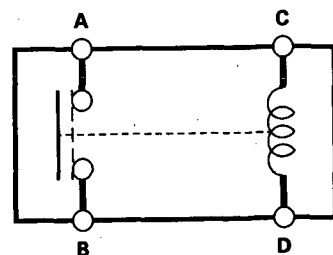
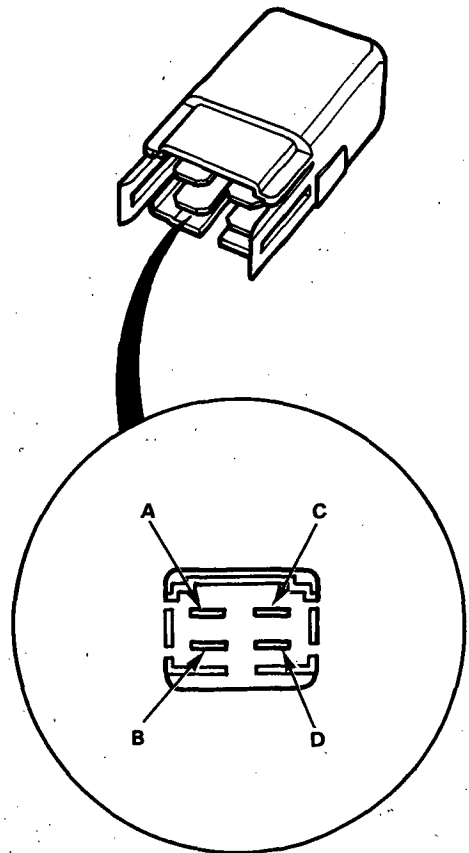
### Rear Switches:

1. Remove the screw and the inside handle trim plate.
2. Remove the two screws and the switch, then disconnect the 5-P connector.



## Relay Test

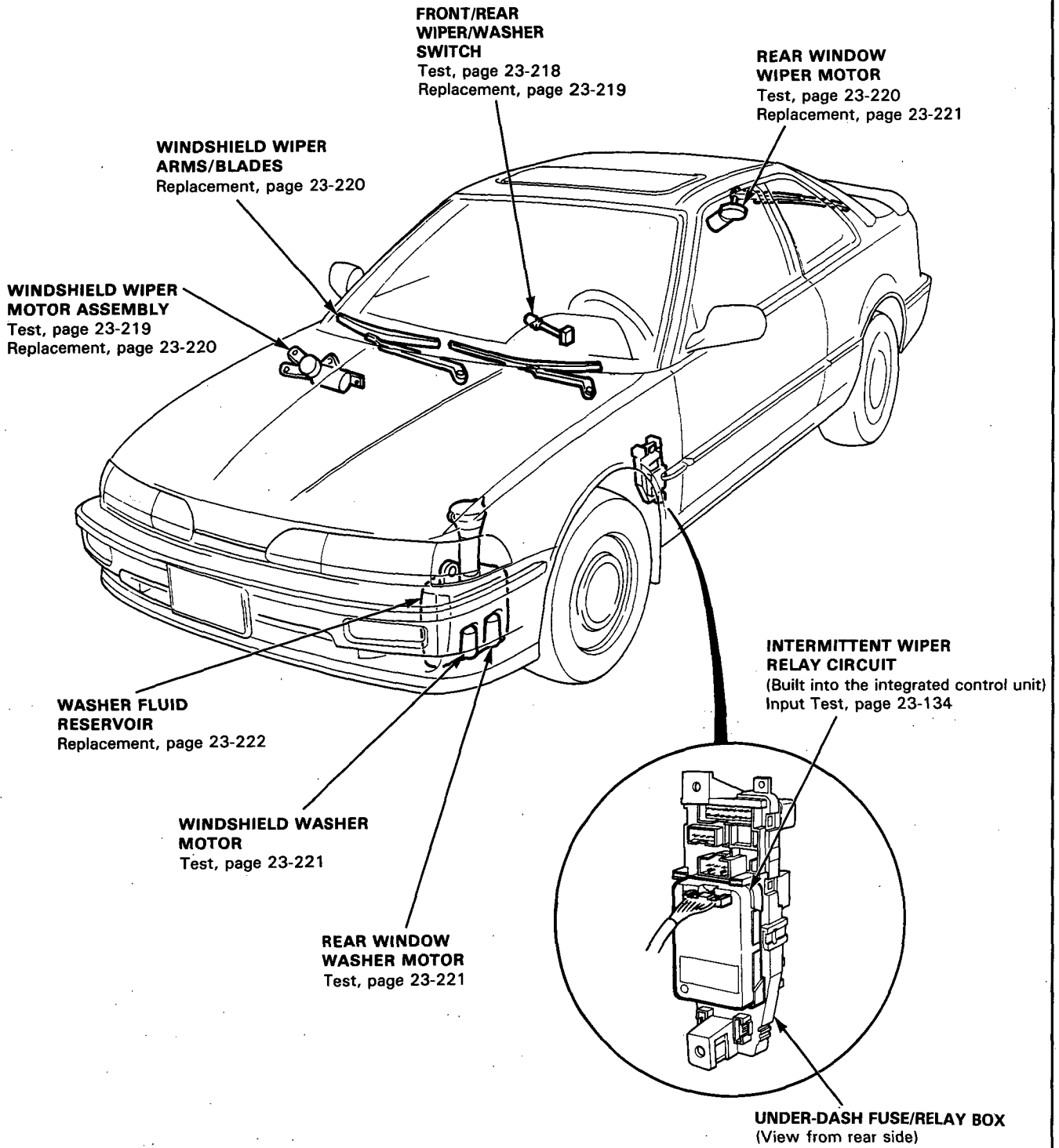
1. Remove the relay from the under-dash fuse/relay box.
2. There should be continuity between the C and D terminals.
3. There should be continuity between the A and B terminals when battery power and ground are connected to the C and D terminals. There should be no continuity when power is disconnected.



# Wipers/Washers



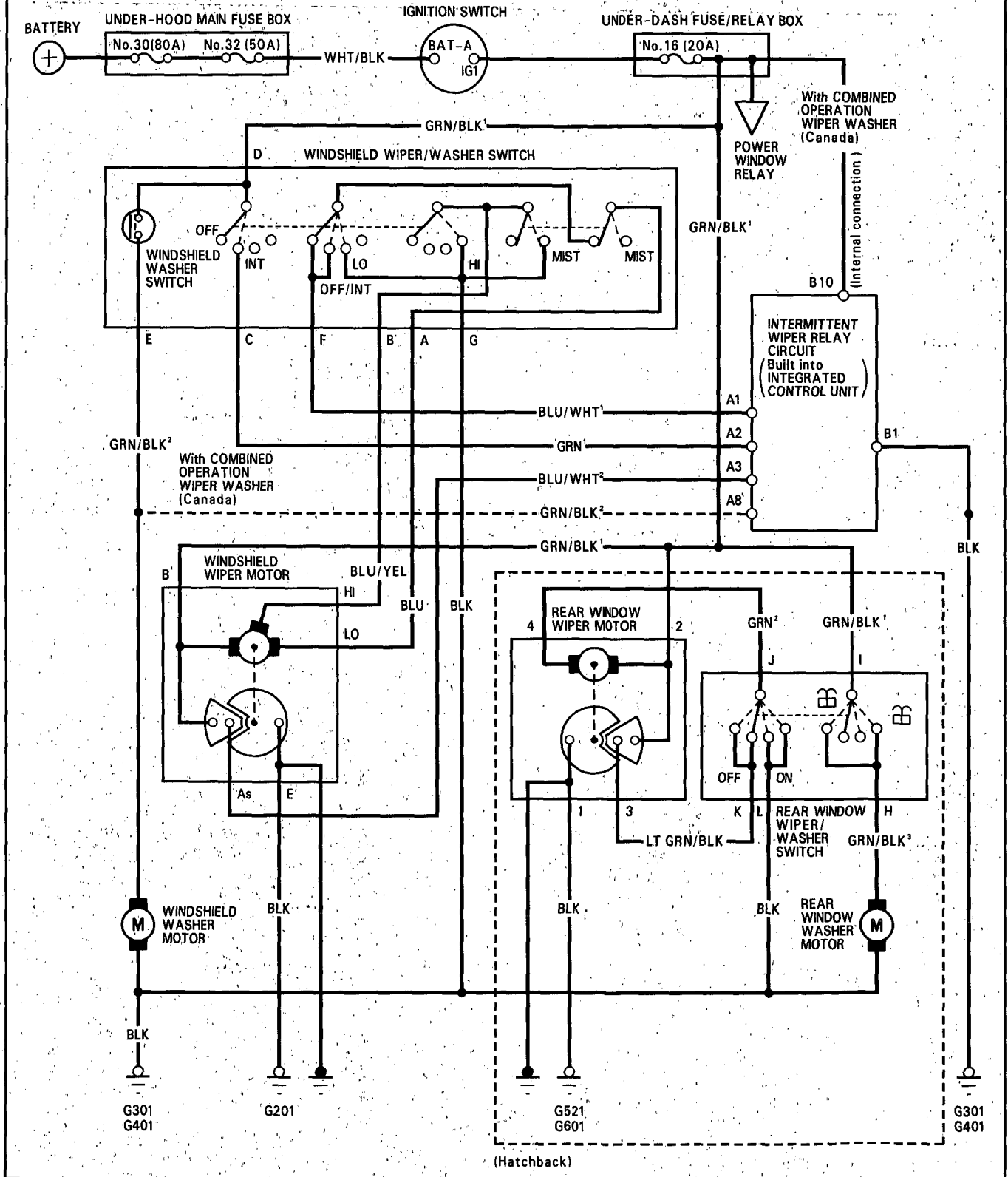
## Component Location Index



# Wipers/Washers

## Circuit Diagram

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/BLK<sup>1</sup> and GRN/BLK<sup>2</sup> are not the same).







## Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

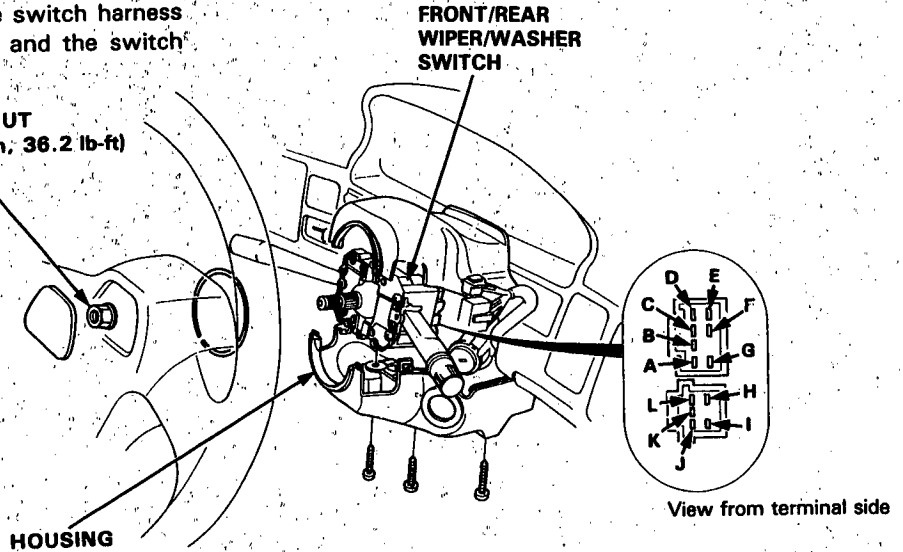
Item to be inspected		Symptom										Poor ground	Open circuit in wires, loose or disconnected terminals
		Blown No.16 (20A) fuse (In the under-dash fuse/relay box)	Wiper switch	Wiper motor assembly	Washer switch	Washer motor	Intermittent wiper relay circuit (In the integrated control unit)	Insufficient washer fluid in reservoir	Disconnected, blocked washer hose or clogged outlet	Disconnected wiper linkages			
Wipers do not operate.	In all positions	1	4	2						3	G201	GRN/BLK <sup>1</sup>	
	In INT		1			2						GRN <sup>1</sup> , BLU/WHT <sup>1</sup>	
	In LO or HI		1										
	In Mist		1										
Rear window wiper does not operate.		1	3	2							G521, G601	GRN/BLK <sup>1</sup> , GRN <sup>2</sup>	
Blades do not return to park position when wipers are turned OFF.			2	1								BLU/WHT <sup>2</sup>	
Erratic intermittent cycle or wipers do not operate intermittently.			1			2						GRN <sup>1</sup> , BLU/WHT <sup>1</sup> , BLU/WHT <sup>2</sup>	
Little or no washer fluid is pumped.					4	3		1	2		G301, 401	GRN/BLK <sup>2</sup> , GRN/BLK <sup>3</sup>	

# Wipers/Washers

## Front/Rear Wiper/Washer Switch Test

1. Remove the steering wheel and the steering column covers.
2. Disconnect the 8-P and 6-P connectors from the switch.
3. Check for continuity between the terminals in each switch position according to the table.
4. If all the tests prove OK, but the system does not work, check for continuity of the switch harness (between the main wire harness and the switch assembly).

**SELF-LOCKING NUT**  
50 N·m (5.0 kg-m, 36.2 lb-ft)  
Replace.



### FRONT

Terminal	A	B	C	D	E	F	G
Position							
OFF	○					○	
INT	○		○	○		○	
LO	○						○
HI		○					○
Mist Switch "ON"		○					○
Washer Switch "ON"				○	○		

### REAR

Terminal	H	I	J	K	L
Position					
Washer Switch "ON"	○	○	○	○	○
OFF			○	○	
ON			○	○	○
Washer Switch "ON"	○	○			



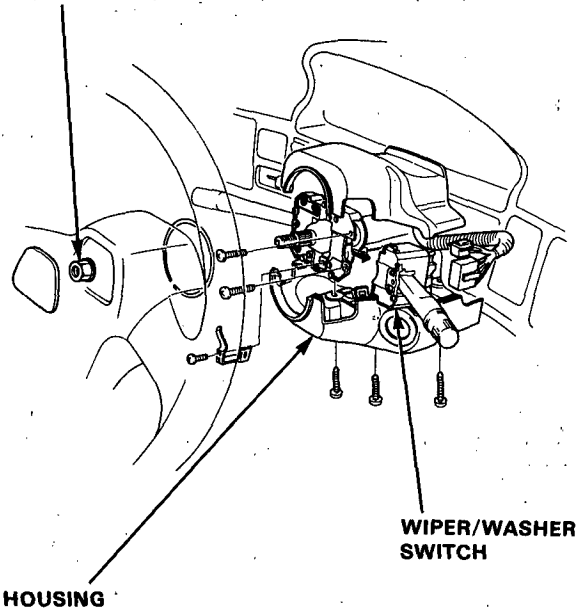
## Front/Rear Wiper/Washer Switch Replacement

1. Remove the steering wheel.
2. Remove the lower and upper covers from the steering column.
3. Disconnect the 8-P and 6-P connectors from the front/rear wiper/washer switch.
4. Remove the two screws and slide the front/rear wiper/washer switch out of the housing as shown.

### NOTE:

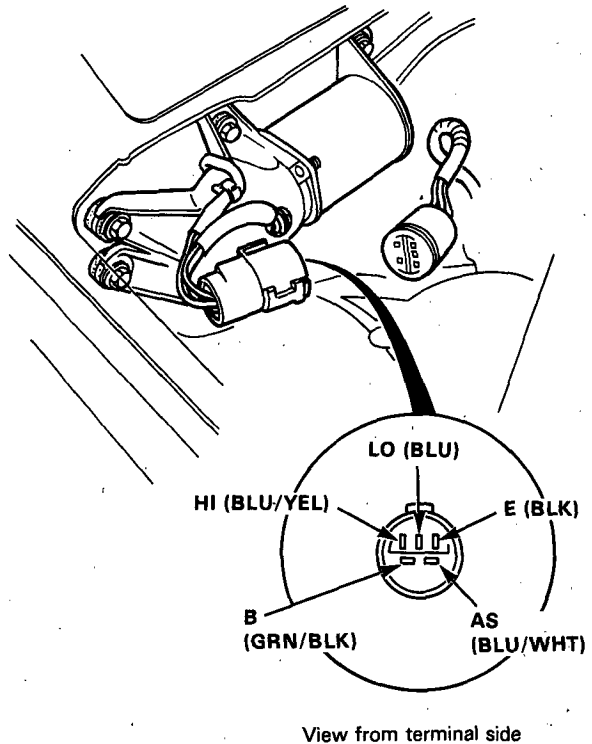
- Be careful not to damage the steering wheel cover.
- If equipped with cruise control, remove the front/rear wiper/washer switch after removing the slip ring (see page 23-231).

**SELF-LOCKING NUT**  
50 N·m (5.0 kg·m, 36.2 lb-ft)  
Replace.



## Windshield Wiper Motor Test

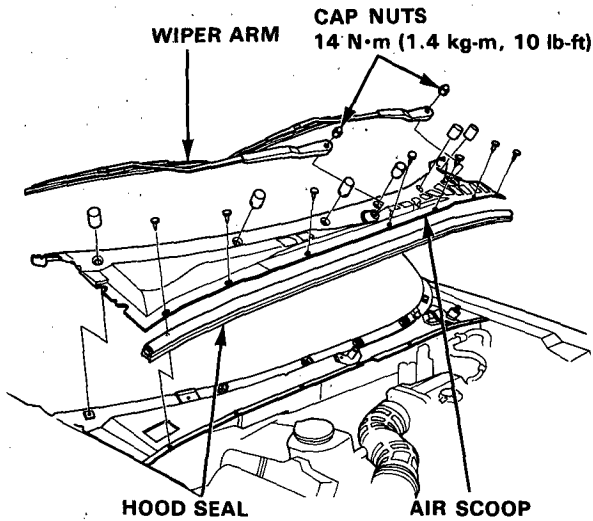
1. Disconnect the 5-P connector of the wiper motor assembly.
2. Test motor operation:  
**LOW SPEED:** Connect battery power to the B (GRN/BLK) terminal and ground to the Lo (BLU) terminal.  
**HIGH SPEED:** Connect battery power to the B (GRN/BLK) terminal and ground to the Hi (BLU/YEL) terminal.
3. If the motor fails to run smoothly, replace it.



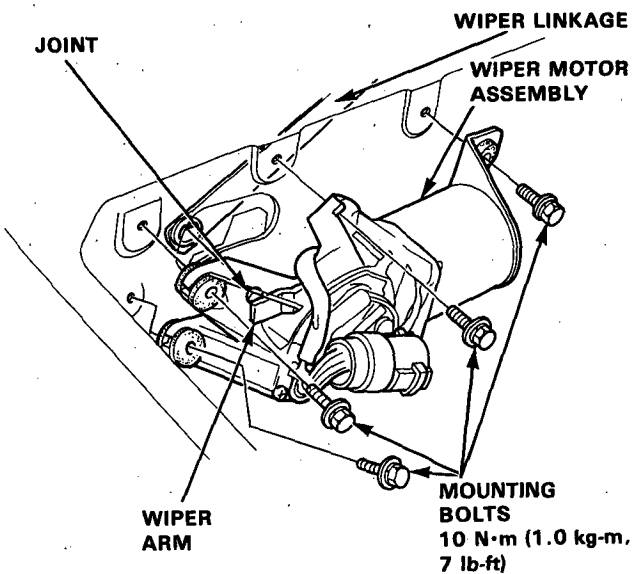
# Wipers/Washers

## Windshield Wiper Motor Replacement

1. Open the hood, remove the cap nuts, and carefully remove the wiper arms so they don't hit the hood.
2. Remove the hood seal and air scoop by prying out their trim clips and removing the screws.



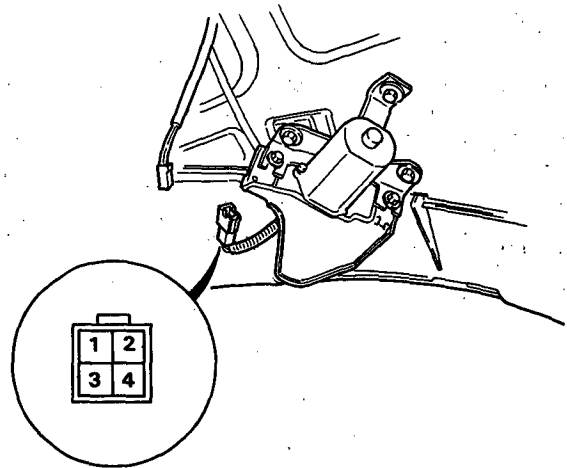
3. Pry the wiper linkage off the motor arm with a screw driver.
4. Disconnect the 5-P connector from the wiper motor assembly, then remove the four mounting bolts and the wiper motor assembly.



5. Install the wiper motor assembly in the reverse order of removal.

## Rear Window Wiper Motor Test

1. Remove the tailgate trim panel.
2. Disconnect the 4-P connector.
3. Test the wiper motor by connecting battery power to the No. 2 terminal and ground to the No. 4 terminal.
4. If the motor fails to run smoothly, replace it.



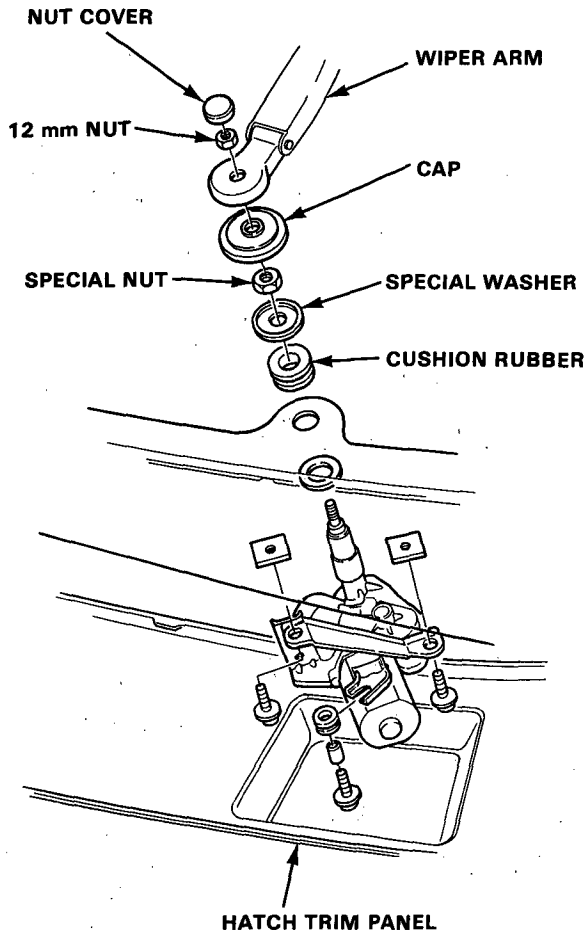
5. Check for continuity between the terminals according to the table.

Terminal	1	2	3
Wiper Blade			
At park position		○	○
At center position	○		○



## Rear Window Wiper Motor Replacement

1. Remove the tailgate trim panel.
2. Remove the nut cover, 12 mm nut, wiper arm, cap, special nut, special washer, and the cushion rubber.
3. Disconnect the 4-P connector from the wiper motor.
4. Remove the three mounting bolts and the wiper motor.

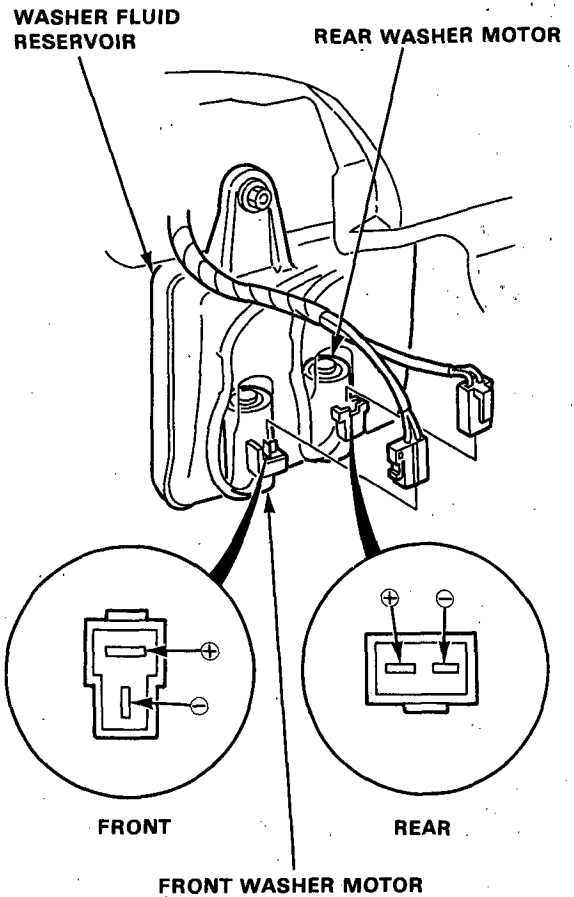


5. Install the wiper motor assembly in the reverse order of removal.

- Do not tighten the special nut too much.
- Check for water leakage in the rear wiper arm.

## Washer Motor Test

1. Remove the front bumper and disconnect the 2-P connector from the washer motor.
2. Test either washer motor operation by connecting battery power to the ⊕ terminal and ground to the ⊖ terminal.



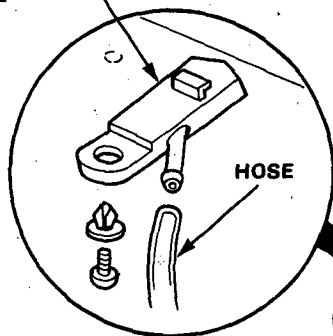
- If the motor fails to run smoothly, replace it.
- If the motor runs smoothly but little or no washer fluid is pumped, check for disconnected or blocked washer hose, or a clogged pump outlet in the motor.

# Wipers/Washers

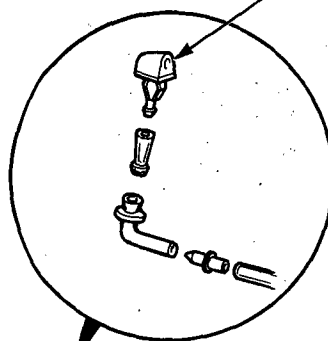
## Washer Replacement

1. Remove the bumper, then remove the washer reservoir by removing the three mounting bolts.
2. Disconnect the hose and the 2-P connectors from the front and rear washer motor.
3. Remove the washer nozzles by removing the screws.
4. When installing the washer system:
  - Clamp the hoses with the wire harness in the left front fender.
  - Take care not to pinch hoses during reinstallation.
  - Install the clips firmly.
5. After installing, adjust the washer nozzles.

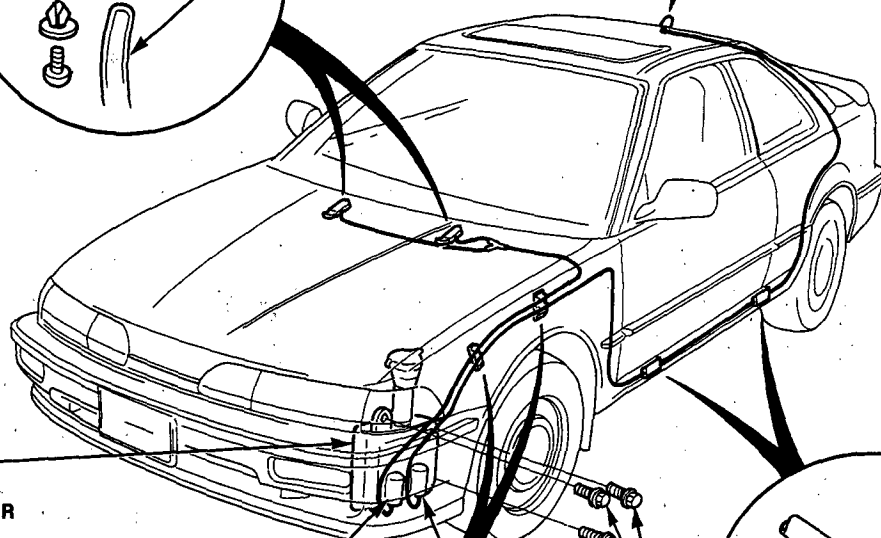
WINDSHIELD  
WASHER  
NOZZLE



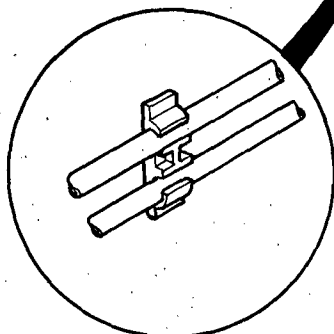
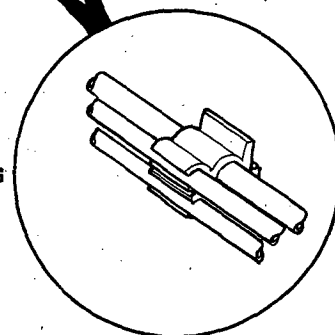
REAR WINDOW  
WASHER NOZZLE



WASHER  
FLUID  
RESERVOIR



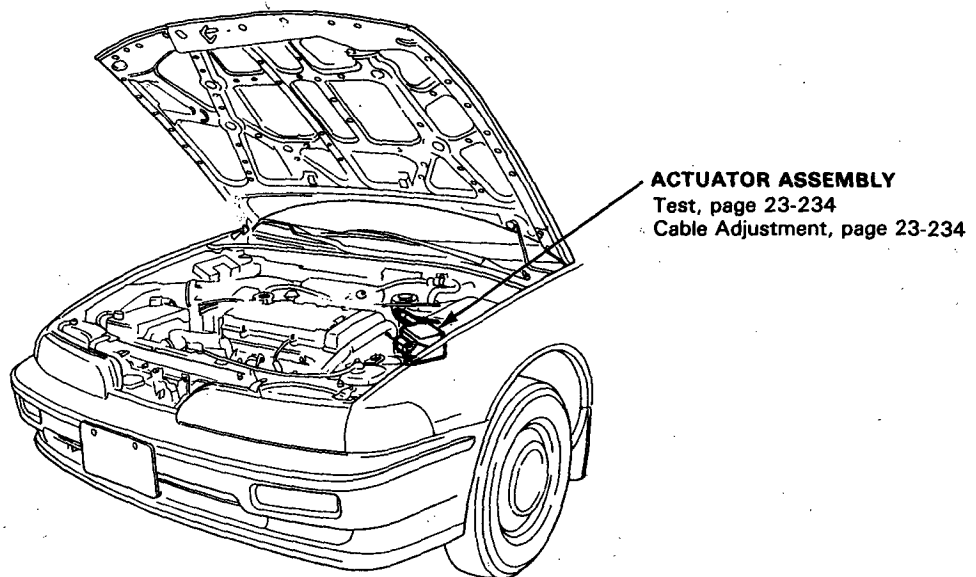
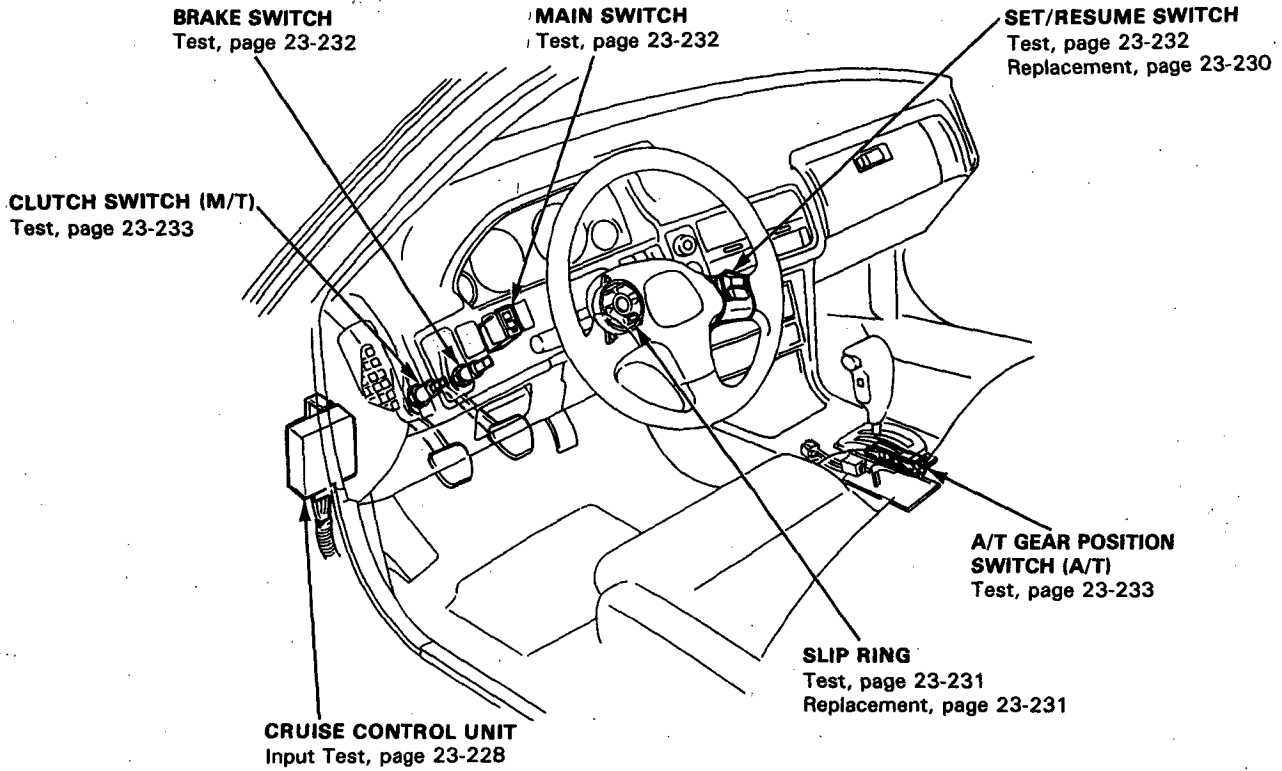
MOUNTING  
BOLTS



# Cruise Control



## Component Location Index



# Cruise Control

## Description

The cruise control system uses mechanically and electrically operated devices to maintain vehicle speed at a setting selected by the driver:

The cruise control unit receives command signals from the cruise control main switch and the cruise control set/resume switch. It receives information about operating conditions from the brake switch, the distributor, vehicle speed sensor (VSS), the clutch switch (with manual transmission), or the A/T gear position switch (with automatic transmission). The cruise control unit sends operational signals to the devices that regulate the throttle position. The throttle position maintains the selected vehicle speed. Essentially, the control unit compares the actual speed of the vehicle to the selected speed. Then, the control unit uses the result of that comparison to open or close the throttle.

The brake switch releases the system's control of the throttle at the instant the driver depresses the brake pedal. The switch sends an electronic signal to the control unit when the brake pedal is depressed; the control unit responds by allowing the throttle to close. The clutch switch (manual transmission) or the A/T gear position switch (automatic transmission) sends a disengage signal input to the control unit that also allows the throttle to close.

## Operation

The cruise control system will set and automatically maintain any speed above 30 mph (45 km/h). To set, make sure that the main switch is in the "ON" position. After reaching the desired speed, press the set switch. The cruise control unit will receive a set signal input and, in turn, will actuate the cruise control actuator. When the set switch is depressed and the cruise control system is on, the "cruise control" on indicator on the warning display will light up.

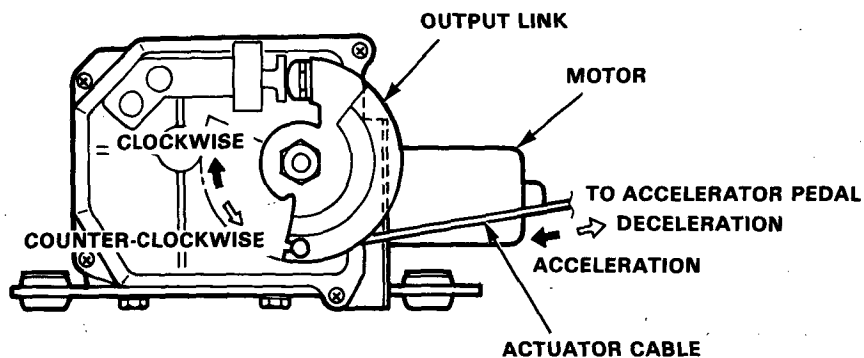
You can cancel the cruise control system by pushing the main switch to "OFF." This removes power to the control unit and erases the set speed from memory. If the system is disengaged temporarily by the brake switch, clutch switch, or A/T gear position switch and vehicle speed is still above 30 mph (45 km/h), press the resume switch. With the resume switch depressed and the set memory retained, the vehicle automatically returns to the previous set speed.

For gradual acceleration without depressing the accelerator pedal, push the resume switch down and hold it there until the desired speed is reached. This will send an acceleration signal input to the control unit. When the switch is released, the system will be reprogrammed for the new speed. To slow the vehicle down, depress the set switch. This will send a deceleration signal input to the control unit causing the vehicle to coast until the desired speed is reached. When the desired speed is reached, release the set switch. This will reprogram the system for the new speed.





The electrically operated actuator controls the throttle position in the same way as a vacuum operated actuator. The magnetic clutch is part of the safety system and controls acceleration or deceleration.

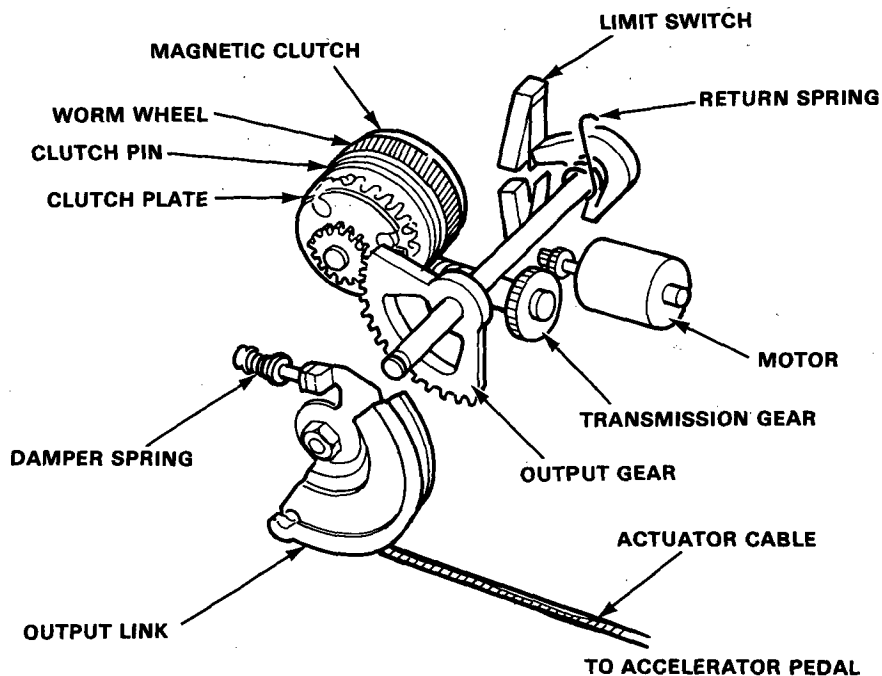


#### Acceleration

Due to the rotation of the motor output shaft, power is transmitted to the magnetic clutch by the transmission gear and the worm wheel. The magnetic clutch is rotated and magnetized. It attracts the clutch plate, and power is transmitted to the output link by the gear directly connected to the clutch plate and the output gear. The output link rotates clockwise, then the actuator cable opens the throttle, and the car accelerates.

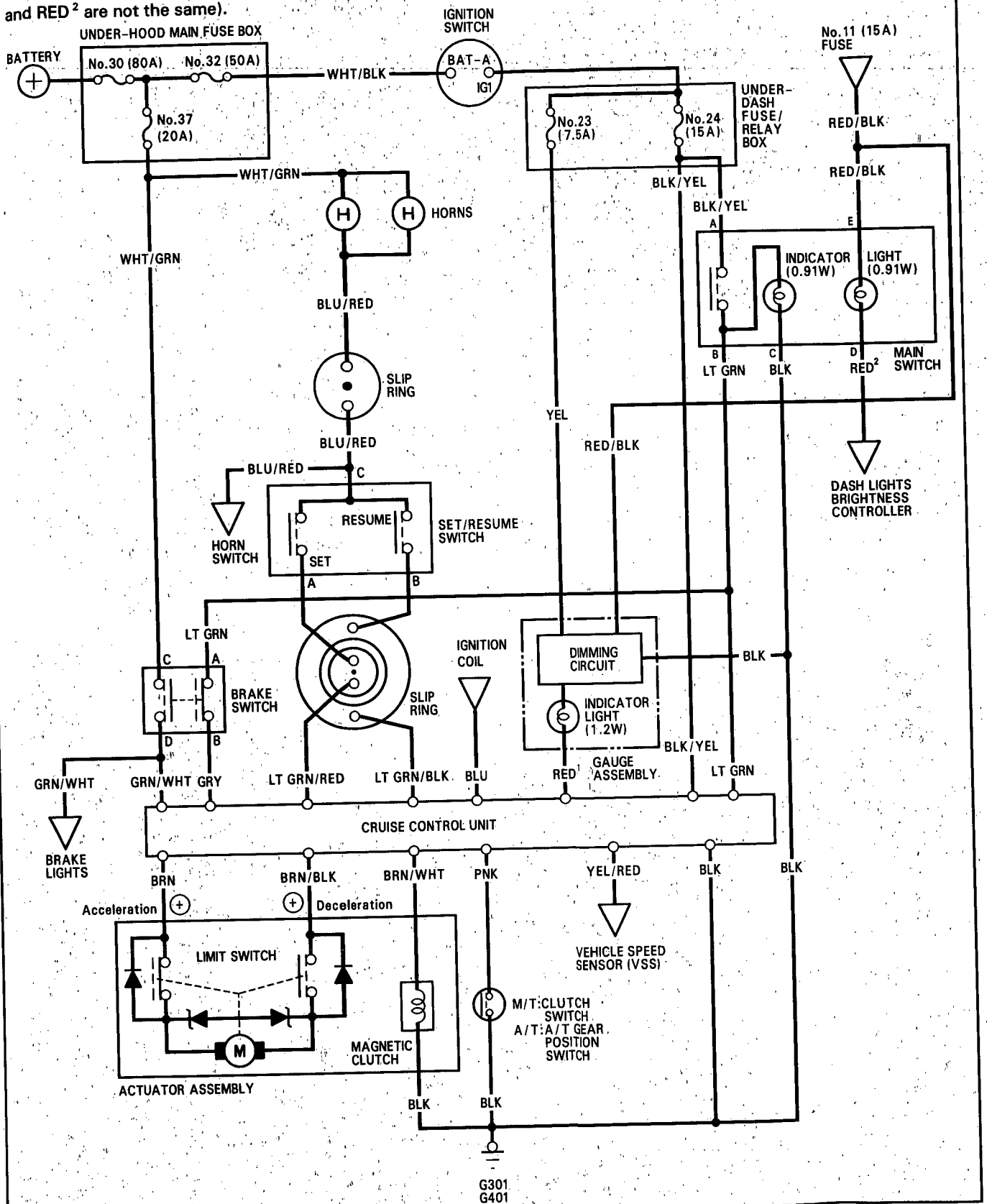
#### Deceleration

The motor output shaft rotates in the reverse direction of acceleration; then, in the same way, the power is transmitted to the output link. The output link rotates counterclockwise, then the actuator cable closes the throttle, and the car decelerates.



# Cruise Control Circuit Diagram

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, RED<sup>1</sup> and RED<sup>2</sup> are not the same).





# Troubleshooting

**NOTE:**

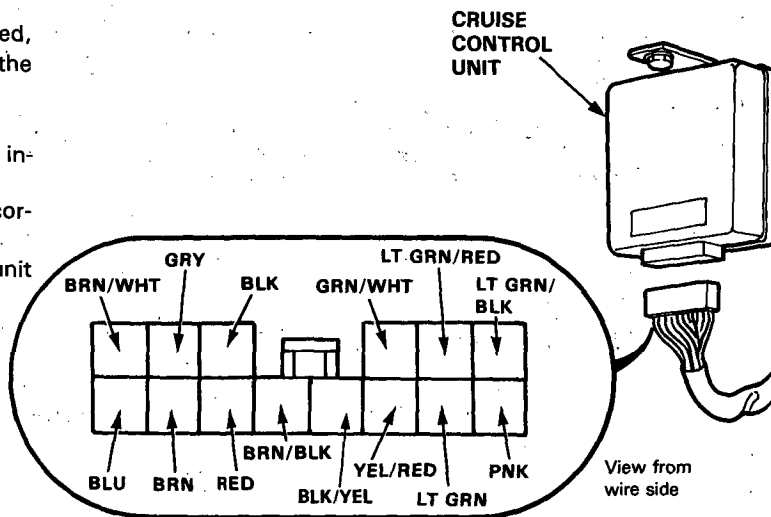
- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting.
  - Check the No. 23 (7.5 A) and No. 24 (15 A) fuses in the under-dash fuse/relay box, and the No. 30 (80 A), No. 32 (50 A), and No. 37 (20 A) fuses in the under-hood main fuse box.
  - Check that the horns sound.
  - Check the tachometer for proper operation.

Items to be inspected.	Main switch	SET/RESUME switch	Brake light switch/adjustment	Clutch switch/adjustment (M/T)	A/T gear position switch (A/T)	Vehicle speed sensor (VSS) or cable	Dimming circuit in gauges	Actuator and cable free play	Control unit input	Poor ground	Open circuit in wires, loose or disconnected terminals
Cruise control can't be set.	1	2							3	G301, G401	BLK/YEL or LT GRN
Cruise control can be set, but indicator light does not go on.							1		2	G301, G401	YEL or RED <sup>1</sup>
Cruise speed noticeably higher or lower than what was set.						1		2	3		
Excessive overshooting and/or undershooting when trying to set speed.						2		1	3		
Steady speed not held even on a flat road with cruise control set.						1		2	3		
Car does not decelerate or accelerate accordingly when SET or RESUME button is pushed.		1							2		LT GRN/BLK LT GRN/RED
Set speed not canceled when clutch pedal is pushed (M/T).				1					2		
Set speed not canceled when shift lever is moved to <b>N</b> (A/T).					1				2		
Set speed not canceled when brake pedal is pushed.			1						2		
Set speed not canceled when main switch is pushed OFF.	1								2		
Set speed not resumed when RESUME button is pushed (with main switch on, but set speed temporarily canceled).		1							2		LT GRN/BLK LT GRN/RED

# Cruise Control

## Control Unit Input Test

- Remove the dashboard lower cover and left knee bolster.
- Disconnect the 14-P connector from the control unit. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the connector.
    - If any test indicators a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, the control unit must be faulty; replace it.



No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>Poor ground (G301, G401).</li> <li>An open in the wire.</li> </ul>
2	BLK/YEL	Ignition switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>An open in the wire.</li> <li>Blown No. 24 (15 A) fuse.</li> </ul>
3	LT GRN	Ignition switch ON and main switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>An open in the wire.</li> <li>Faulty main switch.</li> <li>Blown No. 24 (15 A) fuse.</li> </ul>
4	LT GRN /BLK	Resume switch pushed.	Ground each terminal: Horns should sound as the switch is pushed.	<ul style="list-style-type: none"> <li>An open in the wire.</li> <li>Faulty SET/RESUME switch.</li> <li>Faulty slip ring.</li> <li>Faulty horn.</li> <li>Blown No. 37 (20 A) fuse.</li> </ul>
5	LT GRN /RED	Set switch pushed.		
6	PNK	M/T: Clutch pedal not pushed. A/T: Shift lever in <b>2</b> , <b>S</b> or <b>D</b>	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>Poor ground (G301, G401)</li> <li>An open in the wire.</li> <li>Faulty or misadjusted clutch switch (M/T).</li> <li>Faulty A/T gear position switch (A/T).</li> </ul>
7	BLU	Start the engine.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>An open in the wire.</li> <li>Faulty ignition system.</li> </ul>
8	YEL/RED	Raise the front of the car and rotate one wheel or remove the speedometer cable from the transmission and turn slowly by hand.	Check resistance in both directions between the YEL/RED and BLK terminals: There should be continuity in only one direction four times per cable revolution or 23 times per 10 wheel revolutions.	<ul style="list-style-type: none"> <li>Faulty speed pulser in speedometer.</li> <li>An open in the wire.</li> <li>Poor ground (G301, G401).</li> </ul>



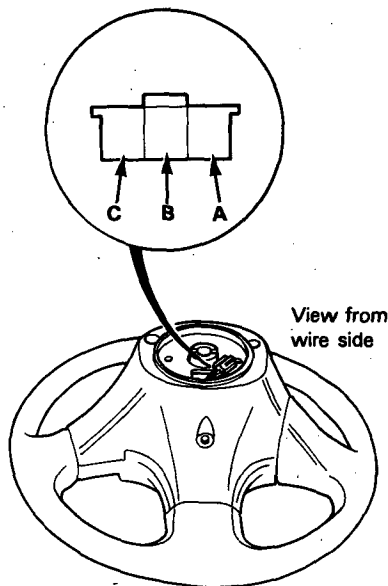
No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
9	GRY	Ignition switch ON, main switch ON, and brake pedal pushed, then released.	Check for voltage to ground: There should be 0 V with the pedal pushed and battery voltage with the pedal released.	<ul style="list-style-type: none"><li>• An open in the GRY wire circuit.</li><li>• Faulty brake switch.</li></ul>
10	GRN/WHT	Brake pedal pushed, then released.	Check for voltage to ground: There should be battery voltage with the pedal pushed, and 0 V with the pedal released.	<ul style="list-style-type: none"><li>• An open in the GRN/WHT wire circuit.</li><li>• Blown No. 37 (20 A) fuse.</li><li>• Faulty brake switch.</li></ul>
11	RED	Ignition switch ON.	Attach RED terminals to ground: Indicator light in dash should come on.	<ul style="list-style-type: none"><li>• Blown bulb.</li><li>• An open in the RED wire circuit.</li><li>• Faulty dimming circuit in gauges.</li><li>• Blown No. 23 (7.5 A) fuse.</li></ul>
12	BRN	Connect battery power to the BRN terminal and ground to the BRN/BLK terminal.	Check the operation of the actuator motor: You should be able to hear the motor.	<ul style="list-style-type: none"><li>• Faulty actuator.</li><li>• An open in the wire.</li></ul>
13	BRN/BLK			
14	BRN/WHT	Connect battery power to the BRN/WHT terminal and ground to body ground.	Check the operation of the magnetic clutch: The clutch should click and the output link should be locked.	<ul style="list-style-type: none"><li>• Faulty actuator.</li><li>• An open in the wire.</li><li>• Poor ground (G301, G401).</li></ul>

# Cruise Control

## Set/Resume Switch Test

1. Remove the steering wheel.
2. Disconnect the 3-P connector.
3. Check for continuity between the terminals in each switch position according to the table.

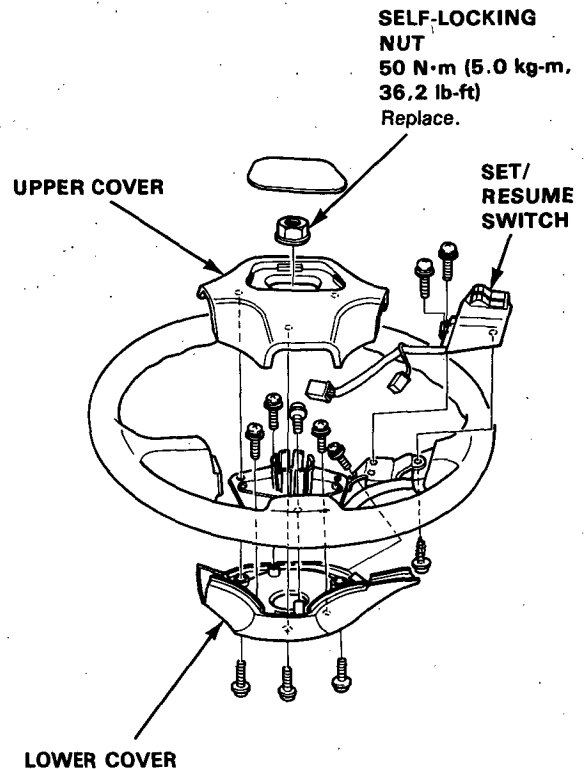
Terminal	A	B	C
Position			
OFF			
SET (ON)	○	—	○
RESUME (ON)		○	○



4. If there is no continuity, replace the switch.

## Set/Resume Switch Replacement

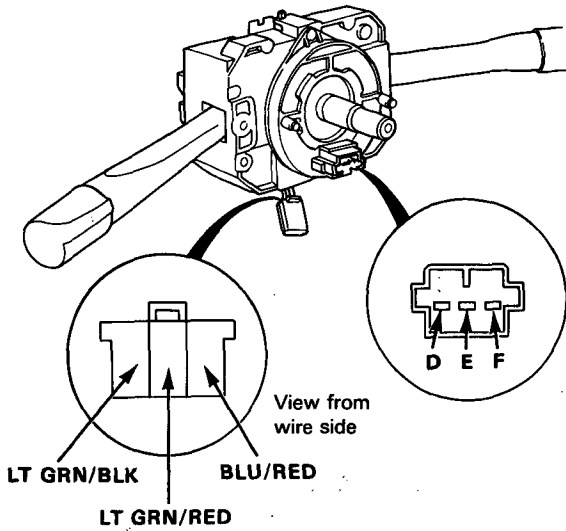
1. Remove the steering wheel.
2. Disconnect the 3-P connector.
3. Remove the wheel upper cover by removing the three screws and disconnect the 1-P connector.
4. Remove the wheel lower cover by removing the four screws.
5. Remove the three screws and the SET/RESUME switch from the steering wheel.





## Slip Ring Test

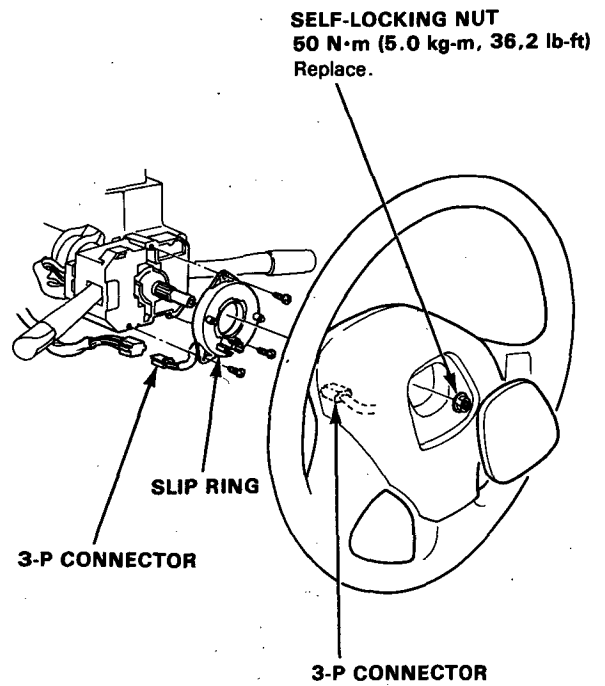
1. Remove the steering wheel.
2. Remove the column cover, then disconnect the 3-P connector from the main wire harness.
3. There should be continuity between the BLU/RED and D terminals, and the LT GRN/RED and E terminals, as you turn the slip ring.



4. If there is no continuity, replace the slip ring.

## Slip Ring Replacement

1. Remove the steering wheel.
2. Remove the column cover, then disconnect the 3-P connector from the main wire harness.
3. Remove the three screws and the slip ring.



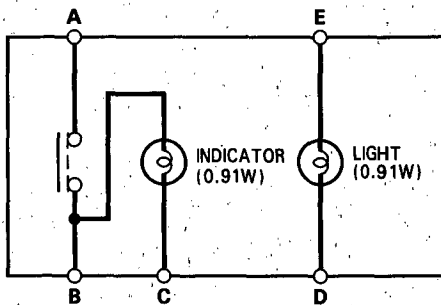
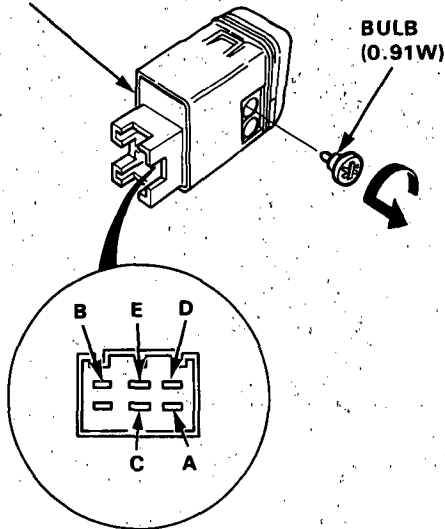
# Cruise Control

## Main Switch Test

1. Remove the switch from the instrument panel.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A	B	C	D	E
OFF		○	⊕	○	⊕
ON	○	○	⊕	○	⊕

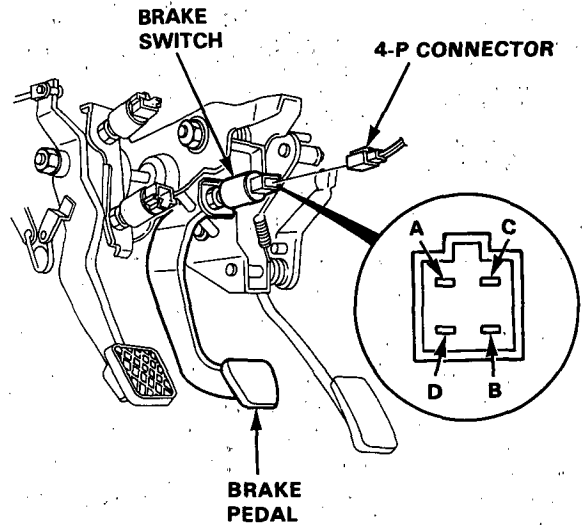
MAIN SWITCH



## Brake Switch Test

1. Disconnect the 4-P connector from the switch.
2. Check for continuity between the terminals according to the table.

Terminal	A	B	C	D
Brake pedal RELEASED	○	○		
Brake pedal PUSHED			○	○



3. If necessary, replace the switch or adjust pedal height (see section 12).

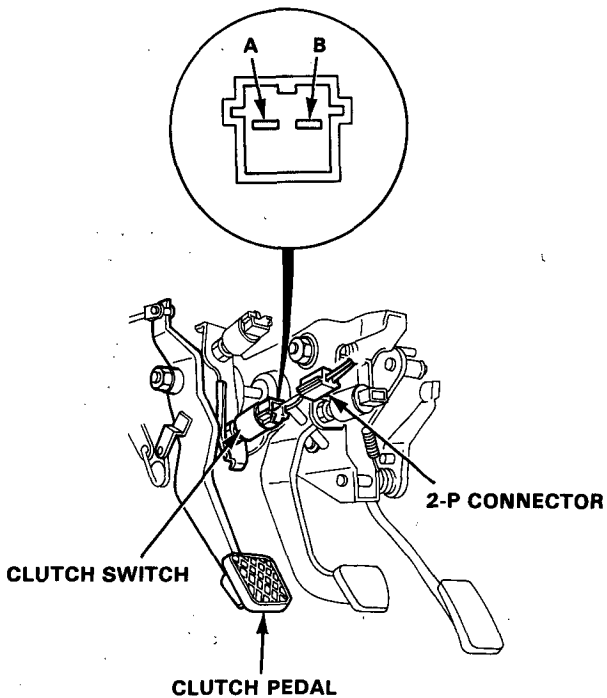




## Clutch Switch Test

1. Disconnect the 2-P connector from the switch.
2. Check for continuity between the terminals according to the table.

Terminal	A	B
Clutch pedal		
RELEASED	○	○
PUSHED		



3. If necessary, replace the switch or adjust pedal height (see section 12).

## A/T Gear Position Switch Test

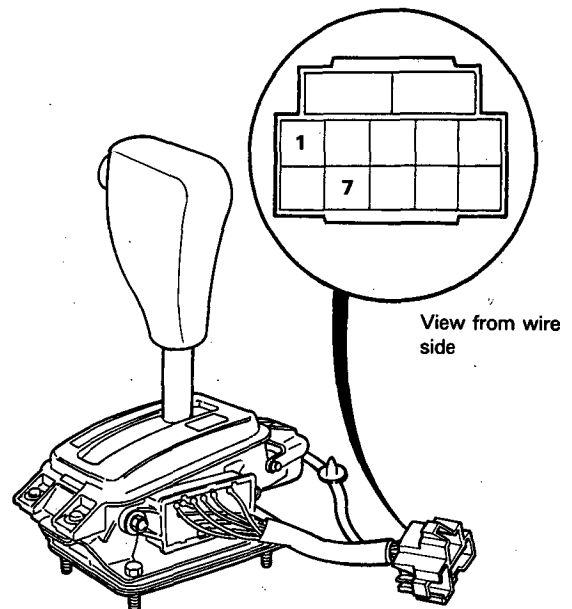
1. Remove the front console, then disconnect the 10-P connector from the switch.
2. Check for continuity between the terminals in each switch position according to the table.

### NOTE:

- Move the lever back and forth without touching the push button at each position, and check for continuity within the range of free play of the shift lever.
- If there is no continuity within the range of free play, adjust the installation position of the switch (see page 23-131).

### A/T Gear Position Switch (For cruise control)

Terminal	1	7
Position		
2	○	○
S	○	○
D	○	○
N		
R		
P		

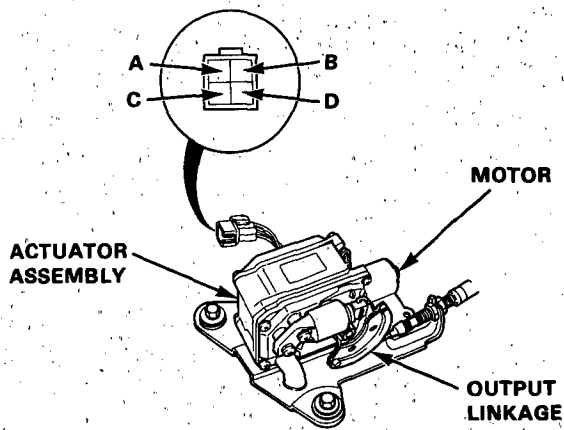


3. If necessary, replace the switch (see page 23-131) or adjust it (see page 23-130).

# Cruise Control

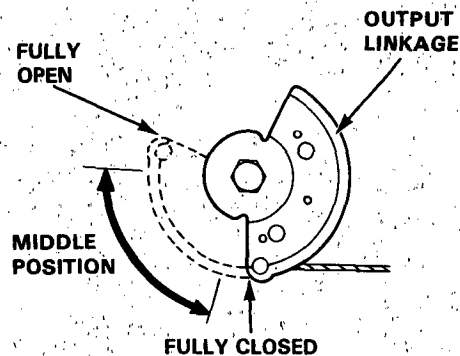
## Actuator Assembly Test

1. Disconnect the 4-P connector from the actuator.
2. Check that the output linkage for smooth movement.
3. Connect battery power to the D terminal and ground to the A terminal.
4. Check for a clicking sound from the magnetic clutch, and that the output linkage is locked.
5. If the output linkage is not locked, replace the actuator assembly.



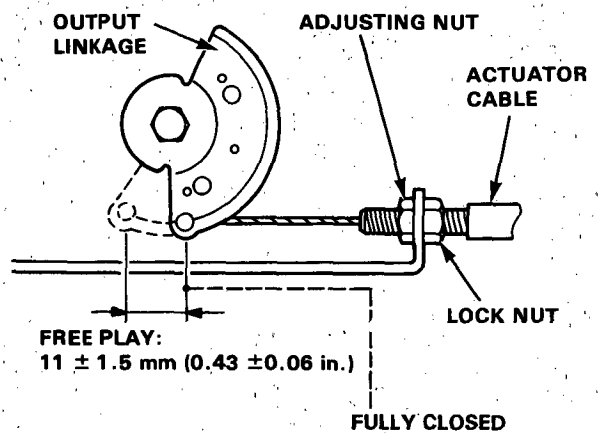
6. Check the operation of the actuator motor in each output linkage position according to the table. You should be able to hear the motor.

Battery polarities		Output linkage position		
⊕	⊖	FULL CLOSE	MIDDLE POSITION	FULL OPEN
C Terminal	B Terminal	The motor runs	The motor runs	The motor stops
B Terminal	C Terminal	The motor stops	The motor runs	The motor runs



## Actuator Cable Adjustment

1. Check that the actuator cable operates smoothly with no-binding or sticking.
2. Start the engine and warm it up to normal operating temperature (radiator and condenser fans come on twice).
3. Measure how far the output linkage moves from the fully closed position before the engine speed starts to increase. Free play should be  $11 \pm 1.5 \text{ mm}$  ( $0.43 \pm 0.06 \text{ in.}$ ).



4. If the free play is not within specs, loosen the locknut and turn the adjusting nut as required.

NOTE: If necessary, check the throttle control system (see section 11), then recheck the output linkage free play.

5. Retighten the locknut and recheck the free play.

# Automatic Shoulder Seat Belt (USA)



## Component Location Index

- **SEAT BELT REMINDER LIGHT**  
(In gauge assembly)  
Replacement, page 23-114
- **DOOR LATCH SWITCH**  
(In door lock assembly)  
Test, page 23-252

**DRIVER'S SHOULDER SEAT BELT RETRACTOR**  
(With solenoid sensor switch and solenoid)  
Test, page 23-248  
Replacement/Inspection, section 20

**FRONT PASSENGER'S SHOULDER SEAT BELT RETRACTOR**  
(With solenoid sensor switch and solenoid)  
Test, page 23-248  
Replacement/Inspection, section 20

**DRIVER'S REAR LOCK POSITION SWITCH (ANCHOR SWITCH and SHOULDER SEAT BELT SWITCH)**  
Test, page 23-250

**DRIVER'S SHOULDER SEAT BELT ANCHOR RAIL ASSEMBLY**  
Replacement, section 20

**FRONT PASSENGER'S REAR LOCK POSITION SWITCH (ANCHOR SWITCH and SHOULDER SEAT BELT SWITCH)**  
Test, page 23-250

**SHOULDER SEAT BELT BUCKLE**

**FRONT POSITION SWITCH**  
Test, page 23-251

**SHOULDER BELT**

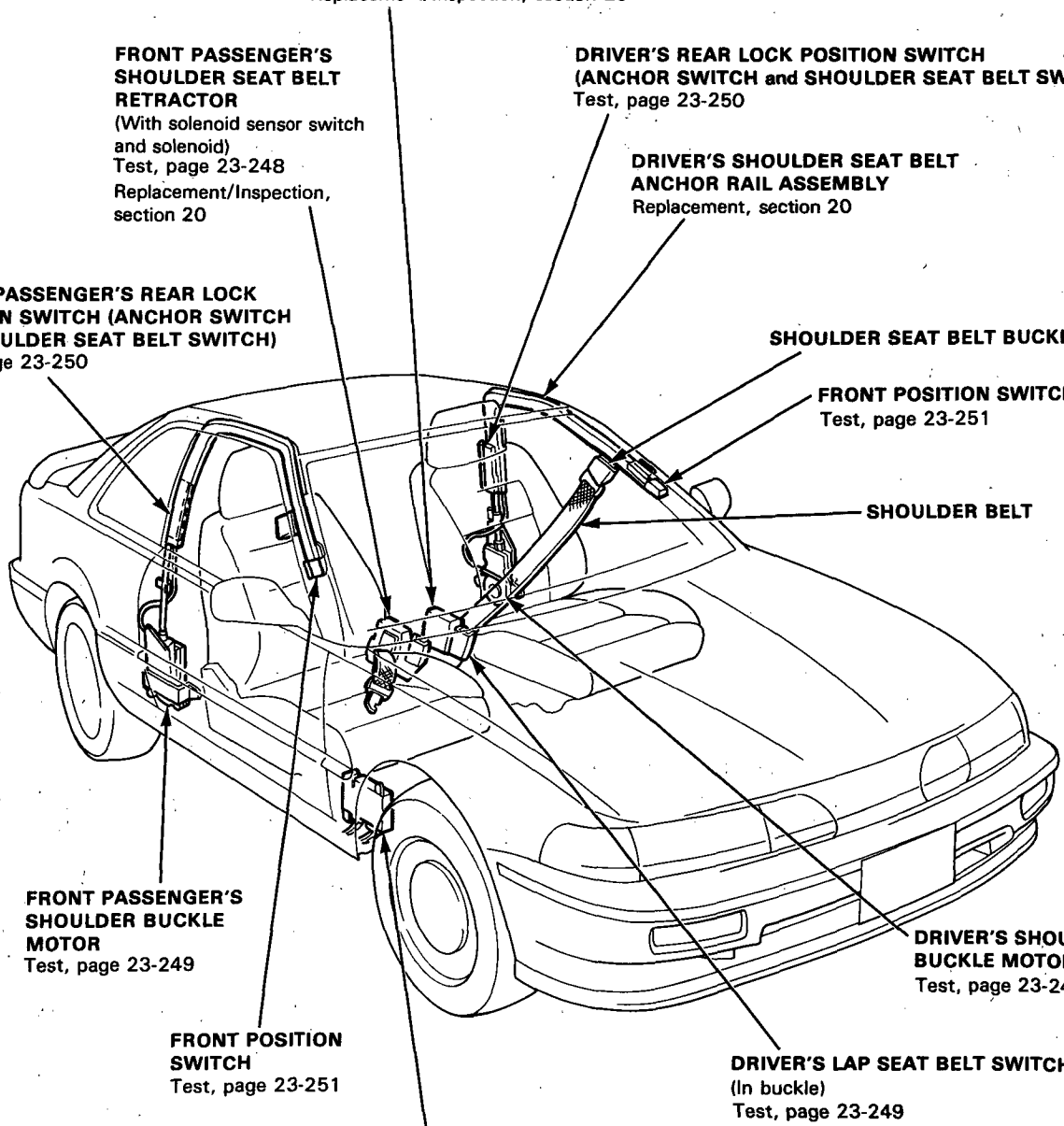
**FRONT PASSENGER'S SHOULDER BUCKLE MOTOR**  
Test, page 23-249

**DRIVER'S SHOULDER BUCKLE MOTOR**  
Test, page 23-249

**FRONT POSITION SWITCH**  
Test, page 23-251

**DRIVER'S LAP SEAT BELT SWITCH**  
(In buckle)  
Test, page 23-249

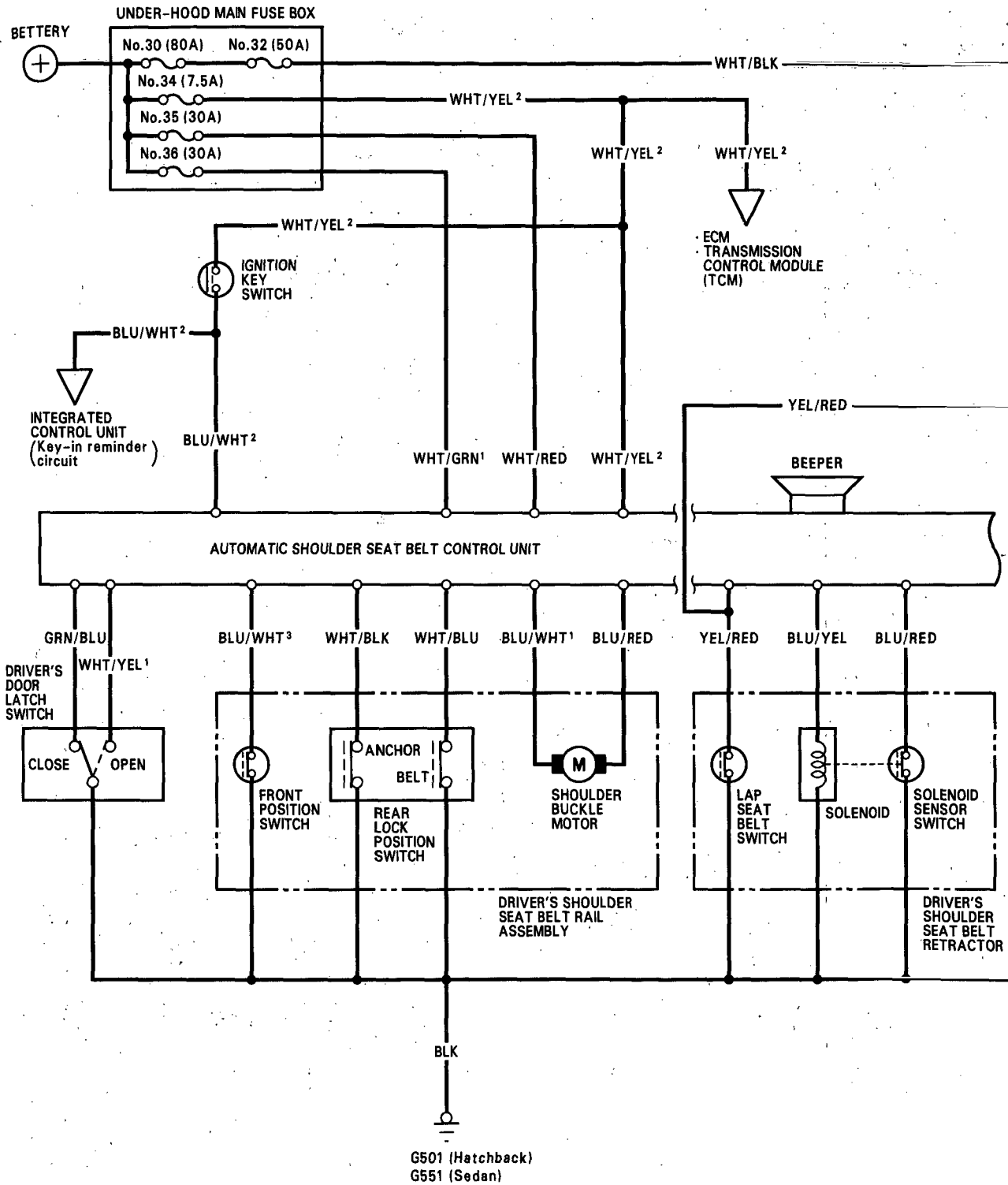
**AUTOMATIC SHOULDER SEAT BELT CONTROL UNIT**  
Input Test, 23-246.



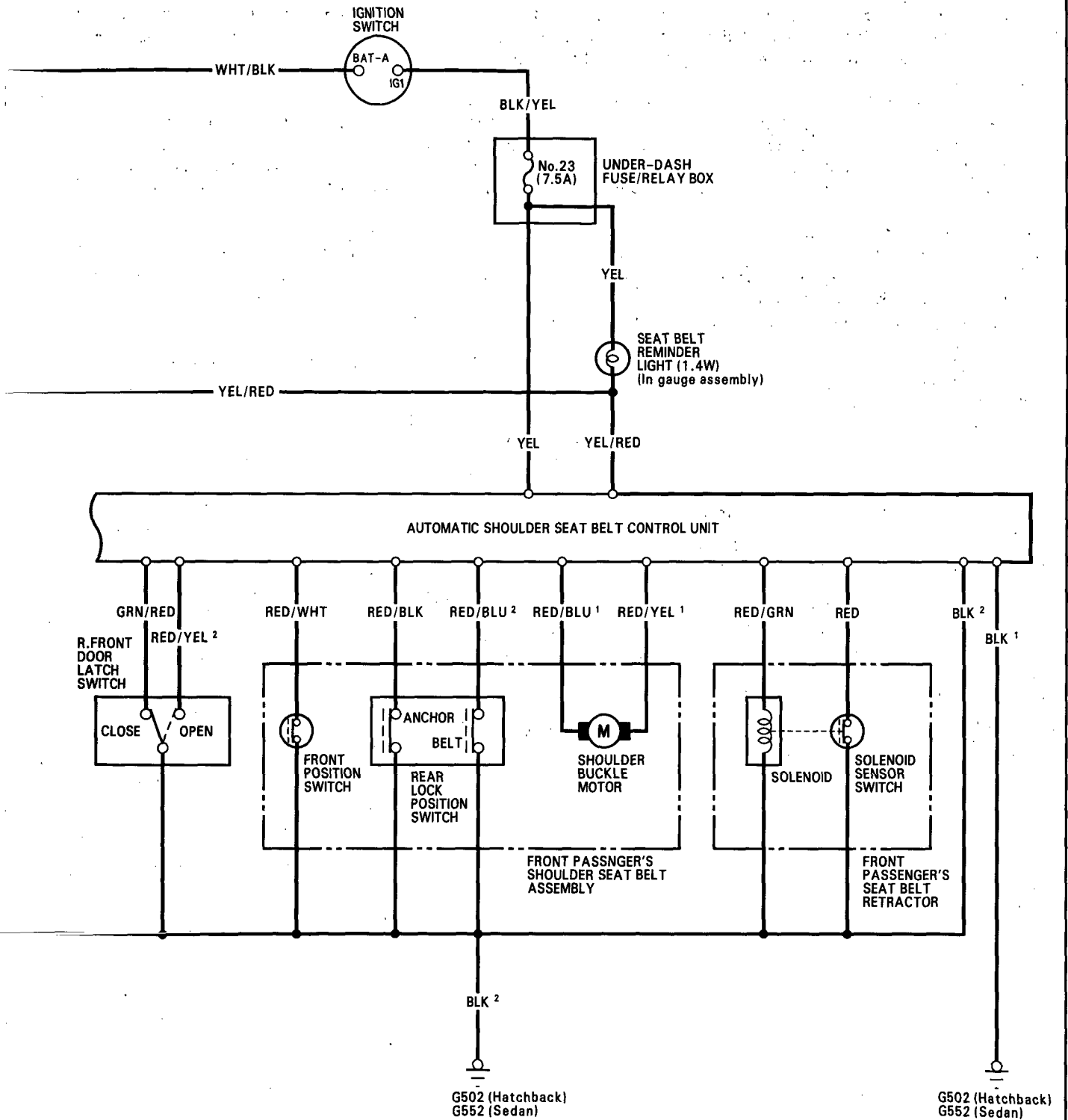
# Automatic Shoulder Seat Belt

## Circuit Diagram

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, BLU/WHT<sup>1</sup> and BLU/WHT<sup>2</sup> are not the same).



Front Position Switch OFF: Buckle is in the front position.  
 Rear Lock Position Anchor Switch OFF: Buckle is in the rear lock position.  
 Rear Lock Position Belt Switch OFF: Buckle is in the rear lock position and shoulder seat belt buckled.  
 Solenoid Sensor Switch OFF: Door is open.  
 Lap Seat Belt Switch OFF: Driver's lap seat belt is buckled.



# Automatic Shoulder Seat Belt

## Description

The automatic shoulder belt system is a combination of mechanical and electrical components. An electronic control unit monitors several switches to automatically control the movement of the belt. The control unit also monitors the shoulder belt electrical system, and will turn on an indicator light and buzzer if it detects a malfunction. The shoulder belt will lock if the car suddenly accelerates or decelerates in any direction, or if it tilts too far in any direction. The locking is done mechanically, and is not affected by the electrical components in the system.

### Seat Belt Control Unit

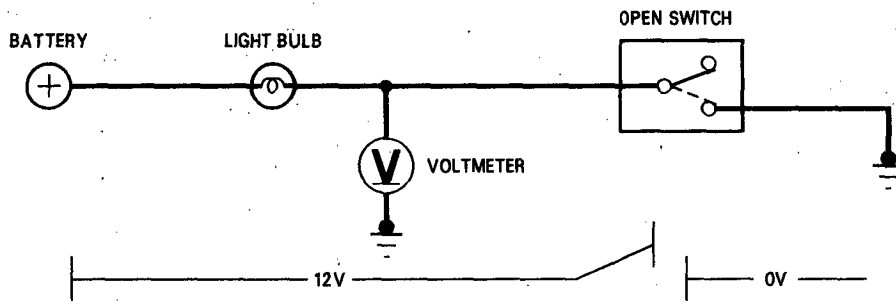
The seat belt control unit operates the shoulder belt motors, shoulder belt retractor solenoids, seat belt indicator light, and beeper. The control unit decides where to position the shoulder belt by monitoring switches in the door latches and in the seat belt tracks. It also continuously monitors those same switches to determine whether the shoulder belts are in the correct position. If the control unit detects a belt in the wrong position, it turns on the indicator light and beeper.

### Understanding Reference Voltage

The control unit uses a "reference" voltage to monitor the switches. The following illustrations show how the voltage can change in portions of a circuit, depending on the position of a switch. These changes enable the control unit to determine whether a switch is open or closed.

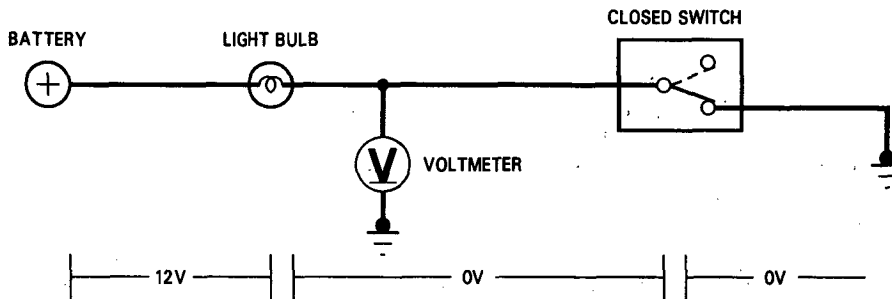
A simple light bulb circuit can be used to show how this "reference" voltage works:

In this illustration, the switch is open; the circuit is not complete. A voltmeter would indicate battery voltage all the way up to the open switch.

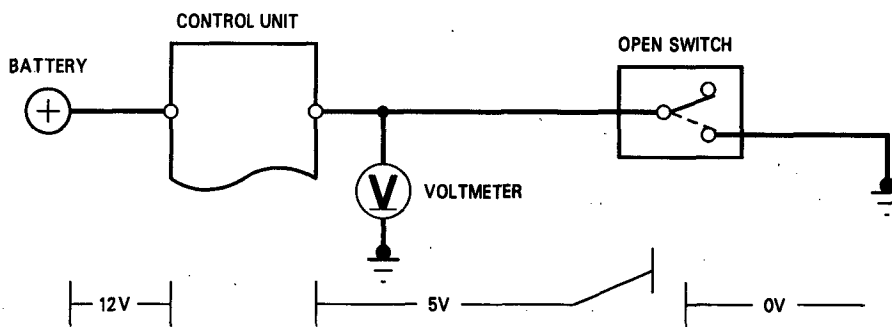




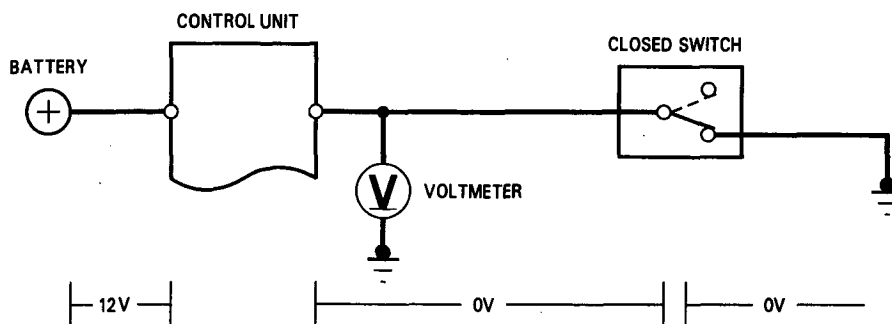
In this illustration, the switch is closed; the circuit is complete. A voltmeter would indicate battery voltage only up to the light bulb. There is no voltage after the bulb because it's "used up" across the bulb filament. The light bulb is the load.



In this illustration, the switch is open; the circuit is not complete. There is battery voltage from the battery to the control unit, and a reference voltage sent by the control unit to the switch. A voltmeter would indicate battery voltage up to the control unit, and control unit reference voltage between the control unit and the open switch.



In this illustration, the switch is closed; the circuit is complete. A voltmeter would indicate battery voltage only up to the control unit. There is no voltage after the control unit because the control unit "used it up". The control unit is the load.



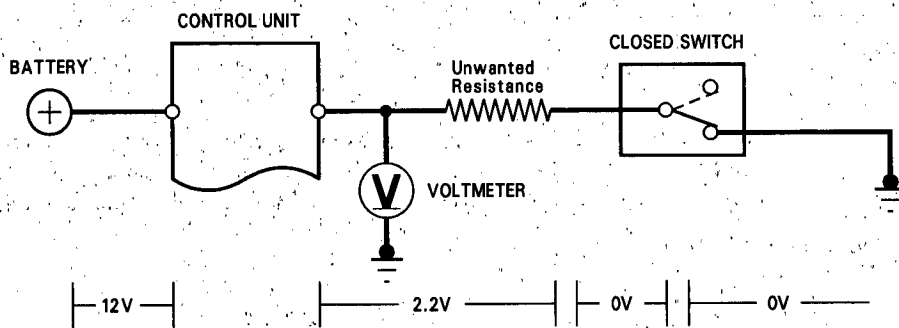
(cont'd)

# Automatic Shoulder Seat Belt

## Description (cont'd)

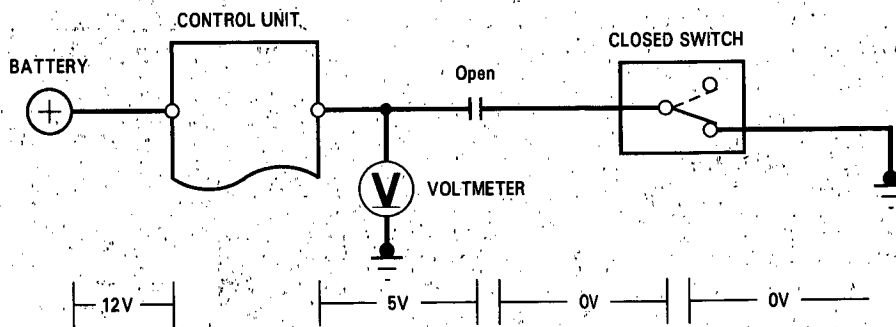
The control unit is supplied with the battery voltage. The control unit then sends a reference voltage to the switch. The reference voltage will change depending on the position of the switch and the condition of the circuit. The change in voltage is what the control unit monitors to determine whether the switch is open or closed. If you check voltage at the control unit (between the control unit and the switch, with a digital voltmeter), the meter will pick up any excessive resistance, an open, or a short in the circuit. The following illustrations show how circuit voltage readings would change because of excess resistance, an open, or a short.

In this illustration, the switch is closed; the circuit is complete. The reference voltage is 2.2 V. The voltage should be zero with the switch closed, but the unwanted resistance in the circuit creates a second load (the first load is the control unit). Voltage is always used up across all the load(s) in a circuit as long as the circuit is complete (current is flowing). The 2.2 V measured are actually the voltage drop across the unwanted resistance.



The unwanted resistance may "confuse" the control unit as to whether the switch is open or closed because when the switch is closed, the reference voltage should be zero. As the unwanted resistance becomes higher, the reference voltage will increase accordingly.

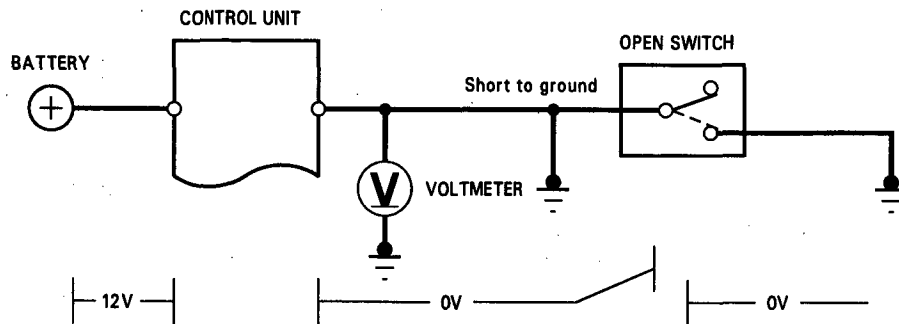
In this illustration, the switch is closed; the circuit should be complete. But since the wire between the control unit and the switch is open, the circuit is not complete. The reference voltage will be exactly the same as if the switch were open.







In this illustration, the wire from the control unit to the switch is shorted to body ground. This completes the circuit, even though the switch is still open. The reference voltage will be the same as if the switch were closed.



#### Retractor

When either front door is opened, the seat belt control unit is signalled by the door latch switch. The control unit energizes the shoulder belt retractor solenoid(s), and then moves the shoulder belt(s) to the appropriate position.

When the shoulder belt is moved from the rearward to forward position it must unwind from the retractor assembly. If it does not, the shoulder belt motor will stall. The retractor solenoid is energized to prevent the retractor from locking. If the retractor were to lock while the belt was being moved to/from the front/rear position, the motor could stall.

If the retractor solenoid is functioning properly, the following condition may still occur: it does not indicate any problem with the system. If there actually is a problem with the system, the indicator light will go on and the beeper will sound.

For the shoulder belt to travel forward the belt must unwind from the retractor. So, before the control unit signals the shoulder belt to move forward, the retractor solenoid is energized. If the shoulder belt is locked, and then the retractor solenoid is energized, it will remain locked (the solenoid cannot override the mechanical lock). The control unit signals the retractor motor to drive the belt forward, but, in this situation, the motor will stall.

**NOTE:** The retractor may be locked because of conditions. It may not be apparent the retractor is locked until the motor tries to drive the belt forward. If the retractor is locked, relieve the tension on the belt and allow it to retract to unlock the retractor.

#### Track Assembly

The shoulder belt track assembly consists of the shoulder belt motor, cables, tracks, a front position switch, a rear lock position switch (anchor), and a rear lock position switch (seat belt).

The shoulder belt track assembly contains the buckle receptacle for the shoulder belt. The control unit signals the motor to drive the shoulder belt forward and rearward, and monitors the switches to determine where the shoulder belt is positioned. It also monitors the rear lock position switch (seat belt) to determine whether the shoulder belt is buckled.

(cont'd)

# Automatic Shoulder Seat Belt

## Seat Belt Operation

### Control Unit

The control unit positions the shoulder belts according to inputs from the ignition switch, the door latch switches (located in the latch assemblies), and the front and rear position switches, located in the shoulder belt track assembly.

When the ignition switch is turned ON and the key removed, the control unit will monitor the door switches, and the front and rear position switches to determine where the shoulder belt is located. If the belt is not in the proper position, the control unit will move it to the correct position. In a properly functioning system, the belts should be in the following positions:

Ignition key position	Door position		Shoulder belt position	
	Left	Right	Left	Right
ON	closed	closed	rear	rear
ON	open	closed	forward	rear
ON	open	open	forward	forward
ON	closed	open	rear	forward

When the ignition switch is turned OFF and the key removed, the driver's side shoulder belt will travel forward and remain there, regardless of the driver's door position. The passenger's belt will remain in the rearward position if the passenger's door is not opened. If the passenger's door is opened, the shoulder belt will travel forward and remain there.

Ignition key position	Door position		Shoulder belt position	
	Left	Right	Left	Right
OFF, key removed	closed	closed	forward	rear
OFF	open	closed	forward	rear
OFF	open	open	forward	forward
OFF, key removed	closed	open	forward	forward



## Monitor Switches

The seat belt control unit monitors all the switches in the automatic shoulder belt system. This chart explains how each switch in the system is "read" by the control unit.

Switch	Function
Door latch switch	The door latch switch has two positions. The control unit has two wires going to this switch. When the door is closed, one wire will be switched to body ground and the other will be opened. When the door is opened, the condition will reverse.
Front position switch	This switch provides a path to ground (the switch is closed) when the shoulder belt is not in the forward position. The switch is open when the shoulder belt is in the forward position (this creates an open in the circuit).
Rear lock position switch (anchor)	This switch provides a path to ground (the switch is closed) when the shoulder belt is not in the rearward position. The switch is open when the shoulder belt is in the rearward position (this creates an open in the circuit).
Rear lock position switch (seat belt)	This switch provides a path to ground (the switch is closed) when the shoulder belt is not in the rearward position. The switch is open when the belt is in the rear position and the shoulder belt is buckled (this creates an open circuit).
Lap seat belt switch	This switch provides a path to ground (the switch is closed) when the lap belt is not buckled. The switch is open when the lap belt is buckled.
Solenoid sensor switch	This switch provides a path to ground (the switch is closed) when the solenoid is not energized. The switch is open when the solenoid is energized.

(cont'd)

# Automatic Shoulder Seat Belt

## Seat Belt Operation (cont'd)

### Troubleshooting Tips

- If the seat belt light and beeper are on, the control unit input test will locate the problem.
- When the input test indicates the voltage should be 1 volt or less, or 0.03 V volts or less, it means exactly what it says. If the voltage exceeds 1 volt there is too much circuit resistance.
- If one of the input tests is failed, the system must be repaired before further testing. If you continue testing, the system gives false results on a later test.
- In the "Test: Desired result" section of the input test, it may indicate what position the shoulder buckle should be in. If the buckle is not in that position, the test results will be incorrect.
- The entire circuit must be checked if the system fails a voltage test. The circuit consists of the wire to the switch, the switch, the wire from the switch, and the ground connection.
- The control unit connectors are part of the circuit. If necessary, remove the female terminals from the back of the connector and adjust them to fit the control unit male terminals snugly.



# Electrical Troubleshooting

**NOTE:**

- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting:
  - Check the No. 23 (7.5 A) fuse in the under-dash fuse/relay box and the No. 34 (7.5 A), No. 35 (30 A) and No. 36 (30 A) fuses in the under-hood main fuse box.
  - Check that the reminder light comes on for about six seconds when the driver's door is opened and the ignition switch is turned on. If it doesn't come on, check for an open circuit or blown bulb.
  - Move the car to your dealer's back lot or some other quiet place where you won't be a road hazard. Drive the car between 10 and 15 mph (16 and 24 km/h), lean forward against the shoulder belt and abruptly apply the brakes, not hard, just enough to dip the front end. You should feel the belt lock as the front end dips. If the shoulder belt locks, its locking mechanism is working.

Symptom	Item to be inspected	Foreign matter stuck between anchor rail and shoulder buckle, or cable not attached properly.		Shoulder buckle motor		Door latch switch stuck closed or opened		Seat belt retractor solenoid and sensor switch		Front position switch		Rear lock position switch		Ignition key switch		Driver's lap seat belt switch		Control unit input test		Poor ground	Open circuit, loose or disconnected terminals.
		Driver's	Front passenger's	Driver's	Front passenger's	Driver's	Front passenger's	Driver's	Front passenger's	Driver's	Front passenger's	Driver's	Front passenger's	Driver's	Front passenger's	Driver's	Front passenger's	Driver's	Front passenger's		
The shoulder seat belt buckle does not move, but shoulder buckle motor runs.		1																			
The shoulder buckle motor does not run.	Driver's		2													1	G501, G502 or G551, G552	BLU/WHT <sup>1</sup> or BLU/RED			
	Front passenger's		2													1	G501, G502 or G551, G552	RED/BLU <sup>1</sup> or RED/YEL <sup>1</sup>			
The shoulder buckle stops on the way between the rear lock and the front position.	Driver's	1		3		4										2					
	Front passenger's	1			3	4										2					
The shoulder seat belt retractor locks when the ignition switch is OFF and the door is open.	Driver's			2		3										1		BLU/YEL, GRN/BLU or WHT/YEL <sup>1</sup>			
	Front passenger's				2	3										1		RED/GRN, GRN/RED or RED/YEL <sup>2</sup>			
The shoulder seat belt buckle motor runs normally, but the reminder light comes on and the beeper sounds.										3	3	2	2		4	1		YEL/RED			
Driver's shoulder seat belt buckle does not shift to front position from rear lock position when the ignition key is removed.																1					

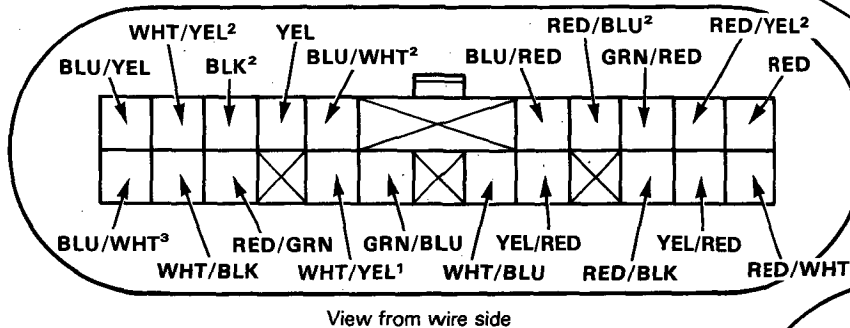
# Automatic Shoulder Seat Belt

## Control Unit Input Test

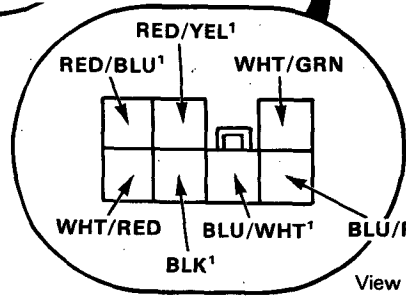
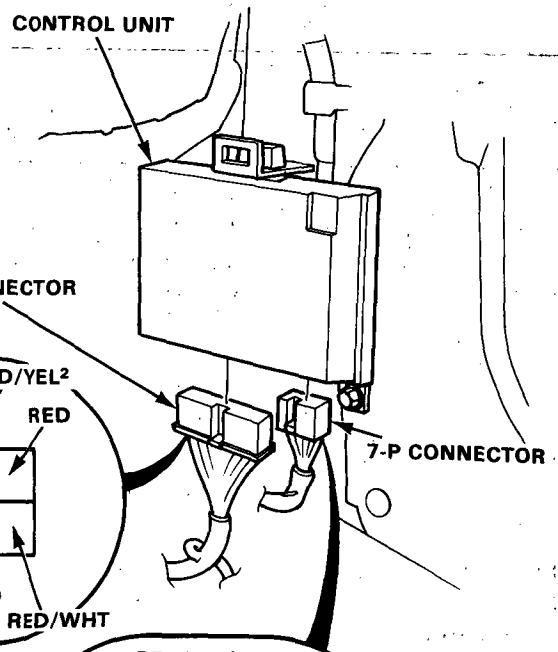
Remove the right kick panel and disconnect the 7-P and 22-P connectors from the control unit.  
Make the following input tests at the connectors.

**NOTE:**

- Recheck the connections between the 7-P, 22-P connectors and the control unit; then replace the control unit if all input tests prove OK.
- Different wires with the same color have been given a number suffix to distinguish them (for example, WHT/GRN<sup>1</sup> and WHT/GRN<sup>2</sup> are not the same).



View from wire side



View from wire side

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	WHT/GRN <sup>1</sup>	Under all conditions.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 36 (30 A) fuse.</li> <li>• An open in the wire.</li> </ul>
2	WHT/RED	Under all conditions.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 35 (30 A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	BLK <sup>1</sup>	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (Hatchback: G502, Sedan: G552).</li> <li>• An open in the wire.</li> </ul>
4	BLU/WHT <sup>1</sup> and BLU/RED (or RED/BLU <sup>1</sup> and RED/YEL <sup>1</sup> )	Connect the BLU/WHT <sup>1</sup> (or RED/BLU <sup>1</sup> ) terminal to the WHT/GRN <sup>1</sup> terminal, and the BLU/RED (or RED/YEL <sup>1</sup> ) terminal to the BLK <sup>1</sup> terminal when the shoulder buckle is in front position.	Check shoulder buckle motor operation: Driver's (or passenger's) shoulder buckle should slide from the front position to the rear lock position. When reversing the test leads, motor direction should change.	<ul style="list-style-type: none"> <li>• Faulty shoulder buckle motor or rail.</li> <li>• An open in the wire.</li> </ul>
5	BLK <sup>2</sup>	Under all conditions.	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (Hatchback: G501, 502, Sedan: G551, 552).</li> <li>• An open in the wire.</li> </ul>
6	WHT/YEL <sup>2</sup>	Under all conditions.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 34 (7.5 A) fuse.</li> <li>• An open in the wire.</li> </ul>



No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
7	BLU/WHT <sup>2</sup>	Ignition key turned from "II" to "O" position.	Check for voltage to ground: There should be battery voltage when the ignition key is turned from "II" to "O" position and no voltage when it is removed.	<ul style="list-style-type: none"> <li>• Faulty ignition key switch.</li> <li>• An open in the wire.</li> </ul>
8	YEL	Ignition switch ON.	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> <li>• Blown No. 23 (7.5 A) fuse.</li> <li>• An open in the wire.</li> </ul>

NOTE: With ignition switch ON, connect the 7-P and 22-P connectors to the control unit and perform tests 10 thru 16.

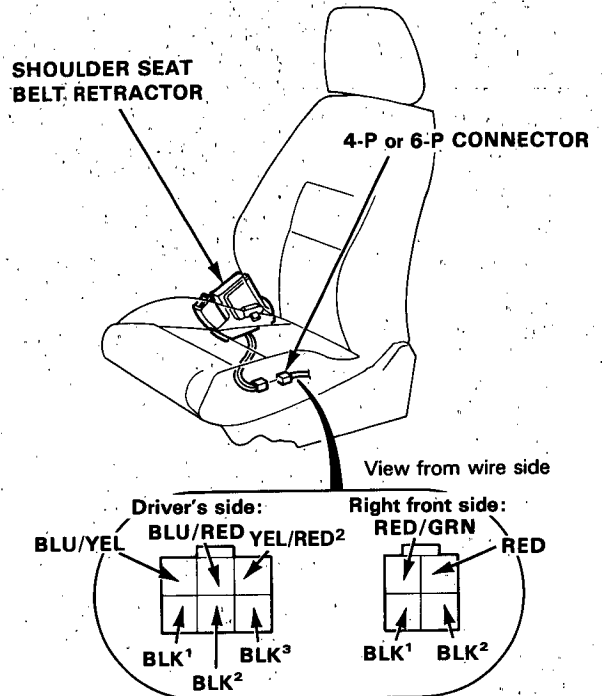
9	GRN/BLU or (GRN/RED)	Driver's (or passenger's) door closed.	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> <li>• Short to ground.</li> <li>• Faulty door latch switch.</li> <li>• Faulty control unit.</li> </ul>
		Driver's (or passenger's) door open.	Check for voltage to ground: There should be approx. 5 V or more.	<ul style="list-style-type: none"> <li>• An open in the wire.</li> <li>• Faulty door latch switch.</li> </ul>
10	WHT/YEL <sup>1</sup> or (RED/YEL <sup>2</sup> )	Driver's (or passenger's) door open.	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> <li>• An open in the wire.</li> <li>• Faulty door latch switch.</li> </ul>
		Driver's (or passenger's) door closed.	Check for voltage to ground: There should be approx. 5 V or more.	<ul style="list-style-type: none"> <li>• Short to ground.</li> <li>• Faulty door latch switch.</li> <li>• Faulty control unit.</li> </ul>
11	WHT/BLK or (RED/BLK)	Driver's (or passenger's) door open	Check for voltage to ground: There should be 0.03 V or less when the shoulder buckle is not in the rear lock position.	<ul style="list-style-type: none"> <li>• Short to ground.</li> <li>• Faulty rear lock position (anchor) switch.</li> <li>• Faulty control unit.</li> </ul>
		Driver's (or passenger's) door closed.	Check for voltage to ground: There should be approx. 5 V or more when the shoulder buckle is in the rear lock position.	<ul style="list-style-type: none"> <li>• An open in the wire.</li> <li>• Faulty rear lock position (anchor) switch.</li> </ul>
12	WHT/BLK or (RED/BLU <sup>2</sup> )	Driver's (or passenger's) door open	Check for voltage to ground: There should be less than 1 V when the shoulder buckle is not in the rear lock position.	<ul style="list-style-type: none"> <li>• Short to ground.</li> <li>• Faulty rear lock position (seat belt) switch.</li> <li>• Faulty control unit.</li> </ul>
		Driver's (or passenger's) door closed.	Check for voltage to ground: There should be approx. 5 V or more when the shoulder buckle is in the rear lock position and shoulder seat belt is buckled.	<ul style="list-style-type: none"> <li>• An open in the wire.</li> <li>• Faulty rear lock position (seat belt) switch.</li> </ul>
13	BLU/WHT <sup>3</sup> or (RED/WHT)	Driver's (or passenger's) door open.	Check for voltage to ground: Should be approx. 5 V or more when the shoulder buckle is in the front position.	<ul style="list-style-type: none"> <li>• An open in the wire.</li> <li>• Faulty front position switch.</li> </ul>
		Driver's (or passenger's) door closed.	Check for voltage to ground: There should be 0.03 V or less when the shoulder buckle is not in the front position.	<ul style="list-style-type: none"> <li>• Short to ground.</li> <li>• Faulty front position switch.</li> <li>• Faulty control unit.</li> </ul>
14	BLU/YEL or (RED/GRN)	Driver's (or passenger's) door open.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Short to ground.</li> <li>• Faulty shoulder seat belt retractor (solenoid).</li> </ul>
		Driver's (or passenger's) door closed.	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> <li>• Faulty control unit.</li> </ul>
	BLU/RED or (RED)	Driver's (or passenger's) door open.	Check for voltage to ground: There should be approx. 5 V or more.	<ul style="list-style-type: none"> <li>• Short to ground.</li> <li>• Faulty shoulder seat belt retractor (sensor switch).</li> <li>• Faulty control unit.</li> </ul>
		Driver's (or passenger's) door closed.	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> <li>• An open in the wire.</li> <li>• Faulty control unit.</li> </ul>
15	YEL/RED <sup>2</sup>	Driver's lap seat belt buckled.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Short to ground.</li> <li>• Faulty driver's shoulder seat belt retractor (lap seat belt switch).</li> <li>• Faulty control unit.</li> </ul>
		Driver's lap seat belt un-buckled.	Check for voltage to ground: There should be less than 1 V. The reminder light in the gauge assembly should come on.	<ul style="list-style-type: none"> <li>• Blown bulb.</li> <li>• An open in the wire.</li> <li>• Faulty driver's shoulder seat belt retractor (lap seat belt switch).</li> </ul>

# Automatic Shoulder Seat Belt

## Retractor Solenoid/Solenoid Sensor Switch Test

**NOTE:** Perform this test on each shoulder seat belt retractor.

1. Slide the front seat forward to disconnect the connector from the shoulder seat belt retractor.
2. Connect the voltmeter positive probe to the BLU/YEL (driver's side) or RED/GRN (right front side) terminal and the negative probe to the BLK<sup>1</sup> terminal of the rear wire harness connector.  
There should be battery voltage when the door is opened.
  - If there is no voltage, check for:
    - An open in the BLU/YEL (driver's side) or RED/GRN (right front side) wire.
    - Poor ground (Hatchback: G501, G502). (Sedan: G551, G552).
    - Control unit input test (see page 23-214).
  - If there is battery voltage, go to step 3.



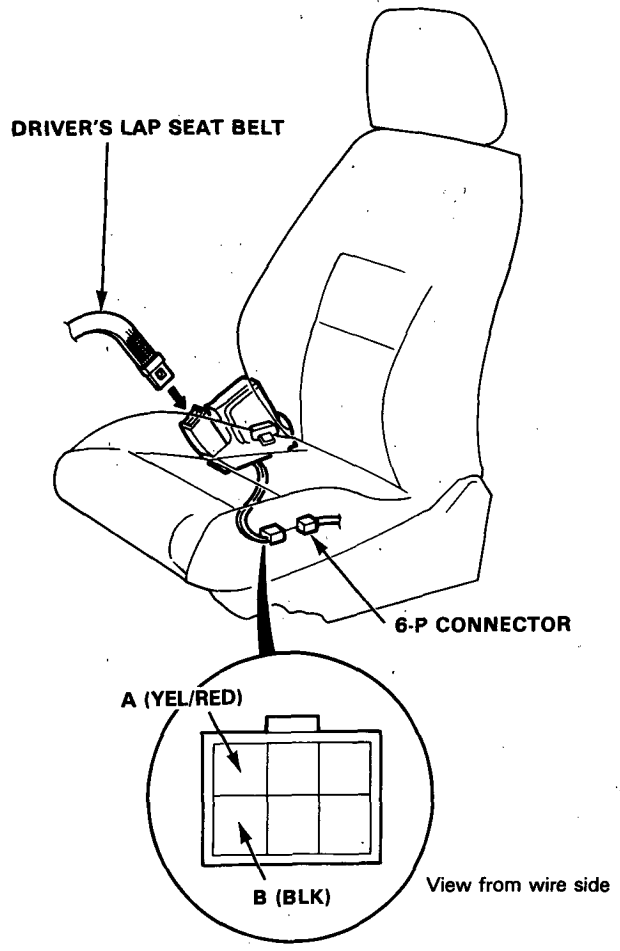
3. Perform retractor solenoid test: With the door open, check for continual clicks of the solenoid plunger whenever the connector is alternately connected and disconnected.
  - If it does not click, replace the shoulder seat belt assembly (solenoid is not available separately).
4. Connect the 6-P or 4-P connector to the shoulder seat belt retractor.
5. Perform solenoid sensor switch test: Check for voltage between the BLU/RED (+) and BLK<sup>2</sup> (-) terminals of the 6-P connector (driver's side), or between the RED (+) and BLK<sup>2</sup> (-) terminals of the 4-P connector (right front side) when the door under test is opened and closed.  
There should be approx. 5V or more when the door is opened and less than 1V when the door is closed.
  - If there is an abnormality, replace the shoulder seat belt assembly.





## Driver's Lap Seat Belt Switch Test

1. Slide the driver's seat forward to disconnect the 6-P connector from the shoulder seat belt retractor.
2. There should be continuity between the A (YEL/RED) and B (BLK) terminals when the driver's lap seat belt is not buckled. There should be no continuity when the driver's lap seat belt is buckled.



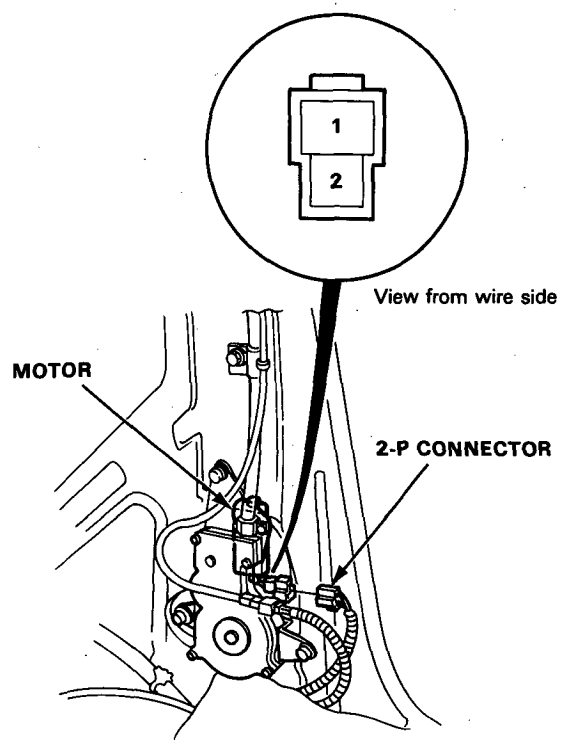
## Shoulder Buckle Motor Test

1. Remove the quarter panel or B pillar lower panel (see section 20).
2. Disconnect the 2-P connector from the shoulder buckle motor.
3. Test the motor by connecting power and ground to the No. 1 and No. 2 terminals. Test the motor in each direction, by switching the leads from the battery.

**CAUTION:** When the motor stops running, disconnect a battery terminal immediately.

4. If the motor does not run, replace the shoulder seat belt rail assembly (see section 20).

**NOTE:** Driver's motor shown; front passenger's motor is similar.



# Automatic Shoulder Seat Belt

## Rear Lock Position Switch Test

1. Remove the quarter panel or B pillar lower panel (see section 20).
2. Disconnect the 2-P connector from the shoulder buckle motor and the 4-P connector from the rear lock position switch.
3. Check for continuity between the terminals in each buckle position according to the table.

NOTE: When power and ground connected to terminals (No. 1 and No. 2), the shoulder buckle motor will run. Consequently, the shoulder buckle will move back and forth (see motor test on page 23-249).

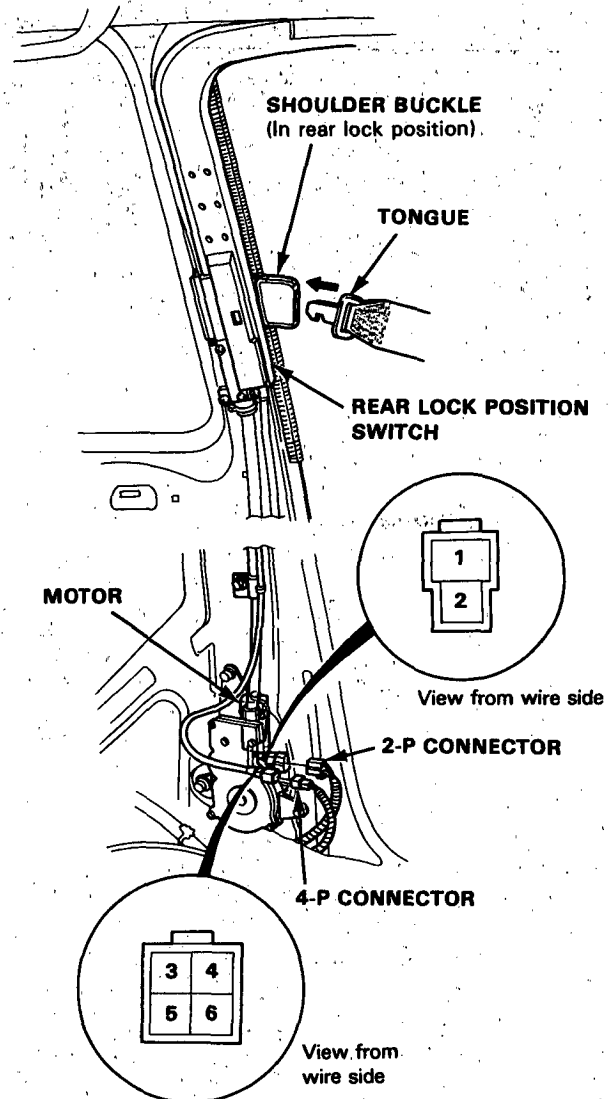
CAUTION: When the motor stops running, disconnect a battery terminal immediately.

### Shoulder Seat Belt Switch

		Terminal	
Position		3	4
Rear lock Position	Seat belt buckled		
	Seat belt unbuckled	○ — ○	○ — ○
Other positions		○ — ○	○ — ○

### Anchor Switch

		Terminal	
Position		5	6
Rear lock position			
Other positions		○ — ○	○ — ○



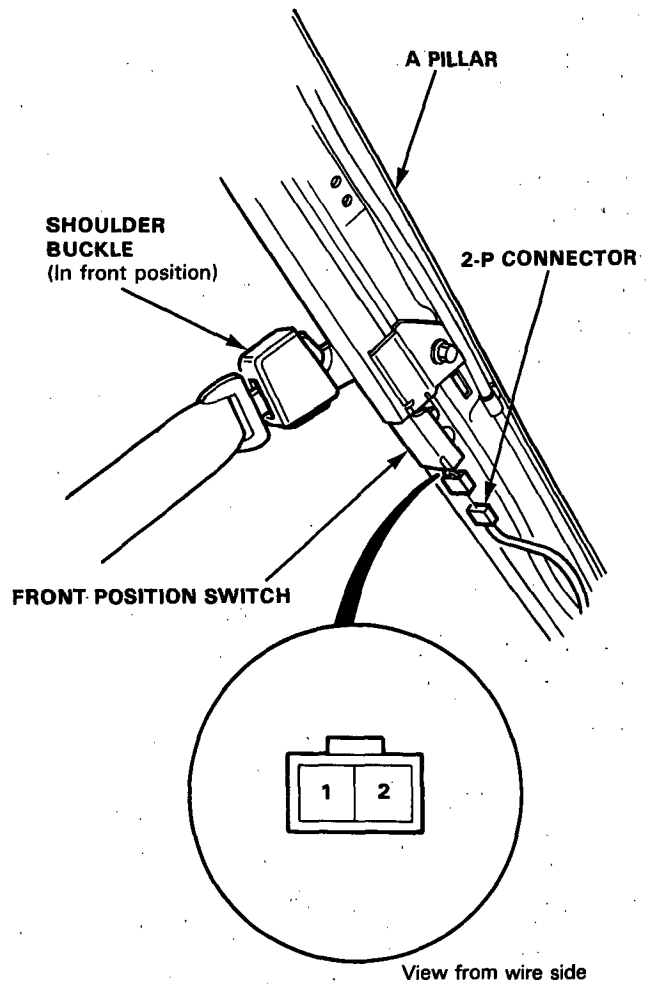
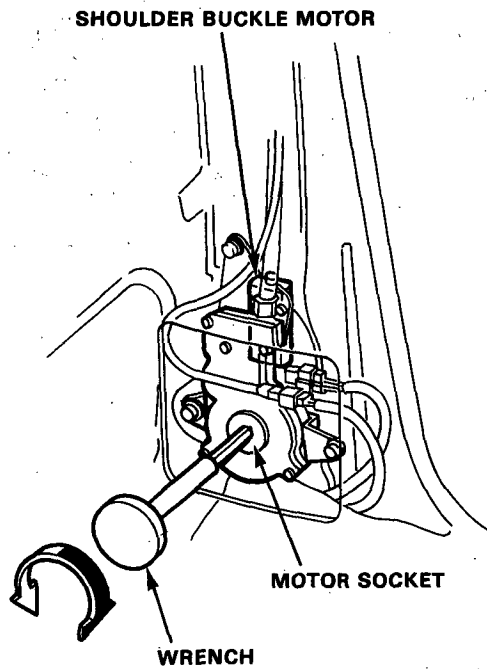


## Front Position Switch Test

**CAUTION:** Always remove the No. 35 (30 A) or No. 36 (30 A) shoulder buckle motor fuse in the main fuse box before testing, otherwise the motor may suddenly activate.

1. Remove the A pillar panel (see section 20).
2. Disconnect the 2-P connector from the front position switch.
3. Check for continuity between the No.1 and No.2 terminals.  
There should be no continuity when the shoulder buckle is in the front position.  
There should be continuity when the shoulder buckle is not in the front position.

**NOTE:** Operate the shoulder buckle motor manually by inserting the wrench provided in the tool bag into the motor socket.



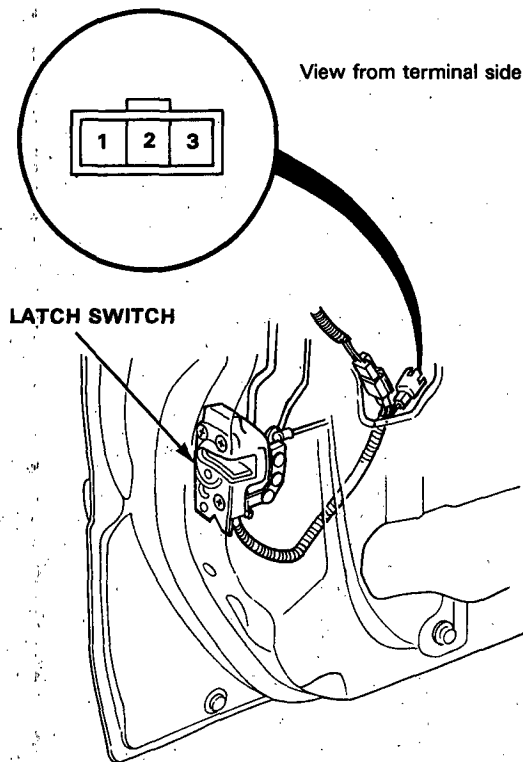
# Automatic Shoulder Seat Belt

## Door Latch Switch Test

1. Remove the door panel.
2. Disconnect the 3-P connector from the switch.
3. Check for continuity between the terminals in each door position according to the table.

Terminal Position	1	2	3
OPEN	○	○	
CLOSE		○	○

NOTE: Driver's door latch switch is shown; front passenger's door latch switch is similar.





# Wiring Diagrams

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