SECTION 8

ELECTRICAL

CONTENTS

SECTION 8A

CAB ELECTRICAL

***NOTICE:** When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.*

CONTENTS

CONTENTS (cont'd)

GENERAL DESCRIPTION
BASIC ELECTRICAL

CIRCUITS

An automotive electrical circuit starts from a supply of electricity, travels through a load (light bulb, starter, etc.), and then conducts the electricity back to the supply. There should be a device to open and close the circuit,and a protective device to open and close the circuit in case too much current flows in the circuit, as in the case of a short.

Electrical circuits can be set up as series circuits or parallel circuits. The circuits in trucks are usually parallel circuits.

SERIES CIRCUITS (Figure 1)

In series circuits, each electrical device is connected in the circuit so that the current can only go along one path as it flows from the power supply, around the circuit and back to the power supply.

PARALLEL CIRCUITS (Figure 1)

In parallel circuits, the electrical devices are connected by parallel wires that are joined at the start of the circuit. The current divides, and part of it flows into each device.

With circuits in parallel, each circuit can be switched on and off by itself since each circuit receives electricity directly from the power supply.

CIRCUIT COMPONENTS (Figure 2)

The usual circuit path starts at the power supply which is the battery/generator system. Next in the circuit is the circuit protection component which can be a fusible link, a fuse, or a circuit breaker. Then the circuit goes to the circuit controller which can be a switch or a relay. From the circuit controller the circuit goes into the circuit load. The circuit load can be one light or many lights in parallel, an electric motor or a solenoid. After the electricity has passed through the load it must return to the power supply via the ground path. The ground path can be a wire in the harness or it could be through the load housing into the body or frame, thus returning the electricity to the power supply. The body and frame are connected by flexible ground straps.

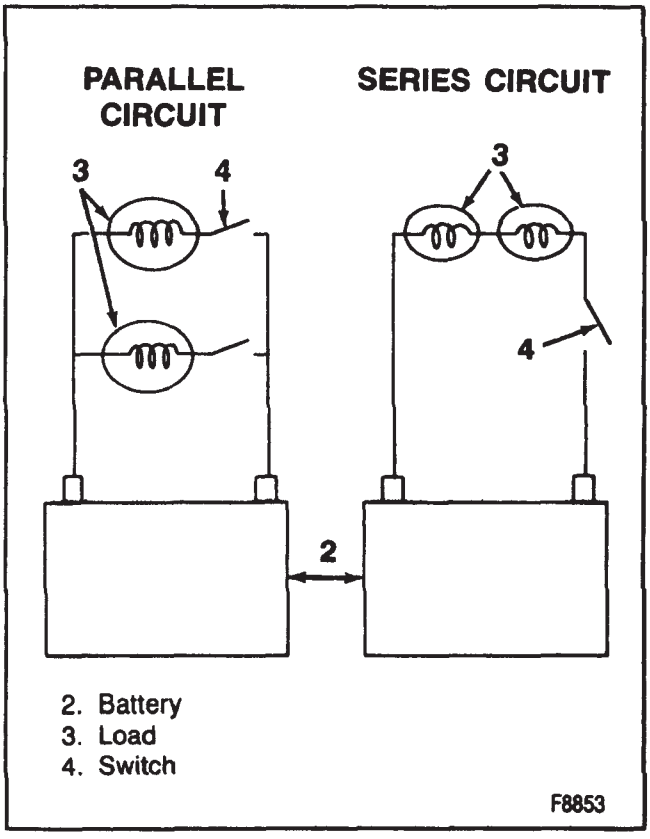

Figure 1—Basic Circuits

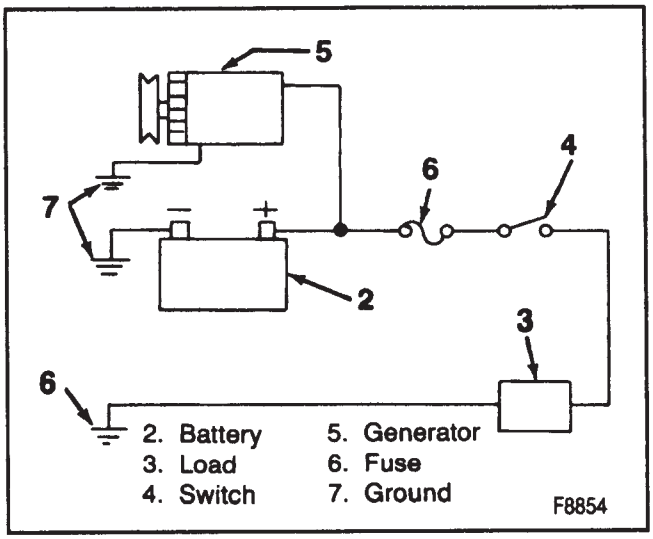

Figure 2—Circuit Components

FUSIBLE LINK

A fusible link is a section of wire that is usually four gage sizes smaller than the circuit it protects. A special insulation is used that swells when heated by the wire. Fusible links are usually found in the engine compartment harnesses. The function of the fusible link is to melt open when an overload occurs, thus preventing any damage to the circuit.

FUSES

The most common protector in the vehicle circuit is a fuse. A fuse consists of a fine wire or strip of metal inside a glass tube or plastic housing. The strip melts and interrupts the flow of current in the circuit when there is an overload caused by an unwanted short or ground. The fuse is designed to melt before the wiring or electrical components in a circuit can be damaged. Naturally, the cause must be located and corrected before the fuse is replaced or the new fuse will also blow.

Since different circuits handle different amounts of current, fuses of various ratings are used. Fuses are rated in amperes. Be sure to replace a blown fuse with a fuse of the correct rating figure 15.

CIRCUIT BREAKERS

Circuit breakers are another form of circuit protector. There are two types of circuit breakers; automatic reset and remote reset.

The automatic reset breaker opens when excess current heats a bimetallic strip, causing the strip to bend and open a set of contacts. Then the strip cools and closes the contacts. So the circuit breaker opens and closes until the excess current condition is corrected or the circuit is disconnected from the power supply.

The remote reset circuit breaker has a heating wire wound around the bimetallic strip. When an excess current happens, the strip heats, bends, and opens the contacts. Then a small current flows through the heat wire, keeping the strip hot and the contacts open. This type of breaker will stay open until either the power supply is disconnected from the circuit or the breaker is removed from the circuit. Then the breaker can cool and reset.

CIRCUIT CONTROLLERS (Figure 3)

Circuit controllers consist of switches or relays. Switches are usually operated by a mechanical means such as a hand or lever. Switches are usually at the beginning of a circuit but can be used to control a ground path. For example, the switch controlling the headlights is at the power end of the circuit while the door switch controlling the domelight completes the ground path.

Relays are remotely controlled switches. They are used in high current circuits and in circuits controlled by sensors.

Relays are designed so that a small current circuit will be able to control a large current circuit.

WIRING HARNESS AND WIRES

Every wire is a specific size with colored or striped insulation that is indicated on the wiring diagrams. Insulation colors help to trace circuits and to make proper connections. Abbreviations and symbols used

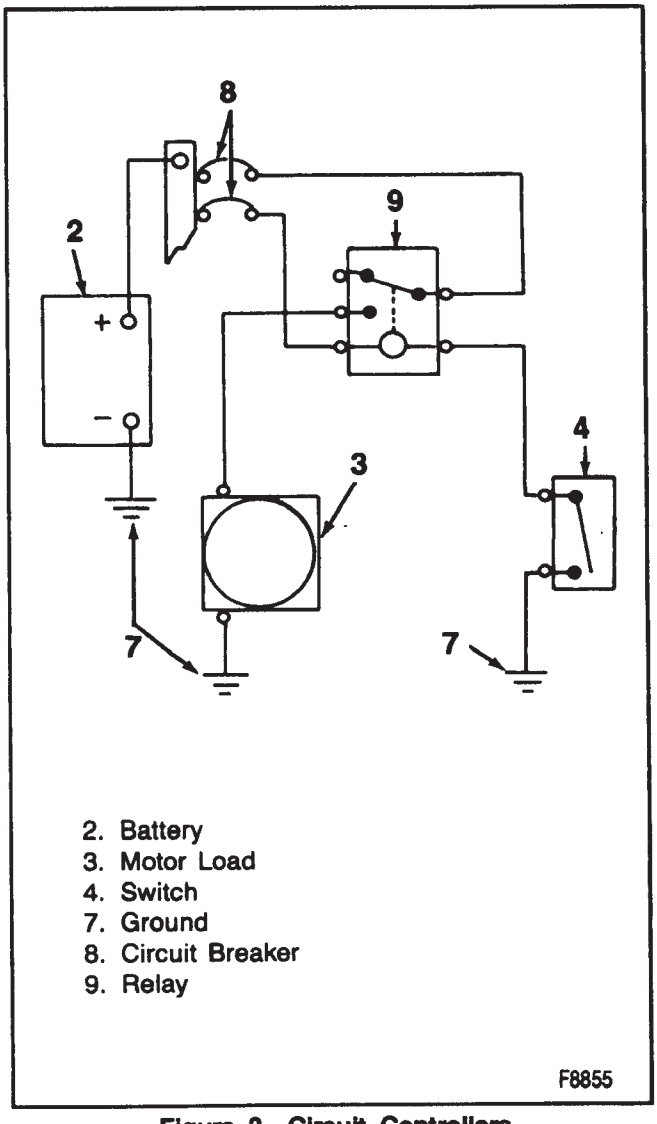

Figure 3—Circuit Controllers

for indicating wire insulation colors and patterns are as follows:

BLK	Black	BLU	Blue
BRN	Brown	PPL	Purple
CHK	Check	TR	Tracer
CR	Cross	YEL	Yellow
GRN	Green	//	Parallel
NAT	Natural	WHT	White
SGL	Single	STR	Stripe
ORN	Orange	PNK	Pink
GR	Gray	DK	Dark

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Some wires are grouped and taped together or encased in a split plastic casing. This grouping of wires is called a harness. For some purposes, it is more practical to use a single wire protected by a braided tubing called a loom.

Wiring harnesses are joined by using a multiple plug and receptacle connector block, or a terminal post chassis junction block. In the instrument panel area plastic insulated blade-type connectors and screw-type terminals are used.

Each harness or wire must be held securely in place by clips or other holding devices to prevent chafing of the insulation.

WIRE SIZE

Wire size in a circuit is determined by the amount of current, the length of the circuit and the voltage drop allowed. Wire size is specified using the metric gage. The metric gage describes the wire size directly in cross section area measured in square millimeters.

WIRE SIZE CONVERSION TABLE

METRIC SIZE $(mm)^2$	AWG SIZE
0.22	24
0.35	22
0.5	20
0.8	18
1.0	16
2.0	14
3.0	12
5.0	10
8.0	8
13.0	6
19.0	4
32.0	2
40.0	1
50.0	0
62.0	00

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CIRCUIT MALFUNCTIONS

There are three electrical conditions that can cause a nonworking circuit; an "Open Circuit," a "Short Circuit," and a "Ground Circuit."

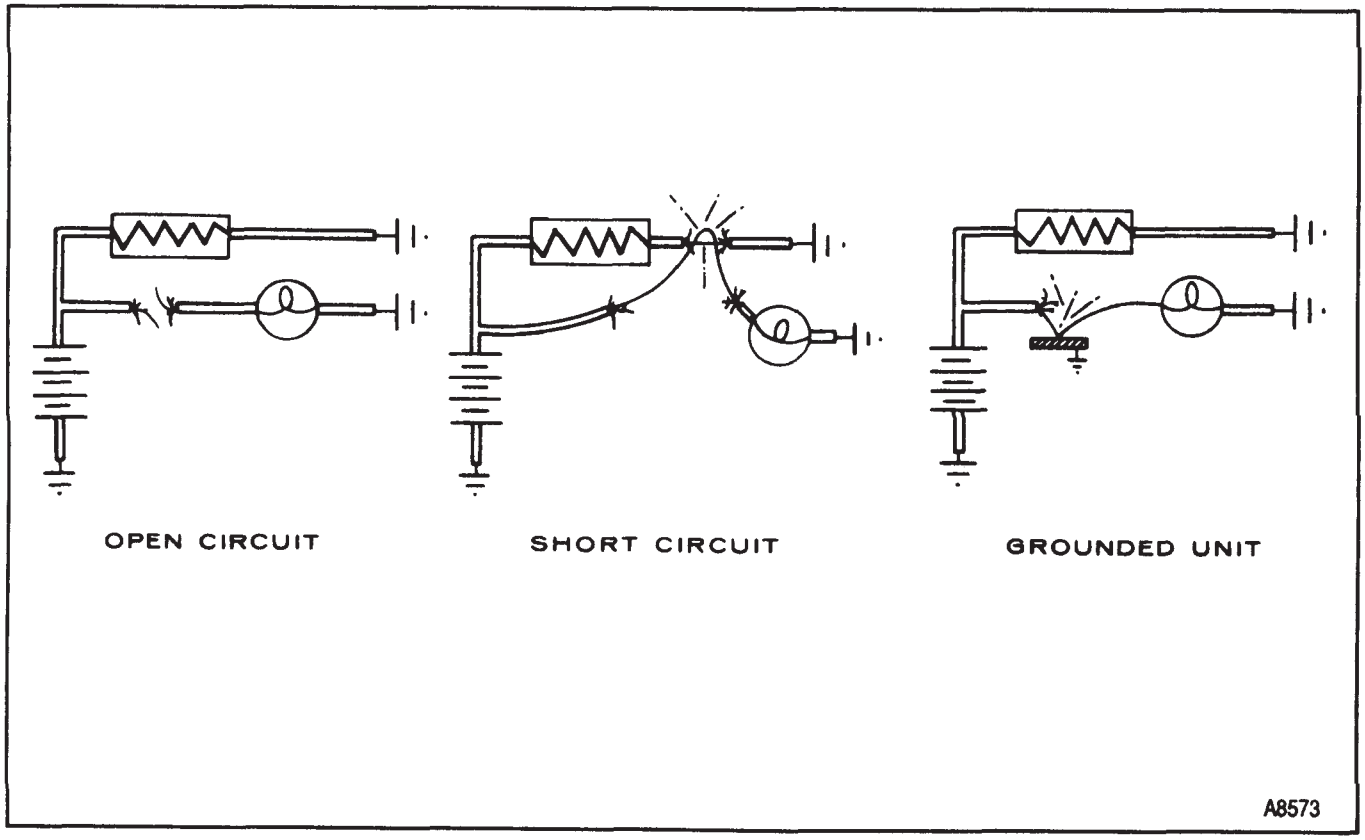


Figure 4—Circuit Malfunctions

OPEN CIRCUIT (Figure 4)

An open circuit occurs whenever there is a break in the circuit. The break can be corrosion at the connector, a wire broken off in a device, or a wire that burned open from too much current.

SHORT CIRCUIT (Figure 4)

A short circuit happens when the current bypasses part of the normal circuit. This bypassing is usually caused by wires touching, salt water in or on a device such as a switch or a connector or solder melting and bridging conductors in a device.

GROUNDED CIRCUIT (Figure 4)

A ground circuit is like a short circuit but the current flows directly into a ground circuit that is not part of the original circuit. This may be caused by a wire rubbing against the frame or body. Sometimes a wire will break and fall against metal that is connected electrically to the ground side of the power supply. A ground circuit may also be caused by deposits of oil, dirt and moisture around connections or terminals, which provide a good path to ground.

CIRCUIT DIAGNOSIS

A clear understanding of the circuit and a wiring diagram are needed for effective diagnosis. Use a logical sequence of testing to find the trouble. Use the diagnostic tools. After the trouble is fixed, make sure the circuit works correctly.

DIAGNOSTIC TOOLS

NOTICE: Test lamps are to be used only on circuits that do not contain solid state devices. If a test lamp is used in a circuit containing a solid state device, the current that the test lamp would draw would be above the current that the solid state device would be able to handle. Using a test lamp on a solid state device may destroy the device.

UNPOWERED TEST LAMP (Figure 5)

This tool consists of a 12-volt lamp with leads. The ends of the leads usually have alligator clamps, but various kinds of probes, terminal spades, and special connectors are used also.

The unpowered test lamp is used on an open circuit. One lead of the test lamp is grounded and the other lead is moved around the circuit to find the open. Depending on the physical layout of the circuit, sometimes it will be easier to start at the power supply and other times it is easier to start at the circuit load, or ground circuit.

POWERED TEST LAMP (Figure 5)

This lamp is a pencil shaped unit with a self contained battery, a 1.5-volt lamp bulb, a sharp probe, and a ground lead fitted with an alligator clip.

This test lamp is used mainly for testing components that are disconnected from the vehicle power supply. The power test lamp is also useful for testing suspected high resistance points in a circuit such as connectors and ground circuits that are corroded or loose.

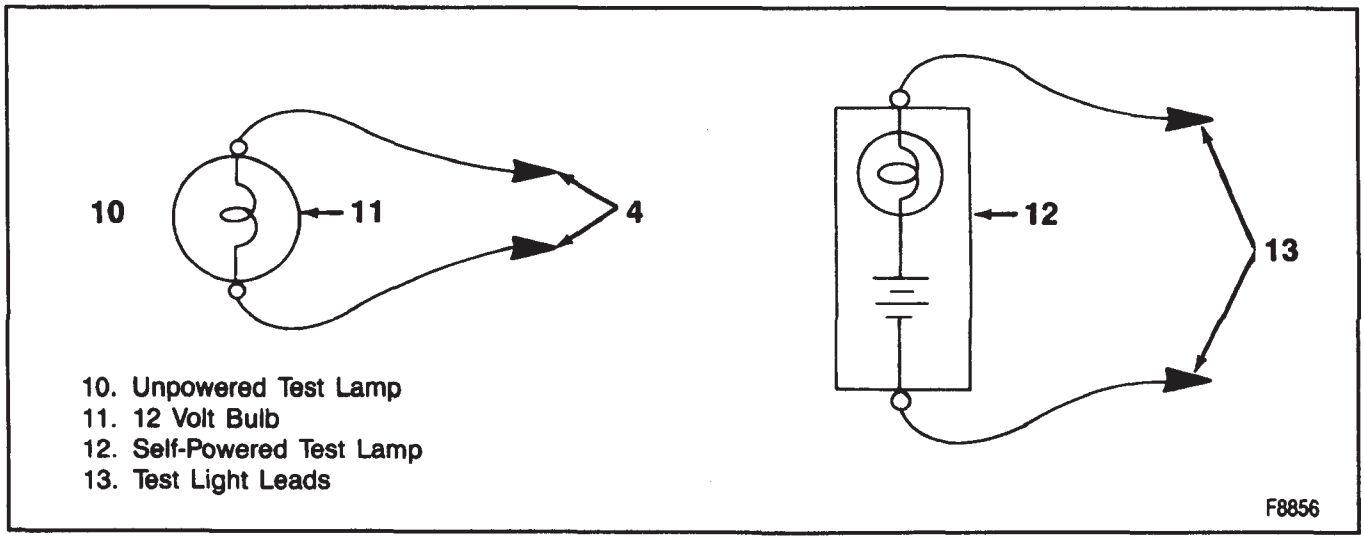
JUMPER

The jumper is usually a long wire with alligator clamps. A version of the jumper has a fuse holder in it with a 10-Amp fuse. This will prevent damaging the circuit if the jumper is connected in the wrong way.

The jumper is used to locate opens in a circuit. One end of the jumper is attached to a power source and then the other end is attached to the load in the circuit, i.e.; lamp, motor. If the load works, try "jumping" to circuit points that are progressively closer to the power supply. When the circuit load stops working, the open has been located.

The jumper is also used to test components in the circuit such as connectors, switches, and suspected high resistance points.

NOTICE: The following instruments: Ammeter, Voltmeter, and Ohmmeter, each have a particular application for trouble shooting electrical circuits.



10. Unpowered Test Lamp
11. 12 Volt Bulb
12. Self-Powered Test Lamp
13. Test Light Leads

Figure 5—Powered and Unpowered Test Lamps

When using an ammeter or voltmeter, and the value being tested is unknown, always use the highest scale first and work downward to a midscale reading whenever possible. This will avoid damage to the instrument.

Never use an ohmmeter in a power circuit, or as a substitute for a voltmeter or ammeter, as damage to the instrument will result.

METERS

Three types of meters are generally used for diagnosis. They are:

1. The voltmeter.
2. The ohmmeter.
3. The ammeter.

These meters are available in two designs. They are:

1. Analog (Needle Type).
2. Digital (Electronic Display Type).

Analog meters may be used for any circuit not containing a solid state device, while a digital meter MUST be used to diagnose any circuit containing a solid state device. An analog meter has a low impeadance. This will affect the readings obtained, because the meter will affect circuit performance. An analog meter will also cause solid state devices to fail because of excessive current flow. A digital meter has a very high impeadance, which causes the meter not to affect circuit performance. This will also be suitable for testing circuits containing solid state devices, since the current draw of the meter will be very small.

NOTICE: The ammeter, voltmeter, and ohmmeter each have a particular application for trouble shooting electrical circuits.

AMMETER (Figure 6)

Disconnect the circuit from the power source before connecting the ammeter. The ammeter measures the amount of electrical current, amperes, moving through a conductor. The ammeter must be placed in series with the circuit being tested. Be sure that the ammeter's positive terminal is connected to the positive (battery) side of the circuit and the ammeter's negative terminal is connected to the negative (ground) side of the circuit.

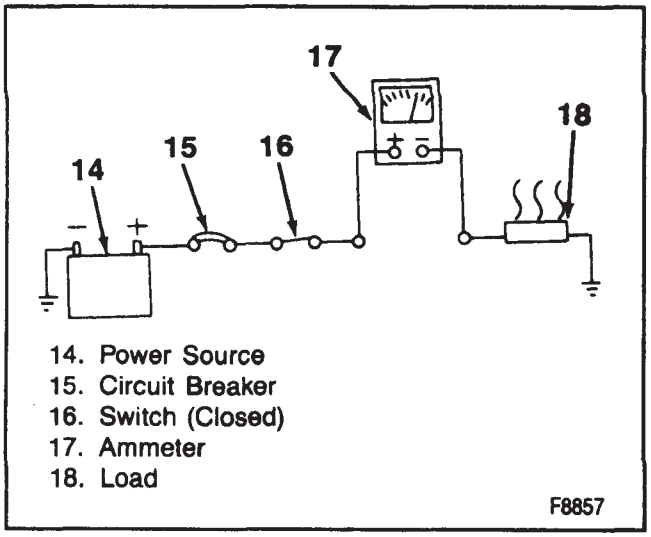


Figure 6—Ammeter Circuit

OHMMETER (Figure 7)

The ohmmeter is an instrument designed to indicate resistance in ohms. It is used to test the condition of a unit disconnected from the circuit.

Ohmmeter Calibration

When the ohmmeter probes are connected, a circuit is completed causing the meter needle to deflect. The needle should read zero ohms, If it does not, rotate the "CAL" or "ADJ" knob to zero the needle.

When the probes are held apart, the needle moves to the maximum (infinite) resistance side of the scale.

The meter is now ready for use.

VOLTMETER (Figure 8)

The voltmeter (properly observed) will give the technician more information than the ammeter, ohmmeter and test lamp combined. Its application for troubleshooting here is to measure the electrical pressure (voltage) drop in a resistance circuit.

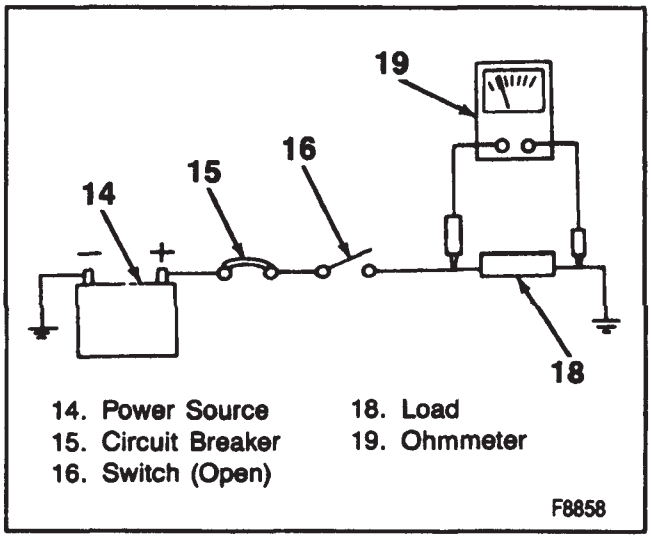


Figure 7—Ohmmeter

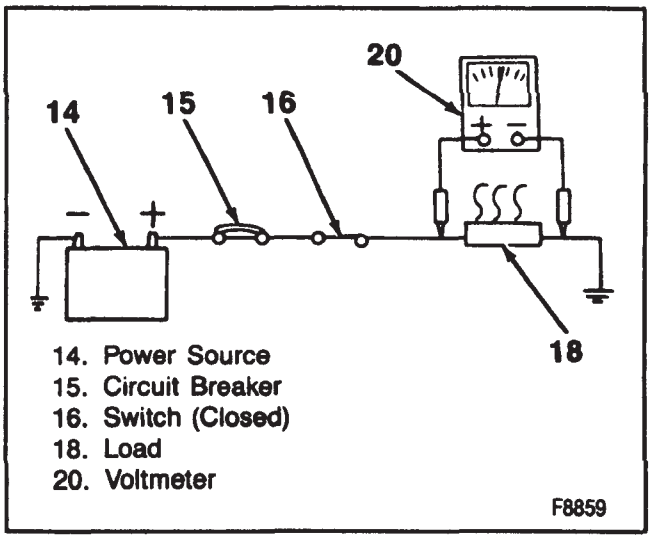


Figure 8—Voltmeter Circuit

To use a voltmeter for troubleshooting an electrical problem, connect it in parallel with the existing circuit. If the voltmeter is connected in series with the circuit being tested, the nature of the circuit would be changed and the reading would have no particular value or use. Connect the meter terminals according to polarity as shown.

The dash mounted voltmeter in the instrument cluster (if used) should also be observed for monitoring proper operation of the generator battery cranking motor, and cranking circuit. In this application, battery voltage drop can be monitored while the engine is cranking; and after the engine is running, generator output voltage can be monitored. This can be a valuable first step prior to diagnosing other electrical problems.

CIRCUIT MAINTENANCE AND REPAIR

MAINTENANCE AND REPAIR

All electrical connections must be kept clean and tight. Loose or corroded connections may cause a discharged battery, difficult starting, dim lamps, and possible damage to the generator and regulator. Wires must be replaced if insulation becomes burned, cracked, or deteriorated.

To splice a wire or repair one that is frayed or broken, always use rosin flux solder to bond the splice and insulating tape to cover all splices or bare wires.

When replacing wire, it is important that the correct size wire be used as shown on applicable wiring diagrams or parts book. Each harness or wire must be held securely in place to prevent chafing or damage to the insulation due to vibration.

Important

- Never replace a wire with one of a smaller size or replace a fusible link with a wire of a larger size.

WIRING CONNECTOR TERMINAL REPLACEMENT (BLADE TYPE)

Remove or Disconnect (Figure 9)

1. Terminal lock tang.
2. Terminal (61).

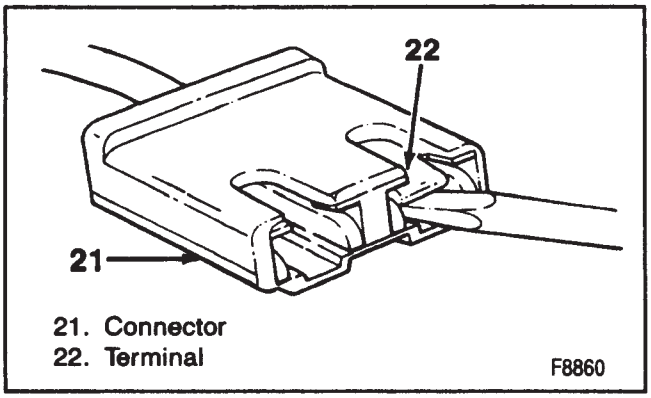


Figure 9—Removing Terminals from the Blade Type Connector

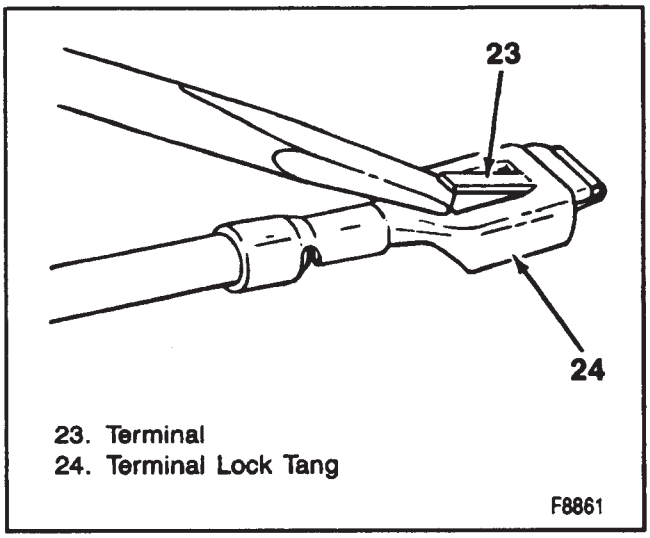


Figure 10—Resetting the Lock Tang

Install or Connect (Figure 10)

1. Pry up on the tang (70).
2. Terminal into the connector.

WIRING CONNECTOR TERMINAL REPLACEMENT (TWIN LOCK TYPE)

Remove or Disconnect (Figure 11)

Tool Required
J 22727 Terminal Remover

1. Connector lock tangs.
2. Terminal locks using J 22727.
3. Terminal.

Install or Connect

1. Pry out the tangs.
2. Terminal into the connector.

METRI-PACK CONNECTOR REPLACEMENT

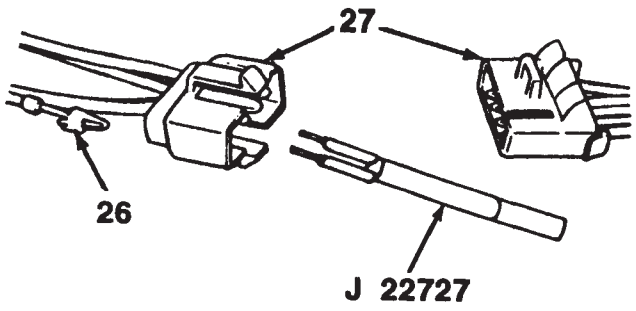
Remove or Disconnect (Figure 12)

Tool Required:
J 35689-A Terminal Remover

1. Primary lock (121) by lifting.
2. Connector body (137).
3. Connector seal (120) by pulling the seal back onto the wires away from the connector body (137).
4. Terminal (136) by inserting J 35689 (139) into the connector body (137) to depress the locking tang (138), then push the wire and terminal through the connector body (figure 10).
   - Snip off the old terminal unless the terminal is to be reused, reshape the locking tang.
5. 5 mm (0.2-inch) of the wire insulation (130).

Clean

- Terminal cavity of the connector body.



26. Wire Terminal
27. Wiring Harness Connector

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Figure 11—Twin Lock Connector Terminal

Install or Connect (Figure 12)

1. Terminal (136) on the wire.
   - Crimp and solder the terminal.
2. Terminal (136) into the connector cavity by pulling the wire on the seal side of the connector until the locking tang (138) is fully seated.
3. Seal (120) by pressing the seal into the connector body (137) until it is fully seated.
4. Connector until the primary lock (121) engages.

WEATHER-PACK CONNECTORS (Figure 12)

Special connectors known as Weather-Pack connectors require a special tool J 28742 for servicing. This special tool is required to remove the pin and sleeve terminals. If removal is attempted with an ordinary pick, there is a good chance that the terminal will be bent or deformed. Unlike standard blade-type terminals, these terminals cannot be straightened once they are bent.

Make sure that the connectors are properly seated and all of the sealing rings are in place when connecting the leads. The hinge-type flap provides a back-up, or secondary locking feature for the terminals. They are used to improve the connector reliability by retaining the terminals if the small terminal lock tangs are not positioned properly.

Molded-on-connectors require complete replacement of the connection. This means splicing a new connector assembly into the harness. Environmental connections cannot be replaced with standard connections. Instructions are provided with the Weather-Pack connector and terminal packages.

With the low current and voltage levels found in some circuits, it is important that the best possible bond at all wire splices be made by soldering the splices.

Use care when probing the connections or replacing terminals in them, it is possible to short between opposite terminals. If this happens to the wrong terminal part, it is possible that damage may be done to certain components. Always use jumper wires between connectors for circuit checking. Never probe through the Weather-Pack seals.

When diagnosing for possible open circuits, it is often difficult to locate them by sight because oxidation or terminal misalignment is hidden by the connectors. Merely wiggling a connector on a sensor or in the wiring harness may correct the open circuit condition. This should always be considered when an open circuit is indicated while troubleshooting. Intermittent problems may also be caused by oxidized or loose connections.

Remove or Disconnect (Figure 12)

Tool Required:
J 28742 Terminal Remover

1. Primary lock (29) by lifting.
2. Connector sections.
3. Secondary lock (31) by spreading the sides of the hasp, thus clearing the staples and rotating the hasp (35).
4. Terminal (37) by using J 28742-A.
   - Snip off the old terminal assembly.
5. 5 mm of the wire insulation (9).

Clean

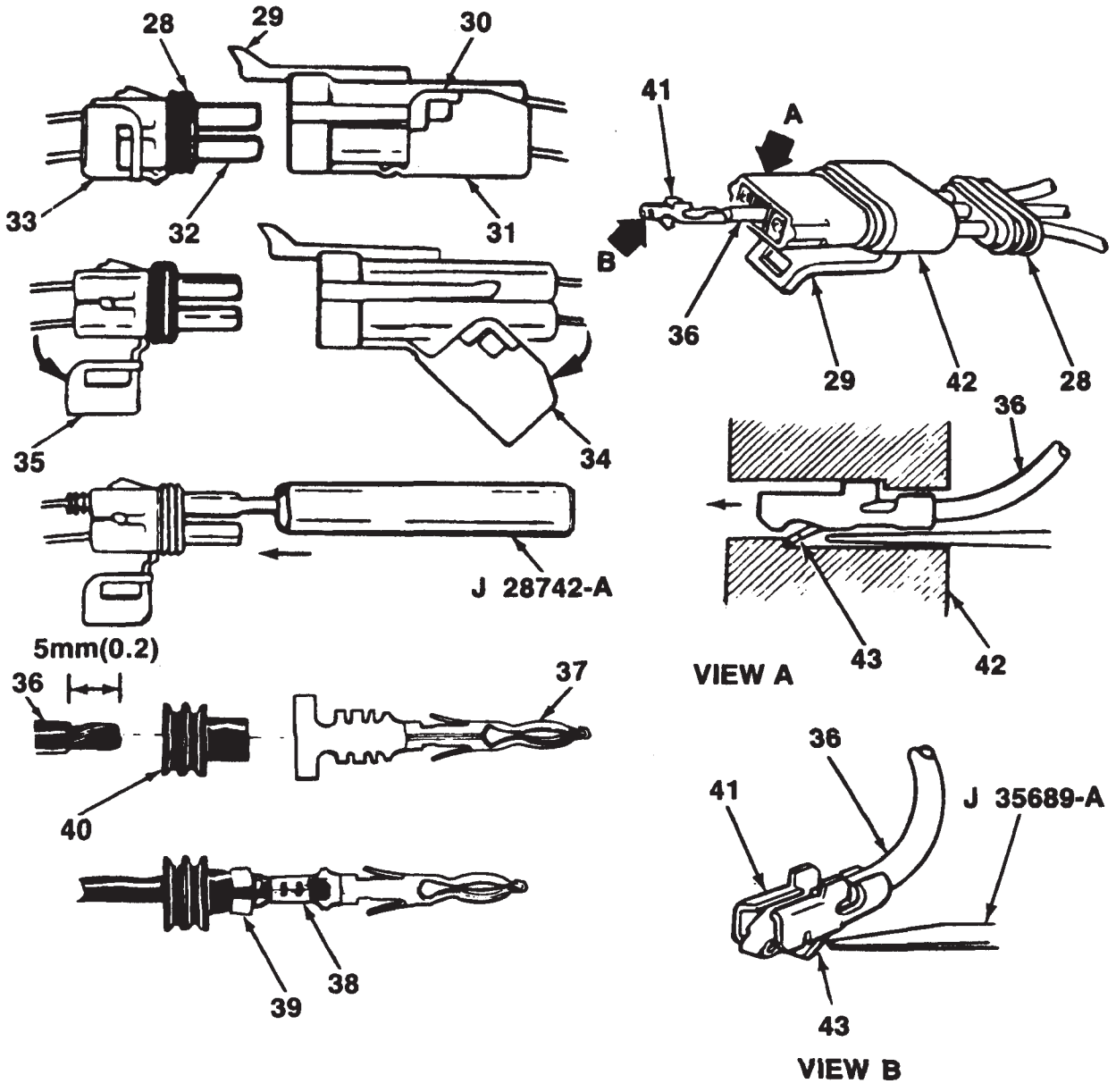
- Terminal barrel (32).

Install or Connect (Figure 12)

1. Terminal insulator (40) on the wire. Slide the insulator back on the wire about 8 cm (3 inches).
2. Terminal (37) on the wire.
   - Roll crimp (38) and solder the terminal.
3. Terminal insulator (40) and roll crimp (39).
4. Terminal into the connector.
5. Secondary lock (33).
6. Connector sections until the primary lock (29) engages.

WIRING REPAIR

The wire repair is very important for the continued reliable operation of the vehicle. This repair must be done as described in the following procedures.



28. Connector Seal
29. Primary Lock
30. Secondary Lock Staple
31. Secondary Lock
32. Terminal Barrel
33. Secondary Lock
34. Lock Opened
35. Lock Opened
36. Wire
37. Terminal
38. Roll Crimp
39. Roll Crimp
40. Terminal Insulator
41. Metri-Pack Series 150 Female Terminal
42. Connector Body
43. Locking Tang

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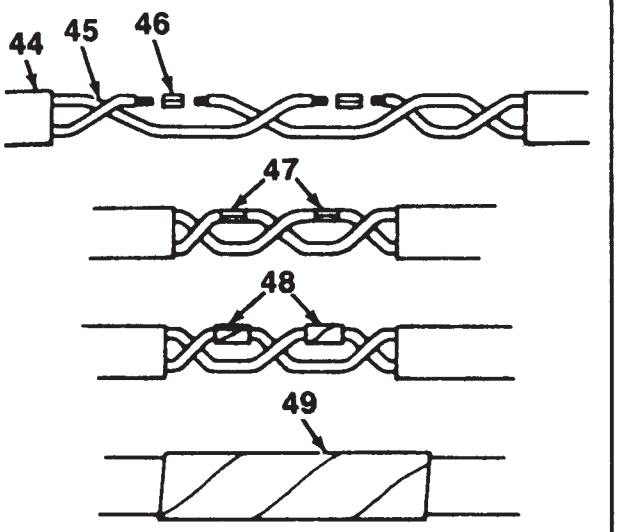
Figure 12—Weather Pack and Metri-Pack Terminals



44. Jacket
45. Twisted Wires
46. Splice Clip
47. Crimp and Solder
48. Electrical Tape Wrap
49. Outer Electrical Tape Wrap

Figure 13—Twisted Lead Repair

Twisted Leads (Figure 13)

Remove or Disconnect

1. Jacket (44).
2. Twisted wires (45).
3. Insulation from the wire.

Install or Connect

1. Splice clip (47).
   - Crimp.
   - Solder.
2. Electrical tape wrap (48) on wires.
3. Outer electrical tape wrap (49).

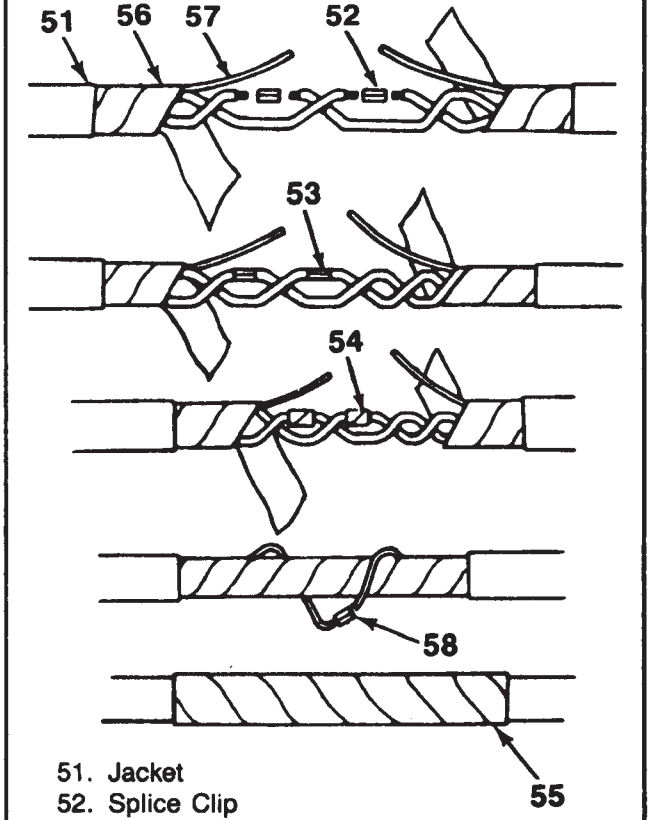
Twisted Leads/Shielded Cable (Figure 14)

Remove or Disconnect

1. Jacket (51).
2. Unwrap aluminum/mylar tape (56).
3. Drain wire (57).
4. Leads.
5. Insulation on the leads.

Install or Connect

1. Splice clips (52).
2. Crimp and solder the splice clips (53).
3. Electrical tape (105) on the splices.
4. Aluminum/mylar tape by wrapping and taping.



51. Jacket
52. Splice Clip
53. Crimp and Solder
54. Electrical Tape Wrap
55. Outer Electrical Tape Wrap
56. Aluminum/Mylar Tape
57. Drain Wire
58. Drain Wire Splice Clip, Crimped and Soldered

Figure 14—Twisted/Shield Lead Repair

5. Drain wire with a splice clip (58). Crimp and solder the splice clip.
6. Outer jacket electrical tape wrap (55).

CAB HARNESSES AND COMPONENTS

FUSE BLOCK

The fuse block is located at the far left side of the dash panel. The fuse block is part of the instrument panel harness. Refer to figure 15.

CONVENIENCE CENTER

The convenience center is located at the left side of the instrument panel. The hazard flasher, horn relay, and alarm module are mounted on the convenience center. Refer to figure 16.

INSTRUMENT PANEL HARNESSES

The instrument panel harnesses are routed from the fuse box, up over the steering column and then along the lower edge of the steering column. The harness is held by brackets which are fastened with capscrews. Refer to figures 17 and 18.

POWER WINDOW AND DOOR LOCK HARNESS

The power window and door lock harness for the front and rear doors is routed with the instrument panel harness along the lower edge of the instrument panel. From the instrument panel, the harnesses are routed into the front and rear doors. Refer to figures 19 through 24.

REAR WINDOW RELEASE ACTUATOR HARNESS

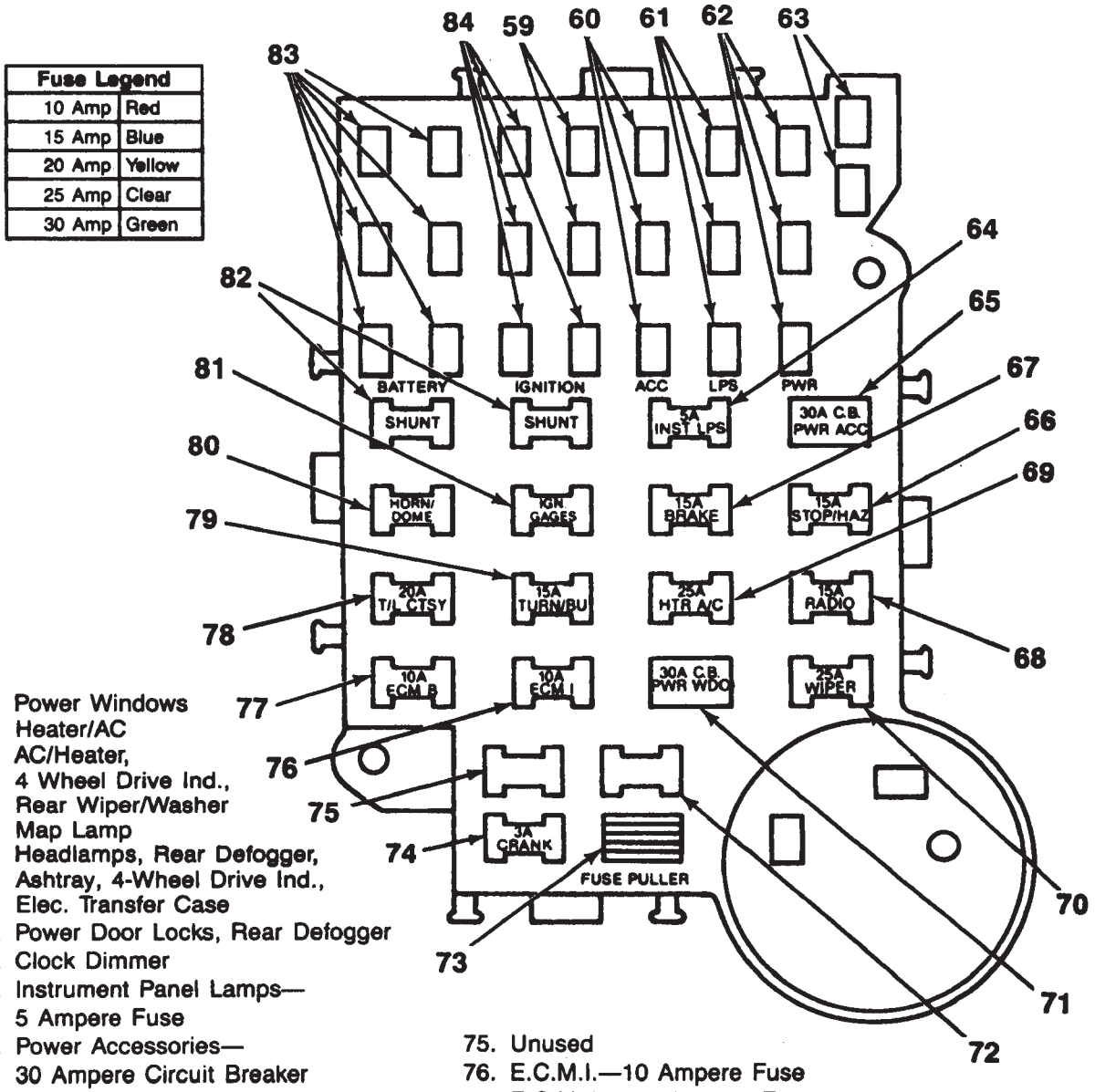
The rear window release harness goes from the fuse block to the switch and then rearward through the cab to the rear window release actuator. Refer to figures 25 and 26.

REAR WINDOW DEFOG HARNESS

The rear window defog harness starts at the fuse block and goes to the defog switch and the relay. The switch controls the relay and the relay handles the power circuit. The harness then follows the rear lamps harness to the rear of the cab. On models with both rear window defog and rear window release, the wiring harness runs to the back of the cab through conduit under the carpet at the left rear cargo area, and goes up to the roof and into the left side of the rear window. The circuit passes through the resistive elements on the window and into the ground lead on the right side of the window. Refer to figures 27, 28, 29, and 30.

REAR WIPER/WASHER HARNESS

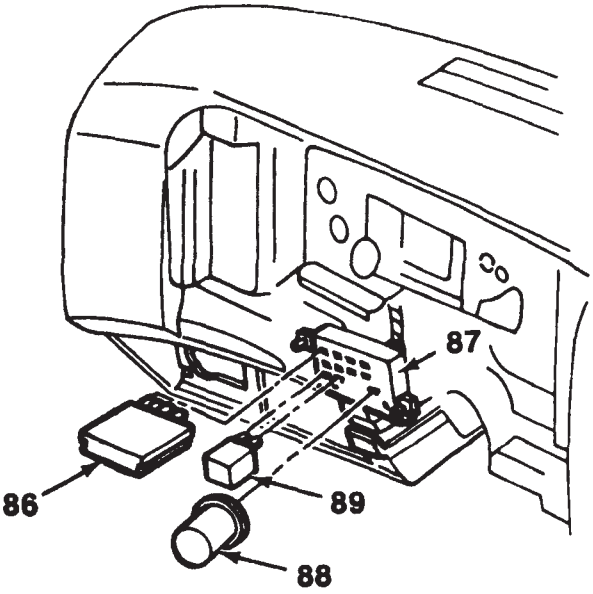
The rear window wiper harness starts at the fuse block and goes to the wiper/washer switch mounted on the upper left side of the instrument panel. The switch controls the power circuit to the wiper motor and to the washer pump. The wiper motor harness along with the washer pump hose, follows the rear lamp harness to the rear of the cab, up the left rear corner, to the center of the window where it is attached to the wiper motor. The washer pump harness starts at the wiper/washer switch and is routed through the cowl to the washer pump motor and returns to the buss bar ground. Refer to figures 30, 31, and 32.



59. Power Windows Heater/AC
60. AC/Heater, 4 Wheel Drive Ind., Rear Wiper/Washer Map Lamp
61. Headlamps, Rear Defogger, Ashtray, 4-Wheel Drive Ind., Elec. Transfer Case
62. Power Door Locks, Rear Defogger
63. Clock Dimmer
64. Instrument Panel Lamps—5 Ampere Fuse
65. Power Accessories—30 Ampere Circuit Breaker
66. Stop/Hazard Lamp System 15 Ampere Fuse
67. Anti-Lock Brake—15 Ampere Fuse
68. Radio—15 Ampere Fuse
69. Heater, Air Conditioning—25 Ampere Fuse
70. Wiper—25 Ampere Fuse
71. Power Window—30 Ampere Circuit Breaker
72. Daytime Running Lights—10 Ampere Fuse
73. Fuse Puller
74. Starting Circuit (E.C.M)—3 Ampere Fuse
75. Unused
76. E.C.M.I.—10 Ampere Fuse
77. E.C.M.B.—10 Ampere Fuse
78. Tail, Courtesy Lamp Circuits—20 Ampere Fuse
79. Turn Signal, Back Up Lamps—15 Ampere Fuse
80. Horn/Dome Lamp—20 Ampere Fuse
81. Ignition/Gages—20 Ampere Fuse
82. Shunt
83. Dome Lamp, Clock, Courtesy Lamp, Lift Gate Release, Vanity Mirror Lamp, Pwr Mirrors
84. Cruise Control, Automatic Transmission, Rear Defogger, Overspeed Warning

F8911

Figure 15—Fuse Block



86. *Seat Belt, Ignition Key,* Headlamp Alarm Module
87. Convenience Center
88. Hazard Flasher Unit
89. Horn Relay Unit

F8871

Figure 16—Convenience Center

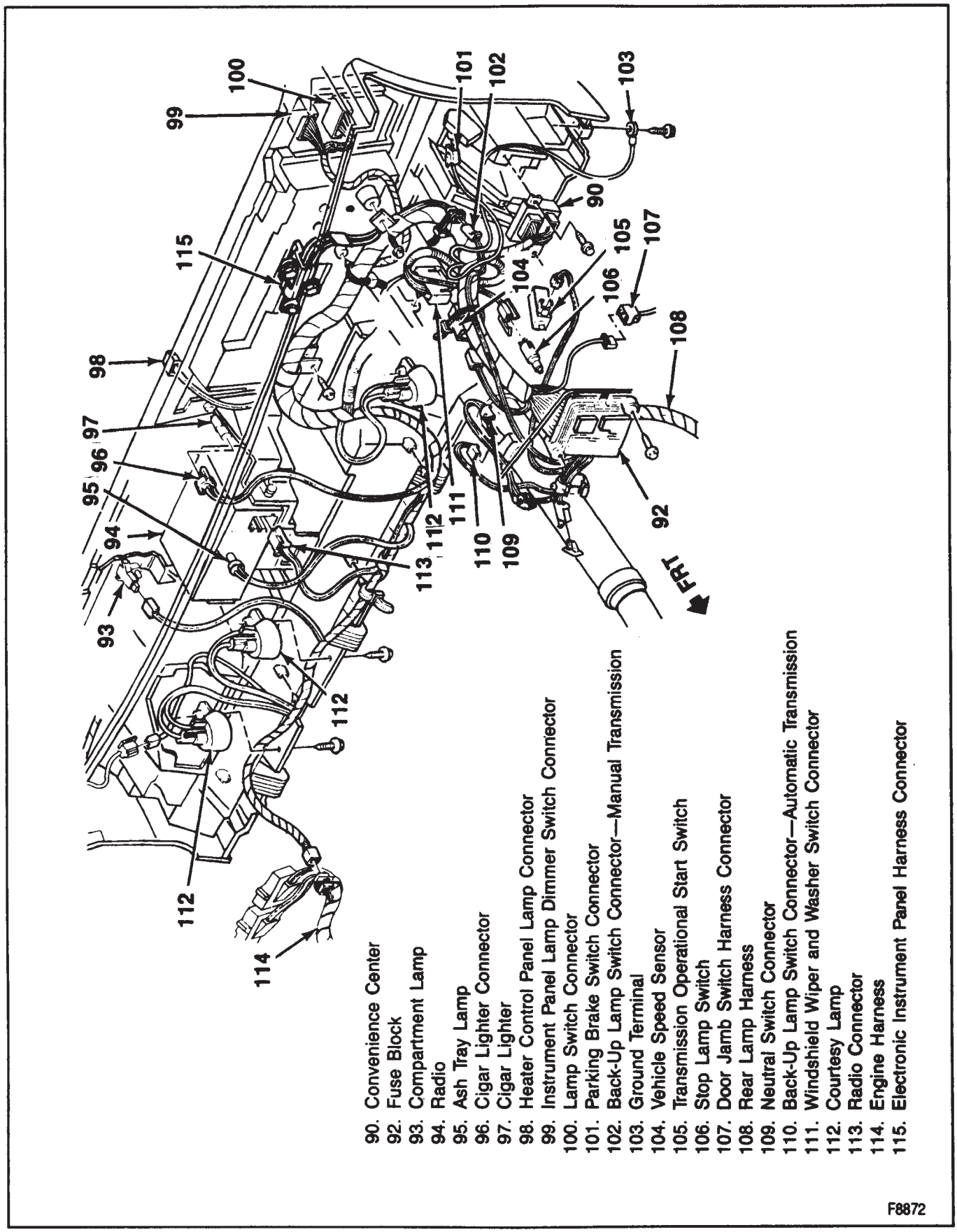
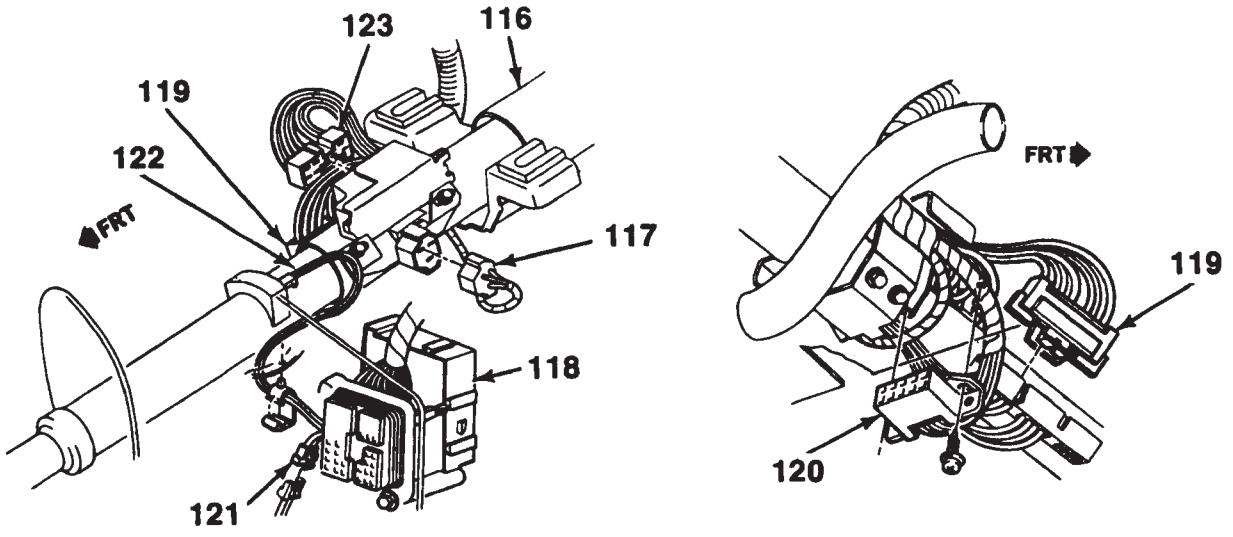


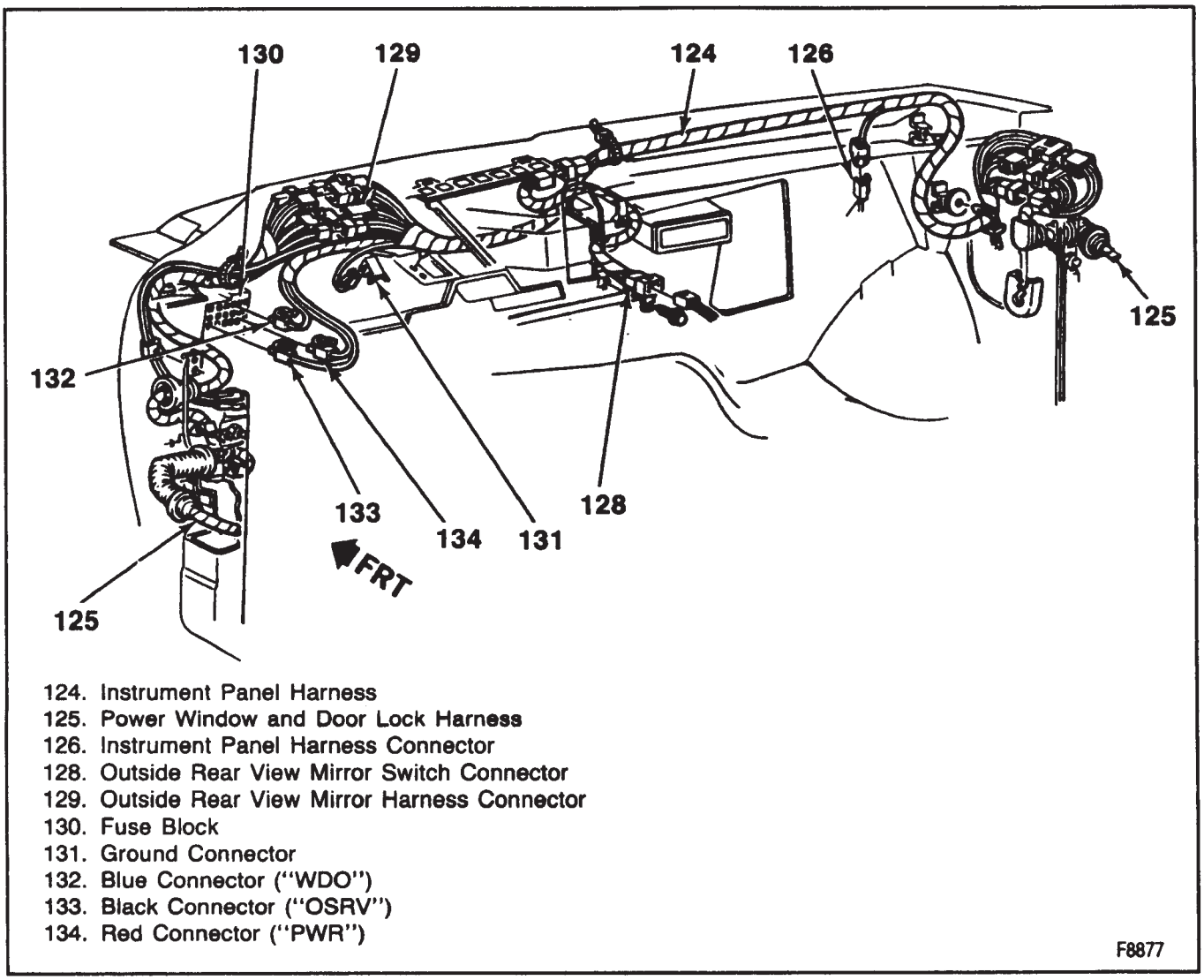
Figure 17—Instrument Panel Harness



116. Steering Column
117. Dimmer Switch Connector
118. Fuse Block
119. Turn Signal Switch Connector
120. A.L.D.L. Connector
121. Seat Belt Retract Switch Connector
122. Neutral Switch Harness
123. Ignition Switch Connector

F8873

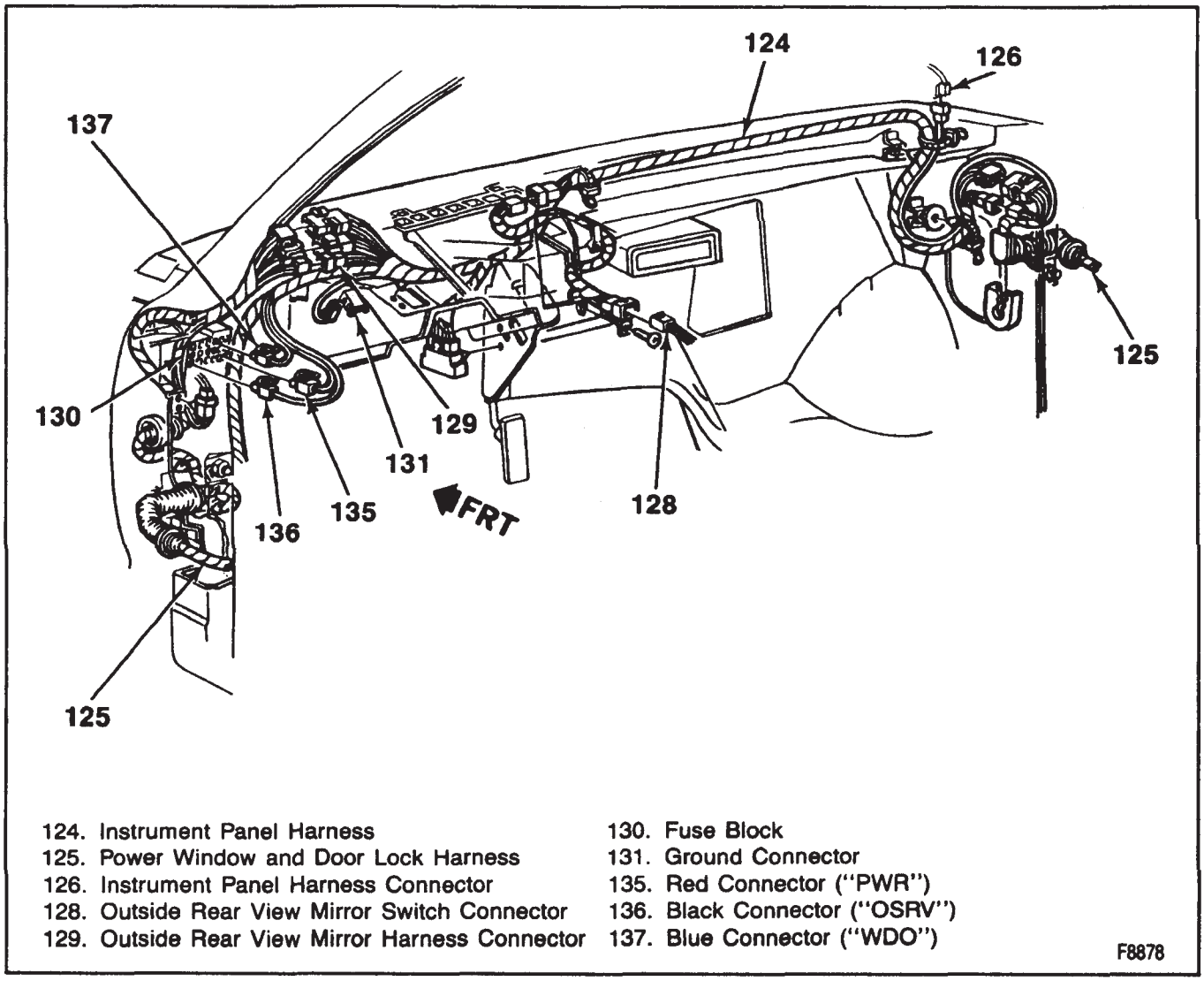
Figure 18—Instrument Panel Harness—Steering Column



124. Instrument Panel Harness
125. Power Window and Door Lock Harness
126. Instrument Panel Harness Connector
128. Outside Rear View Mirror Switch Connector
129. Outside Rear View Mirror Harness Connector
130. Fuse Block
131. Ground Connector
132. Blue Connector ("WDO")
133. Black Connector ("OSRV")
134. Red Connector ("PWR")

F8877

Figure 19—Power Window and Door Lock Harness (Two Door Model)



124. Instrument Panel Harness
125. Power Window and Door Lock Harness
126. Instrument Panel Harness Connector
128. Outside Rear View Mirror Switch Connector
129. Outside Rear View Mirror Harness Connector
130. Fuse Block
131. Ground Connector
135. Red Connector ("PWR")
136. Black Connector ("OSRV")
137. Blue Connector ("WDO")

F8878

Figure 20—Power Window and Door Lock Harness (Four Door Model)

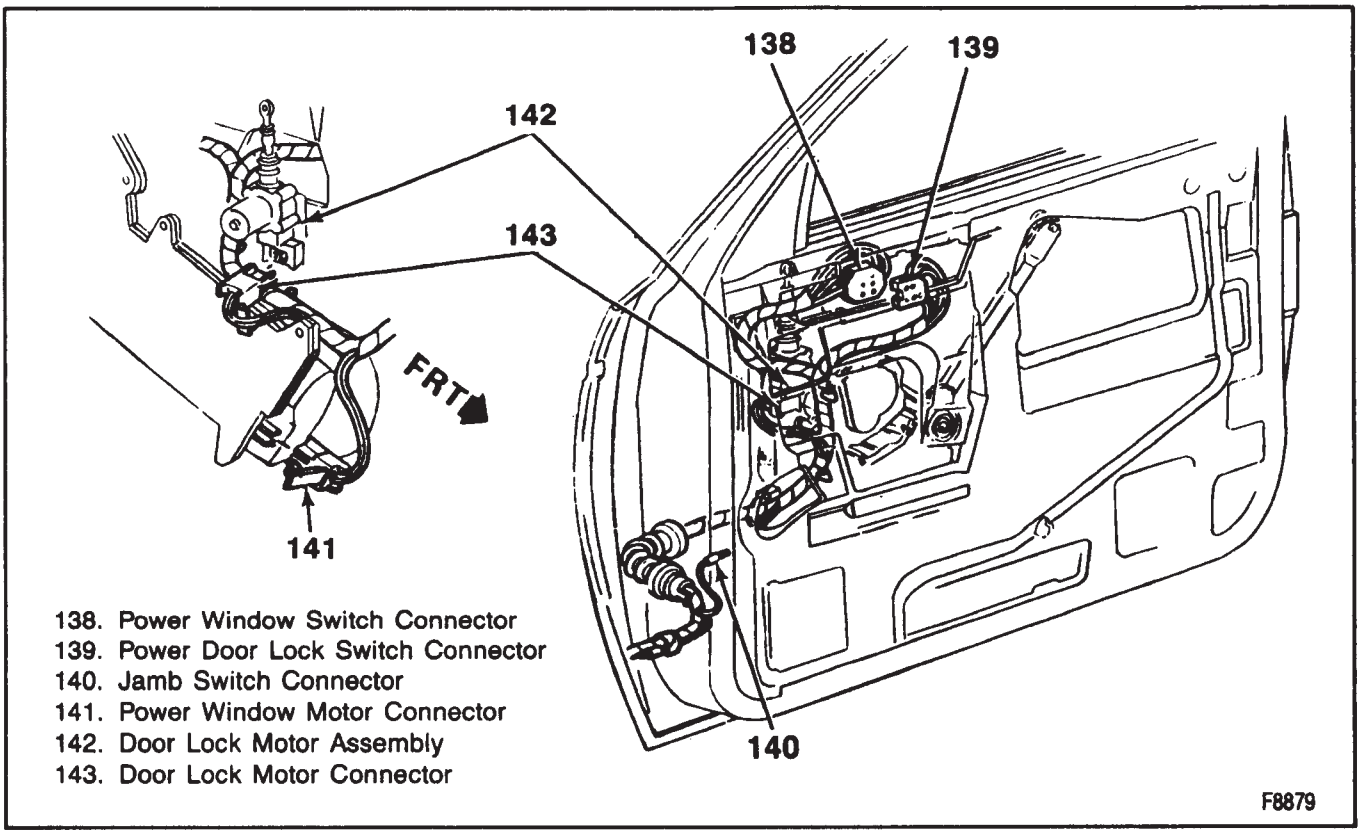


Figure 21—Power Window and Door Lock Harness (Front Side Doors)

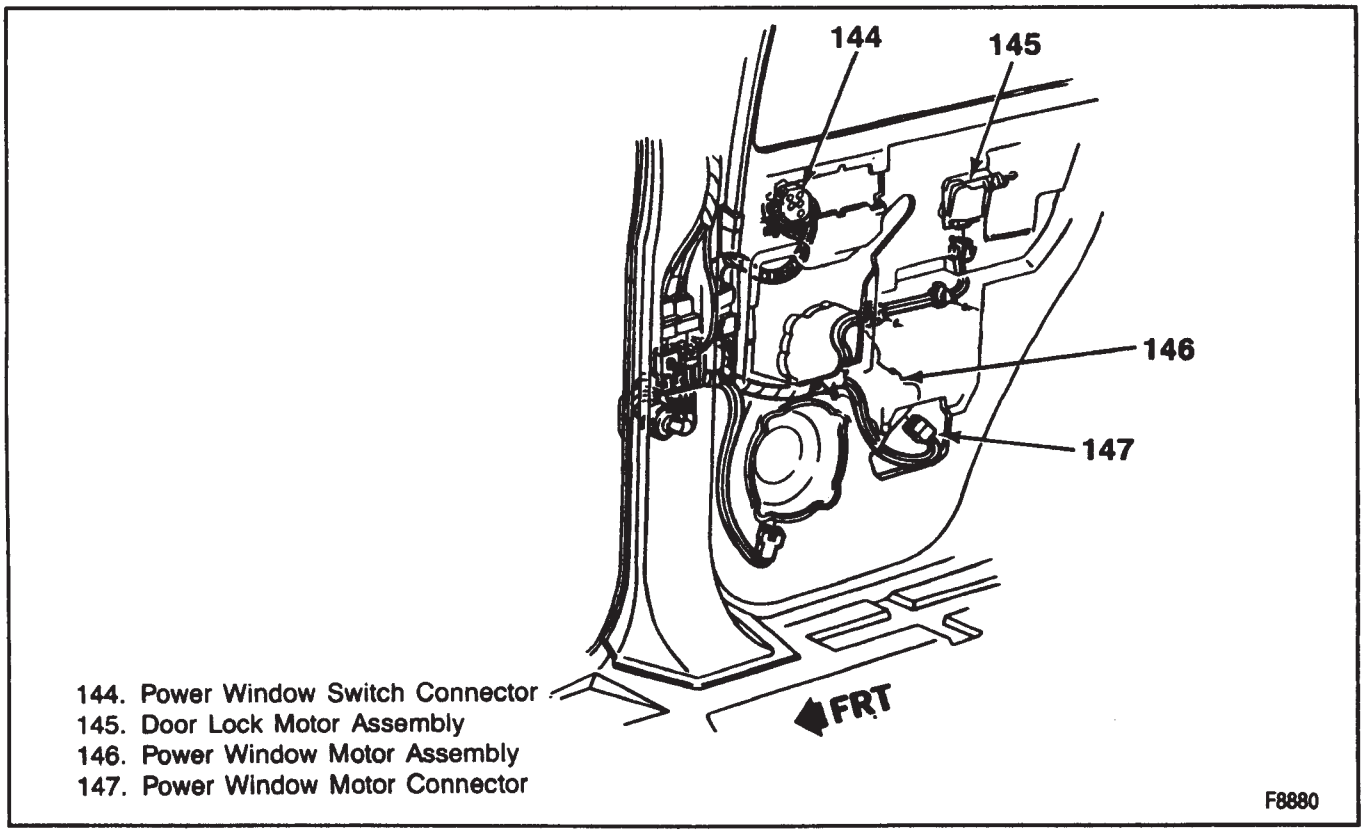
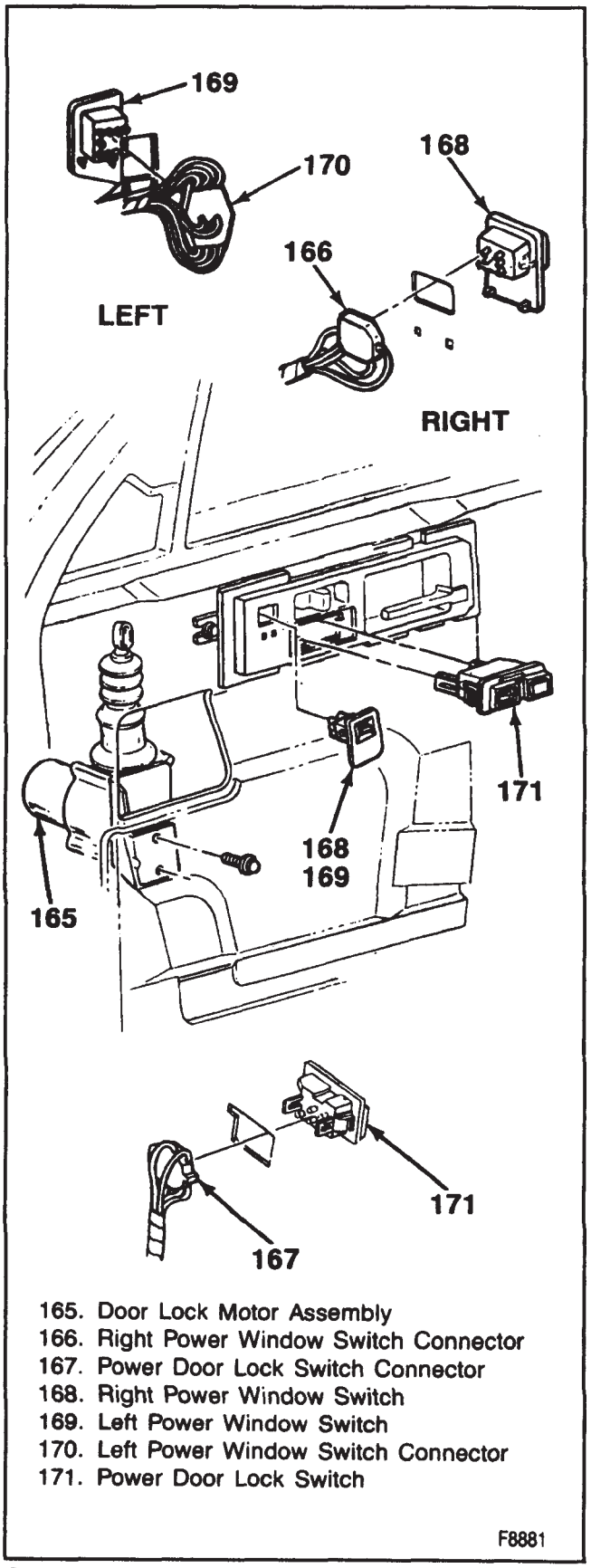


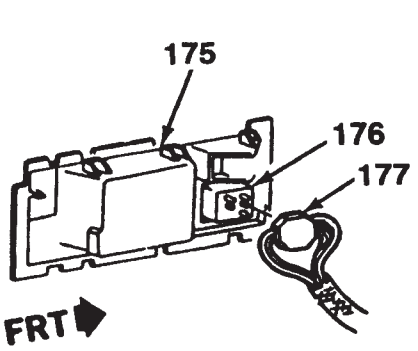
Figure 22—Power Window and Door Lock Harness (Rear Side Doors)

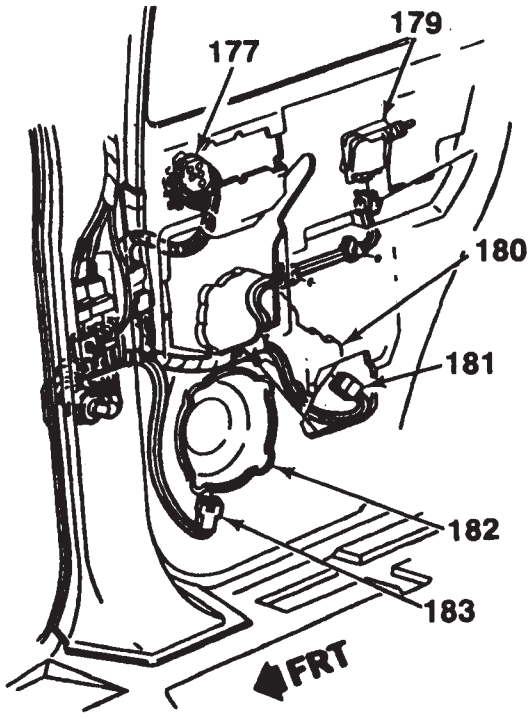


165. Door Lock Motor Assembly
166. Right Power Window Switch Connector
167. Power Door Lock Switch Connector
168. Right Power Window Switch
169. Left Power Window Switch
170. Left Power Window Switch Connector
171. Power Door Lock Switch

F8881

Figure 23—Power Window and Door Lock Switches (Front Side Doors)

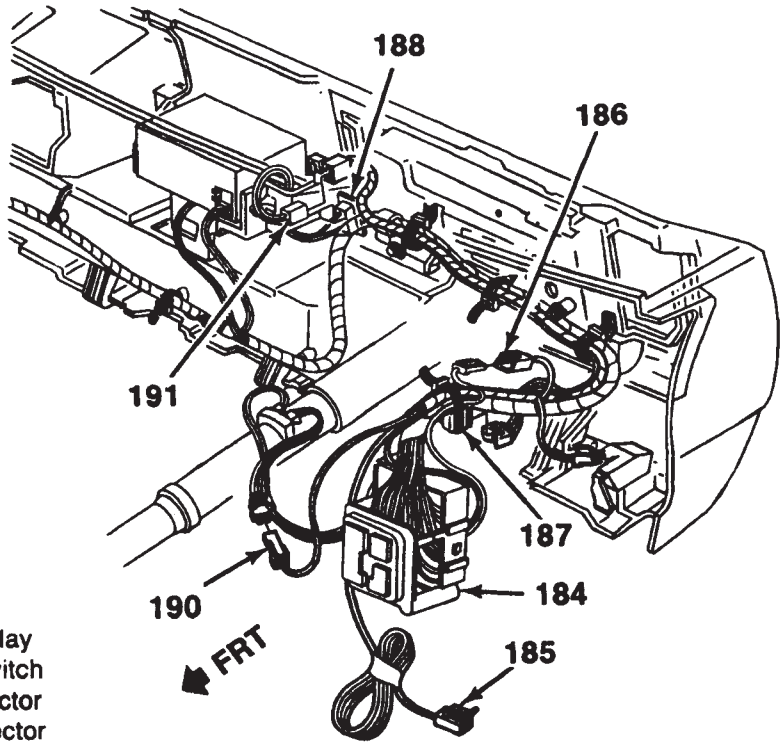




175. Door Lock Control Assembly
176. Power Window Switch
177. Power Window Switch Connector
179. Door Lock Actuator
180. Power Window Motor
181. Window Motor Connector
182. Rear Side Door Speaker
183. Rear Side Door Speaker Connector

F8882

Figure 24—Power Window and Door Lock Switches (Rear Side Doors)



184. Fuse Block
185. Rear Window Release Connecting Harness
186. Parking Brake Switch Connector
187. Rear Window Release Relay
188. Rear Window Release Switch
190. Auto Tran Harness Connector
191. Rear Defog Switch Connector

F8893

Figure 25—Rear Window Release Harness

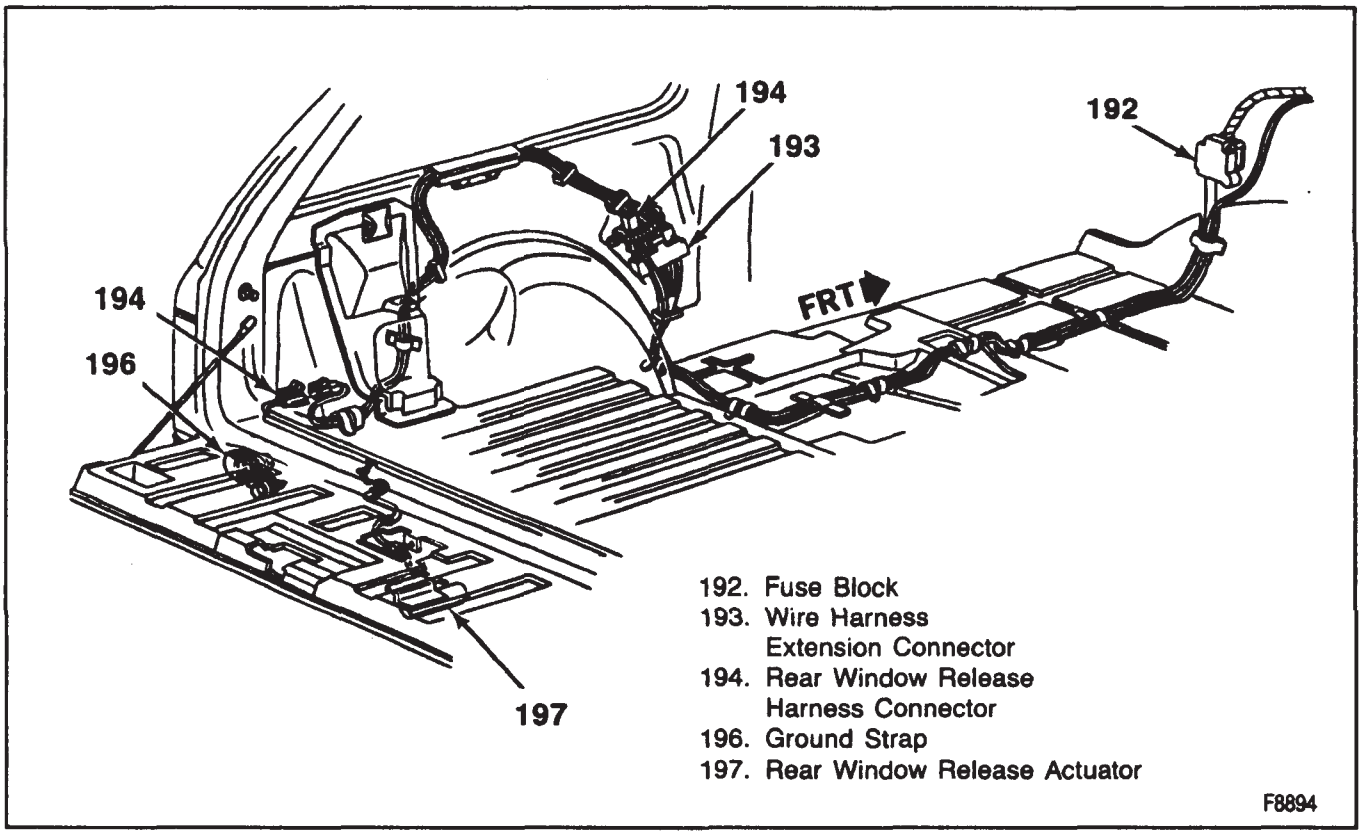
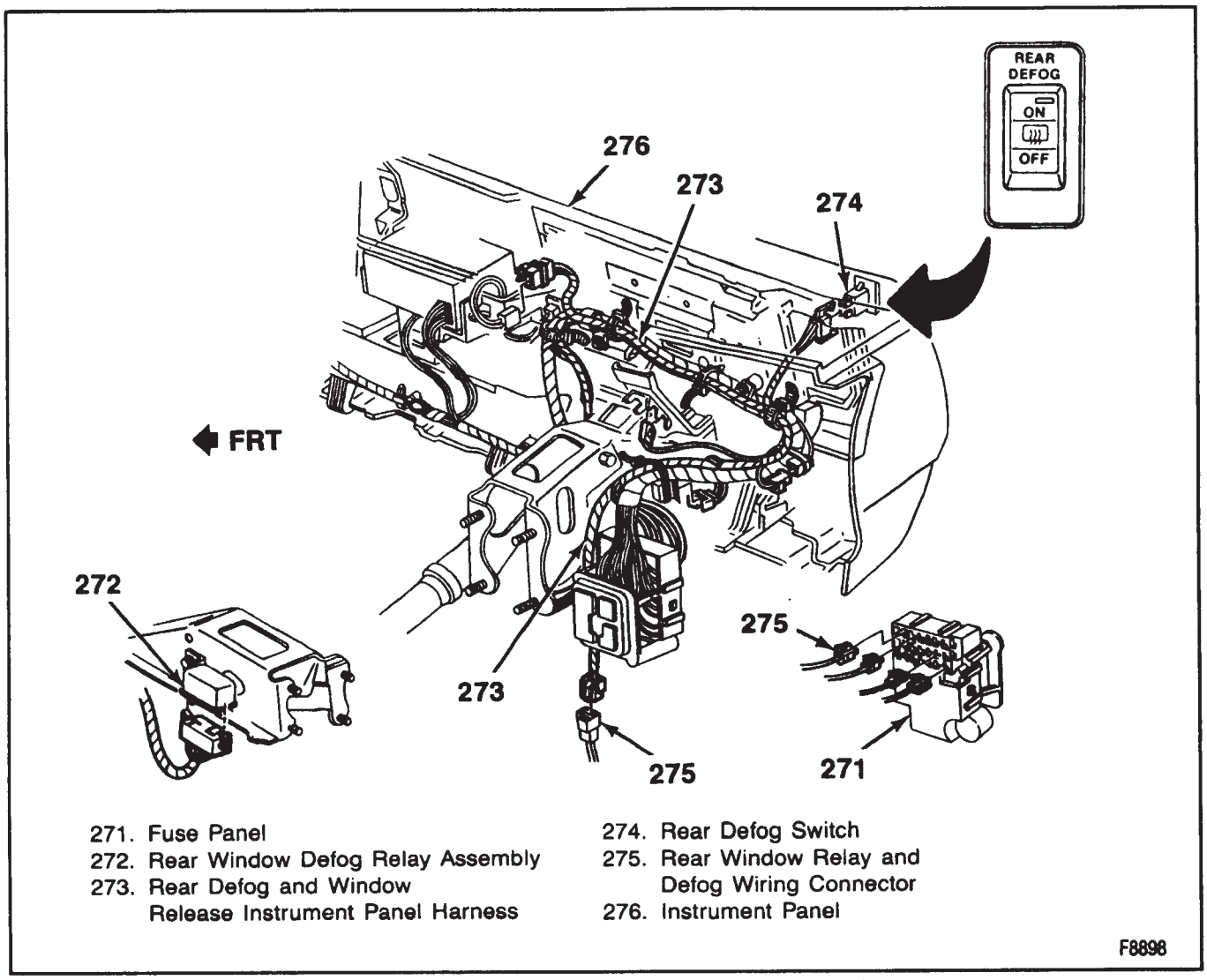
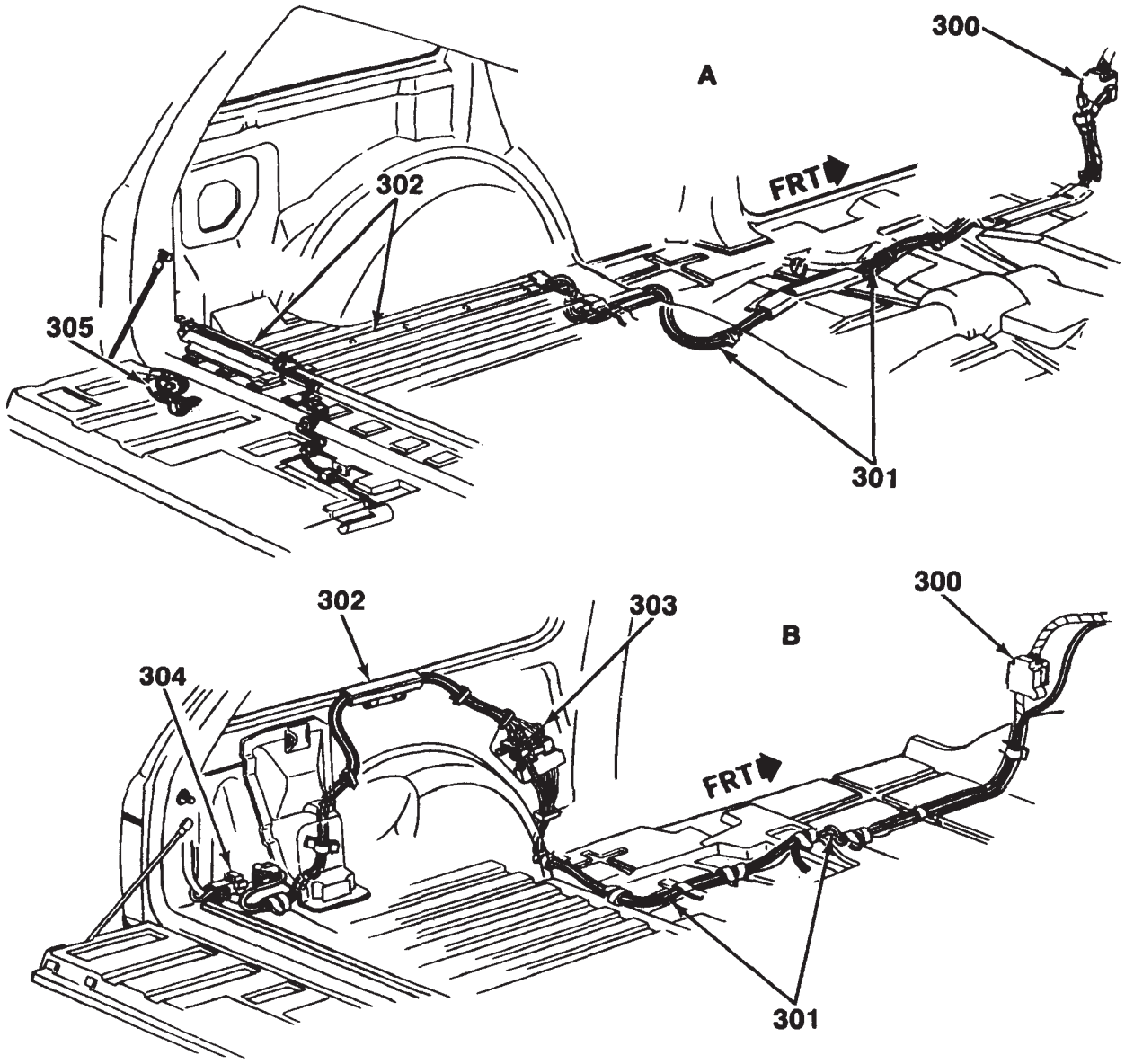


Figure 26—Rear Window Release Chassis Harness



271. Fuse Panel
272. Rear Window Defog Relay Assembly
273. Rear Defog and Window Release Instrument Panel Harness
274. Rear Defog Switch
275. Rear Window Relay and Defog Wiring Connector
276. Instrument Panel

Figure 27—Rear Window Defog (Front Harness)



A. Four Door Vehicle
B. Two Door Vehicle
300. Fuse Block
301. Rear Window Defog Middle Harness
302. Conduit
303. Rear Defog Middle Wiring Harness Connector
304. Rear Defog Connector
305. Ground Strap

F8897

Figure 28—Rear Window Defog (Middle Harness)

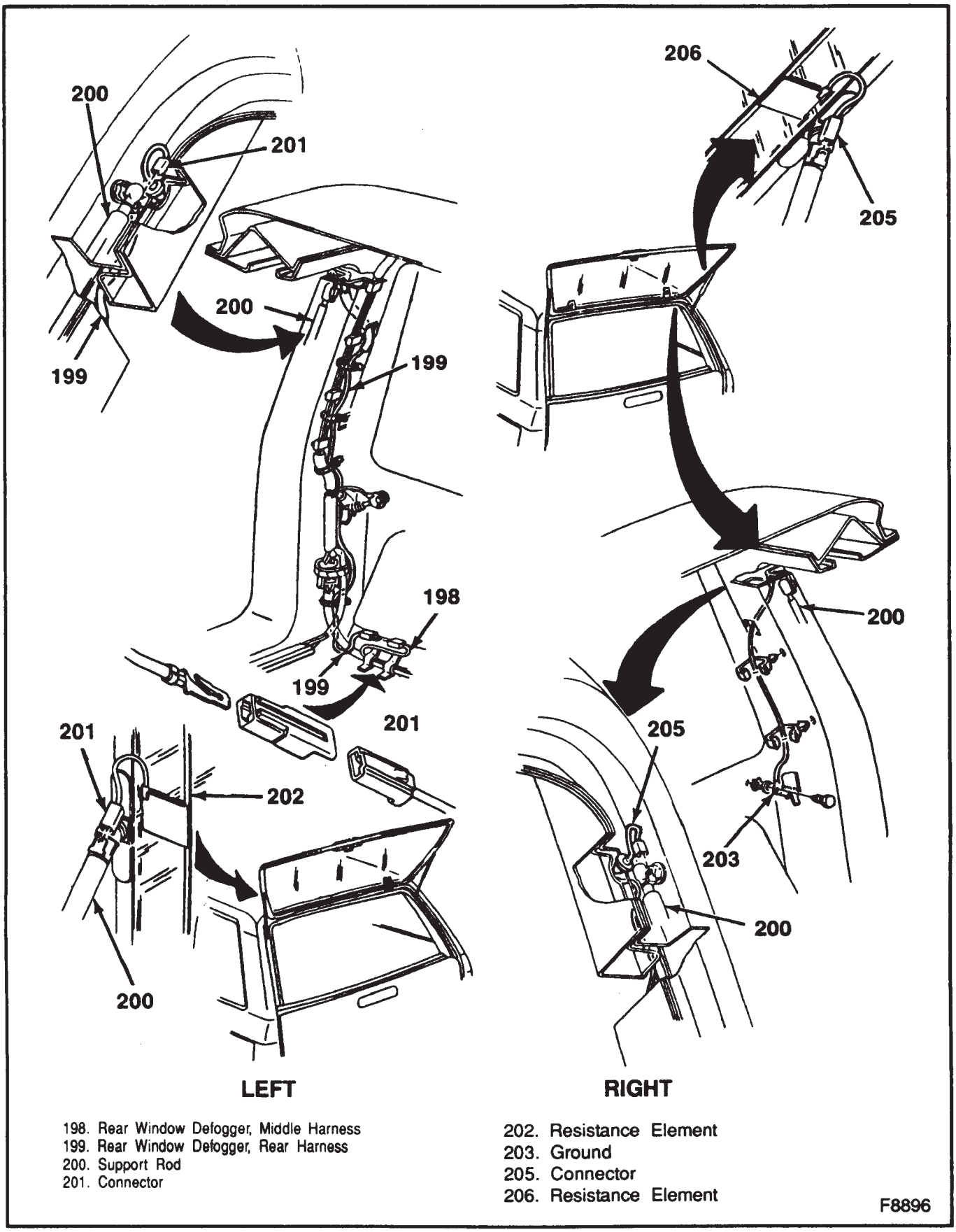
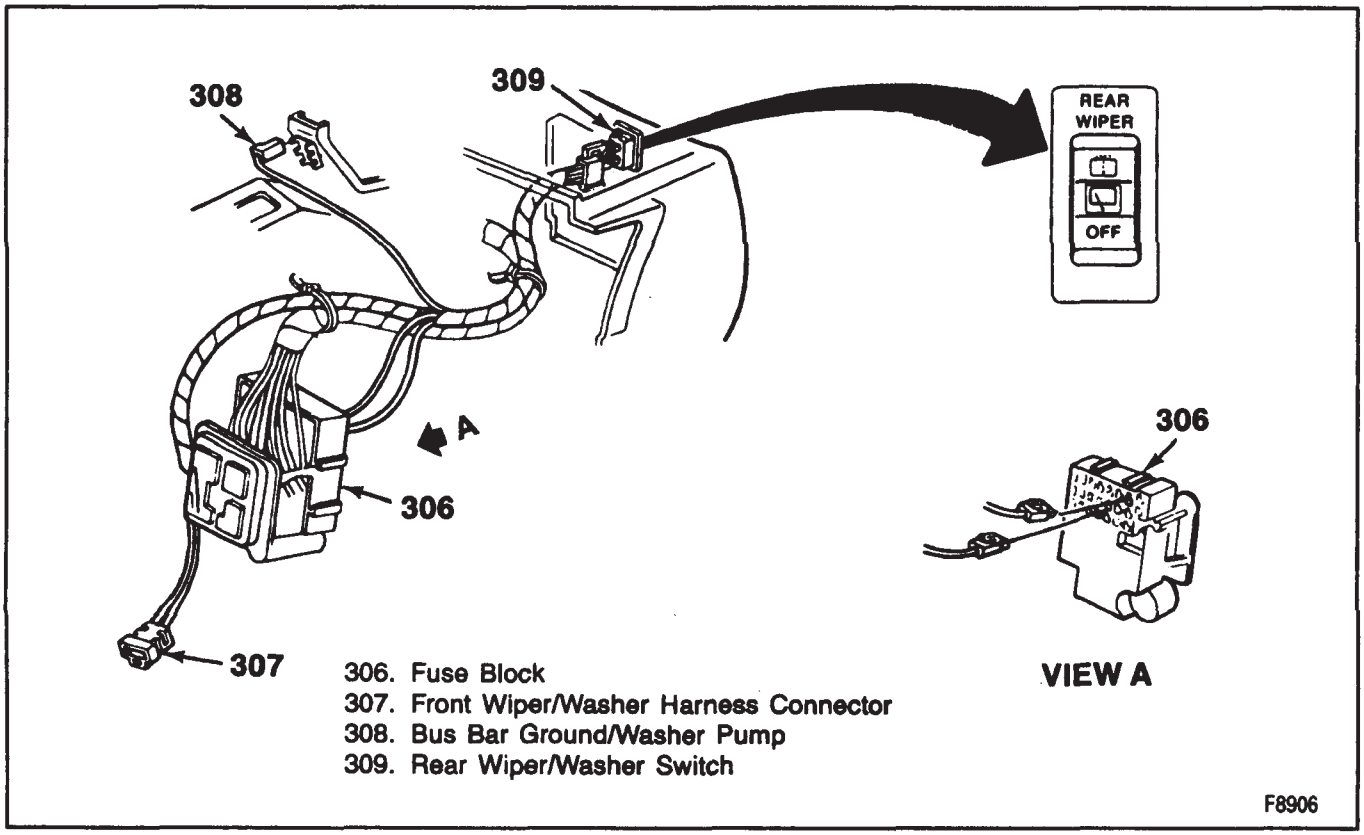


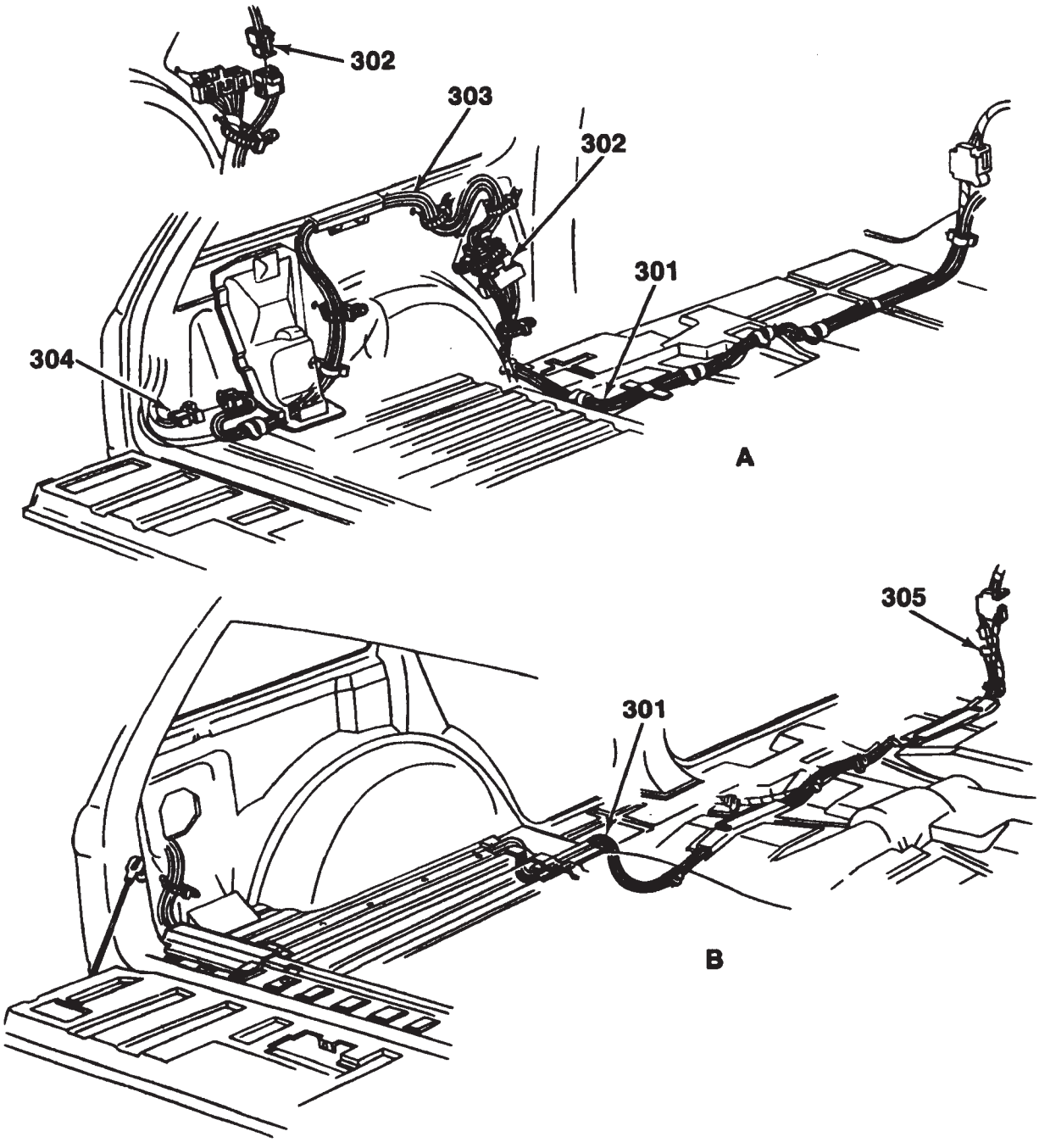
Figure 29—Rear Window Defog (Left and Right Rear Harness)



306. Fuse Block
307. Front Wiper/Washer Harness Connector
308. Bus Bar Ground/Washer Pump
309. Rear Wiper/Washer Switch

F8906

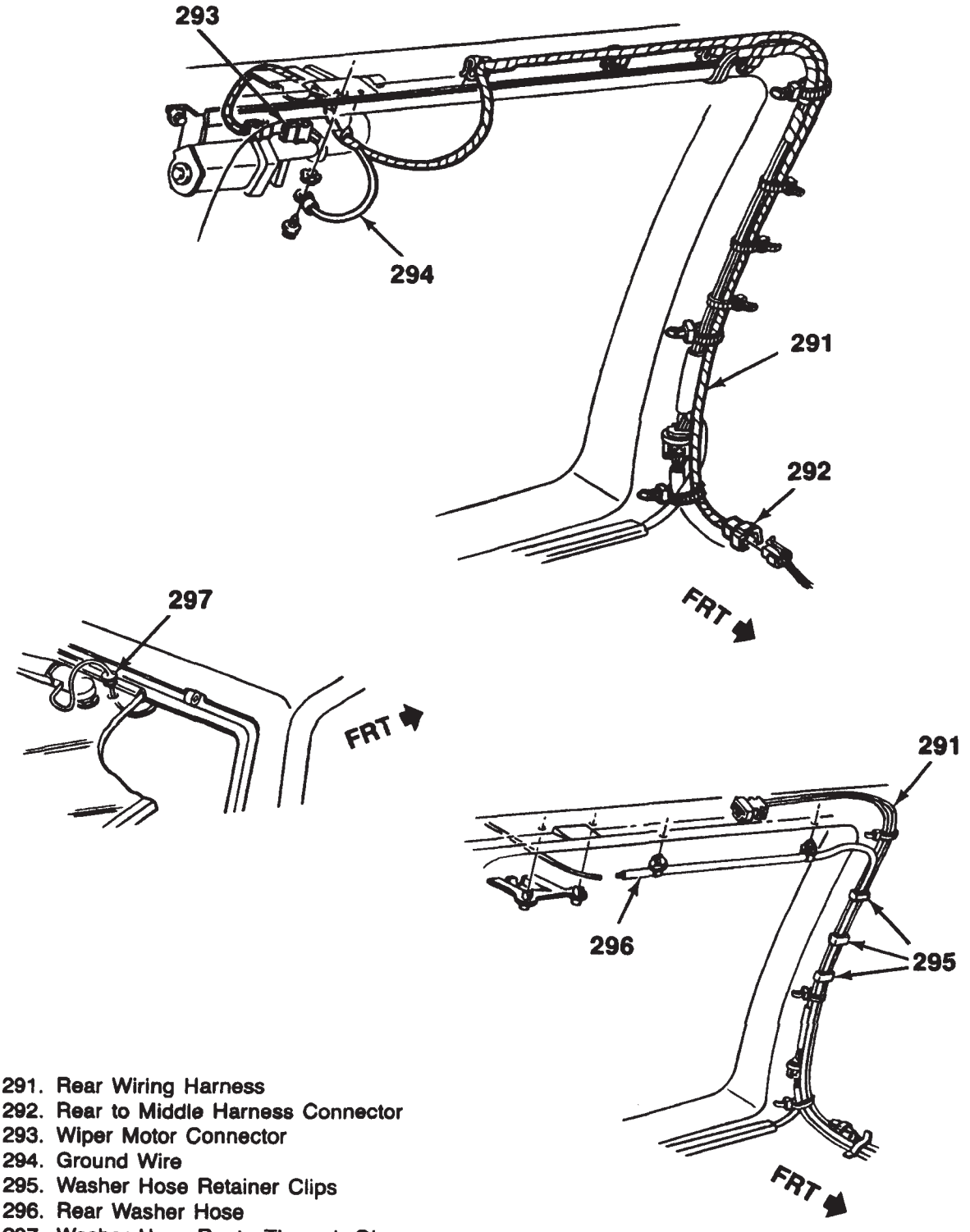
Figure 30—Rear Wiper/Washer (Front Harness)



A. Two Door
B. Four Door
301. Middle Harness
302. Harness Extension Connector
Middle Harness Extension
303. Rear Wiper/Washer Middle Harness
304. Wiper Motor Lead Connector
305. Wiper Washer Switch Connector

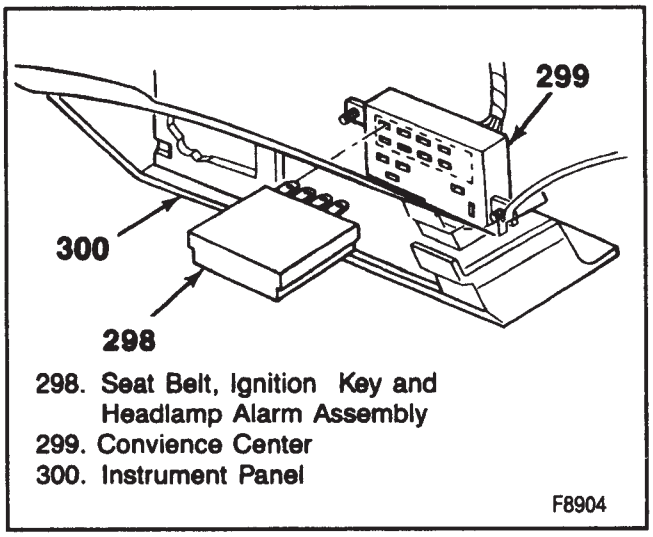
F8905

Figure 31—Rear Wiper/Washer (Middle Harness)



291. Rear Wiring Harness
292. Rear to Middle Harness Connector
293. Wiper Motor Connector
294. Ground Wire
295. Washer Hose Retainer Clips
296. Rear Washer Hose
297. Washer Hose Route Through Glass

Figure 32—Rear Wiper/Washer (Rear Harness)



298. Seat Belt, Ignition Key and Headlamp Alarm Assembly
299. Convience Center
300. Instrument Panel

F8904

Figure 33—Seat Belt, Ignition Key, and Headlamp Alarm Assembly

ELECTRICAL SYSTEM DESCRIPTION

POWER WINDOW SYSTEM

Each power window is moved by a single permanent magnet motor. The direction the motor turns depends on the polarity of the voltage. The control switches control the voltage polarity.

Switches for controlling all the power windows are located at the driver's door. Each passenger window switch controls only the window at that passenger position.

The motors have a self-resetting circuit breaker built in. The circuit breaker allows the motor to be stalled without damage. There are no travel-limit switches.

POWER DOOR LOCK SYSTEM

Individual motors operate each door lock. The direction the motor turns depends on the polarity of the supply voltage. The door lock switches control the supply voltage polarity. Each switch will lock all the doors.

Each motor has a self-resetting circuit breaker built in. Voltage is present at the door switches at all times. The ground lead for the whole circuit is located at the left door switch.

When the left door switch is closed, current flows from the supply terminal through the left switch to the right switch. The current then flows to a harness splice. At the harness the current flows to both motors, thus causing the motors to actuate.

Now the current is in the ground circuit. The current flows out of the motor to a splice in the harness and then through the right switch, the left switch, and ground, in that order.

When the right switch is moved closed, the current flows from the supply terminal in the right switch, through the switch to a splice in the harness and then to both door lock motors. The current then flows out of the motors to a splice in the harness. From the splice the current flows to the right door switch and then to the left door switch to ground.

KEY, HEADLAMP, AND SEAT BELT ALARM MODULE WARNING SYSTEM

Some models use an audio alarm system to remind the driver to fasten the seat belts, remove the ignition key, and to turn off the headlamps.

This system uses an alarm module which will sound three to five times and activate a warning lamp on the instrument panel when the ignition key is turned to the "ON" position if the driver's seat belt is not buckled. If the ignition key is turned to the "OFF" position and the headlamps are on, the alarm module will sound (chime) to remind the driver that the headlamps are on. If, however, the instrument panel lamp dimmer thumbwheel is turned to the full "OFF" position and the headlamps are "ON," the alarm module will not sound when the key is turned to the "OFF" position. If the driver's door is opened and the key is left in the ignition, the alarm module will also sound. The alarm module is mounted on the convenience center.

The seat belt warning system consists of a switch located in the seat belt buckle that provides a ground when the buckle is not joined to the other part of the belt. With the switch closed, the alarm module is activated.

The headlamp "ON" warning circuit will turn on when the headlamps are on and the ignition switch is in the "OFF," "LOCK," or "ACC" position. This will cause the alarm module to turn on and sound an audio alarm.

POWER INSIDE REAR VIEW MIRROR SYSTEM

The power inside rear view mirror is powered from the ignition/accessory fuse in the fuse block. The harness for the mirror is routed from the fuse block up the front door pillar and under the headliner to the power inside rear view mirror connector. At the mirror connector, there is a ground wire that runs along the harness to a sheet metal ground in the windshield upper frame. The connector attaches to the mirror connector to supply the power and ground paths for the mirror. Two switches in the mirror provide the control portion of the circuit. Each switch controls its individual map light in the bottom edge of the mirror (figure 34).

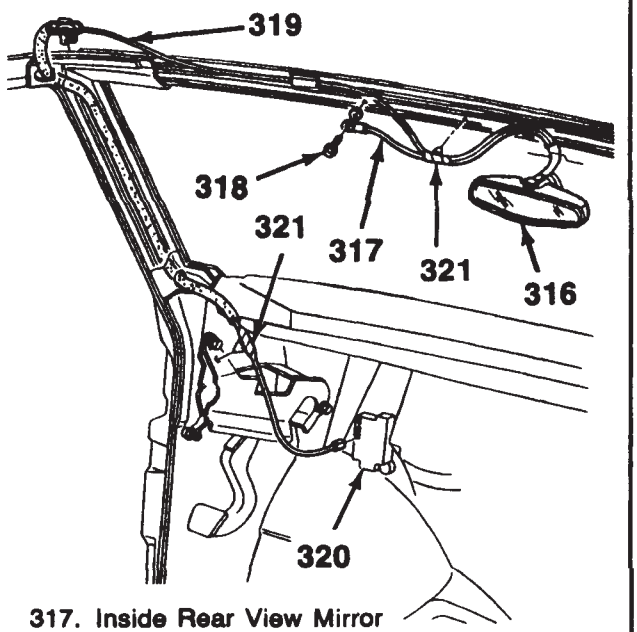
POWER OUTSIDE REAR VIEW MIRROR SYSTEM

The outside rear view mirror is powered from the stop/hazard fuse in the fuse block. The harness is routed to the outside rear view mirror control assembly. The control assembly is mounted on the right side of the instrument cluster. The control assembly controls the power to the right mirror and to the left mirror, it also controls the up/down and sideways movement of the mirror (figures 31, 32, 33) .

REAR WINDOW RELEASE ACTUATOR SYSTEM

The utility model incorporates an optional tail gate release actuator. This actuator will release the tail gate glass electrically when the vehicle is in park or neutral (automatic transmission) or with the parking brake applied (manual transmission).

The release circuit uses a switch mounted on the instrument panel that supplies power to a control relay. The control relay uses the power to energize the coil of the relay and the actuator motor. The relay grounds through the park/neutral switch (automatic transmission) or the park brake switch (manual transmission).



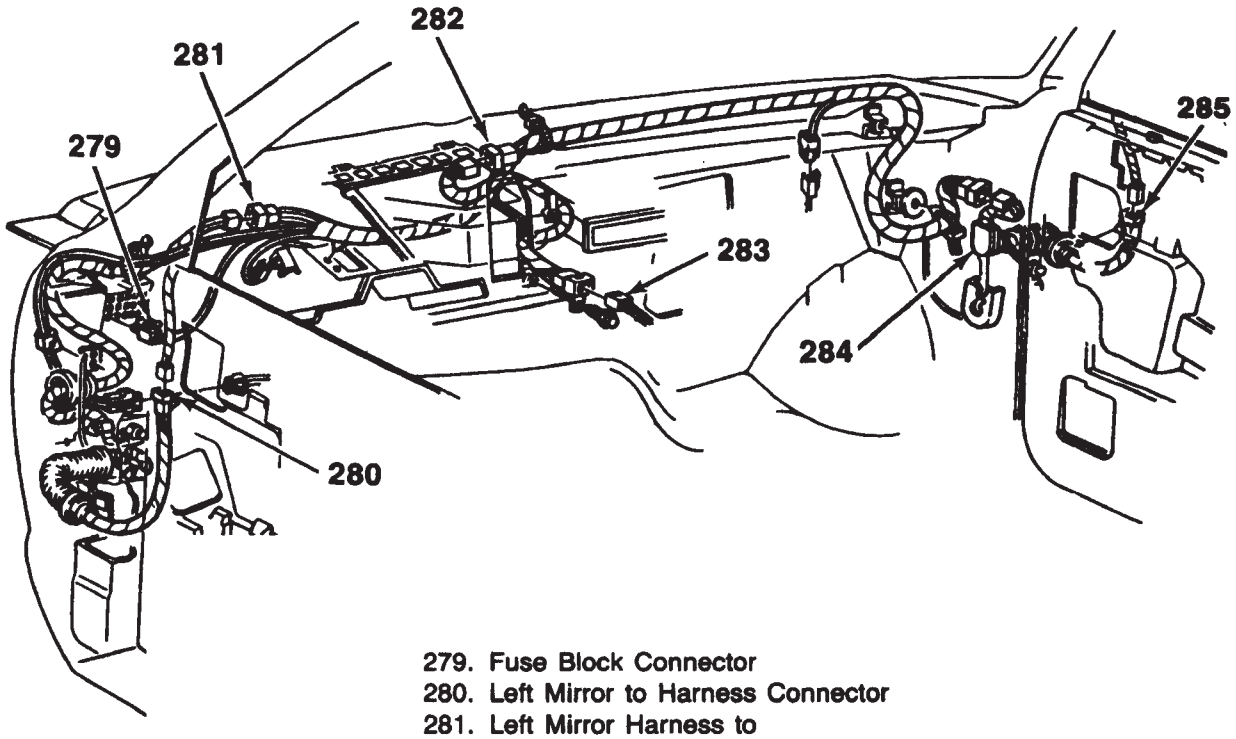
317. Inside Rear View Mirror
318. Ground Strap
319. Harness
320. Fuse Block
321. Clip

F8908

Figure 34—Power Inside Rear View Mirror Harness

When the release switch is pressed without the vehicle in park or neutral, or the parking brake applied, power flows to the coil and stops, because there is no ground path. Without the coil energized, the relay points cannot close and energize the release actuator.

When the release switch is pressed with the vehicle in park or neutral, or the parking brake applied, power flows to the coil and energizes the coil because there is a ground path through the park/neutral switch, or through the parking brake switch. The relay then operates, closing the contact points, allowing the power to flow from the release switch to the end gate release actuator (figure 38).



279. Fuse Block Connector
280. Left Mirror to Harness Connector
281. Left Mirror Harness to Main Harness Connector
282. Mirror Switch Harness Extension Connector
283. Mirror Switch Connector
284. Right Door Harness Connector to Main Connector
285. Right Mirror to Harness Connector

F8900

Figure 35—Power Outside Rear View Mirror Wiring

DIAGNOSIS OF POWER WINDOW SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
Passenger Window Will Not Work, Using Either Passenger Switch Or Driver Switch	1. No power at the passenger switch. 2. Passenger switch is not working. 3. Motor has an internal open.	1. Ignition switch at RUN or ACC. Check for voltage at the passenger switch. If there is no voltage, find the open between the switch and the fuse block. 2. With the voltage on the PNK wire at the switch, move the switch to "UP." There should be voltage at the DK BLU wire. If there is no voltage, replace the switch. 3. With the window switch moved to the "UP" position, check for voltage on the DK BLU wire at the motor. If there is no voltage, find the open between the switch and the motor. If there is voltage on the DK BLU wire, backprobe a jumper ground at the BRN wire at the motor. If the motor does not run, replace the motor. If the motor does run, find the open in the ground circuit. Note: The ground circuit does run back through the passenger window "DN" contacts and the driver window switch "DN" contacts before reaching ground.
Passenger Window Will Not Work Using The Passenger Switch. The Window Will Work Using The Driver Switch.	1. No power at the passenger switch. 2. Switch has internal open.	1. Check for voltage on the PNK wire at the passenger switch. If voltage is not present, find the open in the circuit between the switch and the instrument panel harness connector. 2. If voltage is present, replace the switch.
Passenger Window Won't Work Using The Driver Switch	1. No power. 2. Open in driver switch. 3. Open in harness.	1. Check driver window action. If the driver window works, power is at the switch. 2. With the driver switch moved to "UP," check for voltage on the DK BLU wire at the driver switch. If voltage is not present, replace the switch. 3. With voltage present on the DK BLU wire at the driver switch, find the open between the driver switch and the passenger switch.
Driver Window Won't Work. Passenger Window Works	1. Switch won't work. 2. Motor has internal open. 3. Motor ground circuit is open.	1. Switch moved to "UP." Check for voltage at the DK BLU wire at the switch. If voltage is not present, replace the switch. 2. Switch moved to "UP." Check for voltage on the DK BLU wire at the motor. If voltage is present, backprobe a jumper ground at the BRN wire at the motor. If the motor won't run, replace the motor. 3. Backprobe a jumper ground at the BRN wire at the motor. Move the driver switch to "UP." If the motor runs, find the open in the ground circuit.
		D0075

DIAGNOSIS OF POWER DOOR LOCK SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
One Door Lock Will Not Work	1. No power at the lock motor. 2. Open ground circuit between the motor and the relay.	1. Check for voltage at the lock motor. If no voltage at the lock motor, check for voltage at the connector which is located at the front door hinge pillar. If there is no voltage at the connector, check for an open between the connector and the door lock relay. 2. Move a door switch to "Lock." If there is no voltage, find the open between the motor and the relay.
None Of The Door Locks Function; All Switches Tried	No power.	Check for power at the fuse block. Check for power at the door lock relay. If power is present at the fuse block but not present at the relay, find the open in the harness.
One Switch Won't Lock The Doors	1. No power to the switch. 2. Switch has internal open.	1. Check for voltage at the switch. If there is no voltage, find the open between the switch and the fuse block. 2. Move the switch to "Lock." Check for voltage at the switch. If there is no voltage, replace the switch.

D0076

DIAGNOSIS OF KEY, HEADLIGHT AND SEAT BELT AUDIO ALARM SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
No Alarm Or Audio	1. Faulty circuit board. 2. Faulty/blown fuse.	1. Replace the board. 2. Replace the fuse.
Key Warning Switch Does Not Operate	1. No power to the switch. 2. Open ground circuit.	1. Check for voltage at the switch. 2. Find the open circuit.
Headlight Lamp On Warning	1. Blown fuse. 2. No power to the switch.	1. Replace the fuse. 2. Check for voltage at the switch.
Door Switch Intermittant Or Does Not Operate	1. Faulty door switch. 2. No power to the switch. 3. Open ground circuit.	1. Replace the door switch. 2. Check for voltage at the switch. 3. Find the open between the switch and the fuse block.
Seat Belt Switch Does Not Work	1. Open ground circuit. 2. No power to the switch.	1. Find the open circuit. 2. Check for voltage at the switch.

D0077

DIAGNOSIS OF THE POWER INSIDE REAR VIEW MIRROR

PROBLEM	POSSIBLE CAUSE	CORRECTION
Lamps Won't Light	1. Blown fuse.	1. Check the ignition/accessories fuse. Replace if blown.
	2. Burnt bulb.	2. Replace the burnt bulb.
	3. No power to the mirror.	3. Check for voltage at the brown/white wire of the mirror connector. If there is no voltage at this wire, check for an open or short in the brown/white wire from the fuse block.
	4. Poor ground from the mirror.	4. Check for continuity between the black wire in the mirror connector, and a good chassis ground. If there is not continuity, repair the black wire to ground.
	5. Inoperative switch.	5. Remove the switch and check for continuity. If there is no continuity in either switch position, replace the switch.
		D0078

DIAGNOSIS OF THE REAR WINDOW ACTUATOR

PROBLEM	POSSIBLE CAUSE	CORRECTION
Tail Gate Release Inoperative	1. Transmission not in park/neutral (automatic transmission) or parking brake not applied (manual transmission).	1. Place the transmission in park or neutral, or pull the parking brake (depending on transmission type). Try the tail gate release.
	2. Park/neutral swith out of adjustment.	2. Adjust the park/neutral switch by shifting the transmission through the entire range of gears twice. Try the tail gate release.
	3. No power to the instrument panel switch.	3. Check the horn/dome lamp fuse. Replace if blown. Using a test lamp, check for voltage between the orange wire at the instrument panel switch and a good ground. If the test lamp does not light, repair the short or open between the switch, and the fuse block.
	4. Inoperative instrument panel switch.	4. Using a test lamp, check for voltage between the brown wire at the instrument panel switch, and a good ground with the switch applied. If the test lamp does not light, and there is power on the orange wire at the switch, then replace the switch.
	5. No power to the control relay.	5. Remove the relay from the harness (taped to the steering column). Using a test lamp, check for voltage between the brown wire in the connector and a good chassis ground when the switch is applied. If the test lamp does not light, check for an open or short in the brown wire between the instrument panel switch and the control relay. Repair the wire as necessary.
	6. Inoperative relay.	6. Replace the relay with a known good relay. If the circuit operates properly, replace the relay.
	7. No power to the tail gate solenoid.	7. Remove the relay from the harness (taped to the steering column). Using a fused jumper wire, jump between the brown wire, and the black wire. Operate the I/P switch. If the tail gate solenoid operates, the wiring from the relay to the solenoid and the solenoid are good. If the solenoid does not operate, check for voltage between the black wire at the tail gate release solenoid, and a good chassis ground. If the lamp does not light, repair the short or open in the black wire. If the lamp does light, check the motor, and operate the switch. If the solenoid does not operate, replace the solenoid.

DIAGNOSIS OF THE REAR WINDOW ACTUATOR (cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Tail Gate Release Inoperative (Cont'd.)	1. No ground for the relay.	1. With the relay removed, and the transmission in park/neutral (automatic transmission) or parking brake applied (manual transmission), check for continuity between the tan/white or green/black wire in the relay connector, and ground. If there is no continuity in the harness, check the tan/white or green/black wire for a short or open. Repair the wire if necessary. Check the continuity of the park/neutral switch or the park brake switch, (depending on transmission type). Replace the switch if necessary.
		D0079

DIAGNOSIS OF POWER OUTSIDE REARVIEW MIRROR

PROBLEM	POSSIBLE CAUSE	CORRECTION
Power Mirrors Inoperative	1. No power to switch. 2. Switch inoperative.	1. Check for power at fuse block (dome lamp) (orange wire) or at harness connector. Note: remove retainer screw at connector to check. 2. Check for output at switch.
Power Mirrors Inoperative — One Side	No power from switch.	Locate mirror connector (in doors). Check for power at yellow or green with switch in up or down position. Check lt. blue and white with switch in right or left position.
		D0204

ON-VEHICLE SERVICE

POWER WINDOW SWITCH REPLACEMENT

Remove or Disconnect (Figure 23 and 24)

1. Negative battery cable.
2. Door trim panel. Refer to DOORS (SECTION 10A1).
3. Inner handle housing. Refer to DOORS (SECTION 10A1).
4. Harness connector (201, 202 or 222).
5. Switch (220, 221, or 223). Press in both spring clips and remove the switch.

Install or Connect (Figure 23 and 24)

1. Switch (220, 221, or 223).
2. Harness connector (201, 202 or 222).
3. Inner handle housing. Refer to DOORS (SECTION 10A1).
4. Door trim panel. Refer to DOORS (SECTION 10A1).
5. Negative battery cable.

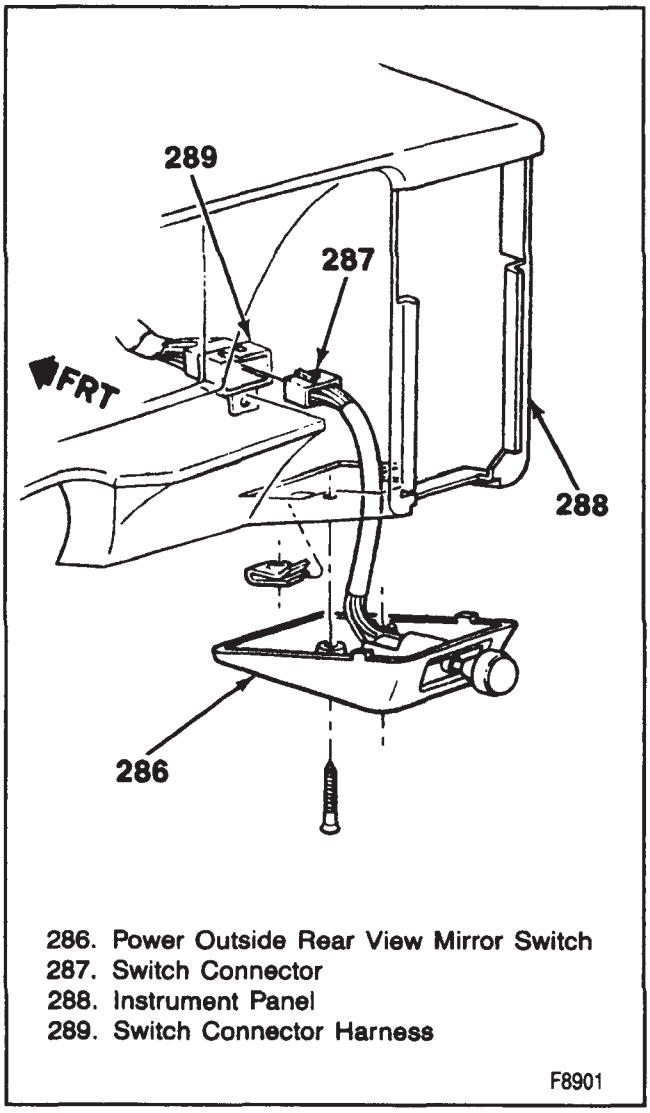
POWER DOOR LOCK SWITCH REPLACEMENT

Remove or Disconnect (Figure 23)

1. Negative battery cable.
2. Switch and bezel from the door panel.
   - Pull the switch from the panel.

Install or Connect (Figure 23)

1. Switch and bezel to the door panel.
   - Push the switch into the connector.
2. Negative battery cable.



286. Power Outside Rear View Mirror Switch
287. Switch Connector
288. Instrument Panel
289. Switch Connector Harness

F8901

Figure 36—Power Outside Rear View Mirror Switch

POWER DOOR LOCK MOTOR REPLACEMENT

Remove or Disconnect (Figures 21, 22, and 23)

1. Negative battery cable.
2. Door trim panel. Refer to DOORS (SECTION 10A1).
3. Motor connector (204).
4. Motor linkage.
5. Motor mounting screws.
6. Motor (200).

Install or Connect (Figures 21, 22 and 23)

1. Motor (200).

NOTICE: See "Notice" on page 8A-1 of this section.

2. Motor mounting screws.
3. Motor linkage.
4. Motor connector (204).
5. Door trim panel. Refer to DOORS (SECTION 10A1).
6. Negative battery cable.

POWER WINDOW MOTOR REPLACEMENT

Refer to DOORS (SECTION 10A1).

REAR WINDOW RELEASE ACTUATOR REPLACEMENT

Refer to END GATE (SECTION 10A5).

REAR WINDOW DEFOG SWITCH REPLACEMENT

Refer to WINDOWS (SECTION 10A3).

REAR WINDOW RELEASE SWITCH REPLACEMENT

Remove or Disconnect (Figure 39)

1. Negative battery cable.
2. Ashtray, and cigarette lighter (326).
3. Trim plate screws (327) from the trim plate (328).
4. Harness connector (324) from the rear window release switch (322).
5. Depress lock tabs on the rear window release switch (322) to remove from the trim plate (328).

Install or Connect (Figure 39)

1. Rear window release switch (322) to the trim plate (328).
2. Harness connector (324) to the rear window release switch (322).

NOTICE: See "Notice" on page 8A-1 of this section.

3. Trim plate screws (327) to the trim plate (328).
4. Ashtray, and cigarette lighter (326).
5. Negative battery cable.

POWER OUTSIDE REAR VIEW MIRROR SWITCH REPLACEMENT

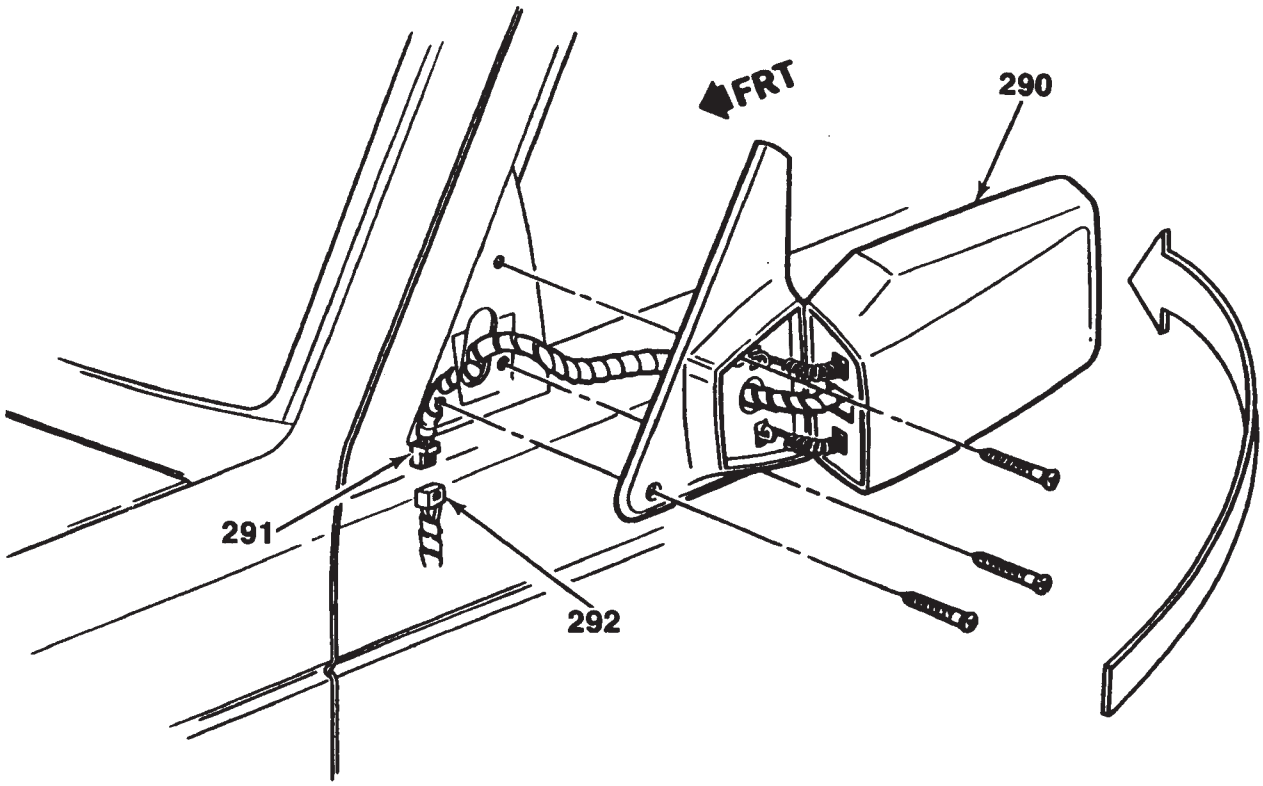
Remove or Disconnect (Figure 36)

1. Negative battery cable.
2. Trim plate screws.
3. Harness connector hold down screw.
4. Switch connector from harness connector.

Install or Connect (Figure 36)

1. Switch connector into harness connector.

NOTICE: For steps 2 and 3 see "Notice" on page 8A-1 of this section.



290. Power Outside Rear View Mirror Assembly
291. Mirror Assembly Connector
292. Mirror Wiring Harness Connector

Figure 37—Power Outside Rear View Mirror Assembly

2. Harness connector hold down screw.
3. Trim plate screws.
4. Negative battery cable.

SEAT BELT WARNING ALARM REPLACEMENT

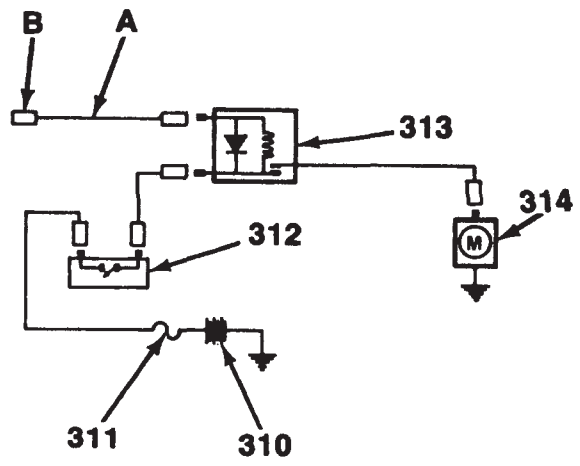
Remove or Disconnect (Figure 16)

The seat belt alarm assembly is located under the left hand side of the instrument panel in the convenience center.

- Seat belt alarm (86) from the convenience center (87).

Install or Connect (Figure 16)

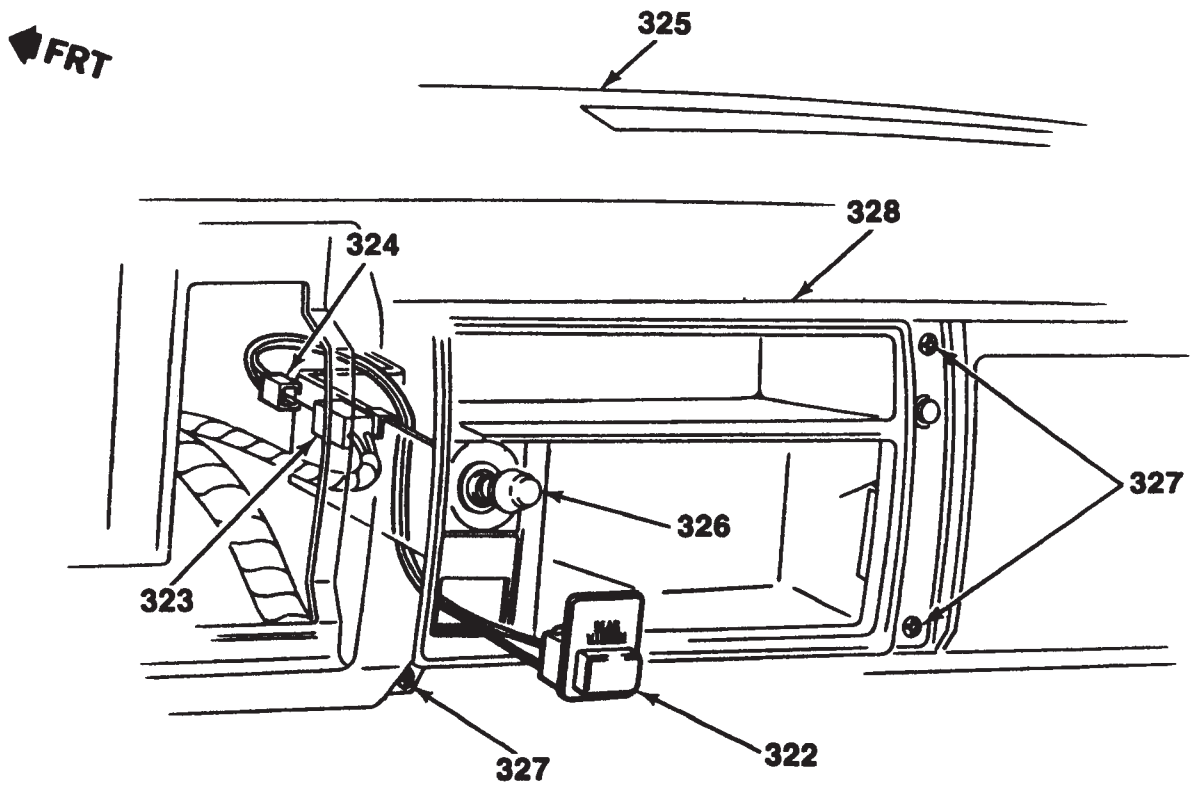
1. New seat belt alarm (86) assembly to the convenience center (87).
- Check alarm assembly for proper operation.



310. Battery
311. Horn/Dome Lamp Fuse(From Fuse Block)
312. Instrument Panel Switch
313. Control Relay
314. Release Actuator
A. Ground in Park or Neutral Through the Park Neutral Switch.
B. From the Instrument Panel Connector

F8907

Figure 38—Power Release Actuator Schematic

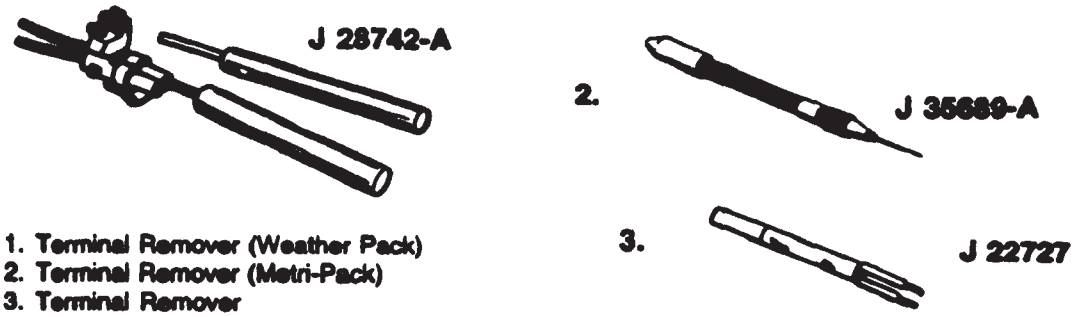


322. Rear Window Release Switch
323. Actuator Harness
324. Rear Window Switch Connector
325. Instrument Panel
326. Lighter
327. Trim Plate Screws
328. Trim Plate

F8909

Figure 39—Rear Window Release Switch

SPECIAL TOOLS



1. Terminal Remover (Weather Pack)
2. Terminal Remover (Metri-Pack)
3. Terminal Remover

L0248

SECTION 8B

LIGHTING SYSTEMS

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

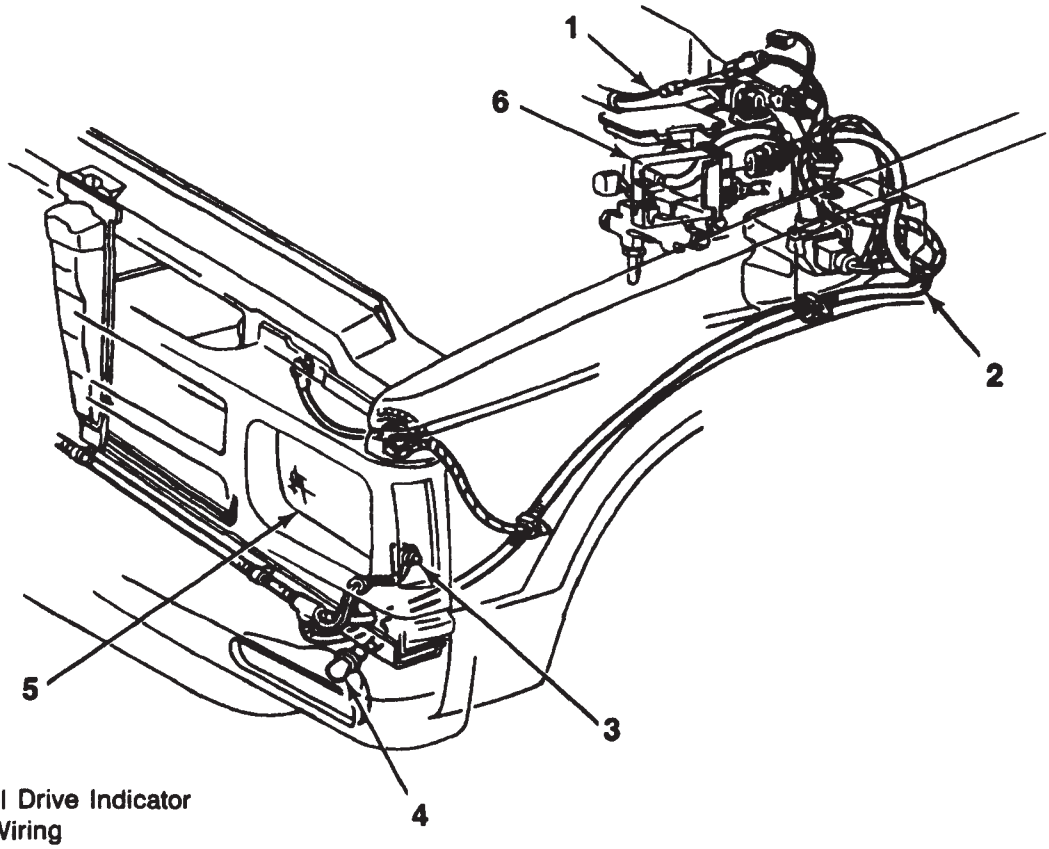
CONTENTS (cont'd)

DESCRIPTION OF EXTERIOR LIGHTING

HEADLAMP SYSTEM

The headlamps are controlled by a lamp switch that is located on the left side of the instrument panel. The headlamps are halogen and rectangular in shape.

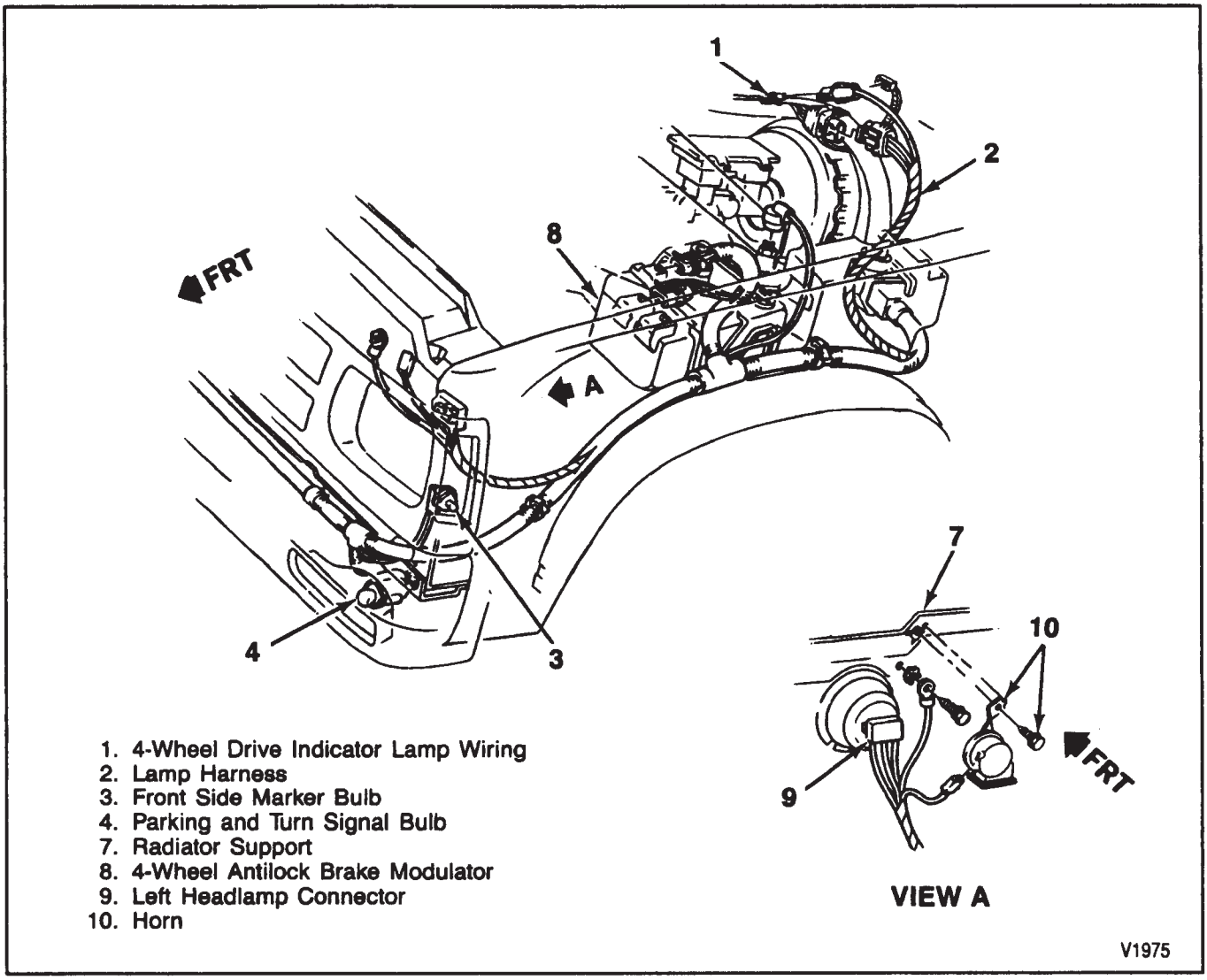
The headlamp harness is routed from the fuse block to the lamp switches and then to the left side of the engine compartment and across the lower radiator support (figures 1, 2 and 3).



1. 4-Wheel Drive Indicator Lamp Wiring
2. Lamp Harness
3. Front Side Marker Bulb
4. Parking and Turn Signal Bulb
5. Headlamp
6. Brake Control Module Assembly

F8943

Figure 1—Left Forward Lamp Harness - Rear Wheel Antilock Brakes



1. 4-Wheel Drive Indicator Lamp Wiring
2. Lamp Harness
3. Front Side Marker Bulb
4. Parking and Turn Signal Bulb
7. Radiator Support
8. 4-Wheel Antilock Brake Modulator
9. Left Headlamp Connector
10. Horn

Figure 2—Left Forward Lamp Harness - 4-Wheel Antilock Brakes

The headlamp high and low beams are controlled by the dimmer switch which is located on the steering column.

DAYTIME RUNNING LIGHTS

Canadian vehicles are equipped with daytime running lights (DRL) (figure 4). The system is designed to turn on the high beam headlamps but at reduced brightness any time the ignition switch is in the RUN position and the parking brake is released. If the headlamp switch is turned on, or the parking brake applied, the DRL system is disconnected by the DRL module, and the headlamps operate in the usual way.

When the daytime running lamps are on, an indicator lamp will light on the instrument panel.

OPERATION (Figure 5)

With the ignition switch in RUN, power is available to the DRL relay, DRL module, and DRL indicator lamp through the IGN/GAGES fuse and the PNK/BLK (39) wire. Ground is provided through the BLK (150) wire.

With the parking brake applied, the DRL module senses ground (less than one volt) at the TAN/WHT (33) wire, which prevents the module from turning on the headlamps. When the parking brake is released, the module senses full system voltage at the TAN/WHT (33) wire through the brake diode module.

With full system voltage at the PNK/BLK and TAN/WHT wires, the DRL module switches the LT GRN/BLK (592) wire to ground. The DRL indicator lamp lights on the instrument panel and the DRL relay is energized. Current from the DRL fuse flows through the ORN (340) wire, the closed contacts of the DRL relay, the DK BLU/WHT (593) wire, the high beam filament of the left headlamp, the LT GRN wire, the high beam filament of the right headlamp, and to ground.

Turning on the headlamp switch sends a battery voltage signal to the DRL module through the YEL (10) wire. The module then disconnects the LT GRN/BLK (592) wire from ground, turning off the DRL indicator lamp and the the DRL relay.

With the relay deenergized, the headlamps work in the normal way. Ground for the right headlamp is provided through the black wire. Ground for the left headlamp is provided through the DR BLU/WHT (593) wire,

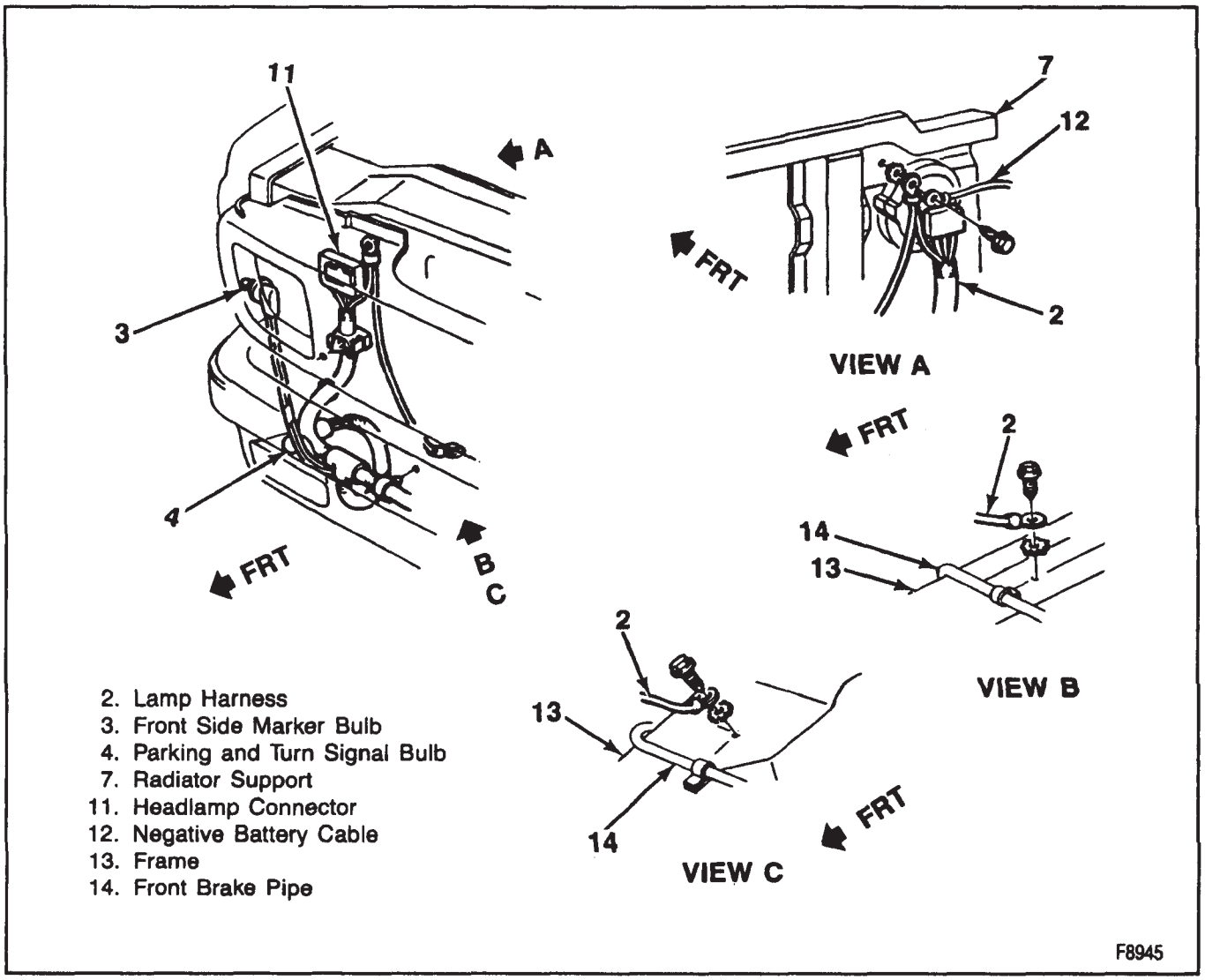


Figure 3—Right Forward Lamp Harness

the normally closed contacts of the DRL relay, and the the BLK (150) wire which eventually grounds at the engine.

FOG LAMPS

Fog lamps are optional (figure 6). The fog lamp circuit is controlled by a switch located to the left of the steering column, below the headlamp switch. When the parking lamps are on, voltage is supplied to the fog lamp switch through the BRN wire (figure 7). When the fog lamp switch is turned on, that voltage is applied to the fog lamp relay coil. The relay contacts close, and current flows to the fog lamps through the PPL wire.

The relay coil is wired to the high beam portion of the headlamp dimmer switch. When the headlamps are switched to high beams, current through the coil is interrupted, and the fog lamps turn off.

The fog lamps operate the same way on vehicles with daytime running lights, except that the fog lamp relay coil is grounded by the DRL module through the DK GRN wire.

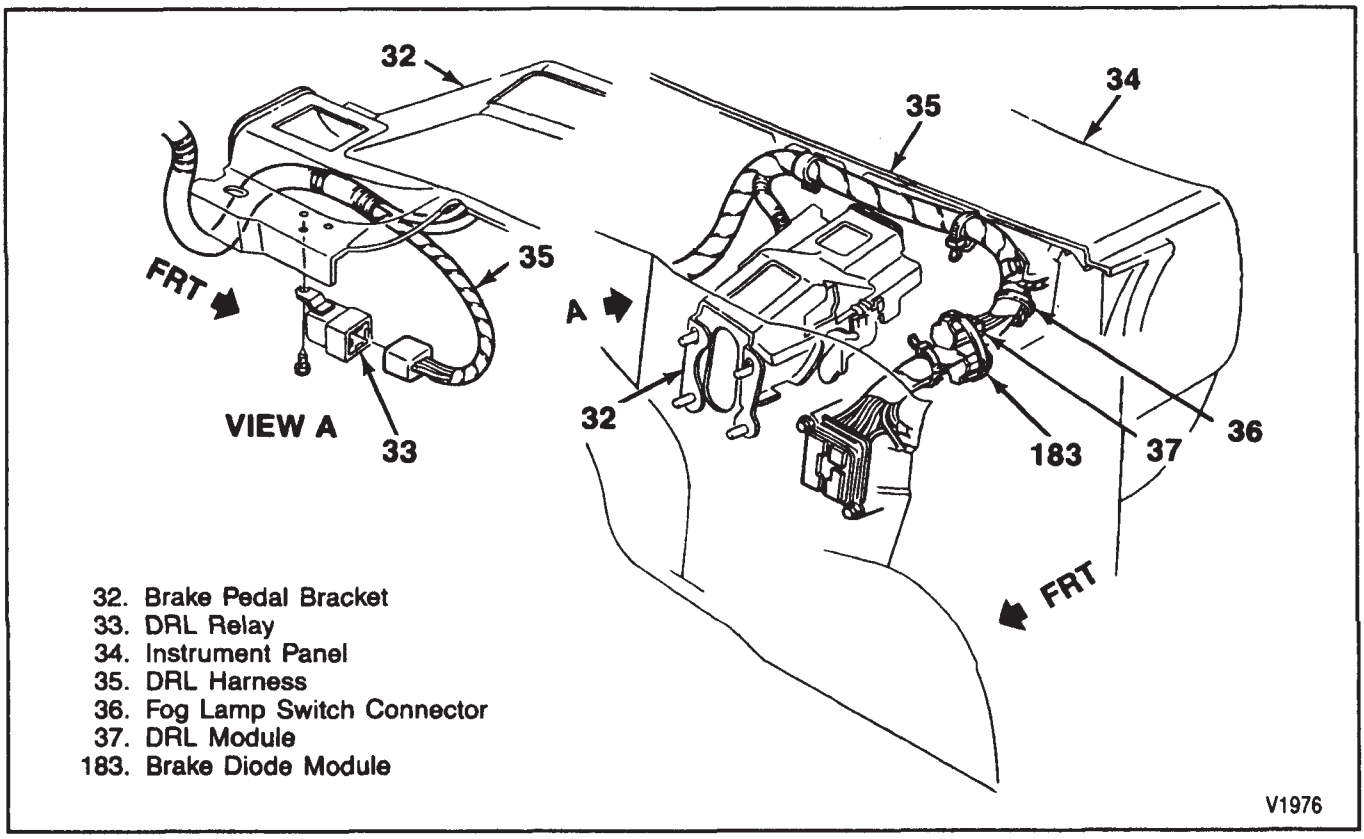
BACKUP LAMP SYSTEM

The backup lamp system consists of the backup switch and the backup lamp circuit. The backup switch is located either on the steering column and is part of the neutral switch (automatic transmissions) or on the transmission (manual transmissions).

With the ignition switch in RUN or START, voltage is applied through the TURN/BU fuse to the transmission neutral sense switch or the backup lamp switch.The backup lamps are turned on when the transmission is shifted into reverse. The backup lamps are located in the rear lamp assemblies.

HAZARD FLASHER SYSTEM

The hazard flasher system consists of a hazard switch which is mounted on the lower right side of the steering column, and a hazard flasher unit which is mounted on the convenience center or on the fuse block (vehicles with an electronic cluster) (figure 8). The convenience center is located on the left of the steering column and at the lower edge of the instrument panel. Refer to STEERING COLUMN - STAN-



32. Brake Pedal Bracket
33. DRL Relay
34. Instrument Panel
35. DRL Harness
36. Fog Lamp Switch Connector
37. DRL Module
183. Brake Diode Module

Figure 4—Daytime Running Lights Wiring Harness - with Fog Lamps

DARD (SECTION 3F1) or STEERING COLUMN - TILT (SECTION 3F2) for service information on the hazard switch.

LICENSE LAMP CIRCUIT

The license lamp circuit branches from the rear lamp harness at the rear of the vehicle. The circuit then passes over to the license plate lamp. The license lamp turns on when the park lamp switch or headlamp switch is turned on.

MARKER, PARK, AND TAILLAMP SYSTEM

The marker lamp system consists of marker lamps which are located at each corner of the vehicle. The marker lamps have wrap-around lenses which enable the lamps to function as parking lamps in front and taillamps in the rear.

The marker lamps are turned on when the parking lamp switch or the headlamp switch is turned on. The front harness of this system is routed along the left side of the engine compartment and along the bottom of the radiator support (figures 1, 2 and 3). The rear harness is routed from the engine compartment to the frame then along the frame to the rear panel on pickup truck models (figures 9 and 10). On utility vehicles, the rear harness is routed from the instrument panel to the floor panel and back to the rear of the vehicle along the left side. The rear harness is located below the mat or carpet (figures 11 through 14).

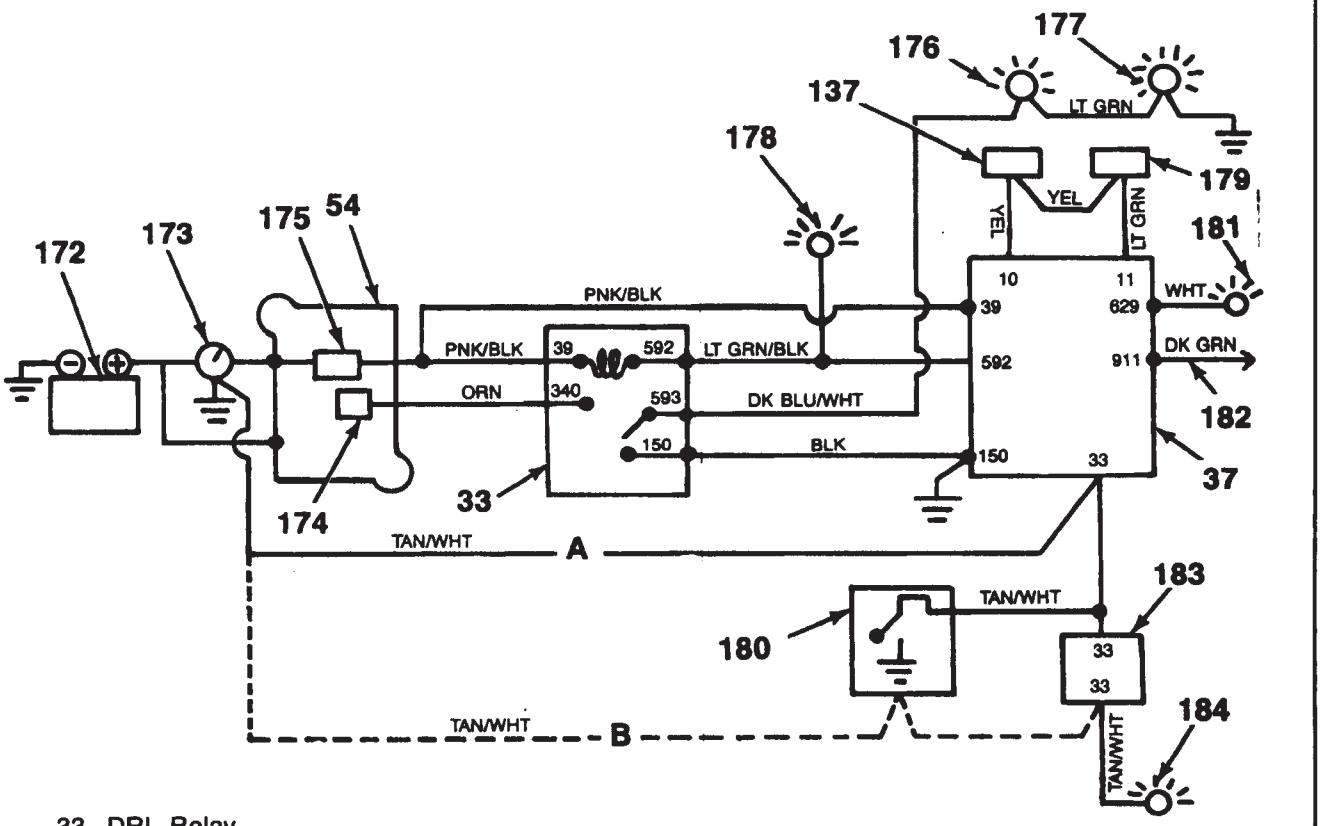
STOPLAMP SYSTEM

The stoplamp system consists of a stop switch connected to the rear taillamps circuit. The stop switch is located at the upper end of the brake pedal lever (figure 15).

TURN SIGNAL SYSTEM

The turn signal system consists of the turn signal switch, the flasher unit, the turn lamps which are located at each corner of the vehicle, and indicator lamps in the instrument cluster. When the turn signal switch is positioned for left or right turn, the left or right turn lamps are connected to the flasher unit. Current now flows through the flasher unit to the lamps and to ground. The flasher unit turns on and off, causing the lamps to flash.

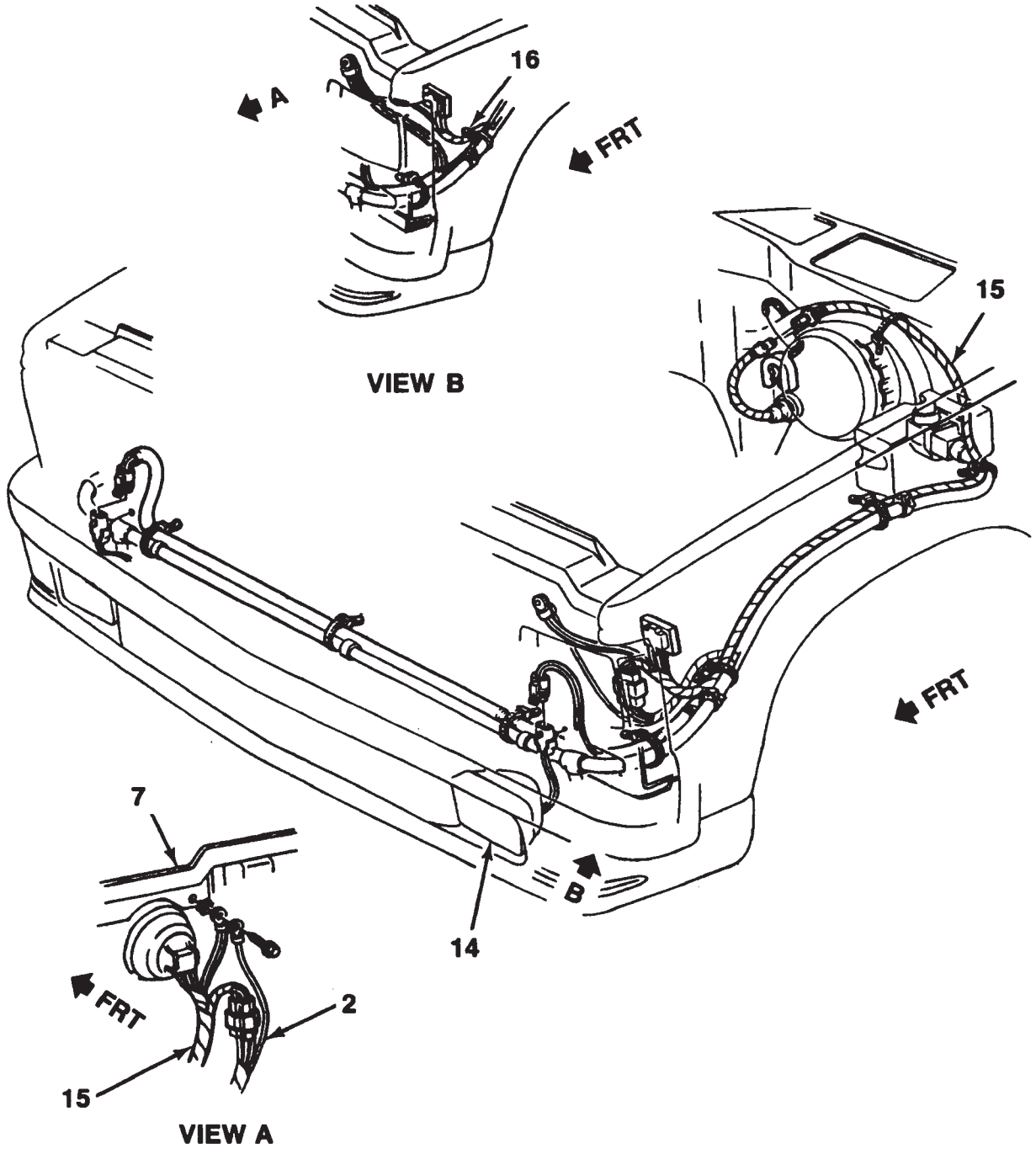
The turn signal system has a turn switch mounted in the steering column, a flasher unit mounted in the fuse block (or in the convenience center on models with electronic instrument clusters) and a harness connecting the front turn lamps and rear taillamps (figures 16 and 17). Refer to STEERING COLUMN - STANDARD (SECTION 3F1) or STEERING COLUMN -TILT (SECTION 3F2) for service information on the turn signal switch.



33. DRL Relay
37. DRL Module
54. Fuse Block
137. Headlamp Switch
172. Battery
173. Ignition Switch
174. 10 Amp DRL Fuse
175. 20 Amp IGN/Gages Fuse
176. Left Headlamp
177. Right Headlamp
178. DRL Indicator Lamp
179. Headlamp Dimmer Switch
180. Parking Brake Switch
181. High Beam Indicator Lamp
182. To Fog Lamp Circuit
183. Diode Module
184. Brake Lamp
A. 4-Door Utility
B. Pickup and 2-Door Utility

V1977

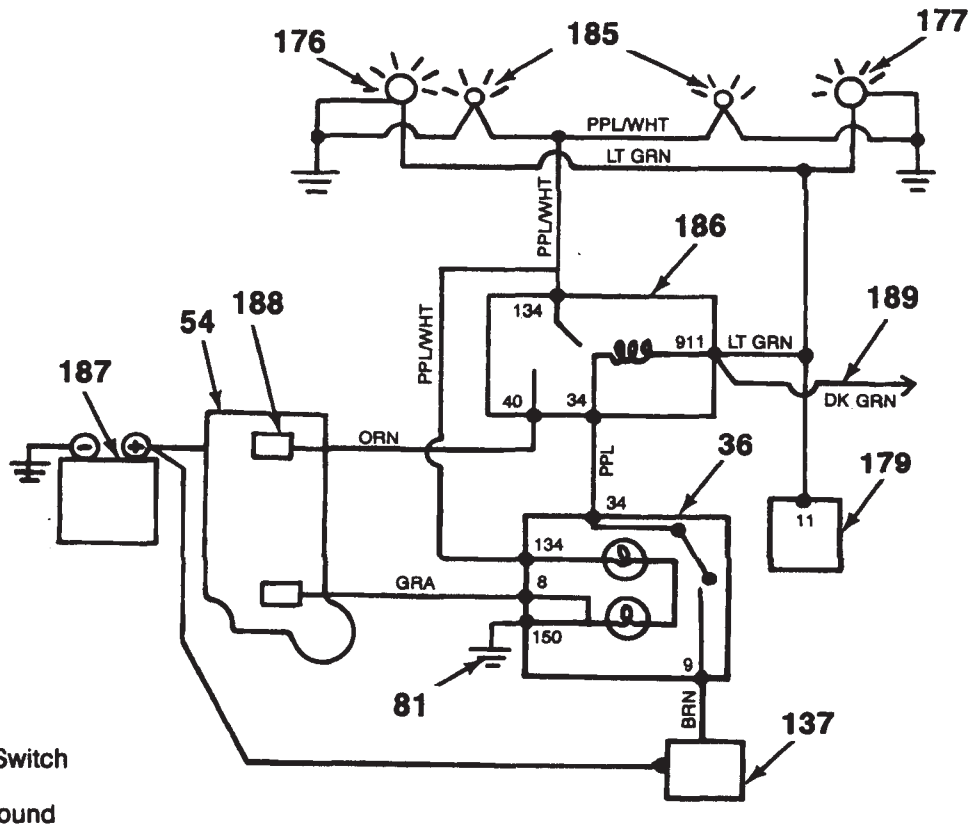
Figure 5—Daytime Running Lights Circuit (Canada only)



2. Lamp Harness
7. Radiator Support
14. Fog Lamp
15. Fog Lamp Harness
16. Fog Lamp Harness
(with Daytime Running Lights)

F8947

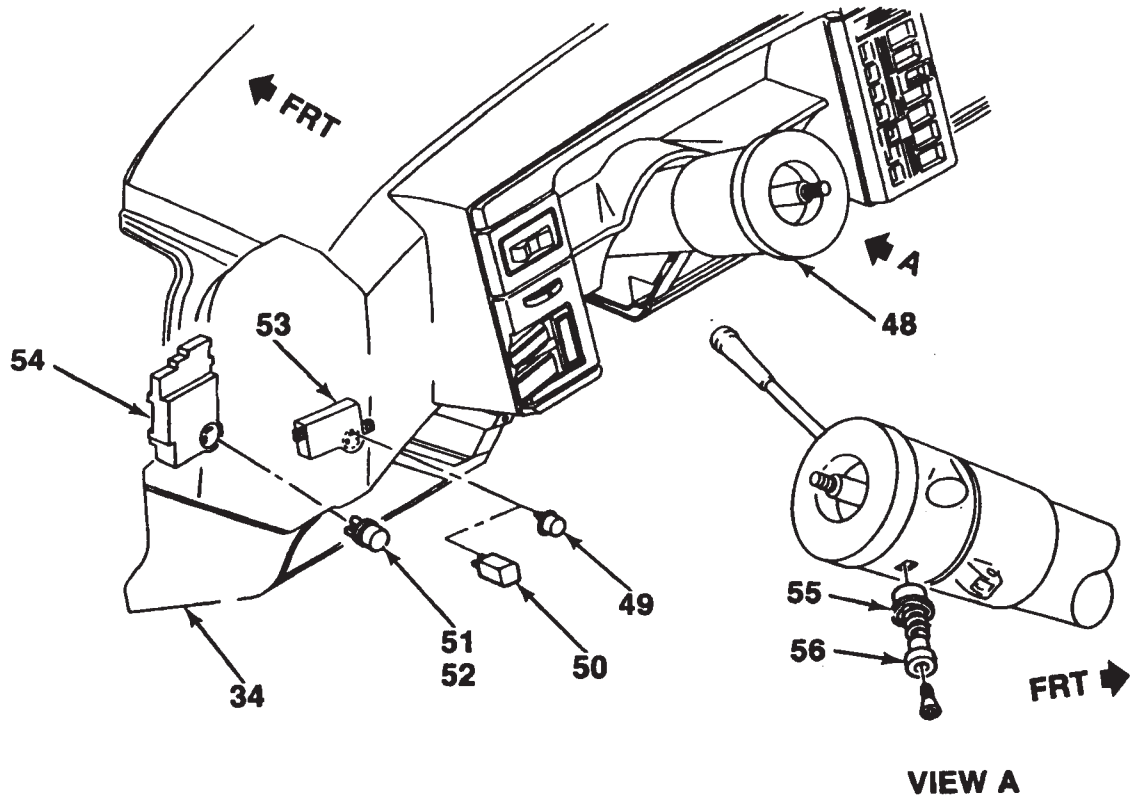
Figure 6—Fog Lamp Wiring



36. Fog Lamp Switch
54. Fuse Block
81. Bus Bar Ground
137. Headlamp Switch
176. Left Headlamp
177. Right Headlamp
179. Headlamp Dimmer Switch
185. Fog Lamp
186. Fog Lamp Relay
187. Battery
188. 20 Amp TAILLAMP CTSY Fuse
189. To DRL Module

V1978

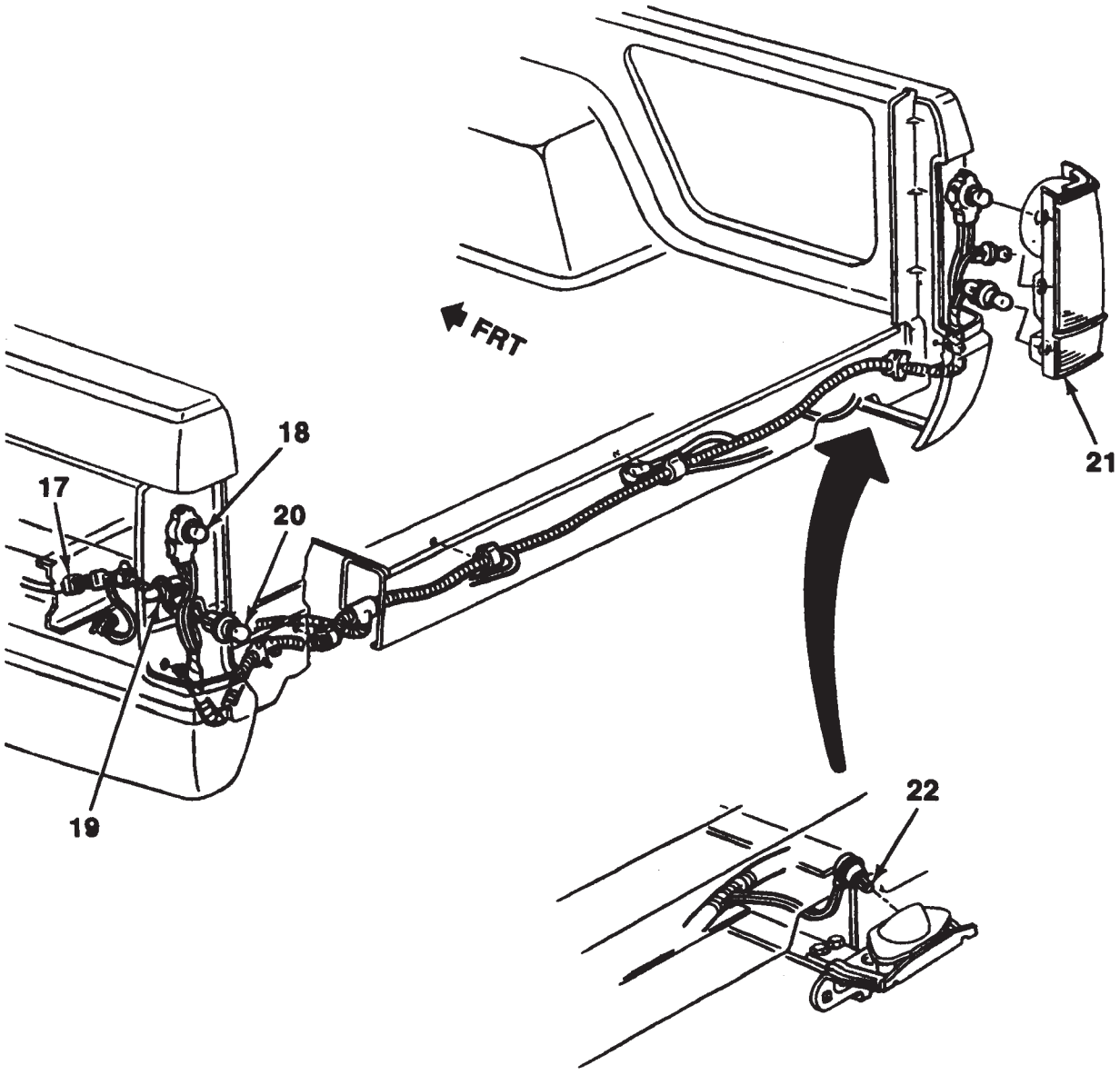
Figure 7—Fog Lamp Circuit



34. Instrument Panel
48. Steering Column
49. Hazard Flasher
50. Directional Signal Flasher (Electronic Cluster)
51. Directional Signal Flasher
52. Hazard Flasher (Electronic Cluster)
53. Convenience Center
54. Fuse Block
55. Hazard Knob
56. Hazard Button

F8955

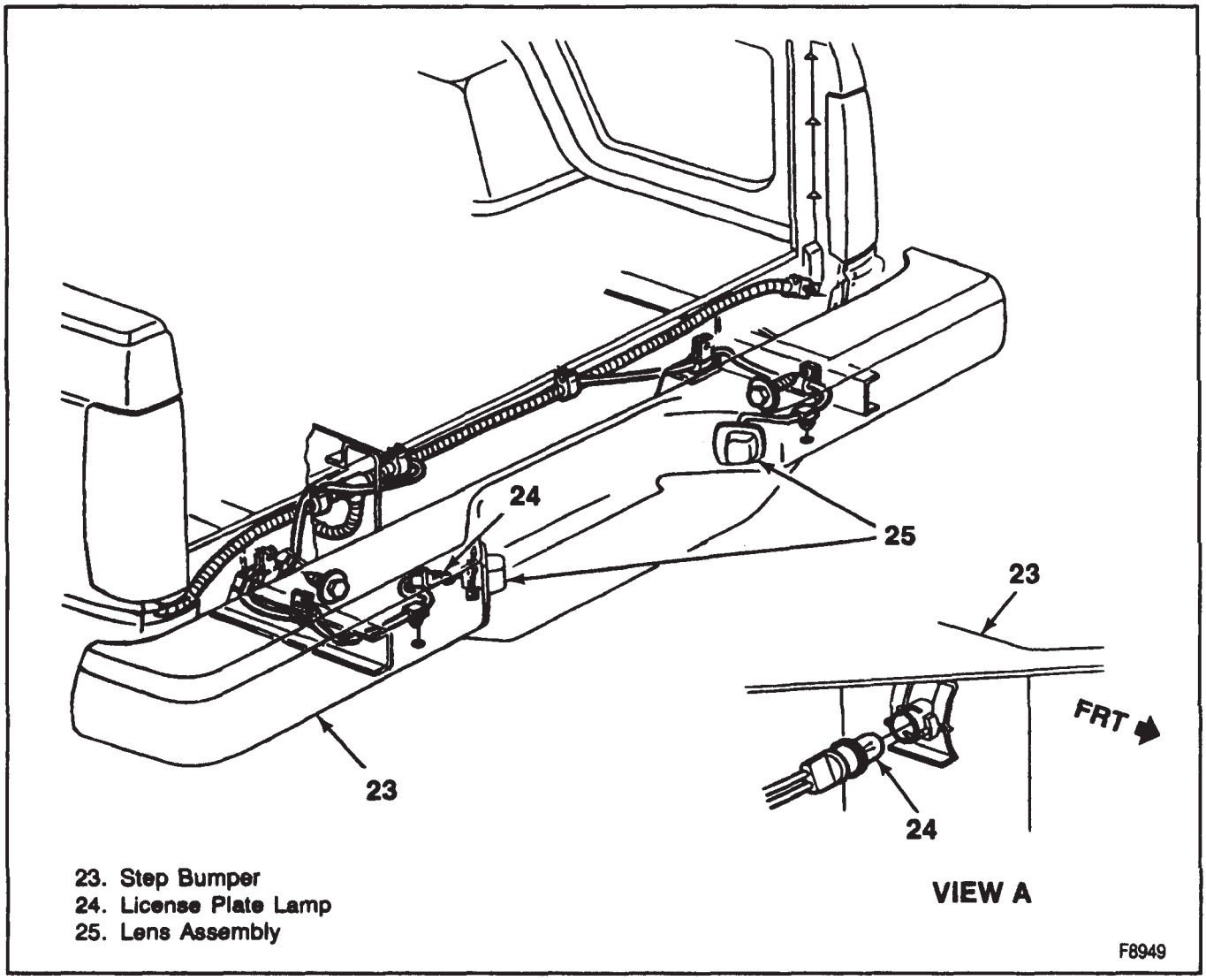
Figure 8—Hazard and Turn Signal Flashers



17. Harness Connector
18. Stop and Turn Signal Lamp
19. Side Marker Lamp
20. Backup Lamp
21. Lens
22. License Plate Lamp

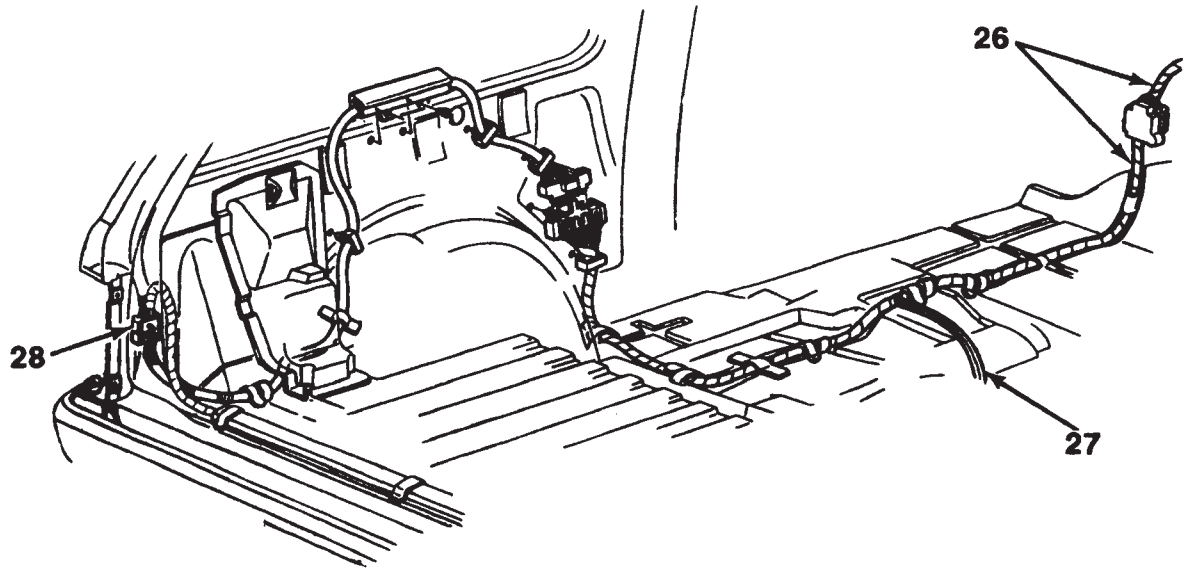
F8948

Figure 9—Rear Lamp Harness - Pickup without Bumper



23. Step Bumper
24. License Plate Lamp
25. Lens Assembly

Figure 10—Rear Lamp Harness - Pickup with Step Bumper



26. Instrument Panel Harness
27. Seat Belt Switch Wire
28. Rear Lamp Wiring

F8950

Figure 11—Rear Lamp Wiring - Body Side - 2-Door Utility Vehicle

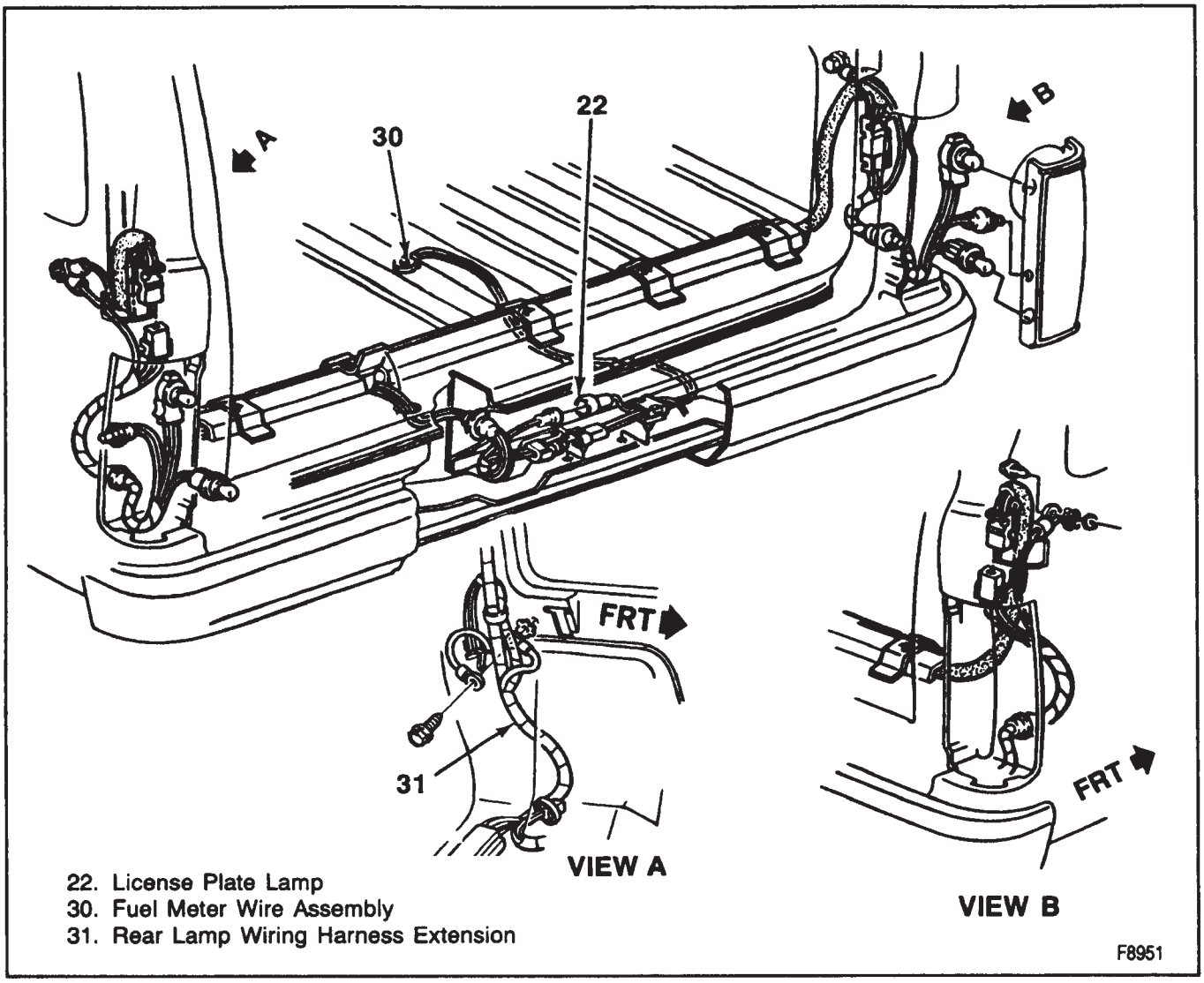


Figure 12—Rear Lamp Wiring - 2-Door Utility Vehicle

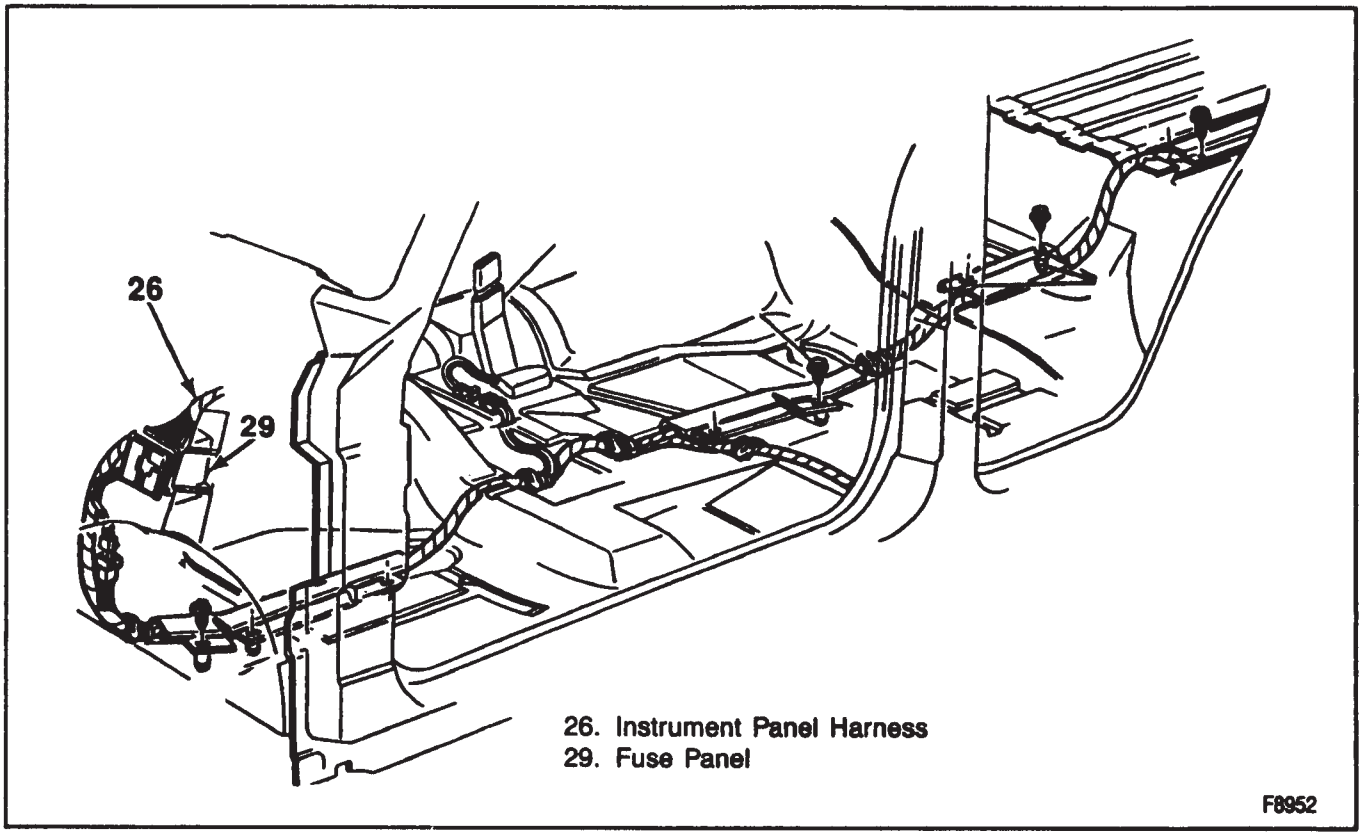
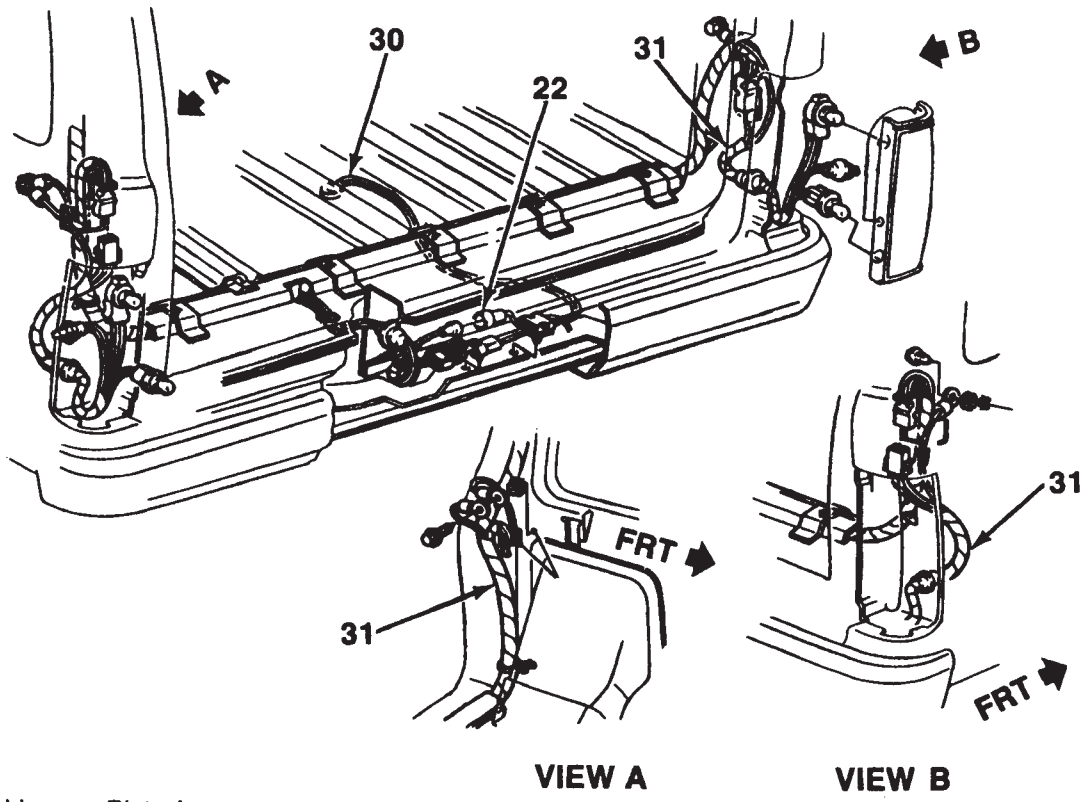


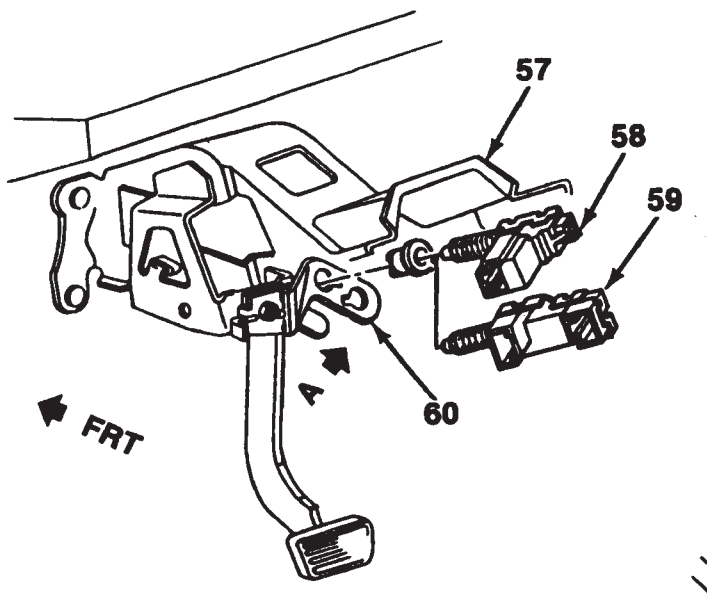
Figure 13—Rear Lamp Wiring - Body Side - 4-Door Utility Vehicle

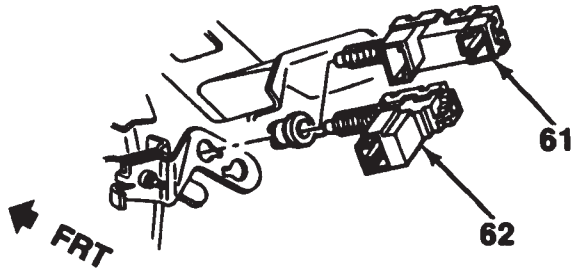


22. License Plate Lamp
30. Fuel Meter Wire Assembly
31. Rear Lamp Wiring Harness

F8953

Figure 14—Rear Lamp Wiring - 4-Door Utility Vehicle



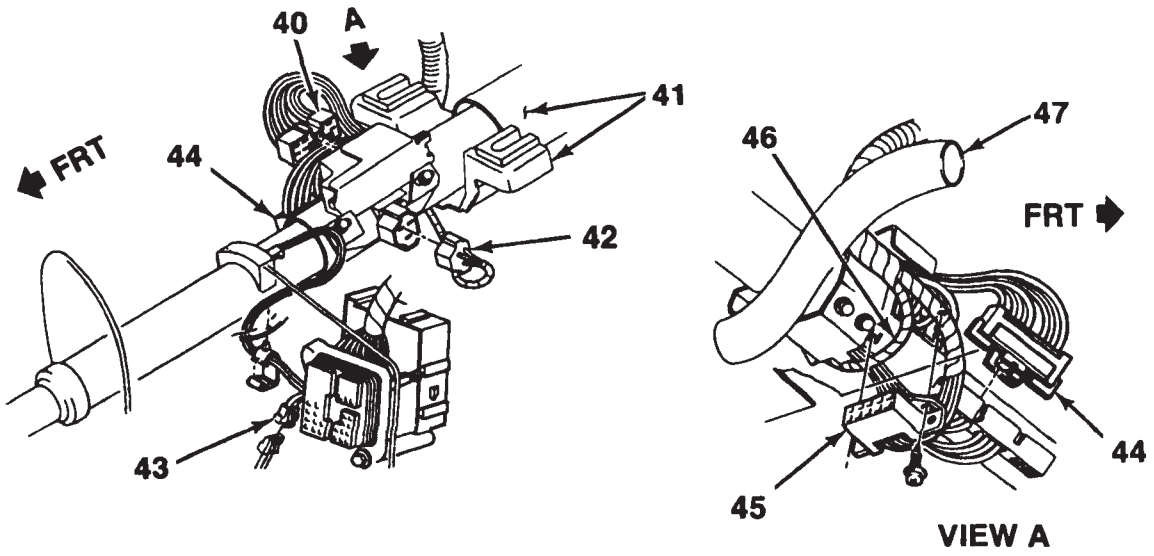


VIEW A

57. Brake Pedal Bracket
58. Switch Assembly
59. Optional Switch
60. Actuator Bracket
61. Switch Assembly (with Cruise Control)
62. Optional Switch

F8956

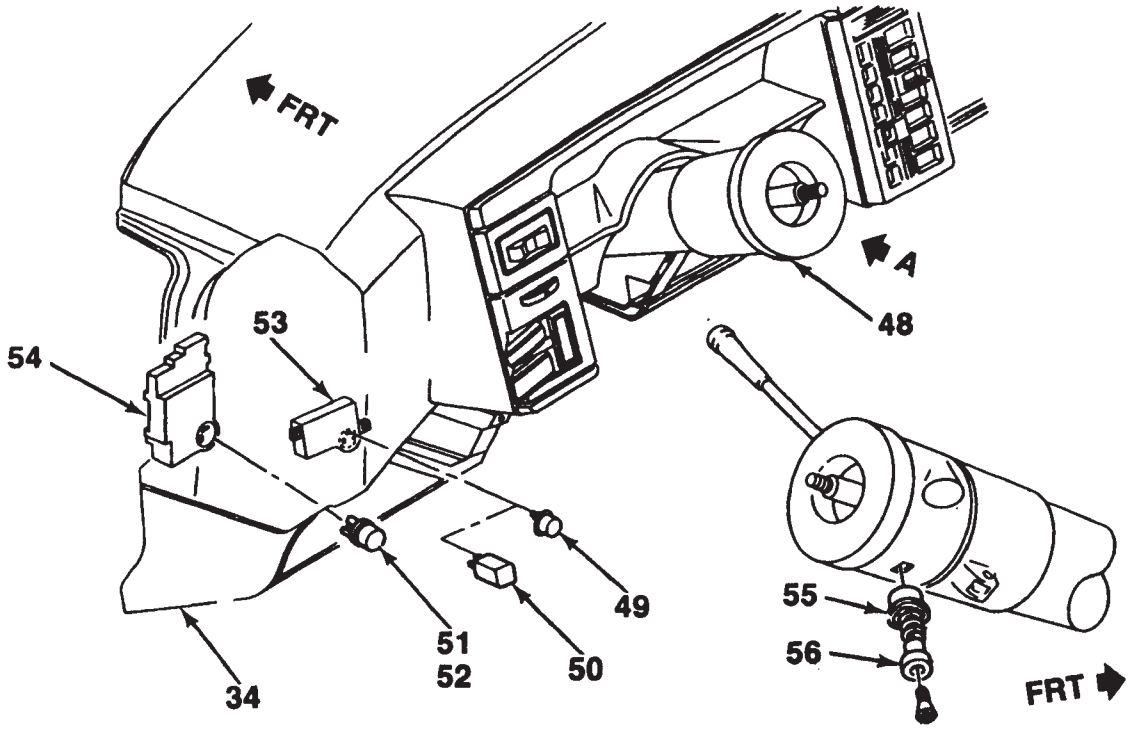
Figure 15—Stoplamp Switch



40. Ignition Switch Connector
41. Steering Column and Bracket
42. Dimmer Switch Connector
43. Seat Belt Retractor Switch Connector
44. Turn Signal Switch Connector
45. ALDL Connector
46. To Dimmer Switch
47. Lap Cooler Duct

F8954

Figure 16—Steering Column Turn Signal Wiring



34. Instrument Panel
48. Steering Column
49. Hazard Flasher
50. Directional Signal Flasher (Electronic Cluster)
51. Directional Signal Flasher
52. Hazard Flasher (Electronic Cluster)
53. Convenience Center
54. Fuse Block
55. Hazard Knob
56. Hazard Button

F8955

Figure 17—Hazard and Turn Signal Flashers

DESCRIPTION OF INTERIOR LIGHTING

DOME LAMP HARNESS

The dome lamp(s) are controlled by the door jamb switches and the instrument panel dimmer switch (above the headlamp switch). The lamp(s) will turn on whenever a door is opened or the dimmer switch is turned all the way to the right past the detent. On the utility vehicle, both lamps and the optional courtesy lamps can be turned on by turning on the switch on the rear dome lamp.

The dome lamp harness for the pickup starts at the fuse block and goes down the left kick panel to the floor, back along the floor to the left rear corner of the cab, and then up the left corner and over to the dome lamp. The circuit then returns to the I/P and connects to the door jamb switch harness.

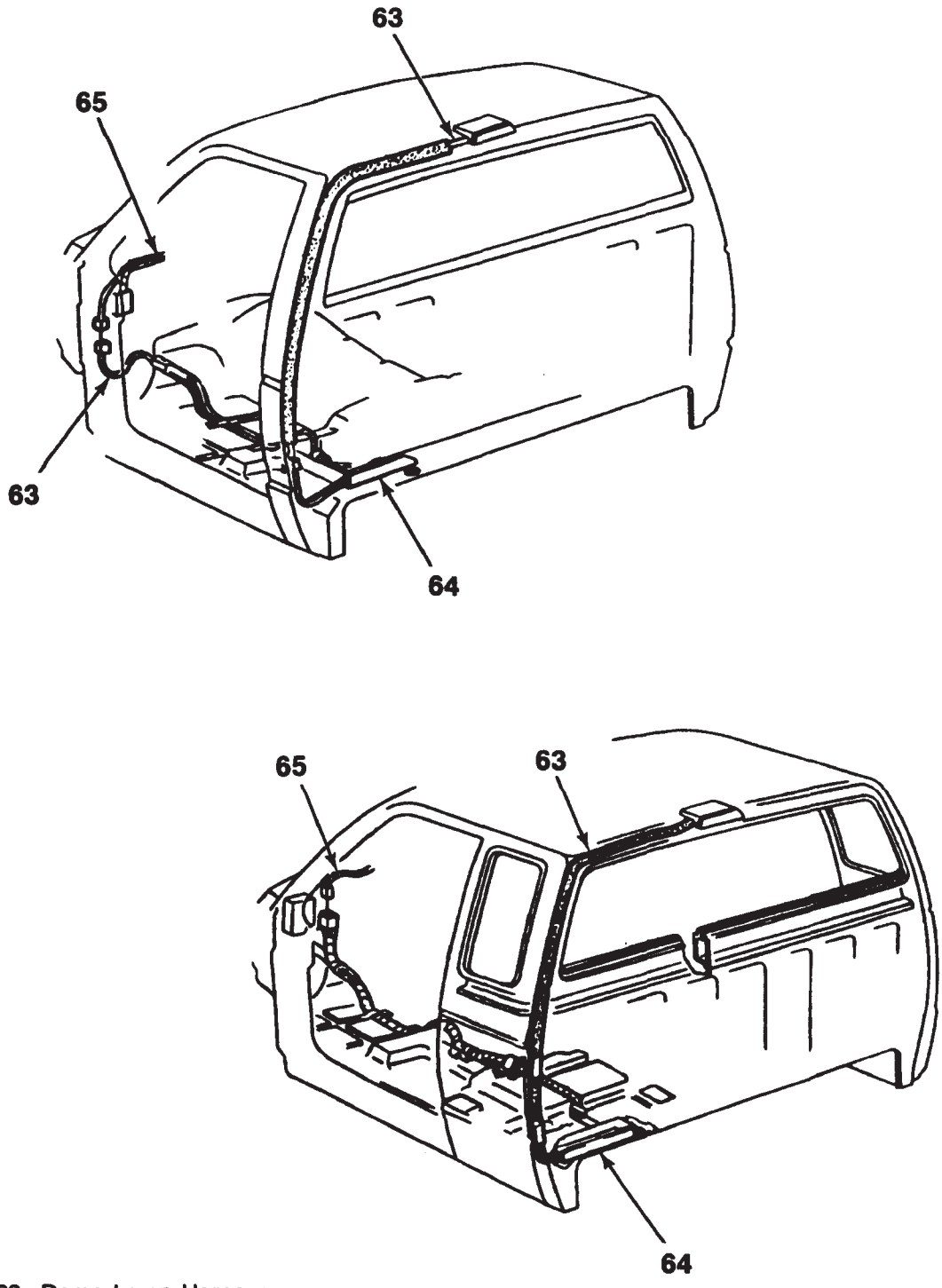
The dome lamp harness for the utility model follows the same route as the pickup model except the harness goes up the left door post and at the roof the harness branches, one branch going to the front dome lamp and the other branch going back along the left edge of the roof to the rear dome lamp. Refer to figures 18 and 19.

DOOR JAMB SWITCH WIRING

On pickup vehicles, the wiring harness for the left door jamb switch connects to the dome lamp harness and the instrument panel harness at the left side of the instrument panel. The wiring continues behind the instrument panel, and connects to the instrument panel wiring harness and the right door jamb switch wiring at the right side (figure 20).

On 2-door utility vehicles, the door jamb switch wiring is routed the same way behind the instrument panel, and connects to the instrument panel wiring harness at the left and right side (figure 21).

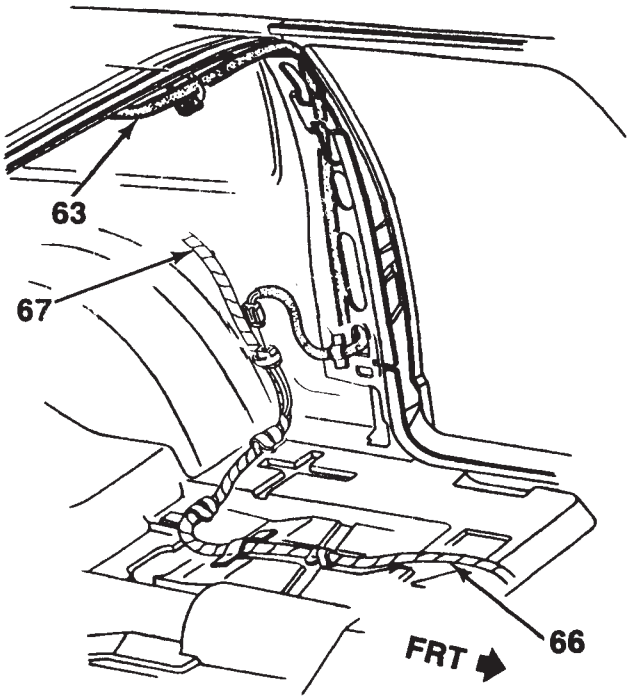
On 4-door utility vehicles, the door jamb switch wiring on both sides is connected directly to the instrument panel harness (figure 22).



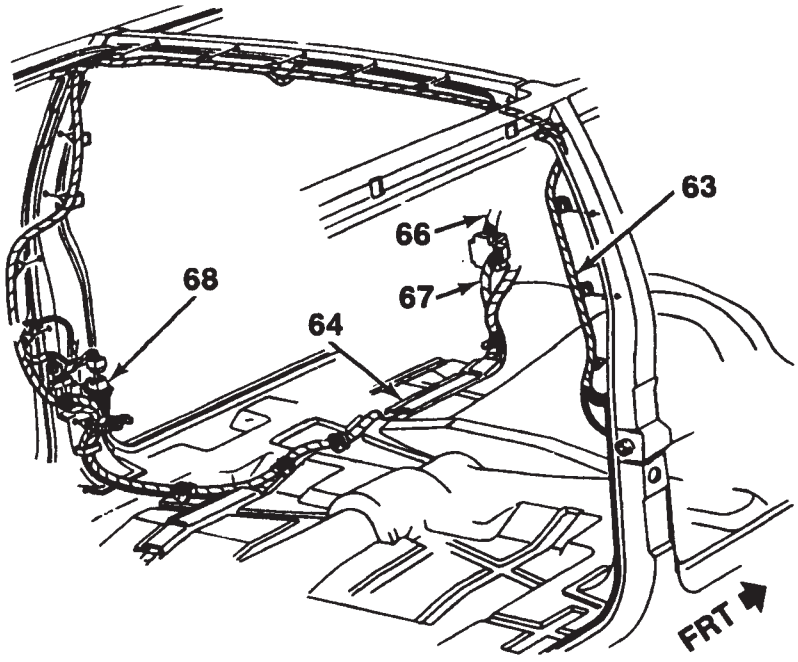
63. Dome Lamp Harness
64. Conduit
65. Body Wiring Harness

F8957

Figure 18—Dome Lamp Wiring - Pickup



A

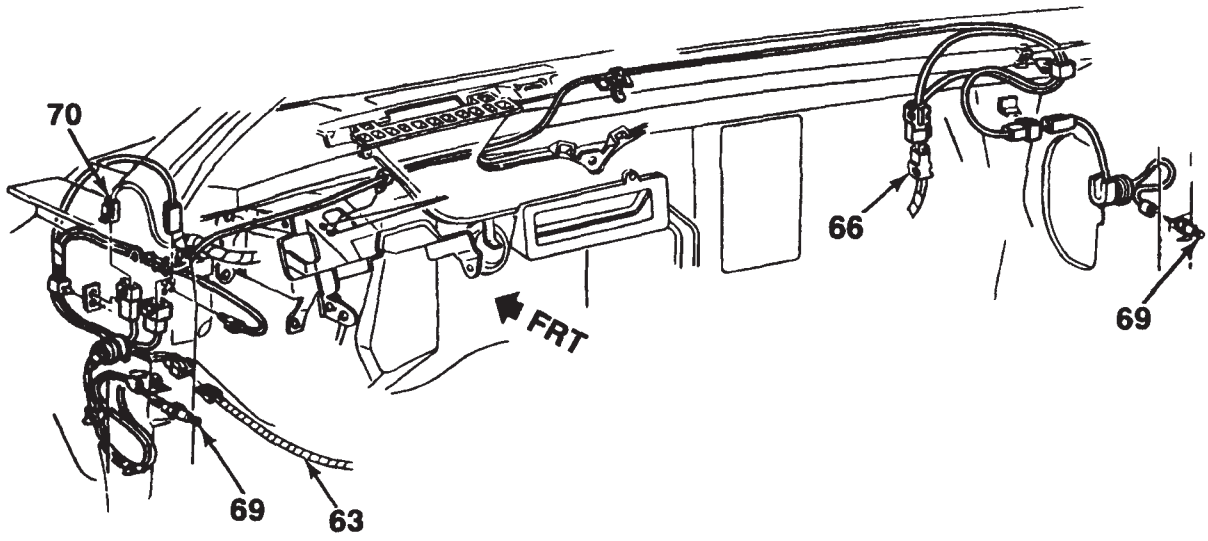


B

63. Dome Lamp Harness
64. Conduit
66. Instrument Panel Harness
67. Right Rear Lamp Wiring
68. Power Window and Door Lock Connector
A. 2 Door Utility Vehicle
B. 4 Door Utility Vehicle

F8958

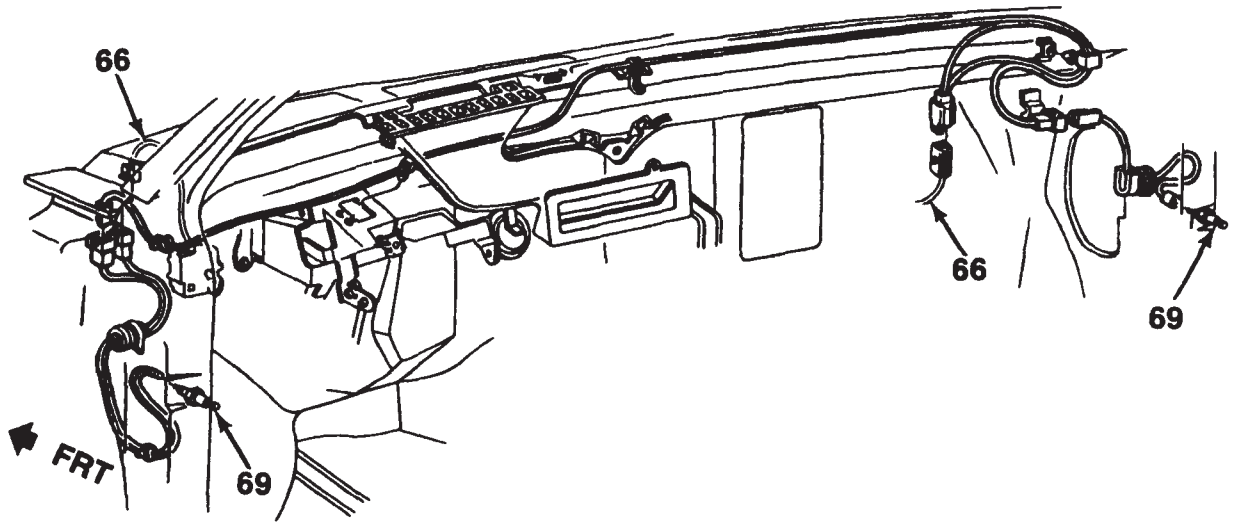
Figure 19—Dome Lamp Wiring - 2-Door and 4-Door Utility Vehicles



63. Dome Lamp Harness
66. Instrument Panel Harness
69. Door Jamb Switch
70. I/P Harness Connector

F8959

Figure 20—Door Jamb Switch Wiring - Pickup



66. Instrument Panel Harness
69. Door Jamb Switch

F8960

Figure 21—Door Jamb Switch Wiring (2-Door Utility Vehicle)

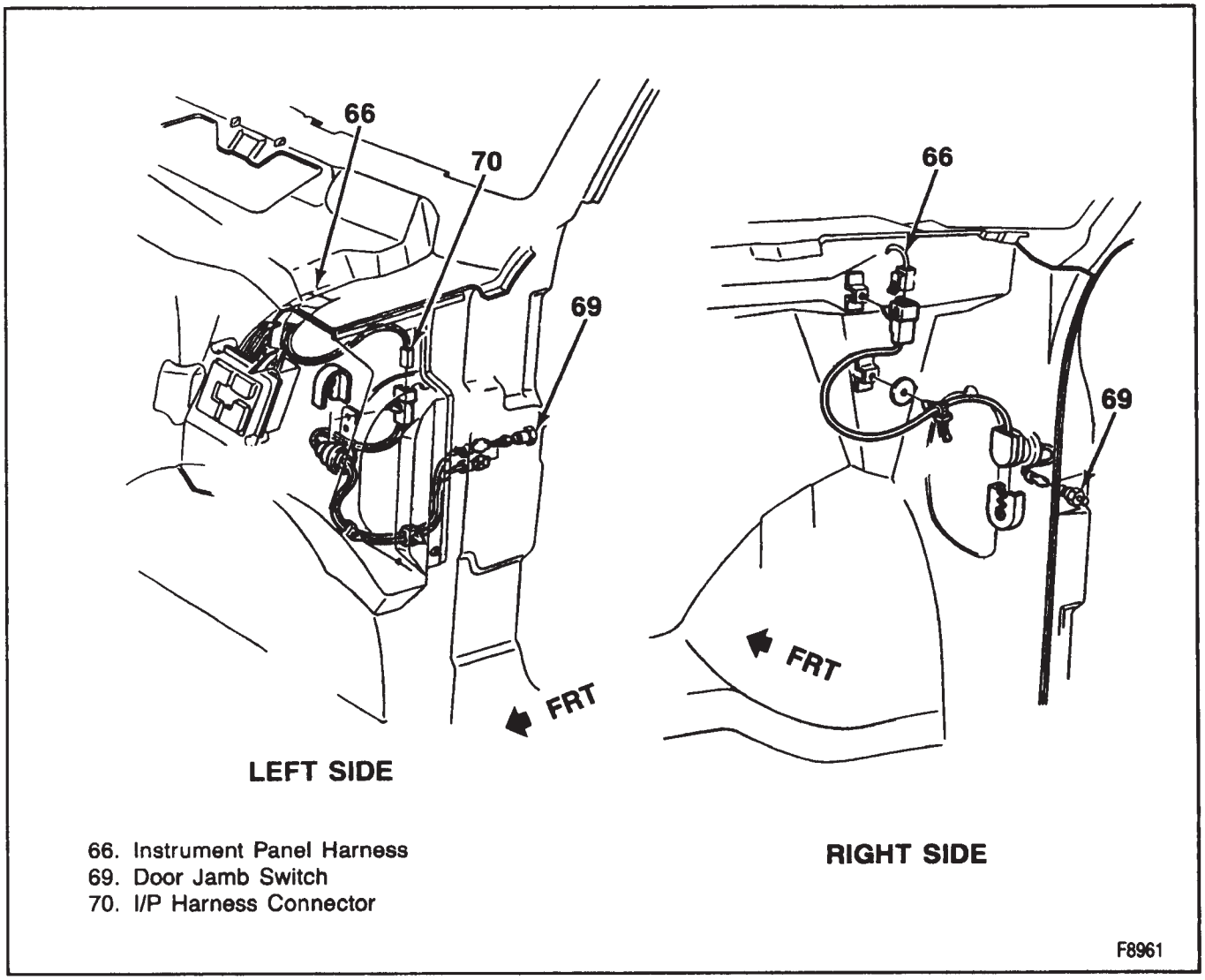


Figure 22—Door Jamb Switch Wiring (4-Door Utility Vehicle)

FOUR-WHEEL DRIVE INDICATOR LAMPS

MANUAL SHIFT

The lamp circuit begins at the IGN/GAUGES fuse and INST LPS fuse and is routed through the floor-mounted selector quadrant switch and grounded at the bus bar. Whenever the vehicle is shifted into four-wheel drive, the front axle switch closes, and the front and rear axle indicator lamp lights. This circuit sends a signal to the RWAL brake module to turn off the RWAL system during four-wheel drive operation.

ELECTRIC SHIFT

The selector switch is located on the instrument panel to the left of the steering column. When the engine is running, and the switch is turned to "4 HI", the front axle switch will close, and the "4 HI" part of the switch will light up in green.

The "4 LO" part of the switch is also wired through the neutral switch (automatic transmission) or the clutch start interlock (manual transmission). If the engine is running and the switch is placed in the "4 LO" position with the transmission in neutral or park, the front axle switch will close and the "4 LO" part of the switch will light up in amber.

In either switch position, the switch light may flicker briefly until the front axle switch closes completely.

For additional information and circuit drawings, refer to the Electrical Diagrams and Diagnosis Manual.

INTERIOR LAMPS

Besides the dome lamp(s), the vehicle may also have courtesy lamps under the instrument panel which turn on with the dome lamp(s), lighted vanity mirrors, a map lamp behind the rear view mirror, an ash tray lamp, and an instrument panel storage compartment lamp (figures 23 through 26).

The courtesy lamps are spliced into the wiring for the instrument panel dimmer switch. The ash tray lamp is wired through the instrument panel lamps 5-amp fuse and grounds to the bus bar. The storage compartment lamp wiring starts at the fuse block, grounds to the bus bar, and is controlled by the storage compartment switch which closes when the compartment is opened. The wiring for the lighted vanity mirrors starts at the

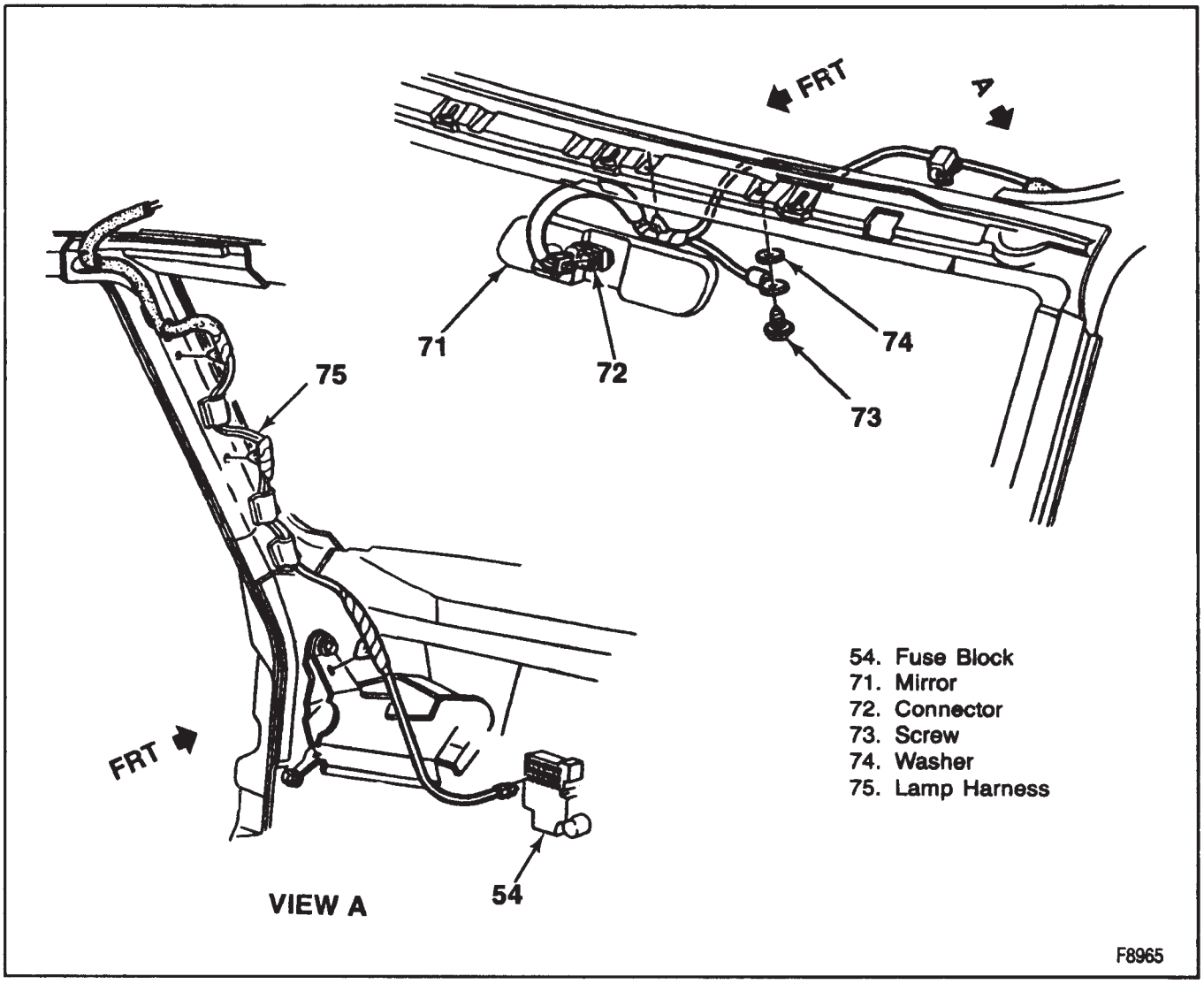


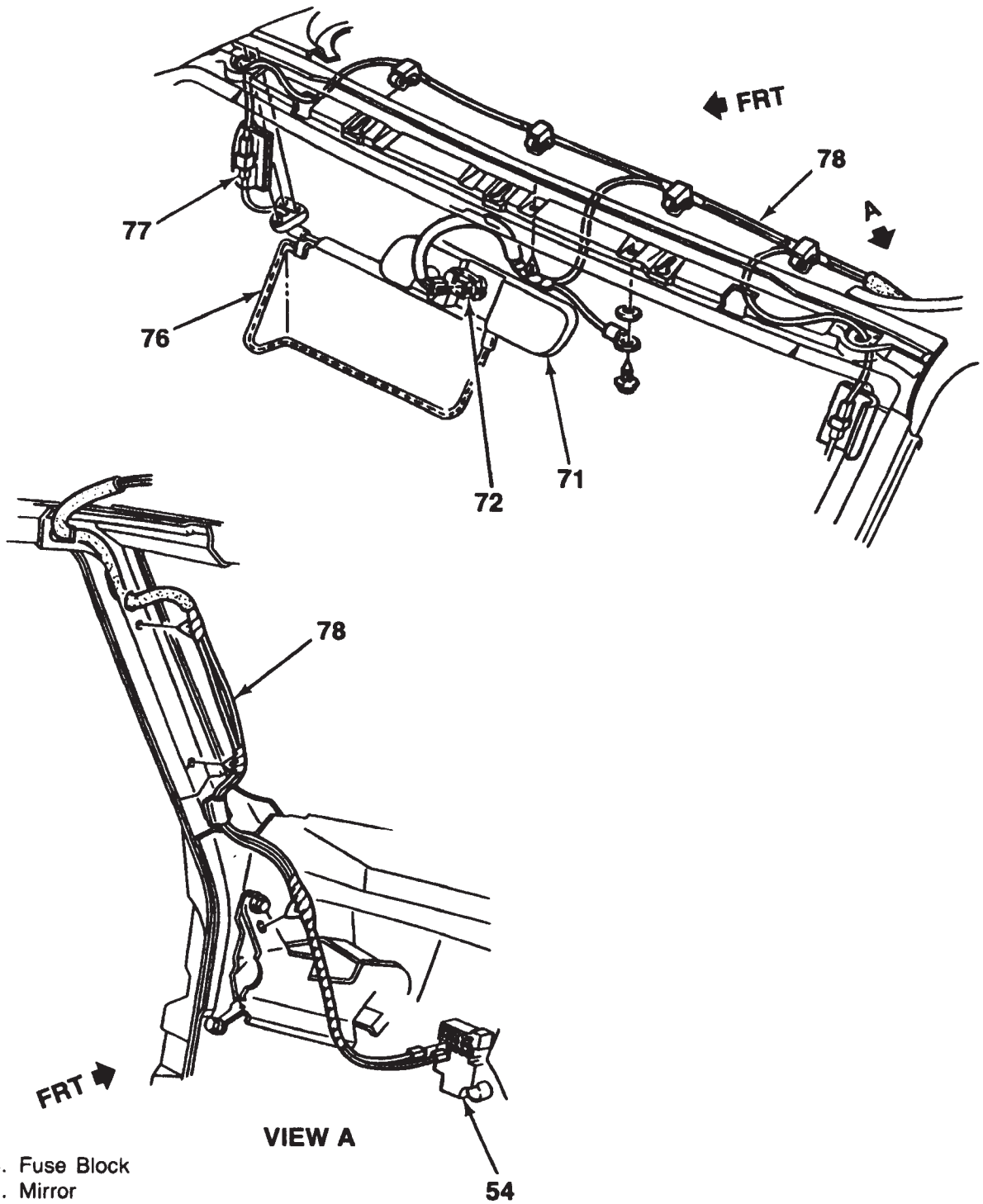
Figure 23—Rear View Mirror Map Lamp Wiring

fuse block. The lamps are controlled by switches at the lamps. The map lamp behind the rear view mirror is wired through the 20 amp ignition fuse and is controlled by a switch at the lamp.

For wiring views and diagnosis of these systems, refer to the Electrical Diagrams and Diagnosis Manual.

UNDERHOOD LAMP

There is an underhood lamp which is wired from the junction block and mounted to the hood.



54. Fuse Block
71. Mirror
72. Connector
76. Sunshade
77. Connector
78. Lamp Harness

F8982

Figure 24—Sunshade Illuminated Mirrors and Rear View Mirror Map Lamp

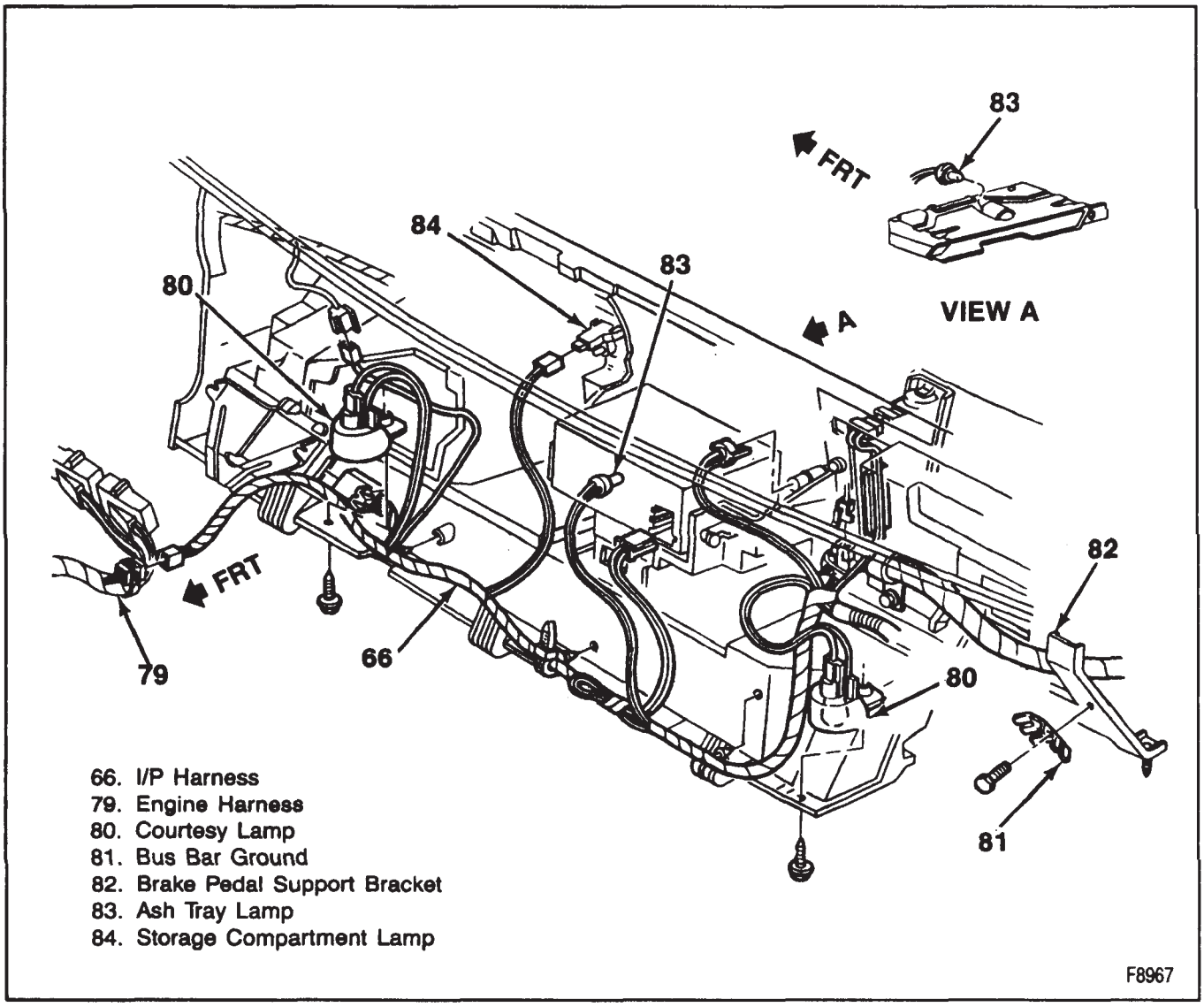
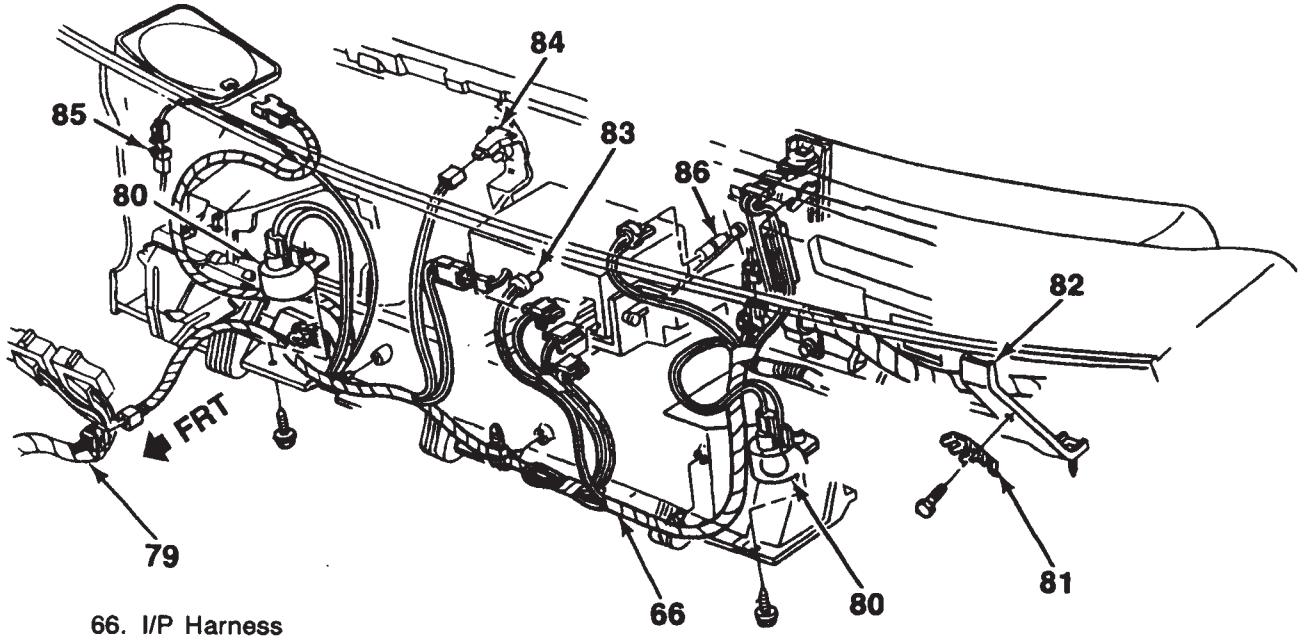


Figure 25—Instrument Panel Wiring (Pickup)



66. I/P Harness
79. Engine Harness
80. Courtesy Lamp
81. Bus Bar Ground
82. Brake Pedal Support Bracket
83. Ash Tray Lamp
84. Storage Compartment Lamp
85. Door Jamb Switch Wiring
86. Cigarette Lighter

F8968

Figure 26—Instrument Panel Wiring (Utility Vehicles)

DIAGNOSIS OF LIGHTING SYSTEMS

DAYTIME RUNNING LIGHTS (CANADA ONLY)

The DRL system operates by disconnecting one of the headlamp system grounds, turning a parallel circuit into a series circuit. If the DRL do not come on when they should, turn on the high beam headlamps. If one of them is burned out, the the DRL system will not operate.

Another cause of the DRL not operating is low battery voltage. If the battery voltage is about 9 volts, the vehicle may start, but the DRL will not turn on. With the engine running, apply the parking brake and then release it, or turn on the headlamp switch and then turn it off. If this causes the DRL to turn on, check the battery voltage. Refer to BATTERY (SECTION 6D1).

For other checks, consult the following diagnostic charts.

For additional description of the lighting systems, refer to the Electrical Diagrams and Diagnosis Manual for S/T trucks.

DIAGNOSIS OF THE HEADLAMP SYSTEM WITHOUT DAYTIME RUNNING LIGHTS

HEADLAMPS DO NOT ILLUMINATE HIGH OR LOW BEAMS - BOTH SIDES

TEST	RESULT	ACTION
1. With the headlamp switch ON, connect a test lamp from the YEL wire at the headlamp switch connector to ground.	Test lamp lights.	Go to step 2.
	Test lamp does not light.	Go to step 4.
2. Connect the test lamp from the YEL wire at the dimmer switch connector to ground.	Test lamp lights.	Go to Step 3.
	Test lamp does not light.	Repair the open in the YEL wire from the headlamp switch to the dimmer switch.
3. Connect the test lamp from the LT GRN wire (HI) or TAN wire (LO) at the dimmer switch connector to ground	Test lamp lights.	Repair the open in the LT GRN wire (HI) or TAN wire (LO) from the dimmer switch to the headlamp.
	Test lamp does not light.	Replace the dimmer switch.
4. Connect the test lamp from the RED wire at the headlamp switch connector to ground.	Test lamp lights.	Replace the headlamp switch.
	Test lamp does not light.	Repair the open in the RED wire between the headlamp switch and generator.

LOW BEAM LAMP(S) DO NO OPERATE

TEST	RESULT	ACTION
1. Turn the headlamp switch ON and the dimmer switch to the low beam position. Connect a test lamp from the TAN wire at the inoperative lamp(s) to ground.	Test lamp does not light.	Go to step 3.
	Test lamp lights.	Go to step 2.
2. Connect the test lamp from the TAN to BLK wire(s) at the headlamp connectors to ground.	Test lamp does not light.	Locate and repair the open in the BLK wire(s) from the headlamp connector(s) to the ground terminal(s).
	Test lamp lights.	Replace the headlamp(s).
3. Connect a test lamp from the TAN wire at the dimmer switch connector to ground.	Test lamp does not light.	Replace the dimmer switch.
	Test lamp lights.	Locate and repair the open in the TAN wire from the dimmer switch to the headlamp.

HIGH BEAM LAMP(S) DO NOT OPERATE

TEST	RESULT	ACTION
1. Turn the headlamp switch to ON and the dimmer switch to the high beam position. Connect a test lamp from the LT GRN wire at the inoperative lamps(s) to ground.	Test lamp does not light.	Go to step 3.
	Test lamp lights.	Go to step 2.
2. Connect the test lamp from the LT GRN wire to the BLK wire(s) at the headlamp connectors.	Test lamp does not light.	Locate and repair the open in BLK wire(s) at the headlamp connector(s) to the ground connection(s).
	Test lamp lights.	Replace the headlamp(s).
3. Connect a test lamp from the LT GRN wire at the dimmer switch connector to ground.	Test lamp does not light.	Replace the dimmer switch.
	Test lamp lights.	Locate and repair the open in LT GRN wire from the headlamps to the dimmer switch.

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DIAGNOSIS OF THE HEADLAMPS WITH DAYTIME RUNNING LIGHTS (CANADIAN ONLY)

HIGH BEAM LAMPS DO NOT OPERATE DURING DAYTIME

TEST	RESULT	ACTION
1. Check the operation of the high beams with the headlamp switch ON.	High beams light.	Go to step 2.
	High beams do not light.	Locate and repair the open in the headlamp wiring as described in the diagnosis chart in this section for vehicles without Daytime Running Lights.
	Left high beam does not light.	Go to step 10.
	Right high beam does not light.	Check the right high beam continuity. Replace the right headlamp if necessary. If bulb continuity is okay, locate and repair the open in the wiring as described in the diagnosis chart in this section.
2. With the ignition switch ON check the condition of the IGN/GAUGES fuse.	Fuse is not blown.	Go to step 3.
	Fuse is blown.	Locate and repair the source of the overload. Then, replace the fuse.
3. Check for 12 volts at pin C on DRL module connector.	12 volts present.	Go to step 4.
	12 volts not present.	Locate and repair the open in the PNK/BLK wire between the DRL module and the IGN/GAUGES fuse.
4. Check the condition of the DRL fuse.	Fuse is not blown.	Go to step 5.
	Fuse is blown.	Locate and repair the source of the overload. Then, replace the fuse.
5. Make certain that the parking brake is released. With the headlamp switch OFF and the ignition switch in the RUN position, connect the test lamp from the ORN wire at the DRL relay connector to ground.	Test lamp lights.	Go to step 6.
	Test lamp does not light.	Repair the open in the ORN wire from the DRL relay to the DRL fuse.
6. Connect the test lamp from the PNK/BLK wire at the DRL relay connector to ground.	Test lamp lights.	Go to step 7.
	Test lamp does not light.	Repair the open in the PNK/BLK wire from the DRL relay to the IGN/GAUGES fuse.
7. Using jumper wire, apply ground to the LT GRN/BLK wire at the DRL relay connector.	High beams light.	Go to step 8.
	High beams do not light.	Replace the DRL relay.
8. Using a voltmeter, check for voltage (greater than 11 volts) on the TAN/WHT wire at the DRL module connector (Pin A).	Voltage sensed.	Go to step 9.
	Voltage not sensed.	Locate and repair the open in the TAN/WHT wire between the DRL module and the parking brake switch or in the parking braking switch.
9. Using jumper wire, apply ground to the LT GRN/BLK wire at the DRL module.	High beams light.	Replace the DRL module.
	High beams do not light.	Locate and repair the open in the LT GRN/BLK wire between the DRL module and the DRL relay.
TEST	**RESULT**	**ACTION**
10. Check the left high beam continuity.	Left high beam continuity okay.	Go to step 11.
	Left high beam filament open.	Replace the left headlamp.

DIAGNOSIS OF THE HEADLAMPS WITH DAYTIME RUNNING LIGHTS (CANADIAN ONLY)

TEST	RESULT	ACTION
11. Make certain that the parking brake is released. Move the headlamp switch to OFF and ignition switch to the RUN position. Using jumper wire, connect ground to the DK BLU/WHT wire at the DRL relay connector.	High beams light.	Locate and repair the open in the DK BLU/WHT wire between the DRL relay and the left headlamp.
	High beams do not light.	Go to step 12.
12. Using jumper wire, apply ground to the BLK wire at the DRL relay connector.	High beams light.	Locate and repair the open in the BLK wire.
	High beams do not light.	Replace the DRL relay.

DAYTIME RUNNING LIGHTS STAY ON WITH IGNITION SWITCH IN RUN AND PARKING BRAKE SET

TEST	RESULT	ACTION
1. Check if the I/P BRAKE indicator lamp is ON.	Lamp is ON.	Go to step 2.
	Lamp is OFF.	Check the parking brake switch and replace it if necessary.
2. Using jumper wire, apply ground to pin A of the DRL module connector.	High beams go OFF.	Locate and repair the open in the TAN/WHT wire between the DRL module and parking brake switch.
	High beams stay ON.	Replace the DRL module.

HIGH BEAM INDICATOR DOES NOT ILLUMINATE WITH HIGH BEAMS ON (WITH DAYTIME RUNNING LIGHTS)

TEST	RESULT	ACTION
1. With the high beams ON, check the high beam indicator bulb filament continuity.	Filament okay.	Go to step 2.
	Filament open.	Replace the bulb.
2. With the ignition switch in RUN and the headlamp switch ON with the high beams ON, check the voltage at pin F of the DRL module connector.	Near battery voltage measured.	Locate and repair the open in the WHT wire between the DRL module and the I/P.
	Less than 10 volts measured.	Replace the DRL module.

DRL INDICATOR LAMP IS NOT ON WITH DAYTIME RUNNING LIGHTS ON

TEST	RESULT	ACTION
1. Check the DRL indicator bulb continuity.	Bulb continuity is okay.	Locate and repair the open in the LT GRN/BLK wire between the I/P and the DRL module.
	Bulb filament is open.	Replace the bulb.

DRL INDICATOR LAMP STAYS ON WITH ONE OR BOTH HIGH BEAM FILAMENTS OPEN IN DAYTIME RUNNING MODE

TEST	RESULT	ACTION
1. Disconnect the left headlamp connector and place the ignition switch in RUN and the headlamp switch in OFF.	DRL indicator lamp is ON.	Go to step 2.
	DRL indicator lamp is OFF.	DRL system is operating correctly.
2. Check the voltage at pin E of the DRL module connector.	Voltage less than two volts.	Replace the DRL module.
	Voltage greater than two volts.	Locate and repair the short to battery voltage in the LT GRN wire.

DIAGNOSIS OF THE HEADLAMPS WITH DAYTIME RUNNING LIGHTS (CANADIAN ONLY)

HIGH BEAMS STAY ON WITH IGNITION SWITCH IN RUN, HEADLAMP SWITCH ON, AND LOW BEAMS ON WITH DRL

TEST	RESULT	ACTION
1. With the ignition switch in RUN and the headlamp switch ON in the low beam position, check the voltage at pin F on the DRL module connector.	Near battery voltage measured.	Replace the DRL module.
	Less than 10 volts measured.	Repair the YEL wire between the DRL module and the headlamp switch.

T2718

DIAGNOSIS OF THE FOG LAMPS (WITHOUT DRL)

NOTE: If the fog lamps do not turn off with the dimmer switch in the HI position, replace the fog lamp relay.

FOG LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from the BRN wire at the fog lamp switch connector to ground with the headlamp switch on.	Test lamp lights.	Go to step 2.
	Test lamp does not light.	Locate and repair the open in the BRN wire between the fog lamp switch and the headlamp switch.
2. Connect a test lamp from the PPL wire at the fog lamp switch connector to ground with the fog lamp switch on.	Test lamp lights.	Go to Step 3.
	Test lamp does not light.	Replace the fog lamp switch.
3. Connect a test lamp from the PPL wire at the fog lamp relay connector and ground.	Test lamp lights.	Go to step 4.
	Test lamp does not light.	Locate and repair the open in the PPL wire between the fog lamp switch and the fog lamp relay.
4. Connect a self-powered test lamp from the LT GRN wire at the fog lamp relay connector to ground.	Test lamp lights.	Go to step 5.
	Test lamp does not light.	Locate and repair the open in LT GRN wire between the fog lamp relay and the left headlamp.
5. Connect a test lamp from the ORN wire at the fog lamp relay connector and ground.	Test lamp lights.	Go to step 6.
	Test lamp does not light.	Locate and repair the open in the ORN wire between the fog lamp relay and fuse block.
6. Connect a test lamp from the PPL/WHT wire at the fog lamp relay connector and ground.	Test lamp lights.	Go to step 7.
	Test lamp does not light.	Replace the fog lamp relay.
7. Connect a test lamp from the PPL/WHT wires at the fog lamp connectors to ground.	Test lamp lights.	Locate and repair the open in the BLK wires and ground.
	Test lamp does not light.	Locate and repair the open in the PPL/WHT wires between the fog lamp relay and the fog lamps.

T2719

DIAGNOSIS OF THE FOG LAMPS (WITH DRL)

FOG LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from the BRN wire at the fog lamp switch connector to ground with the headlamp switch on.	Test lamp lights.	Go to step 2.
	Test lamp does not light.	Locate and repair the open in the BRN wire between the fog lamp switch and the headlamp switch.
2. Connect a test lamp from the PPL wire at the fog lamp switch connector to ground with the fog lamp switch on.	Test lamp lights.	Go to Step 3.
	Test lamp does not light.	Replace the fog lamp switch.
3. Connect a test lamp from the PPL wire at the fog lamp relay connector to ground.	Test lamp lights.	Go to step 4.
	Test lamp does not light.	Locate and repair the open in the PPL wire between the fog lamp switch and the fog lamp relay.
4. Connect a self-powered test lamp from the DK GRN wire at the fog lamp relay connector to ground.	Test lamp lights.	Go to step 7.
	Test lamp does not light.	Go to step 5.
5. Connect an ohmmeter from the DK GRN wire at the DRL module connector to ground.	Continuity.	Locate and repair the open in the DK GRN wire between the DRL module and the fog lamp relay.
	No continuity.	Go to step 6.
6. Connect an ohmmeter from the LT GRN wire at the DRL module connector to ground.	Continuity.	Replace the DRL module.
	No continuity.	Locate and repair the open in the LT GRN wire between the DRL module and the left headlamp.
7. Connect a test lamp from the ORN wire at the fog lamp relay connector and ground.	Test lamp lights.	Go to step 8.
	Test lamp does not light.	Locate and repair the open in the ORN wire between the fog lamp relay and the fuse block.
8. Connect a test lamp from the PPL/WHT wire at the fog lamp relay connector and ground.	Test lamp lights.	Go to step 9.
	Test lamp does not light.	Replace the fog lamp relay.
9. Connect a test lamp from the PPL/WHT wires at the fog lamp connectors to ground.	Test lamp lights.	Locate and repair the open in the BLK wires and ground.
	Test lamp does not light.	Locate and repair the open in the PPL/WHT wires between the fog lamp relay and the fog lamps.

T2720

DIAGNOSIS OF FRONT AND SIDE MARKER LAMPS

FRONT AND SIDE MARKER LAMPS DO NOT OPERATE

If one side of the front marker lamps are operating, check the condition of the bulb(s) that are not operating. If the bulb(s) are good, locate and repair the open in the BRN wire and BLK wire(s).

If none of the marker lamps operate, use the following diagnostic procedures.

TEST	RESULT	ACTION
1. Turn the headlamp switch to the PARK position. Connect a test lamp from the ORN wire at the headlamp switch connector to ground.	Test lamp lights.	Go to step 2.
	Test lamp does not light.	Check the condition of the fuse (T/L CTSY). If the fuse is good, locate and repair the open in the ORN wire.
2. Connect a test lamp from the BRN wire at the headlamp switch connector to ground.	Test lamp lights.	Go to Step 3.
	Test lamp does not light.	Replace the headlamp switch.
3. Connect a test lamp at the BRN wire at the left park lamp connector to ground.	Test lamp lights.	Check the conditions of the bulb sockets and BLK wires from park lamps to ground terminals.
	Test lamp does not light.	Locate and repair the open in the BRN wire from the park lamps to the headlamp switch.

T2721

DIAGNOSIS OF DIRECTIONAL SIGNALS

DIRECTIONAL SIGNALS DO NOT OPERATE ON ONE SIDE

TEST	RESULT	ACTION
1. Turn the hazard warning system ON. Observe the lights on the side of the directional signals that do not work.	Test lamp lights.	Check for improper bulb. Replace if necessary.
	Test lamp does not light.	Go to step 2.
2. Turn the hazard warning system off. Turn the ignition switch to RUN and the turn signal to the side that does not work. Connect a test lamp from the LT BLU wire (LH) or DK BLU wire (RH) at the directional signal switch connector to ground.	Test lamp lights.	Go to Step 3.
	Test lamp does not light.	Replace the directional signal switch.
3. Connect the test lamp from the LT BLU wire (LH or DK BLU wire (RH) at the park lamp connector to ground.	Test lamp lights.	Go to step 4.
	Test lamp does not light.	Locate and repair the open in either the LT BLU or DK BLU wires.
4. Connect the test lamp from the LT BLU or DK BLU wire to the BLK wire at the park lamp connector.	Test lamp lights.	Check the condition of the bulb sockets.
	Test lamp does not light.	Locate and repair the open in either the BLK wires(s).

DIRECTIONAL SIGNALS DO NOT OPERATE (WITHOUT DIGITAL CLUSTER)

TEST	RESULT	ACTION
1. Check the condition of the TURN/BU fuse.	Fuse is not blown.	Go to step 2.
	Fuse is blown.	Locate and repair the source of the overload. Then, replace the fuse.
2. Turn the ignition switch to RUN. Turn the directional signal switch to ON and connect a test lamp from the PPL wire at the directional signal flasher to ground.	Test lamp lights.	Go to step 4.
	Test lamp does not light.	Go to step 3.

DIAGNOSIS OF DIRECTIONAL SIGNALS

TEST	RESULT	ACTION
3. Connect the test lamp from the DK BLU wire at the directional signal flasher to ground.	Test lamp lights.	Replace the directional signal flasher.
	Test lamp does not light.	Repair the open in the DK BLU wire between the TURN/BU fuse and the directional signal flasher.
4. Connect a test lamp from the PPL wire connector and ground.	Test lamp lights.	Replace the directional signal switch.
	Test lamp does not light.	Repair the open in the PPL wire between the connector and the directional signal flasher.

DIRECTIONAL SIGNALS DO NOT OPERATE (WITH DIGITAL CLUSTER)

TEST	RESULT	ACTION
1. Check the condition of the TURN/BU fuse.	Fuse is not blown.	Go to step 2.
	Fuse is blown.	Locate and repair the source of the overload. Then, replace the fuse.
2. Turn the ignition switch to RUN. Turn the directional signal flasher to ON and connect a test lamp from the PPL wire at the directional signal flasher to ground.	Test lamp lights.	Go to step 5.
	Test lamp does not light.	Go to step 3.
3. Connect the test lamp from the DK BLU wire at the directional signal flasher to ground.	Test lamp lights.	Go to step 4.
	Test lamp does not light.	Repair the open in the DK BLU wire between the TURN/BU fuse and the directional signal flasher.
4. Connect an ohmmeter from the BLK wire at the directional signal flasher and ground.	Continuity.	Replace the directional signal flasher.
	No continuity.	Repair the open in the BLK wire.
5. Connect a test lamp from the PPL wire at the connector and ground.	Test lamp lights.	Replace the directional signal switch.
	Test lamp does not light.	Repair the open in the PPL wire between the connector and the directional signal flasher.

T2722

DIAGNOSIS OF HAZARD WARNING LAMPS

HAZARD WARNING LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Check the condition of the STOP/HAZ fuse.	Fuse is not blown.	Go to step 2.
	Fuse is blown.	Locate and repair the source of the overload. Then, replace the fuse.
2. Turn the hazard warning switch ON. Connect a test lamp from the BRN wire at the hazard flasher to ground.	Test lamp lights.	Go to step 4.
	Test lamp does not light.	Go to step 3.
3. Connect a test lamp from the ORN wire at hazard flasher to ground.	Test lamp lights.	Replace the hazard flasher.
	Test lamp does not light.	Repair the open in the ORN wire between the hazard flasher and fuse block.
4. Connect a test lamp from the BRN wire connector to ground.	Test lamp lights.	Replace the directional signal switch.
	Test lamp does not light.	Repair the open in the BRN wire between the hazard flasher and the connector.

T2723

DIAGNOSIS OF REAR LAMP SYSTEMS

The rear lamp systems (taillamps, clearance lamps, and license plate lamps) all receive voltage from the same wire circuit (BRN 9) and share the same ground terminals inside the vehicle at the left and right rear in front of the taillamp assemblies (utility vehicle) or at the rear of the left frame rail (pickups). If only one system is not working, locate and repair an open in the wiring and/or bulbs that pertain to that system.

NONE OF THE REAR LAMP SYSTEMS OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from the ORN wire at the headlamp switch connector to ground.	Test lamp lights.	Go to step 2.
	Test lamp does not light.	Check the condition of the T/L CTSY fuse. If the fuse is good, locate and repair the open in the ORN wire from the headlamp switch to the fuse block.
2. Place the headlamp switch in the PARK position. Connect the test lamp from the BRN wire at the headlamp switch connector to ground.	Test lamp lights.	Go to Step 3.
	Test lamp does not light.	Replace the headlamp switch.
3. Connect a test lamp from the BRN wire at the rear lamp connector to ground.	Test lamp lights.	Locate and repair the open in the BLK wire from the rear lamp to the ground terminal.
	Test lamp does not light.	Locate and repair the open in the BRN wire from the rear lamps to the headlamp switch.

BACKUP LAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Turn the ignition switch to RUN Place the transmission in reverse. Connect the test lamp from the LT GRN wire at the backup lamp connector or to ground.	Test lamp lights.	Go to step 2.
	Test lamp does not light.	Go to step 3.
2. Connect the test lamp from the LT GRN wire to the BLK wire at the backup lamp connector.	Test lamp lights.	Replace the bulb.
	Test lamp does not light.	Locate and repair the open in the BLK wire from the backup lamp to the ground terminal.
3. Connect the test lamp from the DK BLU wire (auto trans) or DK BLU wire (manual trans) at the backup lamp switch connector to ground.	Test lamp lights.	Go to step 4.
	Test lamp does not light.	Check the condition of the TURN/BU fuse. If the fuse is good, locate and repair the open in the DK BLU wire from the backup lamp switch to the fuse block.
4. Connect the test lamp from the LT GRN wire (manual trans) or LT GRN wire (auto trans) at the backup lamp switch connector to ground.	Test lamp lights.	Locate and repair the open in the LT GRN wire from the backup lamp switch to the backup lamps.
	Test lamp does not light.	Adjust the backup lamp switch. If backup lamp switch will not adjust properly, replace it.

STOPLAMPS DO NOT OPERATE

TEST	RESULT	ACTION
1. Connect a test lamp from the ORN wire at the stoplamp switch connector to ground.	Test lamp lights.	Go to step 2.
	Test lamp does not light.	Check the condition of the STOP/HAZ fuse. If the fuse is OK, locate and repair the open in the ORN wire from the stoplamp switch to the fuse block.

DIAGNOSIS OF REAR LAMP SYSTEMS

The rear lamp systems (taillamps, clearance lamps, and license plate lamps) all receive voltage from the same wire circuit (BRN 9) and share the same ground terminals inside the vehicle at the left and right rear in front of the taillamp assemblies (utility vehicle) or at the rear of the left frame rail (pickups). If only one system is not working, locate and repair an open in the wiring and/or bulbs that pertain to that system.

TEST	RESULT	ACTION
2. Connect the test lamp from the WHT wire at the stoplamp switch connector to ground. Depress the brake pedal.	Test lamp lights.	Go to step 3.
	Test lamp does not light.	Replace the stoplamp switch.
3. Connect the test lamp from the WHT wire at the directional signal switch connector to ground. Depress the brake pedal.	Test lamp lights.	Go to step 4.
	Test lamp does not light.	Locate and repair the open in the WHT wire between the stoplamp switch and the directional signal switch.
4. Connect the test lamp from the YEL or DK GRN wire at the directional signal switch connector to ground. Depress the brake pedal.	Test lamp lights.	Locate and repair the open in the YEL or DK GRN wire between the directional signal switch and the rear directional lamps.
	Test lamp does not light.	Replace the directional signal switch.

T2724

ON-VEHICLE SERVICE OF EXTERIOR LIGHTING

FOG LAMP ADJUSTMENT

The fog lamps are bracket mounted to the air dam and bumper.

When checking the aiming the fog lamps, park the vehicle on a level surface. Place a screen 760 mm (2.5 ft.) in front of the vehicle. Turn on the fog lamps and make sure the intensity of the beam is below the centerline of the lamps (figure 27).

The fog lamps can be adjusted up and down by turning the adjusting screw below the lens on the lamp assembly. The lamps cannot be adjusted horizontally.

FOG LAMP REPLACEMENT

FOG LAMP CAPSULE REPLACEMENT

The fog lamp capsule consists of the lamp housing, lens, and a halogen bulb. If the lens is broken, the capsule must be replaced. If the bulb is burned out, it can be replaced separately.

Remove or Disconnect (Figure 28)

1. Fog lamp electrical connector.
2. Bolts (153) holding the fog lamp to the air deflector (149) and bumper (152).
3. Fog lamp from the vehicle.

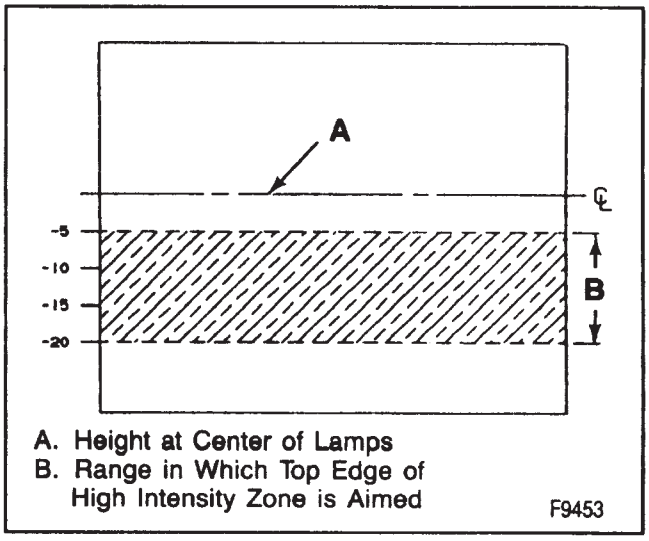
Install or Connect (Figure 28)

1. Fog lamp (14) to the vehicle.
   - Fit the fog lamp into the air deflector (149).
2. Bolts holding the fog lamp to the air deflector (149) and the bumper.
3. Fog lamp electrical connector.

FOG LAMP BULB REPLACEMENT

Remove or Disconnect

1. Negative battery cable or fog lamp electrical connector behind the air dam.
2. Two screws and lens trim panels from the front of the lamp assembly.
   - Pull the lamp and lens assembly forward from the case and turn it over.
3. White wire connector inside the braided insulator.
   - Leave the ground wire connected.
   - Note the position of the wire clip at the lamp and lens assembly, then squeeze the edges of the clip together and remove it.



A. Height at Center of Lamps
B. Range in Which Top Edge of High Intensity Zone is Aimed

F9453

Figure 27—Fog Lamp Aiming Zone

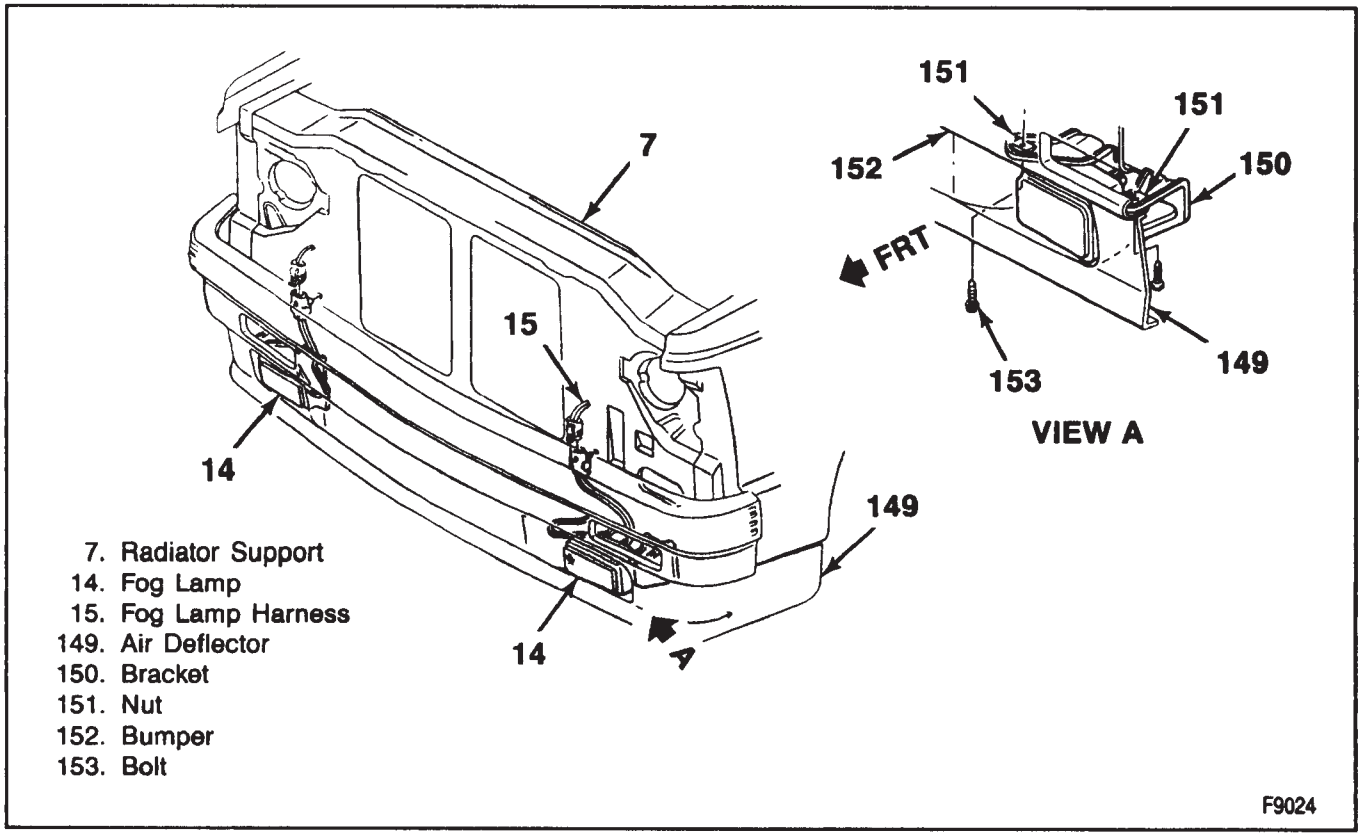


Figure 28—Fog Lamps

CAUTION: Halogen bulbs contain a gas under pressure. Handling a bulb improperly could cause it to shatter into flying glass fragments. To help avoid personal injury:

- **Turn off the lamp switch and allow the bulb to cool before changing it. Leave the switch off until change is complete.**
- **Always wear eye protection when changing a halogen bulb.**
- **Handle the bulb only by its base. Avoid touching the glass.**
- **Do not drop or scratch the bulb. Keep moisture away.**
- **Place the used bulb in the new bulb's carton and dispose of it properly.**

4. Lift out the wire and halogen bulb assembly.

Install or Connect

NOTICE: Avoid touching the bulb or letting it come in contact with anything damp. Oil from your skin or moisture on the bulb can cause the bulb to explode when it is turned on. If either comes in contact with the bulb, clean it with alcohol or a suitable degreaser and wipe the bulb dry.

1. White wire connector to the wiring in the braided insulator.
2. Bulb assembly into the back of the lamp and lens assembly.
3. Wire clip to hold the bulb in place.
   - Be sure it is firmly in position and the bulb assembly is not loose.
4. Lens and lamp assembly into the case.
5. Lens trim panels with two screws.
6. Negative battery cable or fog lamp electrical connector.

FRONT PARKING LAMP REPLACEMENT

Remove or Disconnect (Figure 29)

1. Negative battery cable.
2. Bulb socket from the lens assembly (97) from under the vehicle.
   - Turn the socket 1/4 turn to remove it from the assembly.
3. Bulb from the bulb socket.
4. Lens assembly to bumper screws (99).
5. Lens assembly (9).

Install or Connect (Figure 29)

1. Lens assembly (97) to the bumper.
2. Lens assembly to bumper screws (8).
3. New bulb to the socket.
4. Bulb socket to the lamp assembly (9).
   - Turn the socket 1/4 turn to install it in the lamp assembly.
5. Negative battery cable.

HEADLAMP REPLACEMENT

Remove or Disconnect (Figure 29)

1. Negative battery cable.
2. Headlamp retaining ring screws and ring (88).

CAUTION: Halogen bulbs contain a gas under pressure. Handling a bulb improperly could cause it to shatter into flying glass fragments. To help avoid personal injury:

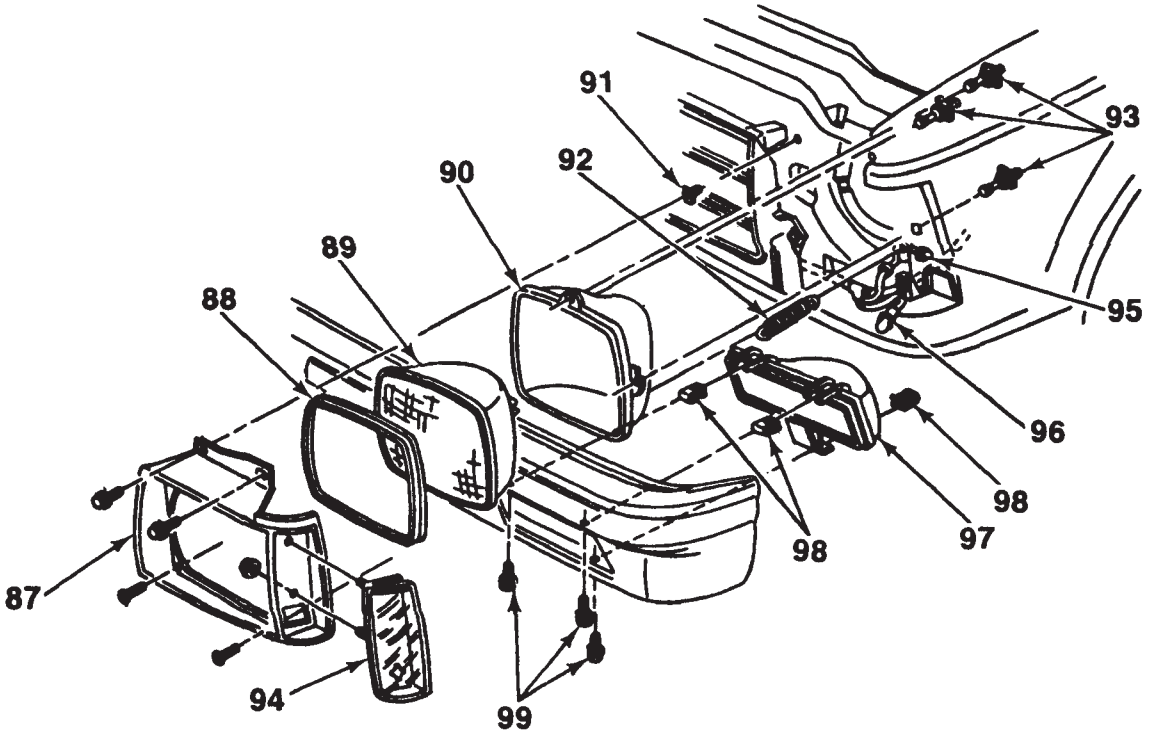
- **Turn off the light switch and allow the bulb to cool before changing bulbs. Leave the switch off until the bulb change is complete.**
- **Always wear eye protection when changing a halogen bulb.**
- **Handle the bulb only by its base. Avoid touching the glass.**
- **Do not drop or scratch the bulb. Keep moisture away.**
- **Place the used bulb in the new bulb's carton and dispose of it properly.**

3. Headlamp (89).
   - Rotate the lamp to the right to remove it from the adjusters.
4. Headlamp wiring harness from the bulb.

Install or Connect (Figure 29)

NOTICE: Avoid touching the bulb or letting it come in contact with anything damp. Oil from your skin or moisture on the bulb can cause the bulb to explode when it is turned on. If either comes in contact with the bulb, clean it with alcohol or a suitable degreaser and wipe the bulb dry.

1. Headlamp wiring harness to the bulb.
2. Headlamp.
3. Retaining ring and screws.
4. Negative battery cable.



87. Grille
88. Headlamp Retaining Ring
89. Headlamp
90. Mounting Ring
91. Nut
92. Spring
93. Headlamp Adjusting Screws
94. Side Marker Lens
95. Side Marker Bulb
96. Parking and Turn Signal Bulb
97. Parking and Turn Signal Lens
98. Nut
99. Screws

F8990

Figure 29—Front Lamp Assemblies

HEADLAMP ADJUSTMENT

Horizontal and vertical aiming of each headlamp is done by two adjusting screws which move the mounting ring against the tension of the coil spring.

Some state and local authorities have specific requirement for aiming headlamps, and these requirements should be followed.

Replacement of a headlamp will normally not require aiming adjustment. However, do check the aim.

Use the safety aimer J 25300-A or equivalent. Instructions for using the safety aimer are supplied by the instrument manufacturer. Refer to figure 30.

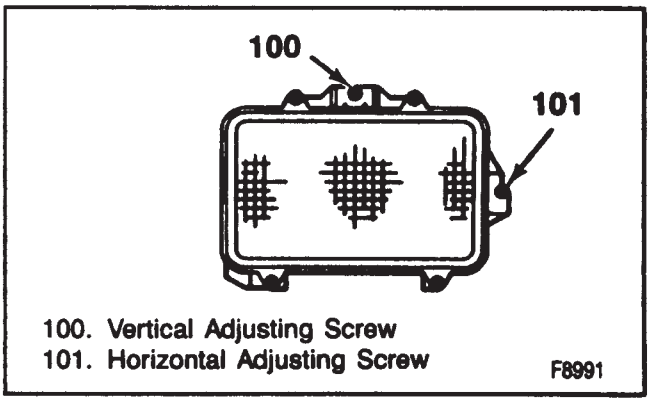


Figure 30—Left Headlamp Adjusting Screws

LICENSE LAMP REPLACEMENT

Because there are two different types of rear bumpers, two different rear license plate lamps are used.

UTILITY VEHICLE REAR BUMPER

Remove or Disconnect (Figure 31)

1. Negative battery cable.
   Bulb Removal:
2. Two screws retaining the lens.
3. Bulb from the socket.
   Lamp Assembly Removal:
4. Two screws (104) and washers retaining the lamp assembly.
5. Wire from the wiring harness.
6. Lamp assembly (106) from under the vehicle.
   - Reach up behind the bumper to remove it.

Install or Connect (Figure 31)

Bulb:

1. Bulb to the socket.
2. Lens to the assembly with two screws.
   Lamp Assembly:
3. Wire to the lamp assembly.
4. Assembly to the vehicle.
   - Reach up from behind the vehicle.
5. Two screws (104) and washers.
6. Negative battery cable.

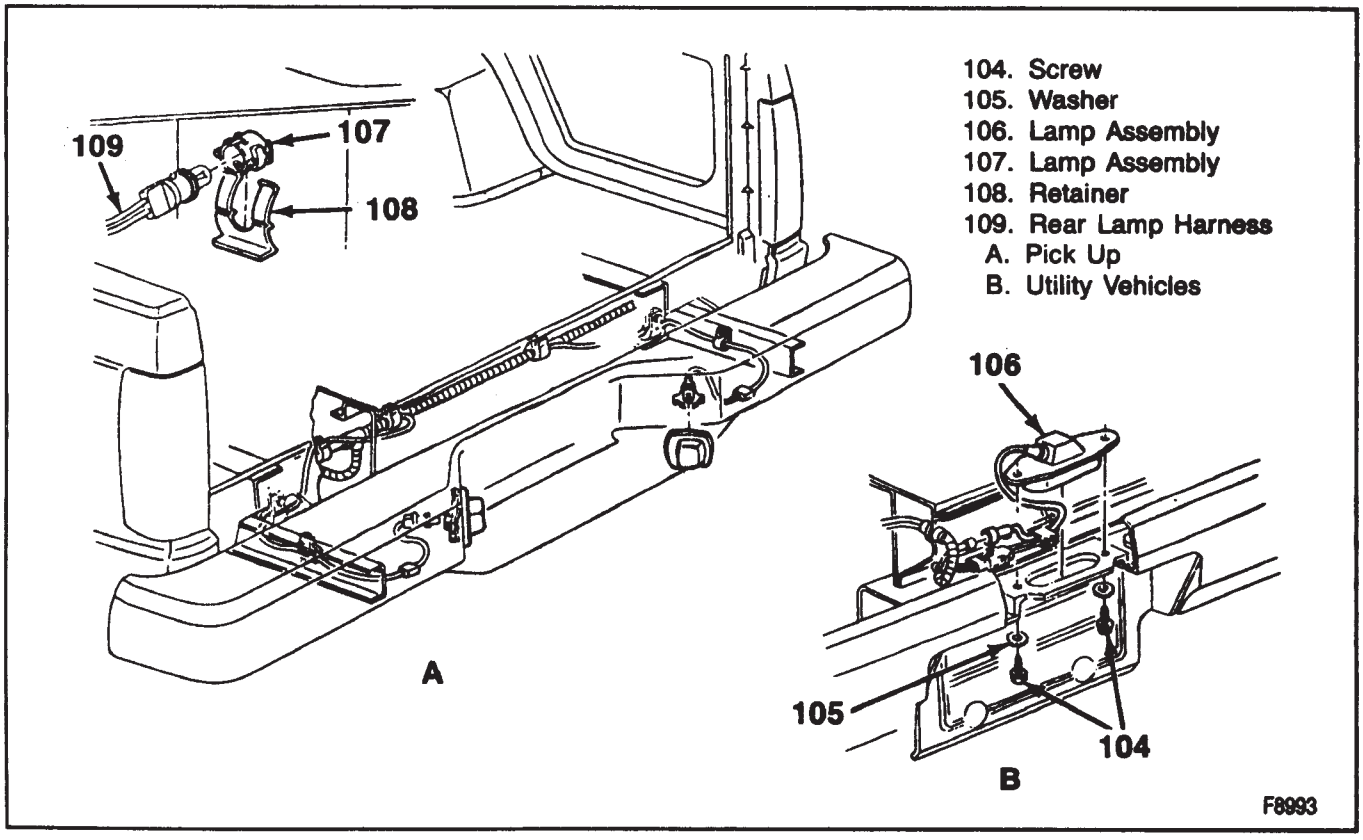


Figure 31—License Lamps

PICKUP REAR BUMPER

Remove or Disconnect (Figure 27)

1. Negative battery cable.
2. Bulb and harness (109) from the lamp assembly (107).
3. Retaining clip (108).
4. Lamp assembly.
5. Bulb from the harness.

Install or Connect (Figure 27)

1. Bulb to the harness.
2. Lamp assembly (107) to the bumper.
3. Retaining clip (108).
4. Bulb and harness into the lamp assembly.
5. Negative battery cable.

REAR LAMP ASSEMBLY REPLACEMENT

The rear lamp assembly contains three bulbs. The top one functions as the tail light, stop light, and directional signal light. The middle one is the side marker light and below that, the backup light.

Remove or Disconnect (Figure 32)

- Lower the tailgate.

1. Negative battery cable.
2. Lamp assembly screws (102).
3. Lamp assembly (103) from the fender.
4. Bulb sockets from the lamp assembly.
   - Turn the sockets 1/4 turn to remove them from the lamp assembly.
5. Bulbs from the bulb sockets.

Install or Connect (Figure 32)

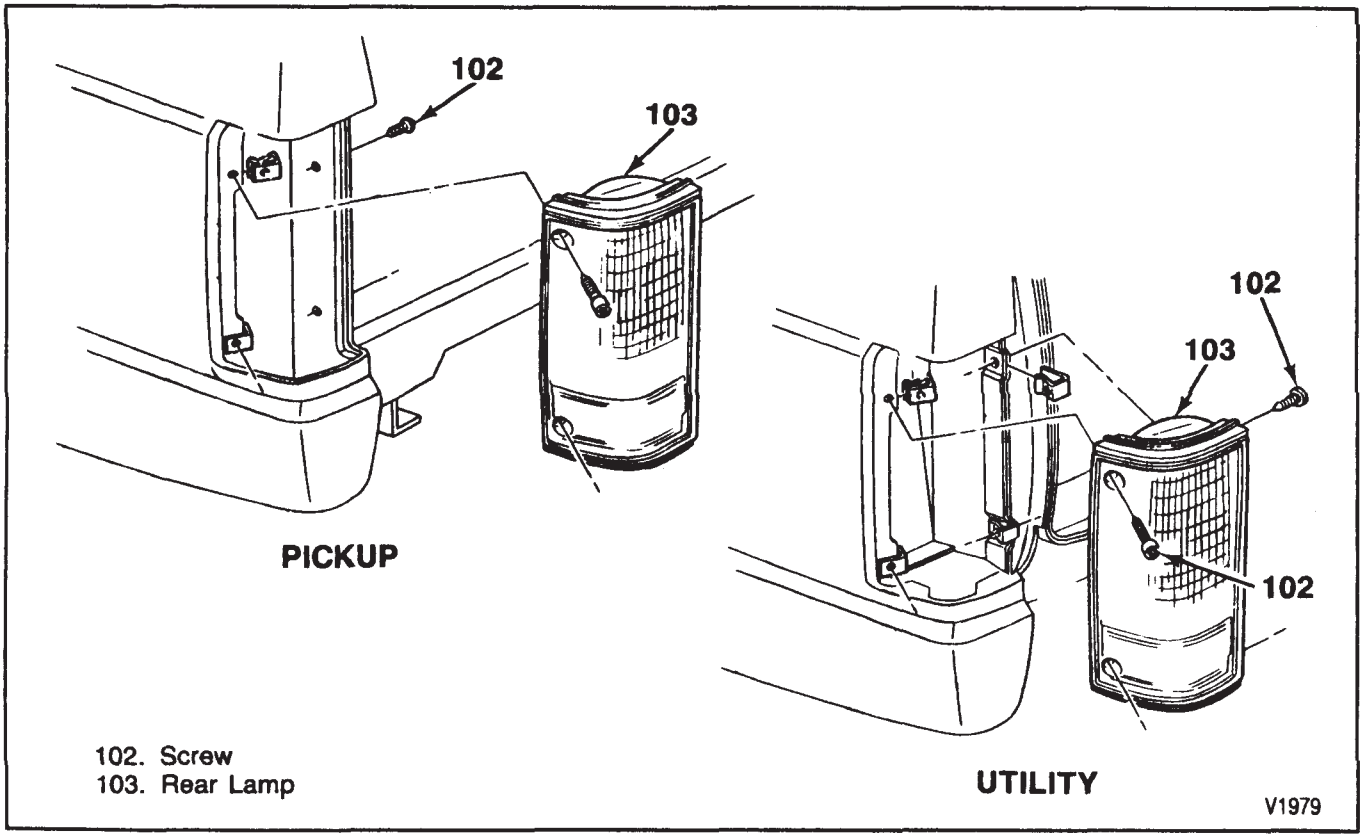
1. Bulbs to the bulb sockets.
2. Bulb sockets to the lamp assembly.
   - Turn the sockets 1/4 turn to install them to the lamp assembly.
3. Lamp assembly (103) to the fender.
4. Lamp assembly screws (102).
5. Negative battery cable.

SIDE MARKER LENS AND BULB REPLACEMENT

Lens Replacement:

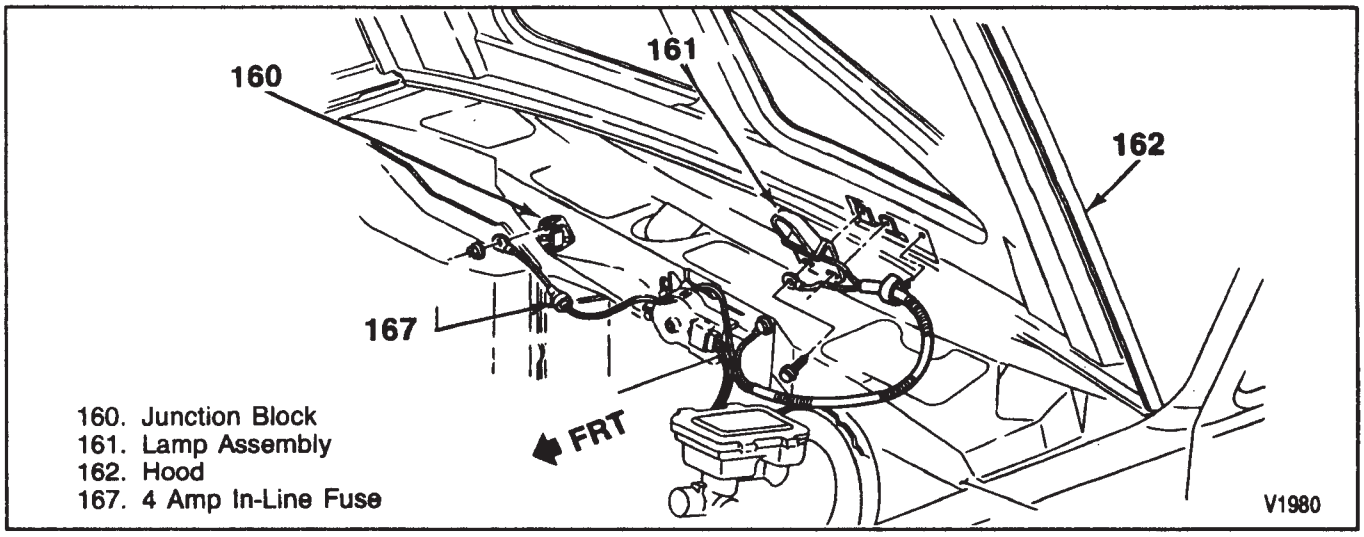
Remove or Disconnect (Figure 29)

1. Negative battery cable.
2. Grille to radiator support screws.
   - Two grille to fender tab screws at each end of the grille.
   - Four screws across the top of the grille.
   - Two grille to radiator support clip screws.
3. Grille.
4. Bulb (95) from the lens (94).
5. Two nuts holding the lens to the grille.
6. Lens.



102. Screw
103. Rear Lamp

Figure 32—Rear Lamps



160. Junction Block
161. Lamp Assembly
162. Hood
167. 4 Amp In-Line Fuse

Figure 33—Underhood Lamp

Install or Connect (Figure 29)

1. Lens (94) with two nuts to the grille.
2. Bulb (95) to the lens.
3. Grille to the radiator support with screws.
4. Negative battery cable.

Side Marker Bulb:

Remove or Disconnect (Figure 29)

1. Negative battery cable.
2. Headlamp. Refer to "Headlamp Replacement".
3. Marker bulb (95) and socket from behind the lens with needle nose pliers.
   - Reach between the headlamp mounting ring and grille.
   - Gently turn the socket 1/4 turn to remove it from the lens assembly.
4. Bulb from the socket.
   - Pull it out from under the headlamp mounting ring (90).

Install or Connect (Figure 29)

1. Bulb (95) into the socket.
2. Bulb and socket into the side marker lens.
   - Turn the socket 1/4 turn to install it in the lens assembly.
3. Headlamp.
4. Negative battery cable.

UNDERHOOD LAMP REPLACEMENT

Remove or Disconnect (Figure 33)

1. Negative battery cable.
2. Nut and lamp wire from the junction block (160).
3. Screw, ground wire, and star washer from the cowl.
4. Two screws.
5. Lamp assembly (161) from the hood.

Install or Connect (Figure 33)

1. Lamp assembly (161) to the hood with two screws.
2. Ground wire to the cowl with screw and washer.
3. Lamp wiring to the junction block (160).
4. Negative battery cable.

ON-VEHICLE SERVICE OF INTERIOR LIGHTING AND SWITCHES

ASH TRAY LAMP BULB REPLACEMENT

Remove or Disconnect (Figure 34)

- Open the I/P storage compartment.

1. Two screws at the lower right side of the radio trim panel.
2. One screw at the lower left of the radio trim panel.
   - Swing the panel aside.
3. Ash tray.
4. Lower right screw retaining the ash tray housing (141).
   - Slide the housing forward.
   - Squeeze the metal tangs on the bulb shield (140) and lift.
   - Lift the bulb from the socket.

Install or Connect (Figure 34)

1. Bulb (142) into the socket.

- Squeeze the tangs on the shield and push it back into the housing.
- Slide the housing back into the instrument panel.

2. Radio trim panel with three screws.
3. Ashtray.

- Close the I/P storage compartment lid.

BACKUP LAMP/NEUTRAL START SWITCH REPLACEMENT

Remove or Disconnect (Figure 35)

1. Negative battery cable from the battery.
2. Lower insulator panel.
3. Harness connector from the switch terminals (99).
4. Switch from the steering column jacket (98) by pulling the switch outward.

Install or Connect (Figure 35)

- Align the actuator on the switch with the holes in the shift tube (101).
  - Set the parking brake. Place the gear selector in neutral to make alignment easier.
- Press down on the front of the switch until the tangs (100) snap into the rectangular holes in the steering column jacket (98).

1. Harness connector.

- Adjust the switch by moving the gear selector to park. The main housing and the housing back should ratchet, providing the proper switch adjustment.

2. Lower insulator panel.
3. Negative battery cable to the battery. Check for proper switch operation.
   - Readjust the switch by moving the housing all the way toward the low gear position. Then repeat the adjustment procedure under step 1.

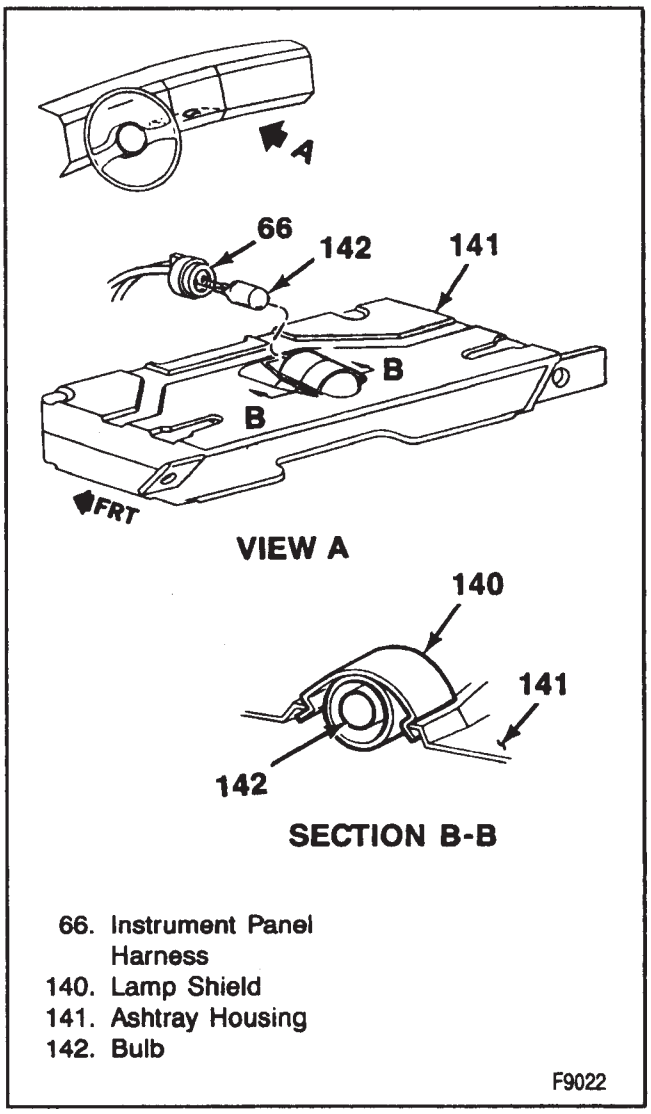


Figure 34—Ash Tray Lamp

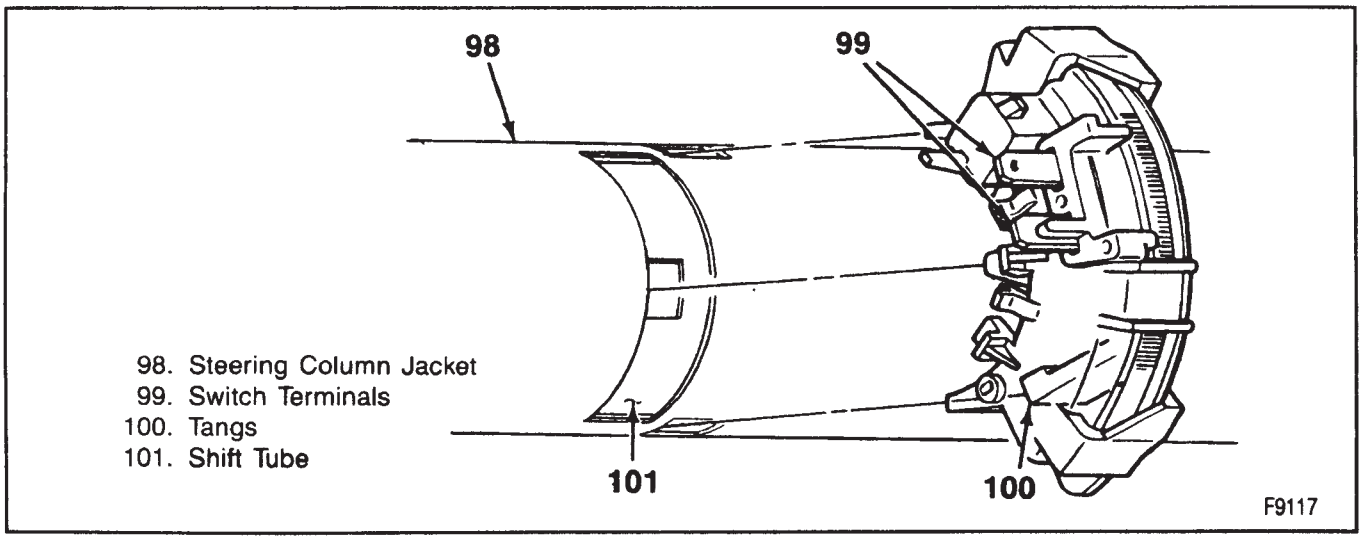


Figure 35—Backup Lamp Switch (Automatic Transmission)

BACKUP LAMP SWITCH REPLACEMENT (MANUAL TRANSMISSION ONLY)

Remove or Disconnect (Figure 36)

1. Negative battery cable.
2. Wiring harness from the switch.
3. Switch wiring from the bracket (4-wheel drive models only).
4. Switch from the transmission.

Install or Connect (Figure 36)

1. Switch to the transmission.
2. Switch wiring to the bracket (4-wheel drive models only).
3. Wiring harness to the switch.
4. Negative battery cable.

DAYTIME RUNNING LIGHTS MODULE AND DIODE MODULE REPLACEMENT

Remove or Disconnect (Figure 4)

1. Negative battery cable.
2. Two insulating panels to the left of the steering wheel under the instrument panel.
3. Tape holding the DRL module (37) and diode module to the wiring harness.

Diode Module:

- Open the brown case and remove the diode module board.

DRL Module:

- Open the black case and remove the DRL module board.

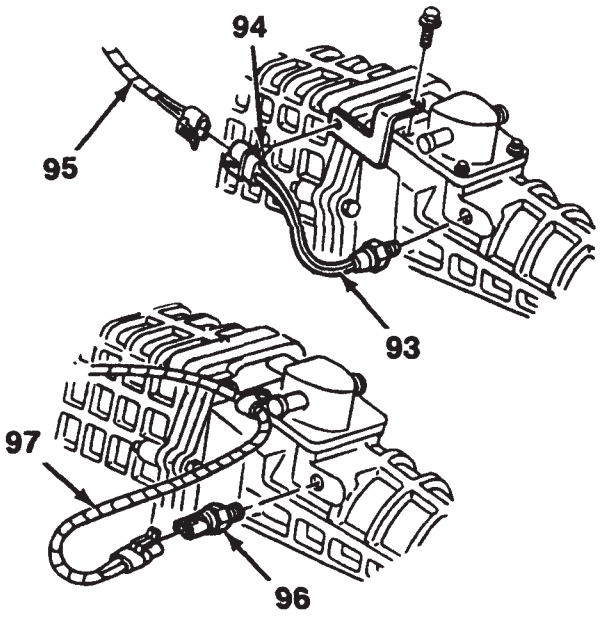
Install or Connect (Figure 4)

1. New DRL module board into the black case or diode module board into the brown case.
   - Close the case.
   - Wrap tape around the modules and wiring harness.
2. Insulating panels under the instrument panel.
3. Negative battery cable.

DAYTIME RUNNING LIGHTS RELAY REPLACEMENT

Remove or Disconnect (Figure 4)

1. Steering column filler panel.
2. Wiring harness connector from the DRL relay (33).
3. Screw holding the relay to the brake pedal bracket.
4. Relay.



93. Backup Lamp Switch (4 Wheel Drive)
94. Anchor
95. Wire Harness
96. Backup Lamp Switch (2 Wheel Drive)
97. Wire Harness

F9116

Figure 36—Backup Lamp Switch (Manual Transmission)

Install or Connect (Figure 4)

1. Relay (33) to the brake pedal bracket with the mounting screw.
2. Wiring harness connector to the relay.
3. Steering column filler panel.

DOME LAMP REPLACEMENT

In the pickup model, the dome lamp is located on the panel above the rear glass. In the utility vehicle, two dome lamps are used. One lamp is located above the front seats, and the other at the rear of the vehicle above the end gate glass.

PICKUP MODELS

Remove or Disconnect (Figure 36)

1. Negative battery cable.
2. Lens (110).
3. Bulb (111).
4. Bolts (112).
5. Lamp assembly (113).
6. Spacers (115) and retainers (116).

Install or Connect (Figure 37)

1. Spacers (115) and retainers (116).
2. Lamp assembly (113).
3. Bolts.
4. Bulb.

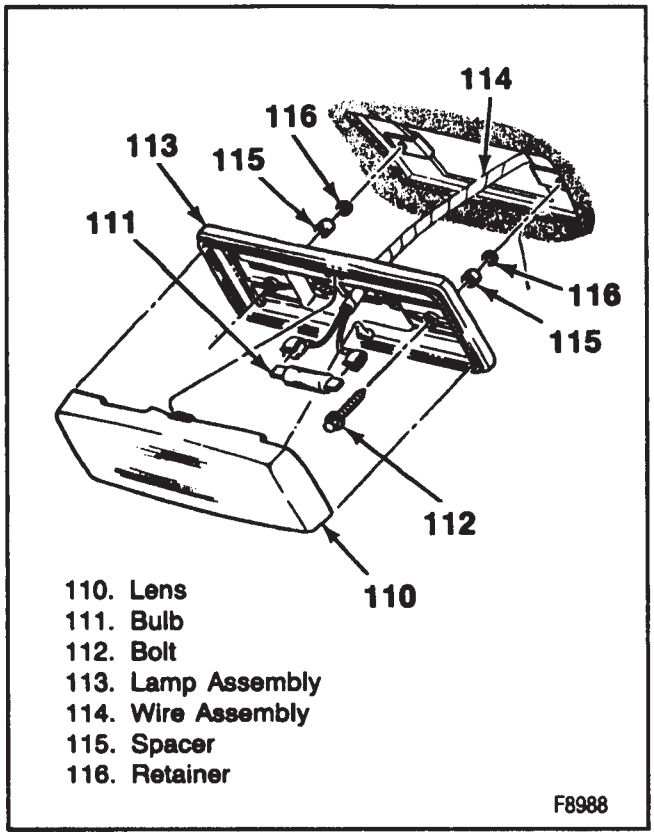


Figure 37—Pickup Model Dome Lamp Components

5. Lens.
6. Negative battery cable.

UTILITY VEHICLE DOME LAMPS

Front Dome Lamp

Remove or Disconnect (Figure 38)

1. Negative battery cable.
2. Lens (117).
3. Push nuts (119).
4. Lamp housing (120).
5. Push nuts (121).
6. Bulb (118).
7. Wire assembly from the studs.

Install or Connect (Figure 38)

1. Wire assembly onto the studs.
2. New push nuts onto the studs.
3. Bulb.
4. Lamp housing (120) onto the studs.
5. New push nuts.
6. Lens.
7. Negative battery cable.

Rear Dome Lamp

Remove or Disconnect (Figure 39)

1. Negative battery cable.
2. Lamp assembly (124).
   - Pull the assembly from the inner roof panel.

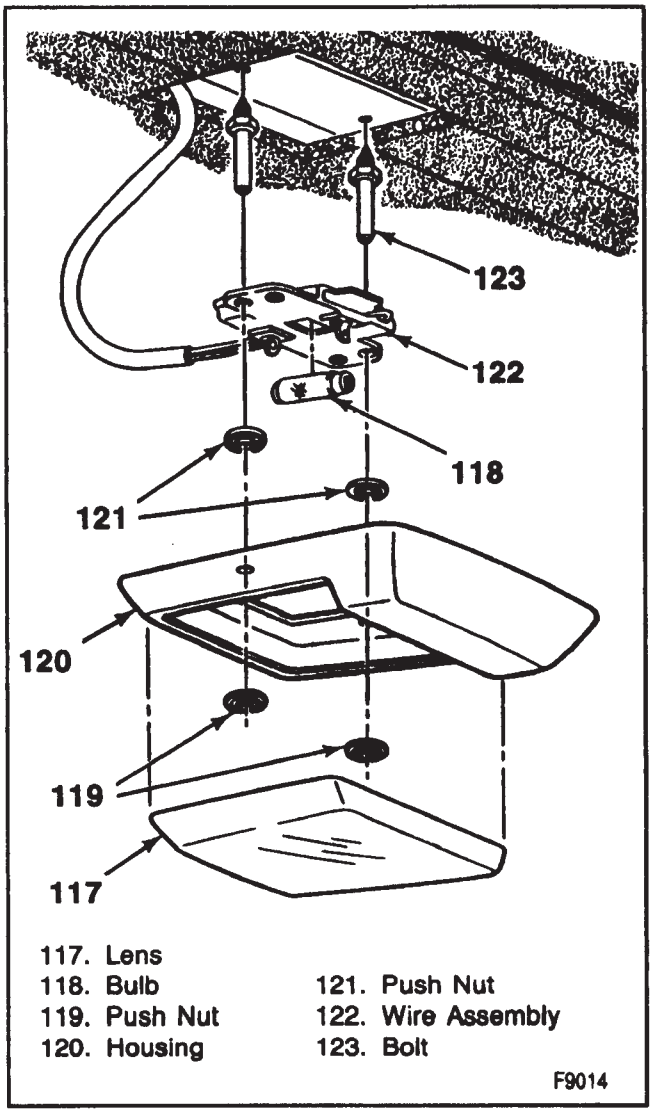


Figure 38—Utility Vehicle Front Dome Lamp

3. Lamp assembly from the wiring harness.

Install or Connect (Figure 39)

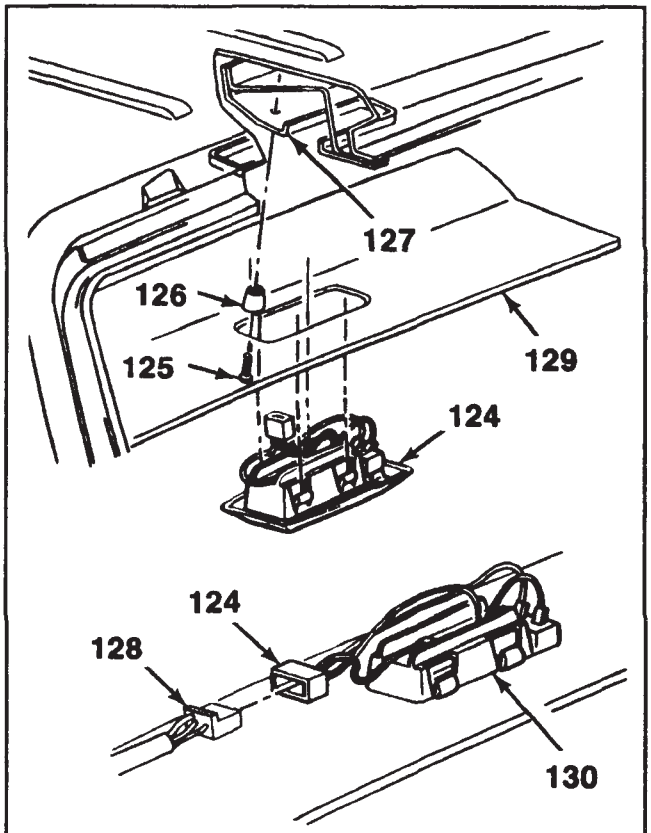
1. Wiring harness onto the lamp assembly.
2. Lamp assembly (124).
   - Push the assembly into the housing (130).
3. Negative battery cable.

DOOR JAMB SWITCH REPLACEMENT

Remove or Disconnect (Figure 40)

- Open the door.

1. Negative battery cable.
2. Door jamb switch (131).
3. Wire(s) from the switch.
   - Tape the wires to the body to prevent them from entering the hole in the door pillar.



124. Lamp Assembly
125. Screw
126. Spacer
127. Roof Outer Panel
128. Wire Assembly
129. Garnish Molding
130. Housing

F9016

Figure 39—Utility Vehicle Rear Dome Lamp Components

Install or Connect (Figure 40)

1. Wire(s) to the switch.
2. Door jamb switch (131).
3. Negative battery cable.

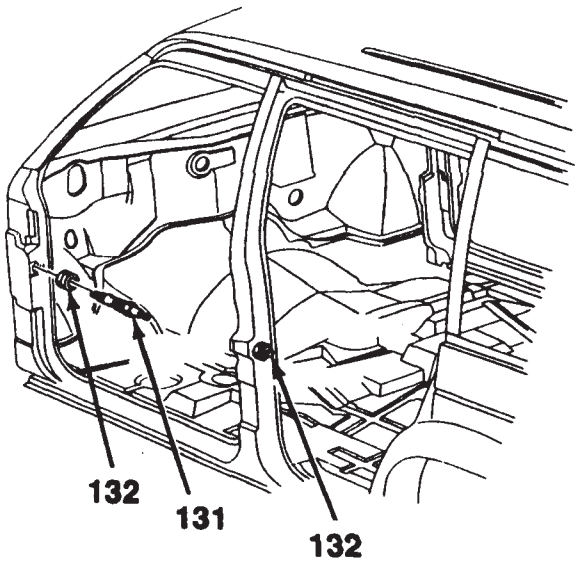
FOG LAMP RELAY REPLACEMENT

Remove or Disconnect (Figure 41)

1. Steering column filler panel (157).
2. Relay screw (156) from beneath the filler panel (157).
3. Relay (159) from the electrical connector.
4. Nut (158) from the relay.

Install or Connect (Figure 41)

1. Nut (158) to the relay.
2. Electrical connector to the relay.
3. Screw (156) through the steering column filler panel, relay, and nut.
4. Filler panel (157) to the instrument panel (34).



131. Door Jamb Switch
132. Boot

F9018

Figure 40—Door Jamb Switch

FOG LAMP SWITCH REPLACEMENT

Remove or Disconnect (Figure 42)

1. Negative battery cable.
2. Switch screws (155).
3. Switch connector.
4. Switch from the instrument panel below the headlamp switch.

Install or Connect (Figure 42)

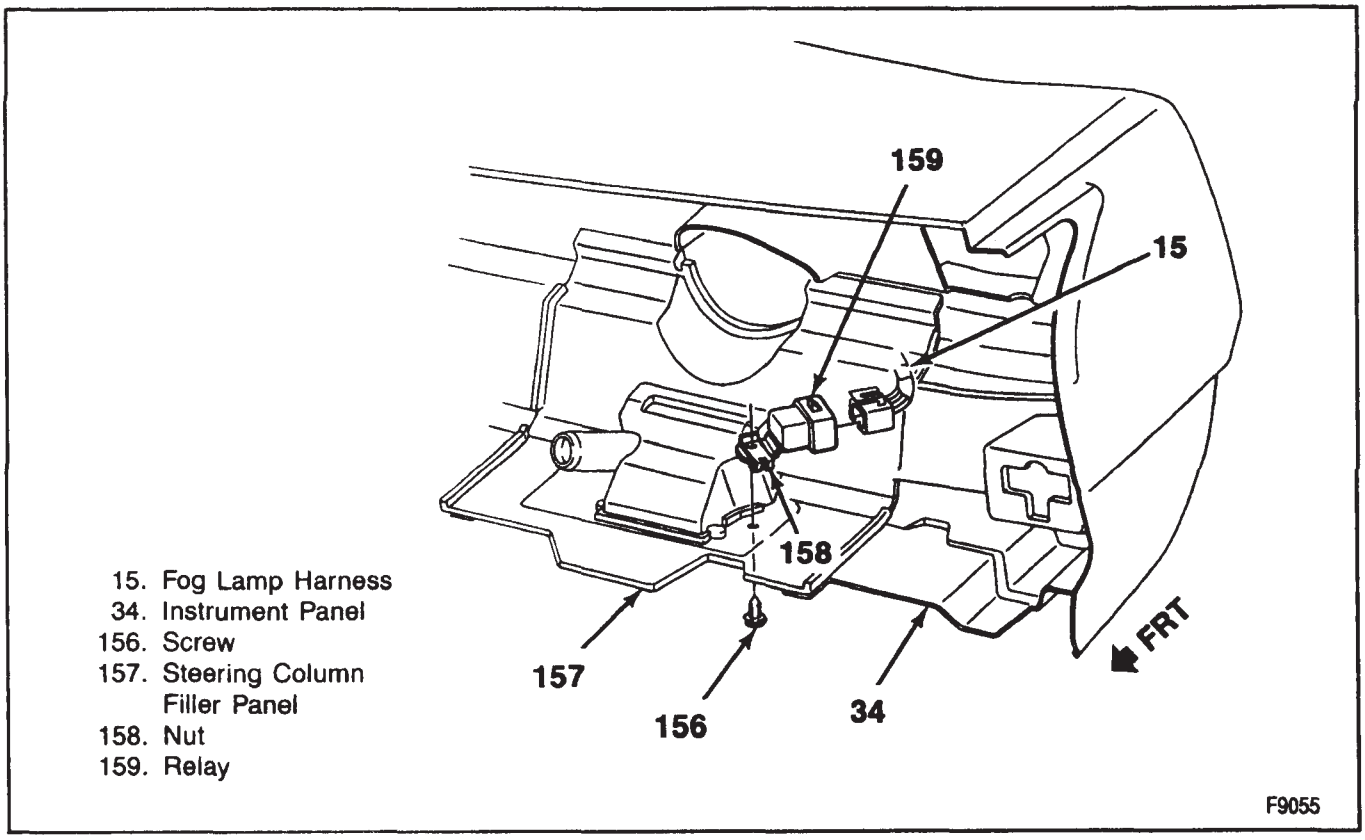
1. Switch (154) to the instrument panel.
2. Electrical connector.
3. Two screws.
4. Negative battery cable.

FOUR-WHEEL DRIVE INDICATOR LAMP REPLACEMENT

MANUAL SHIFT

Remove or Disconnect (Figures 43 and 44)

1. Negative battery cable.
2. Three shift lever bezel to floor screws.
3. Shift lever bezel (193) by carefully lifting it off the transfer case lever and the manual transmission shift lever when present.



15. Fog Lamp Harness
34. Instrument Panel
156. Screw
157. Steering Column Filler Panel
158. Nut
159. Relay

Figure 41—Fog Lamp Relay

4. Two wiring connectors from the indicator assembly (190).
5. Two screws holding the indicator assembly to the shift lever bezel.
6. Lamp assembly(ies) from the back of the indicator.
7. Bulb from the lamp assembly.

Install or Connect (Figures 43 and 44)

1. Bulb(s) into the lamp assembly(ies).
2. *Lamp assemblies into the back of the indicator.*
3. Indicator to the shift lever bezel with two screws.
4. Two wiring connectors to the indicator.
5. Bezel to the floor with three screws.
6. Negative battery cable.

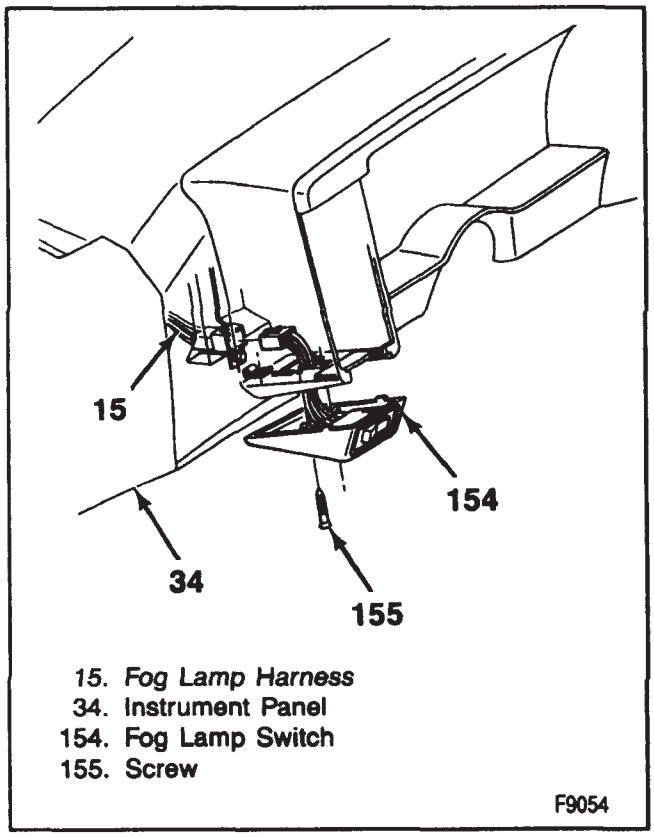
ELECTRIC SHIFT

Remove or Disconnect (Figures 45 and 46)

1. Negative battery cable.
2. Trim plate screws from under the trim plate (143).
3. Switch trim plate.
4. Select switch wiring harness from the switch.
5. Switch from the trim plate.

Install or Connect (Figures 45 and 46)

1. Switch to the trim plate.
2. Wiring connector to the switch.
3. Trim plate to the instrument panel with screws.
4. Negative battery cable.



15. *Fog Lamp Harness*
34. Instrument Panel
154. Fog Lamp Switch
155. Screw

Figure 42—Fog Lamp Switch

HEADLAMP DIMMER SWITCH REPLACEMENT

Refer to STEERING COLUMN - STANDARD (SECTION 3F1) or STEERING COLUMN - TILT (SECTION 3F2) for service information on the dimmer switch (part of the turn signal control lever).

HEADLAMP SWITCH REPLACEMENT

Remove or Disconnect (Figure 47)

1. Negative battery cable.
2. Trim plate screws (133).
3. Switch trim plate (134).
   - Pivot the trim plate outward at the bottom, and pull the plate down.
4. Instrument panel wiring harness (135) connectors.
5. Retainer screws (136) from the switch trim plate (134).
6. Headlamp switch (137) from the switch bracket (138).

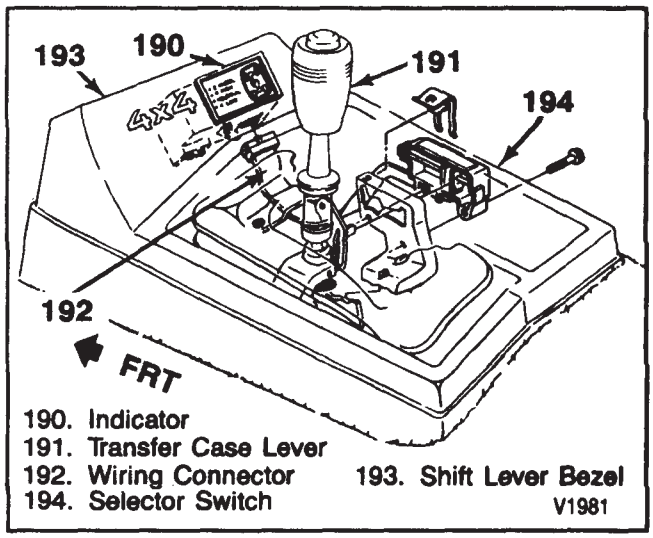


Figure 43—Transfer Case Controls - Manual Shift

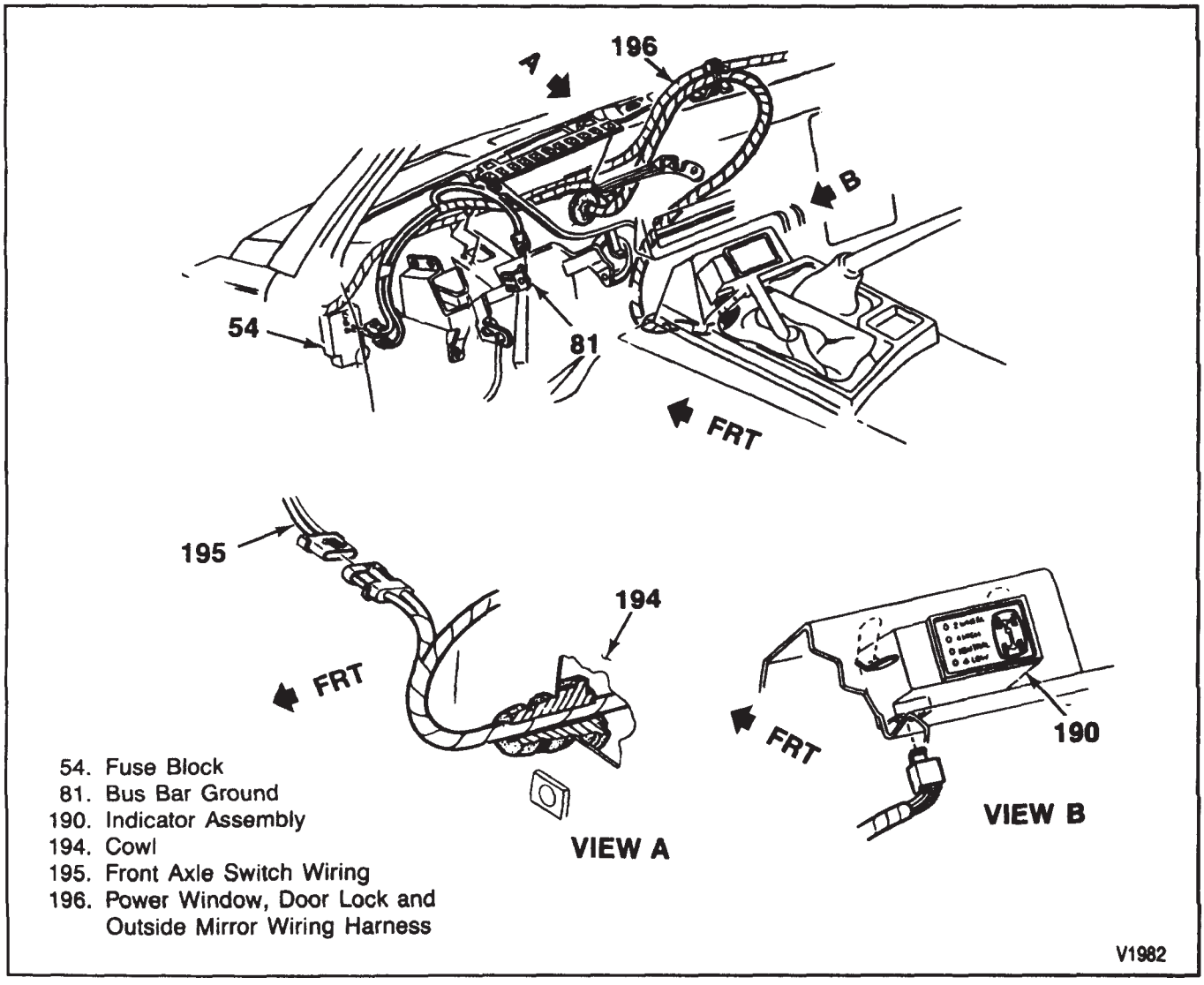
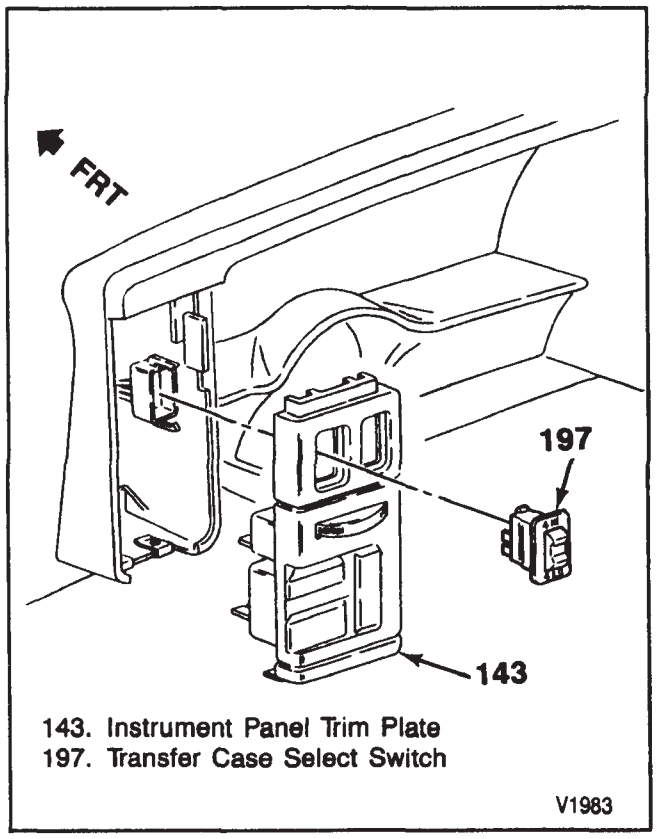


Figure 44—Transfer Case Shift Indicator Wiring



143. Instrument Panel Trim Plate
197. Transfer Case Select Switch

V1983

Figure 45—Electric Shift Select Switch

Install or Connect (Figure 47)

1. Headlamp switch (137) to the switch bracket (138).
2. Retainer screws (136) to the switch trim plate (134).
3. Instrument panel wiring harness (135) connectors.
   - Pivot the trim plate inward at the bottom and align.
4. Switch trim plate (134).
5. Trim plate screws (133).
6. Negative battery cable.

INSTRUMENT PANEL DIMMER SWITCH REPLACEMENT

Remove or Disconnect (Figure 47)

1. Negative battery cable.
2. Trim plate screws (1339).
3. Switch trim plate (134).
   - Pivot the trim plate outward at the bottom, and pull the plate down.
4. Instrument panel wiring harness (135) connectors.
5. Retainer screws (136) from the switch trim plate (134.
6. Instrument panel dimmer switch (139) from the switch bracket (138).

Install or Connect (Figure 47)

1. Instrument panel dimmer switch to the switch bracket.
2. Retainer screws to the switch trim plate (134).
3. Instrument panel wiring harness connectors.
   - Pivot the trim plate inward at the bottom and align.
4. Switch trim plate.
5. Trim plate screws.
6. Negative battery cable.

INSTRUMENT PANEL STORAGE COMPARTMENT BULB REPLACEMENT

Remove or Disconnect (Figure 48)

- Open the compartment door.

1. Three screws retaining the instrument panel trim plate (143).
2. Storage compartment trim plate (148).
3. Lens (145) from the inside of the compartment.
   - Pry it out.
4. Lamp switch (145) by prying it out.
   - Reach through the lens opening and push the lamp switch forward.
5. Bulb by pulling it out from behind the switch.

Install or Connect (Figure 48)

1. Bulb into the switch assembly (146).
2. Switch assembly into the instrument panel.
3. Storage compartment trim plate (148).
4. Instrument panel trim plate with three screws.
5. Lens (145) into the compartment.

STOPLAMP SWITCH REPLACEMENT

Remove or Disconnect (Figure 15)

1. Cruise control switch.
   - Lift it up from the actuator bracket (60) and move it aside.
2. Stoplamp switch.
   - Pull it up from the actuator bracket.
3. Two wiring connectors to the stoplamp switch.

Remove or Disconnect (Figure 15)

1. Two wiring connectors to the stoplamp switch.
2. Stoplamp switch into the actuator bracket.
   - Depress the brake pedal and push the switch into the bracket as far as it will go.
3. Cruise control switch into the actuator bracket.
   - Depress the brake pedal and push the switch into the bracket as far as it will go.
   - Adjust the switch by depressing the brake pedal all the way and then releasing it several times.

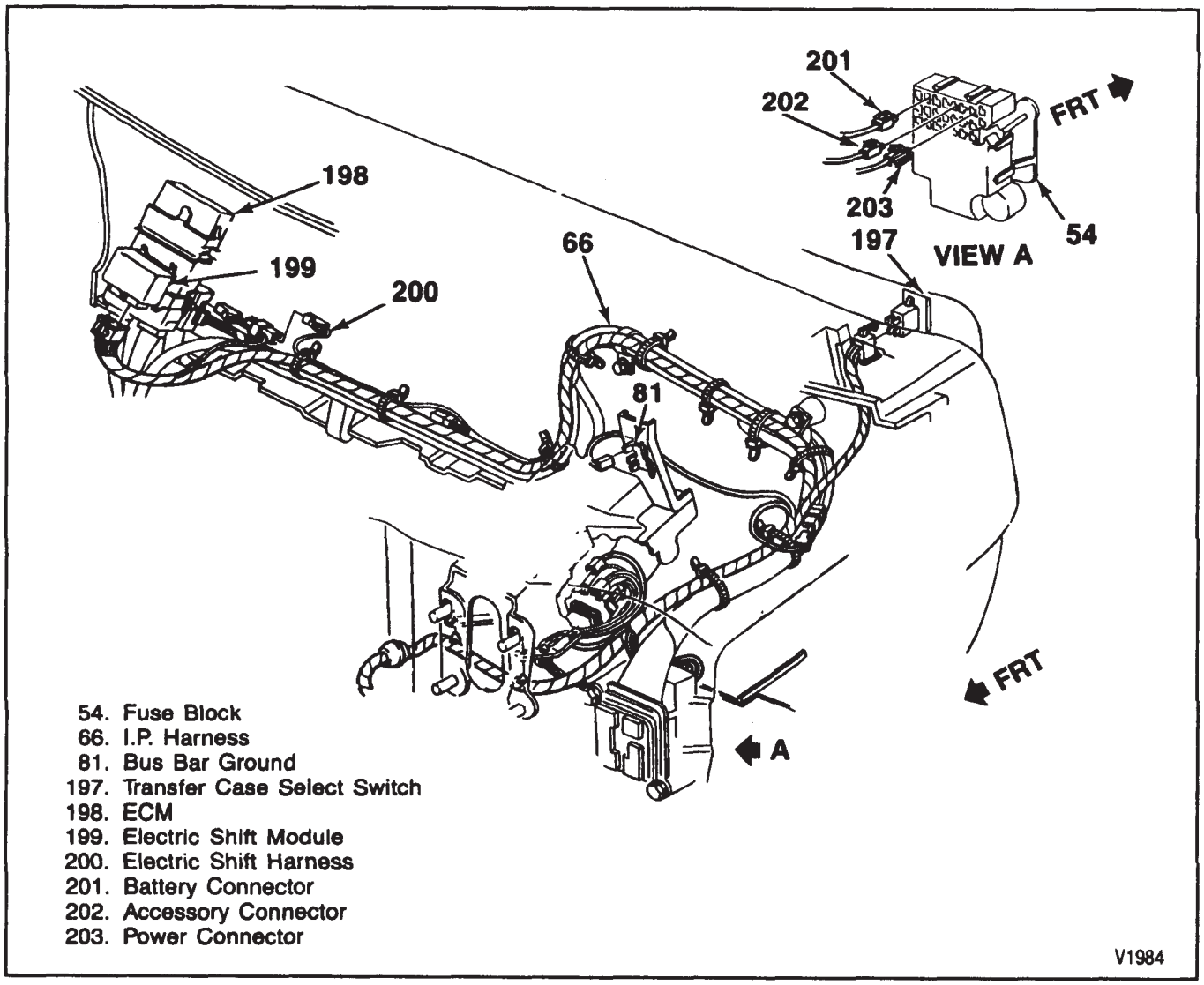


Figure 46—Transfer Case Electric Shift Wiring

133. Switch Trim Plate Screws
134. Switch Trim Plate
135. Wiring Harness Connectors
136. Retainer Screw
137. Headlamp Switch
138. Switch Bracket
139. Instrument Panel Dimmer Switch

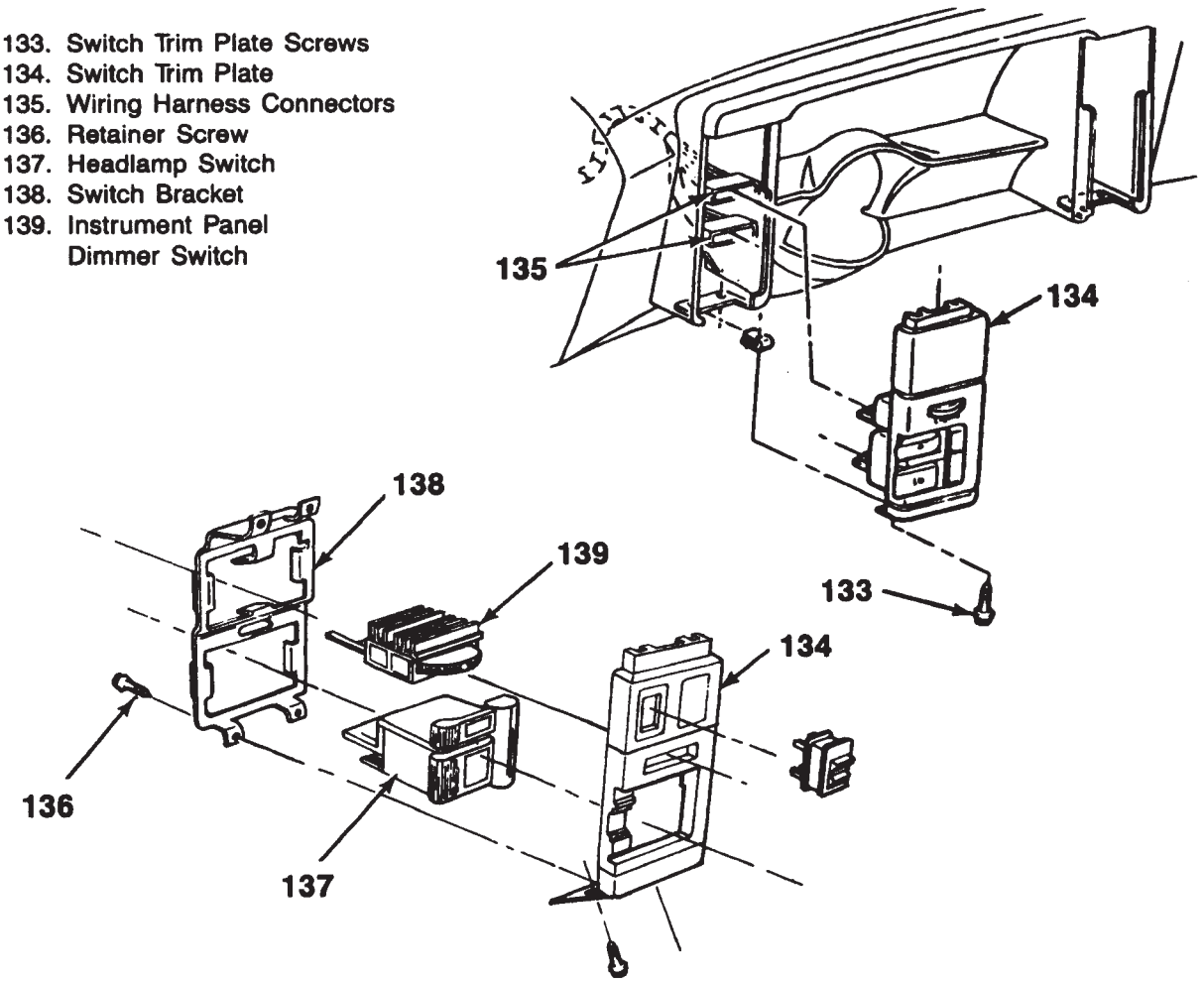
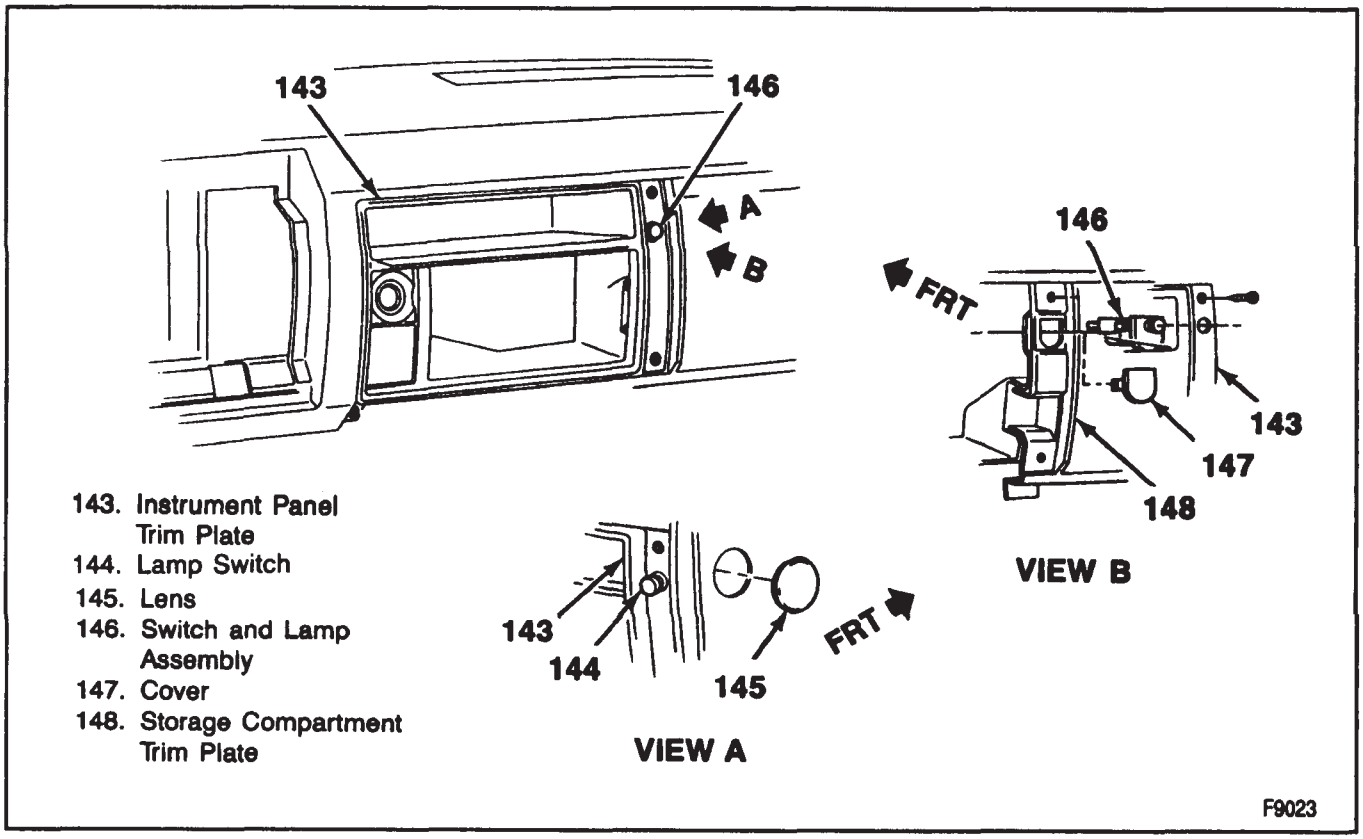


Figure 47—Headlamp Switch



143. Instrument Panel Trim Plate
144. Lamp Switch
145. Lens
146. Switch and Lamp Assembly
147. Cover
148. Storage Compartment Trim Plate

Figure 48—Instrument Panel Storage Compartment Lamp

SPECIFICATIONS

LAMP AND BULB DATA

AC type guide lamps are recommended when replacement becomes necessary

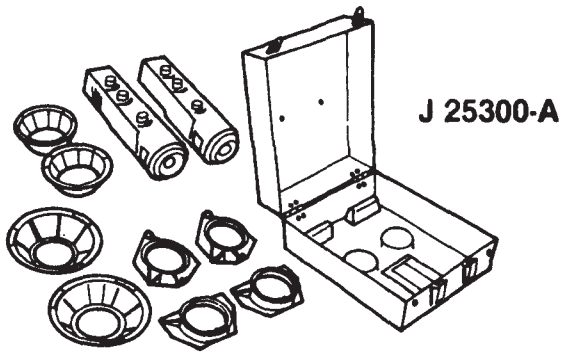
Exterior Lamp Usage	Quantity	Candle Power	Trade No.
Headlamps	2	55W/65W	6052
Headlamps (Halogen)	2	35W/65W	H6054
Backup Lamp	2	32	1156
License Lamp	1	2	194
License Lamp (Step Bumper)	2	4	67
License Lamp (Utility Models)	1	4	67
Tail and Stop Lamps	2	32/2	2057
Marker Lamp—Front	2	2	194
Marker Lamp—Rear	2	2	194
Parking and Signal Lamp	2	32/2	2057
Fog Lamp Bulb and Wire Assembly—GM Part No. 11513798			
Fog Lamp Capsule Assembly (Bulb, Lens and Case)—GM Part No. 16515501			
Interior Lamp Usage			
Dome Lamp	1	12	211-2
Dome Lamp (Utility Models)	2	12	561
Instrument Panel Compartment Lamp	1	15	1003
Courtesy Lamp	2	15	1003
Ash Tray Lamp	1	1	161
Turn Signal Indicator	2	.7	174
High Beam Indicator	1	.7	174
Brake Indicator	1	.7	174
Oil Pressure Indicator	1	.7	174
Generator Indicator	1	.7	174
Temperature Indicator	1	.7	174
Heater	1	2	194
Windshield Wiper Switch	1	2	194
Underhood Lamp	1	15	93
Four Wheel Drive Indicator	6	1	161
Inst. Cluster Illum.	3	2	194
Inst. Cluster Illum.	1	3	168
Inst. Cluster Illum.[1]	2	2	194
Inst. Cluster Illum.[1]	3	3	168
Seatbelt Indicator	1	.7	174
Seatbelt Indicator[1]	1	2	194
Seatbelt Indicator	1	.7	174
Service Engine Soon Indicator	1	.7	174
Check Gages Indicator	1	.7	174
Upshift Indicator	1	.7	174

[1]With Gage Option

T2736

SPECIAL TOOLS

1. J 25300 Headlight Aimer



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SECTION 8C

INSTRUMENT PANEL AND GAGES

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

GENERAL DESCRIPTION

INSTRUMENT PANEL

The instrument panel is designed to permit the removal of all control switches from the driver's side. The standard instrument panel is equipped with gages to monitor vehicle and engine operations. The optional instrument panel is equipped with gages. There is also an electronic digital instrument cluster that uses blue and green vacuum fluorescent displays. Refer to "Electronic Digital Instrument Cluster" in this section.

ELECTRIC SPEEDOMETER

The electric speedometer drive replaces the mechanical drive for all S/T applications. Integrated circuits control the air core speedometer and stepper motor

odometer. The speedometer and odometer receives a signal from the vehicle speed sensor buffer (DRAC) generated by the vehicle speed sensor (VSS).

VEHICLE SPEED SENSOR

The vehicle speed sensor (VSS) is a permanent magnet signal generator located on the transmission or transfer case output shaft housing. The vehicle speed sensor sends an analog signal proportional to the propeller shaft speed. This signal goes to the vehicle speed sensor buffer (DRAC) (figure 1).

VEHICLE SPEED SENSOR BUFFER (DRAC)

The vehicle speed sensor buffer was previously known as the digital ratio adapter controller (DRAC). It is a solid state device that is used to change the signal from the speed sensor to a digital signal. The VSS buffer will change the signal from the speed sensor to a signal containing 4000 pulses per mile (PPM) for the instrument cluster. The vehicle speed sensor buffer is matched to the final drive and tire size of each vehicle, so it must be replaced with the proper buffer to match the final drive and tire size of that vehicle. If the final drive or tire size is changed for any reason, the buffer must also be changed to continue to produce an accurate speedometer/odometer reading. The incorrect buffer will also affect the Anti-Lock brakes, the Electronic Control Module (ECM) and the cruise control module.

FUEL GAGE

The fuel gage is an electrical instrument that measures an electrical current from a variable resistance in the fuel tank. The variable resistance is controlled by a float. When the fuel tank is full, the resistance is high and the fuel gage pointer is moved to its maximum position, which is FULL on the gage face.

FUEL GAGE SENDER

The fuel gage sender is attached to the top of the fuel tank. The sender is retained with a cam lock ring. A seal is used between the tank and the sender.

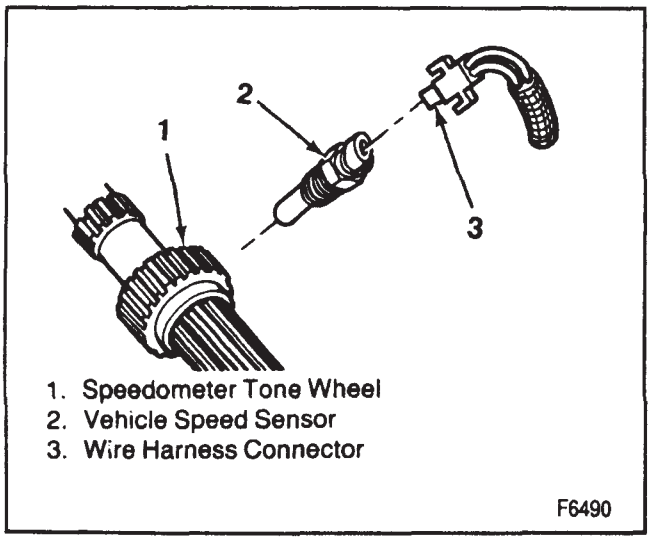


Figure 1—Vehicle Speed Sensor

The sender will have two or three places to attach hoses. One line is for the fuel feed line. The second line is connected to the vapor canister. The third line is used as a fuel return line to the fuel tank. On some senders a short connector lead is used, while on other senders the connector attaches directly to the sender.

COOLANT TEMPERATURE GAGE

The coolant temperature gage is an electrical gage which measures current flowing from a variable resistance sender in the engine coolant jacket. The sender is located at the left rear corner of the cylinder head of the 2.5L engine, and at the front left corner of the 2.8L engine.

On the 4.3L engine, the coolant temperature sender is located between the 3rd and 5th cylinders on the right of the block. On the 4.3L (VIN W) engine the temperature sender is located on the left side of the block between the 3rd and 5th cylinders.

OIL PRESSURE GAGE

The oil pressure gage is an electrical gage which measures current flowing from a variable resistance sender. The sender is located on the right side of the 2.5L engine, below the intake manifold. On the 2.8L engine, the sender is located above or on the oil filter adapter. On the 4.3L engine, the sender is located on the top of the engine block near the distributor. On the 4.3L (VIN W) engine, the oil pressure sender is also located on the top of the engine block near the distributor.

VOLTMETER

The voltmeter measures the voltage level of the electrical system. The voltmeter uses an internal shunt.

CHARGING SYSTEM WARNING SYSTEM

The charging system warning system consists of a warning lamp with one side of the bulb connected to the generator and the other side of the bulb connected to the battery. The lamp comes on when the battery voltage exceeds the generator voltage.

"SERVICE ENGINE SOON" LAMP

This system is part of the Computer Command Control System. Refer to the 1992 Light Duty Fuel and Emissions manual if you are using X-9229 and to the Fuel and Emission section at the rear of this manual if you are using ST-369-92.

BRAKE WARNING SYSTEM

The brake warning system consists of a differential switch which is mounted on the brake combination valve, and the warning lamp which is mounted on the instrument panel. Refer to REAR WHEEL ANTI-LOCK BRAKE SYSTEM (SECTION 5A3).

"CHECK GAGES" LAMP (GAGE CLUSTER ONLY)

The optional light turns on when the engine coolant temperature is too high or when the engine oil pressure is too low. The signals from the engine coolant sender

and the engine oil pressure sender are monitored by the check gages lamp driver which is part of the temperature gage circuit board. This controls the current flow to the "Check Gages" lamp mounted in the instrument cluster.

DIAGNOSIS OF THE ELECTRONIC DIGITAL INSTRUMENT CLUSTER

PROBLEM	POSSIBLE CAUSE	CORRECTION
Cluster Display Does Not Light	1. No ignition feed to the cluster.	1. Remove the large 17-pin connector from the cluster. Using a digital volt-ohm meter, measure the voltage from pin A13 to ground with the ignition in "RUN". The meter should read battery voltage. If the meter reads less than battery voltage, or zero, repair the pink/white wire from the ignition switch.
	2. No ground to the cluster.	2. Measure the resistance from pin A15 and A16 to ground using a digital volt-ohm meter. If the meter reads anything but 0 - 0.5 ohms, repair the black wires at A15 and A16 to ground.
	3. Inoperative cluster	3. Replace the cluster.
Cluster Display Does Not Dim With Lights On	1. Park lamp feed open or shorted.	1. Measure between pin A8 of the large 17-pin connector, and ground using a digital volt-ohm meter. Ignition in "RUN", parking lamps on. If the reading is less than battery voltage, repair the open or short at the brown wire.
	2. Park lamp switch feed open or shorted.	2. Measure between pin A8 of the large 17 pin connector, and ground using a digital volt-ohm meter. Ignition in "RUN", parking lamps on. Adjust the panel lamp switch from high intensity to low intensity. The voltmeter should read between 0 to battery voltage. If this reading is not obtained, repair the gray wire and/or the park lamp switch.
	3. Cluster inoperative.	3. If the previous 2 steps are OK, replace the instrument cluster.
Cluster Display Always Dim	Inoperative cluster.	Replace the cluster.
Cluster Display Does Not Switch Between English and Metric	1. Inoperative cluster control switch or wiring.	1. Disconnect the large 17-pin connector at the cluster. Measure the resistance between pin A2 and ground. The resistance should be zero in one position, and open in the other. If the switch does not respond in this manner, repair the light blue wire from the cluster to the switch, or the black wire from the switch to ground.
	2. Inoperative cluster.	2. If the switch and wiring are correct, replace the cluster.
Speedometer Inoperative or Inaccurate, Odometer Operates Correctly	Inoperative instrument cluster.	Replace the cluster.

DIAGNOSIS OF THE ELECTRONIC DIGITAL INSTRUMENT CLUSTER (cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTION
One Or Both Odometers Do Not Operate Properly But The Speedometer Operates Properly	Inoperative instrument cluster.	Replace the cluster.
Speedometer And Odometers Do Not Operate	No vehicle speed sensor signal.	Disconnect the large 17-pin connector from the cluster, and the connector from the digital ratio adapter. Measure the resistance between the wire at pin A1 of the cluster and the wire at pin B of the digital ratio adapter harness. If the resistance is above zero ohms, and the vehicle speed sensor circuit is working properly, replace the instrument cluster.
Cluster Display Does Not Switch Between Total And Trip Odometer	1. Inoperative cluster control switch or wiring. 2. Inoperative cluster.	1. Disconnect the large 17-pin connector at the cluster. Measure the resistance between pin A3 and ground. The resistance should be zero in one position, and open in the other. If the switch does not respond in this manner, repair the light green wire from the cluster to the switch, or the black wire from the switch to ground. 2. If the switch and wiring are correct, replace the cluster.
Trip Odometer Does Not Reset	1. Inoperative cluster control switch or wiring. 2. Inoperative cluster.	1. Disconnect the large 17 pin connector at the cluster. Measure the resistance between pin A5 and ground. The resistance should be zero in one position, and open in the other. If the switch does not respond in this manner repair the light green/black wire from the cluster to the switch, the switch, or black wire from the switch to ground. 2. If the switch and wiring are correct, replace the cluster.
Fuel Gage Is Inaccurate	Shorts or opens in the wiring from the fuel tank sender, or an inoperative fuel sender unit.	Disconnect the fuel gage sender at the tank and connect one lead of J 33431-B to the pink wire and the other to ground. Turn the ignition to the run position, and set the resistance dials of J 33431-B to zero ohms. The fuel gage should read empty. Set the resistance dials to 44 ohms. The fuel gage should read half full (7 to 8 segments lit). Set the resistance dials to 90 OHMs. The fuel gage should read full. If the gage responds correctly, check the black wire to ground at the fuel sender unit. If the black wire is OK replace the fuel tank sender. If the gage does not respond correctly to the test, check the pink wire from the fuel sender to the cluster. If this wire is OK replace the cluster.

DIAGNOSIS OF THE ELECTRONIC DIGITAL INSTRUMENT CLUSTER (cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Low Fuel Indicator Does Not Light With Low Fuel Level	Inoperative cluster.	Replace the cluster.
Temperature Gage Is Inaccurate	Shorts or opens in the wiring from the temperature sender, or an inoperative temperature sending unit.	Disconnect the temperature sender and connect one lead of J 33431-B to the dark green wire and the other to ground. Turn the ignition to the "RUN" position, and set the resistance dials of J 33431-B to 1400 ohms. The temperature gage should read cold. Set the resistance dials to 245 ohms. The fuel gage should read half (7 to 8 segments lit). Set the resistance dials to zero ohms. The fuel gage should read full. If the gage responds correctly, replace the temperature gage sender. If the gage does not respond correctly to the test, check the dark green wire from the temperature sender to the cluster. If this wire is OK, replace the cluster.
Temperature Indicator Does Not Light With The Engine Coolant Overheated	Inoperative cluster.	Replace the instrument cluster.
Oil Pressure Gage Is Inaccurate	Shorts or opens in the wire from the oil pressure sender, or an inoperative oil pressure sending unit.	Disconnect the oil pressure sender and connect one lead of J 33431-B to the tan wire and the other to ground. Turn the ignition to the run position, and set the resistance dials of J 33431-B to zero ohms. The oil gage should read low. Set the resistance dials to 42 ohms. The oil gage should read half (7 to 8 segments lit). Set the resistance dials to 90 ohms. The oil gage should read high. If the gage responds correctly, replace the oil gage sender. If the gage does not respond correctly to the test, check the tan wire from the oil sender to the cluster. If this wire is OK replace the cluster.
Oil Pressure Indicator Does Not Light	Inoperative cluster.	Replace the instrument cluster.
Voltmeter Is Inaccurate	Short, open or high resistance in the brown wire from the generator.	Measure the voltage between the battery terminals. Then measure the voltage between the brown wire, and a good chassis ground. If the readings are different, repair the brown wire. If the readings are the same, check the black wire for high resistance to ground. If the black wires at the cluster are OK replace the instrument cluster.
		D0150

DIAGNOSIS OF THE SPEEDOMETER AND VEHICLE SPEED SENSOR BUFFER (DRAC)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Speedometer and Odometer are Inaccurate	Incorrect vehicle speed sensor buffer (DRAC).	Install correct vehicle speed sensor buffer (DRAC).
Speedometer And Odometer Do Not Operate Properly	1. Inoperative vehicle speed sensor buffer (DRAC).	1. Disconnect the vehicle speed sensor buffer (DRAC), and place the ignition in "RUN". Check for voltage between the pink/black wire in the harness and a good chassis ground. If the voltage is less than the battery voltage, check for an open or short in the pink/black wire.
	2. Poor ground path from the vehicle speed sensor buffer (DRAC).	2. Check for voltage between the pink/black wire in the harness and the black/white wire. If the voltage is less than battery voltage, check for an open or short in the black/white wire.
	3. No signal from the vehicle speed sensor.	3. Raise and support the vehicle, start the engine, and place the transmission in drive. Check for AC voltage that changes with the engine rpm between the purple/white wire, and the light green/black wire at the vehicle speed sensor buffer (DRAC). If there is not AC voltage at these wires, check for opens in the purple/white wire and the light green wire. If there are not shorts or opens, replace the vehicle speed sensor.
	4. Inoperative vehicle speed sensor buffer (DRAC) (speedometer output).	4. Raise and support the vehicle, start the engine, and place the transmission in drive. Check for AC voltage that changes with the engine RPM, replace the vehicle speed sensor buffer (DRAC).
	5. Inoperative vehicle speed sensor buffer (DRAC) (cruise output).	5. Raise and support the vehicle, start the engine, and place the transmission in drive. Check for AC voltage that changes with the engine rpm between the yellow and the black/white wires at the vehicle speed sensor buffer (DRAC) connector (connector attached) if AC voltage values with rpm, replace the vehicle speed sensor buffer (DRAC).
	6. Inoperative instrument cluster.	6. Refer to Diagnosis Of The Electronic Instrument Cluster in this section.

D0151

DIAGNOSIS OF THE FUEL GAGE

PROBLEM	POSSIBLE CAUSE	CORRECTION
Gage Stays at Empty	1. No fuel. 2. Circuit is grounded.	1. Fill the fuel tank. 2. Disconnect the lead at the fuel tank. The gage should read past the full mark. If the gage does not read past the full mark, replace the fuel tank sender. If the gage stays at the empty mark, find the ground in the circuit between the gage and the fuel tank.
Gage Stays at Full or Beyond	Open circuit between the gage and the sender.	Disconnect the sender lead at the fuel tank. Ground the lead. The fuel gage should read at the empty mark. If the gage reads at the empty mark, replace the sender. If the gage still reads at full or beyond, find the open between the gage and the fuel tank.
Gage Reads Wrong	1. Corrosion or a loose connection. 2. Sender. 3. Gage.	1. Clean the terminals. Tighten the terminals. 2. Remove the sender. Test the sender with an ohmmeter. The empty position should read 1 ohm. The one-half full position should read 44 ohms. The full position should read 88 ohms. 3. Disconnect the front body connector. Connect J 24538-B tester to the lead that goes to the gage. Turn the engine control switch "ON". If the gage responds accurately, check the wiring between the rear compartment and the front body connector. If the gage reads between one-fourth and one-half with the J 24538-B set at 90 ohms, replace the cluster.

D0152

DIAGNOSIS OF THE COOLANT TEMPERATURE GAGE

PROBLEM	POSSIBLE CAUSE	CORRECTION
Gage Does Not Move from "Cold" when the Engine is "Hot"	1. Blown fuse.	1. Check fuse and replace if blown. If the lamp does not glow, check for continuity between the sensor unit terminal at the gage and ground, and between the ignition terminal and ground. If all checks "OK," replace the cluster. Turn switch "OFF."
	2. Sensor.	2. Turn engine control switch key "on." Do not start engine. Remove the lead at the sensor unit. Connect the test lamp from the sensor lead to ground. If the lamp glows, then short the sensor lead to ground. Gage should indicate "HOT." If the gage indicates "HOT," check the sensor lead connector on the sensor. If OK, replace the sensor. If the gage indicates "COLD," the gage is stuck. Replace the gage.
	3. Open circuit.	3. If the lamp does not glow, check for continuity between the sensor unit terminal at the gage and ground, and between the ignition terminal and ground. If all checks "OK," replace the cluster. Turn switch "OFF."
Gage Indicates "Hot" with Cold Engine	Shorted or grounded circuit.	Remove the sensor lead at the sensor unit. The gage should swing to "COLD." If the gage does not swing to "COLD," check the sensor unit for an external short. If there is no external short, replace the sensor. If the gage stays "HOT," check for a short circuit in the gage to sensor wiring. If there is no short, replace the cluster.
Gage Reads Low	1. Resistance in the circuit due to corrosion or a loose connection.	1. Clean and tighten the terminals and connections in the circuit. Check for resistance in the ground path of the sensor.
	2. Sensor.	2. Remove the lead at the sensor. Measure the resistance with an ohmmeter. At 40°C (104°F) the resistance is 1200 ohms. At 125°C (257°F) the resistance is 53.4 ohms. If the sensor does not have approximately these values, replace the sensor.
Gage Reads High	1. Sensor.	1. Measure the sensor's resistance as described in the previous step.
	2. Circuit has a high resistance ground.	2. Disconnect the sensor lead at the gage and sensor. Check for a high resistance ground with an ohmmeter. Repair the circuit.
		D0153

DIAGNOSIS OF THE OIL PRESSURE GAGE

PROBLEM	POSSIBLE CAUSE	CORRECTION
Gage Reads at "0"	1. Low oil level.	1. Check oil level. Add oil if necessary. Refer to ENGINE (SECTION 6).
	2. The circuit is grounded between the gage and the sensor.	2. Remove the sensor lead at the sensor. The gage should read "80." If the gage stays at "0", remove the sensor lead at the gage. The gage should read "80." If the gage reads "80", find the ground in the circuit between the gage and the sensor. If the gage reads "0", replace the cluster.
	3. Sensor.	3. Remove the sensor lead at the sensor. Connect an ohmmeter to the sensor. With the engine stopped, the resistance should be one ohm. With the engine running, the resistance should be about 44 ohms at 40 psi (275 kPa). If the sensor reads one ohm with the engine running, replace the sensor.
Gage Reads 80# psi or Above	The sensor circuit has an open.	Disconnect the sensor lead from the sensor. Ground the sensor lead. The gage should read "0" psi. If the gage reads "0" psi, replace the sensor. If the gage stays at "80" psi, find the open in the circuit between the gage and the sensor.
Gage Readings are In Error	Gage.	Remove the sensor lead from the sensor. Connect the J 24538-B Tester to the sensor lead and ground. If the gage responds accurately to the tester, replace the sensor. If the gage does not respond accurately to the tester, replace the cluster.
		D0154

DIAGNOSIS OF THE VOLTMETER

PROBLEM	POSSIBLE CAUSE	CORRECTION
Voltmeter Reads at 9 or Below	1. Discharged battery.	1. Measure the voltage across the battery. Recharge the battery. Read the dash voltmeter with the charger working. The voltage should come up to at least 12 volts. Find and correct the cause of the battery discharging.
	2. High resistance in the voltmeter connections.	2. Clean and tighten the connections.
	3. Voltmeter.	3. Apply 12 volts across the ignition and ground leads. If the voltmeter doesn't respond accurately, replace the cluster.
		D0155

DIAGNOSIS OF THE CHARGING SYSTEM WARNING SYSTEM

Refer to ENGINE ELECTRICAL (SECTION 6D).

DIAGNOSIS OF THE BRAKE WARNING SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
Warning Lamp Won't Light During Bulb Check	1. Lamp bulb is burned out. 2. Open in the circuit.	1. Replace the bulb. 2. Remove the switch lead at the switch. Refer to BRAKES (SECTION 5). Ground the switch lead with a jumper. If the lamp comes on, test the switch. Refer to BRAKES (SECTION 5). If the switch is bad, replace it. Refer to BRAKES (SECTION 5).
		D0158

DIAGNOSIS OF THE "CHECK GAGES" LAMP (Gages Cluster Only)

PROBLEM	POSSIBLE CAUSE	CORRECTION
"Check Gages" Telltale Lamp Does Not Light With High Temperature	1. Burned out bulb. 2. Inoperative check gages circuit.	1. Replace "Check Gages" telltale bulb. 2. Replace cluster.
"Check Gages" Telltale Lamp Does Not Light With Low Oil Pressure	1. Burned out bulb. 2. Inoperative check gages circuit.	1. Replace "Check Gages" telltale bulb. 2. Replace cluster.
Check Gages Telltale Lights at All Times	1. Verify temperature gage circuit works correctly. 2. Verify oil pressure gage circuit works correctly.	1. Replace cluster. 2. Replace cluster.
		D0111

ON-VEHICLE SERVICE

HANDLING ELECTROSTATIC DISCHARGE (ESD) SENSITIVE PARTS

Many solid state electrical components can be damaged by Electrostatic Discharge (ESD). Some will display a symbol but many will not (figure 2).

NOTICE: In order to avoid possibly damaging any components, observe the following:

1. Body movement produces an electrostatic charge. To discharge personal static electricity, touch a ground point (metal) on the vehicle. This should be done any time you:
   - Slide across the vehicle seat.
   - Sit down or get up.
   - Do any walking.
2. Do not touch exposed terminals on components with your finger or any tools. Remember, the connector that you are checking might be tied into a circuit that could be damaged by Electrostatic Discharge.
3. When using a screwdriver or similar tool to disconnect a connector, never let the tool come in contact with or come between the exposed terminals.
4. Never jump, ground, or use test equipment probes on any components or connectors unless specified in diagnosis. When using test equipment, always connect the ground lead first.
5. Do not remove the solid state component from its protective packaging until you are ready to install the part.
6. Always touch the solid state component's package to a ground before opening. Solid state components can also be damaged if:
   - They are bumped or dropped.
   - They are laid on any metal work benches or components that operate electrically, such as a TV, radio, or oscilloscope.

INSTRUMENT CLUSTER REPLACEMENT

Remove or Disconnect (Figures 3 and 4)

1. Negative battery cable.
2. Lamp switch trim plate screws (3).

NOTICE

CONTENTS SENSITIVE
TO
STATIC ELECTRICITY

F9382

Figure 2—Electrostatic Discharge Symbol

3. Lamp switch trim plate (4).
4. Lamp switch harness.
5. A/C and heater control assembly screws (3).
6. A/C and heater control assembly (2).
7. A/C and heater control assembly harness.
8. Filler panel screws (13).
9. Filler panel (14).
10. Instrument cluster housing nuts (10).
11. Instrument cluster housing (12).
12. Instrument cluster nuts (10).
13. Instrument cluster (11).

Install or Connect (Figures 3 and 4)

1. Instrument cluster (11).

NOTICE: For steps 2, 4, 6, 9, and 12 see "Notice" on page 8C-1 of this section.

2. Instrument cluster nuts (10).
3. Instrument cluster housing (12).
4. Instrument cluster housing nuts (10).
5. Filler panel (14).
6. Filler panel screws (13).
7. A/C and heater control harness.
8. A/C and heater control assembly (2).
9. A/C and heater control assembly screws (3).
10. Lamp switch harness.
11. Lamp switch trim plate (4).
12. Lamp switch trim plate screws (3).
13. Negative battery cable.

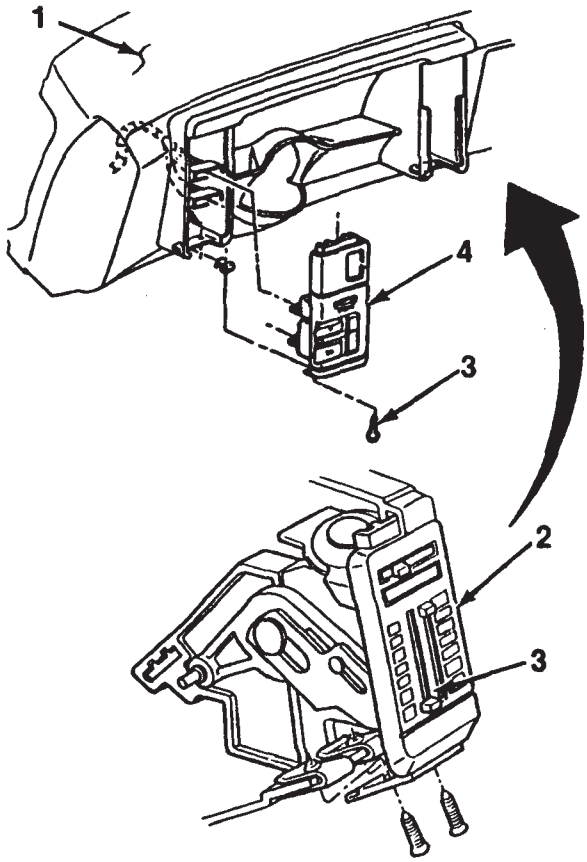
INSTRUMENT CLUSTER LENS REPLACEMENT

Remove or Disconnect (Figures 5 through 9)

1. Instrument cluster (11). Refer to "Instrument Cluster Replacement" in this section.
2. Lens retaining screws (21) and lens (24) from the cluster housing (23).

Install or Connect (Figures 5 through 9)

NOTICE: See "Notice" on page 8C-1 of this section.



1. Instrument Panel
2. A/C and Heater Control Assembly
3. Screw
4. Lamp Switch Trim Plate

F1475

Figure 3—Instrument Panel Controls

1. Lens (24) and lens retaining screws (21) to the cluster panel (23).
2. Instrument cluster (11). Refer to "Instrument Cluster Replacement" in this section.

VEHICLE SPEED SENSOR BUFFER (DRAC) REPLACEMENT

Remove or Disconnect (Figure 10)

1. Negative battery cable.
2. Instrument panel harness connector (100) from the buffer (101).
3. Bracket screw (102) from the (ECM) bracket (103).
4. Bracket screws (104) from the controller (101).

Install or Connect (Figure 10)

NOTICE: See "Notice" on page 8C-1 of this section.

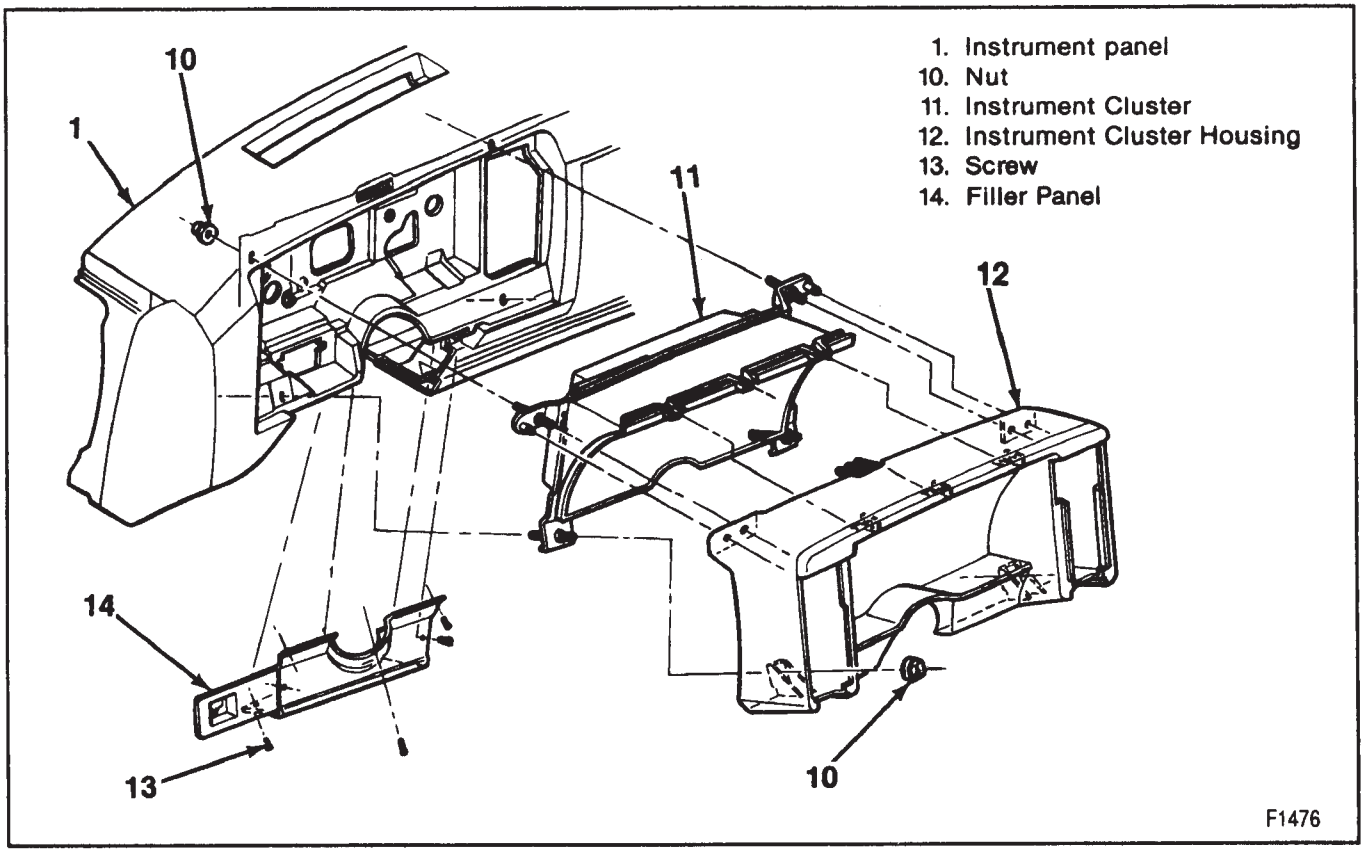


Figure 4—Instrument Panel Components

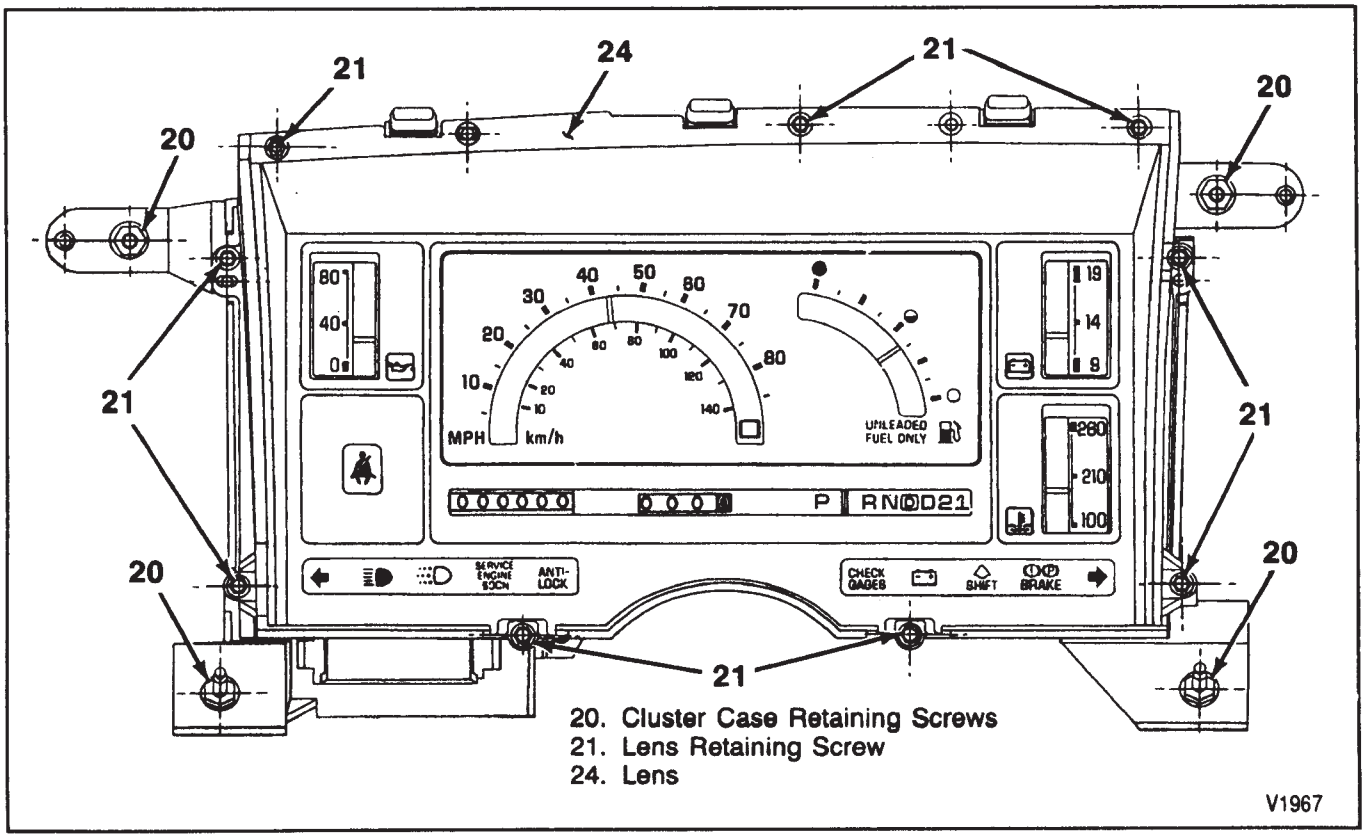


Figure 5—Instrument Cluster Front (Standard)

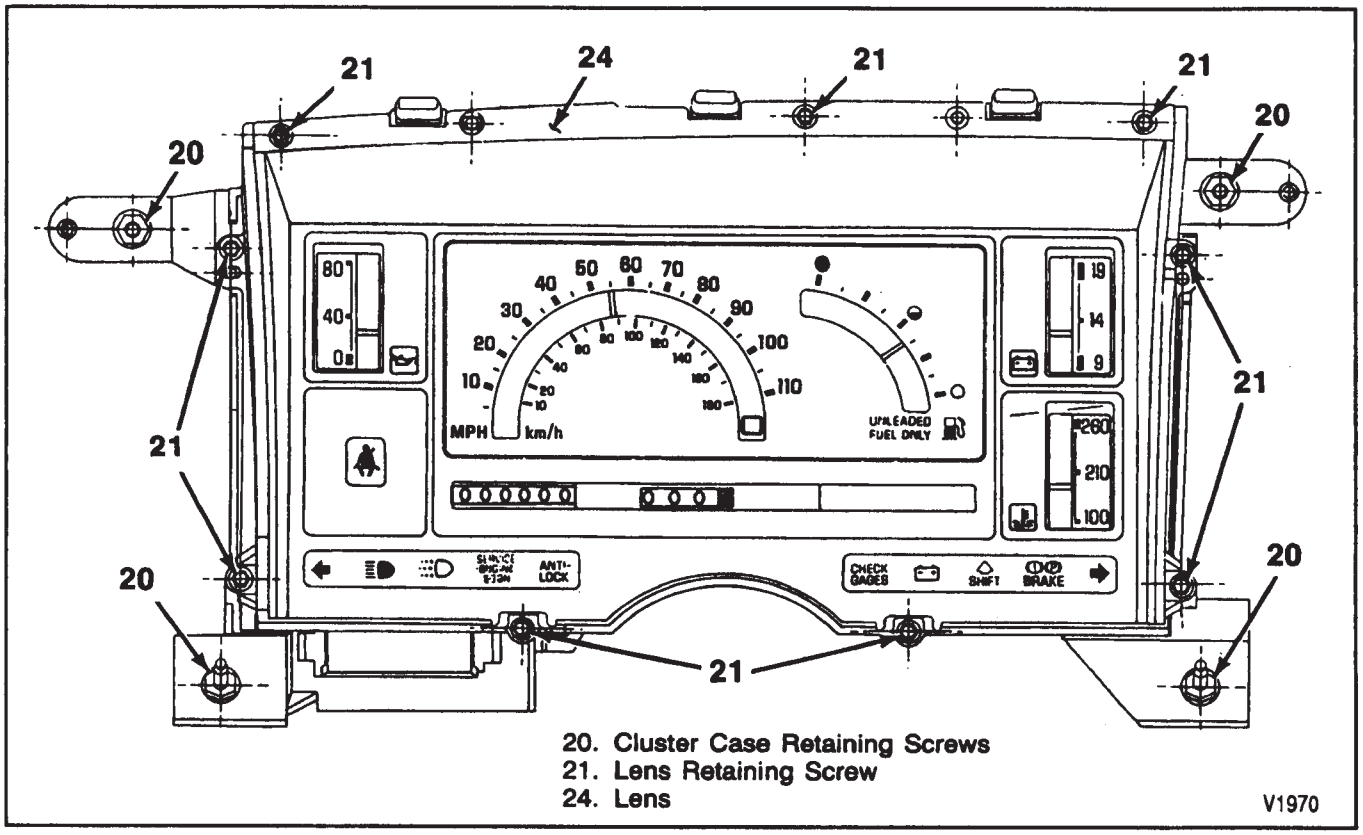


Figure 6—Instrument Cluster Front (4.3L Engine VIN W)

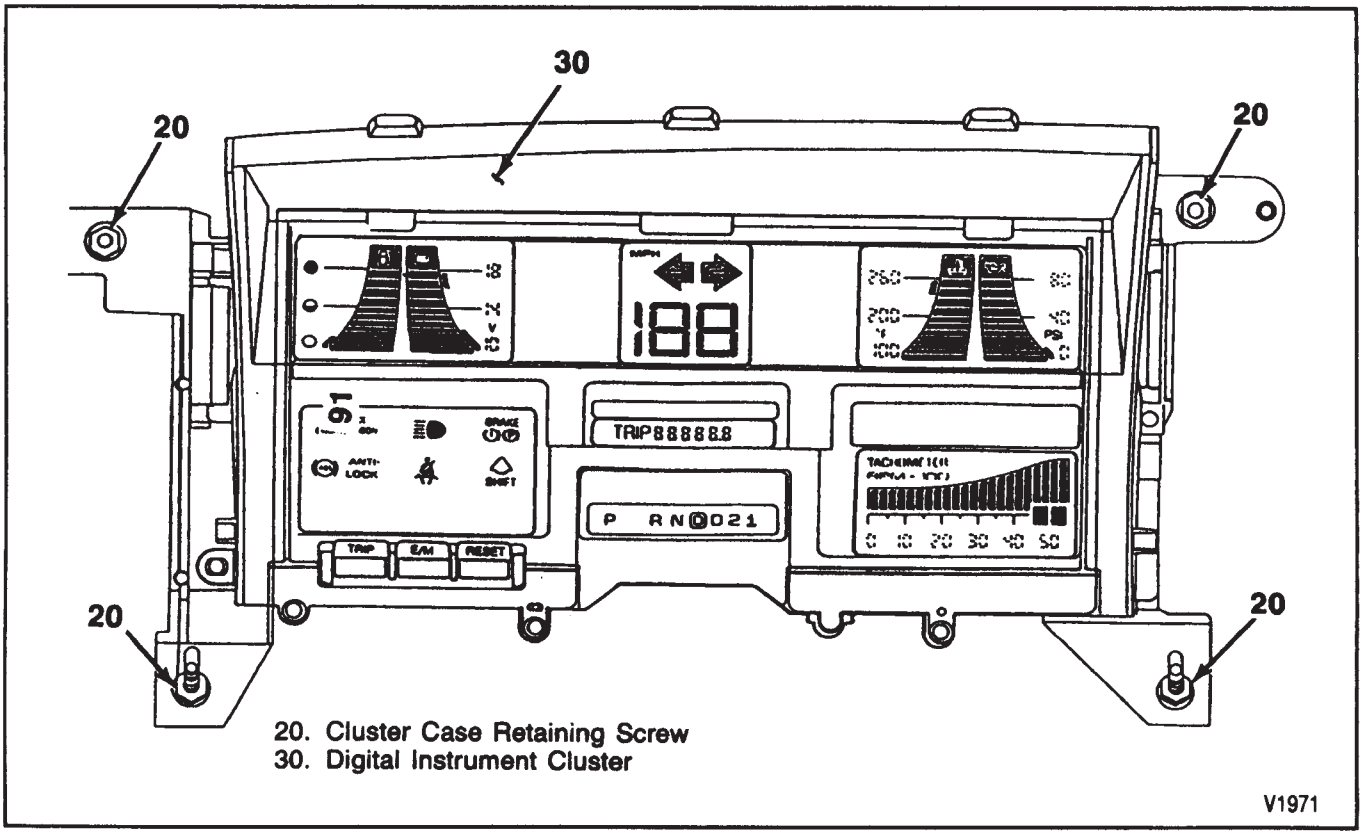
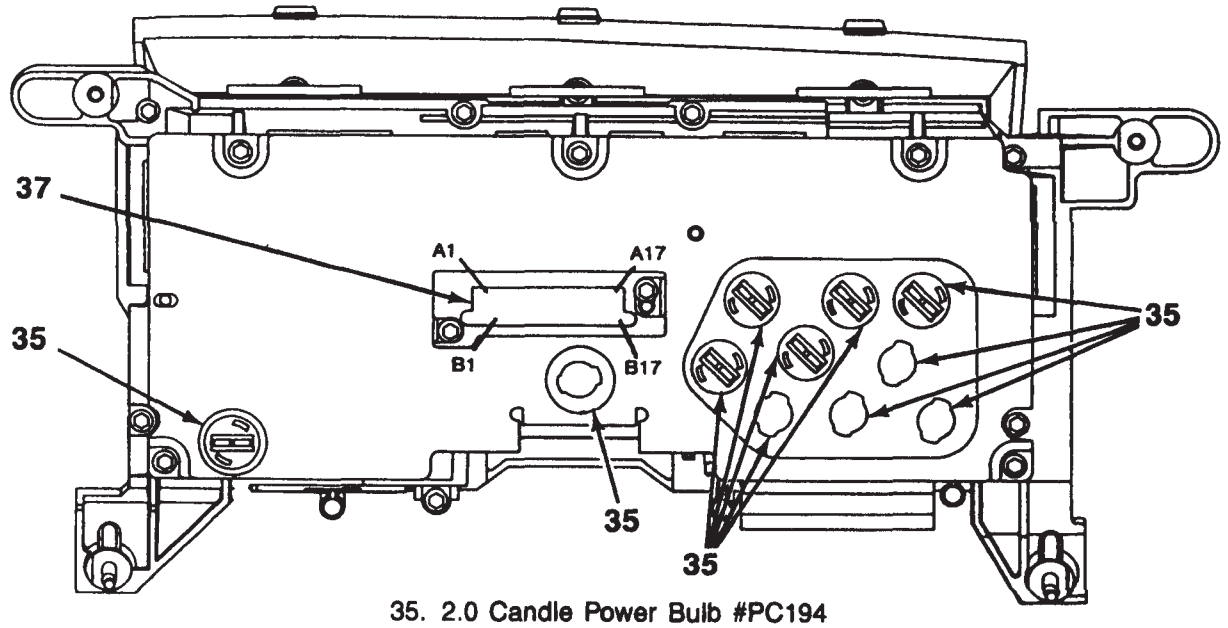


Figure 7—Digital Instrument Cluster (Front)

TERMINALS A	
PIN #	FUNCTION
1	TEMPERATURE SENDER INPUT
2	OIL PRESSURE SENDER INPUT
3	OPEN
4	TACHOMETER INPUT
5	OPEN
6	PARK LAMP INPUT
7	RIGHT TURN SIGNAL
8	LEFT TURN SIGNAL
9	SIGNAL GROUND
10	CHARGE TELLTALE INPUT
11	SPEED
12	FUEL SENDER INPUT
13	PANEL LAMP INPUT
14	SERVICE ENGINE SOON
15	IGNITION 1
16	BRAKE TELLTALE
17	HIGH BEAM TELLTALE

TERMINALS B	
PIN #	FUNCTION
1	IGNITION 3
2	IGNITION 3
3	OPEN
4	BATTERY FEED
5	OPEN
6	OPEN
7	POWER GROUND
8	OPEN
9	OPEN
10	OPEN
11	OPEN
12	CHECK FLUIDS TELLTALE
13	CRUISE TELLTALE
14	UPSHIFT TELLTALE
15	RUN LIGHTS TELLTALE
16	ANTI LOCK TELLTALE
17	FASTEN BELTS TELLTALE



35. 2.0 Candle Power Bulb #PC194
37. 34 P.I.N. Connector

V1972

Figure 8—Digital Instrument Cluster (Rear)

1. Bracket screws (104) to the buffer (101).
2. Bracket screws (102) to the (ECM) bracket (103).
3. Instrument panel harness connector (100) to the controller (101).
4. Negative battery cable.

VEHICLE SPEED SENSOR REPLACEMENT

Refer to TRANSMISSIONS (SECTION 7).

FUEL GAGE SENDER REPLACEMENT

Refer to FUEL SYSTEM (SECTION 6C).

COOLANT TEMPERATURE SENSOR REPLACEMENT

Remove or Disconnect (Figures 11 and 12)

1. Negative battery cable.

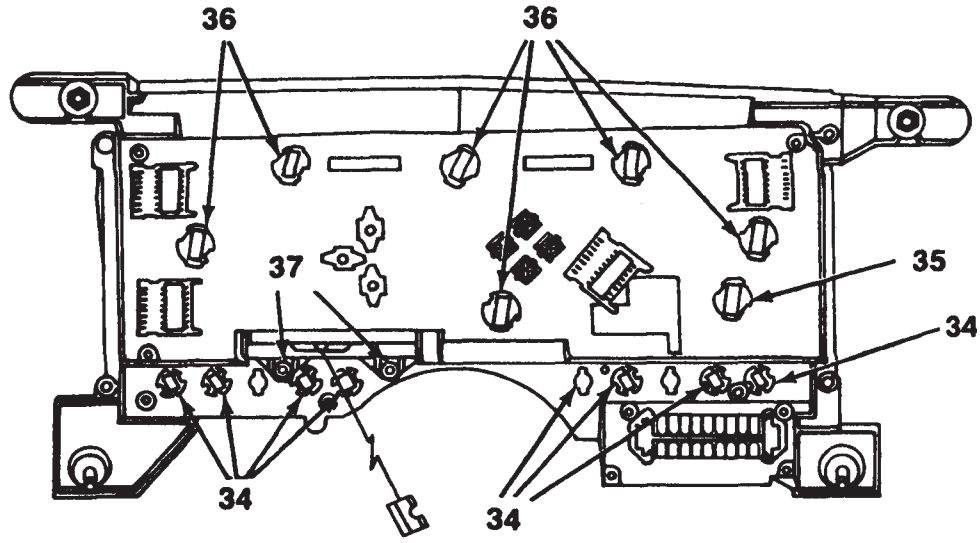
CAUTION: The radiator cap should be removed from a cool engine only. If the radiator cap is removed from a cooling system, serious personal injury may result.

This caution should be followed before removing the coolant sensor.

2. Coolant.
3. Sensor connector.
4. Sensor (81) or (92).

Install or Connect (Figures 11 and 12)

1. Sensor (81) or (92).
2. Sensor connector.
3. Coolant to proper level.
4. Negative battery cable.



34. 0.7 Candle Power #PC74
35. 2.0 Candle Power #PC194
36. #.0 Candle Power #PC168
37. Shift Indicator Mounting Screws

F6496

Figure 9—Instrument Cluster Rear (Standard)

OIL PRESSURE SENSOR REPLACEMENT

Remove or Disconnect (Figures 11 and 12)

Tool Required:
J 35748, Oil Pressure Sensor Socket

1. Negative battery cable.
2. Sensor connector.
3. Sensor (84) or (91).

Install or Connect (Figures 11 and 12)

Tool Required:
J 35748, Oil Pressure Sensor Socket

1. Sensor (84) or (91).
2. Sensor connector.
3. Negative battery cable.

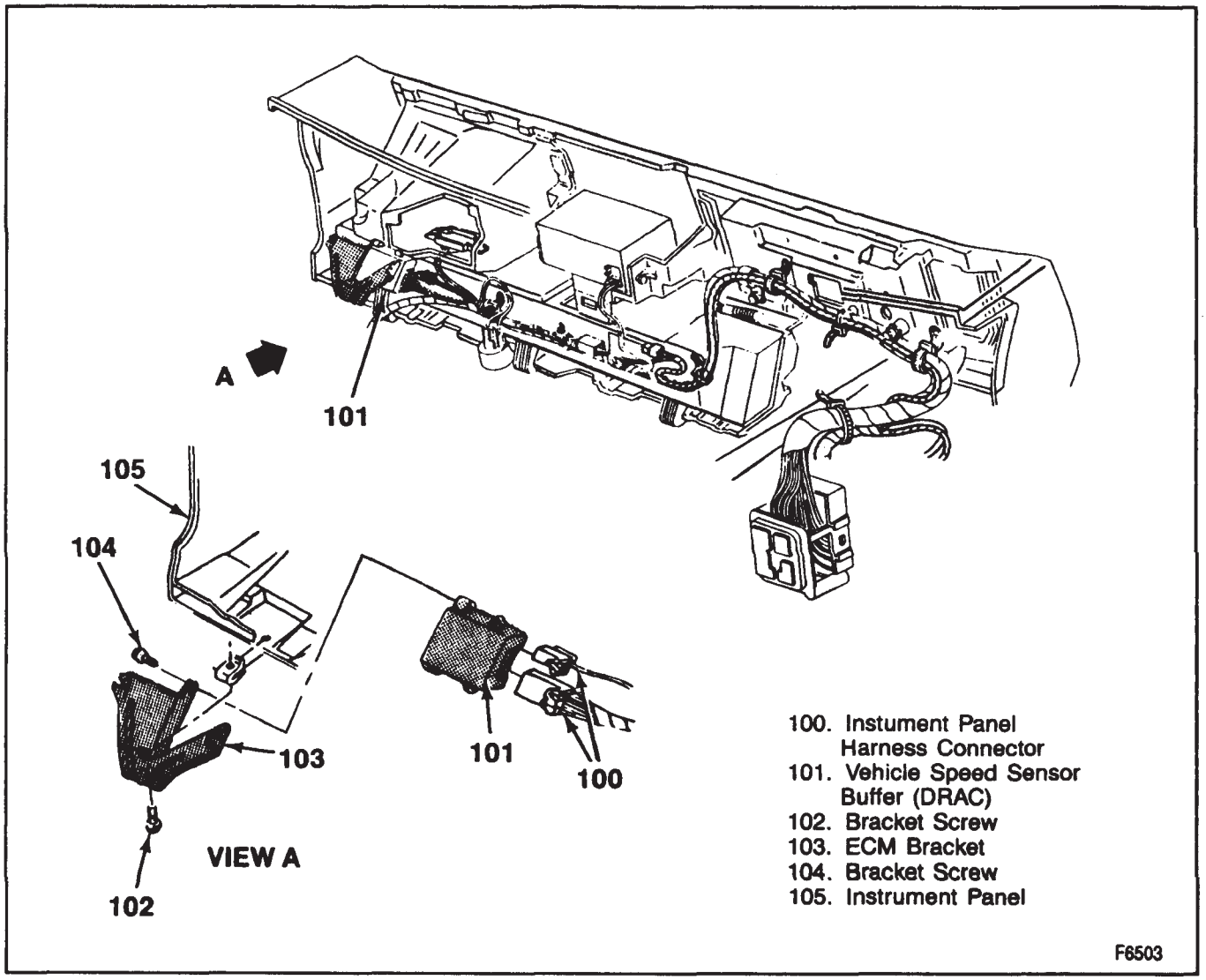


Figure 10—Vehicle Speed Sensor Buffer Replacement

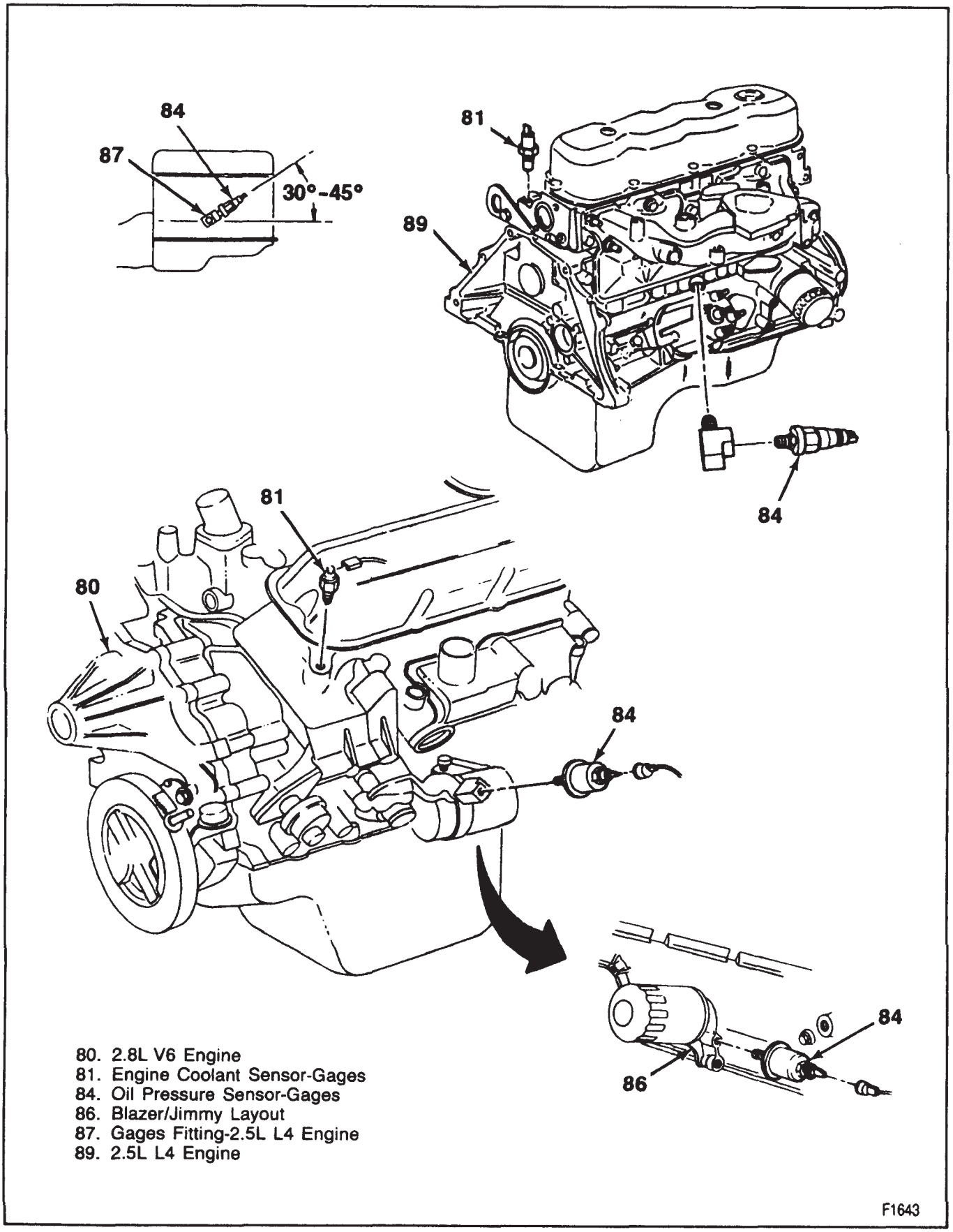
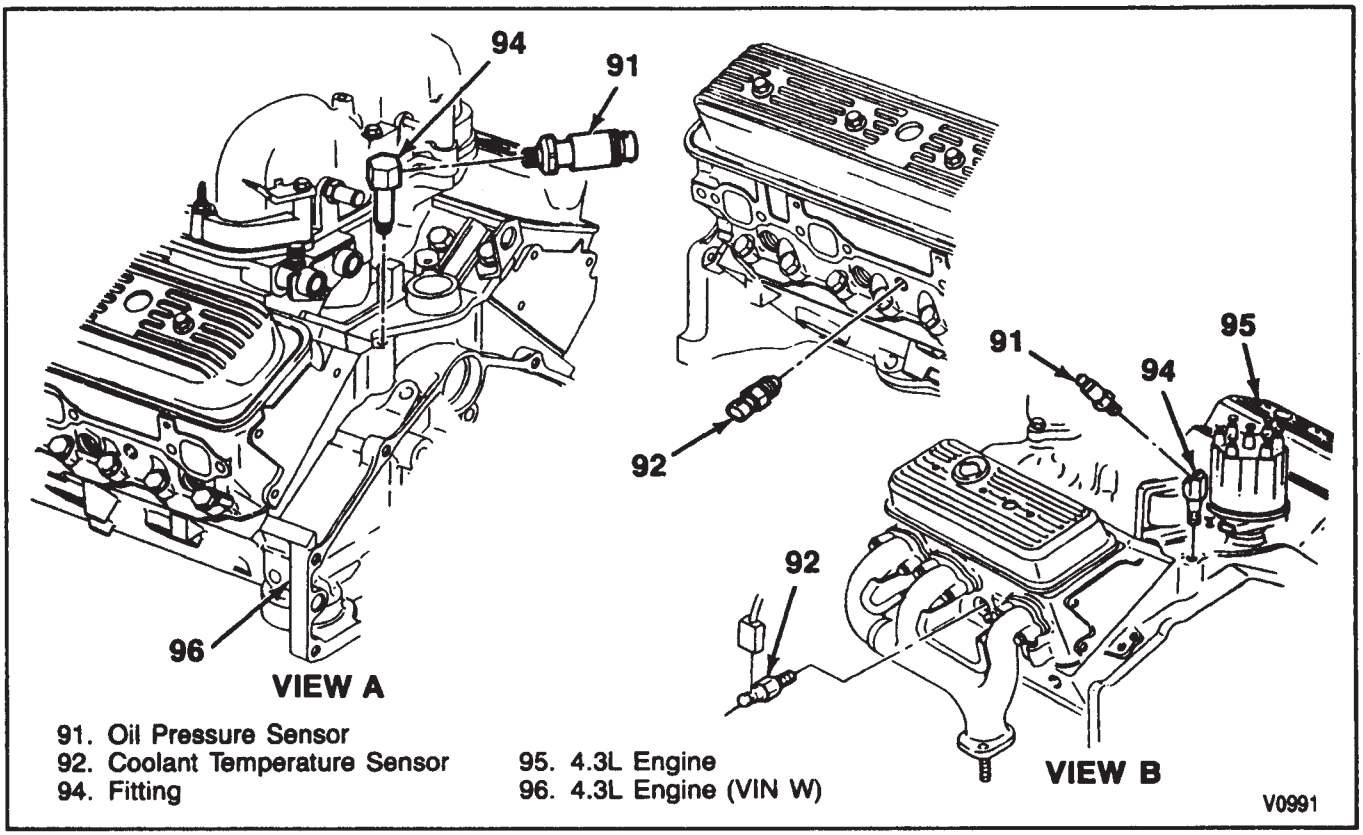


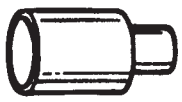
Figure 11—2.5L and 2.8L Sensor Locations

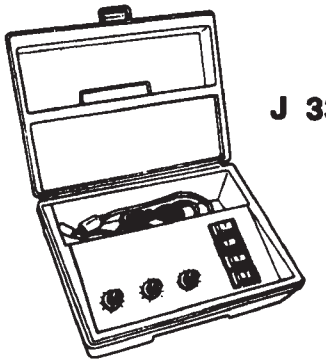


91. Oil Pressure Sensor
92. Coolant Temperature Sensor
94. Fitting
95. 4.3L Engine
96. 4.3L Engine (VIN W)

Figure 12—4.3L and 4.3L Engine (VIN W) Sensor Locations

SPECIAL TOOLS

1.  J 35748

2.  J 33431-A

1. Oil Pressure Sending Unit Socket
2. Signal Generator and Instrument Panel Tester

V2089

SECTION 8D

CHASSIS ELECTRICAL

CONTENTS

GENERAL DESCRIPTION

HORN SYSTEM

The horn system starts at the fuse block. From the fuse block, the circuit goes to the horn relay. At the horn relay, the circuit splits, one branch going through the relay coil to the horn switch in the steering column, and the other branch going through the relay contacts to the horn.

When the horn switch is closed, it provides a ground path for the horn relay coil. Current flows in the coil, closing the relay contacts. Now current flows to the horn, creating a loud sound.

The horn relay is located in the convenience center which is located under the instrument panel and on the left side of the steering column.

TRAILER WIRING

There are two types of trailer harnesses available. Option UY7 is a heavy duty trailer harness. One portion of the harness is a 30-amp fused battery feed wire from the junction block mounted on the cowl. This harness is routed along the vehicle frame rail to the rear bumper crossmember. The rest of the trailer harness is spliced from the rear lamp harness. This harness is for the brake/parking lamps, and an auxiliary power feed. The harness is located at the rear of the left frame rail, and is wrapped and bound with a plastic strip on all pickup models. The harness is located on the frame crossmember nearest the rear bumper on the utility vehicle. The wires are taped over the harness to prevent shorting of the wires.

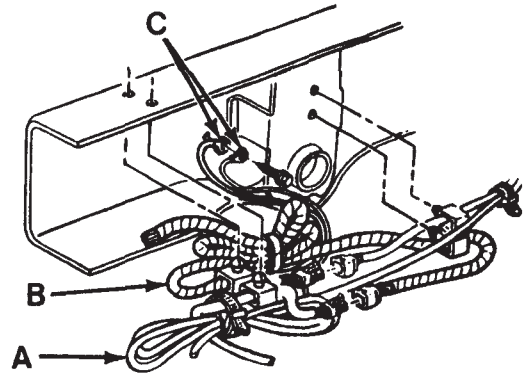
This option does not include a connector at the end of the harness, and must be wired after production by a qualified service person (figures 1, 2, and 3).

The six wires included in the harness are:

1. White—Ground.
2. Dark Blue—An auxiliary circuit. The other end of this wire is taped to the fused red wire near the junction block on the cowl.
3. Brown—Tail lamps.
4. Light Green—Back up lamps.
5. Dark Green—Right turn signal, and stop lamp.
6. Yellow—Left turn signal, and stop lamp.

The second wire (the 30-amp fused battery feed) must also be wired after production. The function of this wire may vary depending on application. This red wire is taped to prevent accidental grounding which would blow the fuse.

The second wiring harness option, U89, is also spliced from the rear lamp harness. This harness is for the brake/parking lamps and an auxiliary power feed. The harness is located at the rear of the left frame rail, and is wrapped and bound with a plastic strap on all



A. 30 Amp Fused Battery Feed Harness
B. Stop/Tail Lamp Harness
C. Ground Wires

F5800

Figure 1—Pickup Trailering Harness-Heavy Duty

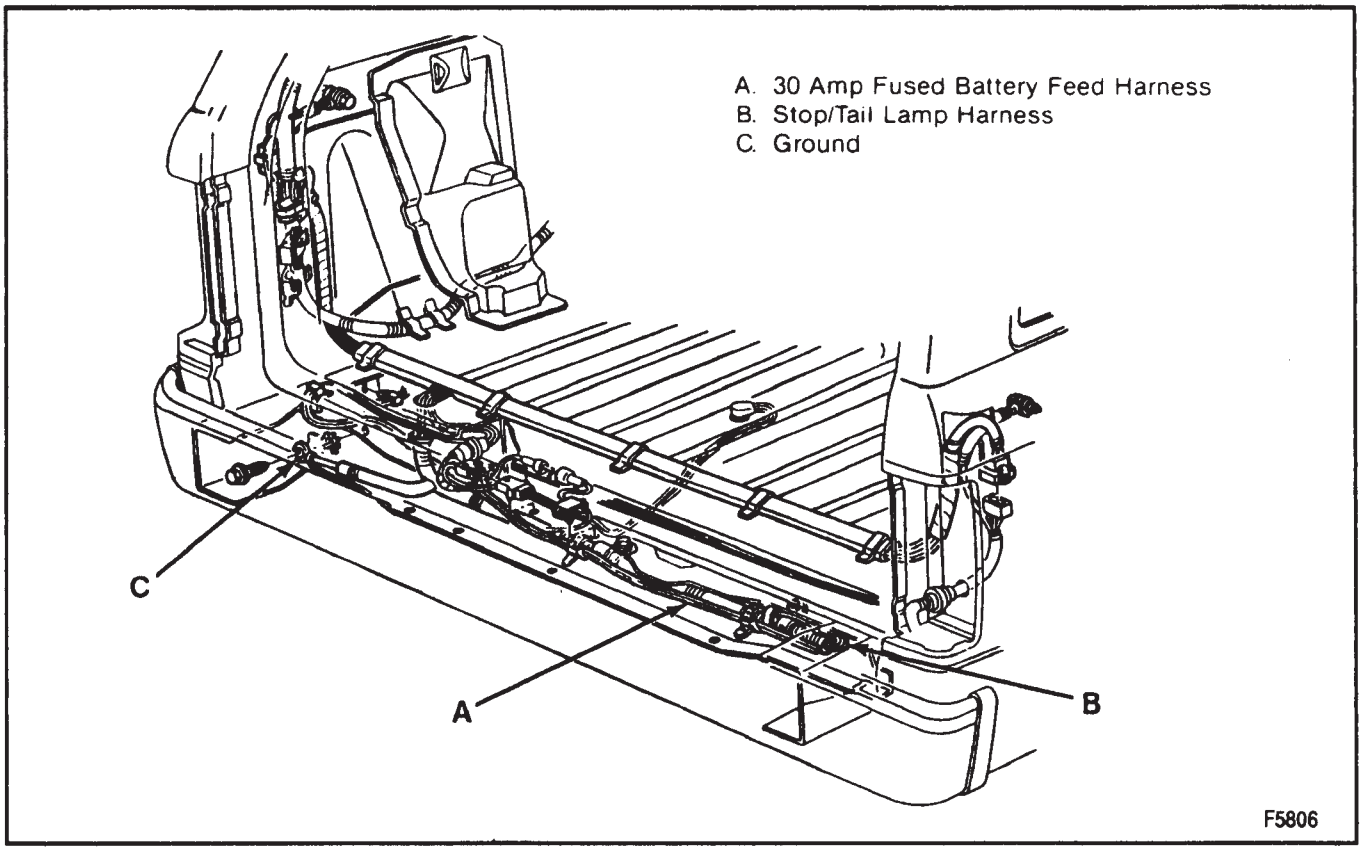


Figure 2—Utility Vehicle Trailering Harness-Heavy Duty

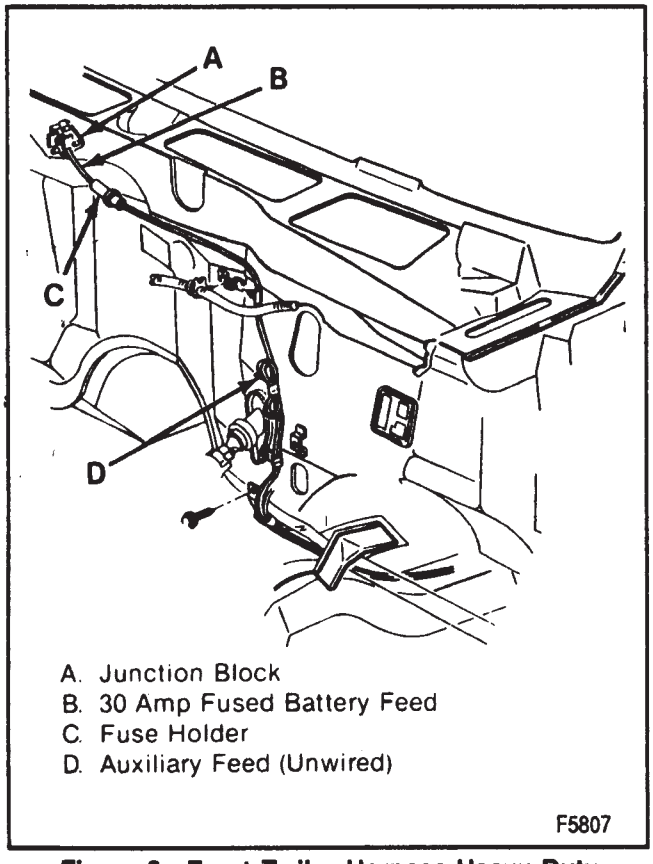


Figure 3—Front Trailer Harness-Heavy Duty

pickup models. On the utility vehicle model, the harness is attached with its own connector to the rear lamp harness connector (figures 4 and 5).

This option uses a single harness with five wires, and has both a male and female connector included with the option. The portion of the harness that includes the unattached wires, is to be connected to the trailer wiring. The functions of the wires are:

1. Dark Blue—An auxiliary circuit. The other end of this wire is taped to the body harness where it connects to the trailer harness.
2. Dark Green—Right turn signal, and stop lamp.
3. Yellow—Left turn signal, and stop lamp.
4. Brown—Tail lamps.
5. White—Ground.

The wiring harness on the utility vehicle should be routed between the endgate and the floor sill plate in such a way so as not to pinch or cut the wiring. Enough of the harness should be left on both sides of the gate to prevent the harness from being pulled by either the trailer or the body. Do not allow the harness to be so loose that it drags on the ground. Tape or strap the trailer portion of the harness (if used) to the tongue of the trailer. This will prevent the harness from dragging on the ground.

When the wiring is not being used, wrap the harness together, and bind it with a tie strap to keep it from being damaged. Store the harness behind the rear wheel well on the drivers side of the vehicle.

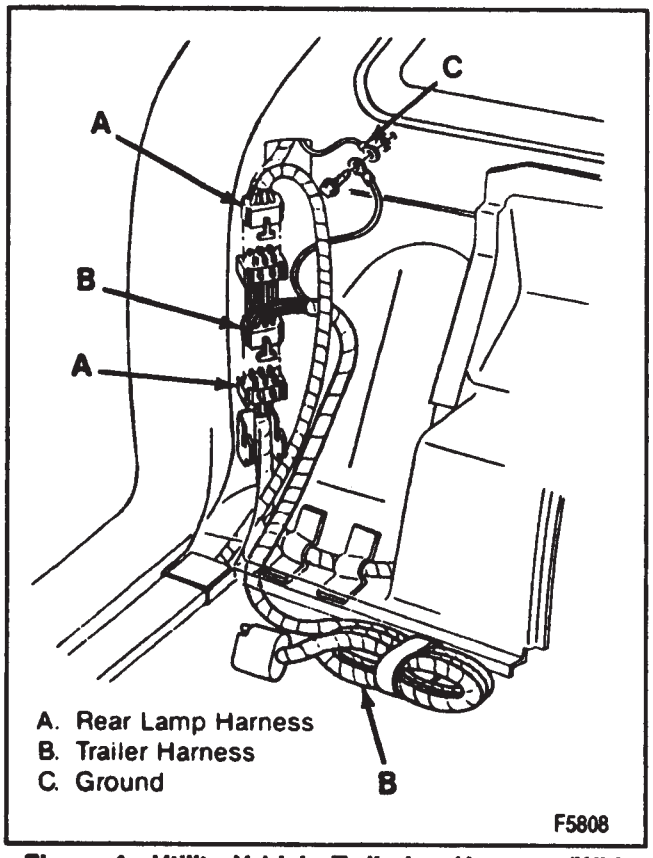


Figure 4—Utility Vehicle Trailering Harness (With Connector)

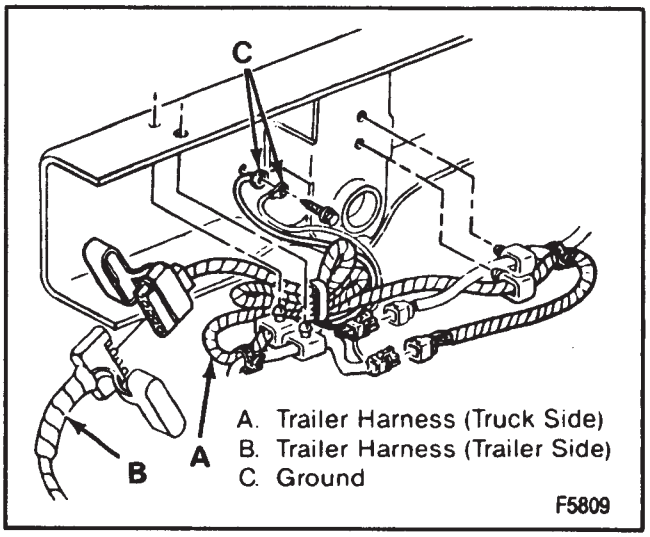


Figure 5—Pickup Trailering Harness (With Connector)

In the pick-up, the wiring should be attached to the trailer, and then strapped to the vehicle frame rail in such a way that enough slack is left in the harness to prevent bending, binding, or breakage of the wiring. Do not allow the harness to be so loose that it drags on the ground. Tape or strap the trailer portion of the harness (if used) to the tongue of the trailer. This will prevent the harness from dragging on the ground.

When the wiring is not being used, wrap the harness together, and bind it with a tie strap to keep it from being damaged. Store the harness behind the rear bumper on the left hand frame rail with a band or tie strap.

DIAGNOSIS OF THE HORN SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
Horn and Interior Lights Inoperative	1. Horn/dome lamp fuse blown.	1. Check horn/dome lamp fuse. Replace as necessary. If the new fuse blows, repair short to ground in the ORG/BLK wire from the fuse to the horn relay. If fuse blows when horn switch is depressed, repair short to ground in the GRN wire from the horn relay to the horn. If fuse continues to blow check other circuits on horn/dome lamp fuse for short to ground.
Horn Inoperative	1. Horn relay inoperative. 2. Open circuit.	1. Check for battery voltage at terminal #29 of the convenience center, relay installed, while depressing the horn switch. If (B+), relay ok. No (B+) and all other circuits known good, replace relay. 2. Check the ORN/BLK (140) wire for an open circuit between the fuse block and the convenience center. Repair as necessary. Check DK GRN wire (29) for an open circuit between the horn relay and the horn. Repair as necessary. Check BLK wire (28) and horn switch for an open circuit. Repair as necessary.
		D0112

ON-VEHICLE SERVICE

HORN REPLACEMENT

Remove or Disconnect (Figure 6)

1. Negative battery cable.
2. Wiring harness.
3. Bolt (25).
4. Horn (26).

Install or Connect (Figure 6)

1. Horn (26).

NOTICE: See "NOTICE" on page 8D-1 of this section.

2. Bolt (25).
3. Wiring harness.
4. Negative battery cable.

HORN RELAY REPLACEMENT

Refer to INSTRUMENT PANEL AND GAGES (SECTION 8C).

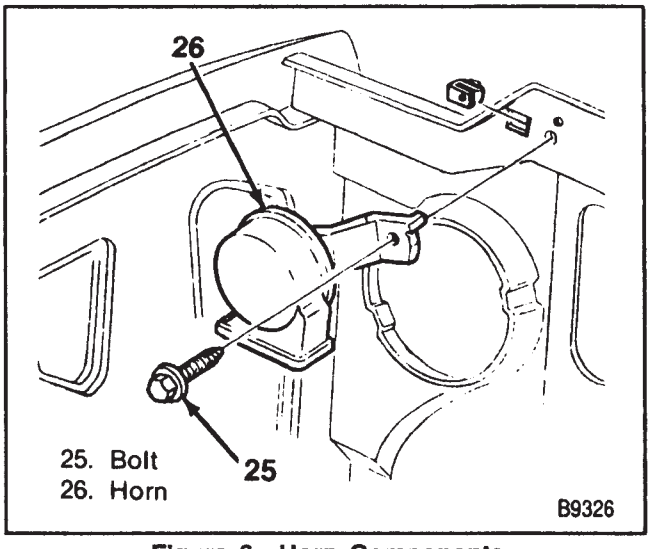


Figure 6—Horn Components

SECTION 8E

WIPER/WASHER SYSTEM

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

GENERAL DESCRIPTION

WIPER/WASHER SYSTEM (FRONT)

The wiper/washer system consists of a permanent magnet, positive-park wiper motor which is mounted on the engine side of the cowl. The motor drives a crank arm which is attached to a transmission and link assembly mounted in front of the windshield in the fresh air plenum. The transmission transfers rotary motion from the motor into reciprocating motion at the wiper drive shaft.

There are two different systems available on this truck. The base system uses a windshield wiper motor that has a high, low, and mist mode. The optional motor includes a pulse mode as well as the modes available with the base motor.

The components of this system are:

1. The turn signal lever.
2. The wiring harness from the turn signal lever to the wiper motor.
3. The wiper motor.

The pulse systems has in addition, an integrated circuit board and a variable resistor (rheostat) in the turn signal switch to control the rate of pulse to the wiper motor circuit board.

WIPER MOTOR OPERATION

Internal parts of the wiper motor assembly, field magnet, armature, drive gear, park switch actuator and brush holding assembly are enclosed in an aluminum

die cast housing with a plastic cover. The housing and cover are attached to each other by seven rivets. The wiper is equipped with a radio frequency interference suppressor which is located in the terminal connector on the wiper motor. A strap is attached to one of the motor bolt hole grommets to provide a ground for the suppressor. The motor is protected by an automatic reset type circuit breaker located on the motor brush holder assembly. A fuse located in the fuse block protects the vehicle wiring.

As shown in figure 1, the base wiper motor has three brushes which are referred to as off, low speed and high speed. When the ignition switch is on, 12V-plus circuit is completed to both the low and high speed fixed contacts in the column switch. The low and high speed brushes are connected to the column switch through terminals 2 and 1. The armature is grounded through the common brush via the ground strap.

LOW AND HIGH SPEED CIRCUITS (BASE MODEL)

Moving the column switch to the low or high speed position completes the respective brush circuit to 12V-plus at the column switch so the wiper motor runs at that speed.

When the wiper is turned off at the column switch, in order to have the blades stop in their normal park position and the wiper motor shut off properly, the motor operates in low speed. This is accomplished as follows: with the column switch in the OFF position, the low speed brush circuit is completed to 12V-plus at the column switch through a park switch located on the brush assembly (terminals 3 and 4). The park switch contacts are normally closed and this permits the wiper to continue to run.

When the blades reach their park position, a cam on the large gear moves the park switch actuator that open the normally closed positive park switch and grounds the wiper motor. This accomplishes a reversal of the motor flux path which causes a no-coast positive park, shutting off the wiper.

WASHER PUMP OPERATION

Actuating the washer portion of the column switch completes the washer pump motor circuit to ground and mechanically moves the wiper switch to the low speed position. This dual function starts the wiper motor and washer operation at the same time. The washer pump runs only while the washer switch is activated.

The washer pump consists of a permanent magnet motor and pump assembly that is mounted to the top of the washer reservoir. The wiper motor can be operated only when the ignition switch is in the "RUN" or "Accessory" position.

DELAY WIPER SYSTEM

The pulse wiper system can be diagnosed in one of two ways. The system can be diagnosed by testing the harness and the switch with a volt-ohmmeter, and the motor with a series of voltages and resistances for each mode, or by using J 34660 Windshield Wiper Systems Tester. The special tool will duplicate all the test parameters necessary for diagnosing the operation of the windshield wiper motor.

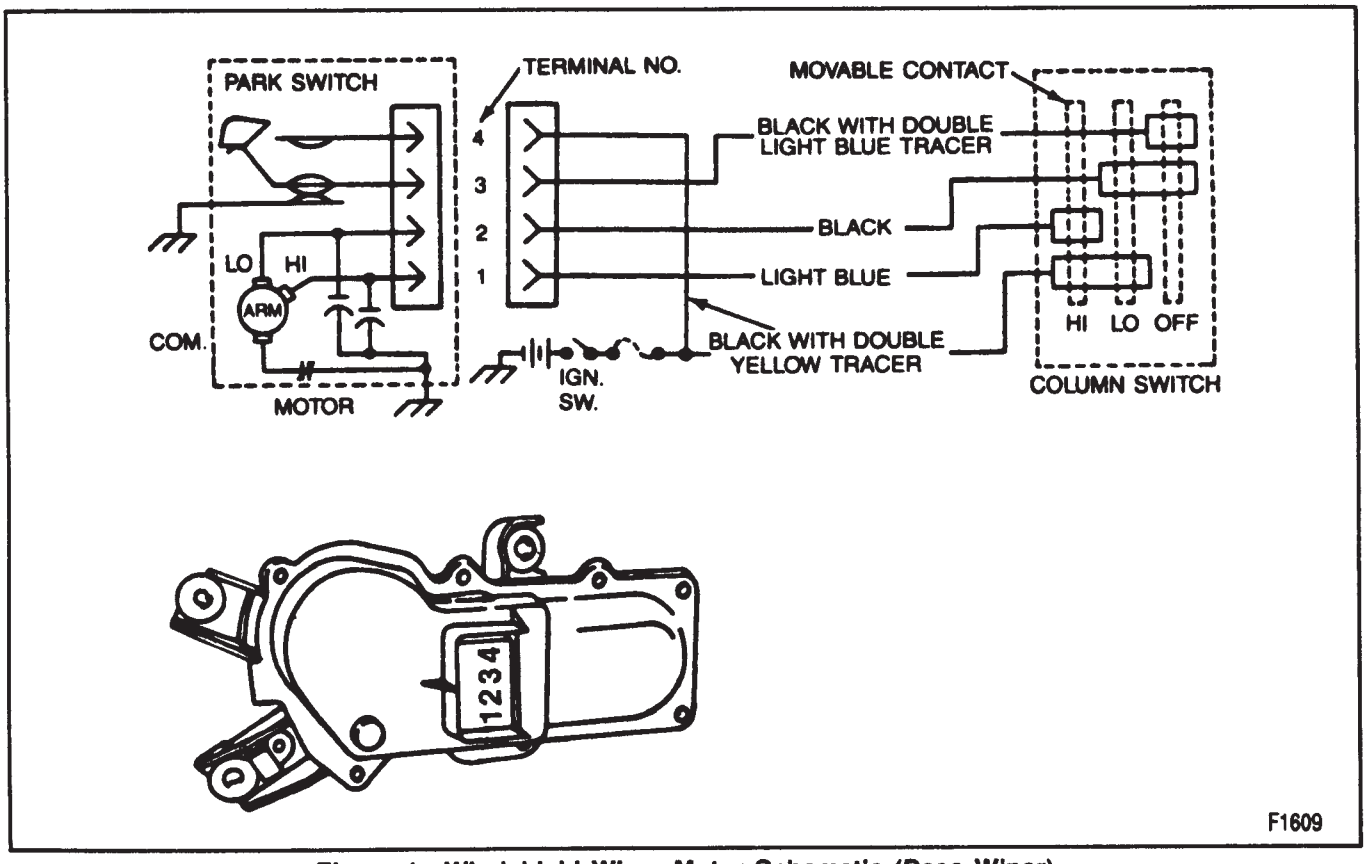


Figure 1—Windshield Wiper Motor Schematic (Base Wiper)

WIPER SWITCH AND HARNESS TEST

To check the multi-function switch and harness from the switch to the wiper motor remove the connector from the wiper motor, and measure the voltages from the connector pins to ground using a volt-ohmmeter. Place the ignition switch in "RUN" and check the operation of the switch in the different modes. Refer to figure 2 for the proper operating parameters for the different switch modes. If the switch does not produce the voltages given in figure 2, remove the connector from the switch, and check for the proper voltage at the switch. If the proper voltage cannot be obtained at the switch, check for power to the switch. If there is power to the switch, then replace the switch.

If the voltages at the switch are correct, then locate and repair the short or open in the wiring harness between the switch, and the motor.

WIPER MOTOR TEST

There are two ways to test the wiper motor. The first way is to set up a power supply and resistance framework as shown in figure 3. This set of voltages and resistances when applied to the different pins of the motor will cause the motor to run in its operating modes.

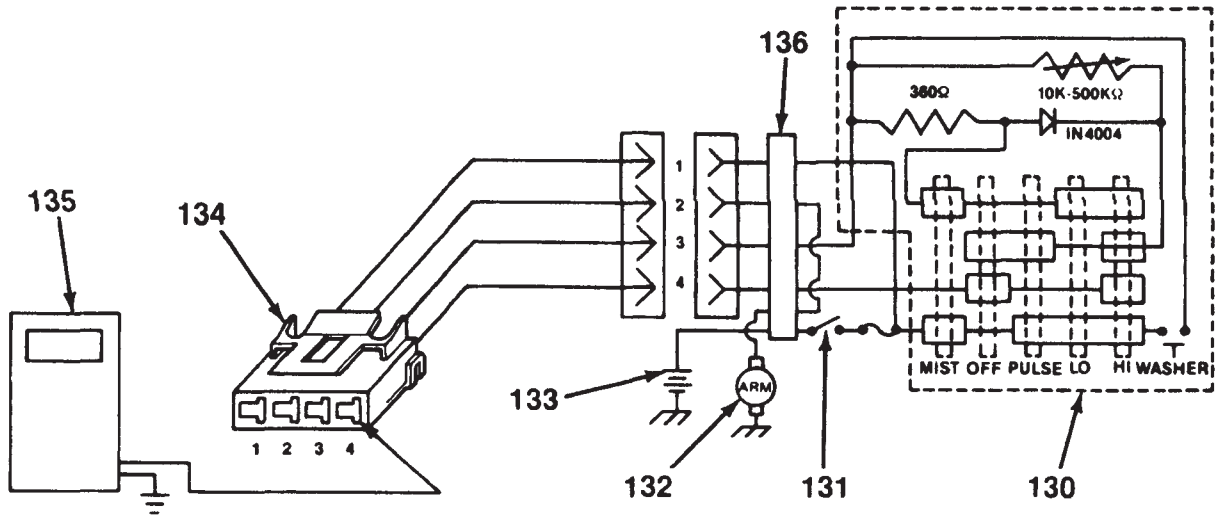
The second way to test the motor is by using J 34660-A Windshield Wiper Tester J 34660-A is set up to duplicate the parameters in figure 3. By plugging the proper adapter into the motor, all of the modes of the wiper motor operation can be checked, (figures 2 through 12).

After choosing one of the above systems, test the motor. If a problem with the motor is discovered, replace the circuit board with a known good board. If the motor does not operate properly, repair or replace the motor.

BASE WIPER SYSTEM

The diagnostic procedures covered in this portion of the section are for diagnosis of the system with a test light. If the Universal Wiper System Tester J 25079-B is used, follow the instructions contained in the tool in order to diagnose the system.

Before starting the diagnosis, confirm the reported condition by completely checking the operation of the wiper and the washer systems. Then, match the condition with the conditions listed on the charts in figures 2 through 12.



SWITCH MODE / TERMINAL #	MIST	OFF	PULSE OR DELAY	LO	HI	WASH (while in off)
1	B(+)	B(+)	B(+)	B(+)	B(+)	B(+)
2	0V	0V	0V	0V	0V	0V
3	B(+)	0	B(+)	B(+)	B(+)	B(+)
4	0V	0V	0V	0V	B(+)	0V

130. Multi-Function Switch
131. Ignition Switch
132. Washer Pump
133. Battery
134. Harness
135. Volt-Ohmmeter
136. Bulkhead Connector

F5713

Figure 2—Wiper Switch Mode Test

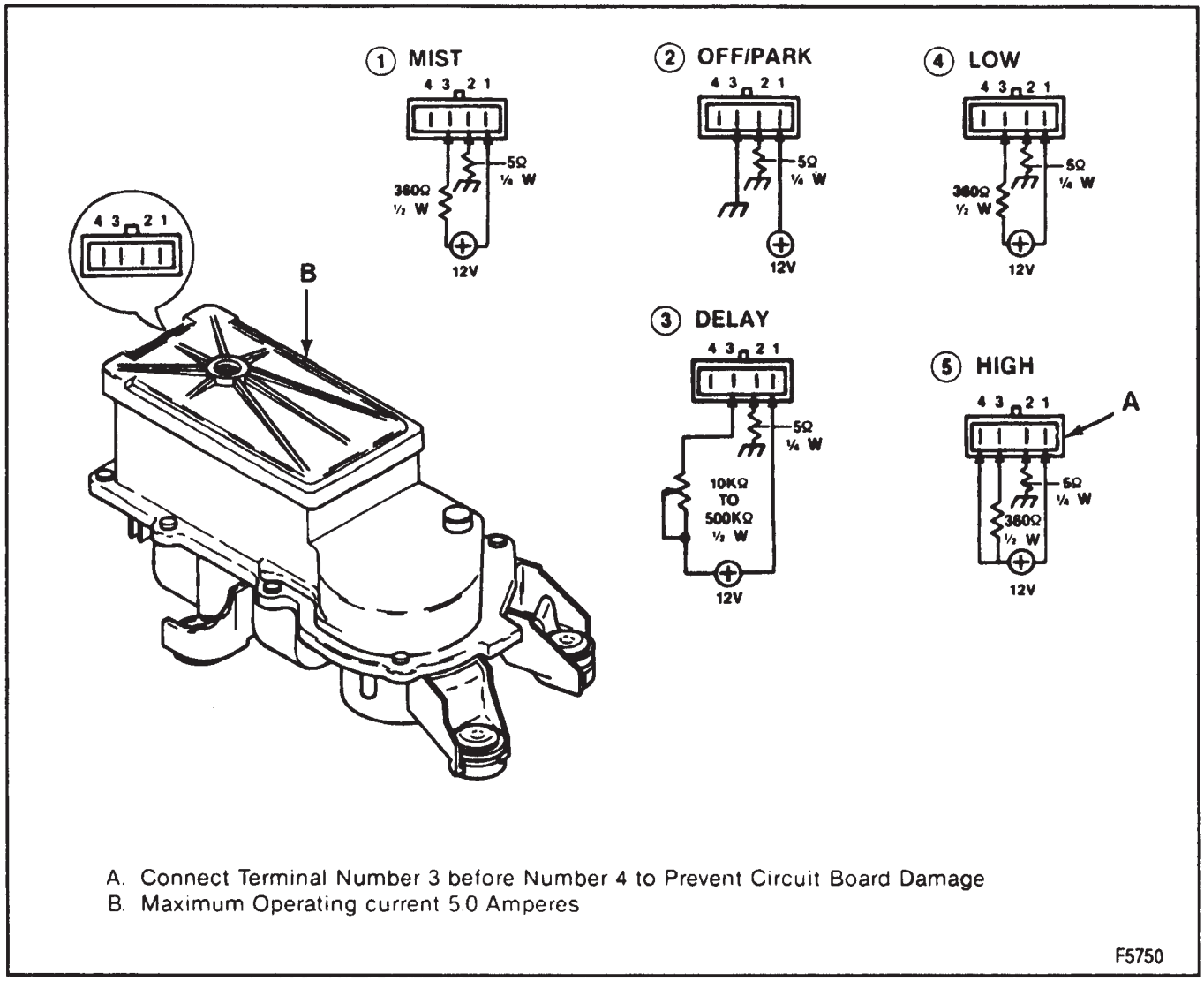


Figure 3—Wiper Motor Test

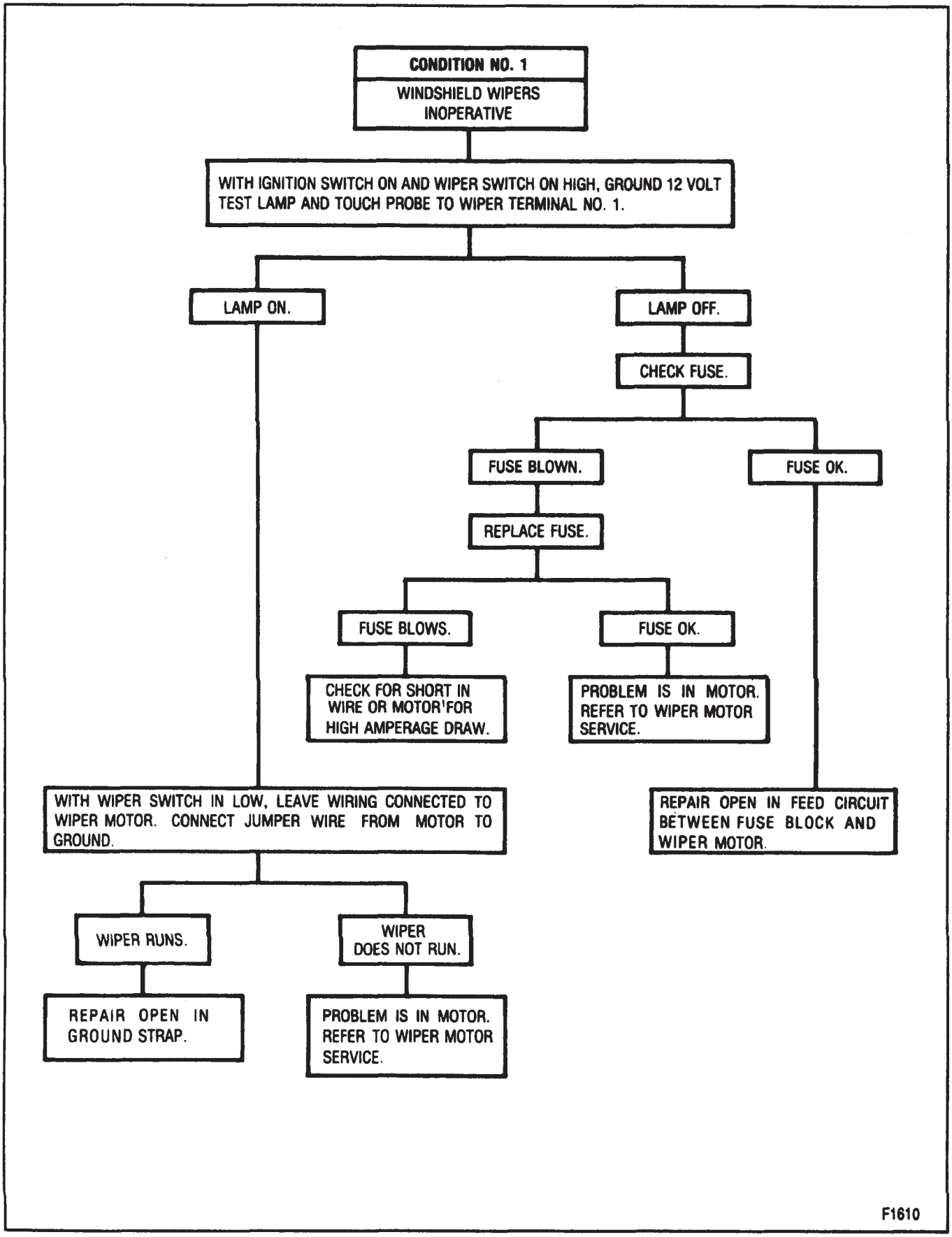


Figure 4—Wiper System Diagnosis (Base Wiper)

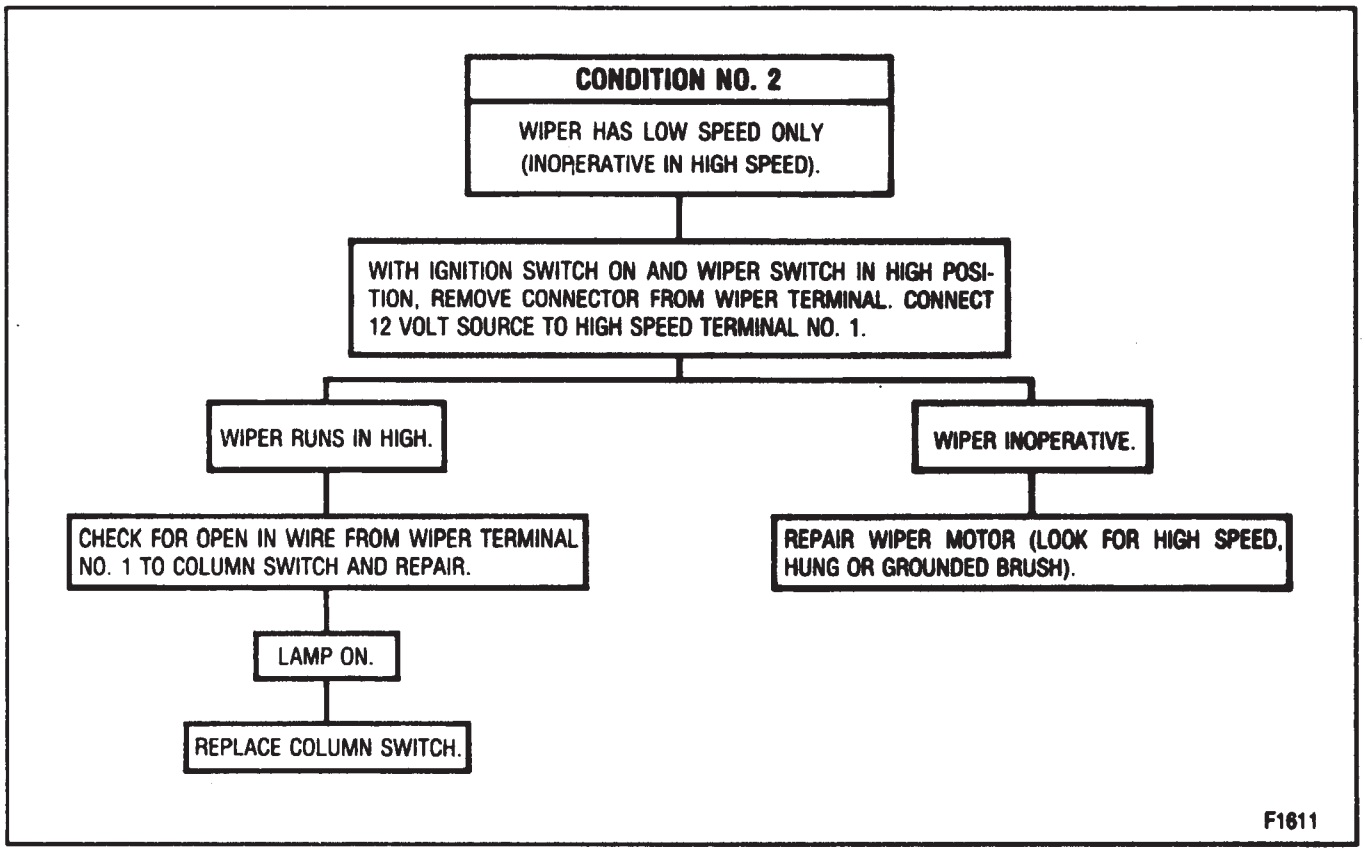


Figure 5—Wiper System Diagnosis (Base Wiper)

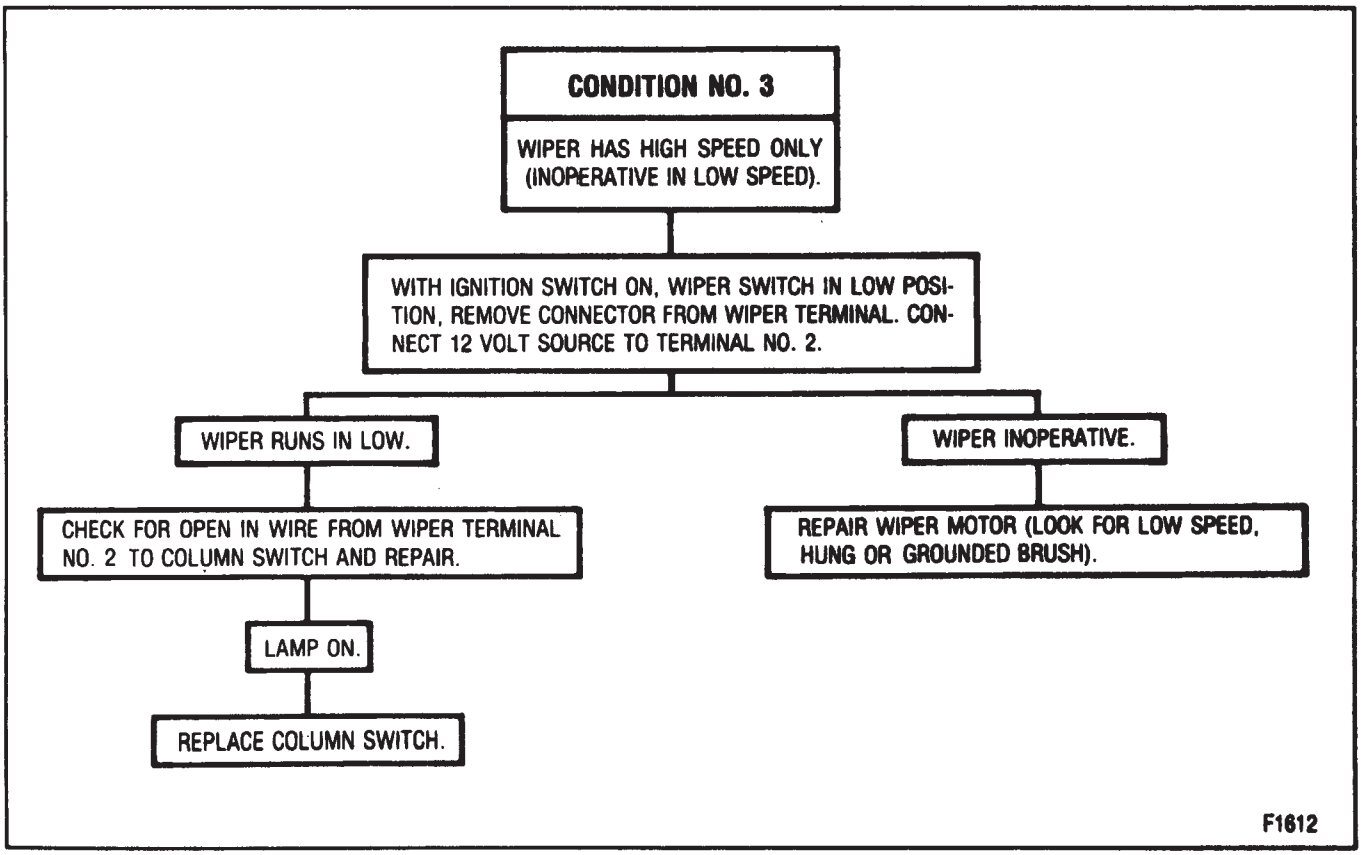


Figure 6—Wiper System Diagnosis (Base Wiper)

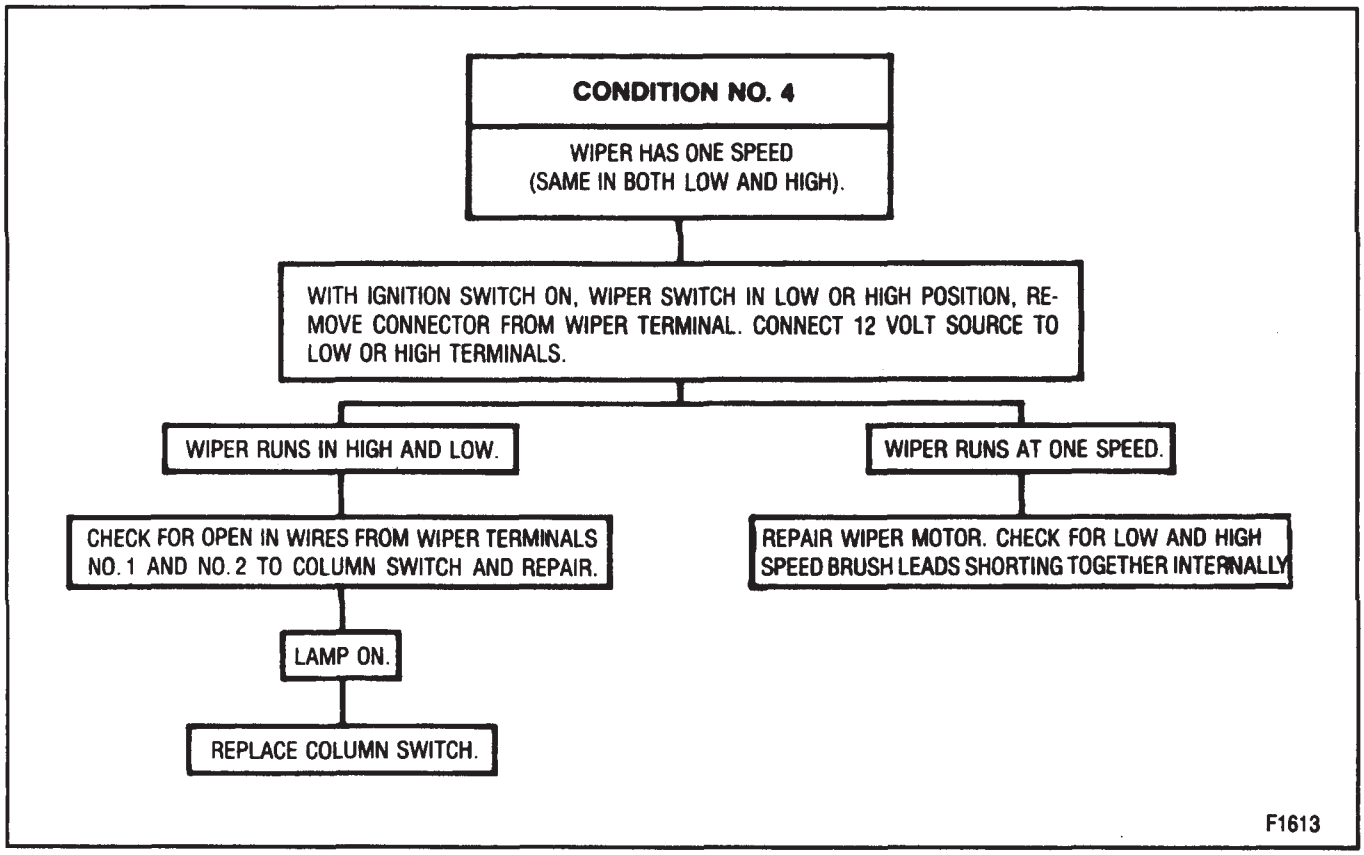


Figure 7—Wiper System Diagnosis (Base Wiper)

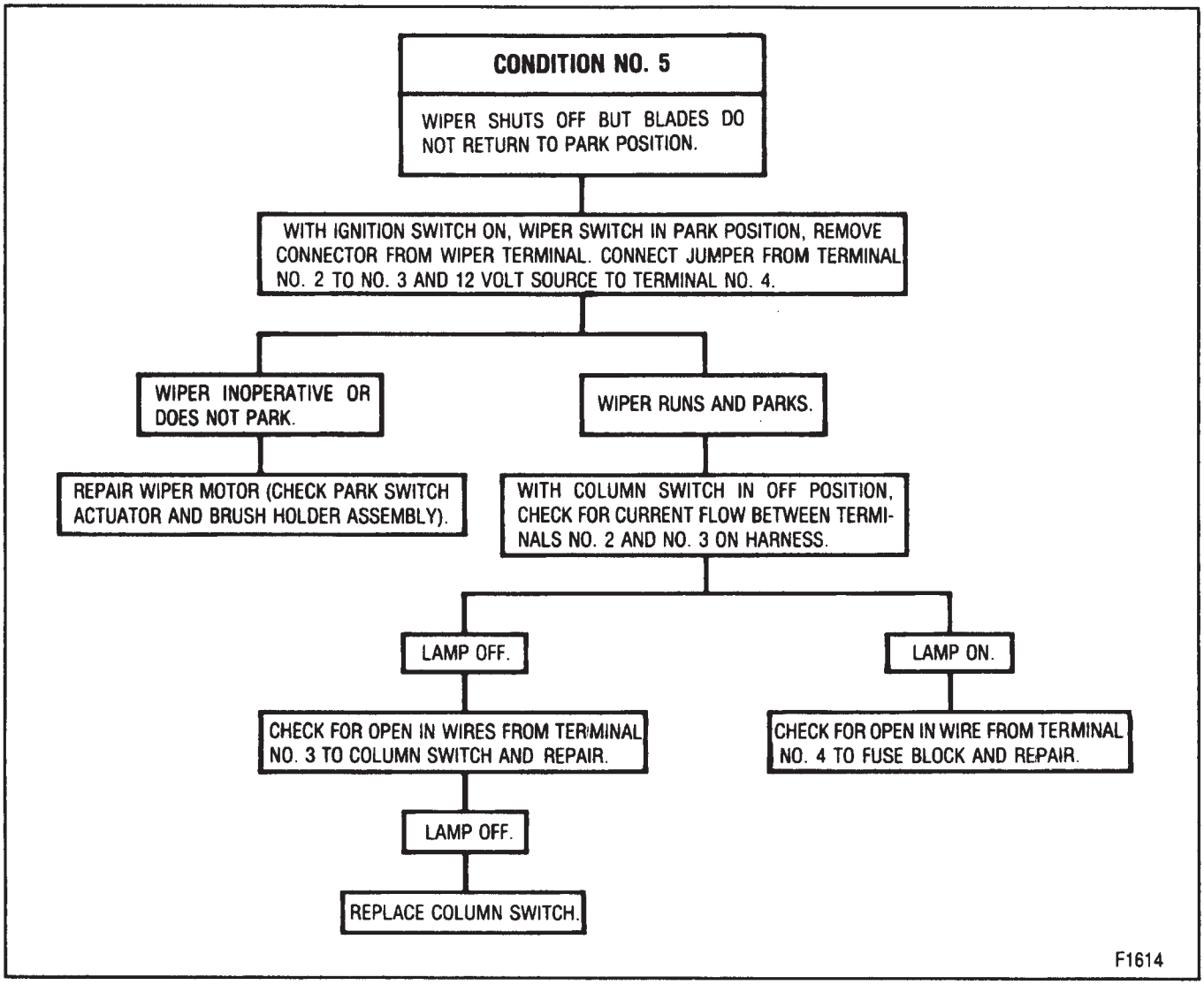


Figure 8—Wiper System Diagnosis (Base Wiper)

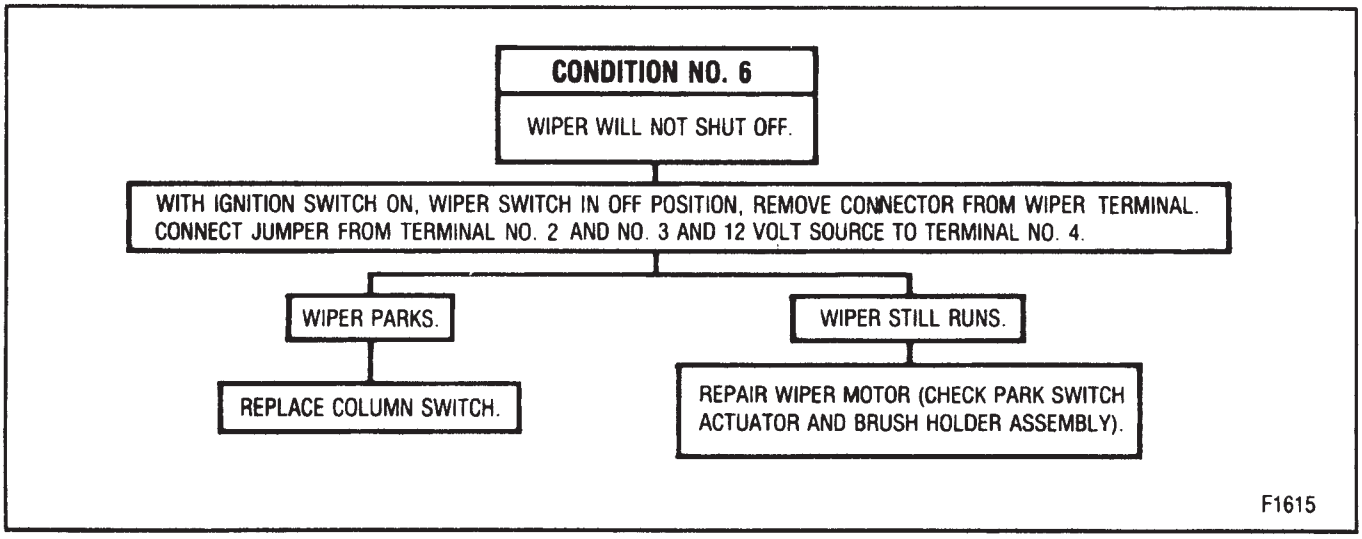


Figure 9—Wiper System Diagnosis (Base Wiper)

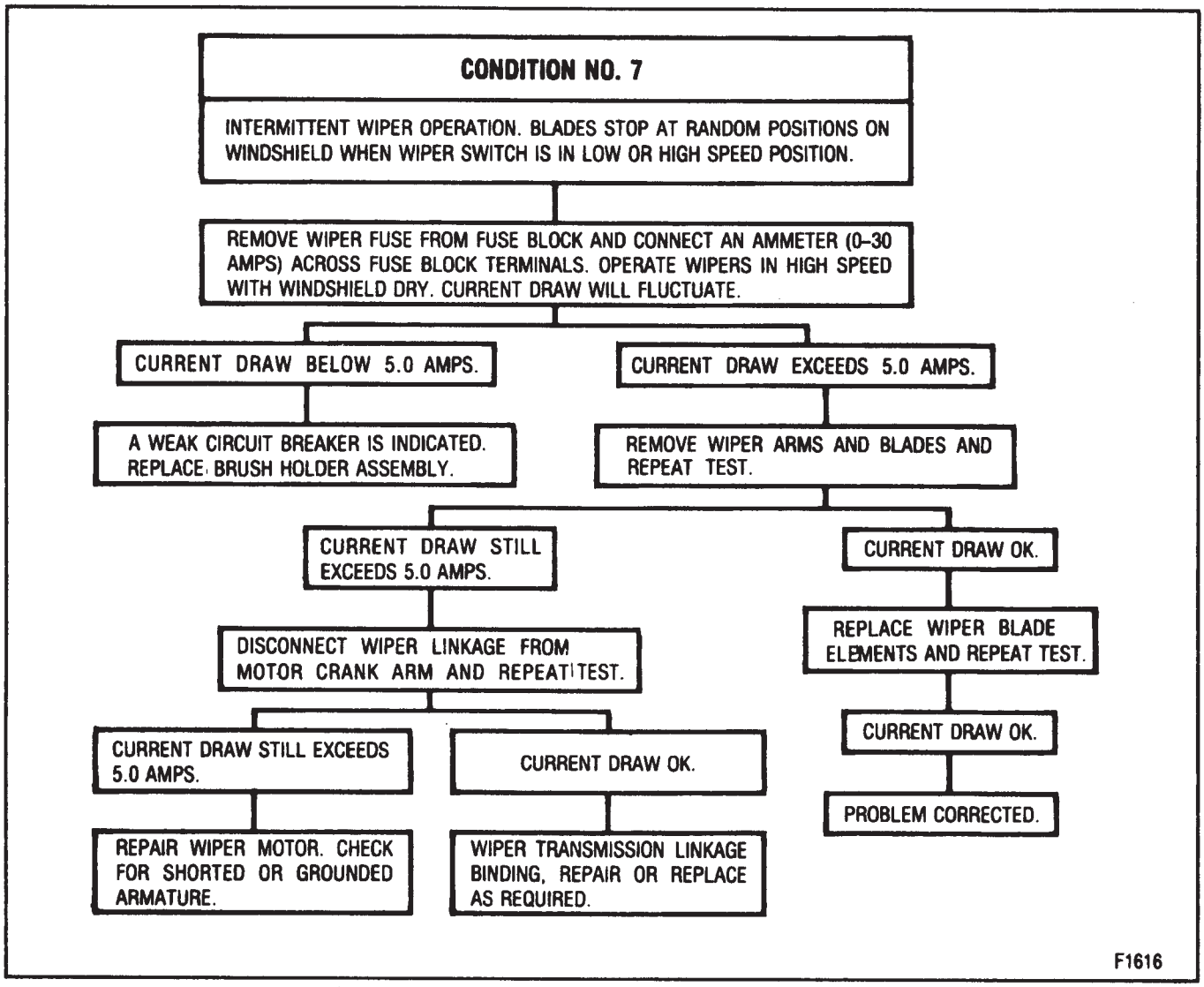


Figure 10—Wiper System Diagnosis (Base Wiper)

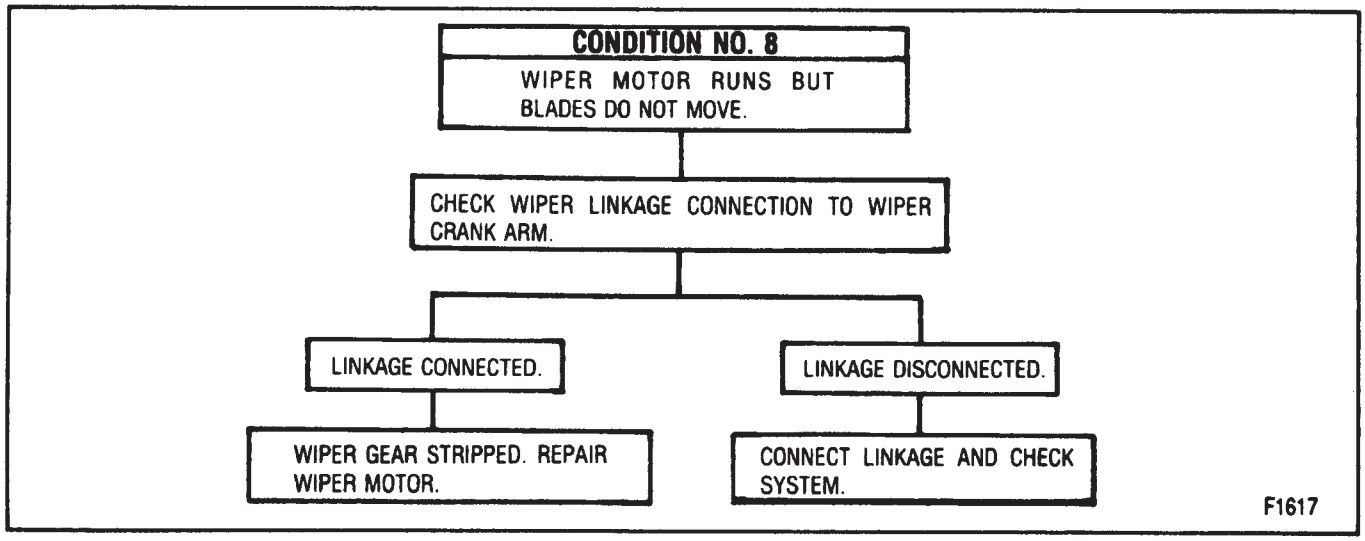


Figure 11—Wiper System Diagnosis (Base Wiper)

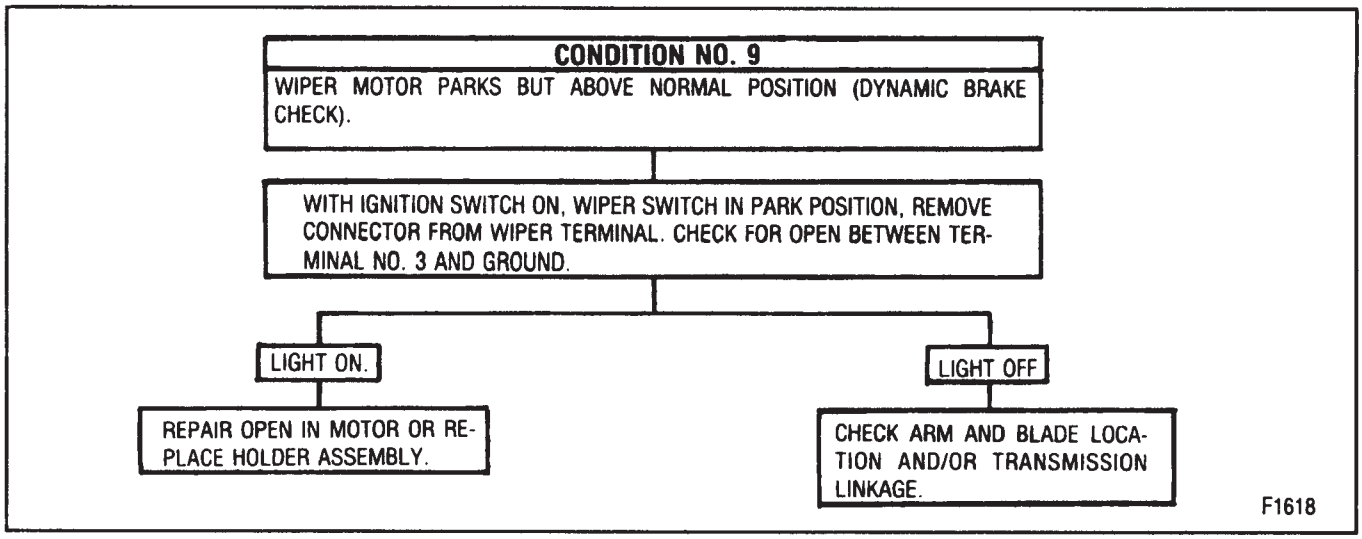


Figure 12—Wiper System Diagnosis (Base Wiper)

DIAGNOSIS OF THE WIPER/WASHER SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
Wiper Motor Inoperative	1. No power to the switch. 2. No power to the wiper motor. 3. Binding linkage. 4. Broken wiper motor.	1. Check the fuse for the wiper. Replace if necessary. 2. Do the mode test in figure 20. If the switch and harness fail the mode test, check the harness for shorts or opens. If the harness is O.K., replace the switch. 3. Disconnect the motor linkage, and retry the motor. 4. Check the wiper motor using the motor testing procedure or J 34660-A. Repair or replace the wiper motor if necessary.
Wiper Motor Will Not Shut Off	1. Inoperative circuit board. 2. Inoperative park switch.	1. Replace the circuit board. 2. Check the park switch for operation and replace if necessary.
Wiper Has High Speed and Delay	1. Improper voltage from the multi-function switch. 2. Inoperative circuit board. 3. Broken wiper motor.	1. Do the mode test in figure 20. If the switch and harness fail the mode test, check the harness for shorts or opens. If the harness is O.K., replace the switch. 2. Replace the circuit board. 3. Check the wiper motor using the motor testing procedure or J 34660-A. Repair or replace the wiper motor if necessary.
Wiper Has High Speed Only. No Delay.	1. Inoperative circuit board 2. Broken wiper motor.	1. Replace the circuit board. 2. 34660-A. Repair or replace the wiper motor if necessary.
Wiper Operates In All Modes But Delay	1. Inoperative circuit board. 2. Improper voltage from the multi-function switch.	1. Replace the circuit board. 2. Do the mode test in figure 20. If the switch and harness fail the mode test check the harness for shorts or opens. If the harness is O.K., replace the switch.
Wiper Does Not Delay Between Wipes	Inoperative circuit board.	Replace the circuit board.

DIAGNOSIS OF THE WIPER/WASHER SYSTEM (cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Wiper Operates Intermittently	1. Broken wiper motor. 2. Inoperative circuit board. 3. Stripped gear train.	1. Check the wiper motor using the motor testing procedure, or J 34660-A. Repair or replace the wiper motor if necessary. 2. Replace the circuit board. 3. Check the gear train, replace if necessary.
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ON-VEHICLE SERVICE

WIPER MOTOR REPLACEMENT

Remove or Disconnect (Figure 13)

1. Negative battery cable.
2. Windshield wiper arms.
3. Cowl vent grille.
4. Cowl vent screen.
   - Mark the position of the wiper motor arm.
5. Wiper motor arm nut.
6. Wiper motor arm.
7. Wiper motor wiring harness.
8. Wiper motor bolts (74).
9. Wiper motor (73) from the vehicle.

Install or Connect (Figure 13)

1. Wiper motor (73) to the vehicle.

NOTICE: For steps 2 and 5, see "Notice" on page 8E-1 of this section.

2. Wiper motor bolts (74).
3. Wiper motor wiring harness.
4. Wiper motor arm.
   - Install the arm in alignment with the previously made mark.
5. Wiper motor arm nut.
6. Cowl vent screen.
7. Cowl vent grille.
8. Windshield wiper arms.
9. Negative battery cable.

TRANSMISSION REPLACEMENT

Remove or Disconnect (Figure 13)

1. Negative battery cable.
2. Windshield wiper arms.
3. Cowl vent grille.
4. Link to motor arm nuts.
5. Transmission link (62) from the motor arm.
6. Transmission to cowl screws.
7. Transmission (62) from the vehicle.

Install or Connect (Figure 13)

1. Transmission (62) to the vehicle.

NOTICE: For steps 2 and 4, see "Notice" on page 8E-1 of this section.

2. Transmission to cowl screws.
3. Transmission link (62) to the motor arm.
4. Link to motor arm nuts.
5. Cowl vent grille.
6. Windshield wiper arms.
7. Negative battery cable.

HOUSING REPLACEMENT

Remove or Disconnect (Figures 14 and 15)

1. Rivets that attach the housing cover to the housing.
   - Drill out the seven rivets.
2. Screw (105).
3. Circuit board cover (104).
4. Printed circuit board (103).
   - Lift the outboard end of the board to disengage the terminal clips at the inboard end.
5. Housing cover (77).
6. Prevailing torque nut (93).
   - Place the crank arm in a vise to prevent damage to the gears.

Important

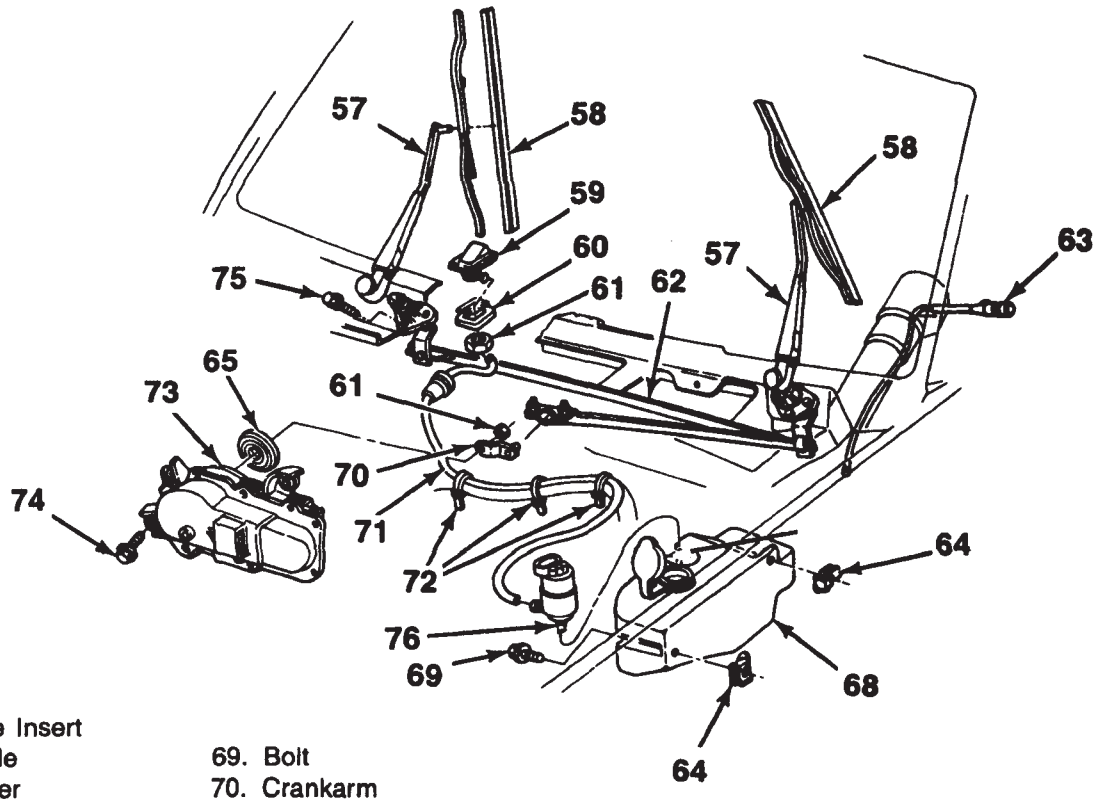
- Mark the output shaft of the gear assembly in relation to the ball crank arm.

7. Crank arm (94), shaft seal (95), retaining ring (99), thrust collar (96), and flat washer (97).

Important

- To prevent scoring of the housing (77) bearing, check the shaft of the gear assembly (79) for burrs at the retaining ring groove and crank arm seat. Remove any burrs if found.

8. Gear assembly (79) and washer (80).



57. Arm
58. Blade Insert
59. Nozzle
60. Spacer
61. Nut
62. Transmission
63. Lever
64. U-nut
65. Seal
68. Reservoir
69. Bolt
70. Crankarm
71. Hose
72. Connector
73. Motor Assembly
74. Bolt
75. Screw
76. Pump

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Figure 13—Wiper System Components

9. Spring washer (107), washer (82), intermediate gear (86), and washer (80).
10. Park switch actuator (89).

Important

- When drilling, use care not to get metal chips in the motor.

11. Bearing strap rivets from the motor by drilling.
12. Bearing straps (83) and (100).
13. Screws (88) attaching the armature/brush assembly (98).
14. Bearing (84), magnet assembly (85) and armature/brush assembly (98).
15. Grommets (101) and ground strap assembly (106) by drilling.

Important

- Use care when drilling out the thrust pin so as not to damage the casting threads.

16. Thrust pin (102).
    - Drill or pry the pin from the motor.

Install or Connect (Figures 14 and 15)

1. Grommets (101) and ground strap assembly (106) with self-tapping screw.
2. Bearing (84), magnet assembly (85) and armature/brush assembly (98).

NOTICE: For steps 3, 10, 11, and 14 see "Notice" on page 8E-1 of this section.

3. Screws (88) attaching the armature/brush assembly (98).
4. Bearing straps (83) and (100).
5. Bearing strap with self-tapping screws.
6. Park switch actuator (89).
7. Spring washer (107), washer (82), intermediate gear (86), and washer (80).
8. Gear assembly (79) and washer (80).
9. Crank arm (94), shaft seal (95), new retaining ring (99), thrust collar (96), and flat washer (97).

10. Prevailing torque nut (93).

Tighten

- Prevailing torque nut to 42 N.m (31 ft. lbs.) with the crank arm in a vise.

11. Housing cover (77) using self-tapping screws.

Important

- When assembling the printed circuit board (103), make sure the terminal clips fully engage all five terminals of the brush assembly.

12. Printed circuit board (103).
13. Circuit board cover (104).
14. Screw (105).
15. New thrust pin (102).
    - Press the pin into the housing as shown in figure 19.

ARMATURE/BRUSH ASSEMBLY REPLACEMENT

Remove or Disconnect (Figures 14 through 19)

1. Rivets that attach the housing cover to the housing.
   - Drill out the seven rivets.
2. Screw (105).
3. Circuit board cover (104).
4. Printed circuit board (103).
   - Lift the outboard end of the board to disengage the terminal clips at the inboard end.

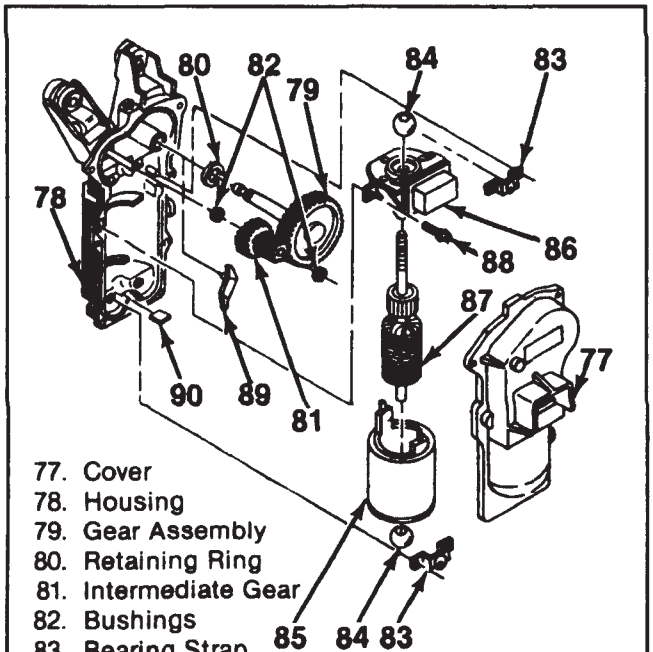


Figure 14—Wiper Motor Components (Base Wiper)

5. Housing cover (71).
6. Prevailing torque nut (93).
   - Place the crank arm in a vise to prevent damage to the gears.

Important

- Mark the output shaft of the gear assembly in relation to the ball crank arm.

7. Crank arm (94), shaft seal (95), retaining ring (99), thrust collar (96), and flat washer (97).

Important

- To prevent scoring of the housing bearing, check the shaft of the gear assembly (79) for burrs at the retaining ring groove and crank arm seat. Remove any burrs if found.

8. Gear assembly (79) and washer (80).
9. Spring washer (107), washer (82), intermediate gear (86), and washer (80).
10. Park switch actuator (89).

Important

- When drilling, use care not to get metal chips in the motor.

11. Bearing strap rivets from the motor by drilling.
12. Bearing straps (83) and (100).
13. Screws (88) attaching the armature/brush assembly (98).
14. Bearing (84), magnet assembly (85) from the armature/brush assembly.

Install or Connect (Figures 14 through 19)

1. Magnet assembly (85) on the new armature/brush assembly (98).
2. Bearing (84).

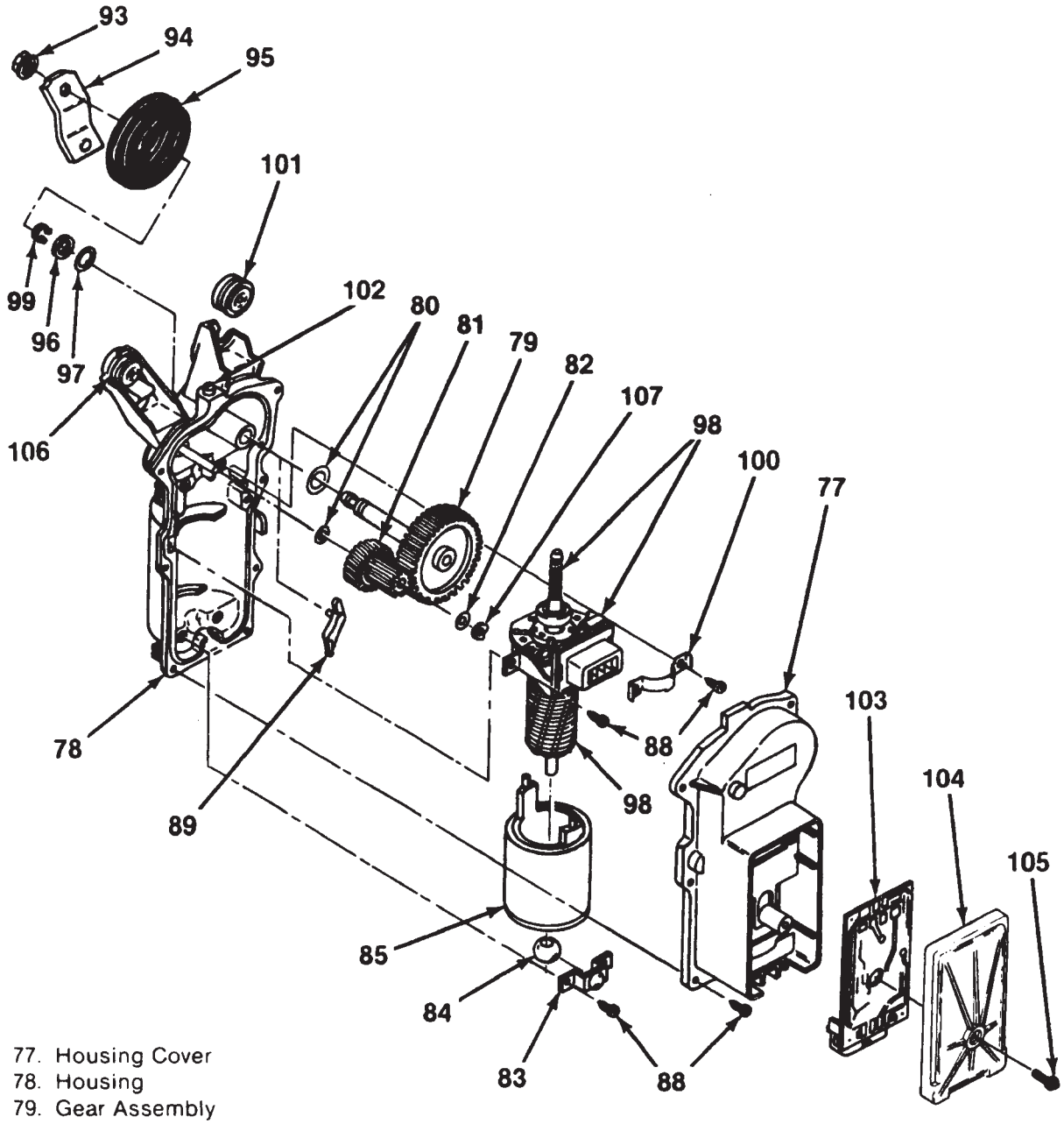
NOTICE: For steps 3, 10, 11, and 14 see "Notice" on page 8E-1 of this section.

3. Screws (88) attaching the armature/brush assembly (98).
4. Bearing straps (83) and (100).
5. Bearing strap with self-tapping screws.
6. Park switch actuator (89).
7. Spring washer (107), washer (82), intermediate gear (86), and washer (80).
8. Gear assembly (79) and washer (80).
9. Crank arm (94), shaft seal (95), new retaining ring (99), thrust collar (96), and flat washer (97) (figure 22).
10. Prevailing torque nut (93).

Tighten

- Prevailing torque nut (93) to 42 N.m (31 ft. lbs.) with the crank arm in a vise.

11. Housing cover (77) using self-tapping screws.



77. Housing Cover
78. Housing
79. Gear Assembly
80. Washers (2)
81. Intermediate Gear
82. Washers (2)
83. Bearing Strap
84. Bearing
85. Magnet Assembly
88. Screws (13)
89. Park Switch Acutator
93. Locknut
94. Crank Arm
95. Shaft Seal
96. Thrust Collar
97. Washer
98. Armature/Brush Assembly
99. Retaining Ring
100. Bearing Strap
101. Grommets (2)
102. Thrust Pin
103. Printed Circuit Board
104. Circuit Board Cover
105. Screw
106. Grommet & Ground Strap Assembly
107. Spring Washer

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Figure 15—Wiper Motor Components (Delay Wiper)

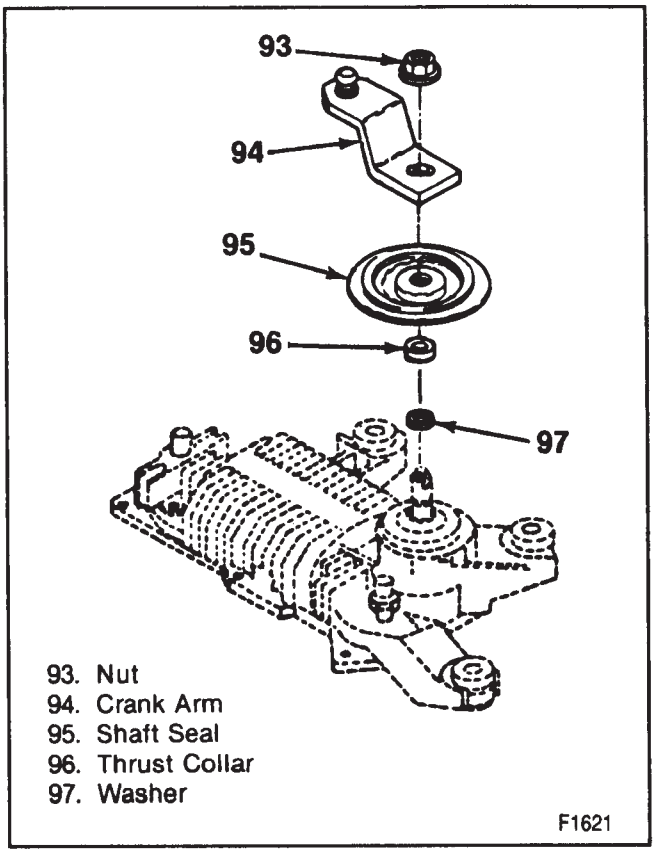


Figure 16—Wiper Crank Arm

Important

- When assembling the printed circuit board (103), make sure the terminal clips fully engage all five terminals of the brush assembly.

12. Printed circuit board (103).
13. Circuit board cover (104).
14. Screw (105).

MAGNET ASSEMBLY REPLACEMENT

Remove or Disconnect (Figures 14 through 19)

1. Rivets that attach the housing cover to the housing.
   - Drill out the seven rivets.
2. Screw (105).
3. Circuit board cover (104).
4. Printed circuit board (103).
   - Lift the outboard end of the board to disengage the terminal clips at the inboard end.
5. Housing cover (77).
6. Prevailing torque nut (93).
   - Place the crank arm in a vise to prevent damage to the gears.

Important

- Mark the output shaft of the gear assembly in relation to the ball crank arm.

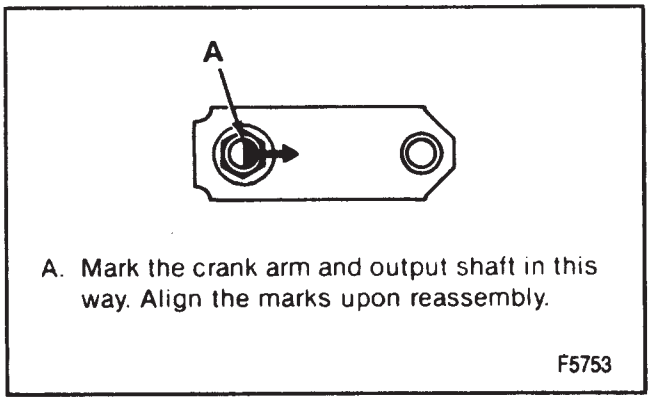


Figure 17—Crank Arm Alignment

7. Crank arm, (94), shaft seal (95), retaining ring (99), thrust collar (96), and flat washer (97).

Important

- To prevent scoring of the housing (77) bearing, check the shaft of the gear assembly (79) for burrs at the retaining ring groove and crank arm seat. Remove any burrs if found.

8. Gear assembly (79) and washer (80).
9. Spring washer (107), washer (82), intermediate gear (86), and washer (80).
10. Park switch actuator (89).

Important

- When drilling, use care not to get metal chips in the motor.

11. Bearing strap rivets from the motor by drilling.
12. Bearing straps (83) and (100).
13. Screws (88) attaching the armature/brush assembly (98).
14. Bearing (84), magnet assembly from the armature/brush assembly (98).

Install or Connect (Figures 14 through 19)

1. New magnet assembly (85).
2. Bearing (84).

NOTICE: For steps 3, 5, 10, 11, and 14 see "Notice" on page 8E-1 of this section.

3. Screws (88) attaching the armature/brush assembly (98).
4. Bearing straps (83) and (100).
5. Bearing strap with self-tapping screws.
6. Park switch actuator (89).
7. Spring washer (107), washer (82), intermediate gear (86), and washer (80).
8. Gear assembly (79) and washer (80).
9. Crank arm (94), shaft seal (95), new retaining ring (99) thrust collar (96), and flat washer (97) (figure 29).
10. Prevailing torque nut (93).

Tighten

- Prevailing torque nut (93) to 42 N·m (31 ft. lbs.) with the crank arm in a vise.

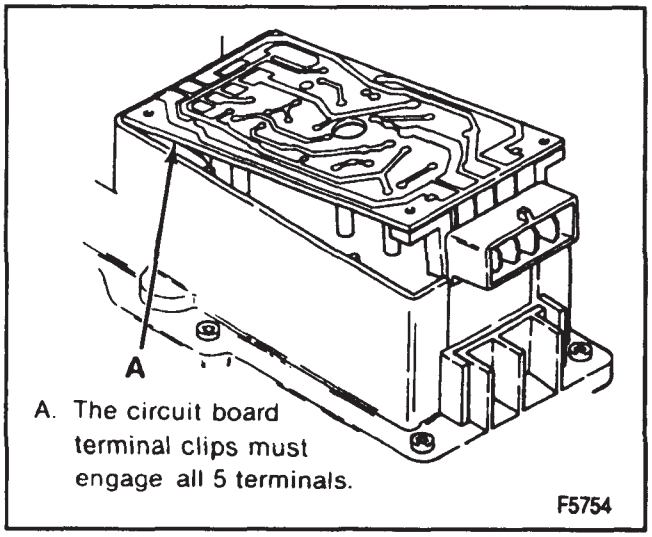


Figure 18—Circuit Board Installation

11. Housing cover (77) using self-tapping screws.

Important

- When assembling the printed circuit board (103), make sure the terminal clips fully engage all five terminals of the brush assembly.

12. Printed circuit board (103).
13. Circuit board cover (104).
14. Screw (105).

PARK SWITCH ACTUATOR REPLACEMENT

Remove or Disconnect (Figures 14 through 19)

1. Rivets that attach the housing cover to the housing.
   - Drill out the seven rivets.
2. Screw (105).
3. Circuit board cover (104).
4. Printed circuit board (103).
   - Lift the outboard end of the board to disengage the terminal clips at the inboard end.
5. Housing cover (77).
6. Prevailing torque nut (93).
   - Place the crank arm in a vise to prevent damage to the gears.

Important

- Mark the output shaft of the gear assembly in relation to the ball crank arm.

7. Crank arm (94), shaft seal (95), retaining ring (99), thrust collar (96), and flat washer (97).

Important

- To prevent scoring of the housing (77) bearing, check the shaft of the gear assembly (79) for burrs at the retaining ring groove and crank arm seat. Remove any burrs if found.

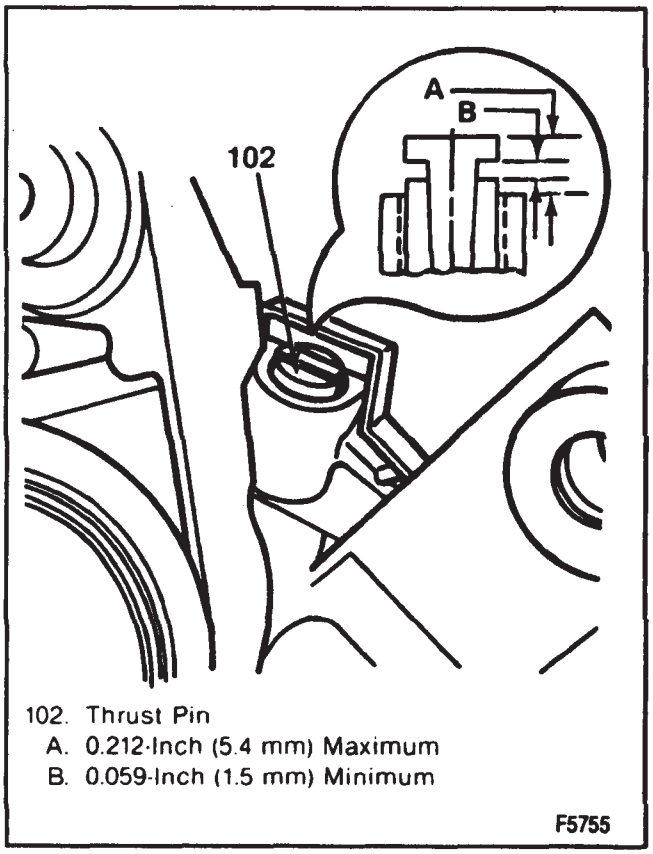


Figure 19—Thrust Pin Dimensions

8. Gear assembly (79) and washer (80).
9. Spring washer (107), washer (82), intermediate gear (86) and washer (80).
10. Park switch actuator (89).

Install or Connect (Figures 14 through 19)

1. Park switch actuator (89).
2. Spring washer (107), washer (82), intermediate gear (86) and washer (80).
3. Gear assembly (79) and washer (80).
4. Crank arm (94), shaft seal (95), new retaining ring (99) thrust collar (96), and flat washer (97) (figure 22).

NOTICE: For steps 5, 6, and 9 see "Notice" on page 8E-1 of this section.

5. Prevailing torque nut (93).

Tighten

- Prevailing torque nut (93) to 42 N.m (31 ft. lbs.) with the crank arm in a vise.

6. Housing cover (77) using self-tapping screws.

Important

- When assembling the printed circuit board (103), make sure the terminal clips fully engage all five terminals of the brush assembly.

7. Printed circuit board (103).
8. Circuit board cover (104).
9. Screw (105).

GEAR REPLACEMENT

Remove or Disconnect (Figures 14 through 19)

1. Rivets that attach the housing cover to the housing.
   - Drill out the seven rivets.
2. Screw (105).
3. Circuit board cover (104).
4. Printed circuit board (103).
   - Lift the outboard end of the board to disengage the terminal clips at the inboard end.
5. Housing cover (77).
6. Prevailing torque nut (93).
   - Place the crank arm in a vise to prevent damage to the gears.

Important

- Mark the output shaft of the gear assembly in relation to the ball crank arm, as shown in figure 17.

7. Crank arm (94), shaft seal (95), retaining ring (99), thrust collar (96), and flat washer (97).

Important

- To prevent scoring of the housing (77) bearing, check the shaft of the gear assembly (79) for burrs at the retaining ring groove and crank arm seat. Remove any burrs if found.

8. Gear assembly (79) and washer (80).
9. Spring washer (107), washer (82), intermediate gear (86), and washer (80).

Install or Connect (Figures 14 through 19)

1. Spring washer (107), washer (82), intermediate gear (86), and washer (80).
2. Gear assembly (79) and washer (80).
3. Crank arm (94), shaft seal (95), new retaining ring (99), thrust collar (96), and flat washer (97) (figure 23).

NOTICE: For steps 4, 5, and 8 see "Notice" on page 8E-1 of this section.

4. Prevailing torque nut (93).

Tighten

- Prevailing torque nut (93) to 42 N·m (31 ft.lbs.) with the crank arm in a vise.

5. Housing cover (77) using self-tapping screws.

Important

- When assembling the printed circuit board (103), make sure the terminal clips fully engage all five terminals of the brush assembly.

6. Printed circuit board (103).
7. Circuit board cover (104).
8. Screw (105).

HOUSING COVER REPLACEMENT

Remove or Disconnect (Figures 14 through 19)

1. Rivets that attach the housing cover to the housing.
   - Drill out the seven rivets.
2. Screws (105).
3. Circuit board cover (104).
4. Printed circuit board (103).
   - Lift the outboard end of the board to disengage the terminal clips at the inboard end.
5. Housing cover (77).

Install or Connect (Figures 14 through 19)

NOTICE: For steps 1 and 4 see "Notice" on page 8E-1 of this section.

1. Housing cover (77) using self-tapping screws.

Important

- When assembling the printed circuit board (103), make sure the terminal clips fully engage all five terminals of the brush assembly.

2. Printed circuit board (103).
3. Circuit board cover (104).
4. Screw (105).

WASHER RESERVOIR AND PUMP REPLACEMENT

Remove or Disconnect (Figures 13)

1. Negative battery cable.
2. Bolts (69).
3. Wiring harness.
4. Hose (70).
5. Reservoir and pump assembly.

Install or Connect (Figure 13)

1. Reservoir and pump assembly to the vehicle.
2. Hose (70).
3. Wiring harness.

NOTICE: See "Notice" on page 8E-1 of this section.

4. Bolts (69).
5. Negative battery cable.

GENERAL DESCRIPTION

REAR WIPER/WASHER SYSTEM (UTILITY ONLY)

The rear wiper/washer consists of a positive-park, single speed, permanent magnet wiper motor attached to the rear glass. A wet wiper arm is attached directly to the wiper motor and operation is controlled by a dash-mounted, two-position switch. The switch has a momentary wash wipe position. The wiper/washer switch must be manually turned off and can only be operated when the ignition switch is in the run or accessory position.

The washer pump consists of a permanent magnet motor and pump assembly. The rear washer pump is mounted to the rear and higher in the washer solvent reservoir, allowing it to run low on fluid before the front washer system. Refer to figure 20.

WIPER MOTOR OPERATION

With the wiper/washer switch in the run position, battery voltage is supplied to terminal (C) of the wiper motor. The ground circuit is provided through terminal (B) and is grounded back through the switch. When the wiper switch is turned to the off position, terminal (A) is positive and the circuit is completed through the park plate. A cam gear on the plate opens the circuit at the park position allowing the wiper to park at the proper location, Refer to figure 21.

DIAGNOSIS OF THE REAR WIPER SYSTEM

Before removing the wiper motor from the rear glass, perform the following tests:

1. Disconnect the wiring harness and apply (+) 12V to terminal (C) of the wiper motor. Ground terminal (B) of the wiper motor. The wiper motor should run. Refer to figure 21.

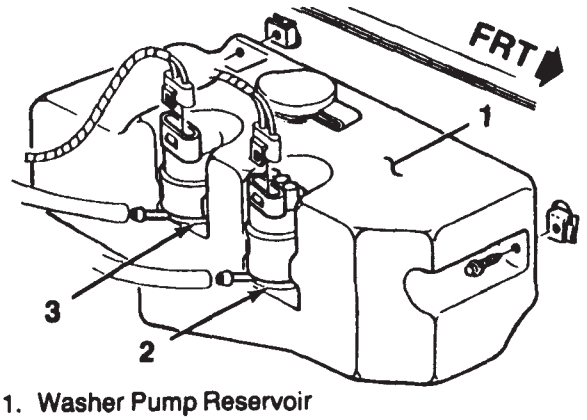
NOTE: Before performing test 2, be sure wiper motor is not in the park position.

2. Test for proper park operation by applying (+) 12V to terminal (A). Ground terminal (B). The wiper motor should go to the park position and shut off. Refer to figure 21.

NOTE: If the wiper motor performs the above tests, the problem is in the wiring harness or the switch. If the motor is faulty, it must be replaced, no internal service parts are available.

The following schematic should be used to check for proper switch operation after checking the 15-amp radio/rear wiper fuse and all wires have been checked for continuity.

With ignition switch in the "RUN" position, harness connected, back probe the connector to the dash switch. All voltage readings must be taken with a good vehicle ground. Refer to figure 21.



1. Washer Pump Reservoir
2. Front Washer Pump
3. Rear Washer Pump (Utility Only)

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Figure 20—Washer Reservoir With Rear Washer Pump

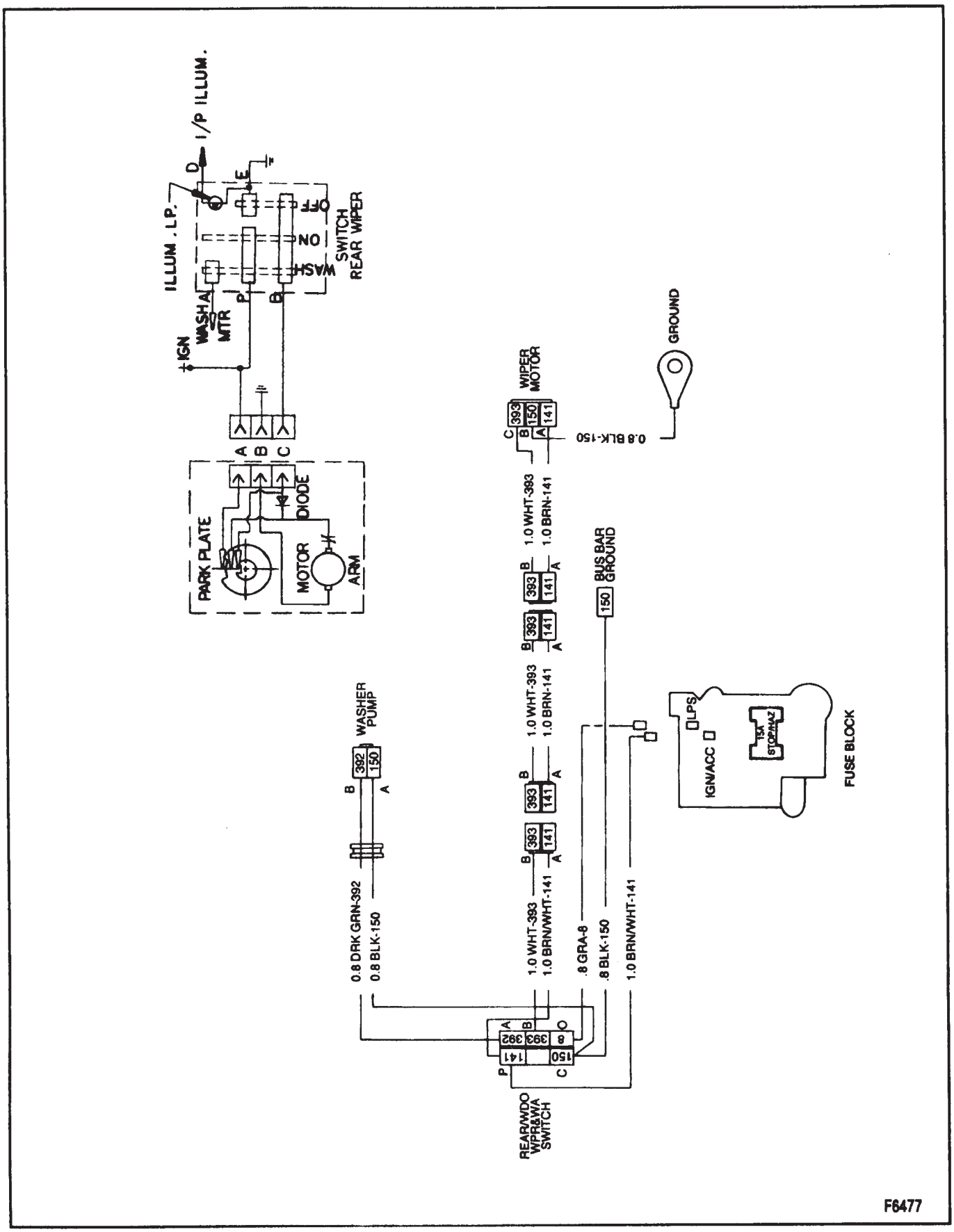


Figure 21—Rear Wiper Washer Schematic

ON-VEHICLE SERVICE

REAR WIPER MOTOR REPLACEMENT (UTILITY ONLY)

Remove or Disconnect (Figures 22 and 23)

1. Negative battery cable.
2. Retainer screws (10) and cover (9) from the wiper motor (1).
3. Wiper arm assembly (8) from the wiper motor (1).

NOTE: For ease of removal and installation of the wiper arm assembly, install an 1/8 drift pin through the wiper arm hinge to control the spring detent. Refer to figure 22.

4. Washer hose from the wiper arm assembly.
5. Glass support arm from the end gate glass and support the end gate glass, Refer to END GATE (SECTION 10A5).
6. Wiper Motor/Hinge bolt (11) from the hinge assembly (7).
7. Nut (6), spacer (5) and flat seal (4) from the wiper motor (1).
8. Wiper motor (1), inner seal grommet (3) and beveled washer (2) from the end gate glass (12).

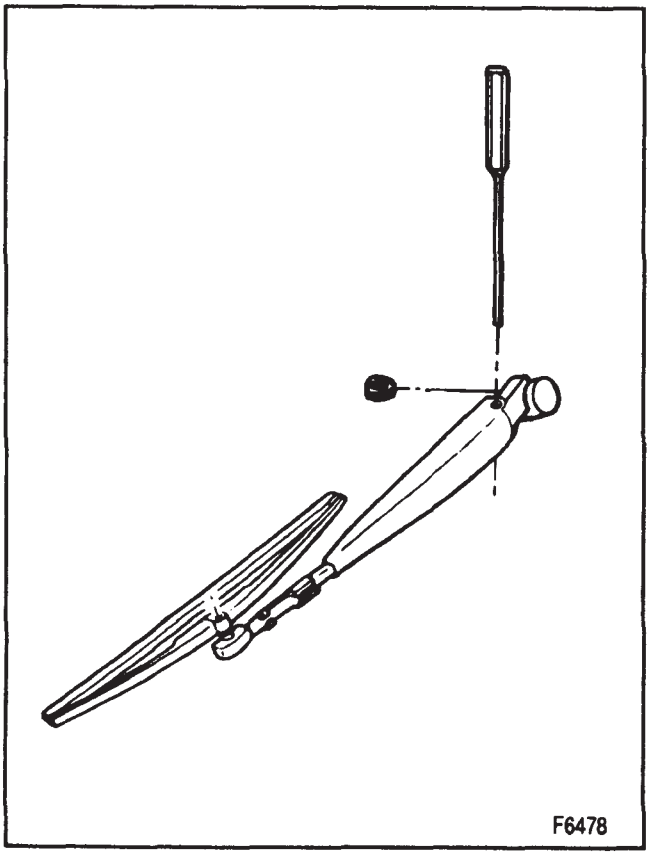


Figure 22—Installing/Removing of the Rear Wiper Arm

Install or Connect (Figures 22 and 23)

1. Beveled washer (2) and the inner seal grommet (3) to the wiper motor (1).
2. Wiper motor (1) to the end gate glass (12).

NOTICE: For steps 3, 4, and 9 see "Notice" on page 8E-1 of this section.

3. Flat seal (4) spacer (5) and nut (6) to the wiper motor (1).
4. Wiper motor/hinge bolt (11) to the hinge assembly (7).
5. Glass support arm to the end gate glass.
6. Align the end gate glass, Refer to END GATE (SECTION 10A5).

Tighten

- Nut (6) to 6 N·m (54 in.lbs.).
- Wiper motor/hinge bolt (11) to 6 N·m (54 in.lbs.).

7. Washer hose to the wiper arm assembly (8).
8. Wiper arm assembly (8) to the wiper motor (1).

NOTE: If drift pin was used remove after assembly.

9. Retainer screws (10) and cover (9) to the wiper motor (1).
10. Negative battery cable.

REAR WIPER SWITCH REPLACEMENT

Remove or Disconnect (Figure 24)

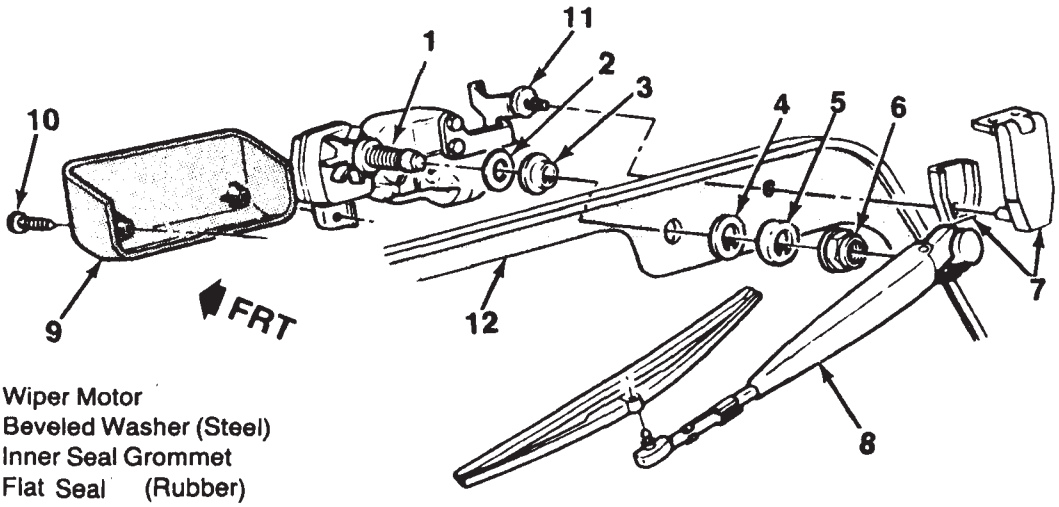
1. Negative battery cable from the battery.
2. Screw (4) from the instrument panel.
3. Switch trim plate (3) from the instrument panel.
4. Connector (1) from the switch (2).
5. Switch (2) from the trim plate (3).

Install or Connect (Figure 24)

1. Switch (2) to the trim plate (3).
2. Connector (1) to the switch (2).
3. Switch trim plate (3) to instrument panel.

NOTICE: See "Notice" on page 8E-1 of this section.

4. Screw (4) to the instrument panel.
5. Negative battery cable to the battery.



1. Wiper Motor
2. Beveled Washer (Steel)
3. Inner Seal Grommet
4. Flat Seal (Rubber)
5. Spacer
6. Nut
7. Hinge Assembly
8. Wiper Arm Assembly
9. Cover
10. Retainer Screws
11. Wiper Motor/Hinge Bolt
12. End Gate Glass

F6479

Figure 23—Rear Wiper Components

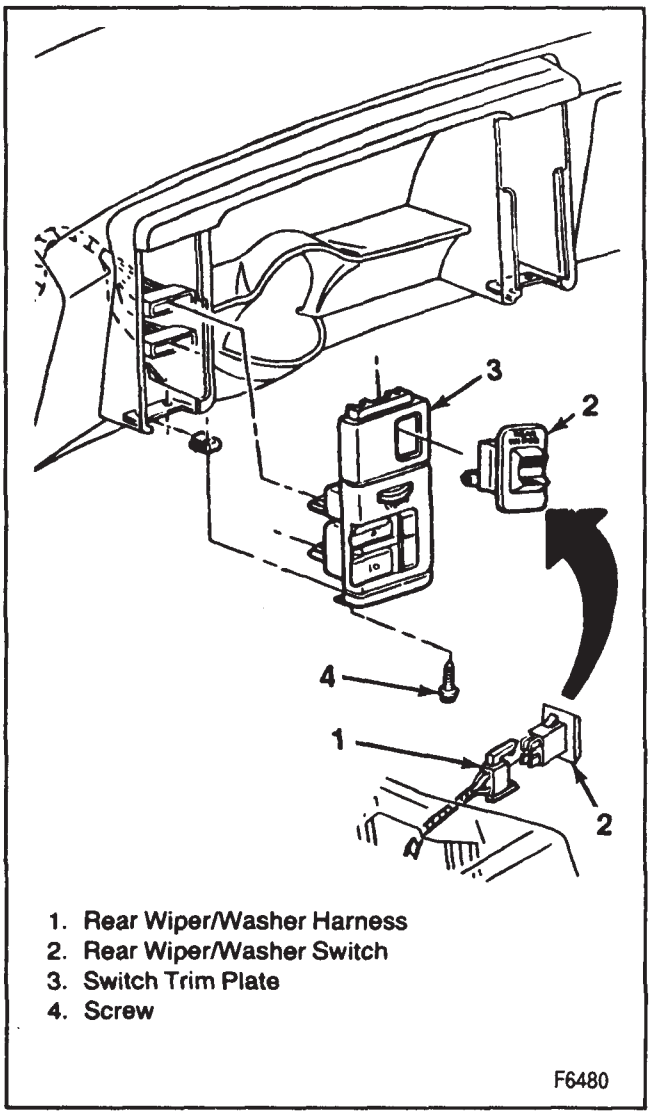
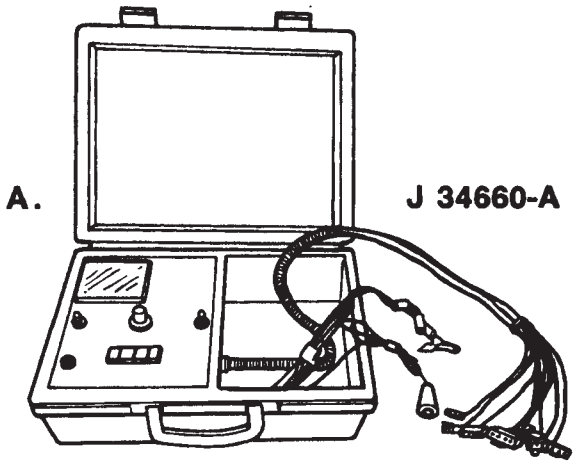


Figure 24—Rear Wiper/Washer Switch

SPECIAL TOOLS



A. Windshield Wiper Tester

F8971

SECTION 9

ACCESSORIES

CONTENTS

SECTION 9A

AUDIO SYSTEMS

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

AUDIO SYSTEMS

GENERAL DESCRIPTION

NOTICE: When jump starting the vehicle, make sure the radio system is turned off. Failure to do so may result in electrical damage to the radio system.

2000 SERIES RECEIVER

The 2000 series radios feature an electronically tuned receiver (ETR), vacuum fluorescent display for radio frequency and digital clock display and seek and scan tuning. The UM6 and UX1 2000 series radio features a cassette tape deck with automatic reverse.

All 2000 series radios have volume control knobs and manual station tuning knobs (figure 1).

AM, FM, FM STEREO, AND COMPACT DISC PLAYER (U1C)

The (U1C model) communication data module is an integral AM/FM receiver and compact disc player. The module contains an electronically tuned receiver, vacuum fluorescent display for radio frequency, digital clock and compact disc (CD) play information. The radio has seek and scan tuning and the CD player has a random play mode. The CD player will accept and play the 120 mm (4.75 inch) compact disc, or the 76 mm (3 inch) compact disc with an approved adapter.

HANDLING ELECTROSTATIC DISCHARGE (ESD) SENSITIVE PARTS

Many solid state electrical components can be damaged by Electrostatic Discharge (ESD). Some will display a label, but many will not (figure 2).

NOTICE: In order to avoid possibly damaging any components, observe the following:

1. Body movement produces an electrostatic charge. To discharge personal static electricity, touch a ground point (metal) on the vehicle. This should be done any time you:
   - Slide across the car seat.
   - Sit down or get up.
   - Do any walking.
2. Do not touch exposed electric terminals on components with your finger or any tools. Remember, the connector that you are checking might be tied into a circuit that could be damaged by Electrostatic Discharge.
3. When using a screwdriver or similar tool to disconnect a connector, never let the tool come in contact with or come between the exposed terminals.
4. Never jumper, ground, or use test equipment probes on any components or connectors unless specified in diagnosis. When using test equipment, always connect the ground lead first.
5. Do not remove the solid state component from its protective packaging until you are ready to install the part.
6. Always touch the solid state components package to a ground before opening. Solid state components can also be damaged if:
   - They are bumped or dropped.
   - They are laid on any metal work benches or components that operate electrically, such as a TV, radio, or oscilloscope.

DESCRIPTION OF OPERATION

2000 SERIES RECEIVER

Power Button (PWR)

The "PWR" button turns the sound system "On" and "Off." If the radio is "Off," pressing the power button will turn the system "On" and pressing the power button again will turn the system "Off." The ignition lock cylinder must be in the "ACCESSORY" or "RUN" position for the radio to operate.

Upper Knob and Balance Control Ring

Turn the knob clockwise to increase volume and counterclockwise to decrease volume.

The control ring behind the knob is the balance control. Turn the ring clockwise to move speaker balance to the right and counterclockwise to move speaker balance to the left.

Recall

If the radio is "On", pressing the upper knob will alternately cause the VF display to change from time of day to radio frequency display.

Lower Knob and Fader Control Ring

Turn the knob to manually select radio stations. When the radio is "On" and the tape player (if equipped) is "Off", press the knob to choose either the AM or the FM band.

If the tape player is "On" (UM6 models), pressing the lower knob will cause the direction of tape play to reverse.

The control ring behind the lower knob fades the sound between the front and rear speakers.

Set Button

The "SET" button is a dual function button. It is used in conjunction with the four radio station preset buttons to program radio frequencies into the memory locations. Its second function is to set the time of day display (clock). To do this, the "SET" button is used in conjunction with the "SEEK" and "SCAN" buttons. See "Clock" for detailed instructions on setting the time of day display. See "Radio Frequency Preset Buttons" for instructions on presetting AM and FM radio stations.

Bass and Treble Controls

Slide the "TREBLE" control up to increase, down to decrease treble. Slide the "BASS" control up to increase, down to decrease bass (UM6, UM7, and UT5 models).

Radio Frequency Preset Buttons

To preset four desired AM stations and four FM stations:

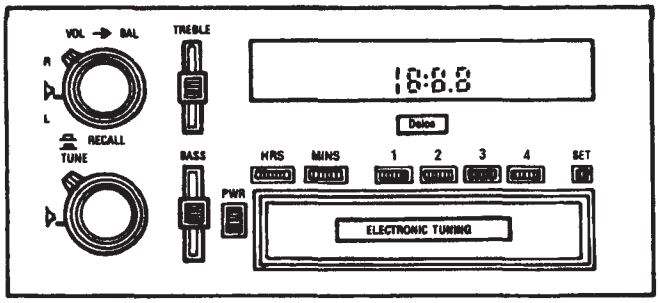
1. Select AM or FM, as desired, and tune to the desired station.
2. Press "Set" button. (The "SET" indicator will light.)
3. Press a station button. (The "SET" indicator will go out.) The radio will then tune to the selected station whenever that push button is pressed.

The 2000 series receiver's with four station push buttons have the ability to store up to seven AM and seven FM stations.

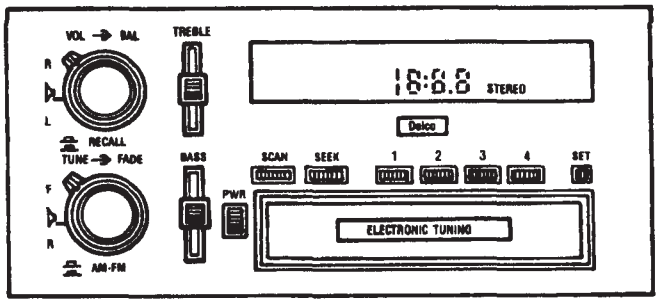
To preset three additional AM stations and three additional FM stations on some radios (figure 3):

1. Tune in desired station.
2. Press "SET", and within five seconds.
3. Press any two adjacent push buttons at the same time.

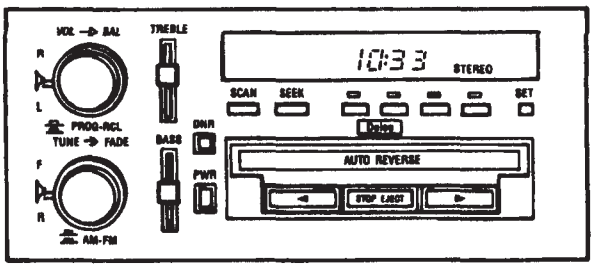
UT5 - AM Radio With Clock



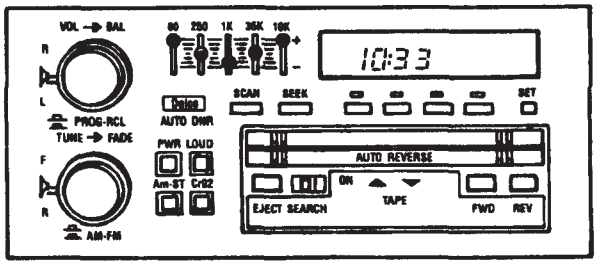
UM7 - AM/FM Stereo Seek and Scan, w/Clock



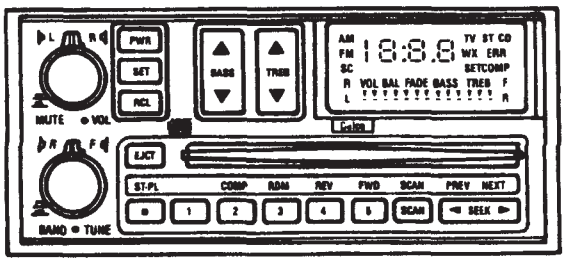
UM6 - AM/FM Stereo Seek and Scan, Cassette w/Clock



***UX1* - AM/FM Stereo Seek and Scan, Cassette w/Clock, and Graphic Equalizer**



UIC - AM/FM Stereo Seek and Scan, w/Clock, and Compact Disc Player



V1333

Figure 1—Radio Receiver Description

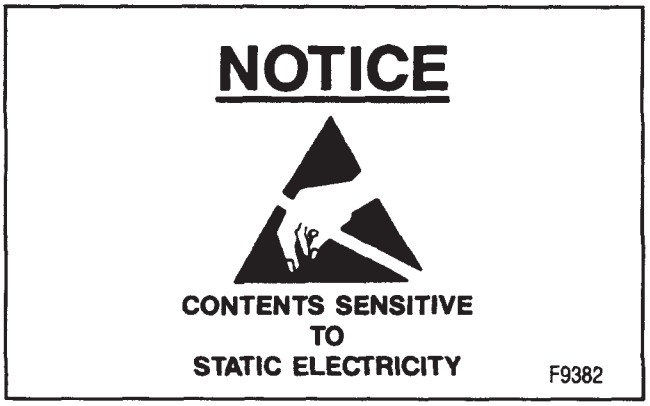


Figure 2—Electrostatic Discharge Symbol

The radio will now tune to the pre-selected station when the button, or button pair is pressed.

If electrical power is interrupted (by a blown fuse, discharged battery, etc.), the station(s) must be reset.

Frequency Band Ranges

The frequency band range for the 2000 Series radio on the AM band is 530 KHz to 1710 KHz in 10 KHz increments.

The FM frequency band range is 87.7 MHz to 107.9 MHz in 200 KHz increments.

Loud Button (UX1)

The UX1 radio system has a "LOUD" button to increase the low and high frequency response when the radio or cassette tape deck is playing at low volume. When the button is "In," the loud feature is "On."

Dynamic Noise Reduction (DNR®) Button

The UM6 radio has the DNR® (dynamic noise reduction) system which reduces background hiss on AM and FM radio broadcasts, as well as on cassette tape players. Push the button to turn the DNR® system "On" (button in) or "Off" (button out). DNR® is a registered trademark of National Semiconductor Corporation.

Automatic Dynamic Noise Reduction

The UX1 radio/tape deck has automatic Dynamic Noise Reduction (DNR®). This system reduces background hiss on AM, FM, and FM stereo broadcasts as well as on cassette tapes. DNR® is a registered trademark of National Semiconductor Corporation.

Clock

To set the clock (display) on a 2000 series radio, the ignition lock cylinder must be in the "ACCESSORY" or "RUN" position and the radio may be "On" or "Off."

The "HOUR" portion of the clock display is set by pushing the "SET" button and within five seconds pushing the "SCAN" and hold the scan button in until the correct hour is displayed.

The "MINUTE" portion of the clock display is set by pushing the "SET" button and within five seconds, pushing the "SEEK" button and hold the seek button in until the correct minute(s) are displayed. If the "SET" is pushed while the radio is turned on, the radio

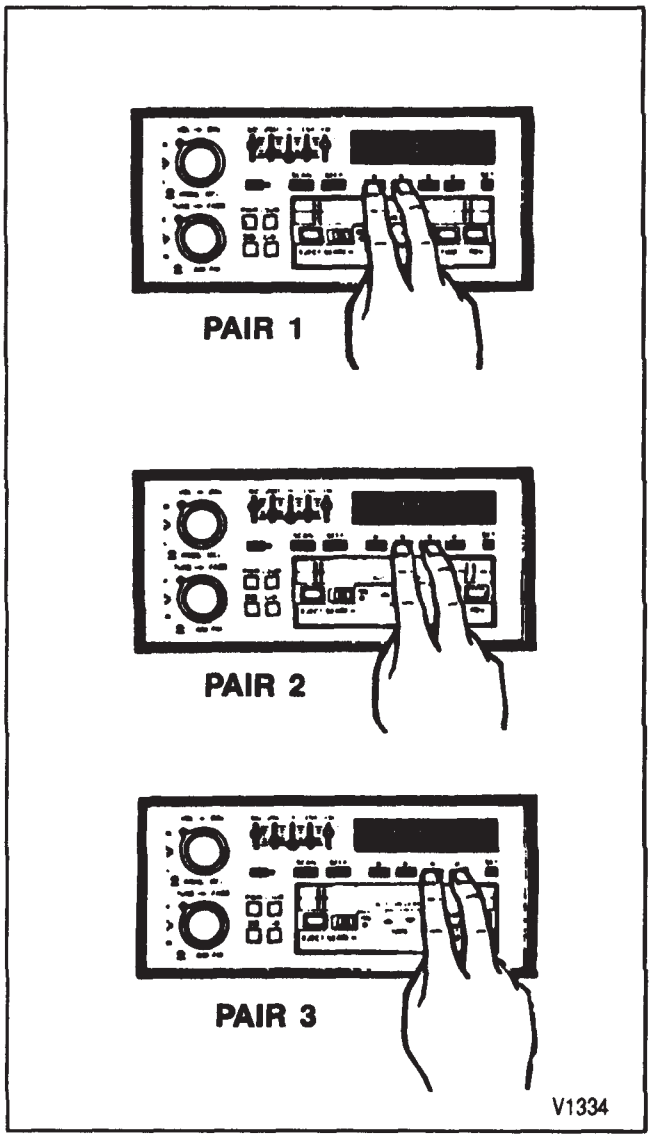


Figure 3—Push Button Pairing

frequency will be displayed. The time of day will display when the "SEEK" and "SCAN" button is pressed.

When the "SET" button is pushed, the "SET" indicator will appear on the display for approximately five seconds. If the "SCAN" or "SEEK" button is pushed after the "SET" button is pushed and before the SET indicator goes out, the SET indicator will stay on while the clock is being set and then will go out about five seconds after the "SCAN" or "SEEK" button has been released.

If electrical power is interrupted (by a blown fuse, discharged battery, etc.), the clock will need to be reset after power is restored.

Seek and Scan (Radio)

The 2000 series radio system has the "Seek" and "Scan" feature for electronic station tuning.

Push the "SEEK" button, the radio will tune to the next strong station which has a higher frequency than the previous station selection. When the "SCAN" is pushed, the radio will move to the next strong station of a higher frequency. It will pause there a few seconds, then scan to the next strong station. The radio will continue scanning new stations until the "SCAN" but-

ton is pushed again. When the radio reaches the upper end of the band, it will return to the low end and resume scanning.

CASSETTE TAPE PLAYER (2000 SERIES)

To play a tape the ignition lock cylinder must be in "ACCESSORY" or "RUN" position and the receiver/tape player must be turned "On." Insert the tape squarely through the door, exposed tape side of the cassette first. When the tape is fully inserted the AM/FM portion will turn "Off" and the tape will begin playing.

To advance the tape, press the forward "FWD" button. To reverse the tape, press the reverse "REV" button. To resume tape play, from fast forward or reverse, press the opposite button lightly. When the tape reaches the end of a side, it will automatically reverse and play the other side of the tape. To resume listening to the radio or to eject the tape, push the "EJECT" or the "STOP-EJECT" button.

The cassette player is turned "Off" by ejecting the tape, pushing the power "PWR" button, or by rotating the ignition lock cylinder to "LOCK", "OFF" or "START". When this occurs, the tape player will either eject the cassette automatically or the internal tape drive and roller will retract automatically. This is to protect the tape player and cassette tape.

Search (UX1)

The UX1 model has the search feature. The search feature is activated by sliding the switch to the "ON" position. The "ON" indicator will light when a tape is fully inserted. With the "Search" indicator "ON" and when the "FWD" button is pushed, the tape will rapidly advance to the beginning of the next selection. If the "REV" button is pushed, the tape will rapidly reverse to the beginning of the current selection.

NOTE: This feature works by "listening" for a "quiet" section. The "Search" feature may stop the tape at a "quiet" section and resume play even though this may not be the beginning of the current or next selection. To defeat the "Search" feature, slide the search switch to the left.

CrO2 Button (Chrome Dioxide) (UX1)

The "CrO" button is used to select the proper tape bias for the tape to be played. Chrome dioxide tapes use 70 microsecond equalization and normal bias tapes use 120 microsecond equalization. For chrome dioxide (CrO) tapes push the button in for 70 microsecond equalization. For normal bias tapes, push the button so it pops out for 120 microsecond equalization. The tape bias (normal or high) is printed on the cassette.

Five Band Equalizer (UX1)

A five-band equalizer is available on the UX1 sound system. The five-band equalizer lets you tailor the frequency response from 60Hz to 10KHz.

The "60" (hertz) and "250" (hertz) levers control bass response. The 1K (hertz) lever controls midrange. Treble is controlled by the "3.5K" (hertz) and "10K" (hertz) levers.

Slide a lever up to increase the frequency range, or down to decrease it. When a lever is in the center position, that frequency range will not be processed by the graphic equalizer. When all five levers are in the center, the sound system will have a flat frequency response.

AM Stereo (UX1)

If an AM station is broadcasting in stereo, pressing the "AM ST" button will enable AM stereo reproduction on the UX1 model.

Switching to stereo improves fidelity, but may increase noise on weaker stations. AM stereo does not have the flutter characteristics of FM (caused by tall buildings, hills, etc.). However, it is subject to interference from power lines, neon signs, atmospheric conditions, and unwanted stations. The stereo lamp will come on only when tuned to a clear, noise-free station broadcasting C-QUAM® AM stereo.

Display Dimming

The receiver's vacuum fluorescent (VF) display has "step" dimming when the headlamps or park lamps are turned on, and the display intensity is continuously variable by the position of the instrument panel lamp dimmer rheostat control.

When no voltage is present at the park lamp input to the radio (parklamps and headlamps off) the display will be at 100 percent intensity and cannot be dimmed by the instrument panel lamp dimmer rheostat control.

Tape Direction Indicators (UM6 and UX1)

The direction the tape is being played or the side of the tape being played is indicated by indicator arrows. When the indicator arrow on the left side is on, the top side of the tape is being played and the tape direction is to the left. When the indicator arrow on the right side is on, the bottom side of the tape is being played and the tape direction is to the right.

AM, FM, FM STEREO AND COMPACT DISC PLAYER (U1C)

Power Button (PWR)

The "PWR" button turns the sound system "On" and "Off." If the radio is "Off," pressing the power button will turn the system "On" and pressing the power button again will turn the system "Off." The ignition lock cylinder must be in the "ACCESSORY" or "RUN" position for the sound system to operate.

Recall Button (RCL)

Pressing the recall (RCL) button will activate the recall mode for five seconds. If the ignition lock cylinder is in the "OFF' or "LOCK" position the time of day display will be recalled when the recall button is pressed. If the radio is "On" when the recall button is pressed, the TOD (time of day) display will be replaced (for five seconds) by the radio recall display, or if the CD player is "On" when the button is pressed, the track and relative time of play (CD recall display) will be recalled for about five seconds.

Radio Frequency Preset Buttons

The five radio frequency preset buttons are located on the button area of the U1C radio face. These buttons have dual functions. When the radio is playing, pushing one of the five buttons will cause the radio to

tune to the preset station frequency (AM or FM). The display will change from the time of day to the radio frequency display for about five seconds and then the time of day display will return. When the compact disc player is playing, pressing preset button 2 through 5 will enable the function as per the label above the button. These CD player functions are explained later in this section.

When the unit is in the radio play mode, the five buttons are backlit. When the unit is in the CD play mode the buttons will not be backlit and the button graphics will not be seen.

To preset five desired AM stations and five FM stations:

1. Tune in desired station.
2. Press "SET" button.
3. Within five seconds, press the desired station button.

If electrical power is interrupted (by a blown fuse, discharged battery, etc.), the stations must be reset.

Set Button

The "SET" button is a dual function button. It is used (as above) in conjunction with the five radio station preset buttons to program radio frequencies into the memory locations. Its second function is to set the time of day display (clock). To do this, the "SET" button is used in conjunction with the "SEEK" and "SCAN" buttons. See "Clock" for detailed instructions on setting the time of day display.

Clock

To set the clock (display) the ignition lock cylinder must be in the "ACCESSORY" or "RUN" position and the radio may be "On" or "Off." If the radio is on, the display must be on the time of day display. The clock cannot be set when the display is the radio frequency display.

The "MINUTES" portion of the clock display is set by pushing the "SET" button and within five seconds, push the "SEEK UP" or "SEEK DOWN" button and hold the seek button in until the correct minutes are displayed. Pressing the right side of the seek button will increase the minutes and pressing the left side of the seek button will decrease the minutes.

The "HOUR" portion of the clock display is set by pushing the "SET" button and within five seconds, push the "SCAN" button and hold the scan button in until the correct hour is displayed. When the scan button is released the seconds counter of the clock automatically becomes "zero" enabling the next minute to contain a full 60 seconds. This feature allows the clock to be synchronized to the nearest second.

When the "SET" button is pushed, the "SET" indicator will appear on the display for approximately five seconds. If the "SCAN" or "SEEK" button is pushed after the "SET" button is pushed and before the SET indicator goes out, the SET indicator will stay on while the clock is being set and then will go out about five seconds after the "SCAN" or "SEEK" button has been released.

If electrical power is interrupted by a battery disconnect or fuse removal, etc., the clock display will need to be reset after power is restored.

Automatic Dynamic Noise Reduction

The U1C radio has the Automatic DNR® (Dynamic Noise Reduction) system which reduces background hiss on AM, FM and FM stereo radio broadcasts.

When a compact disc is being played, the automatic DNR® function is disabled. When the unit is in the radio play mode the automatic DNR® function is enabled. DNR® is a registered trademark of National Semiconductor Corporation.

Volume

To increase the volume of the radio or CD player, rotate the volume knob (upper) clockwise until the desired volume is reached. The arrows on the volume level display will increase to the right as volume increases.

To decrease the volume of the radio or CD player, rotate the volume knob counterclockwise until the desired volume is reached. The arrows on the volume level display will decrease to the left as volume decreases.

Tune Knob

To manually tune to a higher radio frequency, turn the tune knob clockwise (lower knob). When the high end of the radio band is reached, the radio will return to the lowest band frequency and resume tuning upward. The radio frequency will appear on the display while tuning.

To manually tune to a lower radio frequency, turn the tune knob counterclockwise until the desired frequency is reached. When the low end of the radio band is reached, the radio will return to the highest band frequency and resume tuning downward. The radio frequency will appear on the display while tuning.

Seek-Up (Radio)

The radio seek-up function is activated by pressing the right side of the "SEEK" button while the radio is playing. After pressing the right side of the "SEEK" button, the radio recall display appears and the receiver seeks to the next higher station of sufficient signal strength and stops on that station. The radio recall display remains for about five seconds after the seek up function has been completed and then the time of day display returns. When the top of the band is reached (1710 KHz-AM or 107.9 MHz-FM), the seek-up function continues at the bottom of the band (530 KHz-AM or 87.7 MHz-FM).

Seek-Down (Radio)

The radio seek-down function is activated by pressing the left side of the "SEEK" button while the radio is playing. After pressing the left side of the "SEEK" button, the radio recall display appears and the receiver seeks to the next lower station of sufficient signal strength and stops on that station. The radio recall display remains for about five seconds after the seek-down function has been completed and then the time of day display returns. When the bottom of the band is reached (530 KHz-AM or 87.7 MHz-FM), the seek-down function continues at the top of the band (1710 KHz-AM or 107.9 MHz-FM).

Scan (Radio)

The radio scan function is activated by pressing the "SCAN" button while the radio is playing. The radio recall display will replace the time of day display and the scan "SC" indicator will illuminate. The receiver will seek to the next higher station of sufficient signal strength and pauses on that station for about five seconds and then seeks the next station of a higher frequency. When the end of the band is reached, the receiver will resume scanning in the same direction at the opposite end of the band. The scan function may be cancelled by pressing the "SCAN" button a second time, by any tuning operation, pressing the recall "RCL" knob, AM-FM knob, or by turning the radio off. The radio recall display remains for about five seconds following the cancellation of the scan function, then the time of day display returns.

Band Change

To change from the AM band (amplitude modulation) to the FM band (frequency modulation) push the "AM-FM" button (lower control knob). Subsequent pushes of the "AM-FM" button will alternate the radio bands between AM and FM.

Fade Forward

To decrease the volume of the rear speakers relative to the volume of the front speakers, rotate the control ring behind the lower knob clockwise until the relative volume level between the rear and front speakers is reached.

Fade Rearward

To decrease the volume of the front speakers relative to the volume of the rear speakers, rotate the control ring behind the lower knob counter-clockwise until the relative volume level between the rear and front speakers is reached.

When either the fade forward or fade rearward control ring is rotated, the relative fade position will appear on the radio display.

Balance Left and Balance Right

To move the speaker balance to the left, rotate the control ring behind the upper knob counter-clockwise until the desired balance is reached. To move the speaker balance to the right, rotate the control ring behind the upper knob clockwise until the desired balance is reached.

When the balance left or balance right control ring is rotated, the balance position will appear on the radio display.

Bass Button

To increase the amount of bass (low range frequency), push and hold the "BASS" upper button until the desired level of bass is reached. To decrease the amount of bass, push and hold the "BASS" lower button until the desired level of bass is reached.

Press the center of the "BASS" button to return the bass level to the center position.

When the "BASS" increase or decrease button is pushed, the bass level indicator will appear on the radio display.

Treble Button

To increase the amount of treble (high range frequency), push and hold the "TREBLE" upper button until the desired level of treble is reached.

Press the center of the "TREBLE" button to return the treble level to the center position.

To decrease the amount of treble, push and hold the "TREBLE" lower button until the desired level of treble is reached.

When the "TREBLE" increase or decrease button is pushed, the treble level indicator will appear on the radio display.

Compact Disc Player Operation

To play a 4.75 inch (120 mm) compact disc, or 3 inch (76 mm) disc with an approved adapter, turn the power switch on and load the disc into the CD player slot with the disc label up (playing side down). The radio audio will mute and the disc will begin playing at the beginning of track number one. When a disc is loaded into the player the "CD" indicator will illuminate on the CD player display.

When the end of the disc is reached, and no operator commands are issued, the disc will play again beginning on track one. This process will continue until the disc is stopped or ejected.

If a 3 inch (76 mm) disc is loaded into the CD player, (without an approved adapter) the CD player will eject and not play the disc. The 4.75 inch (120 mm) disc or the 3 inch (76 mm) disc with an approved adapter will be accepted and played in the compact disc player. An approved adapter will display the "compact digital audio disc" logo (figure 4).

Eject Button (EJCT)

Pressing the "EJCT" button while a disc is loaded in the CD player and the ignition lock cylinder is in the "ACCESSORY" or "RUN" position causes the disc to eject. Audio will revert to the radio when the eject button is pushed.

If the disc is not removed from the player within 30 seconds after it has been ejected, the disc will reload automatically to protect the disc, provided the receiver is turned off or the ignition lock cylinder is in the "OFF" or "LOCK" position.

Figure 4—Compact Disc Symbol

Stop/Play Button (ST/PL)

Pressing the "ST/PL" button will alternate the CD player between stop and play. It will stop disc play if the disc is playing and revert to the radio mode, or it will resume disc play at the original stopping point if the disc is stopped.

Next Button (NEXT)

Pressing the "NEXT" button while in the CD play mode causes the player to mute and seek to the next track on the disc. Pushing the button repeatedly as the unit is in the next track mode causes the "target" track number on the CD player display to increase once per push of the button and the CD player will seek the displayed track. This feature will "wrap" to track number one when the target track exceeds the highest track available on the disc.

Previous Button (PREV)

Pressing the "PREV" button while in the CD play mode causes the player to mute and seek the beginning of the current track if the current track has been playing longer than eight seconds. If the current track has been playing eight seconds or less, the player will seek the beginning of the previous track. Pushing the "PREV" button repeatedly will cause the target track number on the display to decrease once per push and the player will seek the displayed track and begin playing. This feature will "wrap" to highest track available when the target track precedes track number one.

Random Play Button (RDM)

Pressing the "RDM" button while a CD is playing will cause the current track to stop and then play the tracks (selections) back in a random order. When all of the tracks have been played the unit will continue play in the original random order.

Pressing the "RDM" button at any point during random playback will cause playback to continue in the normal numeric sequence beginning with the track number that was being played when the "RDM" button was pressed.

Fast Reverse and Fast Forward Button (REV and FWD)

The "REV" and "FWD" buttons are functional only when the CD player is operating. Fast forward (FWD) is activated by pressing and holding the "FWD" button. The unit will play the disc in the forward direction at six times the normal rate with a reduced volume level. The time of day display will be replaced by the CD recall display and the CD relative time of play is updated at the accelerated rate. When the "FWD" button is released, the unit returns to the CD play mode and after five seconds the CD recall display is replaced by TOD display. The "CD" indicator will come on to indicate the unit is in the CD play mode.

The fast reverse "REV" is activated by pressing and holding the "REV" button. The unit will play the disc in the reverse direction at six times the normal forward rate with a reduced volume level. The operation and display of the unit is similar to that described for fast forward except the CD recall display will update in a reverse sequence.

If the "REV" button is pressed at the beginning of a disc, the unit will not play while the button is held. Play will resume at the beginning of track 1 as soon as the "REV" button is released. If the "FWD" button is pressed at the end of a disc, the unit will play at the beginning of track 1.

Compression Button (COMP)

Pressing the "COMP" button while in the CD play mode alternately enables and disables the CD compression feature. When the compression function is enabled, the dynamic (volume) range of the audio signal is reduced by increasing the volume of the low volume passages to compensate for ambient (road) noise. This allows the listener to hear the low volume passages over road noise without increasing the overall volume above the desired level. The "COMP" indicator will appear on the display when the compression feature is functional.

Scan

Depression of the "SCAN" button advances the playback unit to the next track and begins playing the selection. If, after 10 seconds, the "SCAN" button is not pressed a second time, the unit again advances to the next selection. This process repeats until the "SCAN" button is pressed a second time. The current track number is displayed during the scanning process. If the "SCAN" button is pressed a second time the unit will continue to play from that point on the disc; the elapsed time will be displayed for 5 seconds followed by TOD and volume. If the last track on the disc is reached during the scanning process, the player will revert back to track 1 and begin scanning from that point. The "SCAN" indicator will be illuminated in the "SCAN" mode.

If "SCAN" is initiated while in the random mode, the unit will scan the tracks as described above in the random order that is selected. Scanning will continue from track to track until the "SCAN" button is depressed a second time.

Error Display (ERR)

If the laser focusing mechanism is impaired by moisture or the CD is loaded upside down, damaged or excessively scratched, "ERR" will appear on the display when the CD is loaded. The unit will switch to the radio mode and automatically eject the CD. "ERR" will remain on the display for five seconds, along with the normal display information.

Display Dimming

The unit's vacuum fluorescent (VF) display has "step" dimming when the headlamps or park lamps are turned on, and the display intensity is continuously variable by the position of the instrument panel lamp dimmer rheostat control.

When no voltage is present at the park lamp input to the radio (parklamps and headlamps off) the display will be at 100 percent intensity and cannot be dimmed by the instrument panel lamp dimmer rheostat control.

THEFT DETERRENT (DELCO LOC II)

The compact disc unit is equipped with Delco LOC II theft deterrent which, when enabled, causes the unit to be inoperative should it be removed from the vehicle.

The theft deterrent is enabled (SECURE mode) by entering a user-selected code into the unit. This code must be re-keyed into the unit following any interruption of battery voltage to resume normal operations. If the correct code is not entered, the unit will be inoperable and will be in the LOCKED mode. Any theft deterrent input mode may be exited by cycling either the radio power or ignition.

Enable

1. Write down any 6-digit number and keep in a safe place.
2. Turn ignition lock cylinder to "ACCESSORY" or "RUN" position.
3. Press "PWR" button to turn radio off.
4. Press preset buttons "1 and 4" together and hold until "---" shows on the display.
   You are now ready to enter your code. Do not wait more than 15 seconds between each step.
5. Press "SET" and "000" appears on the display.
6. Press "SEEK" to the right until the second and third digits of your code appears.
7. Press "SCAN" until the first digit appears.
8. Press "AM-FM" pushbutton and "000" appears; you can now enter the last three digits of your code.
9. Press "SEEK" to the right until the fifth and sixth digits of your code appears.
10. Press "SCAN" until the fourth digit appears.
11. Press "AM-FM" pushbutton; "REP" appears for five seconds, then "000" appears.
12. Repeat Steps 6 through 11. "SEC" will then be seen on the display, meaning your radio is secured.

Disable

1. Turn ignition lock to "ACCESSORY" or "RUN" position.
2. Press "PWR" button to turn radio off.
3. Press preset buttons "1 and 4" together and hold until "SEC" (Secure) shows on the display.
4. Press "SET" and "000" appears on the display.
5. Press "SEEK" to the right until the second and third digits of your code appears.
6. Press "SCAN" until the first digit appears.
7. Press "AM-FM" pushbutton and "000" appears on the display.
8. Press "SEEK" to the right until the fifth and sixth digits of your code appears.
9. Press "SCAN" until the fourth digit appears.
10. Press "AM-FM" pushbutton. If the display shows "---", the disabling sequence was successful and the unit is in the UNSECURED mode. If the display shows "SEC", the numbers did not match the code and the unit will remain in the SECURE mode.

To Unlock Radio After Power Loss

When battery power is reapplied to a ("SEC") secured radio, the radio will not turn on, and "LOC" will appear on the display.

Enter the user code as follows (do not pause more than 15 seconds between steps):

1. Turn ignition lock to "ACCESSORY" or "RUN" position.
2. Press "SET" and "000" appears on the display.
3. Press "SEEK" to the right until the second and third digits of your code appears.
4. Press "SCAN" until the first digit appears.
5. Press "AM-FM" pushbutton and "000" appears on the display.
6. Press "SEEK" to the right until the fifth and sixth digits of your code appears.
7. Press "SCAN" until the fourth digit appears.
8. Press "AM-FM" pushbutton. If the unlock sequence was successful (the numbers matched either the user selected code or the factory back-up code), the display will show "TOD", indicating the unit is operational and in the SECURE mode. If the display shows "LOC", the numbers did not match and the unlock sequence was not successful.

Important

If 8 unsuccessful attempts are made to unlock the radio, the display will return to the "LOC" display, but when you press the "SET" button, "INOP" will be displayed. This means the radio must be left powered up for 1 hour with battery and ignition applied before any more attempts to unlock the radio can be made. Anytime "INOP" is displayed, three more attempts will be allowed after the 1 hour waiting period with battery and ignition applied.

In those cases where the user's code is lost or forgotten, the following sequence may be used (either by a dealer or by a service facility) to read a code from the display. This code will then be transmitted to the service network or Dial Delco, who will verify the authenticity of the request and supply the factory back-up code for that particular unit.

1. If the unit is locked, skip this step. Otherwise depress presets "PREV and 4" for 5 seconds while ignition is on and radio power is off. The display will show either "---" (unsecured mode) or "SEC" (secured mode).
2. Depress presets "2 and 3" for 5 seconds. The display will show the first half of the code.
3. Depress the "AM-FM" pushbutton. The display will show the second half of the code.
4. Depress the "AM-FM" pushbutton again. The unit will revert to the initial display prior to the code retrieval sequence.

DIAGNOSIS

RADIO AND TAPE PLAYER

All radios are the bridge audio type, using two wires to each speaker. It is very important when changing speakers or performing any radio work to avoid pinching the wires. A short circuit to ground from either wire will cause damage to the output circuit in the radio.

Many conditions that affect radio operation may be corrected without removing the radio or tape player from the vehicle. Verify the condition and follow the diagnosis charts to isolate and determine the cause of the problem (figures 5 through 14).

Before attempting to diagnose radio problems with the ignition on, be sure that the battery is fully charged. Batteries supplying less than 9 volts will cause incorrect diagnosis of AM or FM problems.

Because radio service problems are usually corrected at authorized warranty repair stations, the tendency is to remove the radio or tape player when a problem is reported, without any preliminary diagnosis. A large number of radios received by the warranty repair stations are found to be okay. This indicates that the trouble could have been corrected without removing the radio. The inconvenience to an owner of having to drive without a radio while it is at a warranty repair station can frequently be avoided if the diagnosis is used before removing the radio for repairs.

If possible, determine from the owner the exact nature of the radio problem as an aid to diagnosis. Knowing whether the condition is intermittent or constant, whether it occurs with engine off or running, with vehicle stationary or moving, will help pinpoint the problem. Also, check that the antenna is functioning properly and that the lead-in is not at fault. Refer to "Antenna Diagnosis" later in this section.

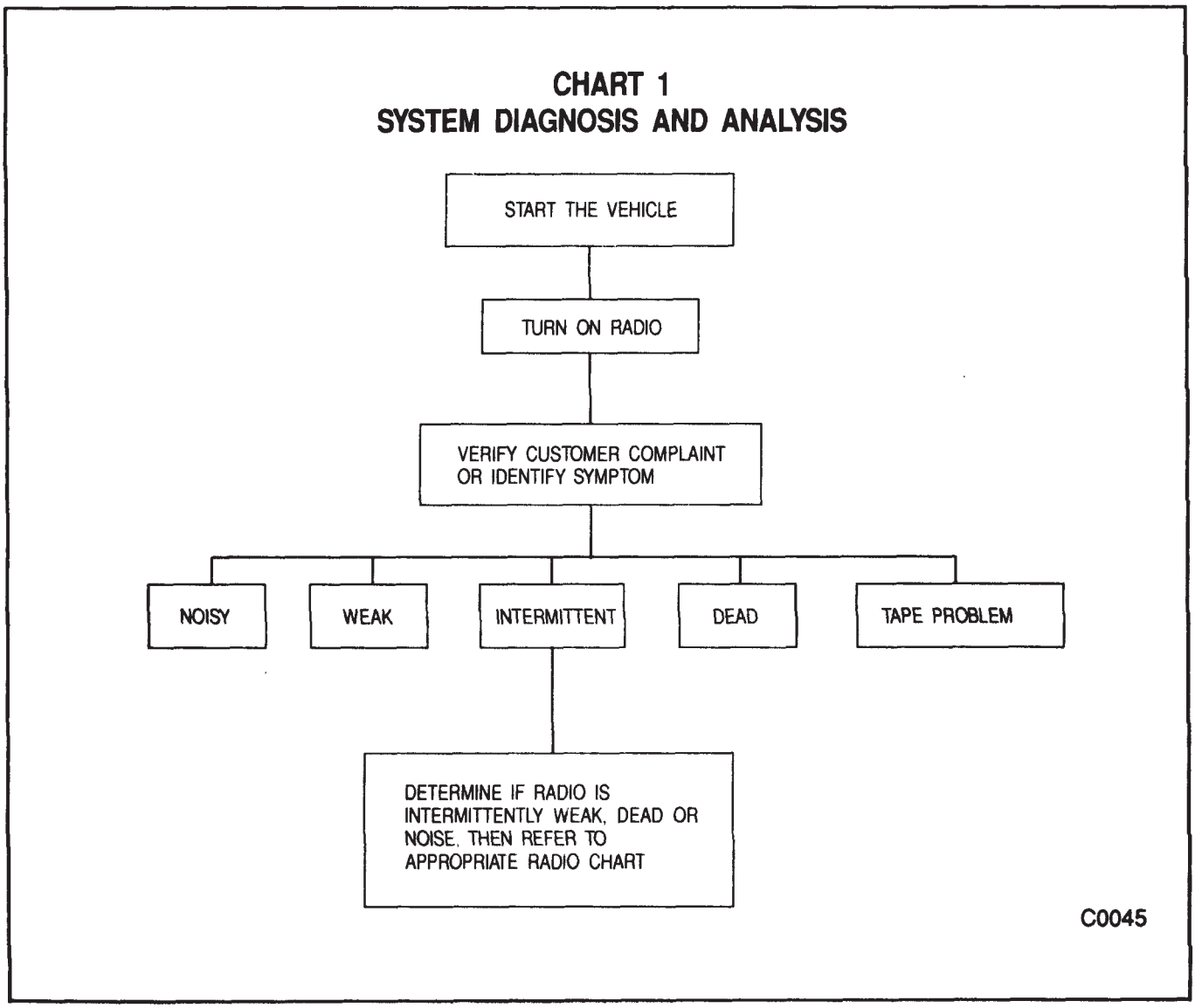


Figure 5—System Diagnosis and Analysis

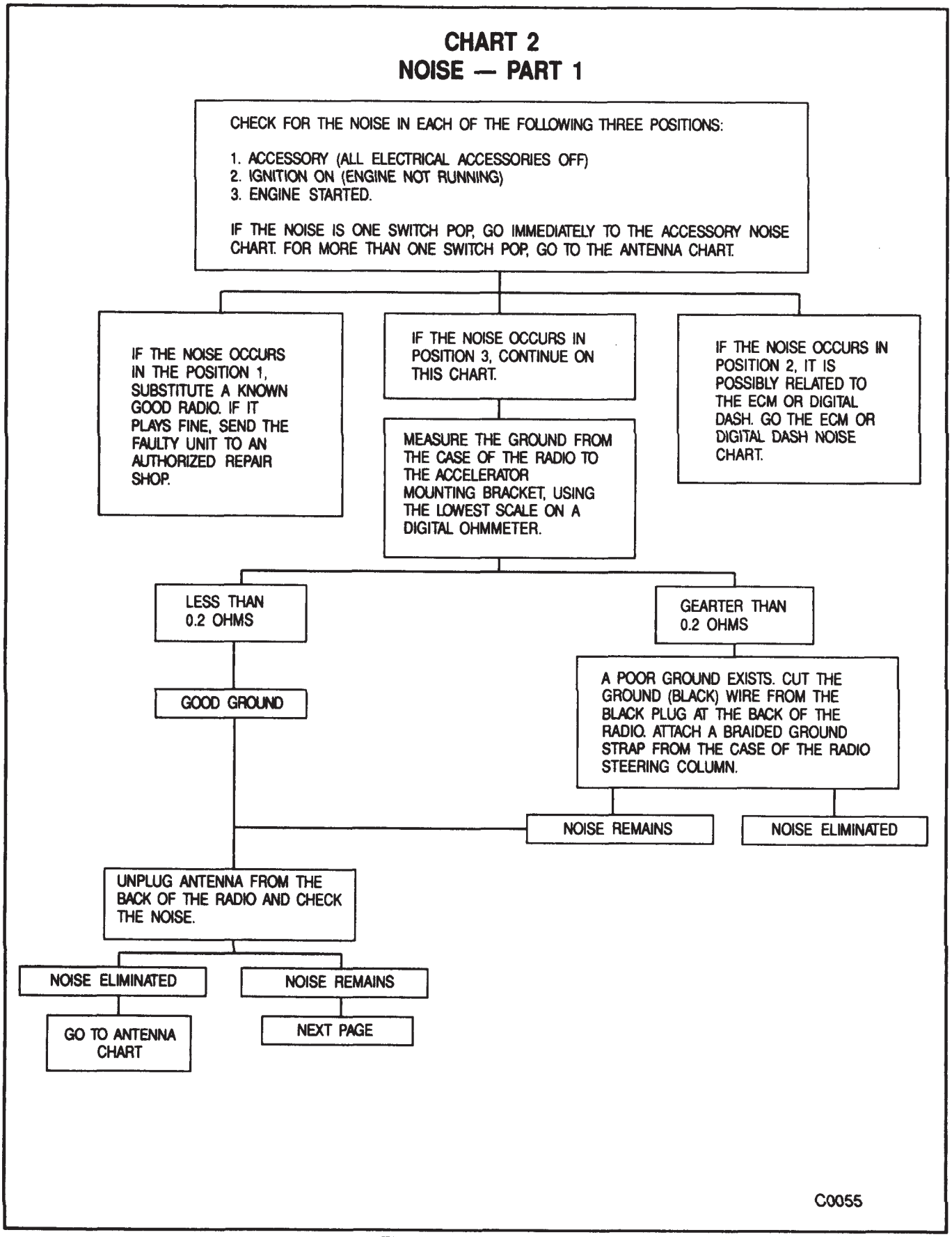


Figure 6—Noisy (Part 1)

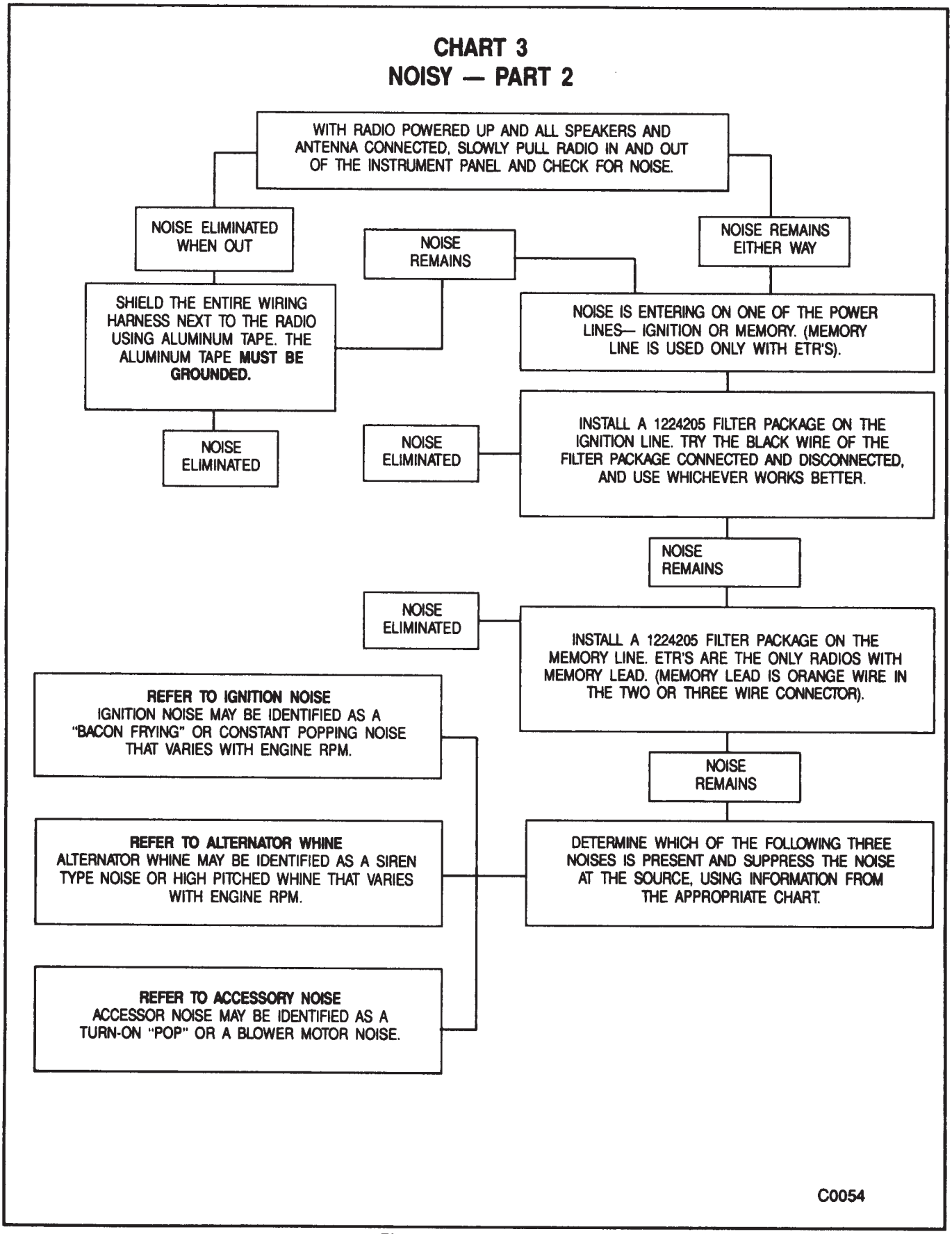


Figure 7—Noisy (Part 2)

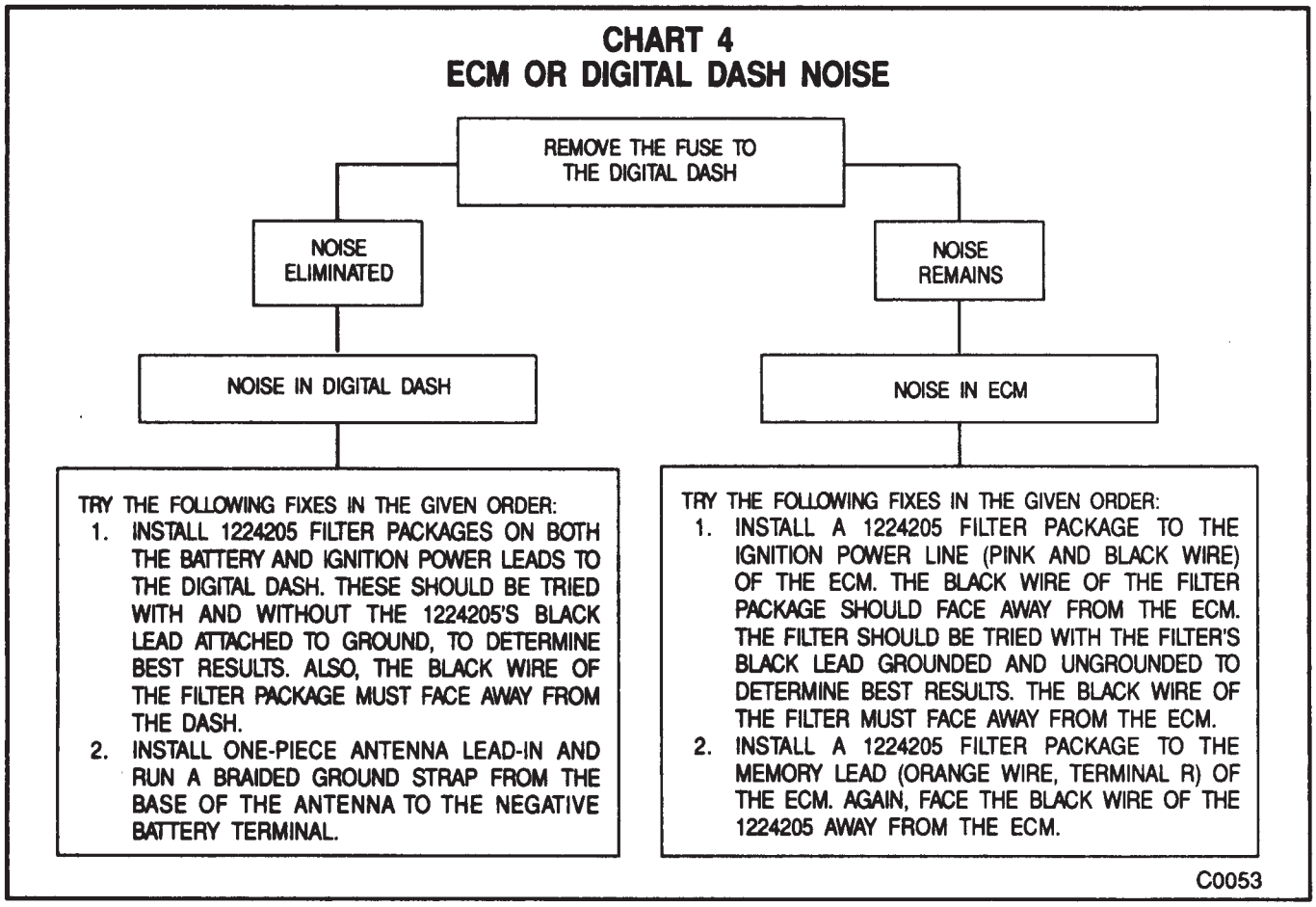


Figure 8—ECM or Digital Dash Noise

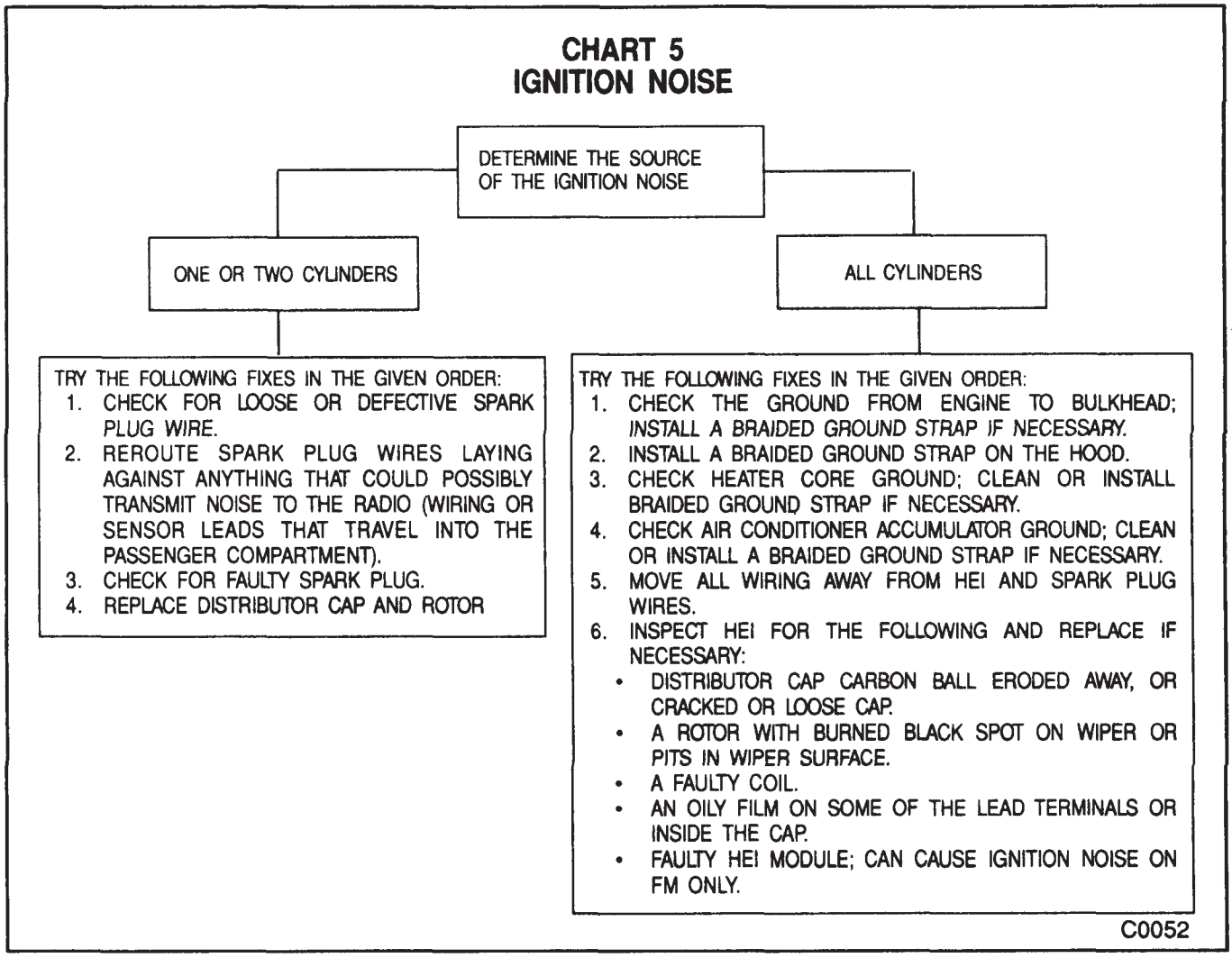


Figure 9—Ignition Noise

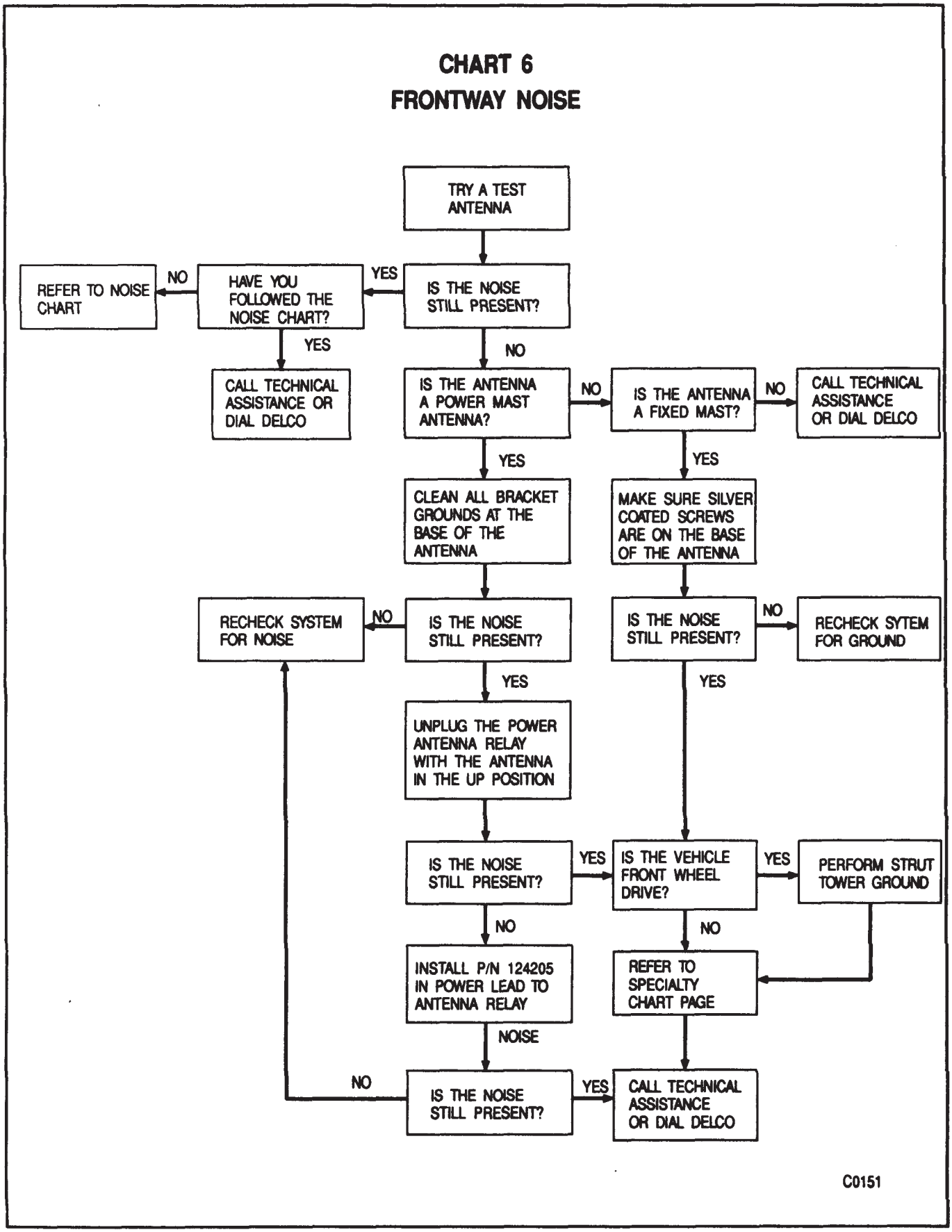


Figure 10—Frontway Noise

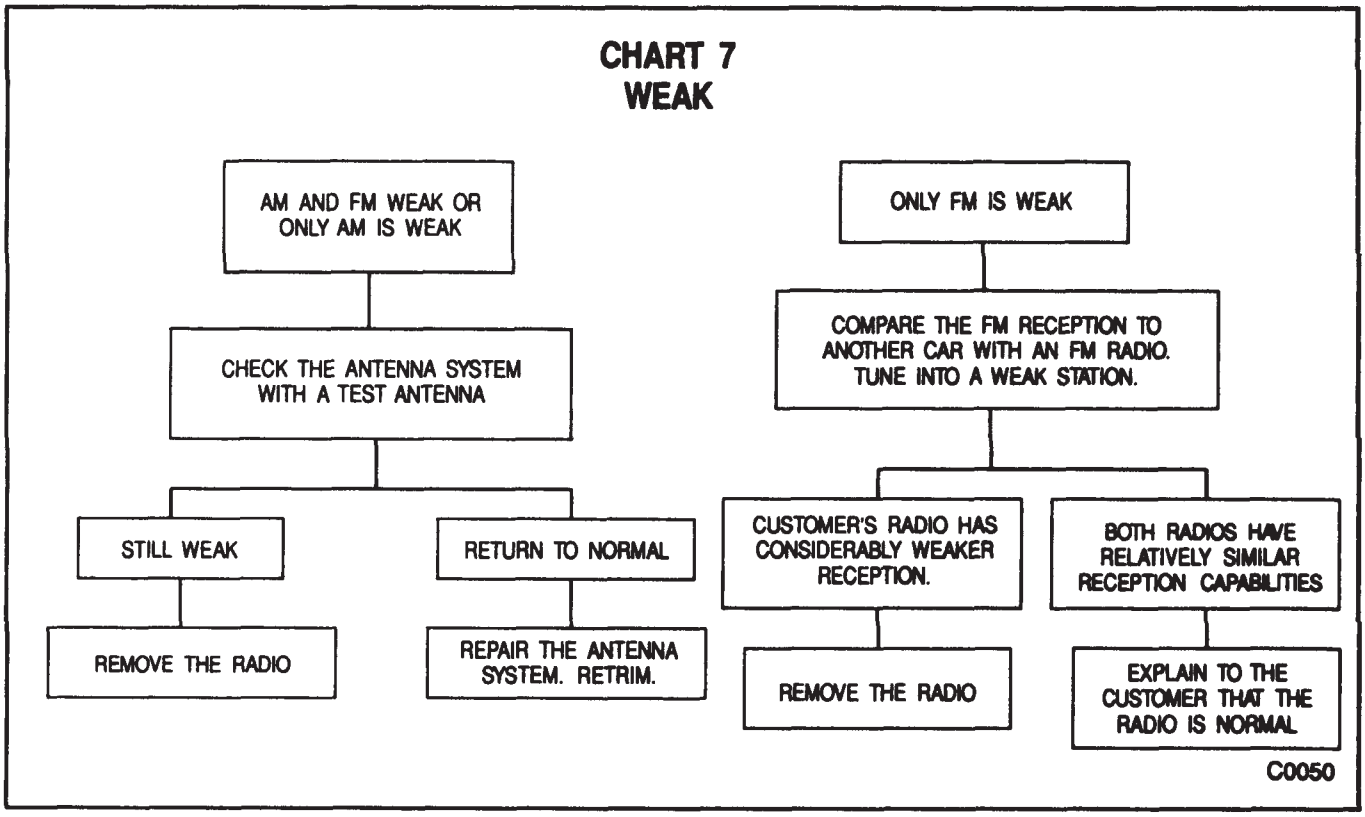


Figure 11—Weak Signal

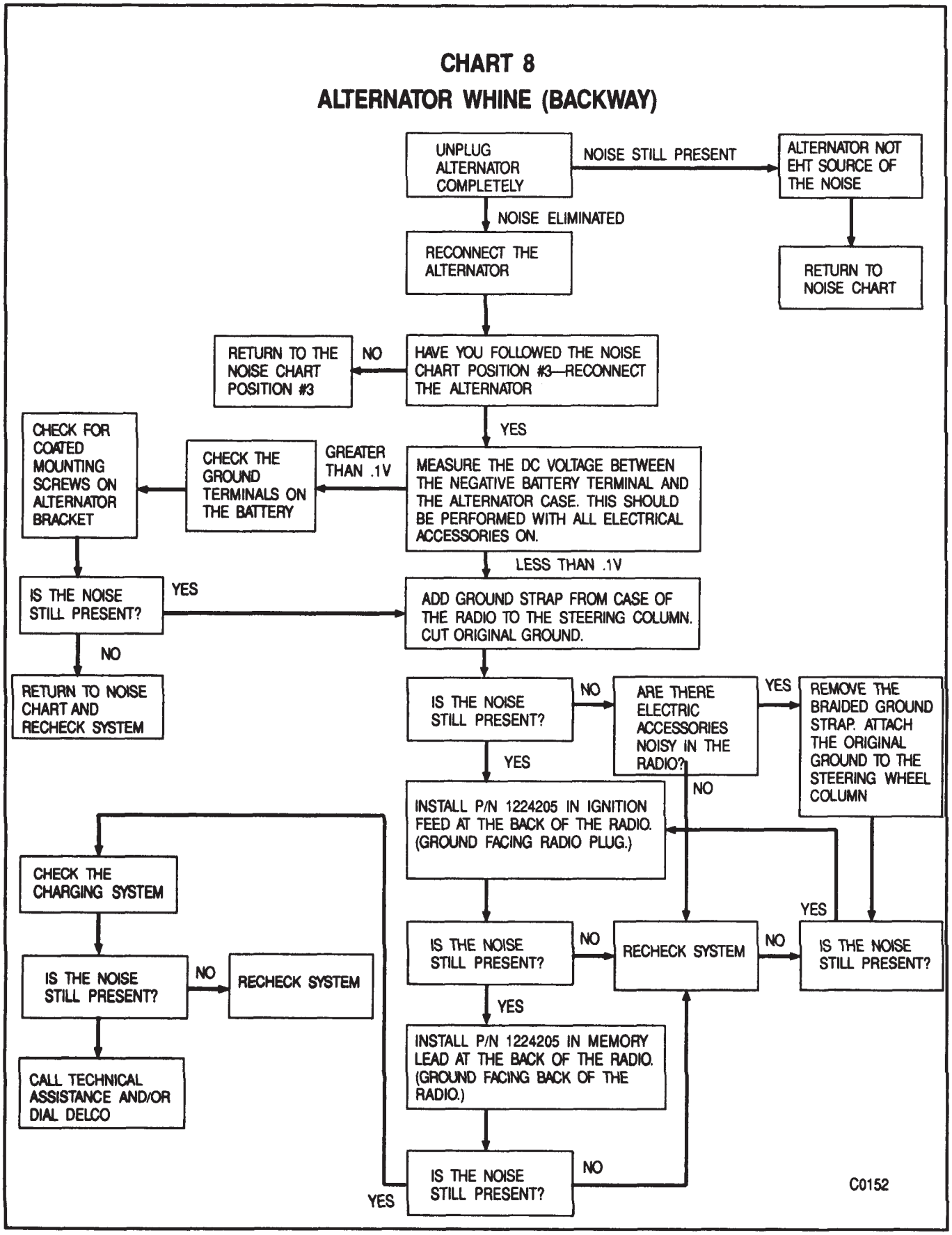


Figure 12—Alternator Whine (Backway)

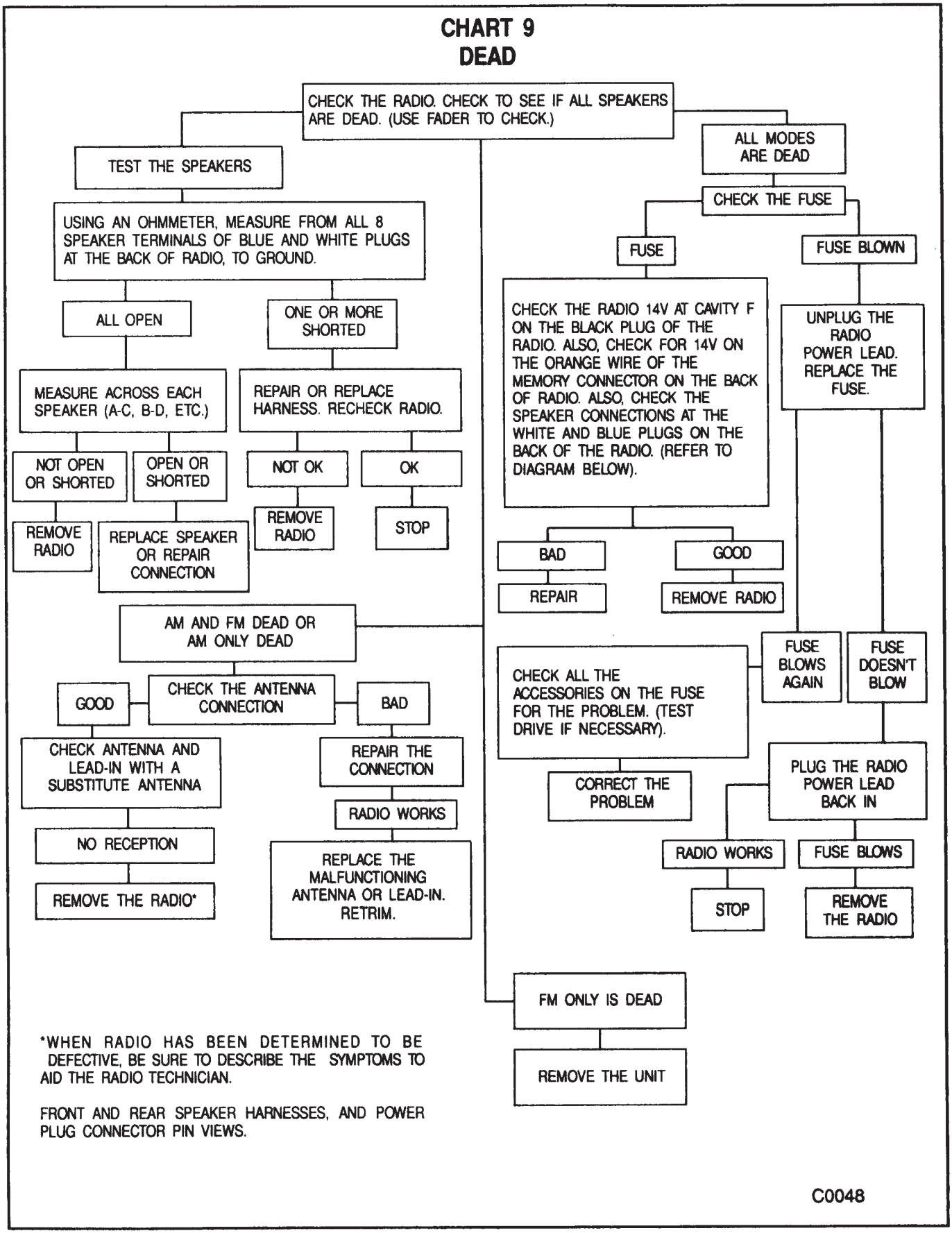


Figure 13—Dead Radio

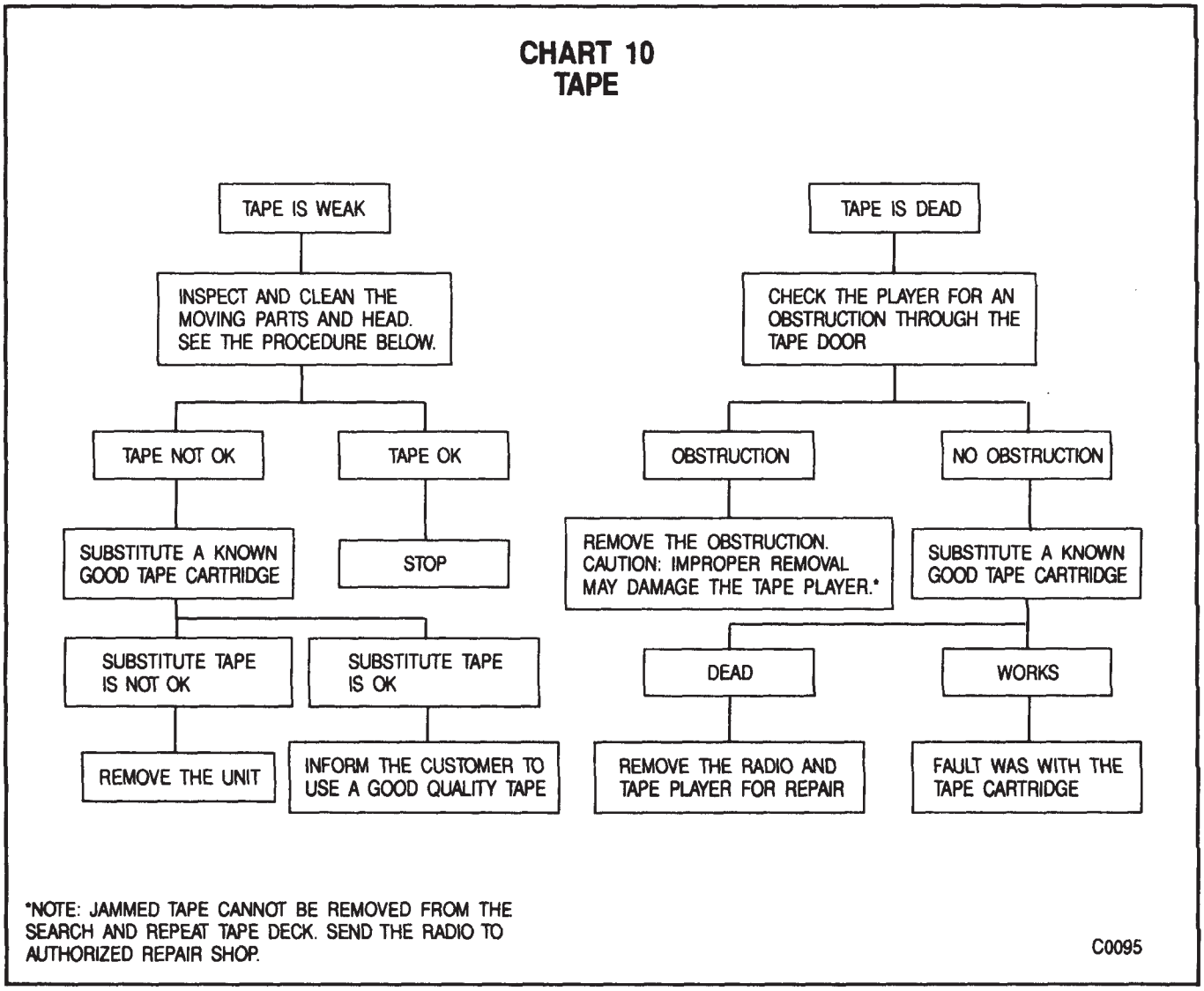


Figure 14—Tape Player Diagnosis

ON-VEHICLE SERVICE

RADIO RECEIVER REPLACEMENT

Remove or Disconnect (Figure 15)

1. Negative battery cable.
2. Ashtray. Refer to INTERIOR TRIM (SECTION 10A4).
3. Accessory trim plate. Refer to INTERIOR TRIM (SECTION 10A4).
4. Nuts from the support clips (4).
5. Support bracket screws.
6. Radio receiver (2).
   - Slide radio rearward and disconnect wiring and antenna lead.
7. Nuts from brackets.
8. Brackets (3 and 5) from radio receiver (2).

Install or Connect (Figure 15)

1. Brackets (3 and 5) to radio receiver (2).

NOTICE: For steps 2, 5, and 6, refer to "Notice" on page 9A-1 of this section.

2. Nuts.

Tighten

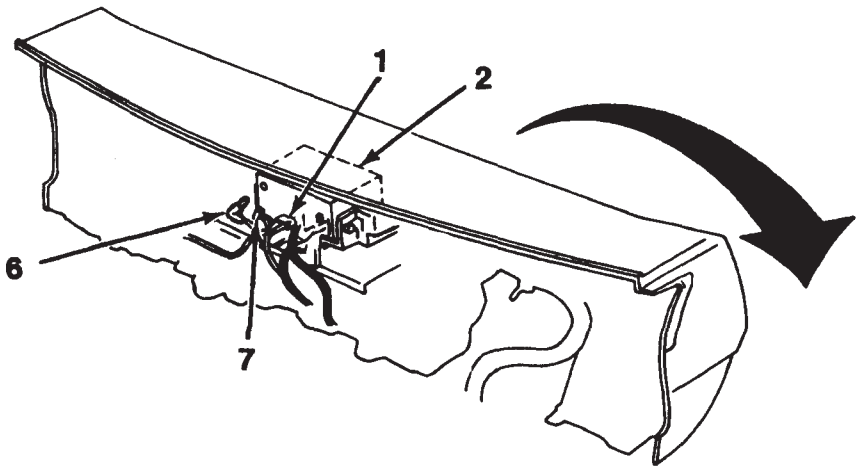
- Nuts to 2.8 N·m (25 in. lb.).

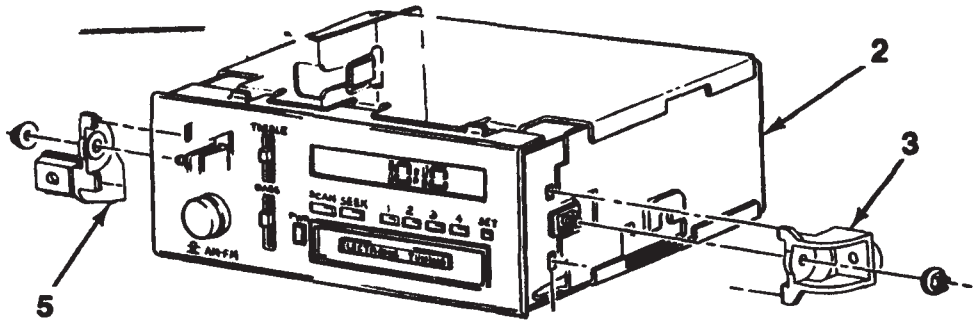
3. Wiring and antenna lead to radio receiver (2).
4. Radio receiver (2).
5. Support bracket screws.

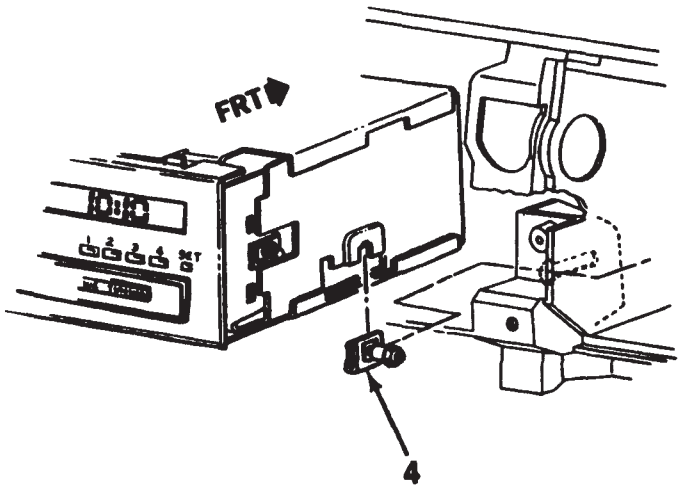
Tighten

- Screws to 1.4 N·m (12 in. lb.).

6. Nuts on the support clips (4).
7. Trim plate. Refer to INTERIOR TRIM (SECTION 10A4).







1. Speaker Harness Connector
2. Receiver
3. Bracket Right Side
4. Clip
5. Bracket Left Side
6. Antenna Cable
7. Clock Connector

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Figure 15—Radio Receiver Mounting

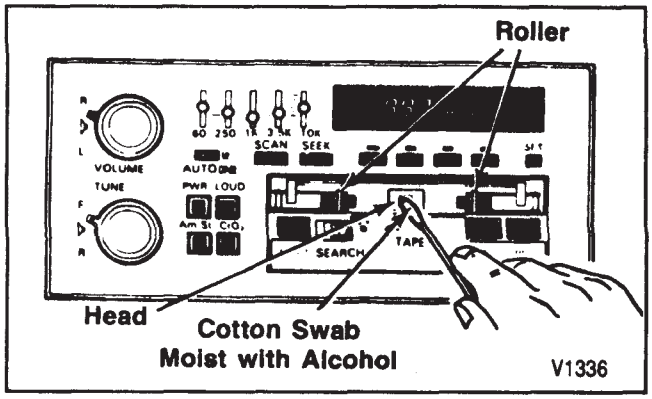


Figure 16—Cassette Player Care

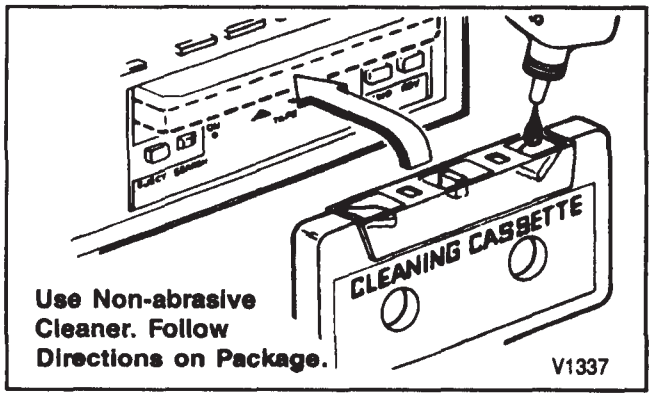


Figure 17—Use of Cleaning Cassette

8. Ashtray. Refer to INTERIOR TRIM (SECTION 10A4).
9. Negative battery cable.
   - Check circuit operation.

TAPE PLAYER AND CASSETTE CARE

For the best operation of the cassette tape player, do not use cassette tapes that are longer than 100 minutes in playback time (50 minutes per side). Cassette tapes longer than 100 minutes may cause tape slippage or jamming.

Tape Head and Capstan Cleaning

There are two parts that are cleaned on a tape player: the head and the capstan. Since they can be reached through the tape door, leave the tape player in the vehicle. This service should be performed every 100 hours of operation.

To clean the head and capstan, use a cotton swab dipped in ordinary rubbing alcohol, or use a cleaning cassette (figure 16).

As an alternate way to clean the head and capstan, a cleaning cassette kit may be purchased (figure 17). Follow the instructions included with the kit to clean the tape player.

Do not contact the tape head with magnetized tools. If the head becomes magnetized, every cassette played in the player will be degraded.

No service is performed on the tapes and warranty of these tapes is handled by the cassette manufacturer, not by the dealer. Any test tapes used by the dealer should be stored in its container to keep the tape clean. Store cassettes away from extreme heat or direct sunlight.

COMPACT DISC PLAYER AND DISC CARE

No maintenance is required to the compact disc player. When a disc is not in the CD player, it should be stored in its protective container. Store discs away from extreme heat and direct sunlight.

For best results, you should apply the same care in storing and handling the compact disc as with conventional records. No further cleaning will be necessary if the compact disc is always held by the edges and is replaced in its case directly after playing. Should the compact disc become soiled by finger prints, dirt or dust, it can be wiped (always in a straight line, from center to edge) with a clean and lint-free soft, dry cloth. No solvent or abrasive cleaner should ever be used on the disc.

SPEAKER REPLACEMENT

FRONT SPEAKER

Remove or Disconnect (Figure 18)

1. Negative battery cable.
2. Grille screws (11).
3. Speaker (9).
   - Lift the front of the grille (10).
   - Pull the grille (10) and the speaker (9) out.
4. Speaker wire (8).
5. Retainer and the grille (10) from the speaker (9).

Install or Connect (Figure 18)

1. Grille (10) and the retainer to the speaker.
2. Speaker wire (8).
3. Speaker (9).
   - Lower the back of the grille (10) in and hook it under the dash.
   - Lower the front of the grille (10) into place.

NOTICE: See "Notice" on page 9A-1 of this section.

4. Grille screws (11).

Tighten

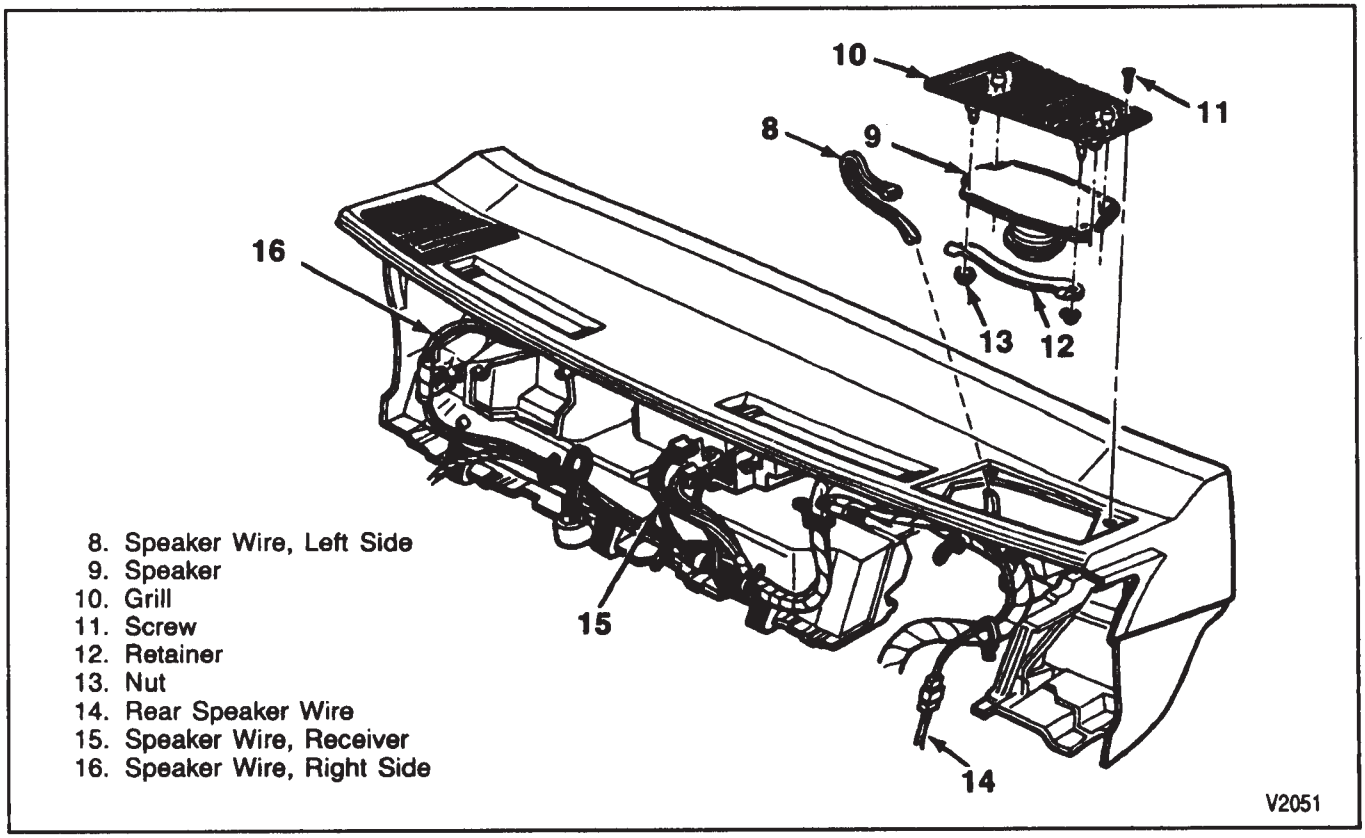
   - Screws (11) to 1.4 N.m (12 in. lb.).
5. Negative battery cable.

REAR SPEAKER

Regular Cab Pickup

Remove or Disconnect (Figure 19)

1. Negative battery cable.
2. Lower rear quarter trim panel. Refer to INTERIOR TRIM (SECTION 10A4).



8. Speaker Wire, Left Side
9. Speaker
10. Grill
11. Screw
12. Retainer
13. Nut
14. Rear Speaker Wire
15. Speaker Wire, Receiver
16. Speaker Wire, Right Side

Figure 18—Front Speaker and Wire Routing

3. Speaker wire (15).
4. Nuts (17).
5. Speaker (18).

Install or Connect (Figure 19)

1. Speaker (18).
   - The right side speaker terminals must be up.
   - The left side speaker terminals must be down.

NOTICE: See "Notice" on page 9A-1 of this section.

2. Nuts (17).

Tighten

   - Nuts (17) to 1.4 N.m (12 in. lb.).

3. Speaker wire (15).
4. Lower rear quarter trim panel. Refer to INTERIOR TRIM (SECTION 10A4).
5. Negative battery cable.

Extended Cab Pickup

Remove or Disconnect (Figure 20)

1. Negative battery cable.
2. Upper rear quarter trim panel and insulation. Refer to INTERIOR TRIM (SECTION 10A4).
3. Speaker wire (15).
4. Nuts (17).
5. Speaker (18).

Install or Connect (Figure 20)

1. Speaker (18).

NOTICE: See "Notice" on page 9A-1 of this section.

2. Nuts (17).

Tighten

   - Nuts (17) to 1.4 N.m (12 in. lb.).

3. Speaker wire (15).
4. Upper rear quarter trim panel and insulation. Refer to INTERIOR TRIM (SECTION 10A4).
5. Negative battery cable.

Utility Vehicle (Two-Door)

Remove or Disconnect (Figure 21)

1. Negative battery cable.
2. Screws (19) and the ashtray assembly (20).
3. Screws (21) and the cover (22).
4. Speaker wire (15).
5. Nuts (17).
6. Speaker (18) from the cover (22).

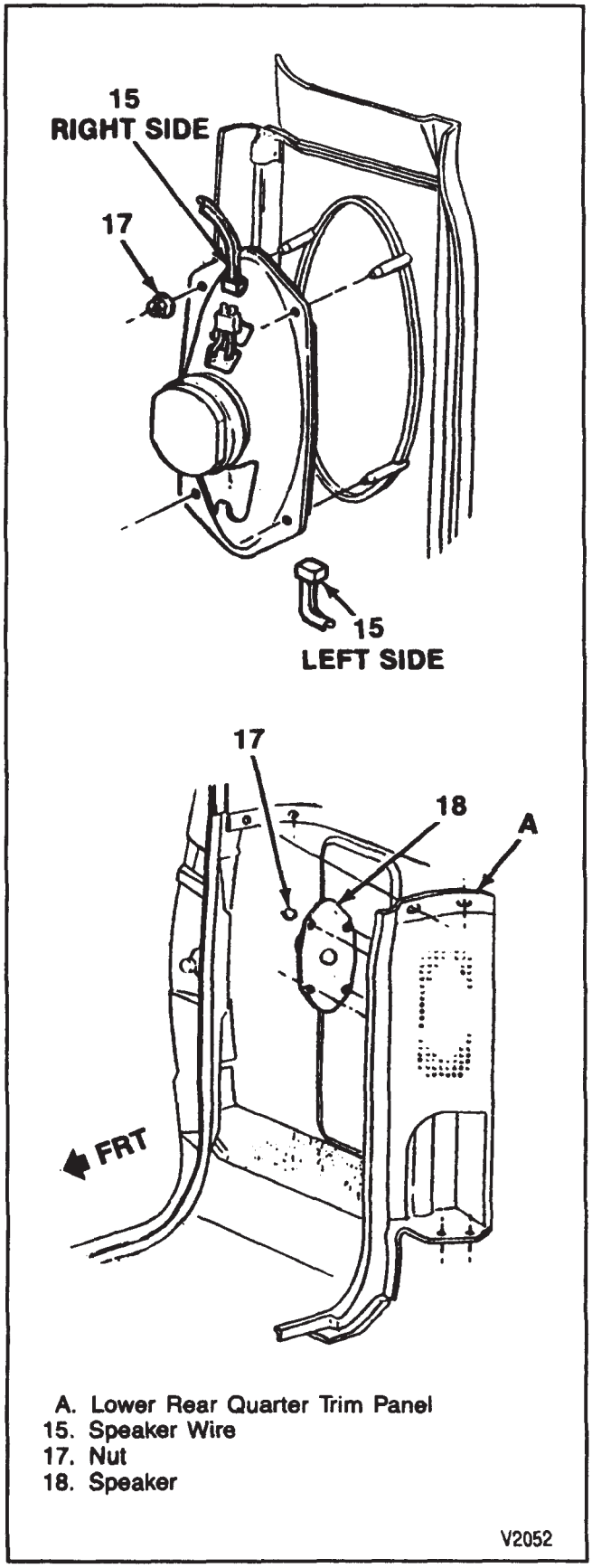


Figure 19—Rear Speakers (Regular Cab Pickup)

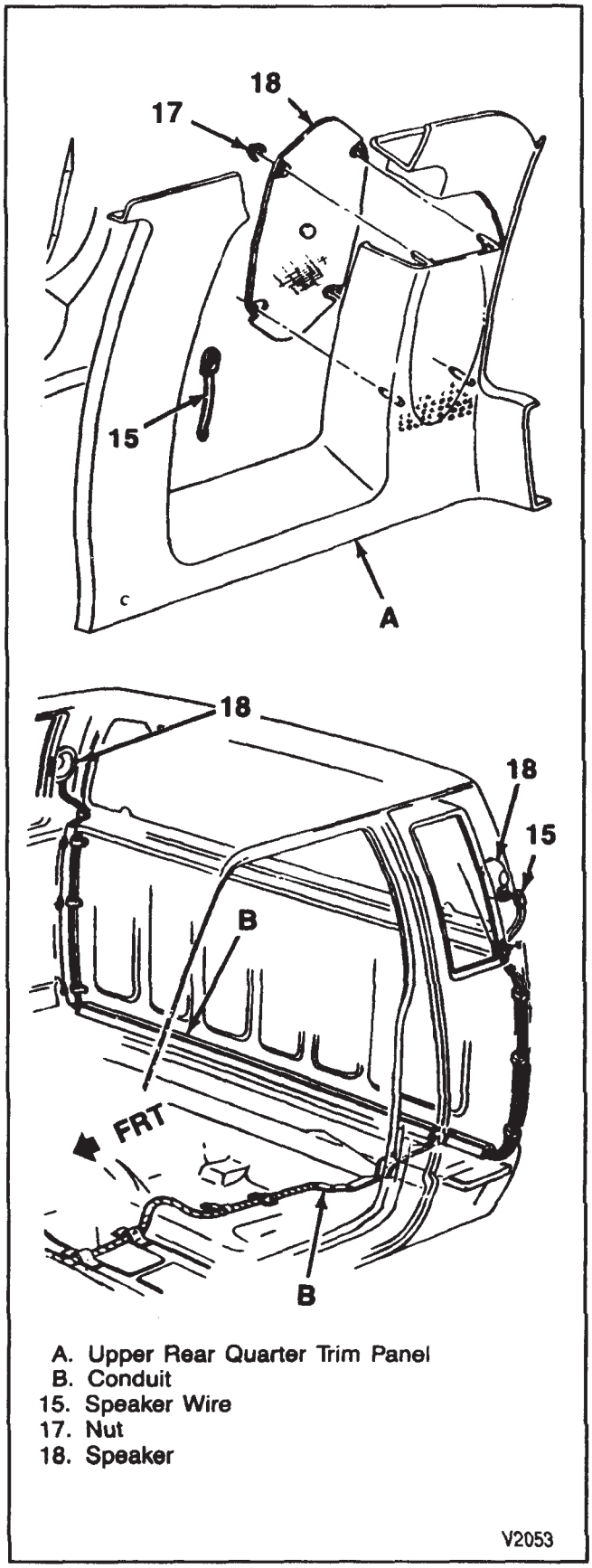


Figure 20—Rear Speakers (Extended Cab Pickup)

Install or Connect (Figure 21)

1. Speaker (18) to the cover (22).

NOTICE: See "Notice" on page 9A-1 of this section.

2. Nuts (17).

Tighten

- Nuts (17) to 1.2 N·m (11 in. lb.).

3. Speaker wire (15).
4. Cover (22) and the screws (21).

Tighten

- Screws (21) to 1.4 N·m (12 in. lb.).

5. Ashtray assembly (20) and the screws (19).
6. Negative battery cable.

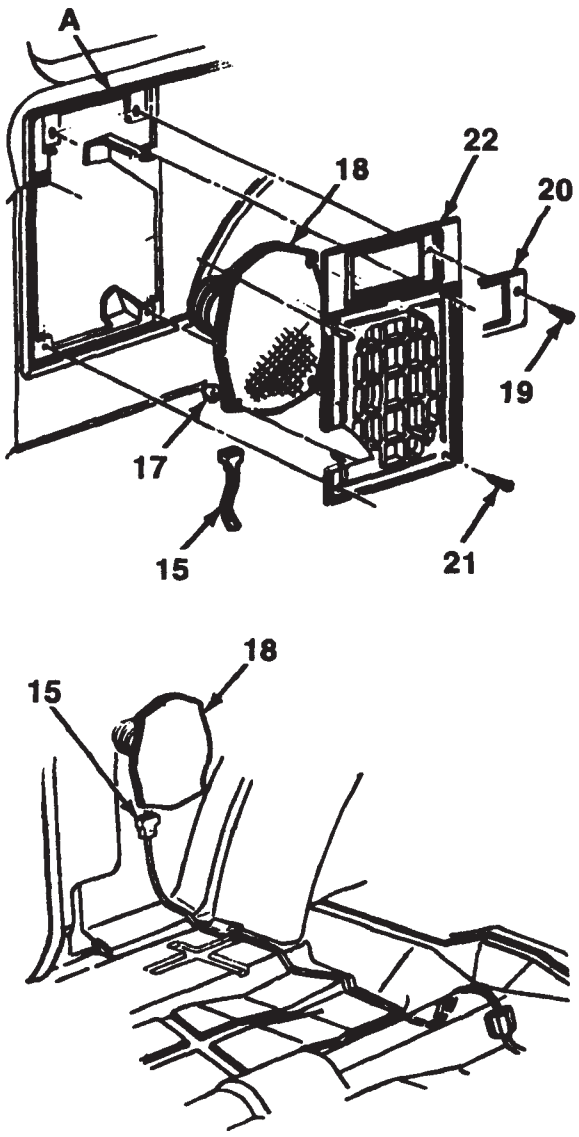
Utility Vehicle (Four-Door)

Remove or Disconnect (Figures 22 and 23)

1. Negative battery cable.
2. Rear door trim panel. Refer to DOORS (SECTION 10A1).
3. Insulator (27).
4. Mounting rivets (26).
5. Speaker (24) and speaker drip shield (25).
6. Speaker harness connector (29) (figure 23).

Install or Connect (Figures 22 and 23)

1. Speaker harness connector (29) (figure 23).
2. Speaker (24) and speaker drip shield (25).
3. Mounting rivets (26).
4. Insulator (27).
5. Rear door trim panel. Refer to DOORS (SECTION 10A1).
6. Negative battery cable.



A. Trim Panel
15. Speaker Wire
17. Nut
18. Speaker
19. Screw
20. Ash Tray Assembly
21. Screw
22. Cover

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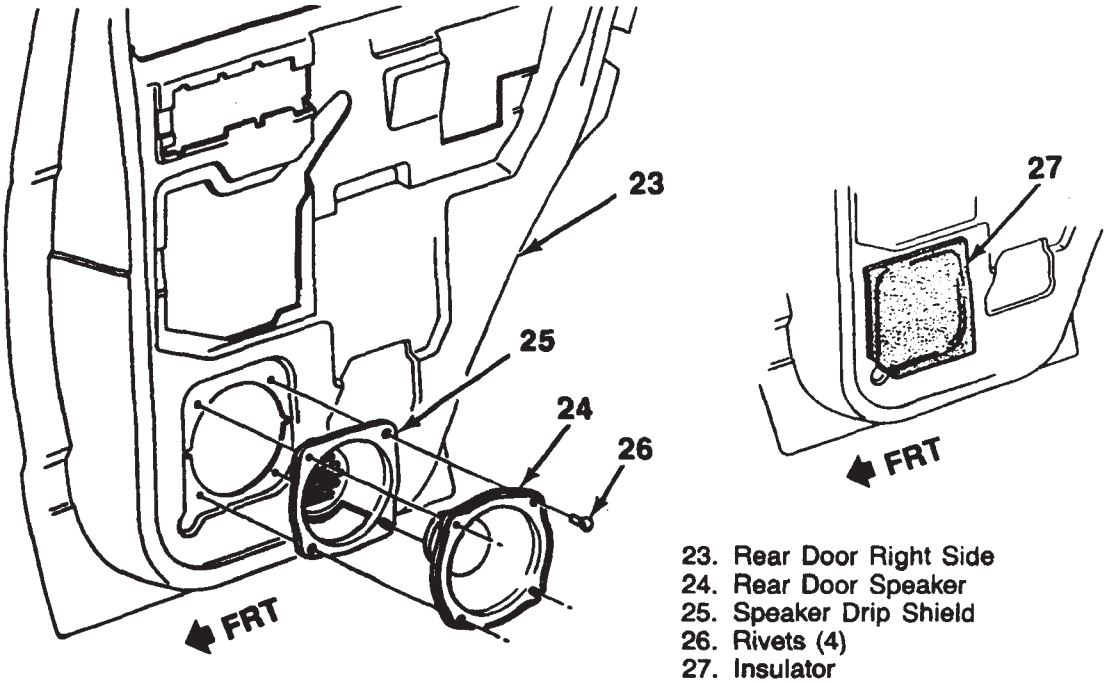
Figure 21—Rear Speakers (Utility Vehicle Two-Door)



23. Rear Door Right Side
24. Rear Door Speaker
25. Speaker Drip Shield
26. Rivets (4)
27. Insulator

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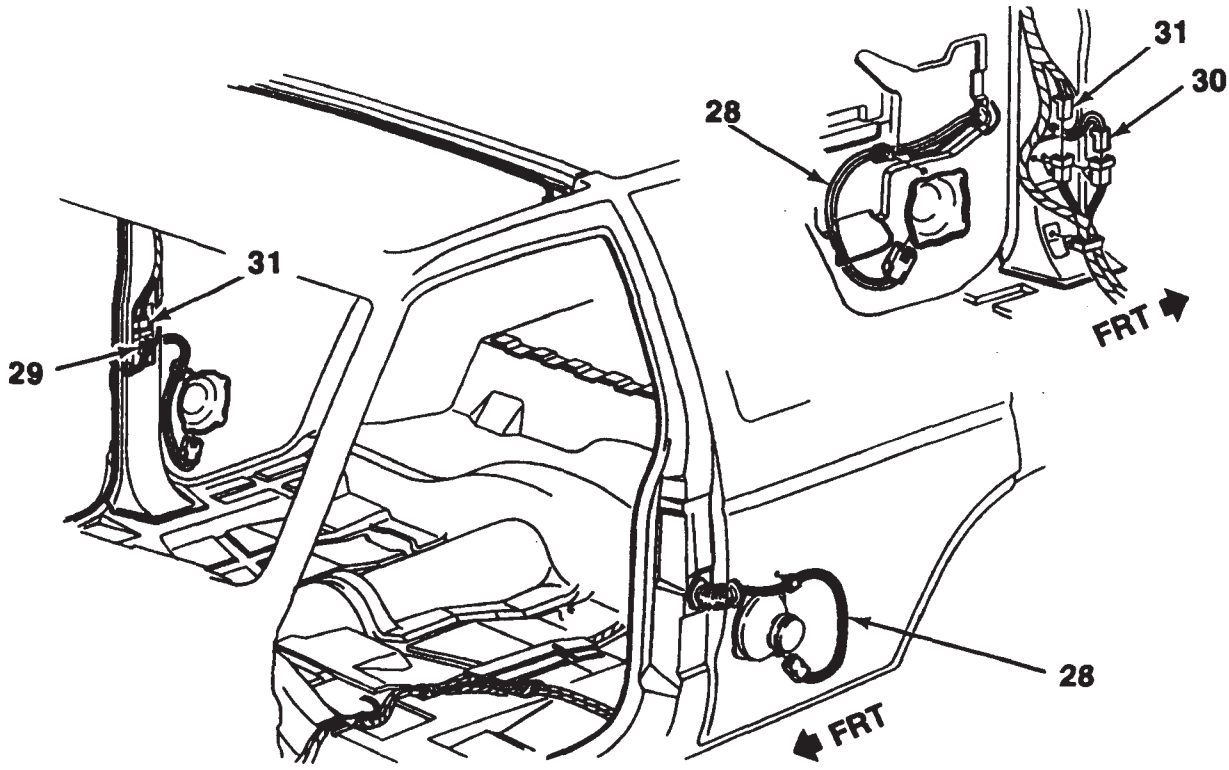
Figure 22—Rear Side Door Speaker Mounting (Four-Door Utility)



28. Left Speaker Harness
29. Right Speaker Harness Connector
30. Left Speaker Harness Connector
31. Dome Lamp Harness Connector

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Figure 23—Rear Side Door Speaker Wiring (Four-Door Utility)

ANTENNAS

GENERAL DESCRIPTION

FIXED MAST

The fixed mast antenna is designed to withstand most car washes without damage. It cannot be adjusted up or down. If the mast becomes slightly bent, you can straighten it by hand. The antenna can be replaced if severely bent (by vandalism, etc.). Antennas must be kept clean for good performance.

DIAGNOSIS

FIXED ANTENNA

Disconnect antenna lead-in cable at back of radio and plug a test antenna into radio. Make sure test antenna is grounded to the vehicle chassis and keep hands off of the antenna. Check radio reception in an area away from electrical interferences such as tall buildings, metal structures, power lines, fluorescent lighting, and power tools. Tune to high and low ends of the dial on both AM and FM, checking weak and strong station reception. *If reception is okay, problem exists* with antenna and/or its lead-in cable. If reception is still poor, refer to "Diagnostic Charts" earlier in this section.

Testing for Good Ground of Antenna Mounting and Connections

Poor grounding at the antenna mounting or any connection in the antenna/lead-in system can result in seriously reduced radio performance. A poor ground can

be a reason for excess ignition noise on AM or erratic audio. Also, be sure lead-in connectors are free of dirt and corrosion, and are tightly fastened.

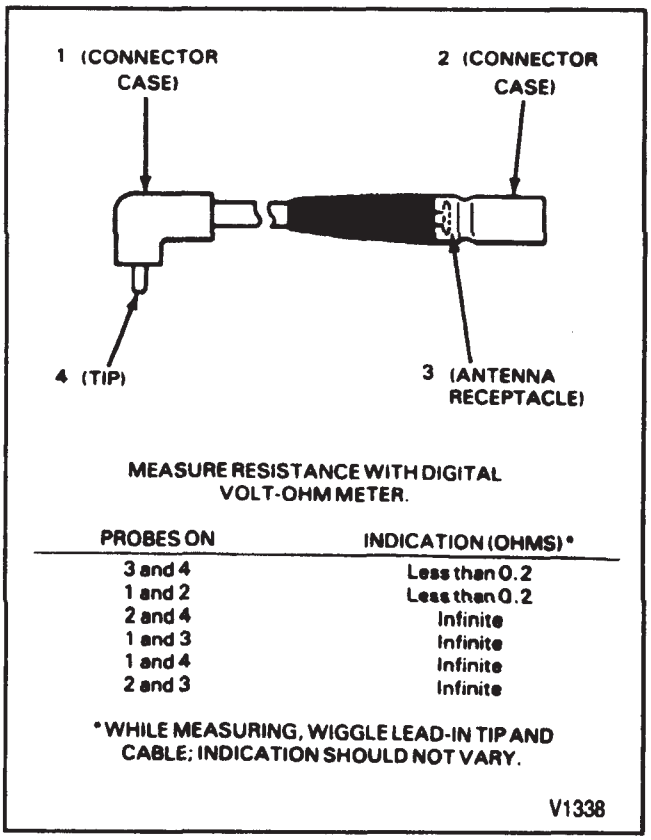
Possible ground loss or high-resistance ground points are:

- Antenna upper mounting (loose screws, paint overspray, etc.).
- Lead-in cable connector at antenna (loose or internally corroded).
- Lead-in cable connector at radio (loose or internally corroded).
- Quick connect connector (corroded).
- Missing ground lead.

Checking Lead-In Cable

Usually, a broken center conductor of the lead-in cable will result in no AM and weak FM. In case of continued reception or noise complaints, always check the lead-in with an ohmmeter (figure 24).

When checking resistance, wiggle the lead-in tip and cable. If the readings shown in figure 24 are not obtained, some portion of the lead-in is intermittent and the lead-in should be replaced.



MEASURE RESISTANCE WITH DIGITAL VOLT-OHM METER.

PROBES ON	INDICATION (OHMS)*
3 and 4	Less than 0.2
1 and 2	Less than 0.2
2 and 4	Infinite
1 and 3	Infinite
1 and 4	Infinite
2 and 3	Infinite

*WHILE MEASURING, WIGGLE LEAD-IN TIP AND CABLE; INDICATION SHOULD NOT VARY.

V1338

Figure 24—Lead-In Cable Diagnosis

ON-VEHICLE SERVICE

ANTENNA REPLACEMENT

Remove or Disconnect (Figure 25)

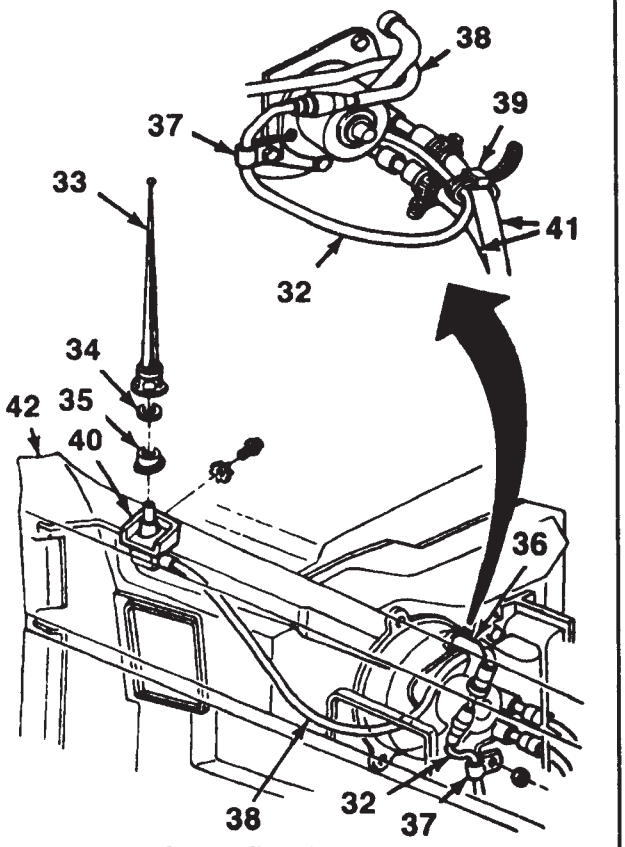
1. Negative battery cable.
2. Mast retaining nut (34).
3. Antenna mast (33).
4. Bezel (35).
5. Antenna cable from the receiver cable.
6. Screws and washers.
7. Antenna cable assembly (40).

Install or Connect (Figure 25)

1. Antenna cable assembly (40).

NOTICE: See "Notice" on page 9A-1 of this section.

2. Washers and screws.
3. Antenna cable to the receiver cable.
4. Bezel (35).
5. Antenna mast (33).
6. Mast retaining nut (34).
7. Negative battery cable.



32. Antenna Cable, Receiver
33. Antenna
34. Nut
35. Bezel
36. Heater Vent Pipe
37. Clamp
38. Antenna Cable
39. Strap
40. Antenna Cable
41. Heater Hoses
42. Right Fender

V2055

Figure 25—Antenna and Cable Mounting

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

ITEM	N·m	In. Lbs.
Mounting Bracket-to-Radio Nut	2.8	25
Mounting Bracket Screw	1.4	12
Front Speaker Mounting Screw	1.4	12
Rear Speaker Mounting Screw	1.4	12

T2734

SECTION 9B

CRUISE CONTROL

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

GENERAL DESCRIPTION

Electronic cruise control is a speed control system which maintains a desired vehicle speed under normal driving conditions. However, steep grades up or down may cause variations in the selected speeds. The electronic cruise control system has the capability to cruise coast, resume speed, accelerate, and "tap-up"and "tap-down."

The main components of the cruise control system are the mode control switches, module, servo unit, vehicle speed sensor, vehicle speed sensor buffer, vacuum supply, electrical and vacuum release switches, and electrical harness.

The cruise control system uses vacuum to operate a throttle servo unit. The servo unit maintains a desired vehicle speed by trapping vacuum in the servo unit at the proper servo position. The module monitors vehicle speed and servo position and operates the vacuum and vent valves in the servo to maintain desired speed. The module contains a low speed limit which will prevent system engagement below a minimum speed, about 25 mph. The operation of the module is controlled by mode control switches located in the end of the directional signal lever. To disengage the system, two release switches are provided. An electrical release switch mounted on the brake pedal bracket disengages the system electrically when the brake pedal is depressed. A vacuum release valve, mounted on the brake pedal bracket, vents the trapped vacuum in the servo to atmosphere when the brake pedal is depressed, allowing the servo unit to quickly return the throttle to idle position.

OPERATION

OFF/ON/RESUME/ACCEL SWITCH

The Off/On/Resume/Accel Switch has three positions (figure 1). This switch turns the cruise control system ON and OFF and also returns cruise control operation to the last speed setting when MOMENTARILY moved towards the R/A position after braking. (Do not hold the slider in the R/A position... release it immediately.) If the slider is held in the R/A position for more than one second, the system reverts to the Accel mode. To accelerate the vehicle, move the slider switch to the R/A position and hold it there until the vehicle reaches the desired increased speed. When the slider switch is released, the speed the vehicle accelerated to becomes the new cruise speed. In order to use the Accel mode, the cruise OFF/ON/Resume/Accel switch must be in the "ON" position and the vehicle must be above the low speed lockout 40 km/hr (25 mph). The slide switch can also be used to "tap-up" vehicle speed. In order to do this the cruise must be engaged and operating. "Tapping-up" is done by quickly press-

ing the slide switch toward the R/A position and quickly releasing it, or "tap" the lever. Do not hold the lever in the R/A position or the system will revert to the Accel mode. "Tap-up" is a function in which cruise speed can be increased by 0.62 km/hr (1 mph) increments (one tap = 1 mph increase) up to ten times. After 10 times the system must be reset to a new speed to continue this function.

SET/COAST BUTTON SWITCH

The "Set/Coast" button (located in the end of the turn signal lever) has two positions - "Normal" and "Depressed" (figure 1).

- **The Set Position**- With the button switch depressed and then released (vehicle speed must exceed the low speed limit point, and the Off/On/Resume/Accel Switch must be in the ON position) the cruise speed will be set at the particular speed the vehicle was at when the button was released. Vehicle cruise speed will be within±0.62 km/hr (1 mph) of the actual speed when engaged. The system will cruise until either the Off/On/Resume/Accel Switch is moved to OFF, the ignition switch is turned off, and/or the Set/Coast Button is pushed in fully and held. Pushing the brake pedal releases the cruise but not the resume capability.
- **The Coast Position**- With the button switch fully depressed, the driver can raise or lower his control speed. To increase control speed, the driver would accelerate to a new speed, fully depress the switch (module releases previously set speed) and release the button. Upon releasing the button a new speed is set. An increased control speed can also be more easily set by the Off/On/Resume/Accel Switch as previously described. To decrease cruise speed, the button switch is held in (depressed position) disengaging the cruise system, and allowing the throttle to return to the idle position. When the vehicle has slowed to the desired tower cruise speed, releasing the switch will re-engage the system at the lower speed.
- **The "Tap-Down" Position**- In order to do this the cruise must be engaged and operating."Tapping-down" is done by quickly pressing the Set/Coast Button to the depressed position and quickly releasing it, or "tap" the button. Do not hold the button in the depressed position or the system will revert to the "coast" mode. "Tap-down" is a function in which cruise speed can be decreased by 0.62 km/hr (1 mph) increments (one tap = 1 mph decrease). The system can "tap-down" until it reaches the low speed lockout 40 km/hr (25 mph), after this cruise will not operate. **The accelerator may be depressed at any time to override the cruise system. Release of the accelerator will return the car to the previously set cruise speed.**

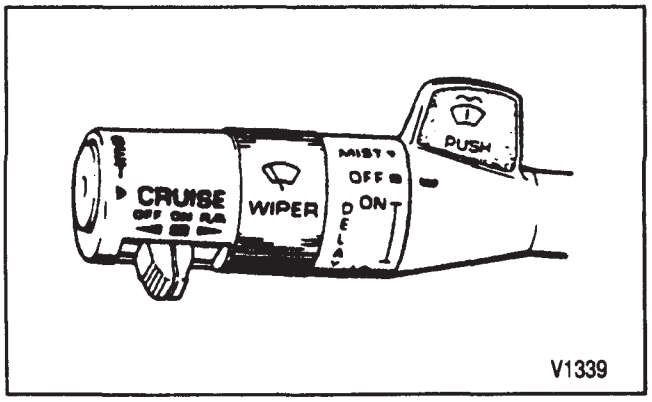


Figure 1—Turn Signal Lever

NOTICE: To keep the vehicle under control, and to prevent possible vehicle damage, it is not advisable to use the cruise control on slippery roads. It is not recommended to use the cruise control in conditions such as on winding roads or in traffic of heavy or varying volume. When traveling down a steeply graded hill, the cruise control should be disengaged by depressing the brake pedal lightly. The transmission can then be shifted into a lower gear range to help control vehicle speed.

COMPONENTS

VACUUM SUPPLY

The vacuum supply to operate the cruise control system is routed to the servo. This is done by routing manifold vacuum to the servo through a vacuum storage tank.

MODULE

The module interprets the position of the servo, the position of the mode control switches and the output of the speed sensor. In response to these inputs, the module electrically signals the opening or closing of the vent and vacuum solenoid valves in the servo.

The module is usually mounted on the back of the instrument panel next to the steering column.

SERVO UNIT

The servo consists of a vacuum operated diaphragm, a normally open solenoid valve to vent the diaphragm *chamber to atmosphere, a normally closed solenoid* valve to connect the diaphragm chamber to the vacuum source, and a variable inductance position sensor. The servo operates the throttle in response to signals from the module as follows:

- **Steady Cruise State** (system engaged and operating)—Both vacuum and vent valves are closed or sealed. The servo has a constant vacuum on the diaphragm and places no-flow requirements on the vacuum source. Vacuum is trapped in diaphragm chamber.
- **Vehicle Losing Speed** (due to steep grades or driver wishes to increase speed by operating *mode control switches)—The module energizes* the vacuum solenoid to open the vacuum valve to the vacuum source. This increases the vacuum level in the servo to increase the throttle opening. The vent remains closed.
- **Vehicle Gaining Speed** (due to steep grades or driver wishes to decrease speed by operating mode control switches)—The module de-energizes the vent solenoid to open the vent valve to the atmosphere which reduces vacuum

in the servo and allows the throttle return spring to decrease the throttle opening. The vacuum valve remains closed. If the vehicle speed goes above cruise "Set" speed, the servo can return the throttle to idle position. However, if vehicle is on a sufficient down hill grade, the vehicle may continue to accelerate due to the low drag coefficient, low rolling resistance and gravity.

When the cruise system is engaged and operating (without any interference from the driver via the mode control switches), no speed correction will be made until the vehicle exceeds approximately±0.5 km/hr (0.25 mph) of set speed.

The cruise system contains a built-in delay feature when it is first turned on. Specifically, with this system, only after the multi-function lever switch has been in the "On" position for approximately one to two seconds will the cruise system engage with depression of the "Set/Coast" button. The reason for this time delay is two fold:

1. It allows time for the electronic control module to correctly interpret vehicle speed.
2. An important safety consideration is yielded as well. This time delay prevents the module from storing an uncalled-for "Set" speed.

This built-in delay should not be mis-diagnosed as a malfunctioning cruise control system.

When the module senses an over or underspeed condition it will pulse the opening of the vent or vacuum valve. The average duration of one pulse will be 10 milliseconds. The pulse will be repeated, as required, until the speed correction required brings the vehicle to the set speed. From any set speed, under normal road load conditions, the vacuum valve will remain in a completely open position when vehicle speed has dropped 5 mph below set speed. Likewise, when vehicle speed has exceeded 3 mph over the set speed, such as down a steep grade, the vent will go into constant open position.

The servo incorporates a steel core which moves within a coil. Its resulting variable inductance provides a continuous servo position signal (voltage) to the module. This voltage signal is constantly compared to the vehicle speed signal. This comparison determines if the pulses issued have corrected the speed error or if additional pulses are required. This comparison is also used to lengthen the average pulse when it is not enough to compensate for the speed error, such as a steep grade.

The servo will go into an open vent valve position under the following conditions:

- When the brake pedal is depressed.
- An open variable inductance position sensor coil in the servo.
- A loss of electrical power to the system.
- The ignition is turned off.
- Mode switch on turn signal lever turned off.

VEHICLE SPEED SENSOR

The vehicle speed sensor (VSS), is located at the rear of the transmission, generates a signal that indicates vehicle speed.

The vehicle speed sensor is a permanent magnet generator comprised of a field coil and a permanent magnet stator that produces AC voltage. When the vehicle is in motion, the sensor produces electrical impulses which are sent to the vehicle speed sensor buffer.

VEHICLE SPEED SENSOR BUFFER (D.R.A.C.)

The vehicle speed sensor buffer is a solid state device that is used to change the signal from the vehicle speed sensor to a digital signal. The vehicle speed sensor buffer will change the signal from the vehicle speed sensor to a signal containing pulses for the cruise control module. The vehicle speed sensor buffer is matched to the final drive of each vehicle, so it must be replaced with the proper adapter to match the final drive of the vehicle. If the final drive ratio of the vehicle is changed for any reason, the vehicle speed sensor buffer must also be changed to continue an accurate speedometer and odometer reading. The incorrect vehicle speed sensor buffer will also affect the electronic control module, as well as the cruise control module. The speed sensor used with the vehicle speed sensor buffer is a permanent magnet type sensor mounted in the automatic transmission.

ELECTRICAL AND VACUUM RELEASE SWITCHES

These switches are used to disengage the cruise control system. An electrical release switch mounted on the brake pedal bracket disengages the system electrically when the brake pedal is depressed. This is done by interrupting the flow of current to the module. A vacuum release valve is also mounted on the brake pedal bracket. This valve vents the trapped vacuum in the servo to atmosphere when the brake pedal is depressed. This allows the servo unit to quickly return the throttle to idle position. A separate vacuum hose is routed from the servo to the normally closed vacuum switch. These two types of switches will also sometimes be combined with stop light switch, TCC switch, etc.

DIAGNOSIS

Before beginning diagnosis, make a visual inspection for the following and repair as needed:

INITIAL INSPECTION

- Check for bare, broken, or disconnected wires.
- Check for pinched, cracked, plugged, or disconnected vacuum hoses.
- Check for binding or misadjusted servo-to-throttle linkage.
- Check "ALT" 20 Amp fuse.

If preliminary inspection reveals no solution, follow the diagnostic charts to isolate and fix the problem (figures 2 through 11). Figure 11 has also been provided as supplementary information on what the module, servo, and control switch voltages and resistances are when the system is operating correctly. These last charts are helpful in isolating electrical problems.

A quick-check box is made available through Kent-Moore Tool Company under tool number J 34185 (or equivalent). This quick-check box will plug in place of the module and determine which part of the system has a malfunction. Instructions on the operation of this tool are provided with the tool.

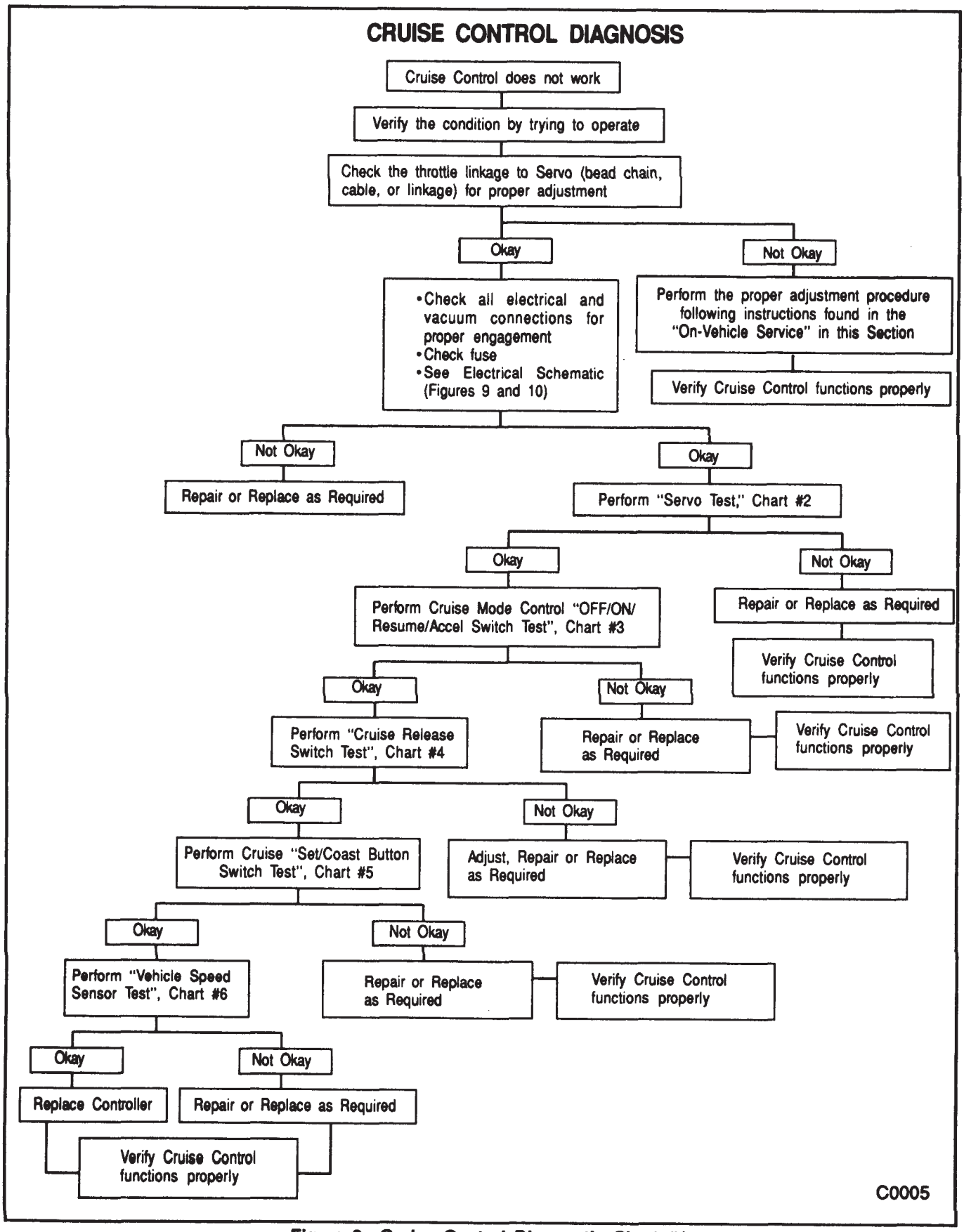


Figure 2—Cruise Control Diagnostic Chart #1

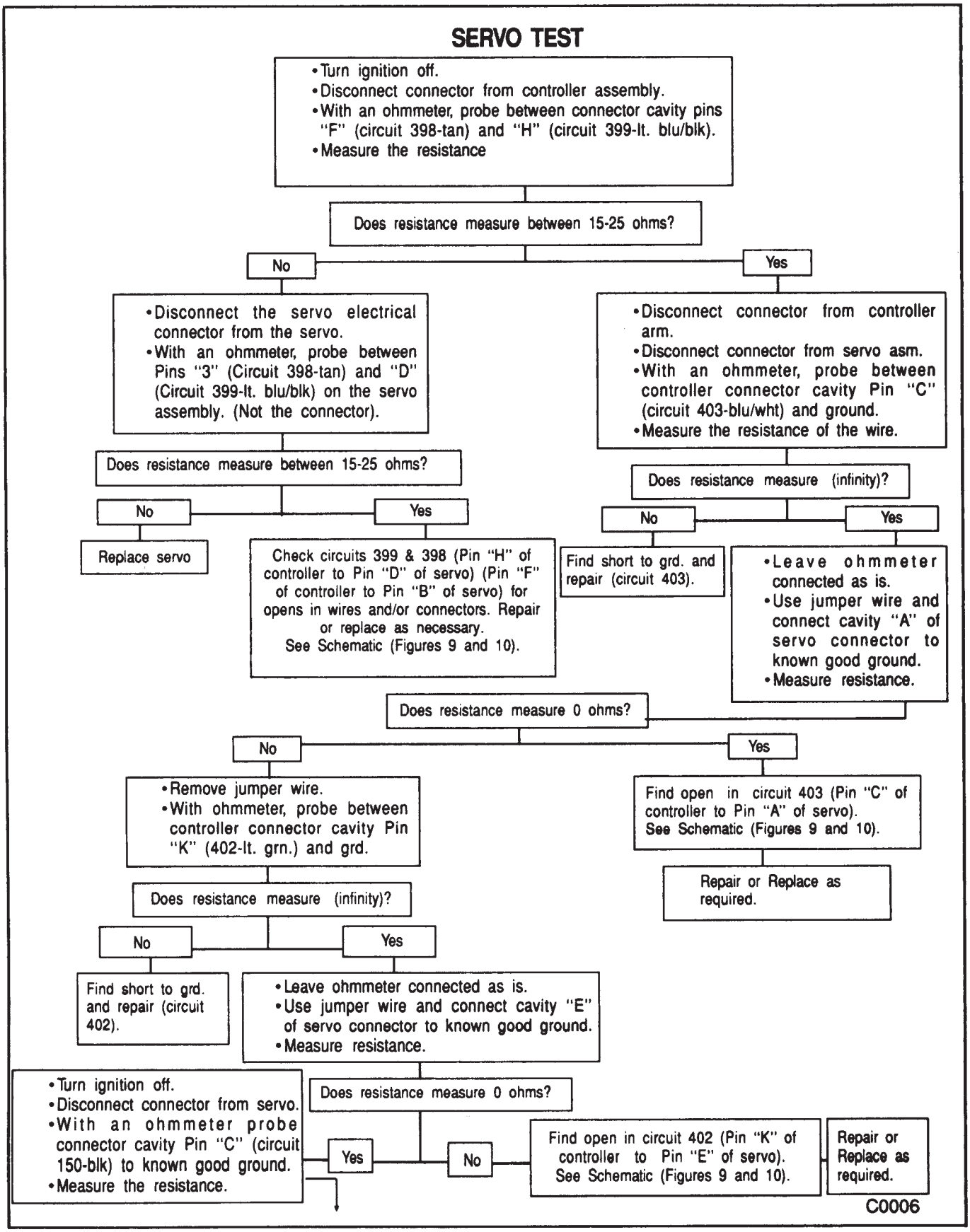


Figure 3—Cruise Control Diagnostic Chart #2

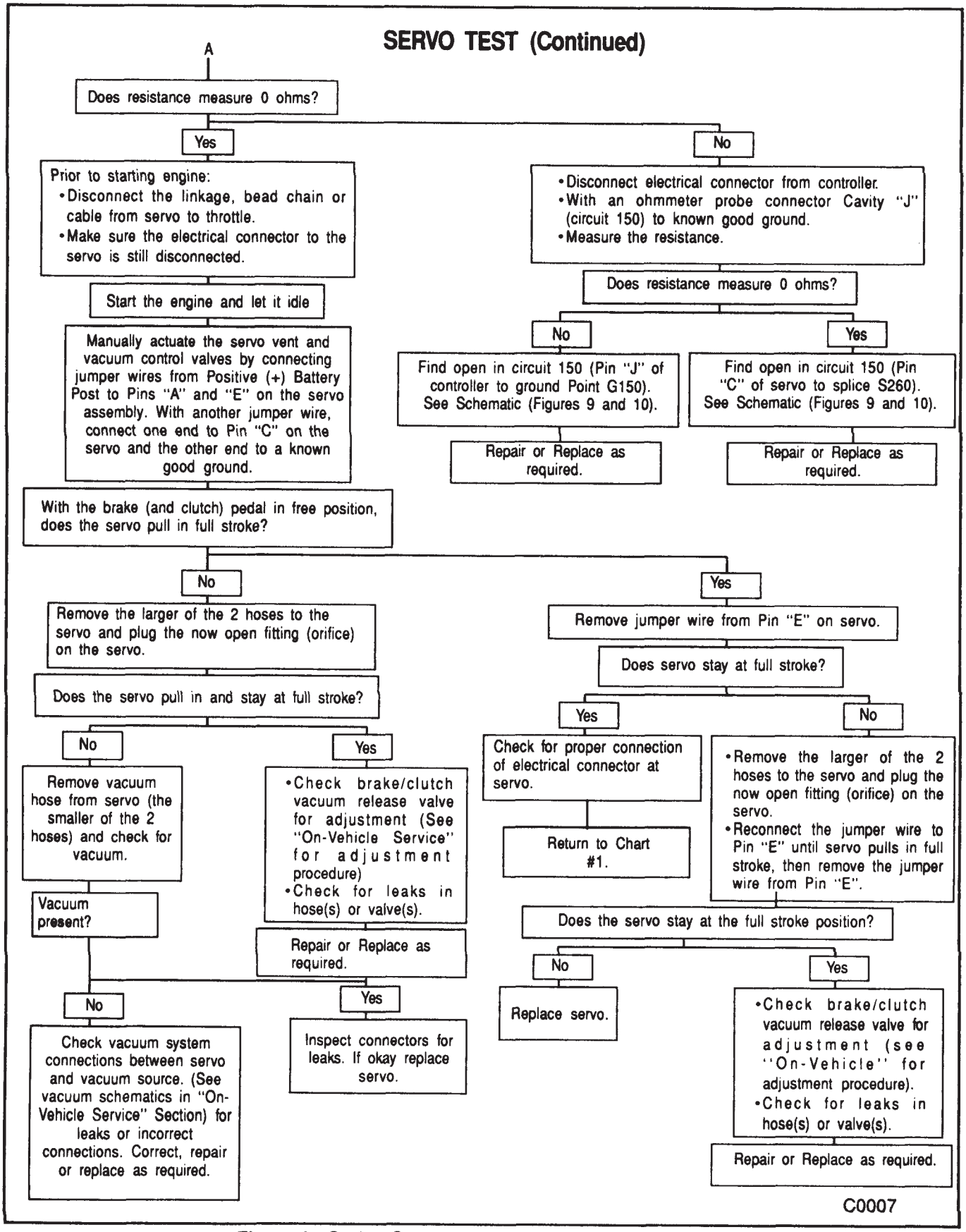


Figure 4—Cruise Control Diagnostic Chart #2 (Continued)

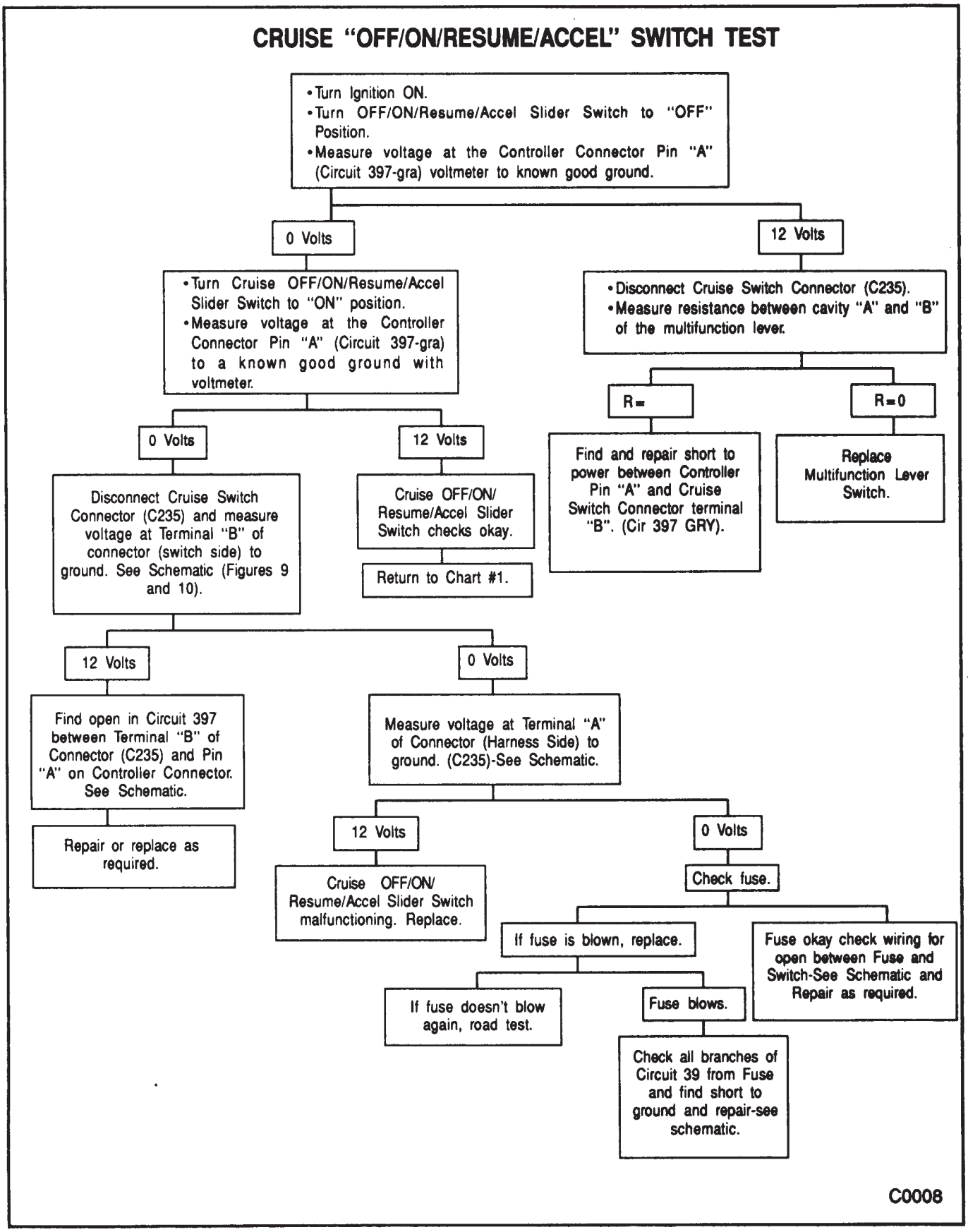


Figure 5—Cruise Control Diagnostic Chart #3

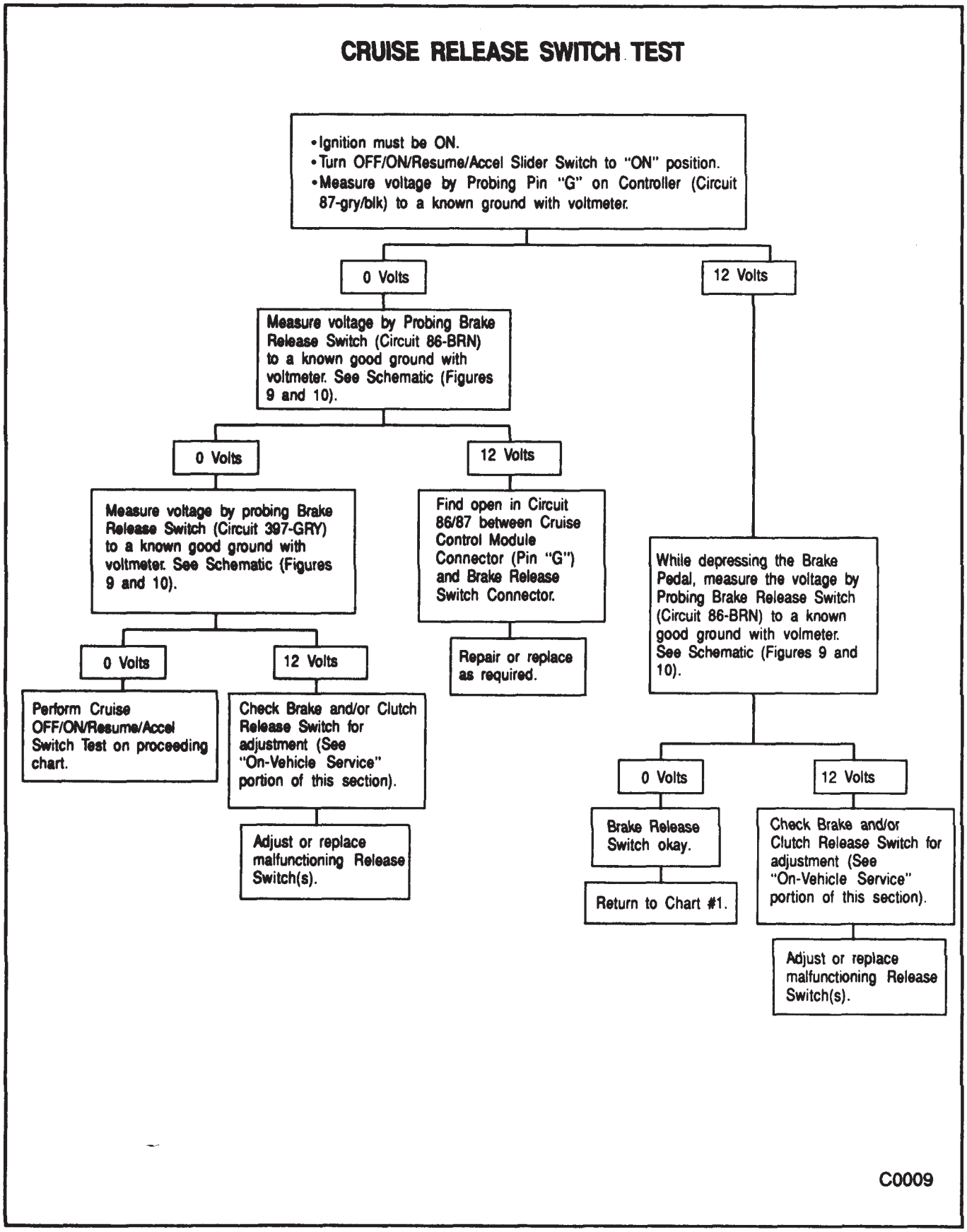


Figure 6—Cruise Control Diagnostic Chart #4

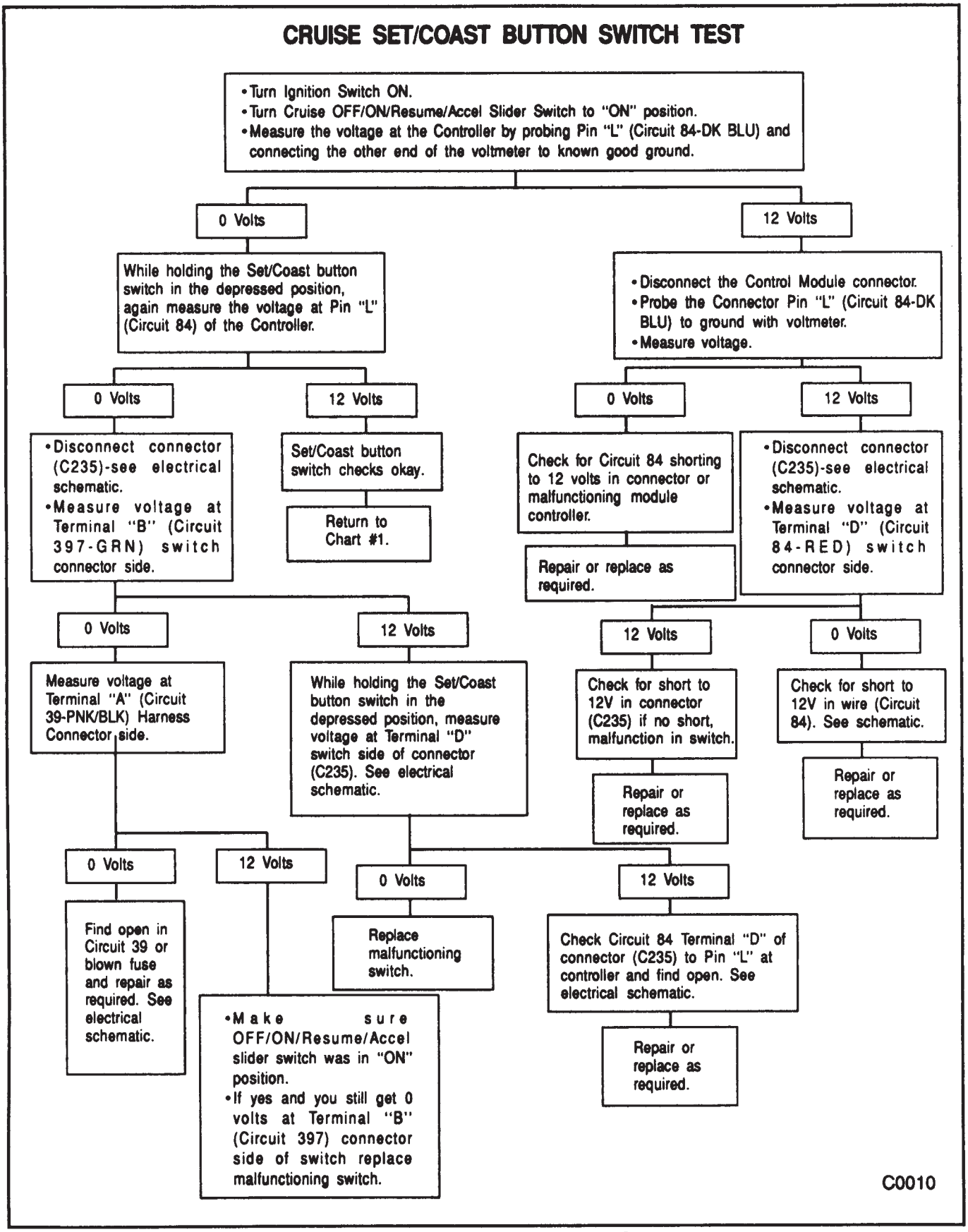


Figure 7—Cruise Control Diagnostic Chart #5

VEHICLE SPEED SENSOR TEST

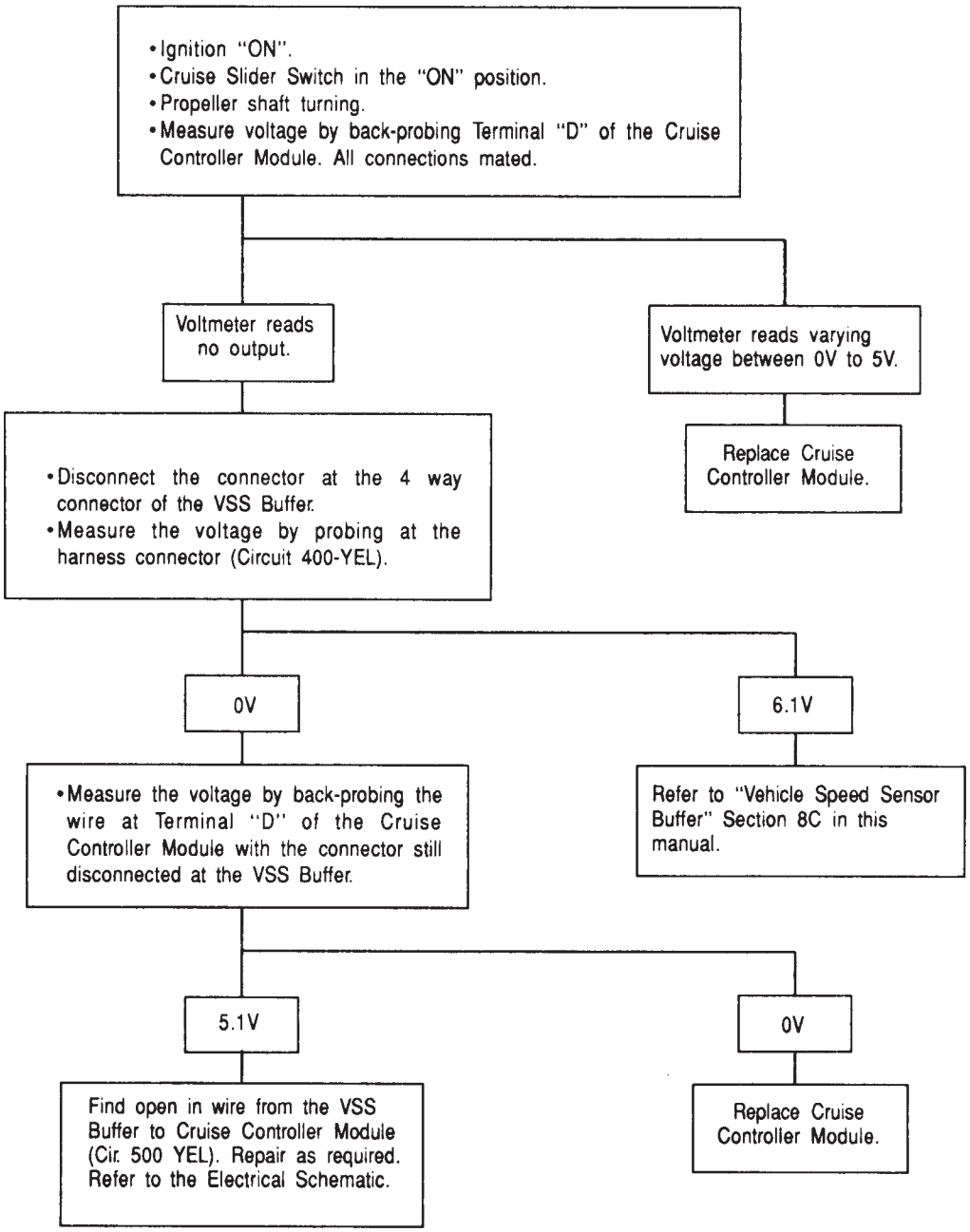


Figure 8—Cruise Control Diagnostic Chart #6

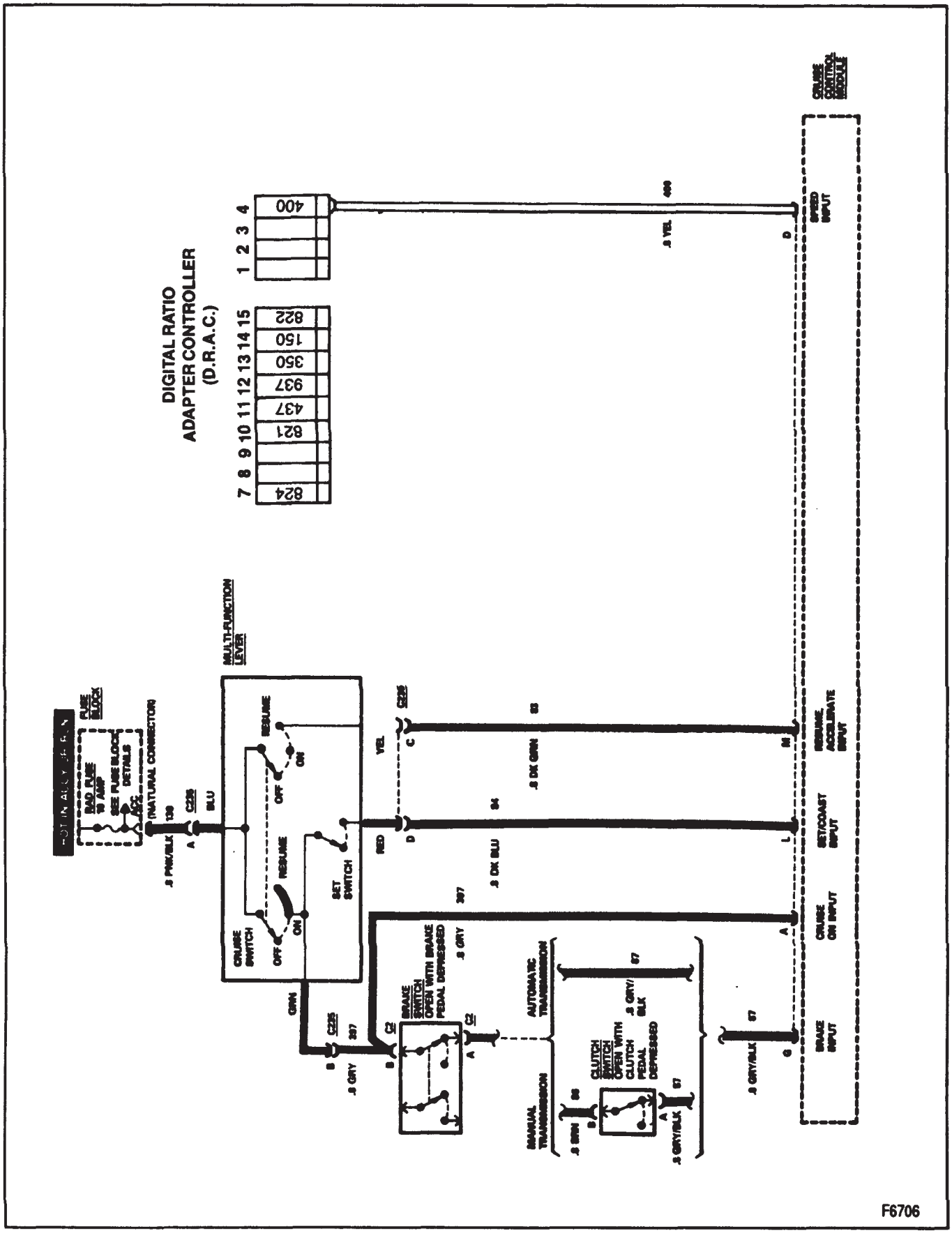


Figure 9—Cruise Control Schematic

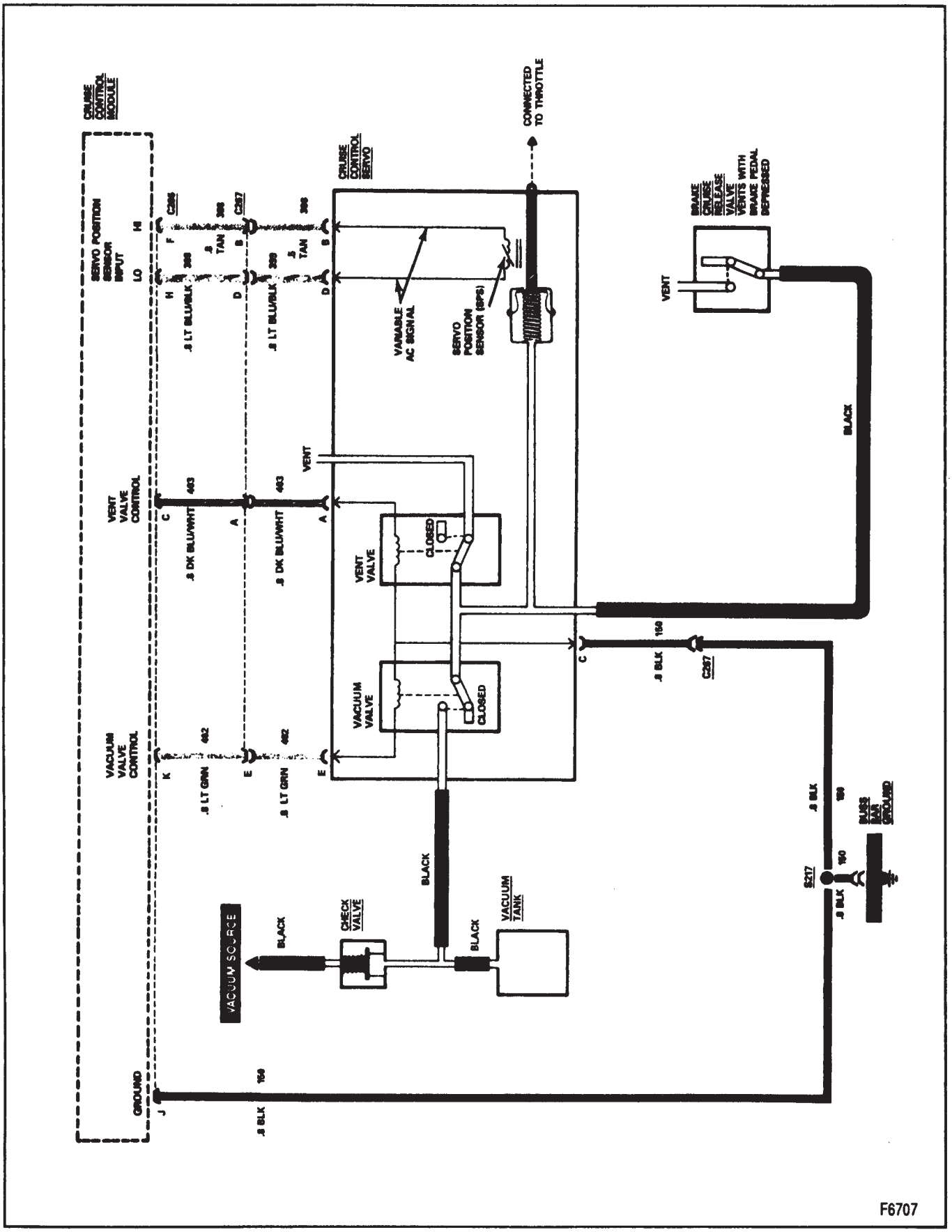
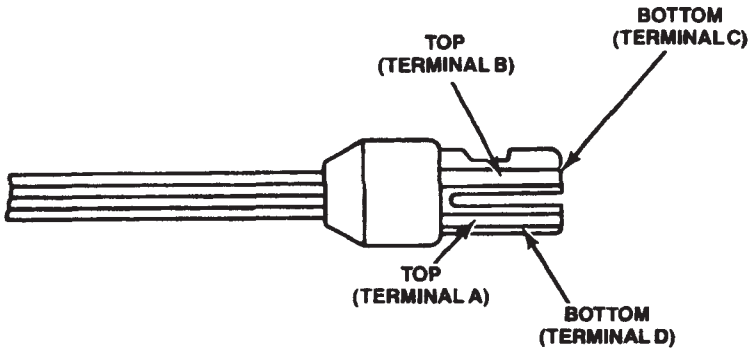


Figure 10—Cruise Control Schematic

CONTROL SWITCH CONTINUNITY CHECK



C-CLOSED
O-OPEN

SET/COAST (S/C) SW	POSITION SLIDER	C-B	C-D	C-A	B-D	B-A	D-A
NORMAL	OFF	O	O	O	O	O	O
NORMAL	ON	O	O	O	O	C	O
NORMAL	R/A	C	O	C	O	C	O
DEPRESSED	OFF	O	O	O	C	O	O
DEPRESSED	ON	O	O	O	C	C	C
DEPRESSED	R/A	C	C	C	C	C	C

CRUISE CONTROLLER (MODULE) CHECKS AT CONNECTOR
- **IGNITION ON**
- **CONTROLLER DISCONNECTED**

PIN	FUNCTION	VOLTAGE TO GND	RESISTANCE	CONDITIONS
G	BRAKE/CLUTCH INPUT	12V 0V	- -	BRAKE (AND CLUTCH) NOT DEPRESSED BRAKE (AND/OR CLUTCH) DEPESSED
L	SET/COAST	12V 0V 0V	- - -	SLIDER SWITCH "ON" - SET/COAST DEPRESSED SLIDER SWITCH "ON" - SET/COAST NORMAL SLIDER SWITCH "OFF" - SET/COAST NORMAL
M	RESUME/ ACCEL. INPUT	12V 0V 0V	- - -	SLIDER SWITCH "R/A" POSITION SLIDER SWITCH "ON" - SET/COAST DEPRESSED OR NORMAL SLIDER SWITCH "OFF" - SET/COAST DEPRESSED OR NORMAL
J	GROUND	-	0 Ω	MEASURED TO VEHICLE GROUND
A	ON/OFF INPUT	12V 0V	- -	SLIDER SWITCH "ON" SLIDER SWITCH "OFF" - SET/COAST DEPRESSED OR NORMAL
B	INDICATOR LAMP	12V	-	CRUISE ARMED
F	SPS HIGH	-	15-25 Ω	MEASURED BETWEEN PINS F & H - SERVO CONNECTED
H	SPS LOW	-	∞ Ω	MEASURED BETWEEN PINS F & H - SERVO DISCONNECTED
D	SPEED SIGNAL			SEE SPEED SENDER TEST CHART
K	VACUUM VALVE CONTROL	- -	30-55 Ω ∞ Ω	MEASURED TO GROUND - SERVO CONNECTED MEASURED TO GROUND - SERVO NOT CONNECTED
C	VENT VALVE CONTROL	- -	30-55 Ω ∞ Ω	MEASURED TO GROUND - SERVO CONNECTED MEASURED TO GROUND - SERVO NOT CONNECTED

SERVO CHECKS
- **SERVO CONNECTOR DISCONNECTED**
- **MEASURE AT SERVO PINS**

PIN	FUNCTION	RESISTANCE	CONDITIONS
D B	SPS HIGH SPS LOW	15-25 -	MEASURED BETWEEN PINS D AND B (IF MEASURED RESISTANCE IS NOT STATED VALVE, REPLACE SERVO)
A	VENT VALVE	30-55 -	MEASURED BETWEEN PINS A AND C (IF MEASURED RESISTANCE IS NOT STATED VALVE, REPLACE SERVO)
E	VACUUM VALVE	30-55	MEASURED BETWEEN PINS E AND C (IF MEASURED RESISTANCE IS NOT STATED VALVE, REPLACE SERVO)

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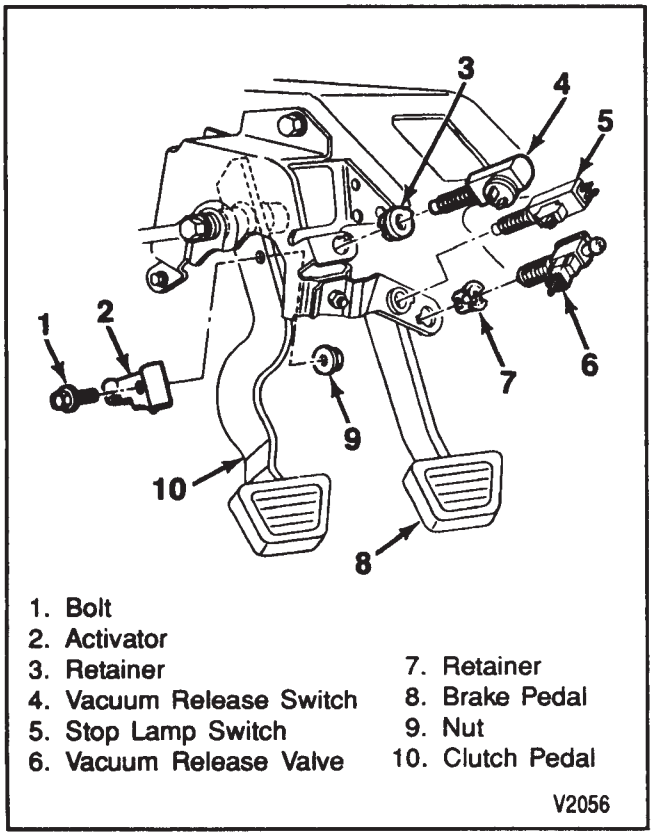
Figure 11—Controller, Servo and Control Switch Check

ON-VEHICLE SERVICE

VACUUM RELEASE VALVE REPLACEMENT

Remove or Disconnect (Figures 12 and 13)

1. Wiring harness connectors, as necessary.
2. Vacuum lines, as necessary.



1. Bolt
2. Activator
3. Retainer
4. Vacuum Release Switch
5. Stop Lamp Switch
6. Vacuum Release Valve
7. Retainer
8. Brake Pedal
9. Nut
10. Clutch Pedal

Figure 12—Vacuum Release Valve (w/ Manual Transmission)

3. Retainer (7). Turn the retainer counterclockwise to unseat it.
4. Vacuum release valve (6).

Install or Connect (Figures 12 and 13)

1. Retainer (7). Turn the retainer clockwise to seat it.
2. Vacuum release valve (6) until it is seated on the retainer with the brake pedal in the depressed position.
   - Note that audible "clicks" can be heard as the threaded portion of the valve is pushed through the retainer toward the brake pedal.
   - Pull the brake pedal fully rearward against the pedal stop until the audible "click" sounds can no longer be heard.
   - Release the brake pedal and repeat step 2 to assure that no audible "click" sounds remain.
3. Vacuum lines, as necessary.
4. Wiring harness connectors, as necessary.

MODULE REPLACEMENT

Remove or Disconnect (Figure 14)

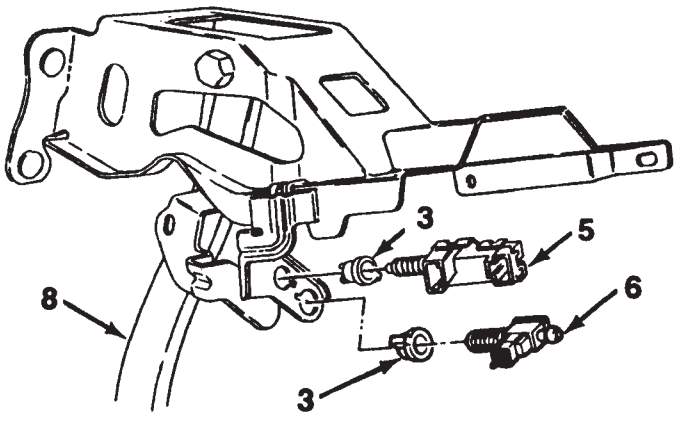
1. Harness connector (12).
2. Module (11) by prying back the retaining clip on the bracket and sliding the module (11) out.

Install or Connect (Figure 14)

1. Module (11) into bracket (13).
2. Harness connector (12).

VEHICLE SPEED SENSOR REPLACEMENT

For replacement of the vehicle speed sensor, refer to TRANSMISSION (SECTION 7).



3. Retainer
5. Stop Lamp Switch
6. Vacuum Release Valve
8. Brake Pedal

Figure 13—Vacuum Release Valve (w/ Automatic Transmission)

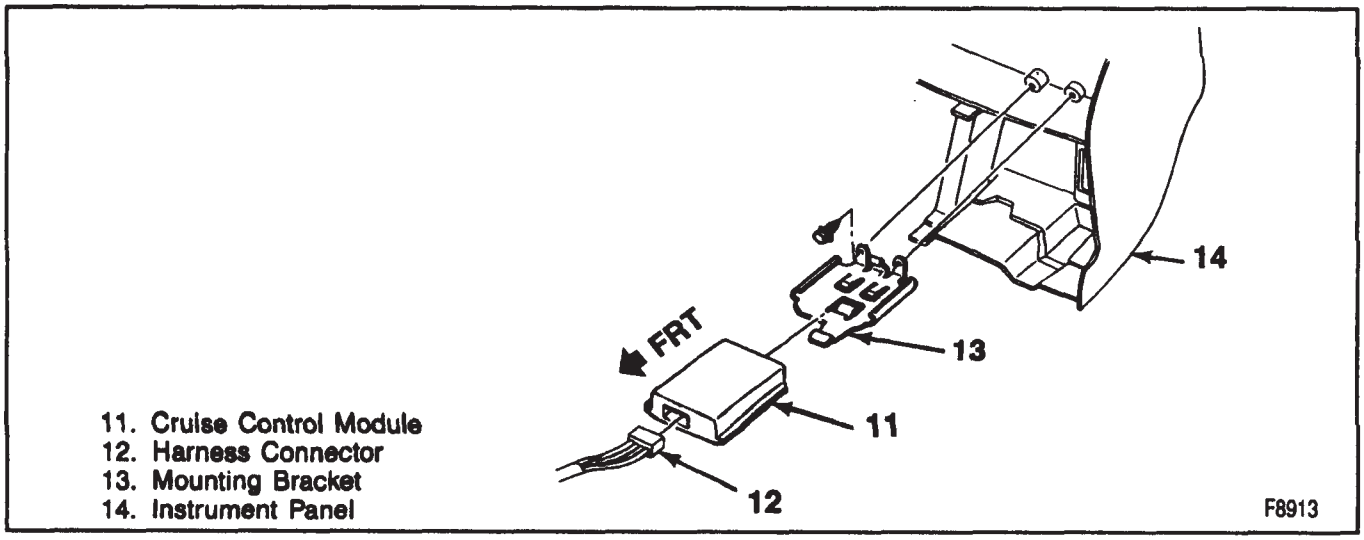
VEHICLE SPEED SENSOR BUFFER REPLACEMENT

For replacement of the vehicle speed sensor buffer, refer to INSTRUMENT PANEL AND GAGES (SECTION 8C).

TURN SIGNAL LEVER REPLACEMENT

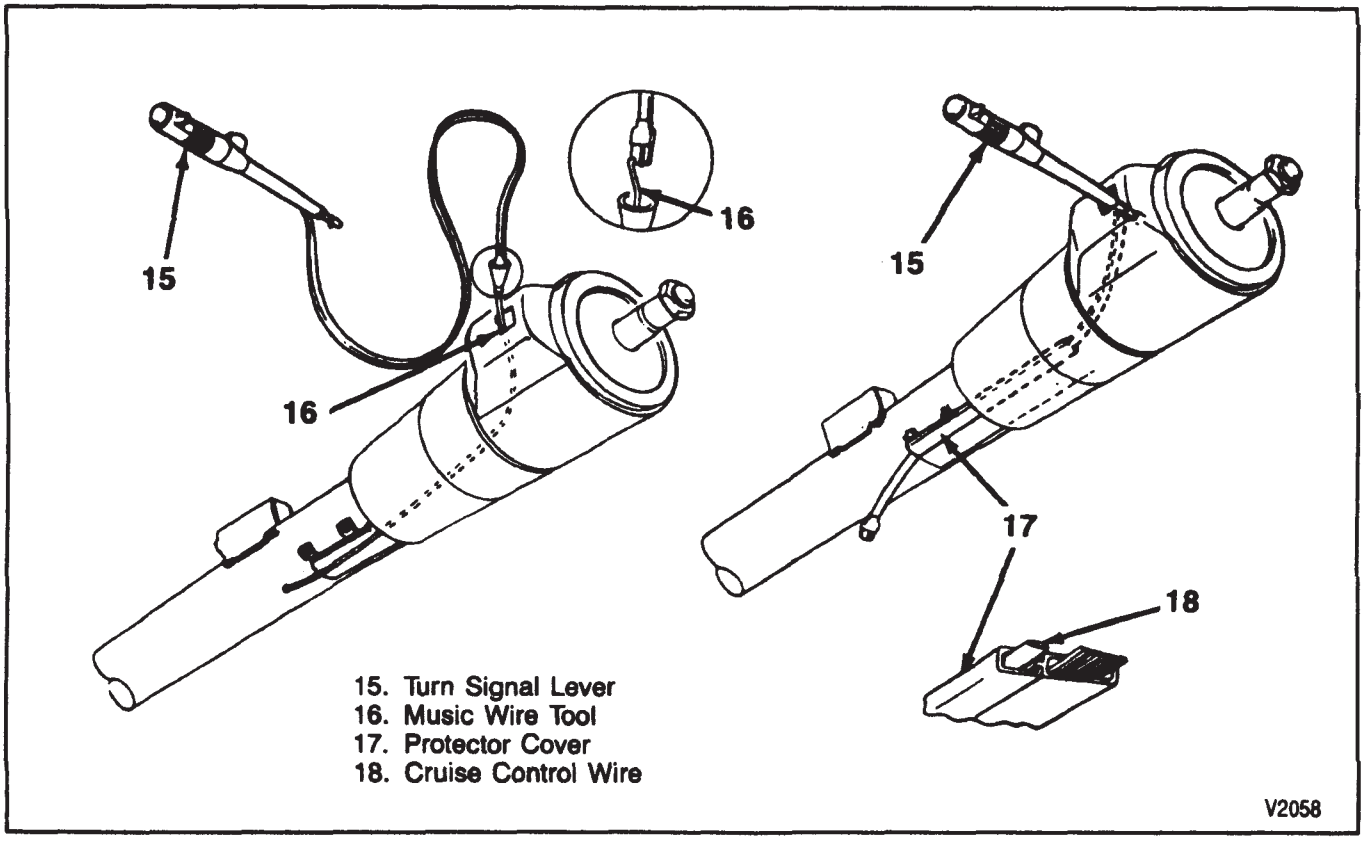
Remove or Disconnect (Figure 15)

1. Wire harness connector.
2. Harness protector cover (17).
   - Attach a long piece of mechanic's wire to the end of the harness connector.
3. Turn signal lever (15) from turn signal switch.



11. Cruise Control Module
12. Harness Connector
13. Mounting Bracket
14. Instrument Panel

Figure 14—Module Mounting



15. Turn Signal Lever
16. Music Wire Tool
17. Protector Cover
18. Cruise Control Wire

Figure 15—Turn Signal Lever

Important

- Pull harness up and out gently so mechanic's wire can be used to install new unit.

Install or Connect (Figure 15)

- Attach upper end of mechanic's wire to harness connector and gently pull mechanic's wire at lower end of column, feeding harness into proper location in column.

1. Turn signal lever (15) into turn signal switch.
   - Disconnect mechanic's wire from harness connector.
2. Harness protector cover (17).
3. Wire harness connector.

SERVO REPLACEMENT

Remove or Disconnect (Figures 16 through 21)

1. Electrical harness connectors, as necessary.
2. Vacuum hoses (figures 18, 19, 20, and 21).
3. Retainer (35).
4. Cruise control cable (29) from servo tab hole.
5. Bolts (23) (figures 16 and 17).
6. Servo (19).

NOTICE: Flexible components (hoses, wires, conduits, etc.) must not be routed within 50 mm (2 inches) of moving parts of the accelerator linkage forward of the servo assembly unless routing is positively controlled.

Install or Connect (Figures 16 through 21)

1. Servo (19).

NOTICE: See "Notice" on page 9B-1 of this section.

2. Bolts (23) (figures 16 and 17).

Tighten

- Bolts (23) to 1.6 N·m (14 in. lb.) (figure 16).
- Bolts (23) to 1.9 N·m (17 in. lb.) (figure 17).

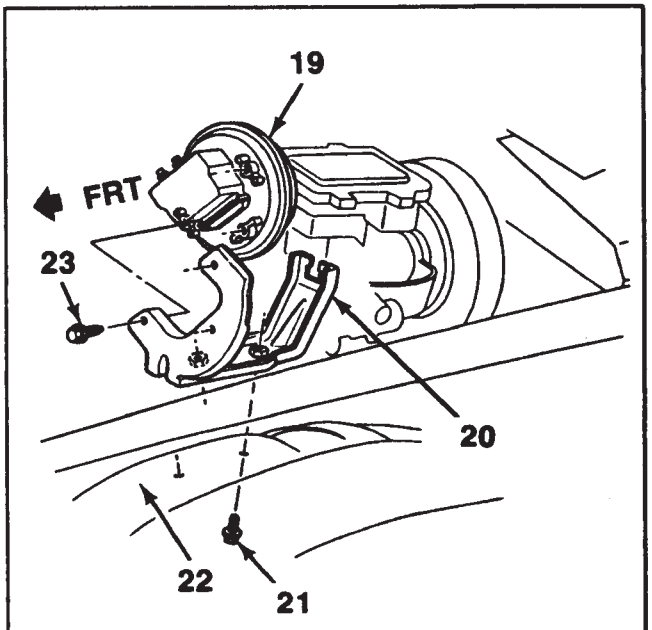
- Ignition and fast idle cam should be off and the throttle should be fully closed before starting the adjustment procedure.

3. Cruise control cable (29) to the nearest servo tab hole.

Adjust

- Rod should have 1 mm (0.39 inches) to 4 mm (0.15 inches) of clearance at the stud.

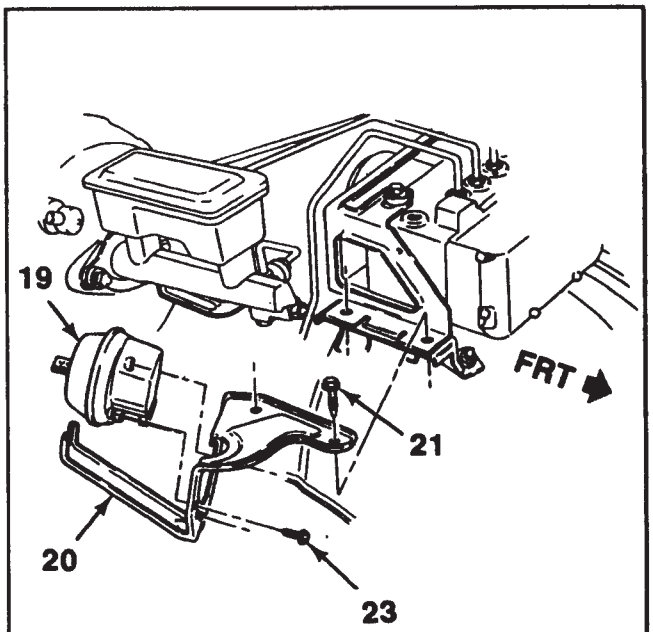
4. Retainer (35).
5. Vacuum hoses (Figures 18, 19, 20, and 21).
6. Electrical harness connectors, as necessary.



19. Servo
20. Mounting Bracket
21. Bolt
22. Fender Skirt
23. Bolt

V2059

Figure 16—Servo Mounting



19. Servo
20. Mounting Bracket
21. Bolt
23. Bolt

V2060

Figure 17—Servo Mounting

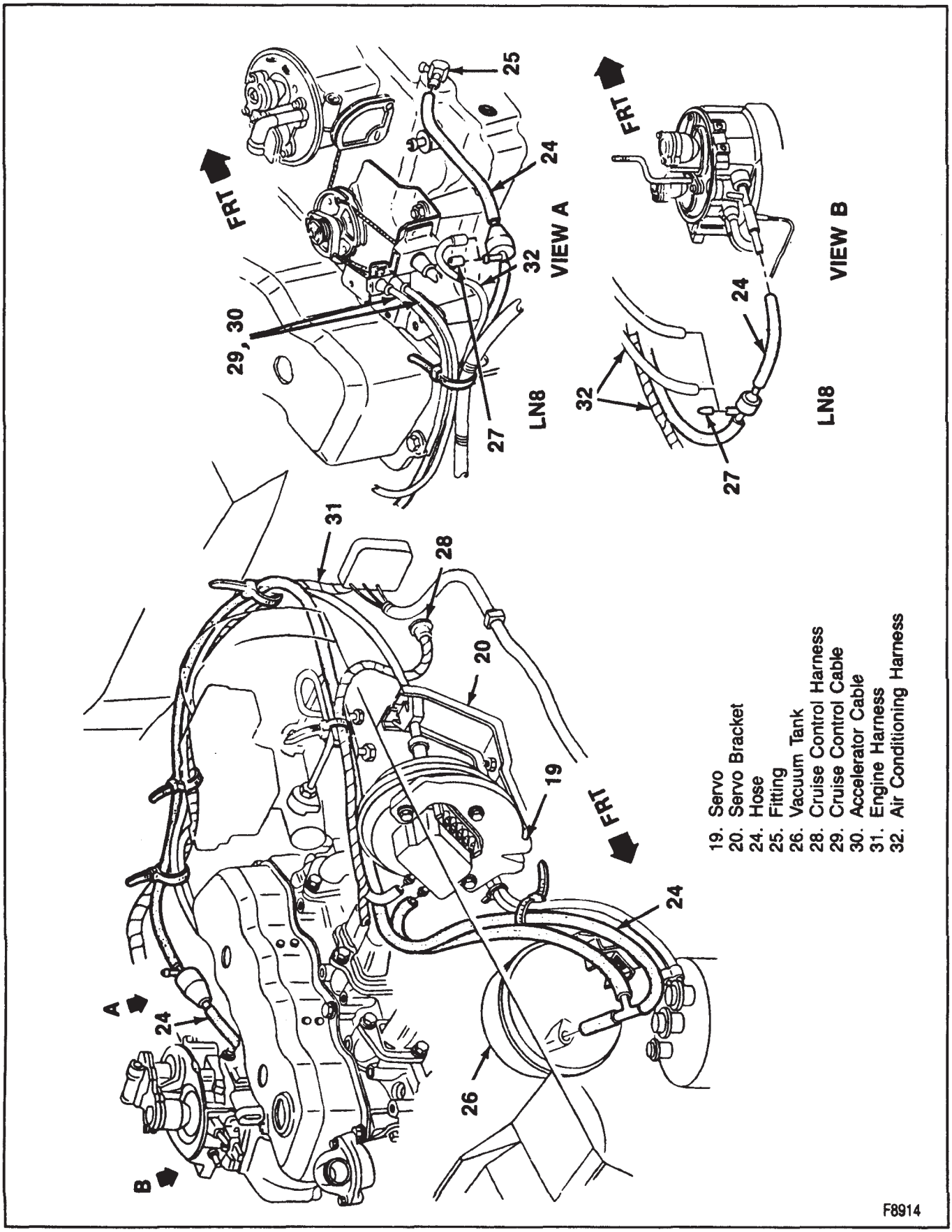


Figure 18—Servo Wiring Harness and Cable Routing—2.5L (VIN A) Engines

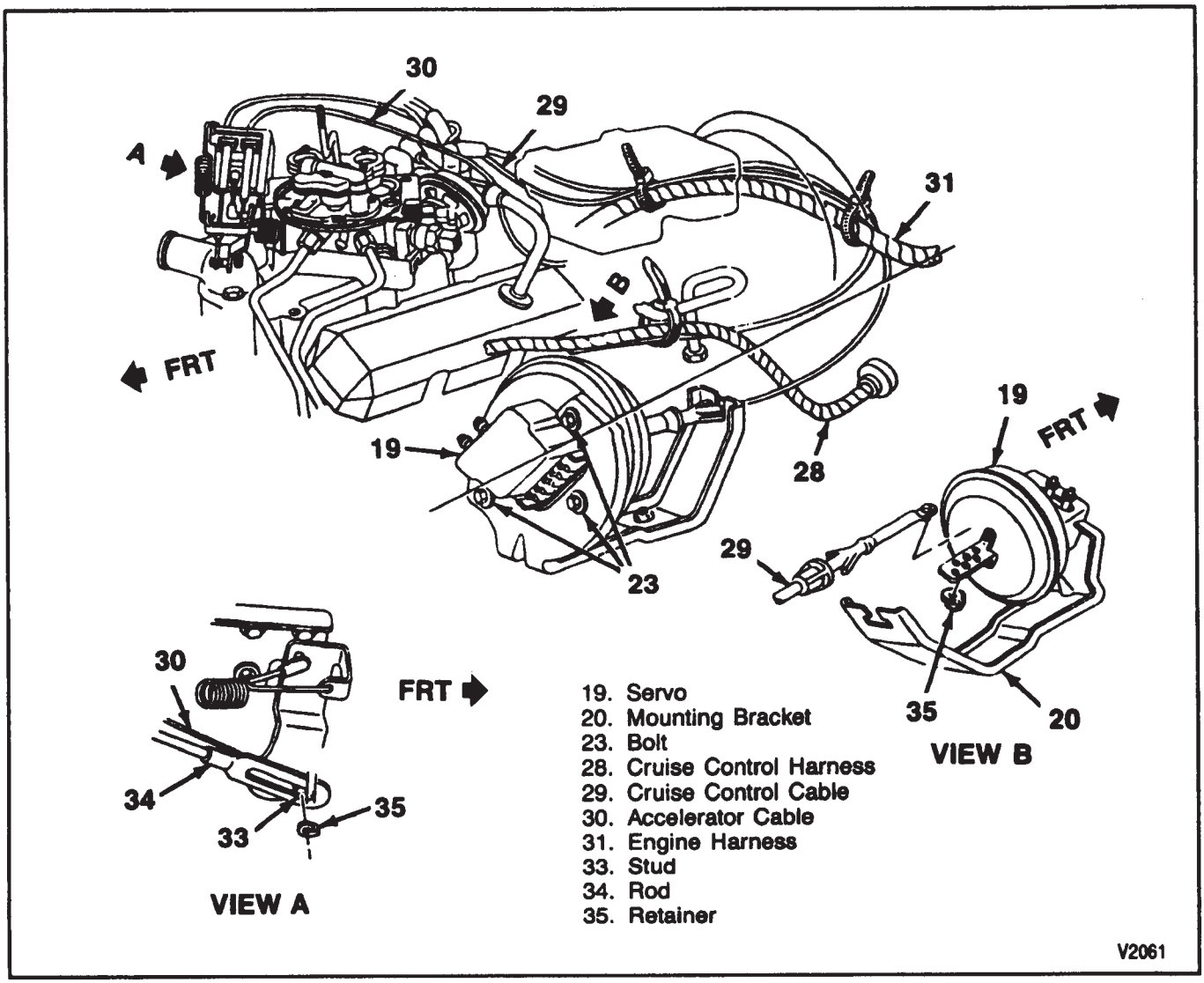
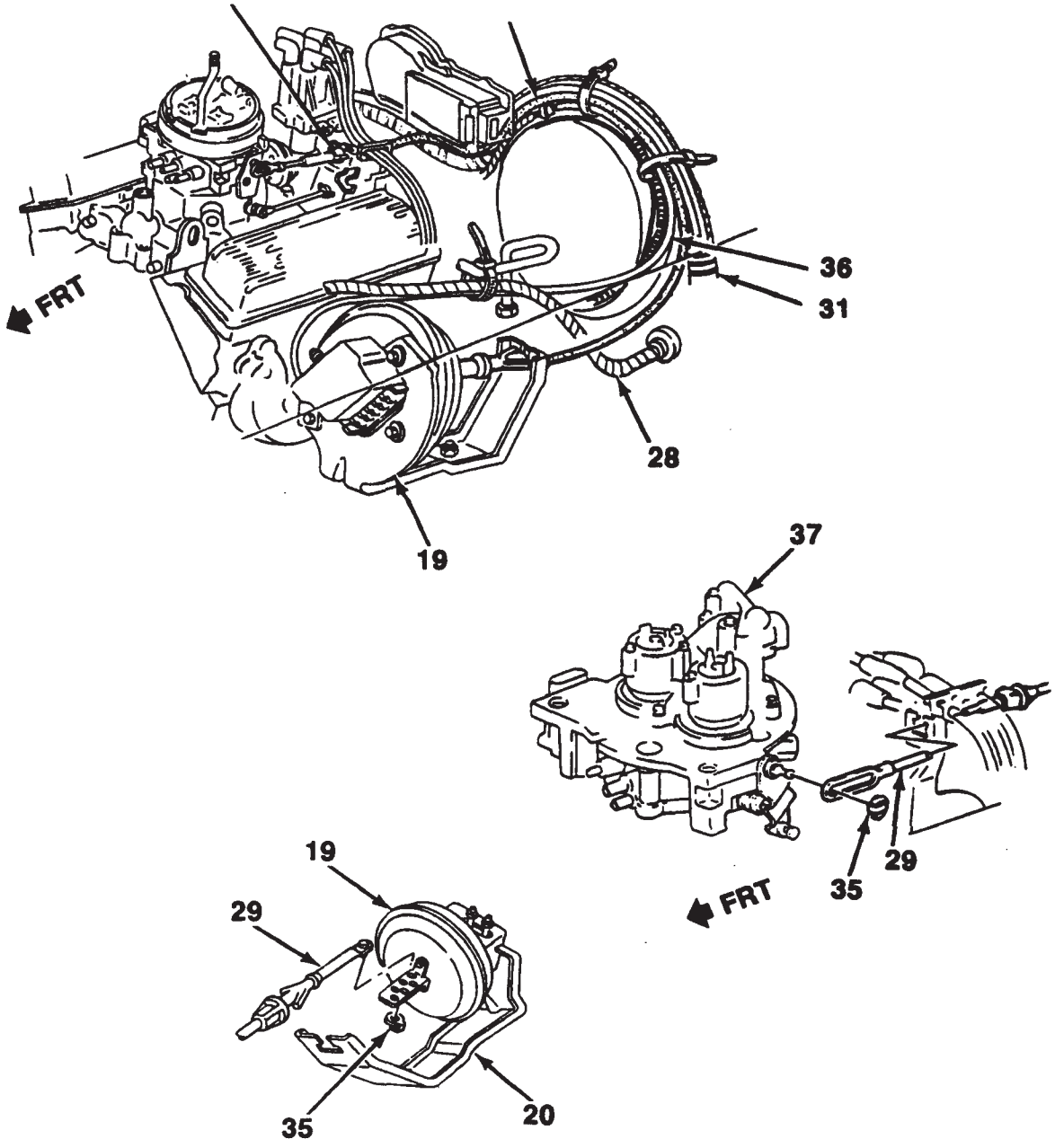


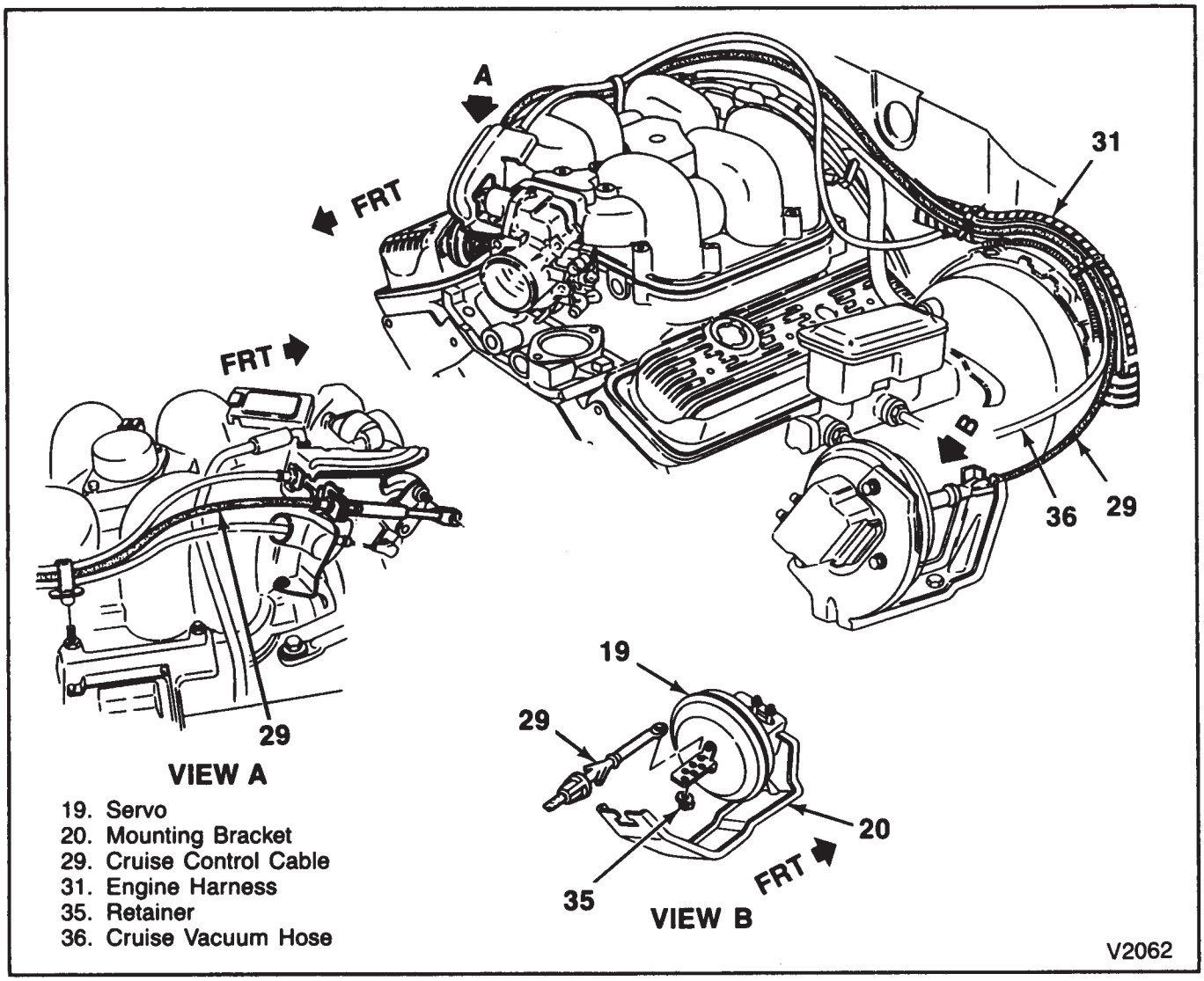
Figure 19—Servo Wiring Harness and Cable Routing—2.8L (VIN R) Engines



19. Servo
20. Mounting Bracket
28. Cruise Control Harness
29. Cruise Control Cable
31. Engine Harness
35. Retainer
36. Cruise Vacuum Hose
37. Throttle Body
38. Cruise Cable Mounting Bracket

F8915

Figure 20—Servo Wiring Harness and Cable Routing—4.3L (VIN Z) Engines



19. Servo
20. Mounting Bracket
29. Cruise Control Cable
31. Engine Harness
35. Retainer
36. Cruise Vacuum Hose

Figure 21—Servo Wiring Harness and Cable Routing—4.3L (VIN W) Engines

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

ITEM	N·m	In. Lbs.
Module Bracket Mounting Screw	1.4	12
Servo-to-Mounting Bracket Screw	1.6	14
Servo Mounting Bracket-to-Fender Skirt Bolt	24	18*

*Ft. Lbs.

T2735

SECTION 9E

ENGINE BLOCK HEATER

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

GENERAL DESCRIPTION

The optional engine block heater (RPO K05) is used to preheat engine coolant for cold weather starting. The engine block heater operates from a 110-volt AC power source and uses a heating element which is installed in the water jacket of the engine block. The heating element warms the coolant as long as the heater cord is plugged into the AC power source.

The unit has a detachable electrical cord. If the heater fails to operate, check the cord, connections, and power supply before replacing the heating element.

ON-VEHICLE SERVICE

ENGINE BLOCK HEATER REPLACEMENT

Remove or Disconnect (Figures 1, 2, and 3)

- Drain coolant. Refer to ENGINE COOLING (SECTION 6B1).

1. Water jacket plug.
   - If not originally equipped with an engine block heater, remove the water jacket plug. Carefully tap it near its outer edge, causing it to rotate out of the hole. Do not score the machined surface of the hole. Grasp with pliers and pull to remove.
2. Cord from engine block heater.
3. Loosen bolt.
4. Engine block heater.

Clean

- Core plug hole, removing any burrs, compound, paint, or rough spots.

1. Engine Block (Outside)
2. Heater Assembly
3. Ground Ring
4. Screw
5. Support
6. O-Ring
7. Element

A. Diplaced Position
B. Locked-in Position

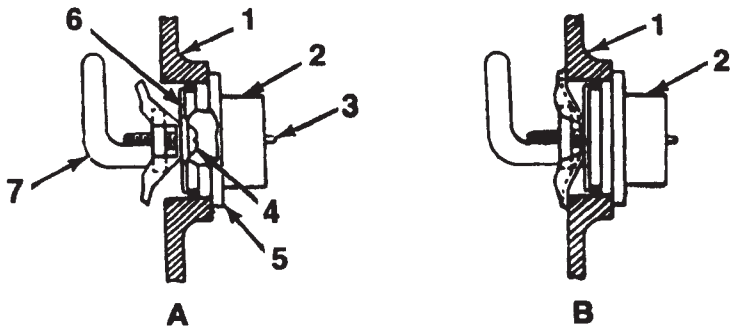
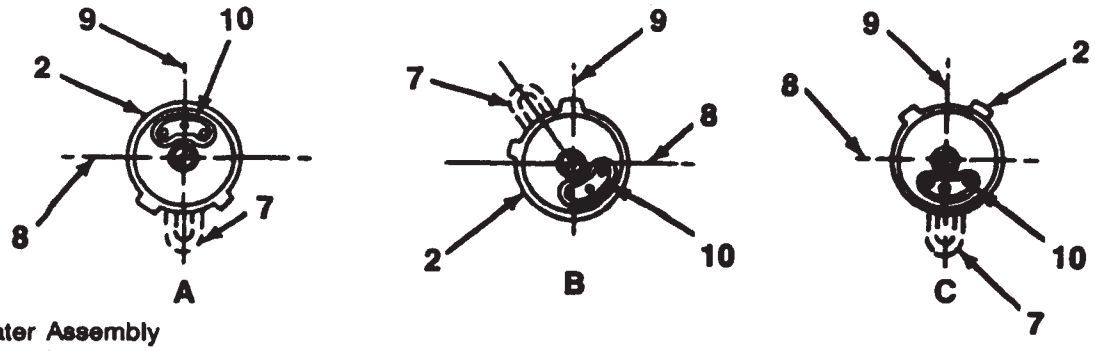


Figure 1—Engine Block Heater



2. Heater Assembly
7. Element
8. Engine Centerline
9. Vertical
10. Connector Boss

A. 2.5L Engine
B. 2.8L Engine
C. 4.3L Engine

V2064

Figure 2—Element Position

Install or Connect (Figures 1, 2, and 3)

- Apply a coating of lubricant to the O-ring and the cleaned surface of plug opening in the block. Use a water spray resistant, high-temperature grease lubricant (GM part #9985164) or equivalent.

1. The block heater and push tight to the block.

Important

- Install the heater element in the correct direction to avoid element contact to the inside walls of the engine block as shown in Figure 2.

NOTICE: See "Notice" on page 9E-1 of this section.

2. Tighten bolt until both locking wings draw tight against inner wall of engine block.

Tighten

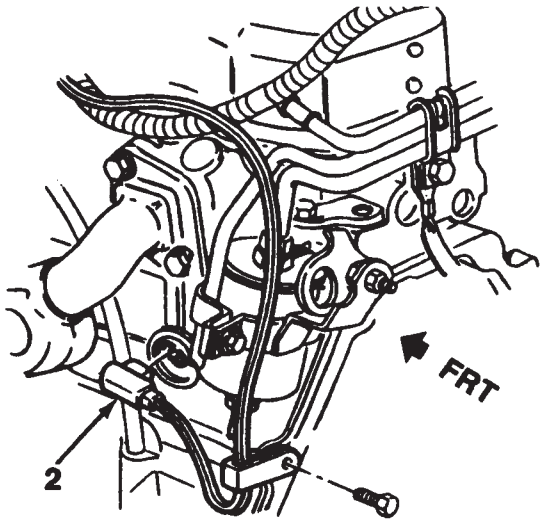
- Bolt to 1.8 N.m (16 in. lb.).

3. Heater cord to the block heater and route heater cord (figure 3).

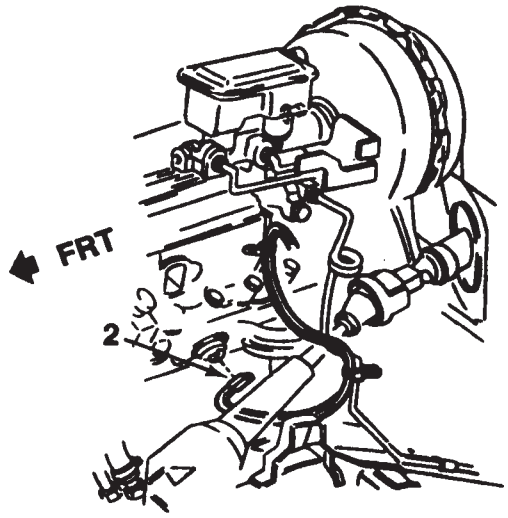
Important

- The heater cord must not touch the engine, hot pipes, manifold, or any moving parts.

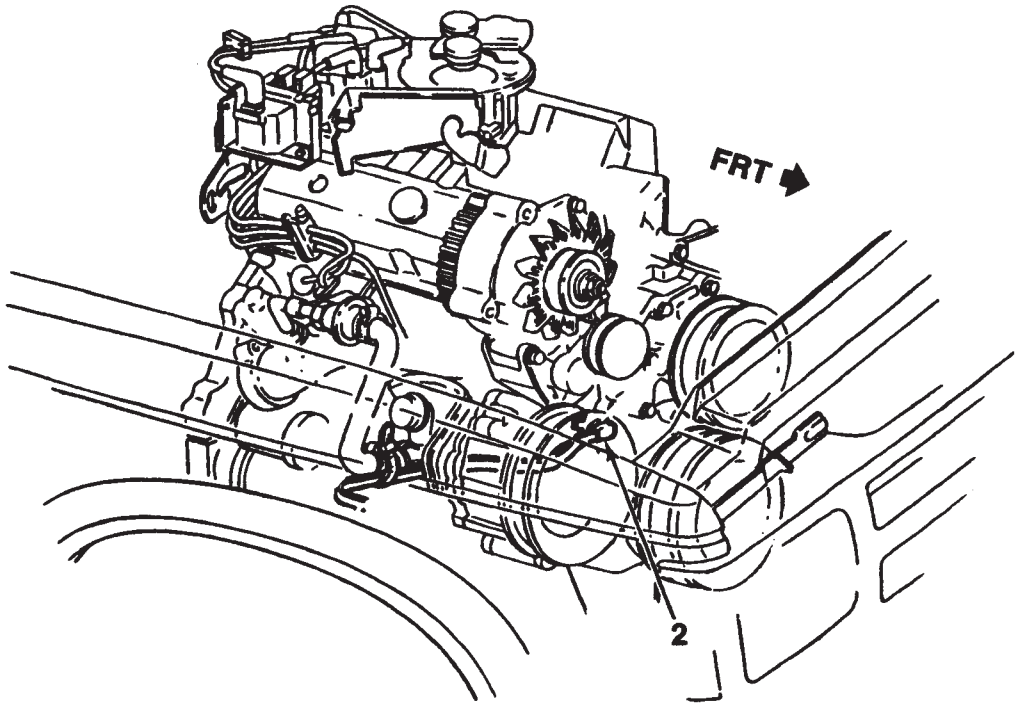
- Fill with coolant. Refer to ENGINE COOLING (SECTION 6B1).



2.5L



4.3L



2.8L

2. Heater Assembly

F8818

Figure 3—Element Installation

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Engine Block Heater Screw	1.8 N·m (16 in. lbs.)

T2714

SECTION 9F

LUGGAGE CARRIER

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

GENERAL DESCRIPTION

The luggage carrier is available as a dealer-installed option. Skid strips and support mounting anchor nuts are installed at the factory. During predelivery operations, the dealer will complete assembly installation.

The following procedures are for complete replacement of a previously installed luggage carrier.

ON-VEHICLE SERVICE

LUGGAGE CARRIER REPLACEMENT

Remove or Disconnect (Figures 1 and 2)

1. Rubber side rail cap (14) from center support (13) (figure 2).
2. Bolts (9) from center supports (13).
3. Bolts (10 and 11).
4. Luggage carrier as an assembly from the roof.
5. Side rail support gaskets (12).

Disassemble

1. Remove screws (8) from side rail supports (1) (figure 1).
2. Side rail supports (1) from side rails (3).
3. Remove screws (5) from cross rails (2).
4. Cross rails (2) from sliders (4).
5. Screws (7) from sliders (4) and lock plates (6).
6. Sliders (4) from slots in side rails (3).

Assemble

NOTICE: For steps 2, 4, and 6, refer to "Notice" on page 9F-1 of this section.

1. Sliders (4) into slots in side rails (3).
2. Screws (7) into sliders (4) and lock plates (6).
3. Cross rails (2) onto sliders (4).
4. Screws (5) to cross rails (2).

Tighten

- Screws (5) to 1.9 N·m (18 in. lb.).

5. Side rail supports (1) to side rails (3).
6. Screws (8) to side rail supports (1).

Tighten

- Screws (8) to 1.9 N·m (18 in. lb.).

Install or Connect (Figures 1 and 2)

NOTICE: For steps 3 and 4, refer to "Notice" on page 9F-1 of this section.

1. Side rail support gaskets (12) to the roof (figure 2).
2. Luggage carrier as an assembly onto the roof.
3. Bolts (10 and 11).
4. Bolts (9) into center supports (13).

Tighten

- Bolts (9, 10, and 11) to 2.8 N·m (25 in. lb.).

5. Rubber side rail cap (14) onto center support (13).

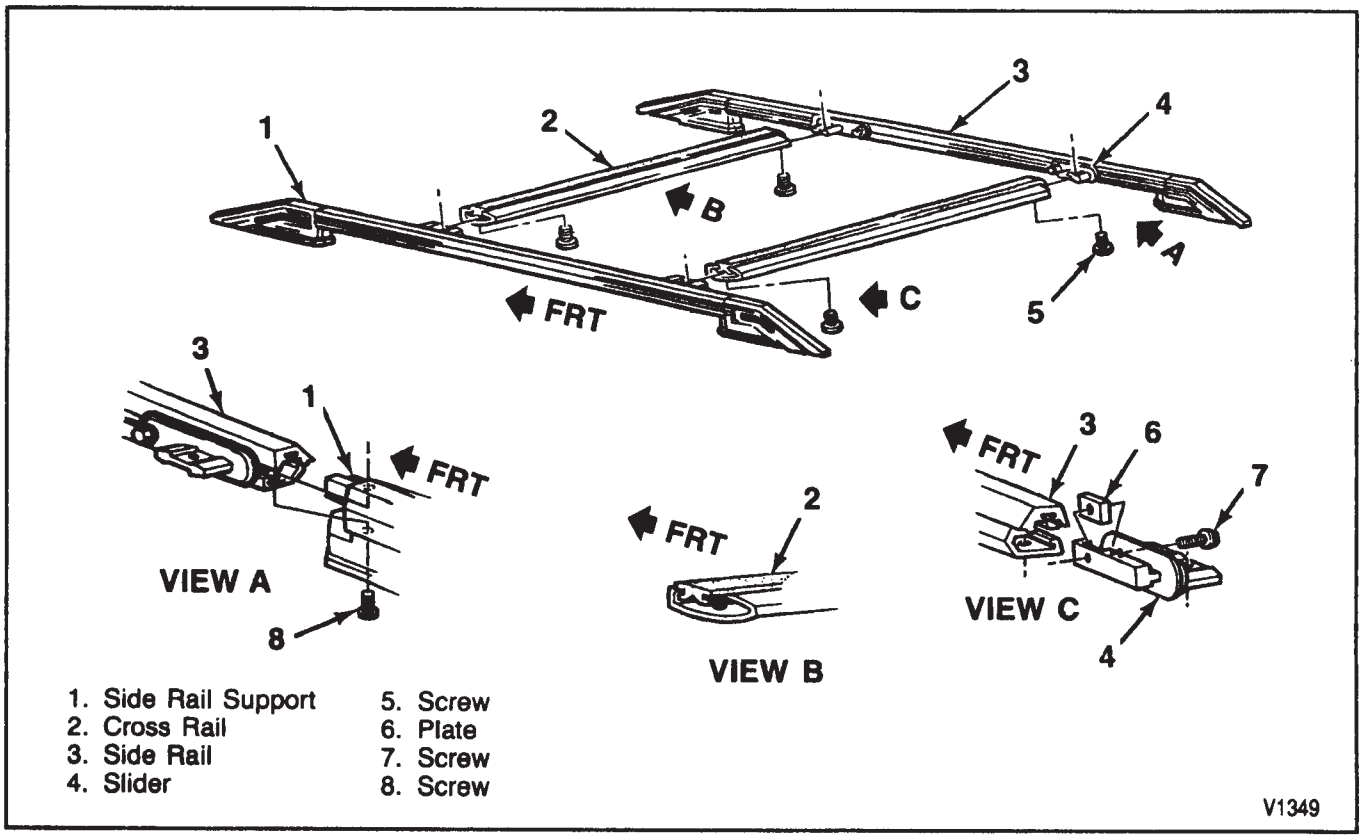


Figure 1—Luggage Carrier Assembly

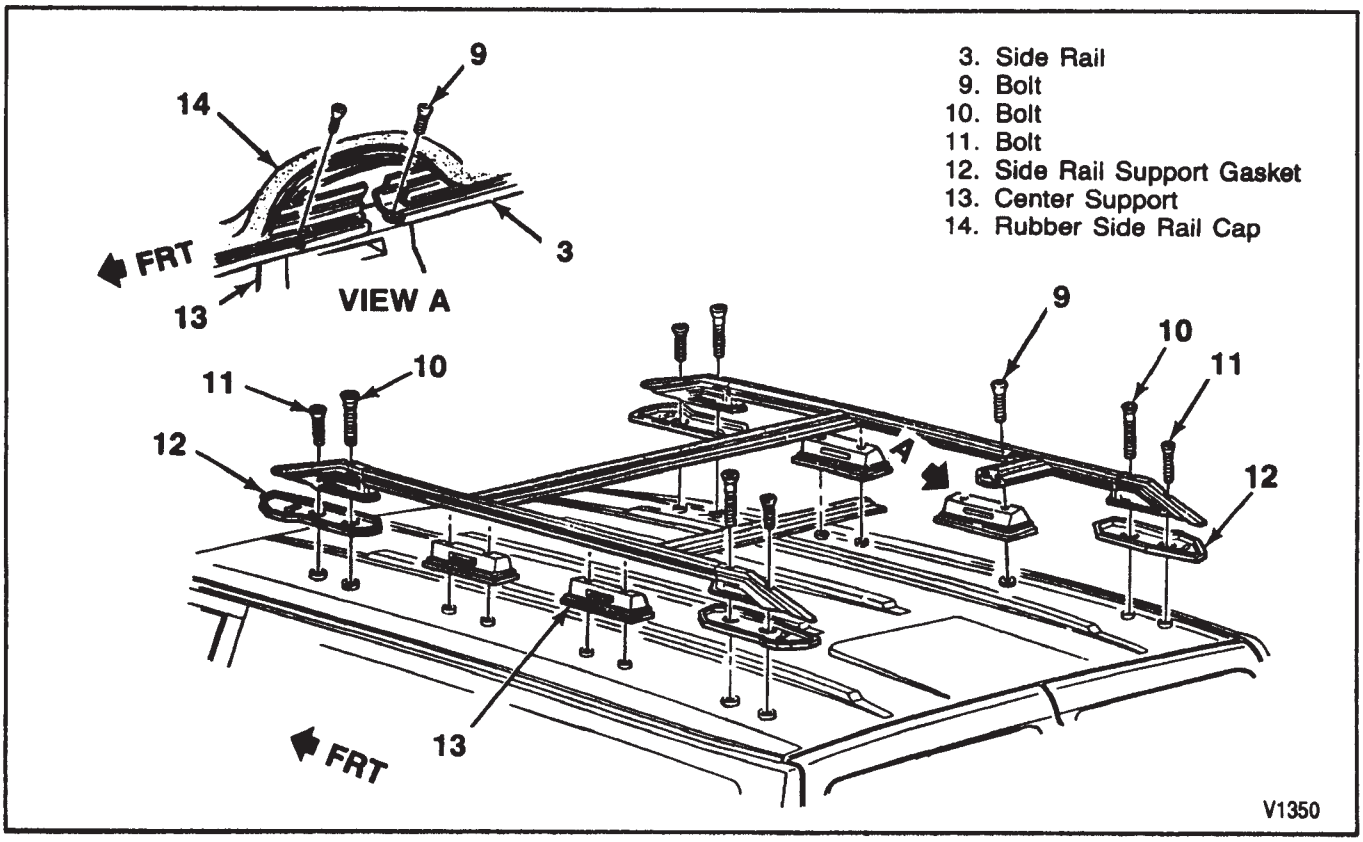


Figure 2—Luggage Carrier Components

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Cross Rail-to-Side Rail Slider Screw	1.9 N·m (18 in. lbs.)
Side Rail Support-to-Side Rail Screw	1.9 N·m (18 in. lbs.)
Side Rail-to-Body Mounting Screw	2.8 N·m (25 in. lbs.)

T2715

SECTION 10

BODY

CONTENTS

SECTION 10A1

DOORS

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

CONTENTS (cont'd)

DOORS

DESCRIPTION

The doors on this model truck use hinges that are welded to the door and the body. No adjustment of this type of hinge is recommended. Replacement hinges bolt on to the door pillar and body side pillar, and are adjustable.

DOOR REPLACEMENT

Tool Required:
J 28625-A Door Hinge Spring Compressor

Remove or Disconnect (Figures 1 and 2)

1. Battery ground cable. (Vehicles with door power components only.)
2. Cowl side vent cover. (Vehicles with door power components only.)
3. Wire harness connectors under the dash. (Vehicles with door power components only.)
   - Receptacles from the wire harness.
   - Retainer from the wire harness grommet.
   - Rubber conduit from the door pillar by pushing *it from the vent cover side.*
- Apply cloth backed tape to the door, and the body pillar.

CAUTION: Before performing the following step, cover the spring with a towel to prevent the spring from "flying" and possibly causing personal injury or damage.

4. Door hinge spring using J 28625-A (figure 3).
5. Hinge pin "barrel" clips.
   - Spread the clip enough to move the clip above the recess in the pin.
   - As the pin is removed, the clip will ride on the *pin, and fall free of the pin.*
6. Lower hinge pin using a soft-head hammer and locking pliers.
- Install a bolt through the lower hinges to hold the door in place while removing the upper hinge pin.
7. Upper hinge pin.
8. Bolt in lower hinge pin hole.
9. Door from the vehicle.

Install or Connect (Figures 1 and 2)

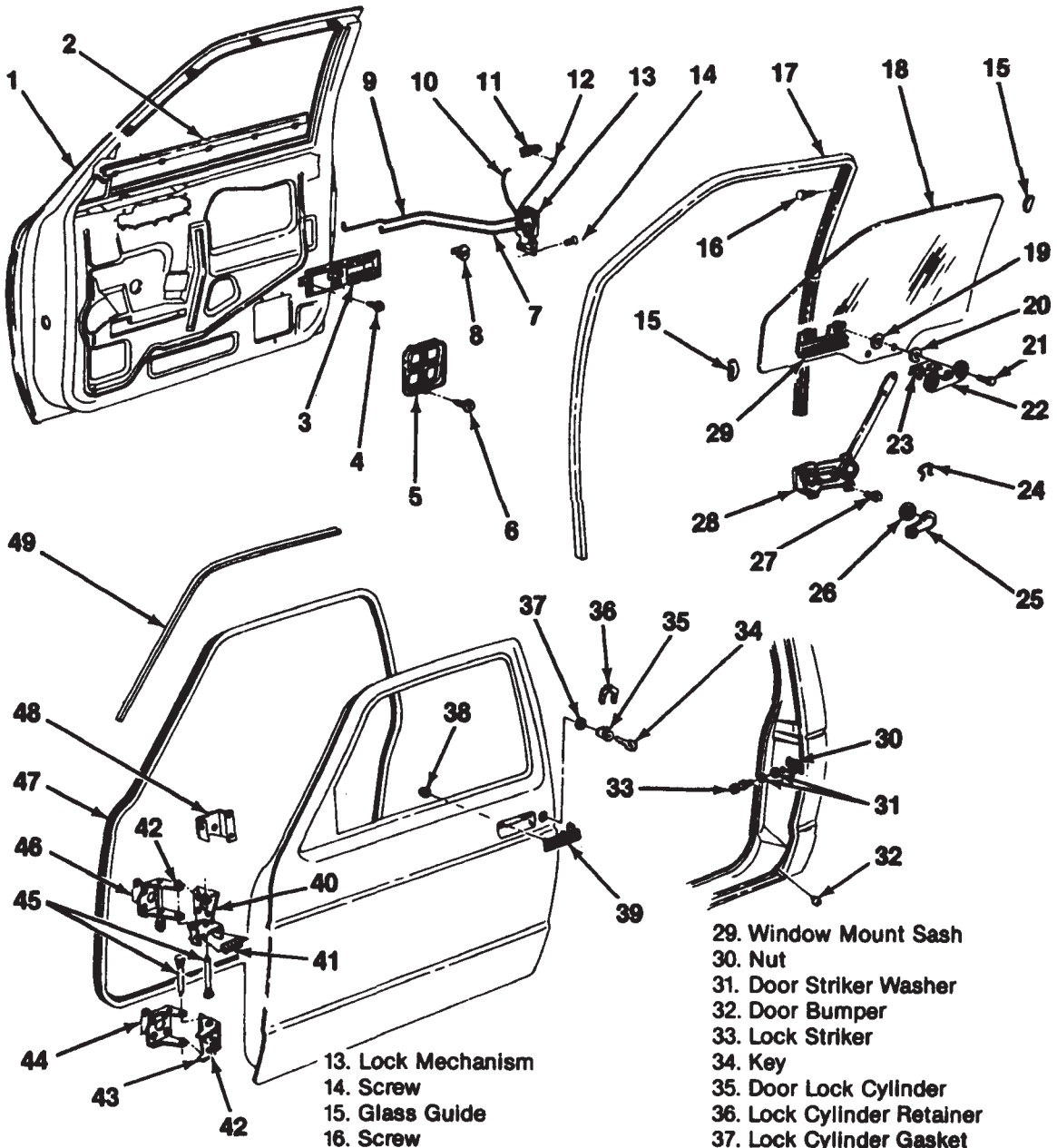
Tool Required:
J 28625-A Door Hinge Spring Compressor

1. Hinge pin clips to the hinge pins.
2. Door to the vehicle.
3. Bolt through the lower hinge pin holes.
4. Upper hinge pin with the pointed end up.
   - Use a soft headed hammer and a pair of locking pliers.
- Remove the bolt from the lower hinge.
5. Lower hinge pin with the pointed edge down.
6. Door hinge spring using J 28625-A.
- *Remove the tape from the door and body pillar.*
7. Wire harness connectors. (Vehicles with power components only).
   - Rubber conduit through the body pillar.
   - Retainer around the wire harness grommet.
   - Receptacles to the wiring harness under the dash.
8. Cowl side vent cover. (Vehicles with power components only.)
9. Battery ground cable. (Vehicles with power components only.)

DOOR HINGE REPLACEMENT

Remove or Disconnect (Figures 3 through 7)

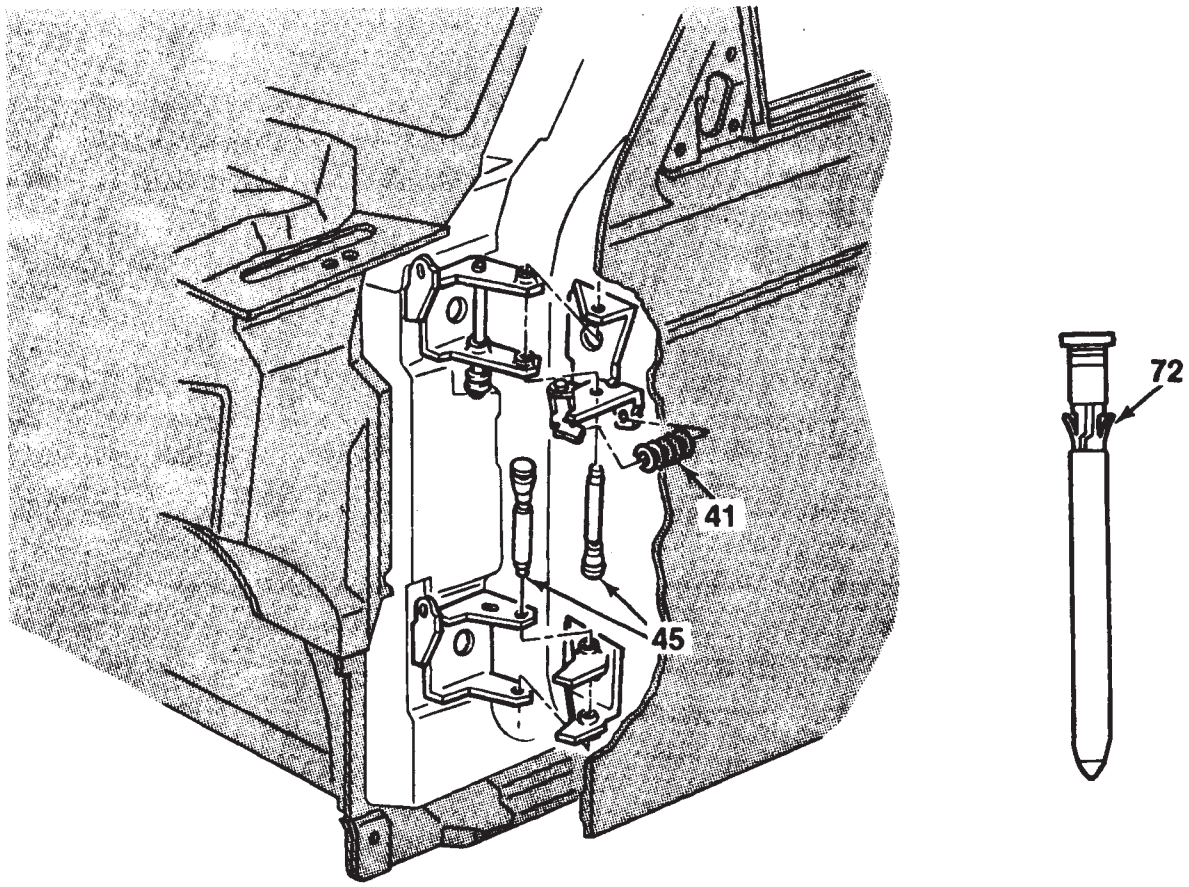
1. Door. Refer to "Door Replacement" in this section.
2. Hinges.
   - Scribe the location of the existing hinges on the body pillar, and the door.
   - Center punch each of the weld marks on the original hinges.
   - Drill a 3 mm (1/8 inch) pilot hole through the *welds only deep enough to penetrate the hinge* base.
   - Drill a 13 mm (1/2 inch) hole through the hinge base only, using the smaller hole as a pilot.
   - Drive a chisel between the hinge from the pillar of door.
3. Dash attaching screws (upper hinge replacement only).
   - Pull the dash outward and support it.
4. Weatherstrip.
5. Door trim panel.



1. Door
2. Door Glass Outer Seal
3. Inner Handle Housing
4. Screw
5. Pressure Relief Valve
6. Screw
7. Door Handle Rod
8. Lock Rod Guide
9. Lock Handle Rod
10. Outside Handle Rod
11. Lock Rod Clip
12. Lock Cylinder Rod
13. Lock Mechanism
14. Screw
15. Glass Guide
16. Screw
17. Window Glass Run
18. Glass
19. Window Glass Mount Washer
20. Window Mount Bushing
21. Bolt
22. Window Mount Sash
23. Side Window Retainer
24. Window Handle Spring
25. Window Handle
26. Window Handle Bearing Plate
27. Bolt
28. Window Regulator
29. Window Mount Sash
30. Nut
31. Door Striker Washer
32. Door Bumper
33. Lock Striker
34. Key
35. Door Lock Cylinder
36. Lock Cylinder Retainer
37. Lock Cylinder Gasket
38. Nut
39. Outside Door Handle
40. Upper Door Side Hinge
41. Upper Hinge Spring
42. Door Hinge Bushing
43. Lower Door Side Hinge
44. Lower Body Side Hinge
45. Hinge Pin
46. Upper Body Side Hinge
47. Front Door Weatherstrip
48. Rear View Mirror Support
49. Roof Drip Molding

B9748

Figure 1—Door Components



41. Upper Hinge Spring
45. Hinge Pin
72. Hinge Pin Clip

B9749

Figure 2—Door Hinge Components

Install or Connect (Figures 4 through 7)

- Prepare the surfaces for the replacement hinges.

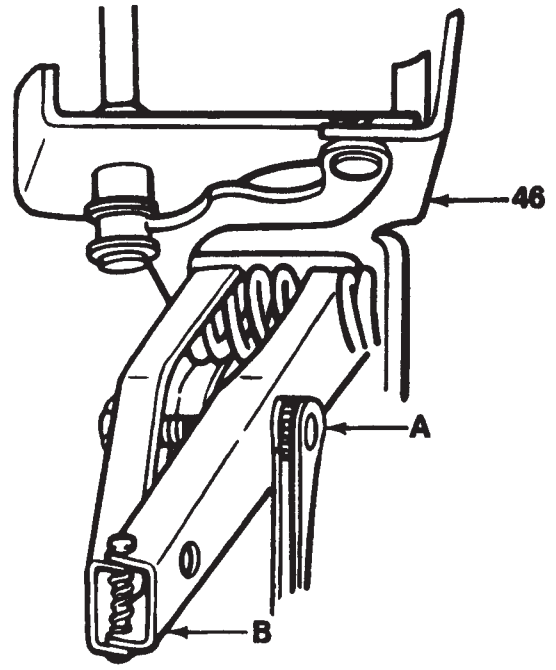
1. Hinges.
   - Position the bolt-on service replacement hinge within the scribe marks made on the body hinge pillar and the door at the time of removal.
   - Center punch each bolt hole location on the body hinge pillar and/or door.
   - Drill a 13 mm (1/2 inch) hinge attaching hole at each center punch mark.
   - Open the body side pinch weld enough to install the tapped anchor plate using a hammer and a chisel.
   - Coat the surface of the hinge that mates to the hinge pillar and the door with a medium bodied sealer.
2. Hinge bolts and tapped backing plate.
   - Align the hinge and tapped plate with the holes in the hinge pillar and the door.
   - Place the bolts through the hinge, pillar, and/or door and into the tapped backing plate.
   - Weld a wire to the dash side of the lower pillar tapped backing plate to aid in aligning the plate.

Tighten

   - Hinge bolts to 35 N·m (26 ft.lbs.).
   - Close the opening in the pinch weld, and spot weld to secure the flange.
   - Refinish and paint the pinch weld.
3. Dash.
4. Weatherstrip.
5. Door trim panel.
6. Door.

Adjust

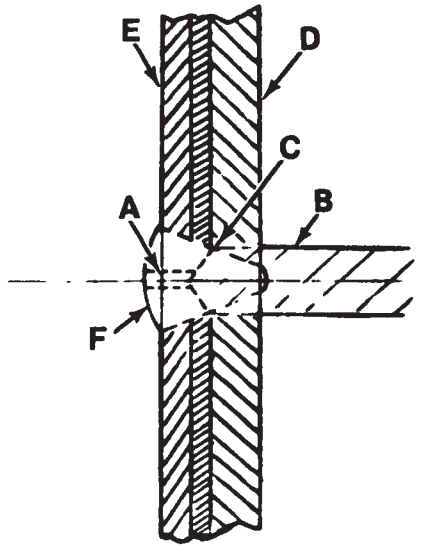
1. The door to fit the door frame opening properly.
2. The striker to properly engage the lock fork bolt.



46. Upper Door Hinge
A. Wrench
B. Door Hinge Spring Compressor J-28625-A

B9750

Figure 3—Hinge Spring Removal



A. Pilot Hole
B. Drill Bit, 13 mm (1/2-Inch)
C. Drill The Hole Deep Enough To Penetrate The Hinge Base Only
D. Hinge Base
E. Body Pillar
F. Weld

B9744

Figure 4—Drilling the Spot Weld

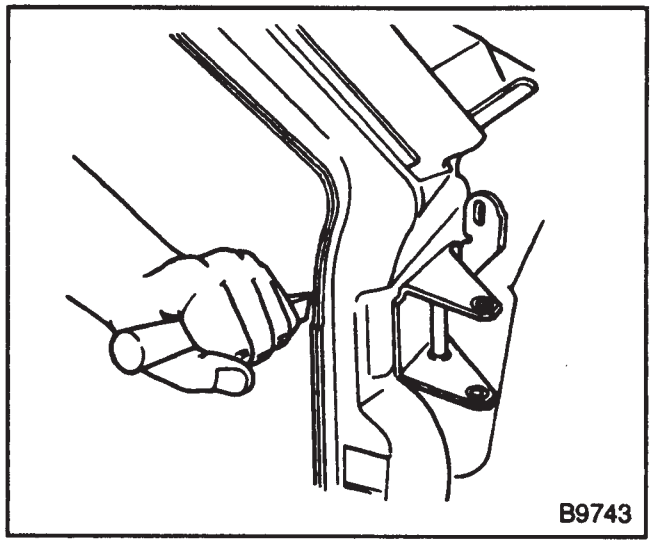


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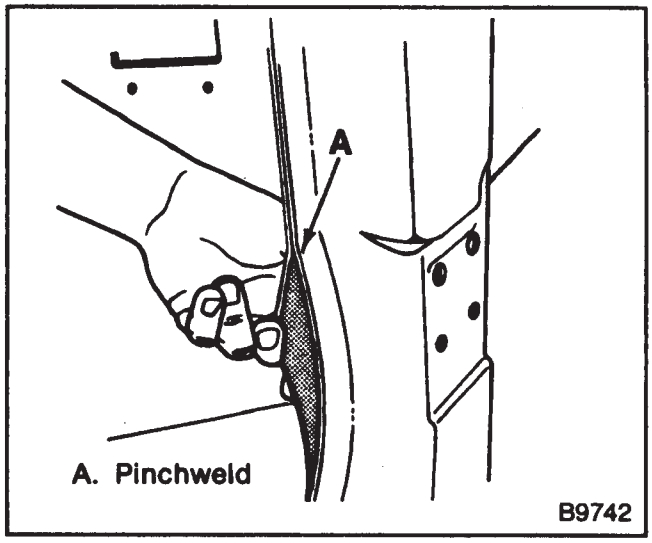
Figure 5—Opening the Pinchweld



B9742

Figure 6—Pinchweld Open

DOOR ADJUSTMENT

This procedure can only be used when bolt-on service replacement hinges are installed.

Remove or Disconnect (Figures 7 and 9)

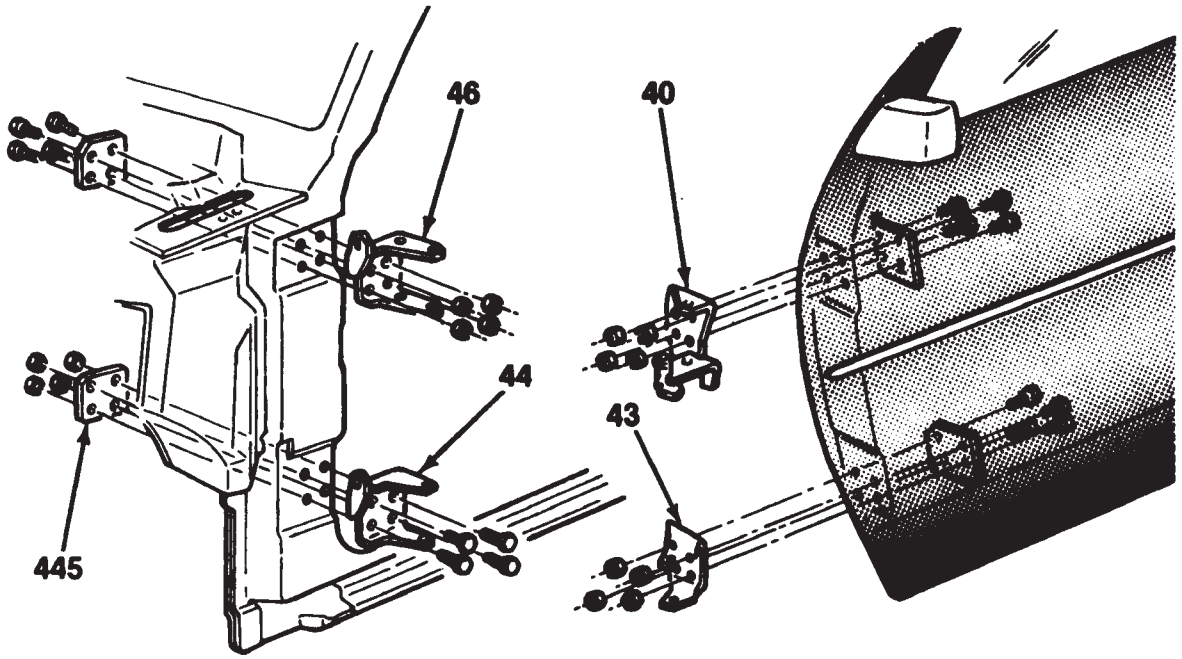
Tool Required:
J 23457-A Wrench

- Door striker bolt using J 23457-A.
- Loosen the door hinge to the body side pillar bolts.

Adjust (Figures 7 and 8)

- Door up or down, forward or rearward and in or out at the door hinges.

1. Gap between the rocker panel and the door to 6 mm ± 1 mm (.24-inch ± .03-inch).
2. Gap between the door and the roof panel to 6 mm ± 1 mm (.24-inch ± .03-inch).
3. Gap between the rear of the door and the rear pillar to 5 mm ± 1 mm (.19-inch ± .03-inch).



40. Upper Door Side Hinge
43. Lower Door Side Hinge
44. Lower Body Side Hinge
46. Upper Body Side Hinge
445. Backing Plate

B9736

Figure 7—Replacement Hinges

4. Gap between the forward edge of the door and the front fender to 5 mm ± 1 mm (.19-inch ± .03-inch).
5. Door surfaces flush with other panels within ± 1 mm (.03-inch).

Tighten

- Hinge bolts to 35 N·m (26 ft.lbs.).

Install or Connect (Figures 9, 10 and 11)

Tool Required:

J 23457-A

NOTICE: See "Notice" on page 10A1-1 of this section.

- Door striker bolt.

Adjust

- Bolt to properly engage the door lock.

Tighten

- Bolt to 63 N·m (46 ft.lbs.).

DOOR STRIKER BOLT REPLACEMENT

The door striker bolt is the special bolt and washer assembly mounted on the door opening's rear pillar. There is an oversize square hole in the pillar. The bolt passes through this hole and is threaded into a plate behind the pillar. The cab door is secured in position when the lock cam (arm) of the locking mechanism engages, and snaps around, the striker bolt.

The striker bolt position can be varied. However, the position of the striker bolt should be used to alter door alignment IN ONLY ONE WAY: It should be adjusted so that the rear section of the door is flush with the cab panel.

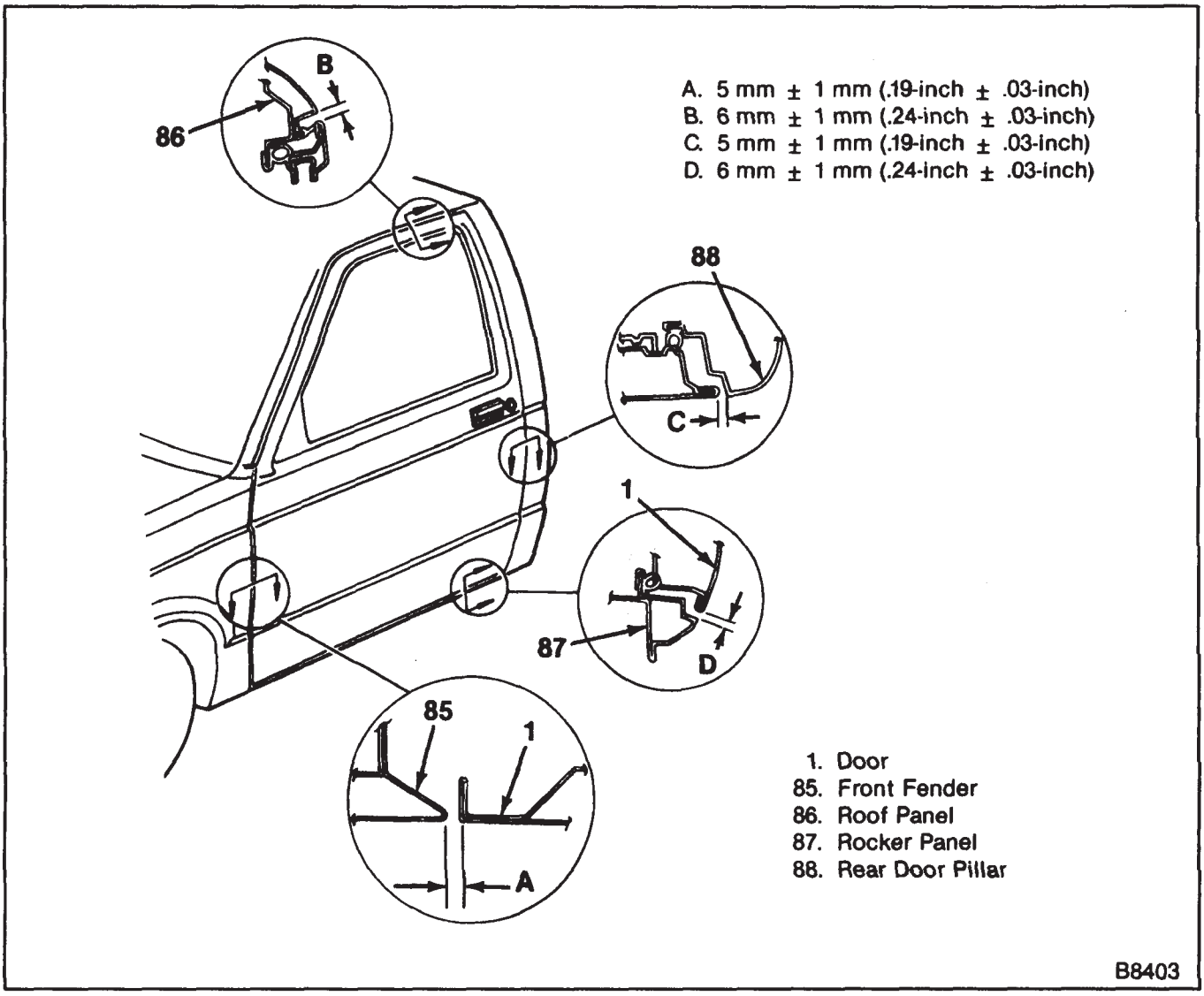


Figure 8—Door Adjustments

Remove or Disconnect (Figures 9 and 10)

Tool Required:

J 23457-A Striker Bolt Wrench

- Mark the position of the striker bolt washer on the door pillar.

- Striker bolt using J 23457-A.

Install or Connect (Figures 9 and 10)

NOTICE: See "Notice" on page 10A1-1 of this section.

- Striker bolt into the door pillar.
  - Align the striker bolt washer with the previously made mark.

Tighten

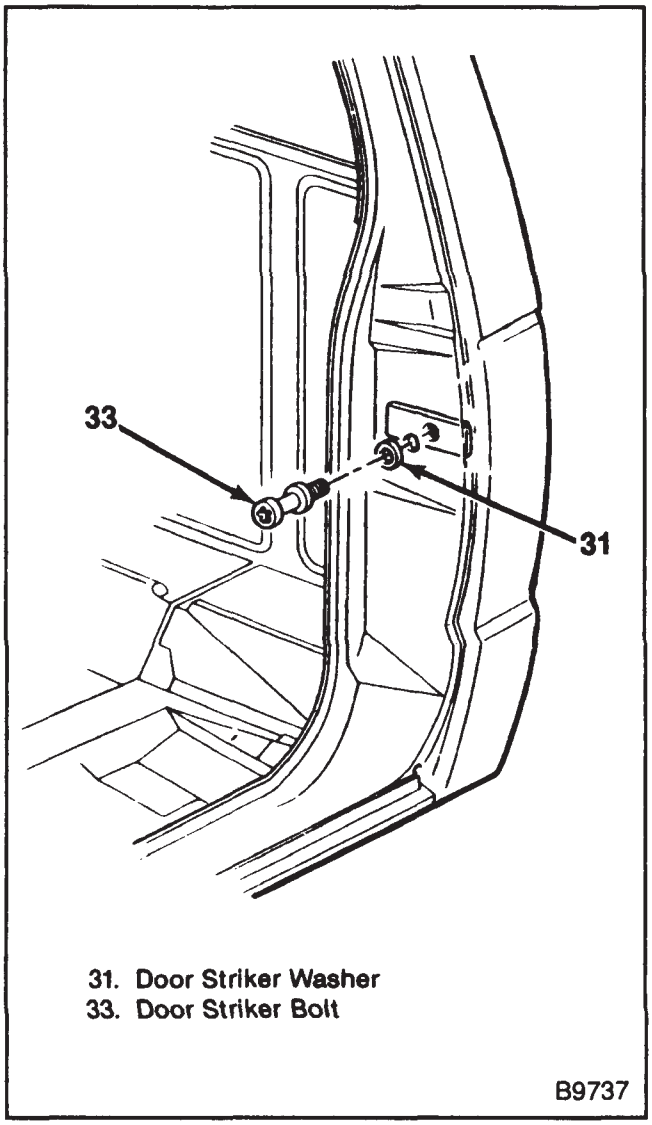
- Striker bolt to 63 N·m (47 ft.lbs.) using J 23457.

ADJUSTMENT (Figure 11)

Tool Required:

J 23457 Door Striker Wrench

1. Smear a small amount of grease on the edge of the lock cam that will contact the striker bolt.
2. Slowly close the door until the lock cam just contacts the side of the striker bolt.
3. Open the door and not the location of the grease on the side of the striker bolt. The edge of the grease should be 3 mm (1/8-inch) from the head of the striker bolt. There should be a mark in the grease on the lock cam. This mark should be slightly above an imaginary horizontal line running lengthwise through the center of the lock cam and slot of the door. The up and down position of the striker bolt is important. It determines how much of the door's weight will rest on the striker bolt when the door is closed. If the bolt is positioned too high on the pillar, rapid wear will occur to the lock cam. If the bolt is positioned too low, the door will be pulled down and out of alignment. In addition, an extra load will be placed on the door hinges.



31. Door Striker Washer
33. Door Striker Bolt

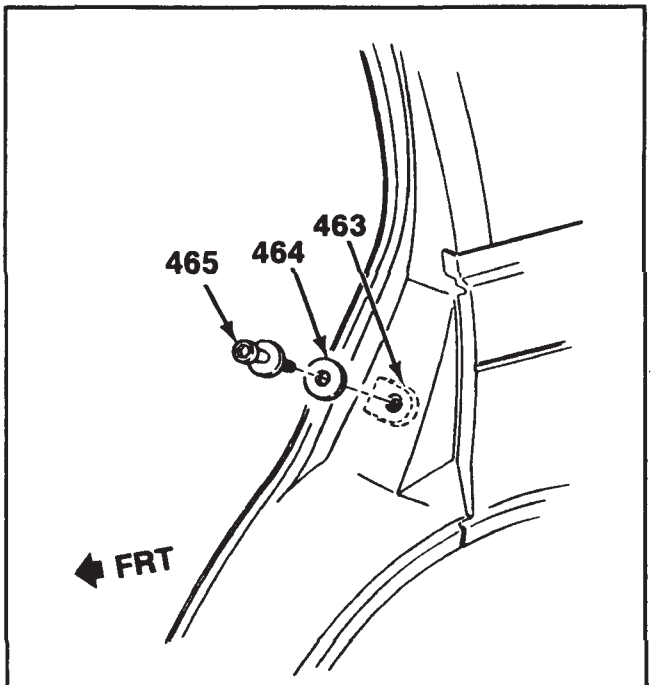
B9737

Figure 9—Front Door Striker Components

4. If it is necessary to alter the striker bolt position, add or delete shim washers to move the bolt fore or aft, or to raise or lower the loosened striker bolt by tapping on the shim washer at the base of the striker bolt. Do not tap on the head of the bolt. To remove or loosen the striker bolt, use tool J 23457-A.
5. Once the striker bolt is aligned as indicated in Step 3, tighten it down snugly.
6. Close the door completely, and not the position of the rear door panel with respect to the cab panel. They should be flush.
7. If the rear of the door and the cab outer panel are not flush, mark the up and down position of the striker bolt washer on the cab pillar.
8. Loosen the striker bolt. Use tool J 23457-A.
9. Tap on the base washer of the bolt to slide the bolt in or out as required.
10. Tighten the striker bolt, check the door position, and, if necessary, repeat the adjustment.

NOTICE: See "Notice" on page 10A1-1 of this section.

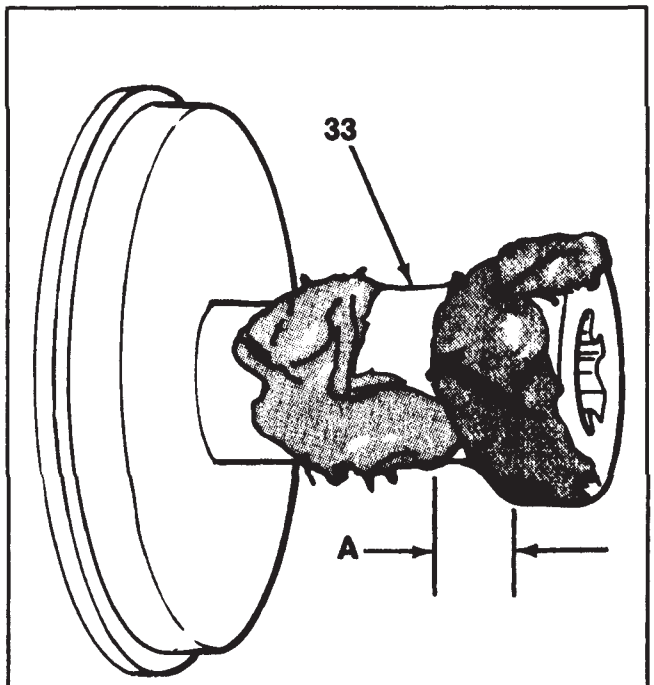
11. Tighten the striker bolt to 63 N·m (47 ft. lbs.).



463. Nut
464. Washer
465. Striker Assembly

F9114

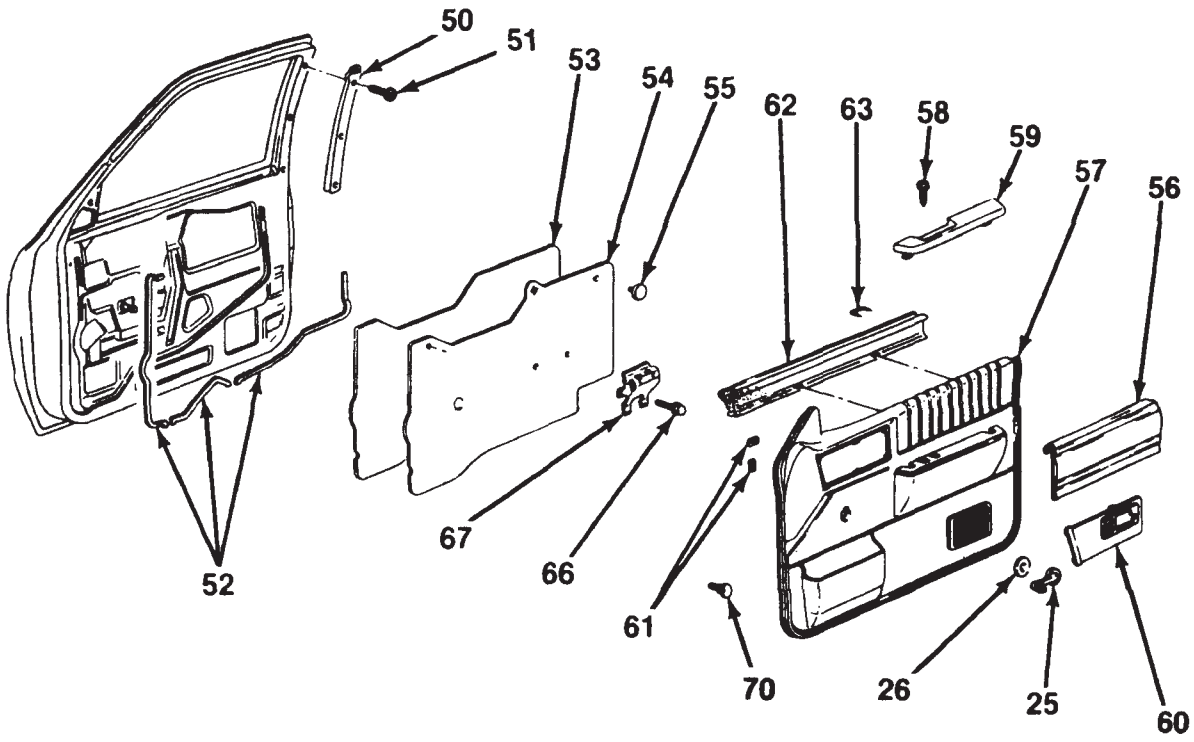
Figure 10—Rear Door Striker Components



33. Lock Striker
A. 3 mm (⅛-inch)

B9738

Figure 11—Striker Position on the Latch



25. Window Handle
26. Window Handle Bearing Plate
50. Door Garnish Molding
51. Screw
52. Adhesive Strip
53. Inner Panel Water Deflector
54. Door Insulator
55. Retainer
56. Trim Panel Insert
57. Trim Panel
58. Screw
59. Arm Rest
60. Bezel
61. Bezel Retainer
62. Weatherstrip
63. Staple
66. Bolt
67. Armrest Bracket

F5698

Figure 12—Front Door Trim Components

DOOR TRIM PANEL REPLACEMENT

Tool Required:

J 21104 Trim Pad Remover

Remove or Disconnect (Figure 12)

1. Door pillar molding.
2. Window regulator handle.
3. Armrest (figure 15).
4. Power window switch, if used.
5. Trim panel. Pry the fasteners from their seats using J 21104.

Install or Connect (Figure 12)

1. Trim panel to the door.
2. Armrest (figure 15).
3. Window regulator handle.
4. Power window switch, if used.
5. Door pillar molding.

WINDOW REGULATOR HANDLE REPLACEMENT

Remove or Disconnect

Tool Required:

J 9886-01 Door Handle Remover

1. Window regulator handle (figure 16).
   - Insert J 9886-01 between the handle and the bearing plate.
   - Align the tool parallel with the door handle, and push to disengage the clip.
   - Pull the handle from the door.
2. Bearing plate.

Install or Connect

1. Bearing plate.
2. Window regulator handle.
   - Place the window in the raised position.
   - Put the clip onto the handle.
   - Insert the handle onto the door so the handle is pointing towards the front of the door.

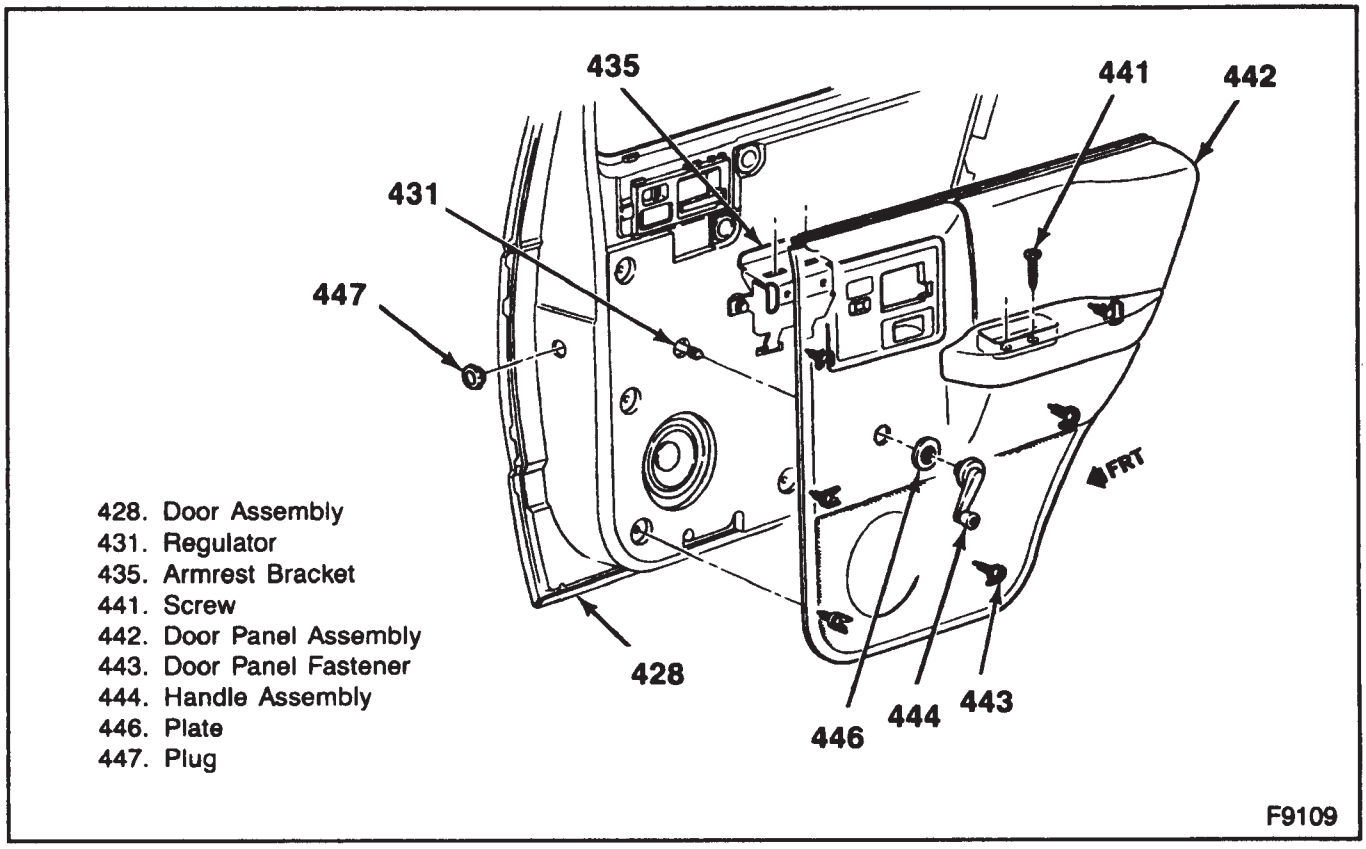


Figure 13—Rear Door Trim Components

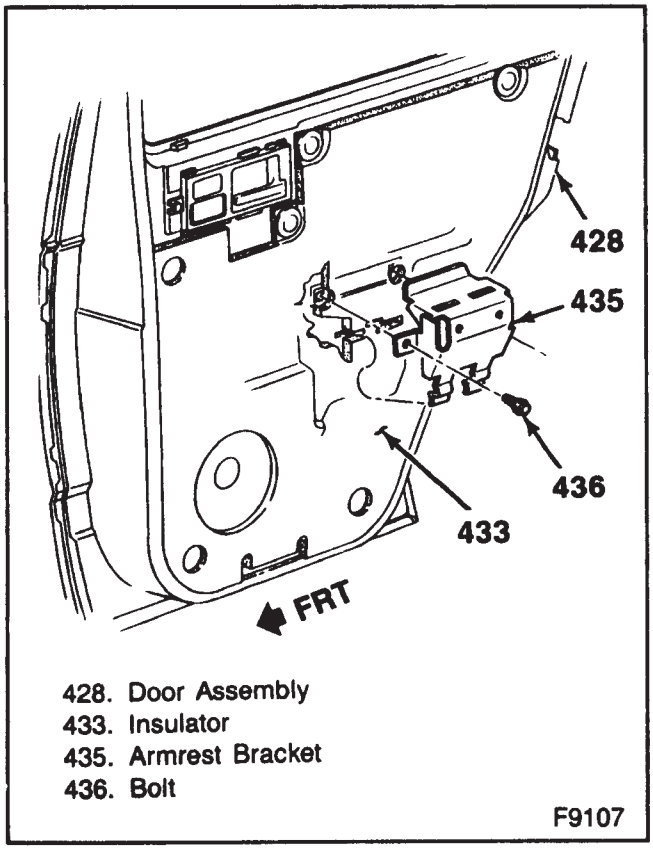


Figure 14—Rear Door Armrest Bracket

- Push on the handle until the clip engages the window regulator shaft.

DOOR ARMREST REPLACEMENT

Remove or Disconnect (Figure 15)

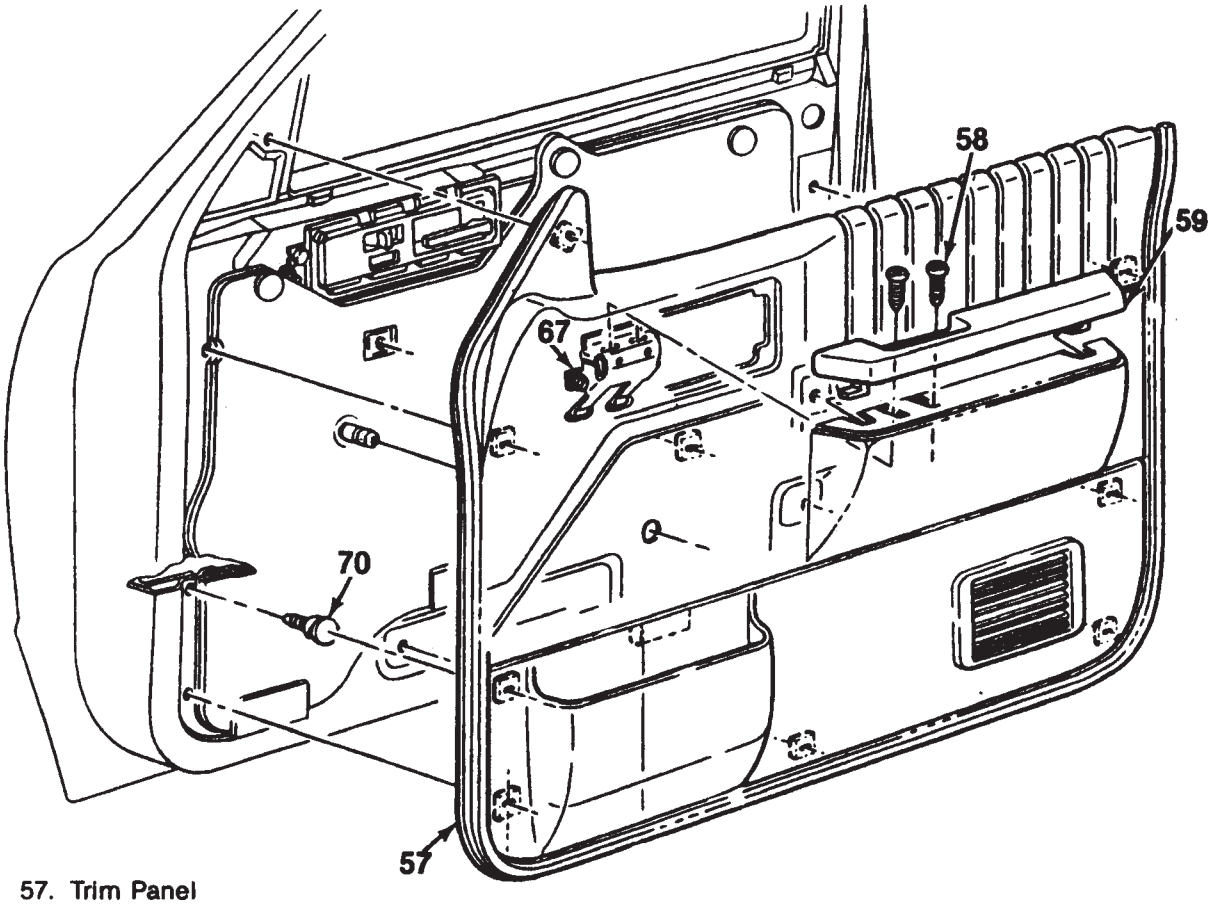
1. Screws securing the armrest to the door trim.
2. Armrest from the door trim.
   - Slide the armrest towards the rear of the door, and then lift the armrest from the door.

Install or Connect (Figure 15)

1. Armrest to the door trim.
   - Place the armrest retaining clips in the slots on the door panel.
   - Slide the armrest toward the front of the door until the holes in the armrest align with the holes in the door trim.
2. Screws securing the armrest to the door trim.

DOOR INNER PANEL WATER DEFLECTOR REPLACEMENT

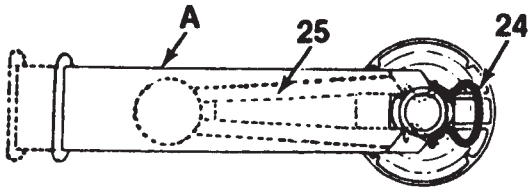
Waterproof deflectors are used to seal the door inner panel, and to prevent water from entering into the body. The deflector is secured by a strip of adhesive between the deflector and the door, as well as waterproof sealing tape.



57. Trim Panel
58. Screw
59. Armrest Pad
67. Armrest Bracket
70. Trim Panel Retainer

B9740

Figure 15—Armrest Removal



24. Spring
25. Window Regulator Handle
A. Door Handle Clip Remover J-9886-01

B9741

Figure 16—Window Handle Replacement

Remove or Disconnect (Figure 17)

1. Door trim panel. Refer to "Door Trim Panel Replacement."
2. Plastic fasteners (when used).
3. Armrest bracket.
4. Water deflector.
   - Pull the waterproof sealing tape from the deflector.
   - Break the bond between the sealer and the door with a flat-bladed tool.

Install or Connect (Figure 17)

1. Water deflector.
   - Use strip caulking as a sealant between the deflector and the door, if needed.
2. Plastic fasteners (when used).
3. Waterproof tape.
4. Armrest bracket.
5. Door trim panel. Refer to "Door Trim Panel Replacement."

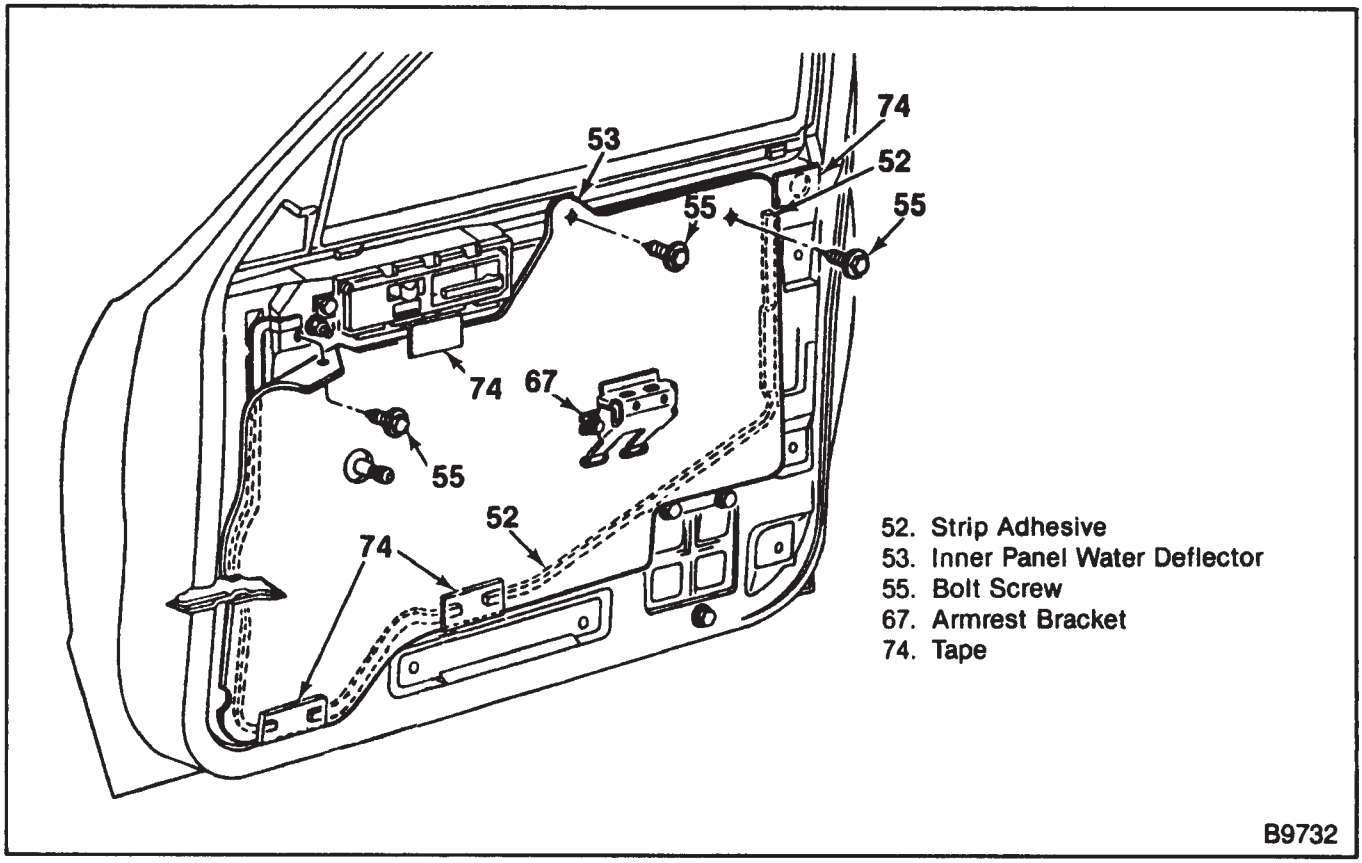


Figure 17—Front Door Inner Panel Water Deflector

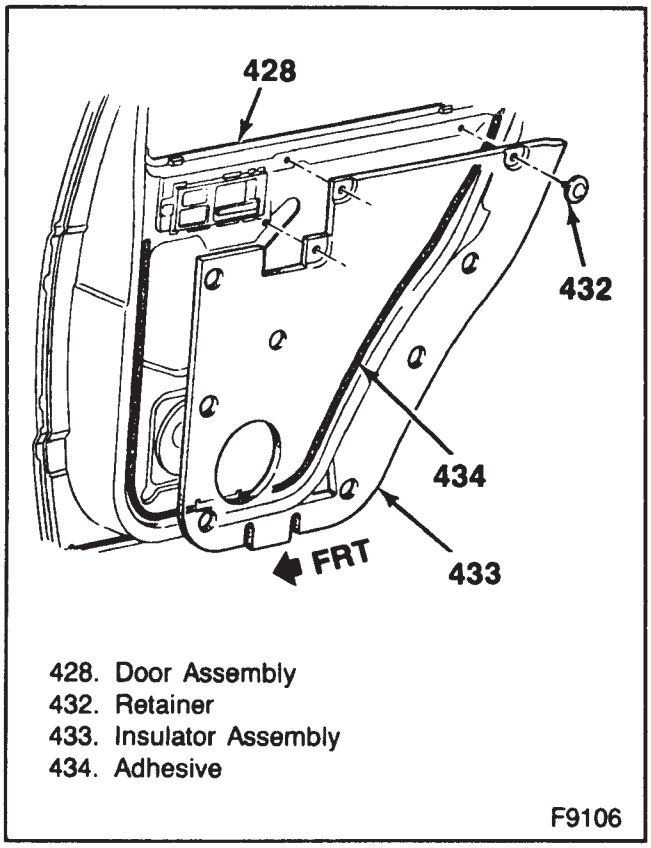


Figure 18—Rear Door Insulator Assembly

DOOR HARDWARE LUBRICATION

The mechanical components of the door assembly are lubricated during assembly. If additional lubrication is required to any door hardware mechanism, lubricate with part no. 1052349, Lubriplate Spray-Lube "A", part no. 1052196, Lubriplate Auto-Lube "A" or equivalent. Door hinge pins and rollers should be lubricated at normal service intervals with 30 weight engine oil. Do not lubricate hinge roller to hold-open link contacting surfaces as this may prevent the roller from rolling properly.

DOOR LOCK REPLACEMENT

Front Door Lock

Remove or Disconnect (Figure 19)

1. Door trim panel. Refer to "Door Trim Panel Replacement."
2. Lock rod from the inner handle housing.
3. Lever rod from the inner handle housing.
4. Outside handle lock rod from the lock mechanism.
5. Lock cylinder rod from the lock cylinder.
6. Lock screws.
7. Lock mechanism.

Install or Connect (Figure 19)

1. Lock mechanism.
2. Lock screws.

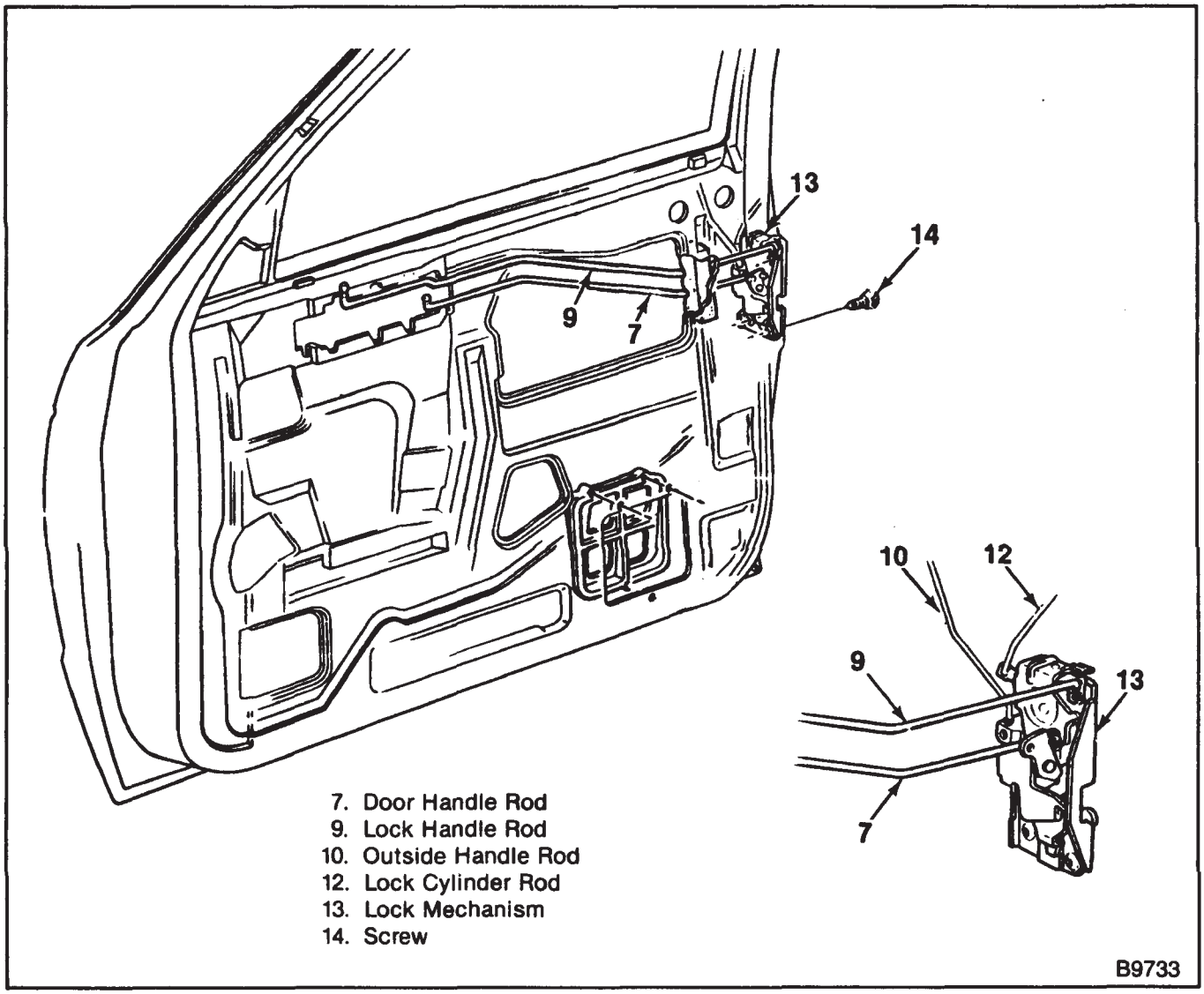


Figure 19—Front Door Lock Components

3. Lock cylinder rod to the lock cylinder.
4. Outside handle lock rod to the lock mechanism.
5. Lever rod to the inner handle housing.
6. Lock rod to the inner handle housing.
7. Door trim panel. Refer to "Door Trim Panel Replacement."

Rear Door Lock

Remove or Disconnect (Figure 20)

1. Armrest.
2. Door trim panel. Refer to "Door Trim Panel Replacement."
3. Armrest bracket.
4. Sound deadener.
5. Linkage rods from the lock mechanism.
6. Lock mechanism.

Install or Connect (Figure 20)

1. Lock mechanism.
2. Linkage rods to the lock mechanism.
3. Armrest bracket.
4. Door trim panel. Refer to "Door Trim Panel Replacement."
5. Armrest.

POWER DOOR LOCK MOTOR REPLACEMENT

Refer to CAB ELECTRICAL (SEC. 8A) for diagnosis of door lock motor.

Remove or Disconnect (Figure 21)

1. Battery ground cable.
2. Door trim panel. Refer to "Door Trim Panel Replacement."
3. Electrical connector from the motor.
4. Motor mounting bolts.
5. Motor from the remote lock lever.
6. Motor from the door.

Install or Connect (Figure 21)

1. Motor to the door.
2. Motor to the remote lock lever.

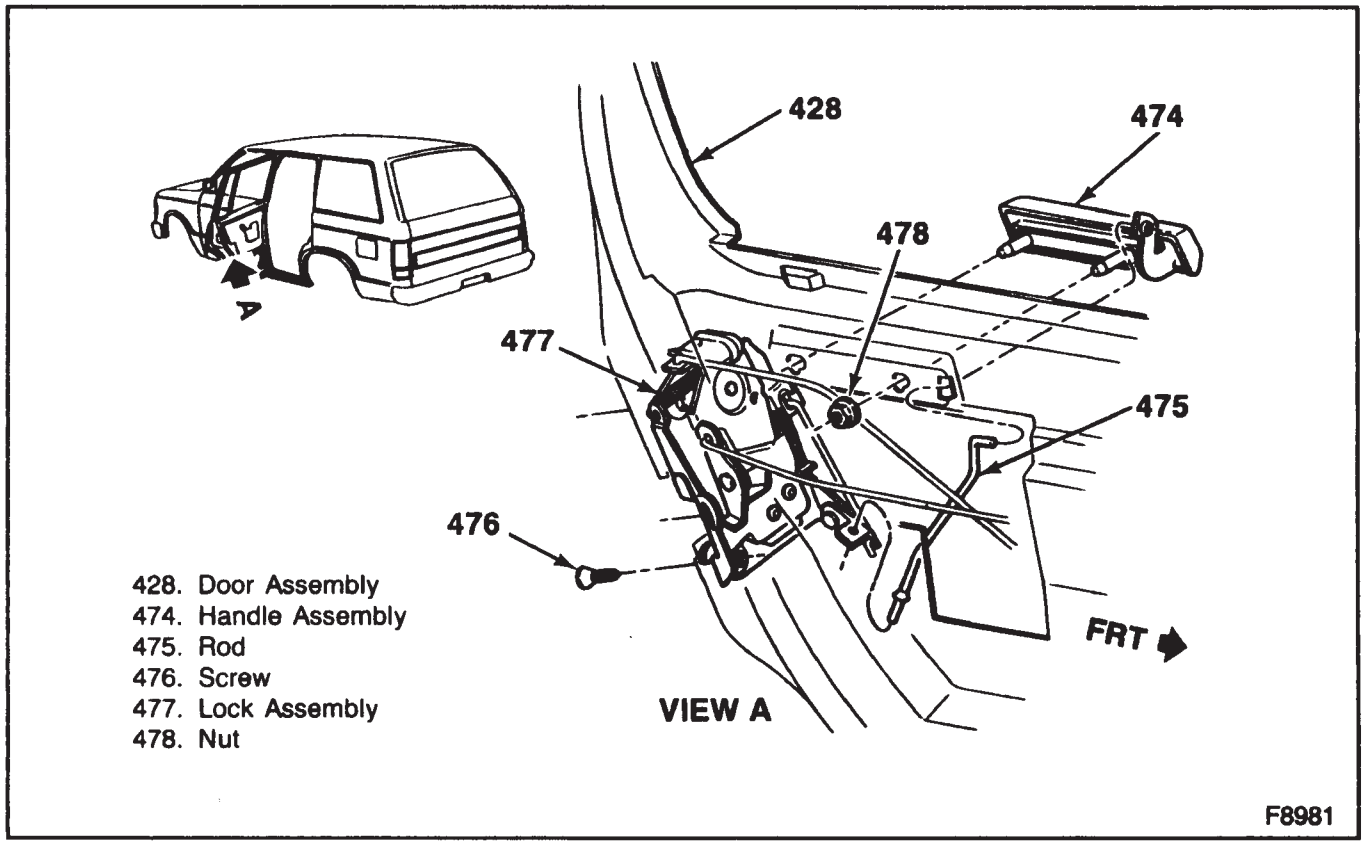


Figure 20—Rear Door Lock Components

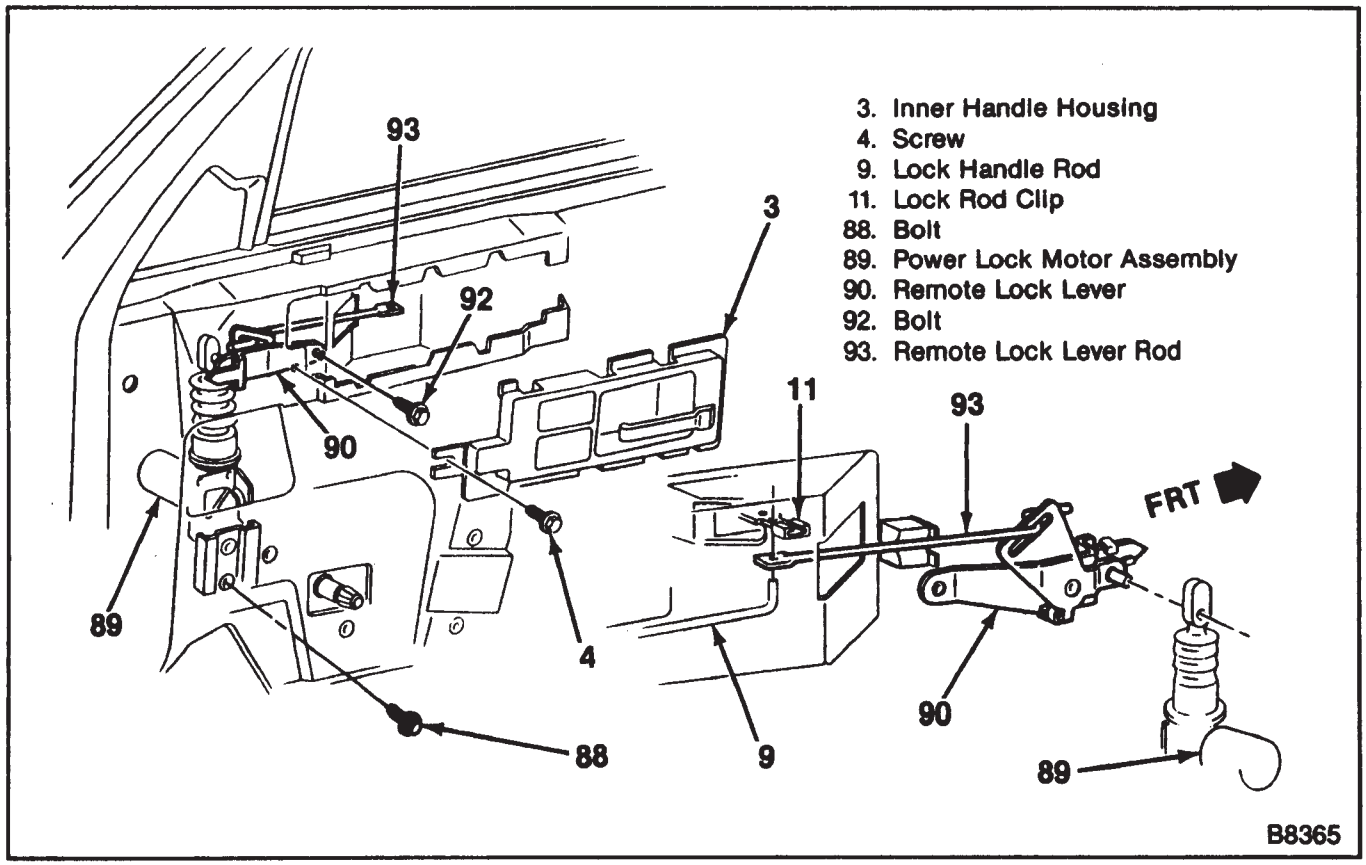


Figure 21—Power Door Lock Components.

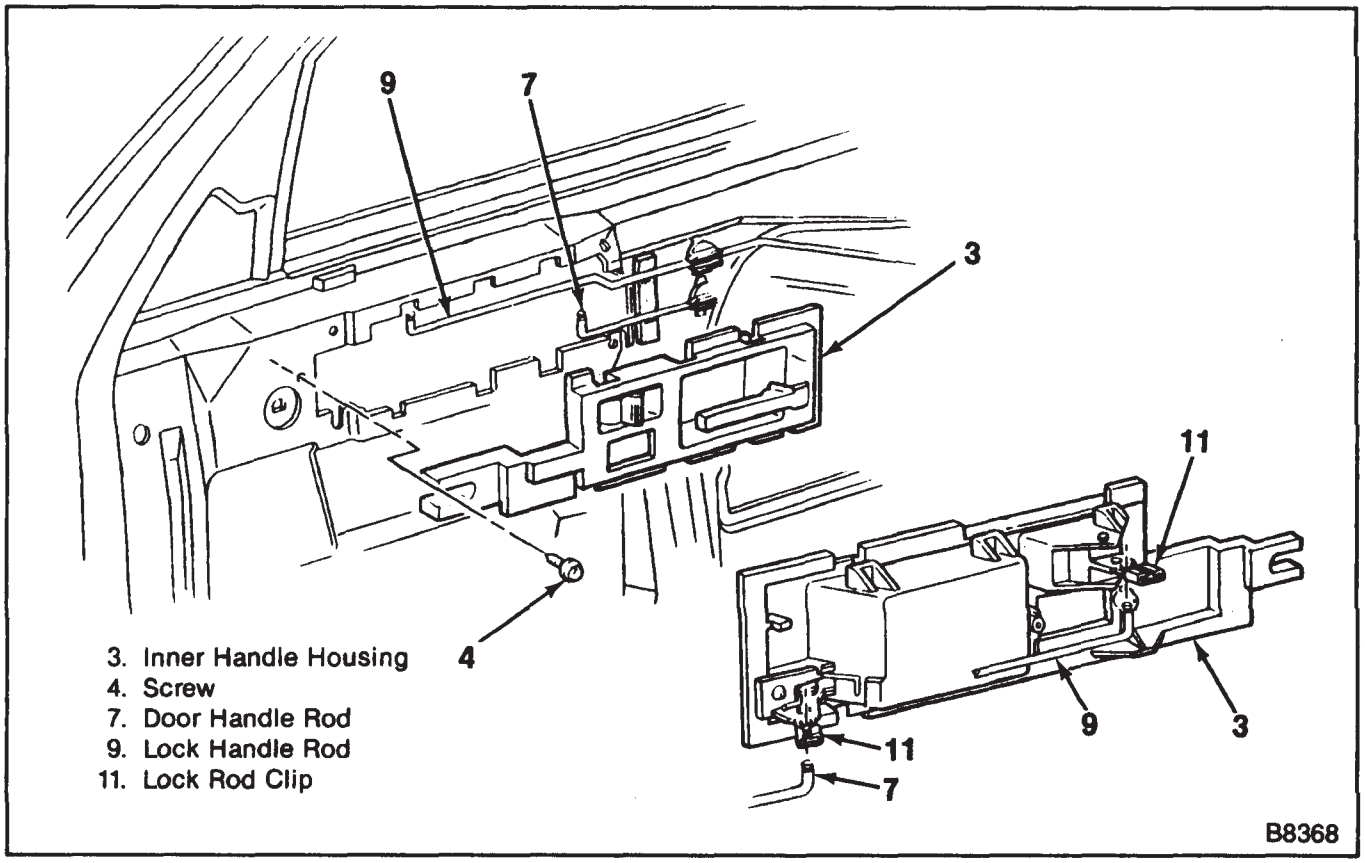


Figure 22—Front Door Inner Handle Housing

3. Motor mounting bolts.
4. Electrical connector to the motor.
5. Door trim panel.
6. Battery ground cable.

REMOTE LOCK LEVER REPLACEMENT

Remove or Disconnect (Figure 21)

1. Door trim panel.
2. Lock rod clip.
3. Lock handle rod from the push-button arm.
4. Remote lock lever rod from the push-button arm.
5. Rivet from the lever assembly.
   - Drill out the rivet head using a 5 mm (3/16-inch) drill bit.
6. Motor from the lever assembly.
   - Loosen the motor mounting bolts and disengage the motor from the lever assembly.
7. Lever assembly.
   - Slide from the tab attached to the door panel.

Install or Connect (Figure 21)

1. Lever assembly.
   - Slide into the tab attached to the door panel.
2. Motor to the lever assembly.
   - Tighten the motor mounting bolts.
3. Lever assembly to the door panel.
   - Install a 6 mm (1/4-inch) diameter, 13 mm (1/2-inch) long bolt with a spring washer and nut through the drilled out rivet hole.
4. Remote lock lever rod to the push-button arm.
5. Lock handle rod to the push-button arm.
6. Lock rod clip.
7. Door trim panel.

DOOR INNER HANDLE HOUSING REPLACEMENT

Front Door

Remove or Disconnect (Figure 22)

1. Door trim panel.
2. Inner handle housing screws.
3. Inner handle housing.
   - Slide the housing towards the front of the door and pull it from the door.
4. Control rods from the handle and the lock.
5. Power door lock wire harness (when used).

Install or Connect (Figure 22)

1. Power door lock wire harness (when used).
2. Control rods to the handle and the lock.
3. Inner handle housing.
   - Insert the housing into the door and slide the housing towards the rear of the door.
4. Inner handle housing screw.
5. Door trim panel.

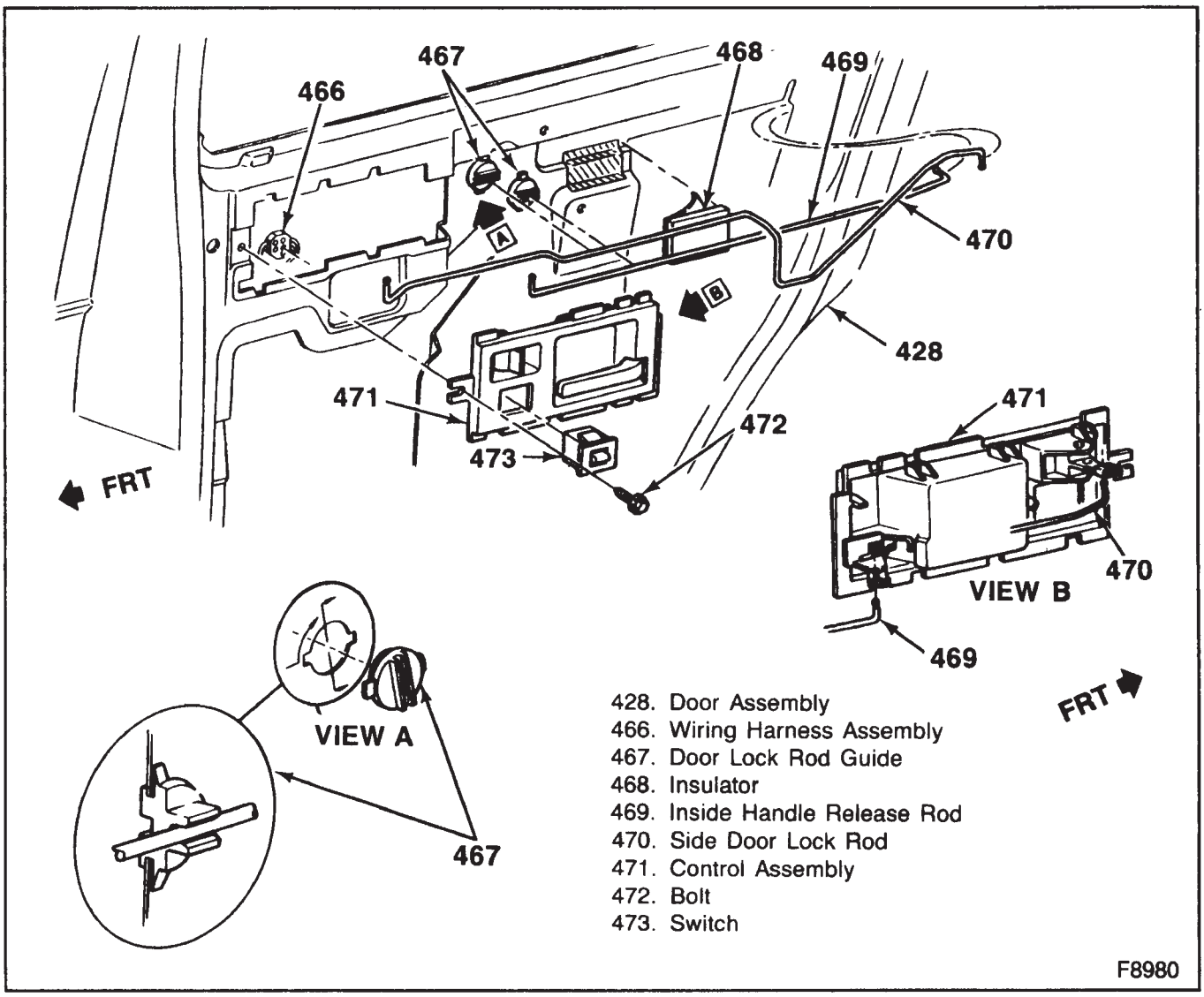


Figure 23—Rear Door Inner Handle Housing

Rear Door

Remove or Disconnect (Figure 23)

1. Armrest.
2. Door trim panel. Refer to "Door Trim Panel Replacement."
3. Handle housing and remote assembly.
4. Linkage rods.

Install or Connect (Figure 23)

1. Linkage rods to the proper clips in the handle housing.
2. Handle housing and remote assembly to the door trim panel.
3. Door trim panel. Refer to "Door Trim Panel Replacement."
4. Armrest.

DOOR LOCK CYLINDER REPLACEMENT

New lock cylinders or new tumblers are available as replacement parts.

Remove or Disconnect (Figure 24)

1. Door trim panel. Refer to "Door Trim Panel Replacement."
2. Armrest bracket.
3. Water deflectors.
   - Roll the window up.
4. Lock cylinder retainer.
5. Lock cylinder.
6. Lock cylinder seal.

Install or Connect (Figure 24)

1. Lock cylinder seal.
2. Lock cylinder.
3. Lock cylinder retainer.
4. Water deflector.

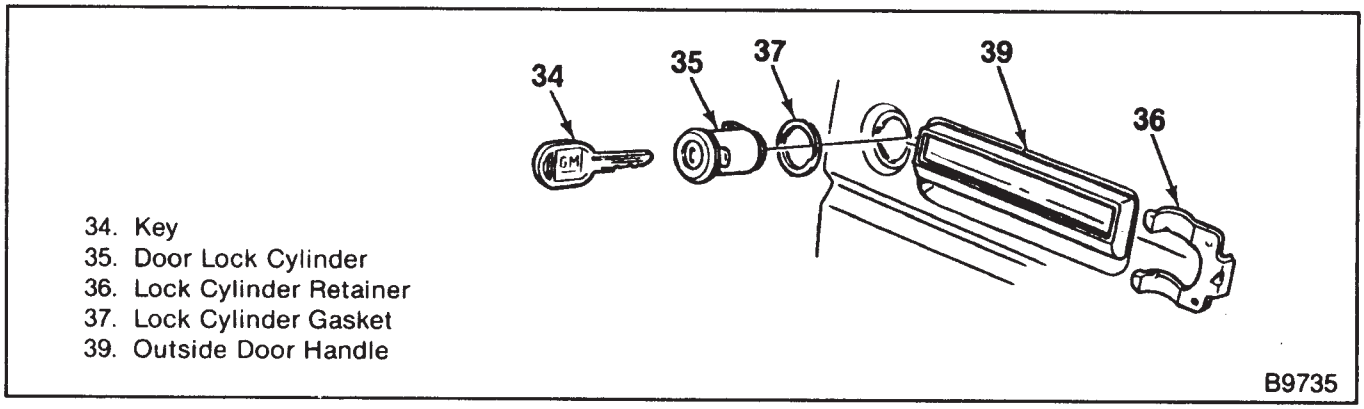


Figure 24—Lock Cylinder Components

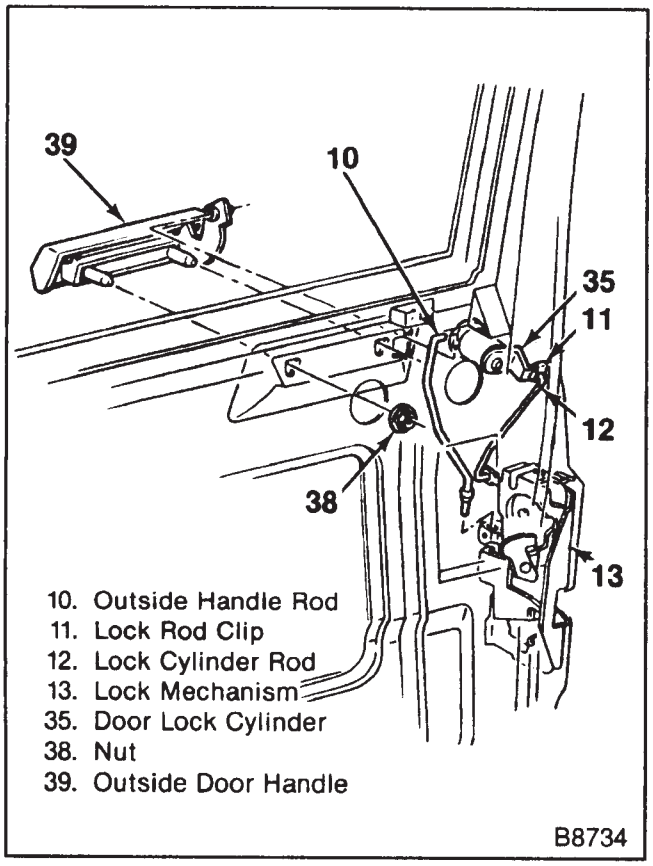


Figure 25—Front Outside Door Handle

5. Armrest bracket.
6. Door trim panel. Refer to "Door Trim Panel Replacement."

DOOR OUTSIDE HANDLE REPLACEMENT

Front Door

Remove or Disconnect (Figure 25)

- Raise the window to the full up position.

1. Door handle bezel.
2. Armrest.
3. Door trim panel.
4. Water deflector.
5. Outside handle linkage rod from the door handle (10).
6. Nuts securing the door handle to the outer door panel (38).
7. Handle from the door (39).

Install or Connect (Figure 25)

1. Handle to the door.
2. Nuts securing the door handle to the outer door panel.
3. Outside handle linkage rod to the door handle.
4. Water deflector.
5. Door trim panel.
6. Armrest.
7. Door handle bezel.

Rear Door

Remove or Disconnect

- Raise window to the full up position.

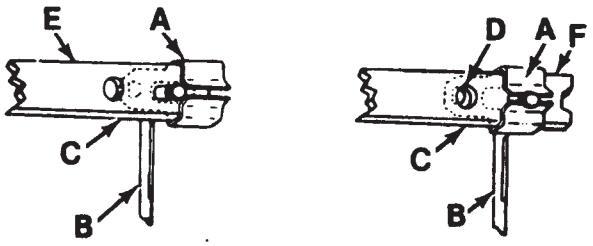
1. Armrest.
2. Door trim panel.
3. Armrest bracket.
4. Sound deadener.
5. Outside handle linkage rod from the door handle.
6. Nuts securing the door handle to the outer door panel.
7. Door handle.

Install or Connect

1. Door handle to the outer door panel.
2. Nuts securing the door handle to the door panel.
3. Outside handle linkage rod to the door handle.
4. Armrest bracket.
5. Door trim panel.
6. Armrest.

DOOR LOCK ROD REPLACEMENT

Rods are used to connect the door actuating levers with the inside and outside handles, and the inside lock knob.

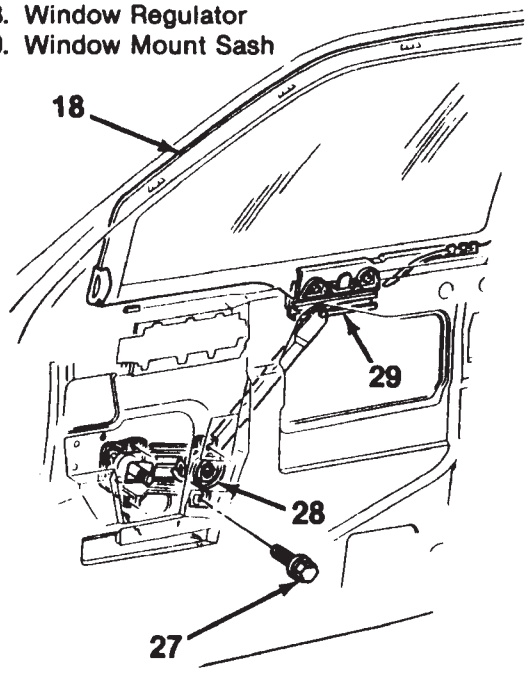


A. Clip
B. Rod
C. Lever
D. Tang Of The Clip In The Lever Hole
E. Clip Disengaged
F. Clip Engaged

B9729

Figure 26—Door Clips

18. Glass
27. Bolt
28. Window Regulator
29. Window Mount Sash



B8355

Figure 27—Front Door Window Regulator

Front Door

Remove or Disconnect (Figure 26)

1. Door trim panel.
2. Water deflector.
3. Spring clip.
   - Insert an awl into the indention on the lever.
   - Slide the clip forward far enough to disengage the rod from the lever.
4. Rod from the lever.

Install or Connect (Figures 25 and 26)

1. Rod through the spring clip.
2. Rod and spring clip to the lever.
   - Slide the clip over the rod, and engage the tang into the indention on the lever.
3. Water deflector.
4. Door trim panel.

Rear Door

Remove or Disconnect (Figure 26)

1. Armrest.
2. Door trim panel.
3. Armrest bracket.
4. Sound deadener.
5. Linkage rod from the handle.
   - Insert an awl into the indention on the lever.
   - Slide the clip forward far enough to disengage the rod from the lever.
6. Linkage rod from the lock.
7. Linkage rod.

Install or Connect (Figure 26)

1. Linkage rod to the lock.
   - Slide the clip over the rod, and engage the tang into the indention on the lever.
2. Linkage rod to the handle.
3. Armrest bracket.
4. Door trim panel.
5. Armrest.

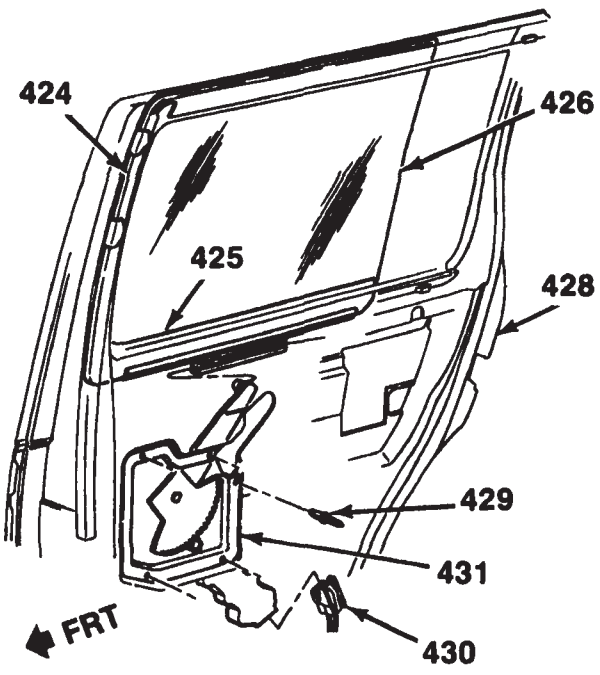
WINDOW REGULATOR REPLACEMENT

Remove or Disconnect (Figures 27 and 28)

1. Door trim panel.
2. Armrest bracket.
3. Water deflector.
   - Raise the window to the full-up position, secure the glass to the door frame using cloth backed tape.
4. Bolts securing the regulator to the door inner panel.
   - The rear door regulator is riveted to the door inner panel. All rivets must be drilled out before the regulator can be removed.
5. Regulator lift arm roller from the window mount sash.
6. Regulator from the door.

Install or Connect (Figures 27 and 28)

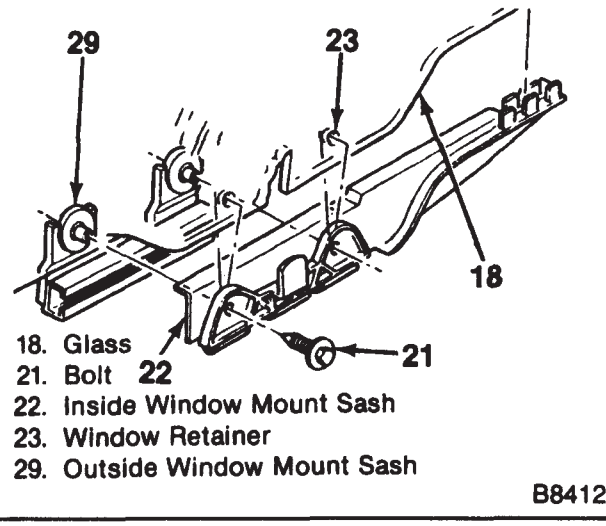
1. Regulator to the door.
2. Regulator lift arm roller to the window mount sash.
3. Bolts securing the regulator to the door inner panel.
   - The rear door regulator must be installed with rivets.
4. Water deflector.
5. Armrest bracket.
6. Door trim panel.



424. Door Channel
425. Run Assembly
426. Door Glass
428. Door Assembly
429. Rivet
430. Wiring Harness Connector
431. Regulator Assembly

F9105

Figure 28—Rear Door Window Regulator



18. Glass
21. Bolt
22. Inside Window Mount Sash
23. Window Retainer
29. Outside Window Mount Sash

B8412

Figure 29—Window Mount Sash Components

POWER WINDOW MOTOR REPLACEMENT

Remove or Disconnect

- Raise the window to the full up position, secure the glass to the door frame using cloth backed tape.

1. Door trim panel.
2. Armrest bracket.
3. Water deflector.
4. Battery ground cable.
5. Wire harness from motor.
6. Regulator lift arm roller from the window mount sash.

CAUTION: Sector gear must be locked into position. Regulator lift arm is under tension from the counterbalance spring and could cause personal injury if the sector gear is not lock in position.

7. Motor from window regulator.
   - Drill hole through the regulator sector gear and backplate, install bolt and nut to lock sector gear in position.
   - Drill out the motor mounting rivets.

Install or Connect

Tool Required:
J 9022-A Rivet Installer

1. Motor to the regulator.
2. Rivets to the motor and regulator.
   - Use tool J 9022-A.
   - Install 4.8 mm (3/16-inch) rivets.
     — Remove nut and bolt used to lock the sector gear in position.
3. Regulator lift arm roller to the window mount sash.
4. Wire harness to the motor.
5. Water deflector.
6. Armrest bracket.
7. Door trim panel.
8. Battery ground cable.

WINDOW SASH CHANNEL REPLACEMENT

Remove or Disconnect (Figure 29)

1. Door trim panel.
2. Door armrest bracket.
3. Water deflector.
4. Bolts securing the sash channel to the glass.
   - Lower the window until the sash channel and glass can be plainly seen through the door panel opening.
   - Apply tape to secure the glass to the door frame.
5. Sash assembly.

Install or Connect (Figure 29)

1. Sash assembly.
   - Lubricate the bracket with Lubriplate or equivalent.

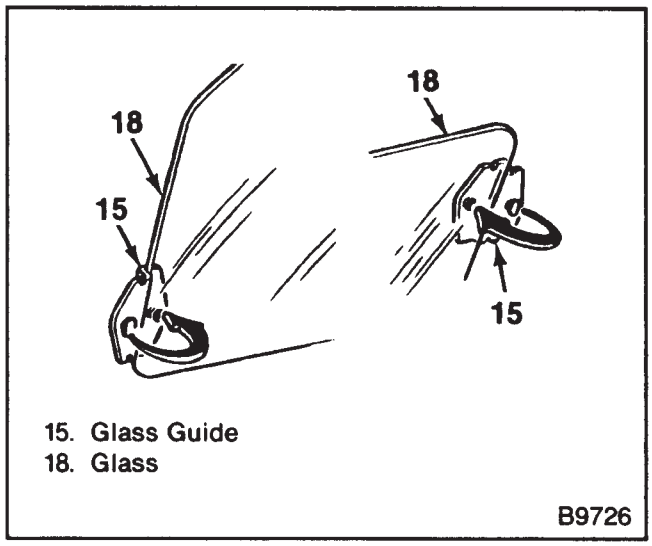


Figure 30—Glass Guide

2. Bolts securing the sash assembly to glass.
3. Water deflector.
4. Door armrest bracket.
5. Door trim panel.

WINDOW REPLACEMENT

Front Door Window

CAUTION: To prevent personal injury, gloves should be worn when removing broken glass.

Remove or Disconnect

1. Door trim panel.
2. Armrest bracket.
3. Water deflector.
4. Bolts securing the sash assembly to the window.
   - Lower the window until the sash channel and the window can be plainly seen in the door panel opening.
5. Sash assembly from the door.
6. Window from the door.

Install or Connect

1. Window into the door.
   - Lower the window into the door and rotate the window into the glass run-channel.
2. Sash assembly to the window.
3. Bolts securing the sash assembly to the window.
4. Water deflector.
5. Armrest bracket.
6. Door trim panel.

Rear Door Window

CAUTION: To prevent personal injury, gloves should be worn when removing broken glass.

Remove or Disconnect (Figures 32 through 35)

1. Armrest.
2. Door trim panel.
3. Armrest bracket.
4. Sound deadener.
5. Stationary glass garnish (inside) molding.
6. Stationary glass reveal (outside) molding.
7. Stationary glass.
8. Inside door handle housing.
9. Lock linkage rods and swing housing away.
10. Outside door handle linkage rod.
11. Outside door handle assembly.
12. Rear run channel screws at door header.
13. Rear run channel speed nuts at inner door and move away.
14. Bolts securing window to the sash.
    - Lower the window until the sash channel and the window can be plainly seen in the door panel opening.
15. Sash assembly from the door.
16. Window from the door.

Important

- Transfer the run channel guide pins to the new window.

Install or Connect (Figures 32 through 35)

1. Window into the door.
   - Lower the window into the door and rotate the window into the glass run-channel.
2. Sash assembly to the window.
3. Bolts securing the sash assembly to the window.
4. Rear run channel speed nuts to inner door.
5. Rear run channel screws to door header.
6. Outside door handle assembly to door.
7. Linkage rod to outside door handle assembly.
8. Lock linkage rods to inside door handle housing.
9. Inside door handle housing.
10. Stationary glass.
11. Stationary glass reveal (outside) molding.
12. Stationary glass garnish (inside) molding.
    - Lubricate and adjust as necessary.
13. Armrest bracket.
14. Door trim panel.
15. Armrest.

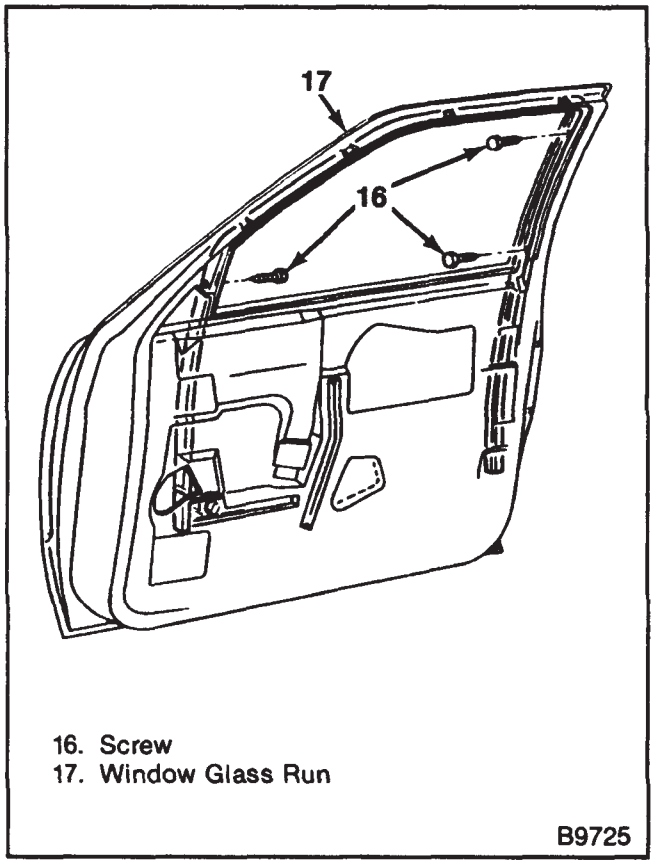
WINDOW GUIDE CLIP REPLACEMENT

The plastic guide clips attach to the rear upper edge and front lower edge of the front door glass through a hole in the glass. The purpose of the guide clips is to keep the glass parallel to the door frame when the glass is cycled. The clips slide in a retainer in the frame run-channel.

Remove or Disconnect (Figure 30)

Tool Required:
J 24595-A Trim Pad Remover

1. Window glass.
2. Guide clips.
   - Wrap tape around the blade of tool J 24595 or equivalent.
   - Insert the tool between the guide clip and the glass, and carefully pry the clip apart.



16. Screw
17. Window Glass Run

Figure 31—Front Door Window Glass Run

Install or Connect

1. Guide clips.
   - Heat the clips with a hot air gun, or soak them in hot water for about one minute.
   - Align the clip with the hole in the glass and carefully press the clip together at the fastener location.
2. Window glass.

GLASS RUN CHANNEL REPLACEMENT

Remove or Disconnect (Figure 31)

1. Door trim panel.
2. Door armrest bracket.
3. Door water deflector.
4. Bolts securing the sash to the windows.
   - Lower the window until the sash channel and the window can be plainly seen in the door panel opening.
5. Window.
6. Screws securing the glass run channel to the door frame.
7. Door garnish molding (if used).
8. Glass run channel.
   - Carefully pry the run channel from the frame.
   - Pull the run channel upward to disengage the run channel from the extension.

Install or Connect (Figure 31)

1. Glass run channel.
   - Push the glass run channel into the channel frame.
2. Screws securing the glass run channel to the upper door frame.
3. Window.
4. Bolts securing the sash to the window.
5. Door water deflector.
6. Door armrest bracket.
7. Door trim panel.

PRESSURE RELIEF VALVE REPLACEMENT

Remove or Disconnect (Figure 36)

- Open the door.

1. Valve screws (6).
2. Valve (5).

Install or Connect (Figure 36)

1. Valve to the door.
2. Valve screws.

PRESSURE RELIEF FLAP REPLACEMENT

Remove or Disconnect (Figure 37)

1. Door trim panel. Refer to "Door Trim Panel Replacement."
2. Pressure relief flap screws.
3. Pressure relief flap.

Install or Connect (Figure 37)

1. Pressure relief flap.
2. Pressure relief flap screws.
3. Door trim panel. Refer to "Door Trim Panel Replacement."

DOOR OUTER BELT SEALING STRIP REPLACEMENT

The door window belt sealing strip is used to seal between the inner and outer door panels, and the window at the beltline. Removal of the inner sealing strip is not recommended, since the strip is stapled to the door trim pad.

Remove or Disconnect (Figure 38)

1. Mirror cover plate (if used).
2. Door outer belt sealing strip (2).
   - Lower the window.
   - Apply a protective cover such as cloth backed tape over the painted surfaces next to the sealing strip.
   - Pry the sealing strip from the door flange.

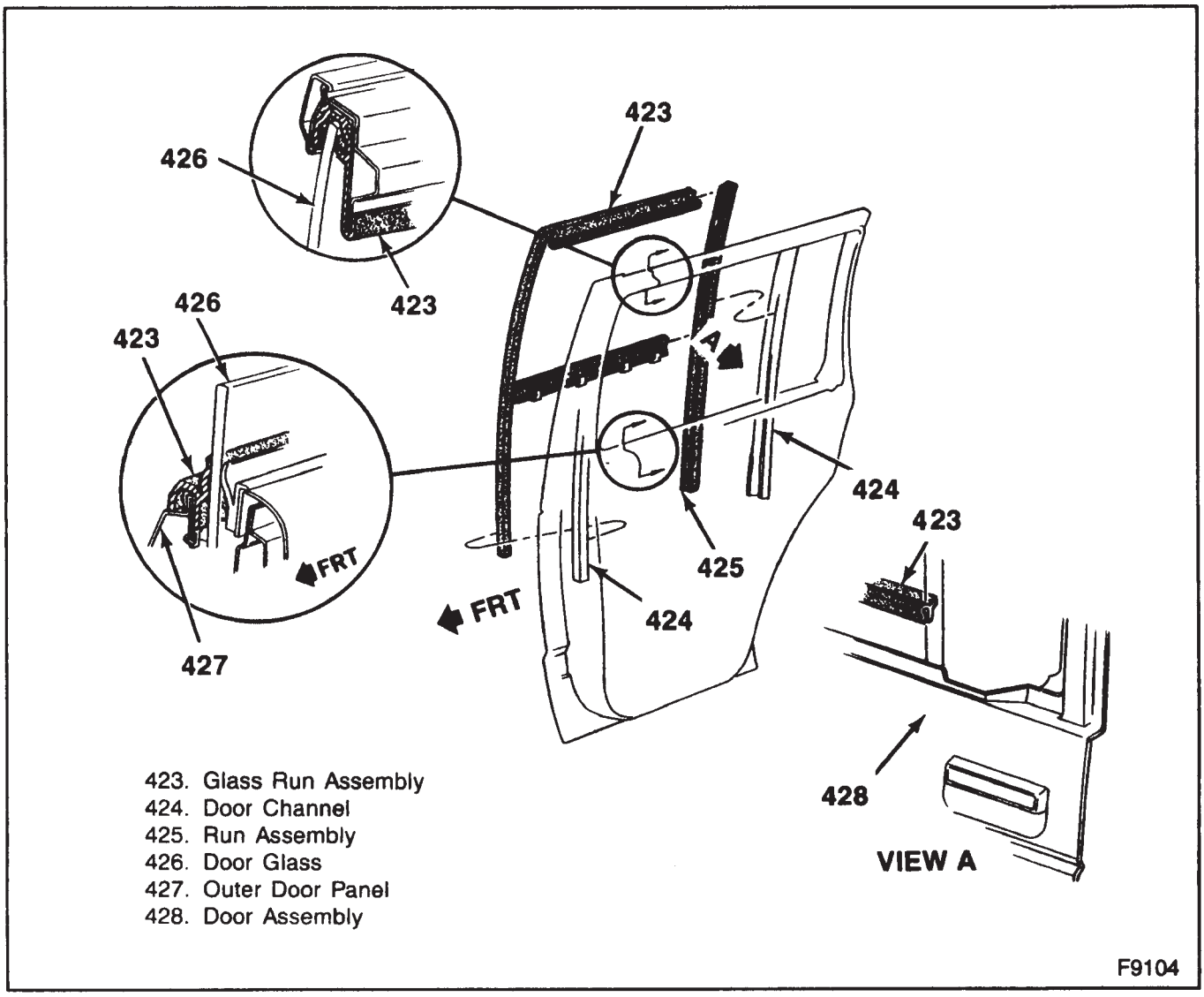


Figure 32—Rear Door Window Glass Run

Install or Connect (Figure 38)

1. Door outer belt sealing strip (2).
   - Push the sealing strip over the flange.
   - Check that the clips are secure.
2. Mirror cover plate (if used).

DOOR OUTSIDE MIRROR REPLACEMENT

Remove or Disconnect (Figure 40)

1. Screws securing the mirror to the door (84).
2. Mirror from the door (80).

Install or Connect (Figure 40)

1. Mirror to the door.
2. Screws securing the mirror to the door.

DOOR MIRROR FACE REPLACEMENT

Remove or Disconnect

1. Mirror from the door.
   - Tape over the mirror face.
   - Cover the mirror face with a cloth.
   - Break the glass.
2. Broken glass and fiber pad from the mirror face.

Clean

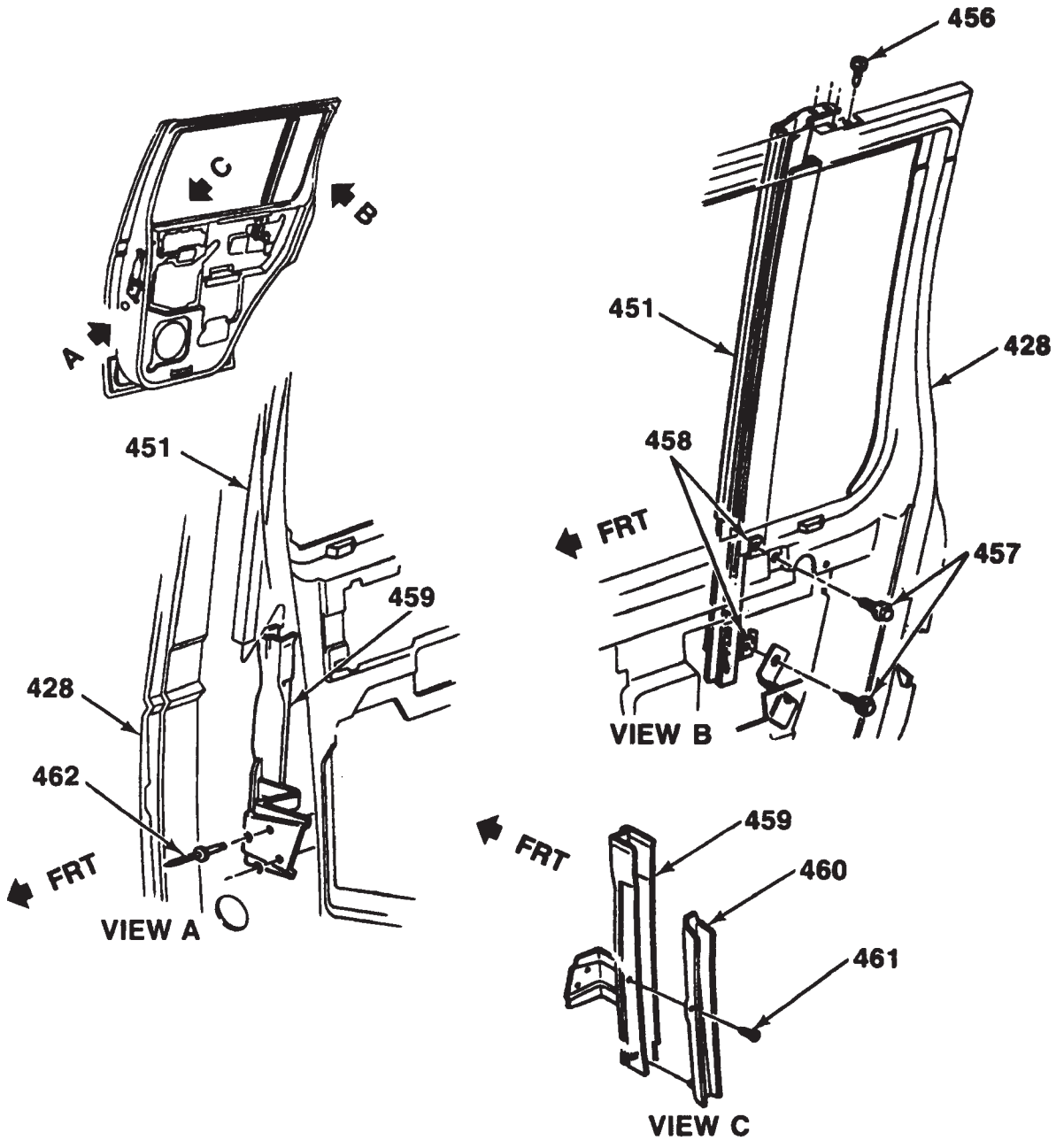
- Inside of the mirror frame.

Remove or Disconnect

- Paper from the backside of the replacement mirror face.

Install or Connect

- Replacement mirror face.



428. Door Assembly
451. Channel Assembly
456. Screw
457. Screw
458. Nut
459. Extension Assembly
460. Guide
461. Screw
462. Rivet

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Figure 33—Rear Door Channel and Extension Assembly

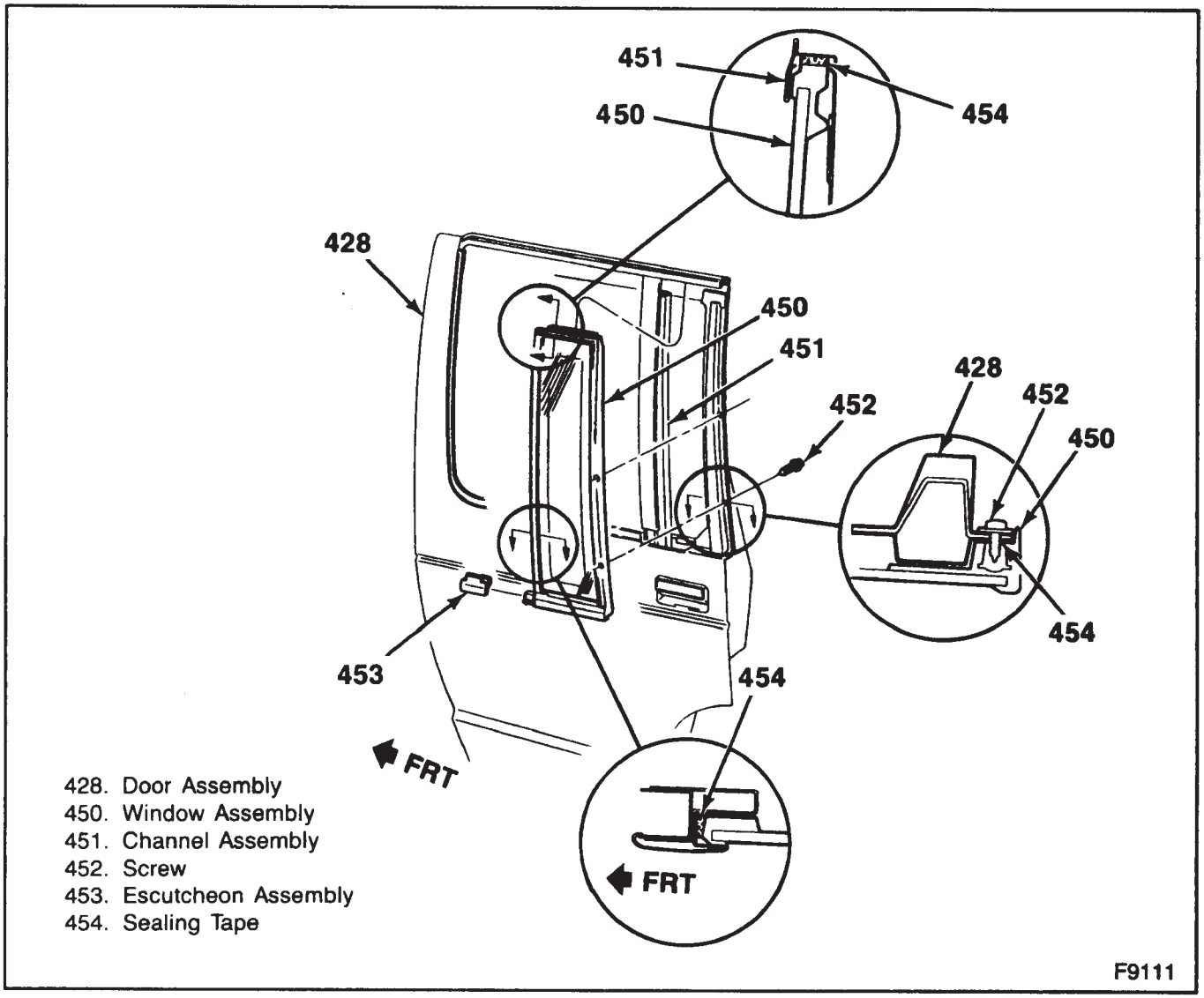

Figure 34—Rear Door Stationary Window Assembly

DOOR OPENING WEATHERSTRIP REPLACEMENT

The door opening weatherstrips are installed at the pinchweld flanges that form at the door openings. The weatherstrip is attached by friction and an adhesive over the pinchweld.

Remove or Disconnect (Figures 41 and 42)

- Door weatherstrip from the door.
  - Pull the strip from the door pinchweld flange.

Install or Connect (Figures 41 and 42)

- Door weatherstrip to the door pinchweld flange.
  - Position the preformed corner of the weatherstrip in the upper rear corner of the door opening.
  - Push the weatherstrip onto the flange, starting at the preformed corner, and working around the entire edge of the door opening.

ROOF DRIP MOLDING REPLACEMENT

Remove or Disconnect

- Roof drip molding.
  - Pull the molding from the roof pinchweld.

Install or Connect

- Roof drip molding.
  - Push the molding over the pinchweld.

DOOR GARNISH MOLDING REPLACEMENT

Remove or Disconnect

1. Screws that retain the molding to the door.
2. Molding from the door.

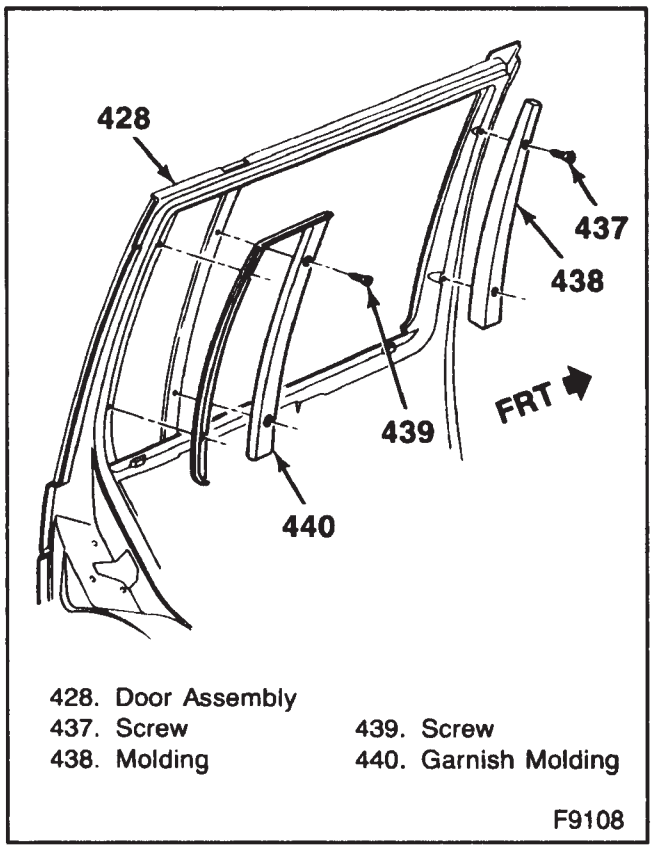

Figure 35—Rear Door Garnish Moldings

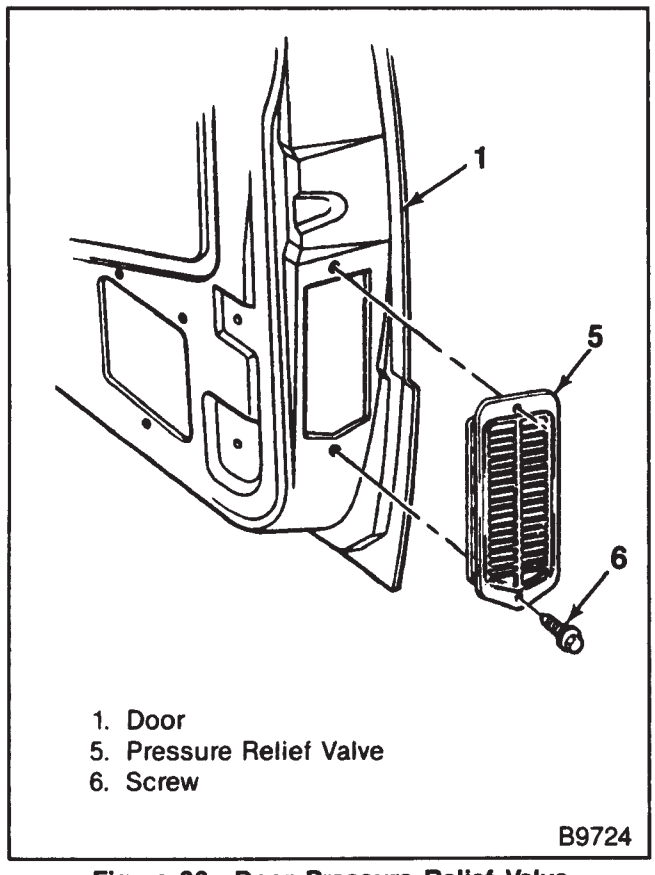

Figure 36—Door Pressure Relief Valve

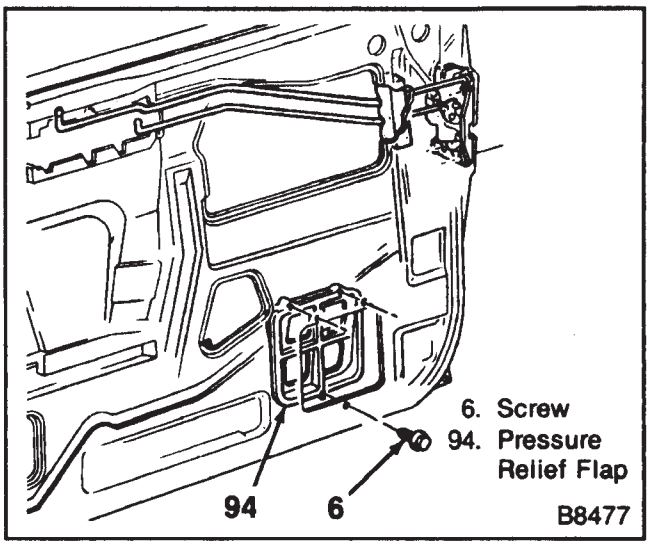

Figure 37—Door Pressure Relief Flap

Install or Connect

1. Molding to the door.
2. Screws that retain the molding to the door.

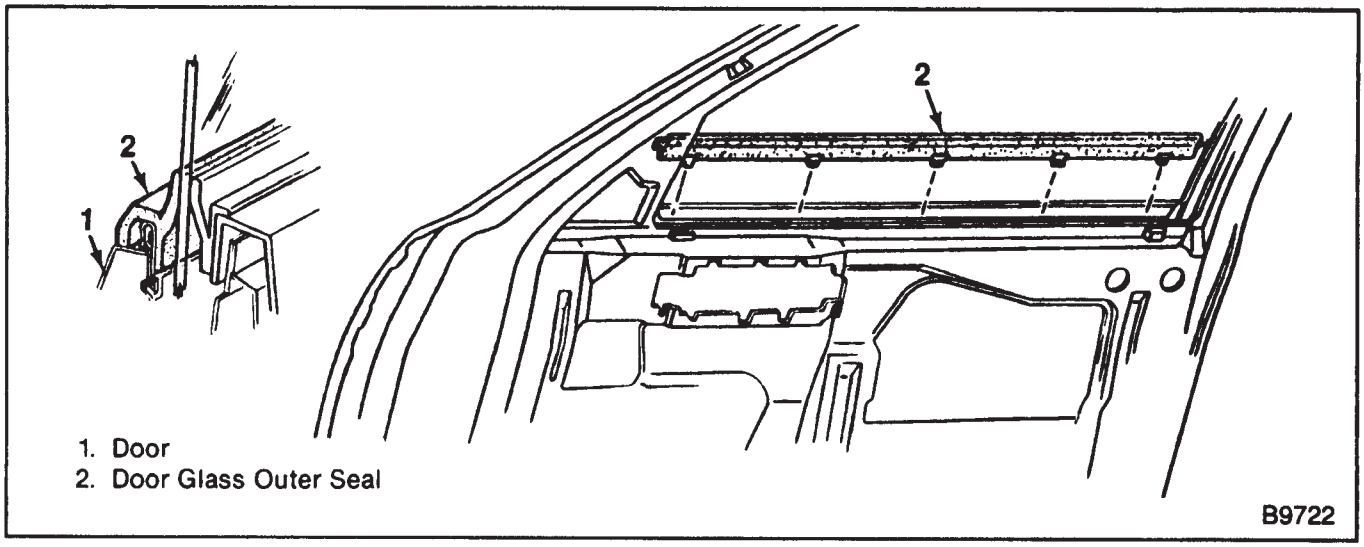

Figure 38—Front Door Glass Outer Seal

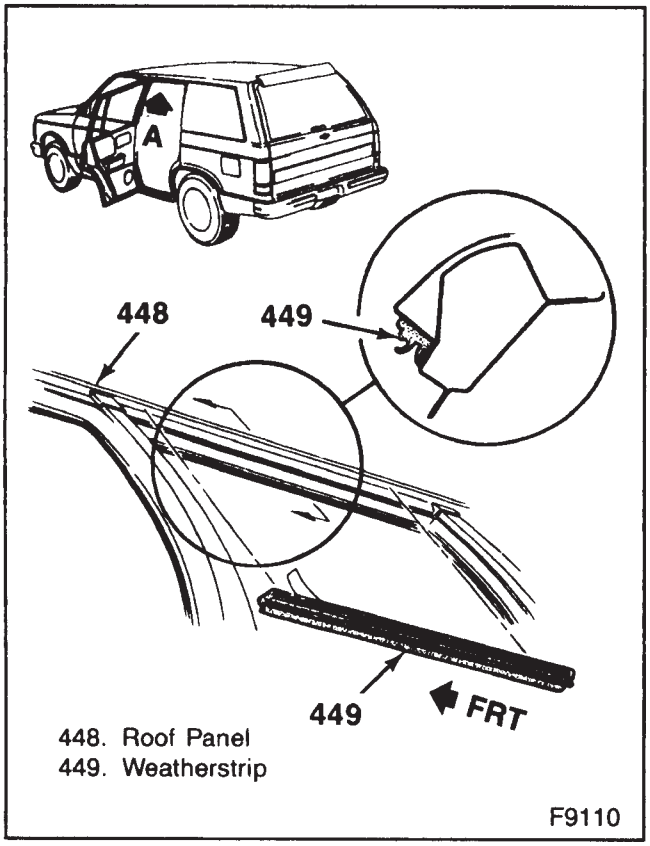

Figure 39—Rear Door Auxiliary Weatherstrip

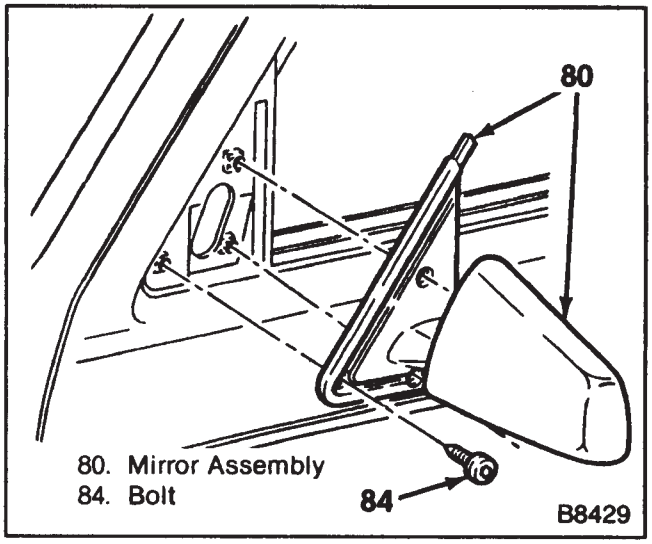

Figure 40—Door Mirror Components

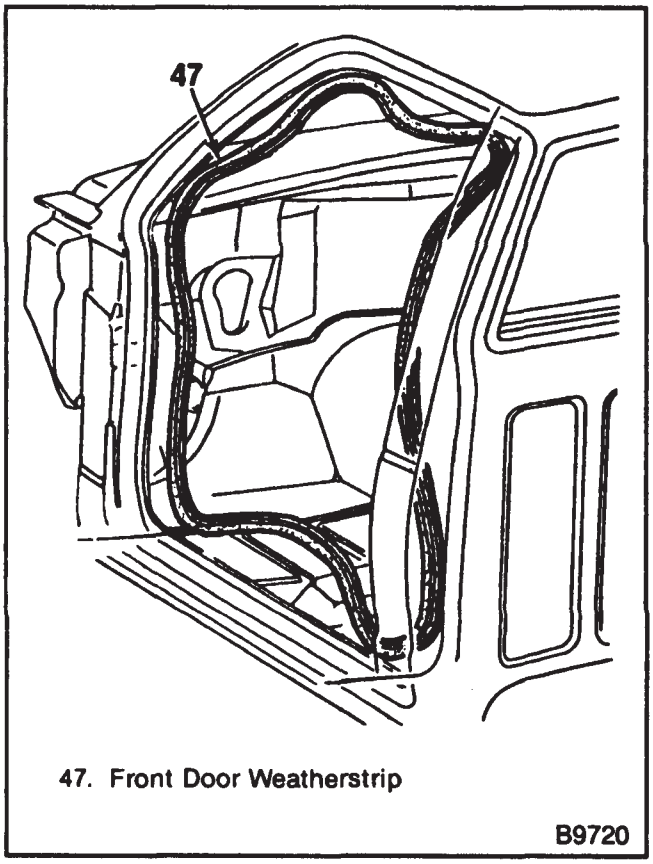

Figure 41—Front Door Weatherstrip

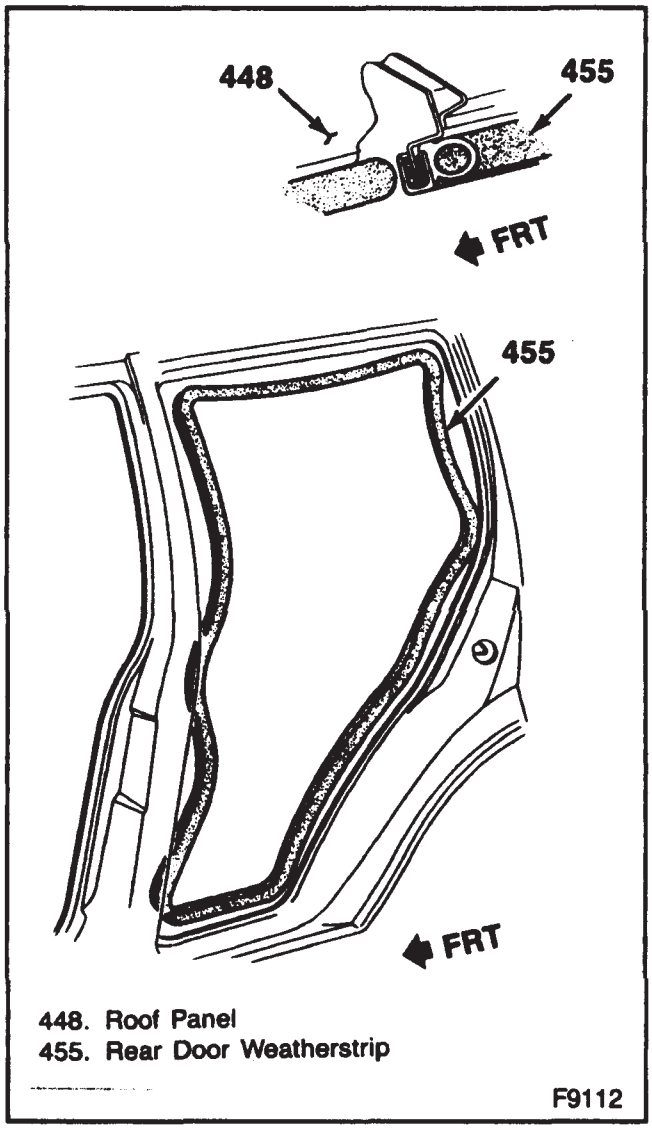

Figure 42—Rear Door Weatherstrip

SPECIAL TOOLS

1.  J 9886-01

2.  J 23457-A

3.  J 28625-A

4.  J 20922-A

5.  J 24595-B

1. Door Handle Clip Remover
2. Door Striker Bolt Wrench
3. Door Hinge Spring Compressor
4. Rivet Installer
5. Trim Pad Remover

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SECTION 10A2

SEATS

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

SEATS

DIAGNOSIS OF MANUAL SEAT ADJUSTER

PROBLEM	POSSIBLE CAUSE	CORRECTION
Adjuster Will Not Lock	1. Locking wire too tight.	1. Loosen locking wire tension enough to provide full engagement of lock bar in locking slots of adjuster lower channel.
	2. Adjuster lock bar spring disconnected or broken.	2. Connect spring or install new spring.
	3. Adjuster lock sticking or binding.	3. Lubricate lock bar pivot. If bar is binding, eliminate cause of binding or replace adjuster.
Adjuster Will Not Unlock	1. Locking wire too loose or disconnected.	1. Tighten locking wire enough to allow lock bar to disengage from locking slots in adjuster lower channel when lock control lever is activited.
	2. Adjuster lock bar sticking or binding.	2. Lubricate lock bar pivot. If bar is binding eliminate cause of binding or replace adjuster.
When Left Adjuster Locks, Right Adjuster Is Between Lock Positions	1. Adjusters new, not seated.	1. Operate seat to full forward and full rearward positions several times to work new tightness out of channels.
	2. Adjuster(s) improperly lubricated.	2. Lubricate adjuster channels with Lubriplate Auto-Lube A or equivalent.
	3. Adjusters binding due to bent or damaged channels.	3. Replace adjuster.
	4. Adjusters not in parallel alignment with each other.	4. Loosen floor pan attaching bolts or nuts, align adjusters parallel on floor pan and retighten bolts or nuts.
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ON-VEHICLE SERVICE

FRONT BUCKET SEAT REPLACEMENT

Remove or Disconnect (Figures 1 and 2)

1. Cover screws and covers from above the seat retaining nuts.
2. Seat retaining nuts.
3. Seat from the vehicle.

Install or Connect (Figures 1 and 2)

NOTICE: For steps 2 and 3 see "Notice" on page 10A2-1.

1. Seat to the vehicle.
2. Seat retaining nuts.

Tighten

- Nuts to 32 N.m (24 ft. lbs.).

3. Covers and cover screws to the seat above the seat retaining nuts.

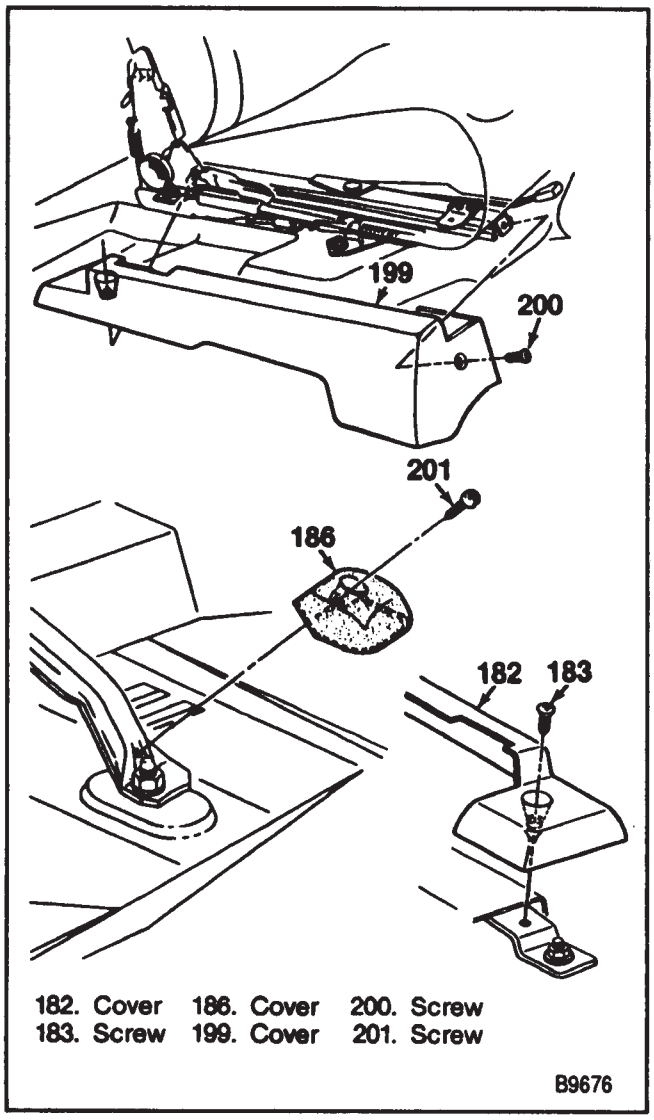


Figure 1—Seat Base Covers

BUCKET SEAT DISASSEMBLY

Remove or Disconnect (Figures 2 and 3)

1. Seat from the vehicle. Refer to "Front Bucket Seat Replacement."
2. Seat adjuster bolts.
3. Seat adjuster.
   - E-Z entry release cable (passenger seat only).
4. Seat back lock upper and lower covers.
5. Seat back lock bolts.
6. Seat back lock.
7. Seat back lock pivot bolt.
8. Seat back.
9. Seat back stop bolt.
10. Seat back stop.

Install or Connect (Figures 2 and 3)

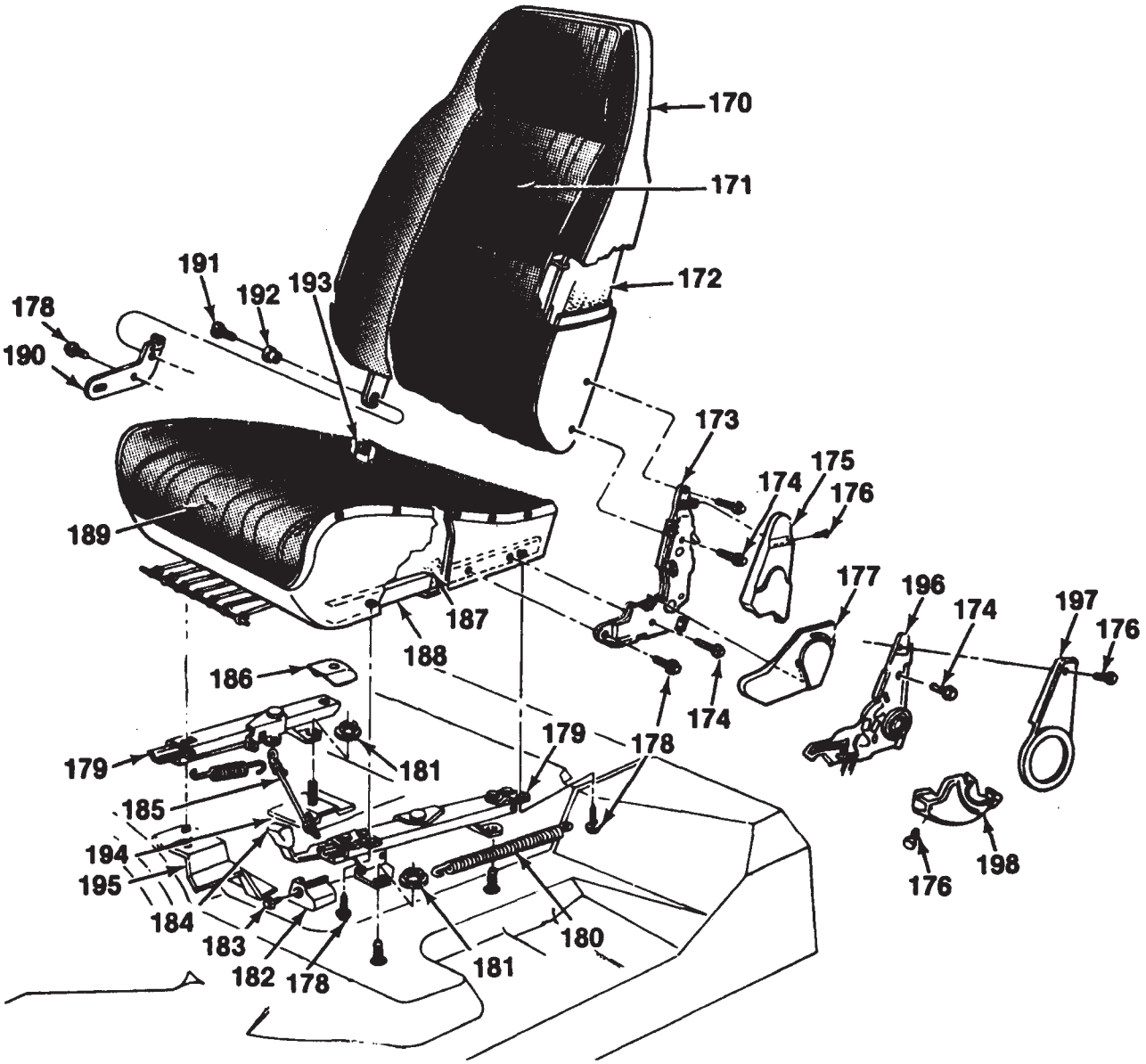
NOTICE: For steps 2, 4, 6, and 9 see "Notice" on page 10A2-1.

1. Seat back stop.
2. Seat back stop bolt.
3. Seat back.
4. Seat back lock pivot bolt.
5. Seat back lock.
6. Seat back lock bolts.
7. Seat back lock upper and lower covers.
8. Seat adjuster.
   - E-Z entry release cable (passenger seat only).
9. Seat adjuster bolts.

Tighten

   - Bolts to 24 N·m (18 ft. lbs.).

10. Seat to the vehicle. Refer to "Front Bucket Seat Replacement."



170. Seat Back Frame
171. Seat Back Trim
172. Seat Back Pad
173. Seat Bacl Lock
174. Screw
175. Seat Back Cover
176. Screw
177. Cover
178. Screw
179. Adjuster
180. Spring
181. Nut
182. Cover
183. Screw
184. Knob
185. Wire
186. Cover
187. Pad
188. Seat Frame
189. Seat Trim
190. Seat Back Stop
191. Bolt
192. Bushing
193. Nut
194. Bracket
195. Plate
196. Control
197. Cover
198. Cover

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Figure 2—Front Bucket Seat Components

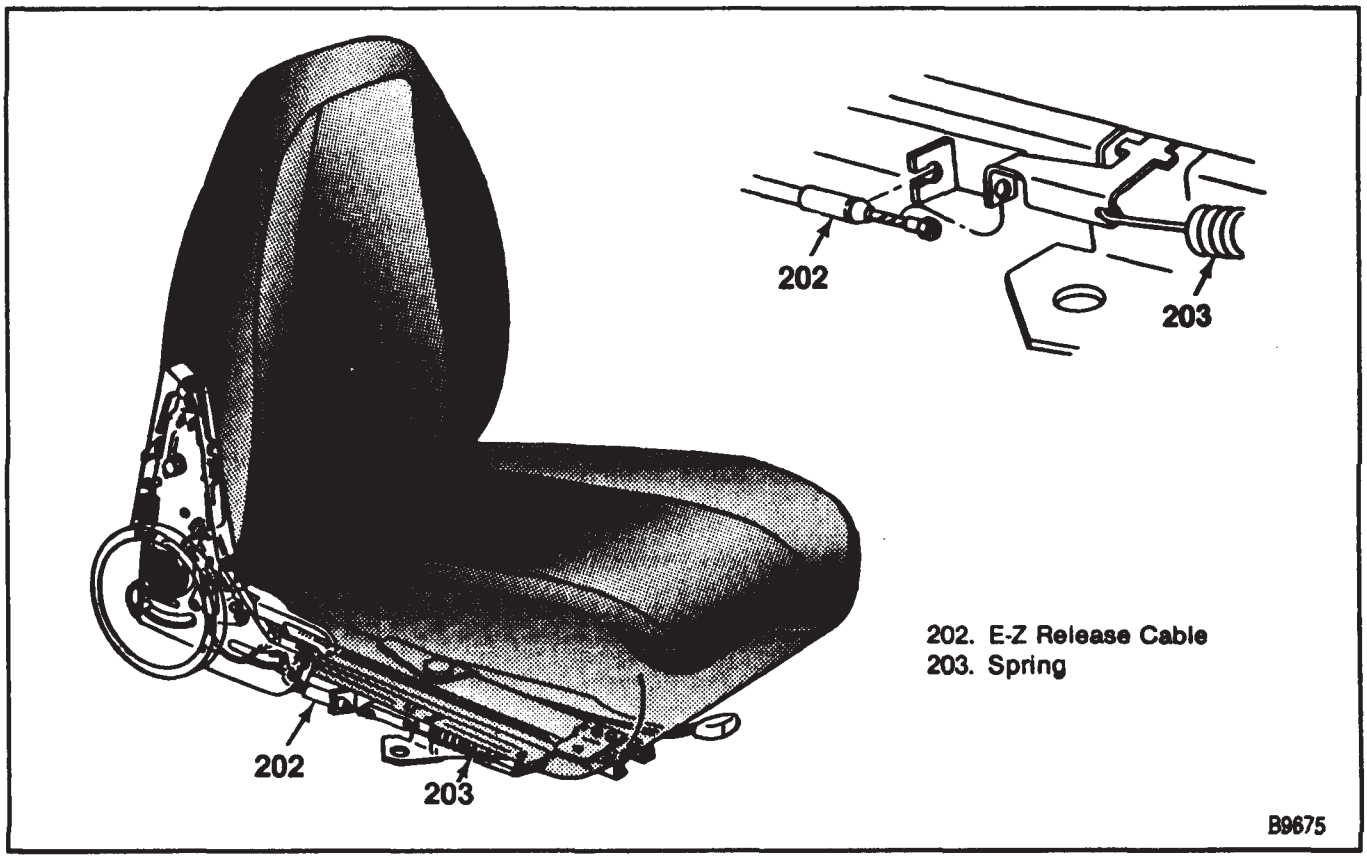


Figure 3—E-Z Entry Release Cable

FRONT BENCH SEAT REPLACEMENT

Remove or Disconnect (Figures 4 and 5)

1. Seat retaining nuts.
2. Seat from the vehicle.

Install or Connect (Figures 4 and 5)

NOTICE: For step 2 see "Notice" on page 10A2-1.

1. Seat to the vehicle.
2. Seat retaining nuts.

Tighten

- Nuts to 32 N·m (24 ft. lbs.).

BENCH SEAT DISASSEMBLY

Remove or Disconnect (Figures 4 and 5)

1. Seat. Refer to "Front Bench Seat Replacement."
2. Seat adjuster bolts.
3. Seat adjuster.
4. Seat back lock cover (figure 6).
5. Seat back lock nuts.
6. Seat back lock.
7. Seat back hinge arm cover.
8. Right and left seat back pivot bolts.
9. Seat back (figure 7).

Install or Connect (Figures 4 and 5)

NOTICE: For steps 2, 5, and 8 see "Notice" on page 10A2-1.

1. Seat back.
2. Right and left seat back pivot bolts.

Tighten

- Bolts to 47 N·m (35 ft. lbs.).

3. Seat back hinge arm cover.
4. Seat back lock.
5. Seat back lock nuts.

Tighten

- Nuts to 10 N·m (89 in. lbs.).

6. Seat back lock cover.
7. Seat adjuster.
8. Seat adjuster bolts.

Tighten

- Bolts to 24 N·m (18 ft. lbs.).

9. Seat. Refer to "Front Bench Seat Replacement."

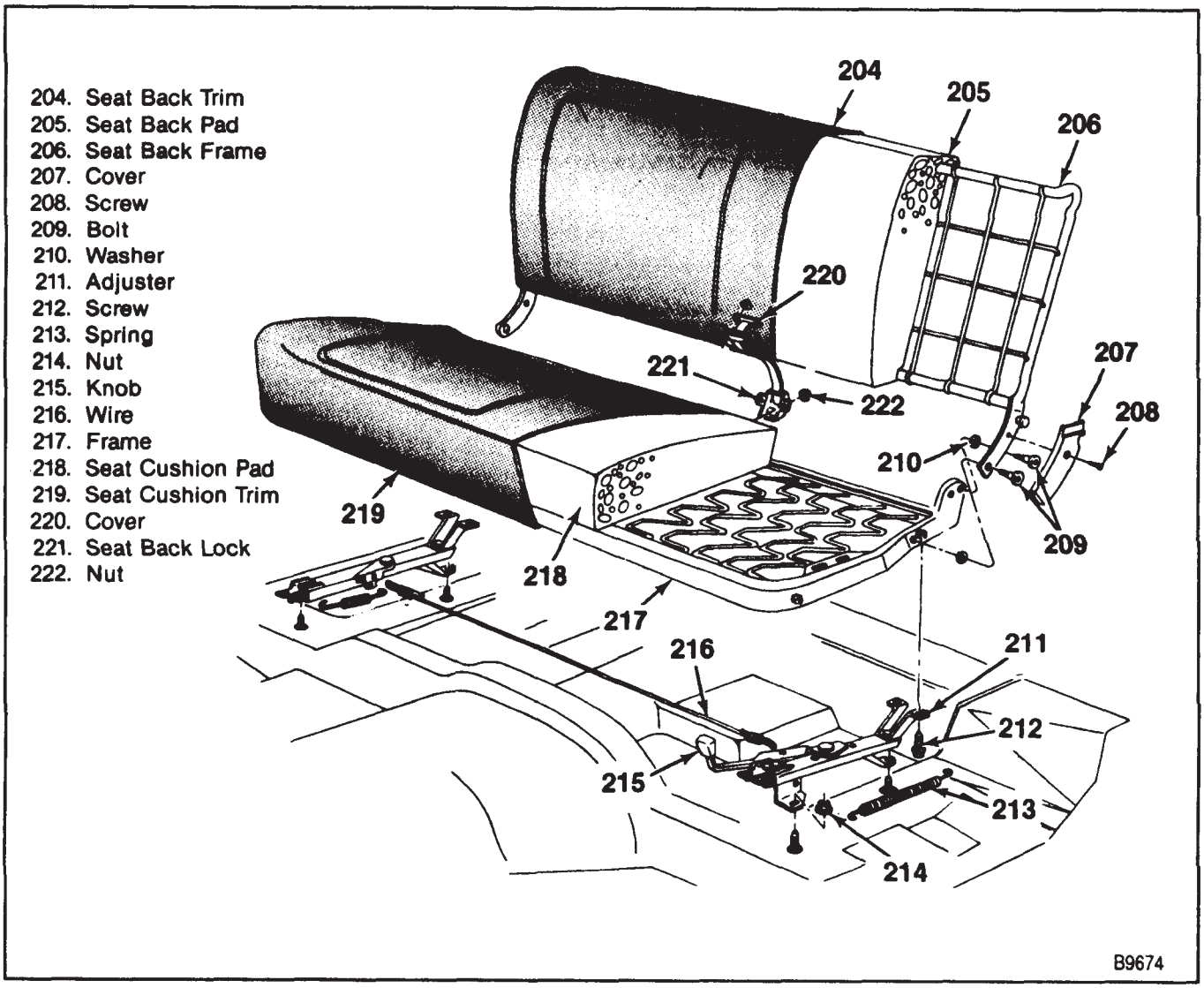


Figure 4—Front Bench Seat Components

REAR SEAT REPLACEMENT

Remove or Disconnect (Figure 8)

1. Front support bracket cover screw.
2. Front support bracket cover (figure 9).
3. Front support bracket bolts (figure 10).
   - Fold the seat forward.
4. Right and left rear support bracket nuts (figure 11).
   - Grasp the seat at the front seat cushion, and lift it to a vertical position.
   - Support the seat.
5. Right and left center support bracket nuts.
6. Seat from the vehicle.

Install or Connect (Figure 8)

NOTICE: For steps 2, 3, and 4 see "Notice" on page 10A2-1.

1. Seat to the vehicle.
   - Place the seat center supports over the studs in the floor panel.
   - Grasp the seat at the front seat cushion, and lift it to a vertical position.
   - Support the seat.
2. Right and left center support bracket nuts (figure 11).

Tighten

   - Nuts to 38 N·m (28 ft. lbs.).
   - Fold the seat back forward.
3. Right and left rear support bracket nuts.

Tighten

   - Nuts to 38 N·m (28 ft. lbs.).
   - Raise the seat to its normal position.
4. Front support bracket bolts.

Tighten

   - Bolts to 47 N·m (35 ft. lbs.).
5. Front support bracket cover.
6. Front support bracket screws.

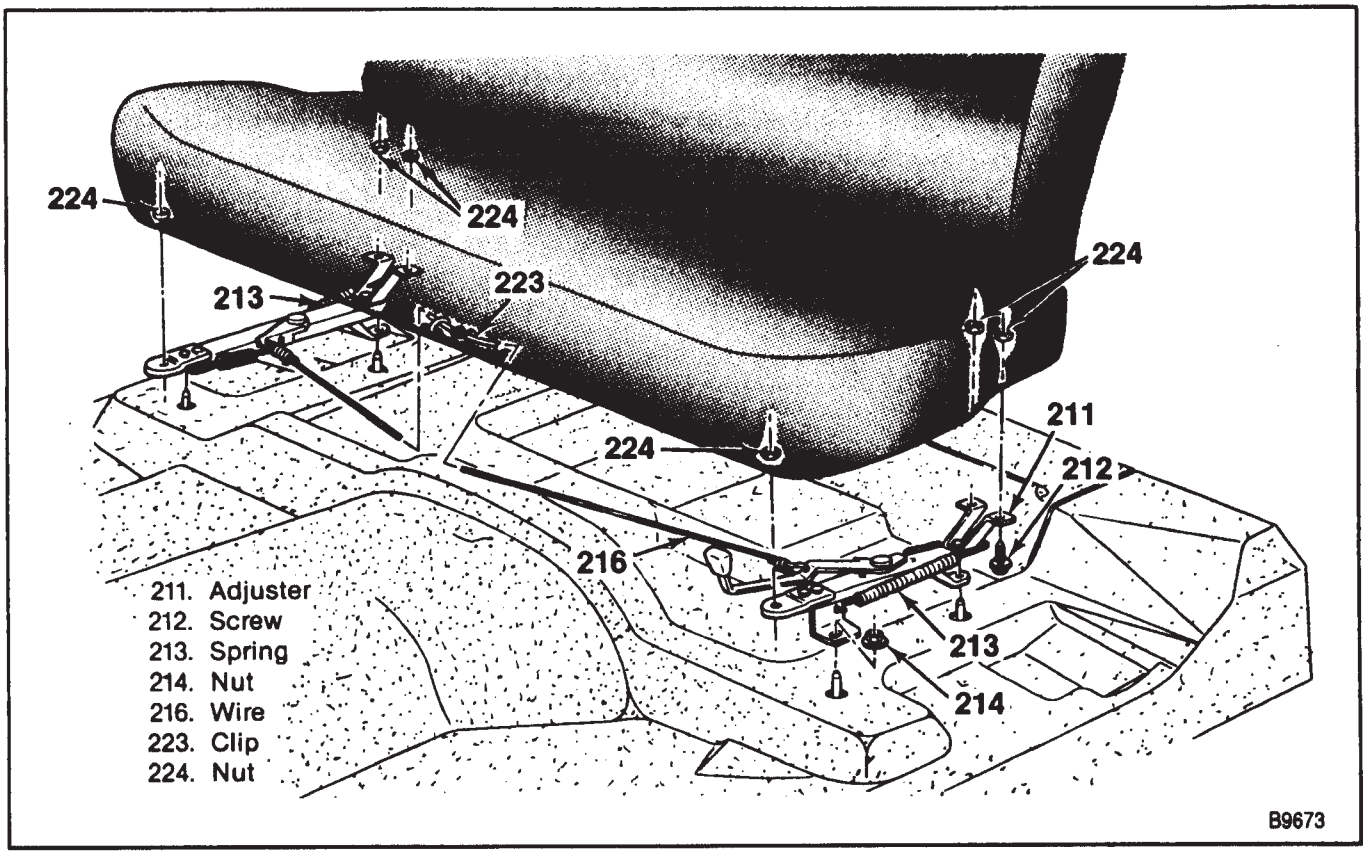


Figure 5—Bench Seat Adjuster Assembly

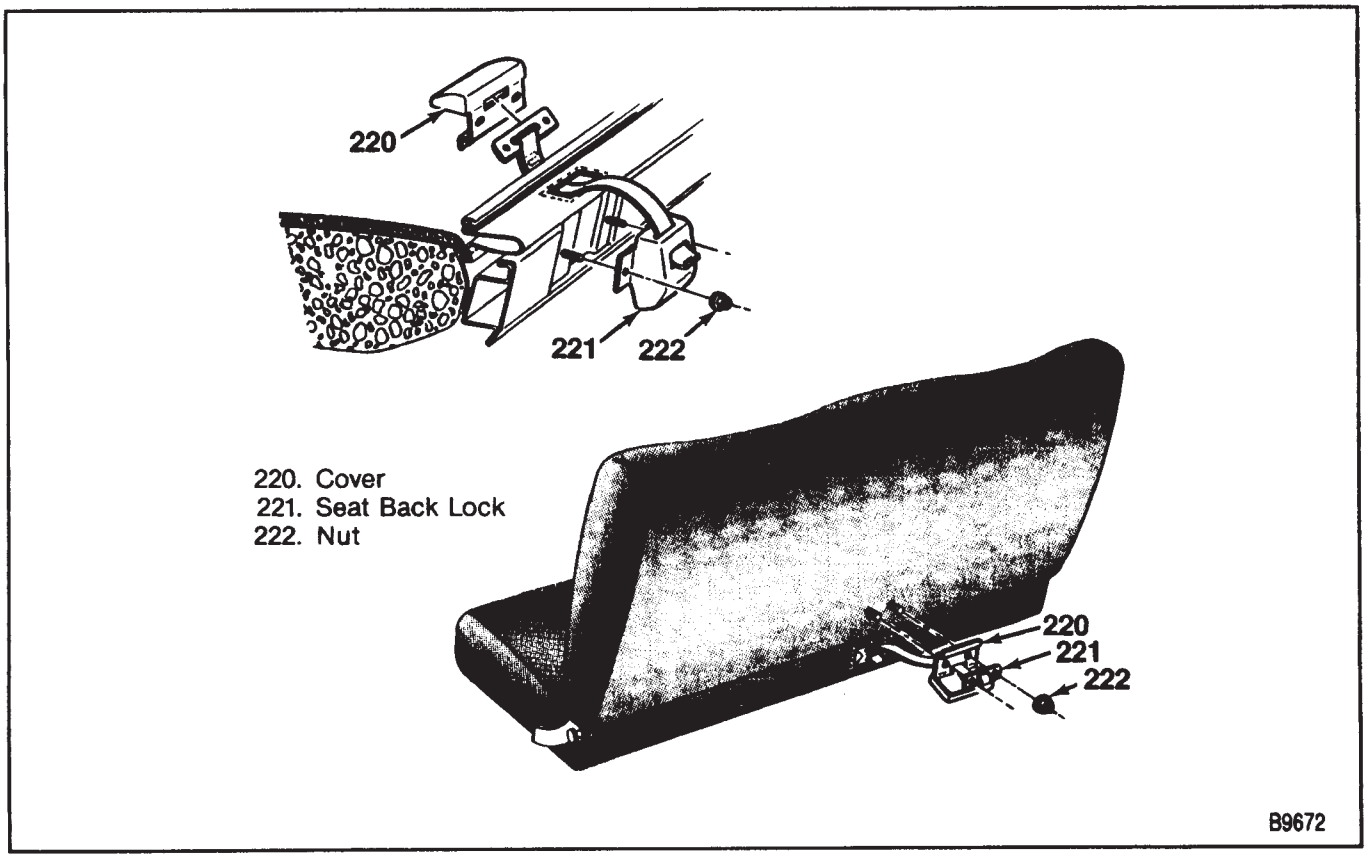


Figure 6—Seat Back Lock

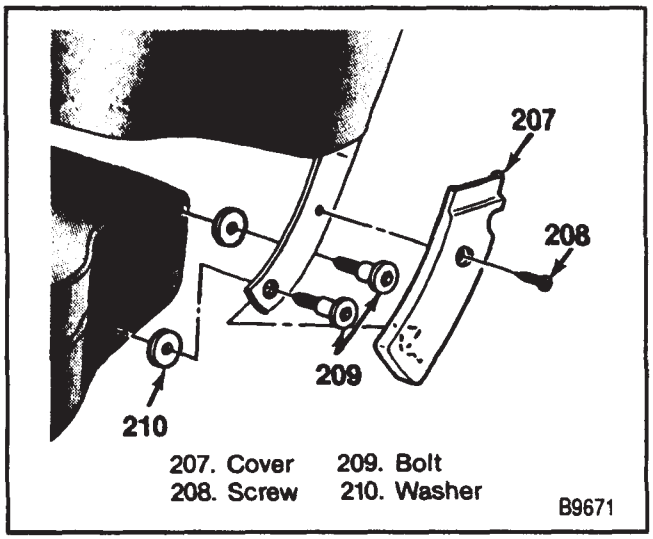


Figure 7—Seat Back Pivot

REAR FOLDING SEAT BACK FILLER PANEL

Remove or Disconnect (Figure 12)

- Move the folding rear seat back forward to the floor position.

1. Three nuts retaining the torque rod to the filler panel.
2. Screws attaching the filler panel to the floor pan.
3. Filler panel from the floor pan.

Install or Connect (Figure 12)

NOTICE: For steps 2 and 3 see "Notice" on page 10A2-1.

1. Filler panel to the floor pan.
2. Screws attaching the filler panel to the floor pan.
   - Attach one screw at each end of the filler panel loosely.
   - Attach the remaining screws.
   - Tighten the end screws.
3. Nuts retaining the torque rod to the filler panel.
   - Move the rear seat back into position.

REAR FOLDING JUMP SEAT REPLACEMENT (EXTENDED CAB MODELS)

Remove or Disconnect (Figures 13, 14, and 15)

1. Bolts securing the seat support to the floor.
2. Seat from the vehicle.

Install or Connect (Figures 13, 14, and 15)

NOTICE: For step 2 see "Notice" on page 10A2-1.

1. Seat to the vehicle.

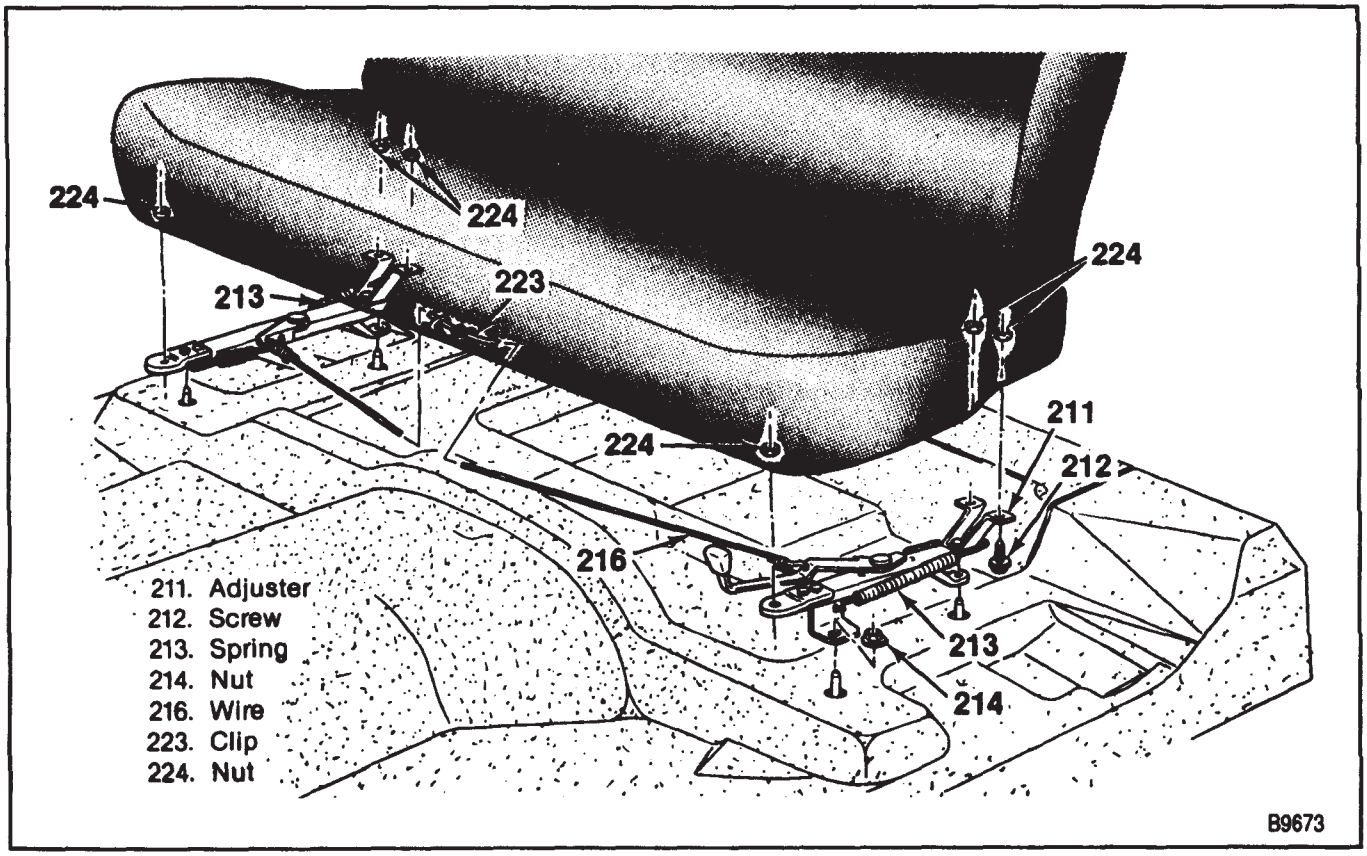
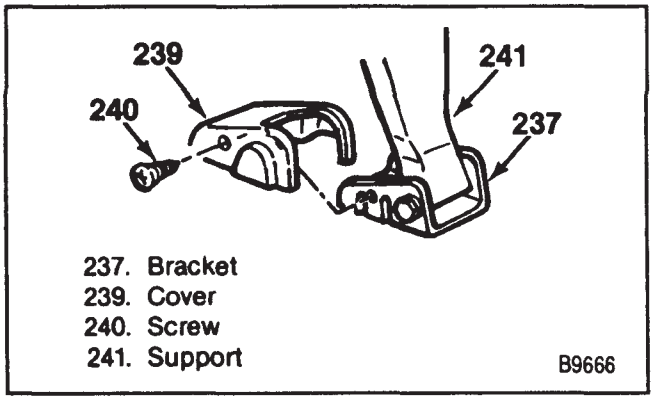


Figure 8—Rear Seat Components



237. Bracket
239. Cover
240. Screw
241. Support

Figure 9—Pivot Bracket Cover

2. *Bolts securing the seat support to the floor.*

Tighten

A. Bolt (263) to 27 N·m (20 ft. lbs.).
B. Bolts (260) to 47 N·m (35 ft. lbs.).

REAR FOLDING JUMP SEAT DISASSEMBLY (EXTENDED CAB MODELS)

Remove or Disconnect

1. Seat from the vehicle. Refer to "Rear Folding Jump Seat Replacement."
2. Nuts retaining the seat back lock assembly to the seat support.
3. Bolts retaining the seat belt and seat cushions to the seat support.
4. Seat belt.
5. Washers.
6. Seat cushions and frames from the support.
7. Tension spring from the seat frame.

Install or Connect

NOTICE: For steps 3 and 4 see "Notice" on page 10A2-1.

1. Tension spring to the seat frame.
2. Seat frame to the seat support.
   - Position the spring between the seat frame and the seat support.
3. Bolts through the seat belt, washers, seat frame, and into the seat support.

Tighten

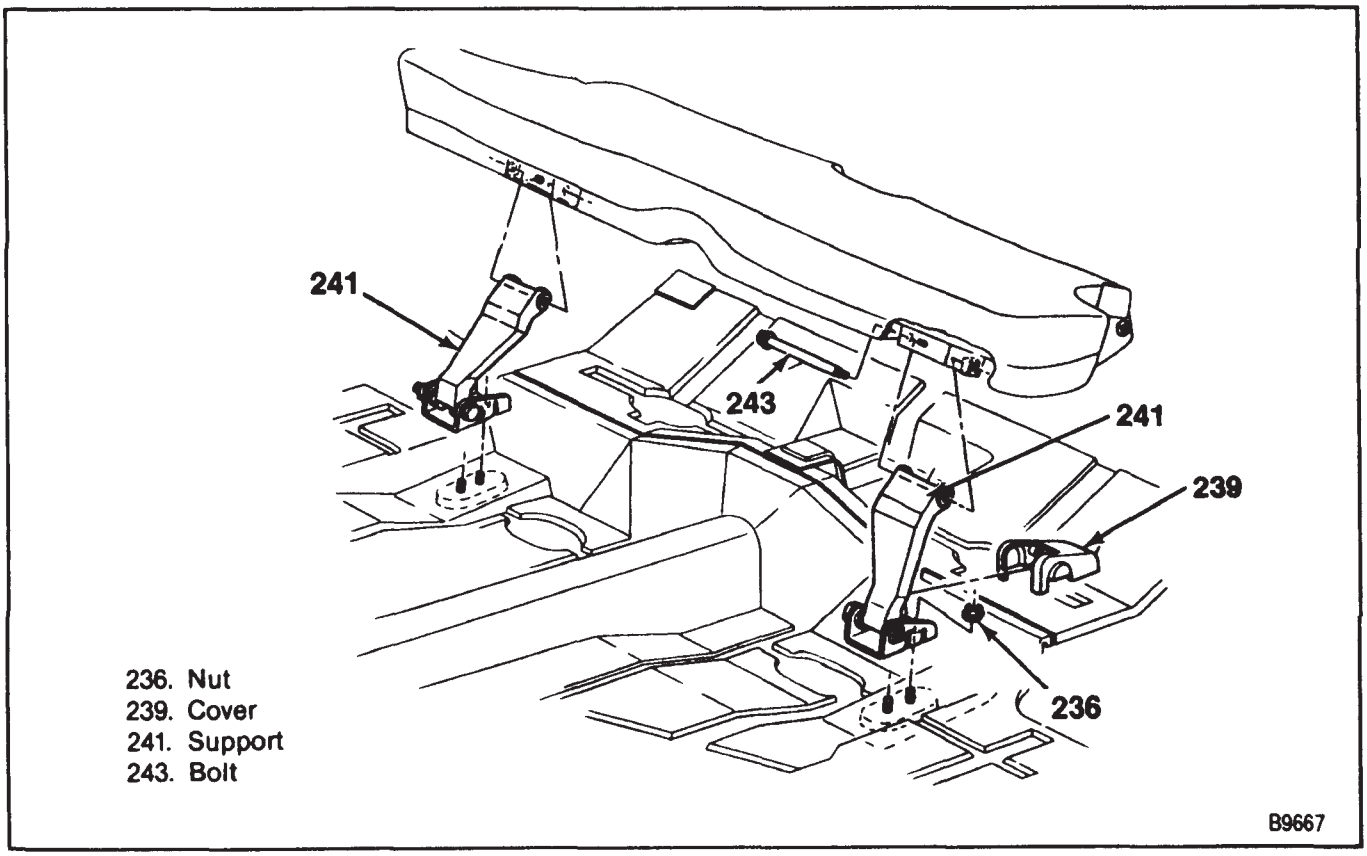
- Bolts to 47 N·m (35 ft. lbs.).

4. Nuts retaining the seat back lock assembly to the seat support.

Tighten

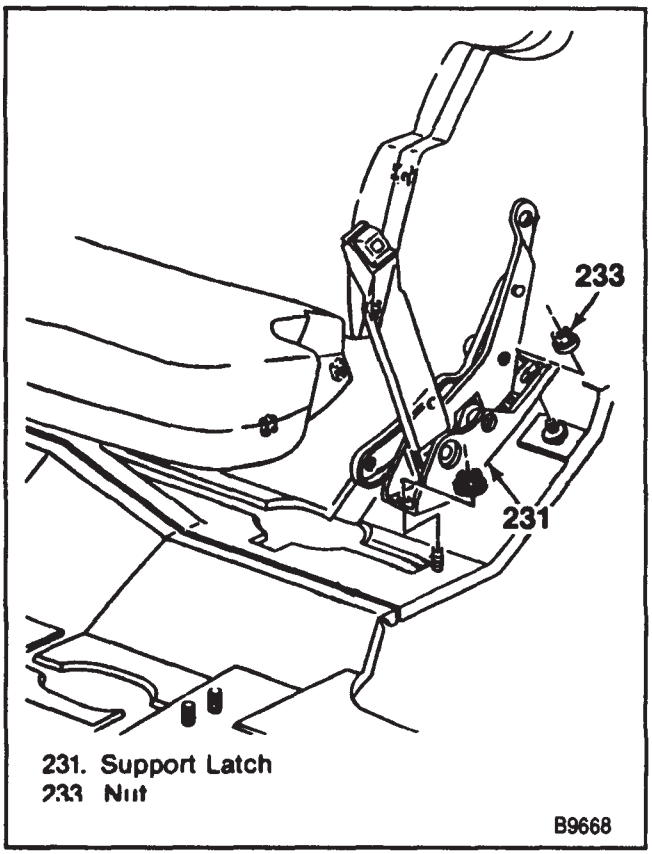
- Nuts to 10 N·m (89 in. lbs.).

5. Seat to the vehicle. Refer to "Rear Folding Jump Seat Replacement."



236. Nut
239. Cover
241. Support
243. Bolt

Figure 10—Pivot Supports



231. Support Latch
233. Nut

Figure 11—Seat Belt Support Bracket

REAR FOLDING JUMP SEAT PIVOT REPLACEMENT

Remove or Disconnect

1. Seat frame from the seat support. Refer to "Rear Folding Jump Seat Disassembly."
2. Bushing from the seat frame.
   - Use a chisel to cut the bushing from the frame.

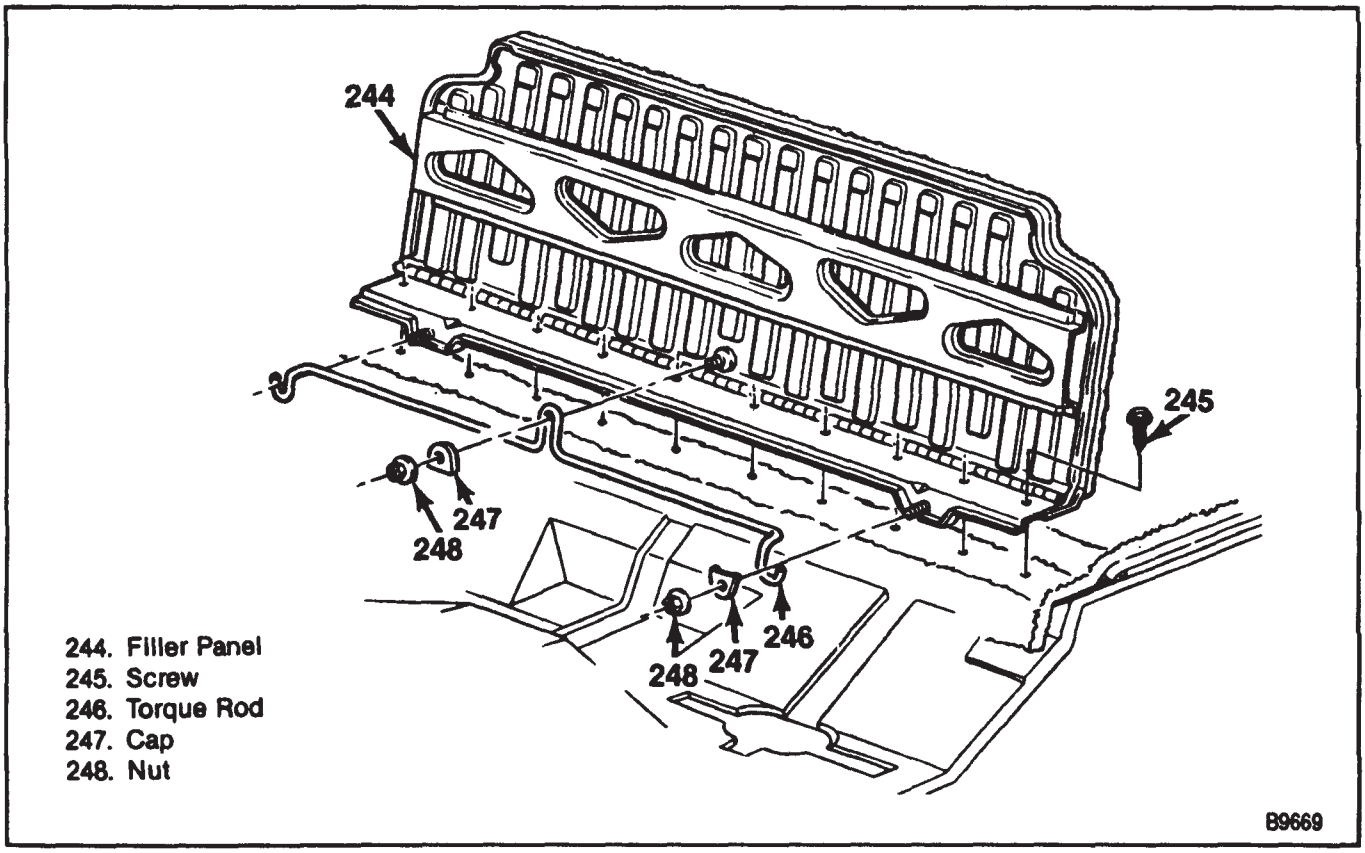
Install or Connect

1. New bushing in the seat frame pivot hole.
   - Heat the inboard side of the bushing and the seat frame with a heat gun.
   - Peen the inboard side of the bushing while supporting the outboard edge of the bushing at the seat frame.
2. Seat frame to the seat support. Refer to "Rear Folding Jump Seat Disassembly."

REAR FOLDING JUMP SEAT TRIM PANEL REPLACEMENT

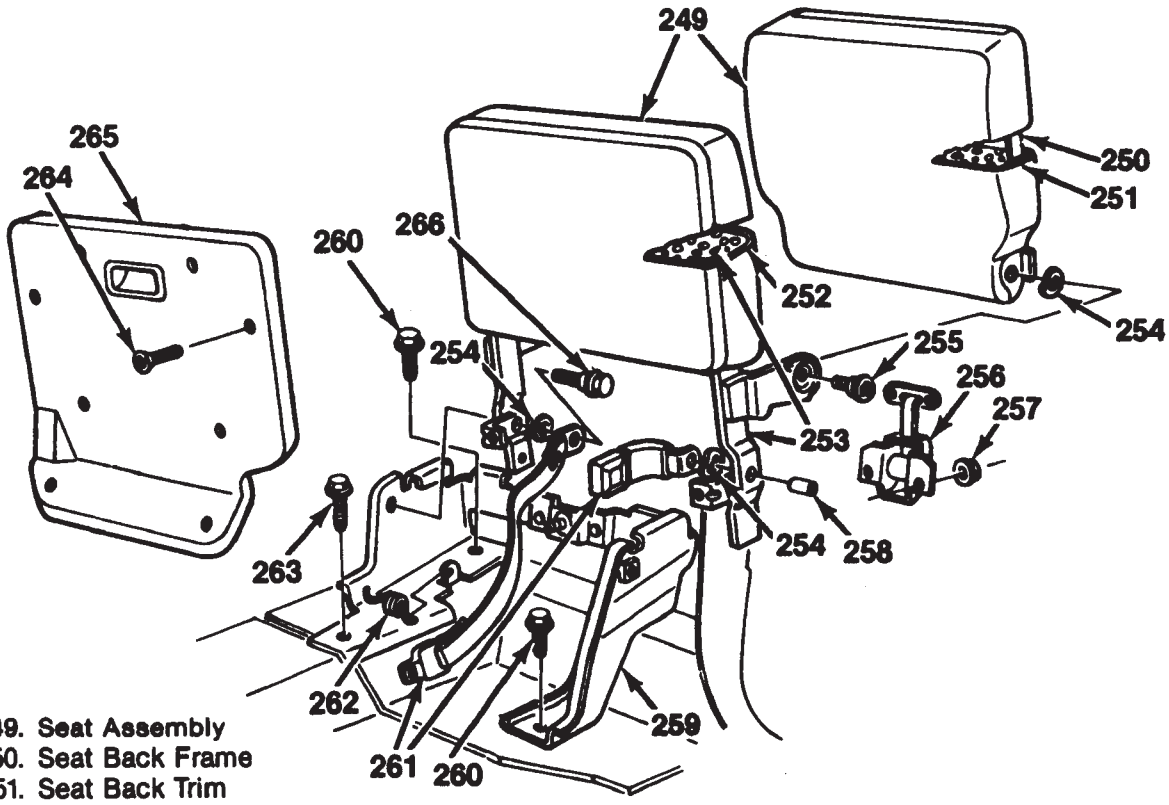
Remove or Disconnect (Figure 16)

1. Screws retaining the panel to the seat bottom.
2. Rivets.



244. Filler Panel
245. Screw
246. Torque Rod
247. Cap
248. Nut

Figure 12—Rear Folding Seat Back Panel



249. Seat Assembly
250. Seat Back Frame
251. Seat Back Trim
252. Seat Cushion Trim
253. Seat Cushion Frame
254. Washer
255. Bolt
256. Seat Back Lock
257. Nut
258. Bushing
259. Support
260. Bolt
261. Belt Assembly
262. Spring
263. Bolt
264. Screw
265. Panel
266. Bolt

Figure 13—Jump Seat Components

- Drill out the rivet heads with a 3.18 mm (1/8 inch) drill bit.

3. Trim panel.

Install or Connect (Figure 16)

1. Trim panel.
2. Rivets using a blind rivet installing tool.
3. Screws retaining the panel to the seat bottom.

NOTICE: For step 3 see "Notice" on page 10A2-1.

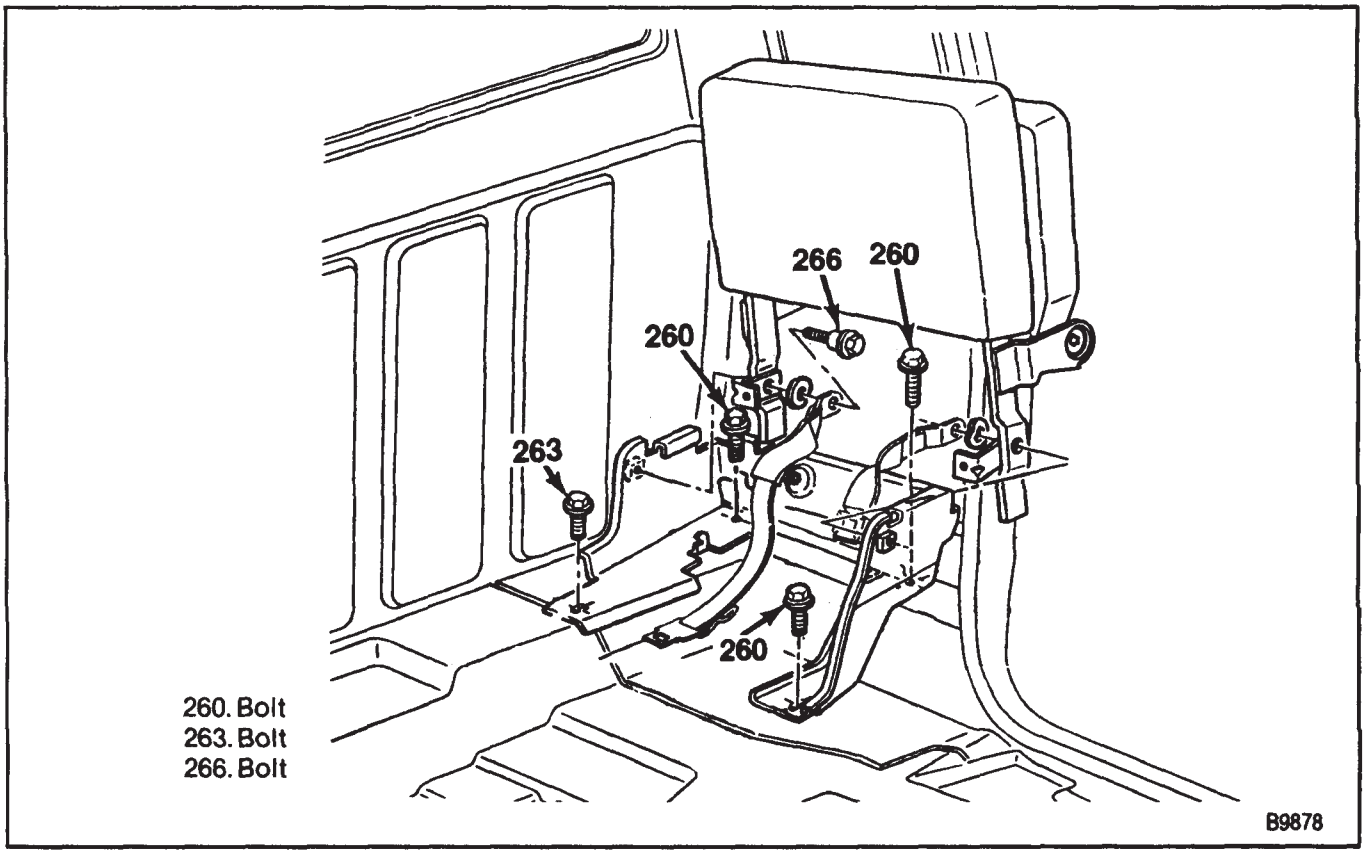


Figure 14—Jump Seat Attaching Positions

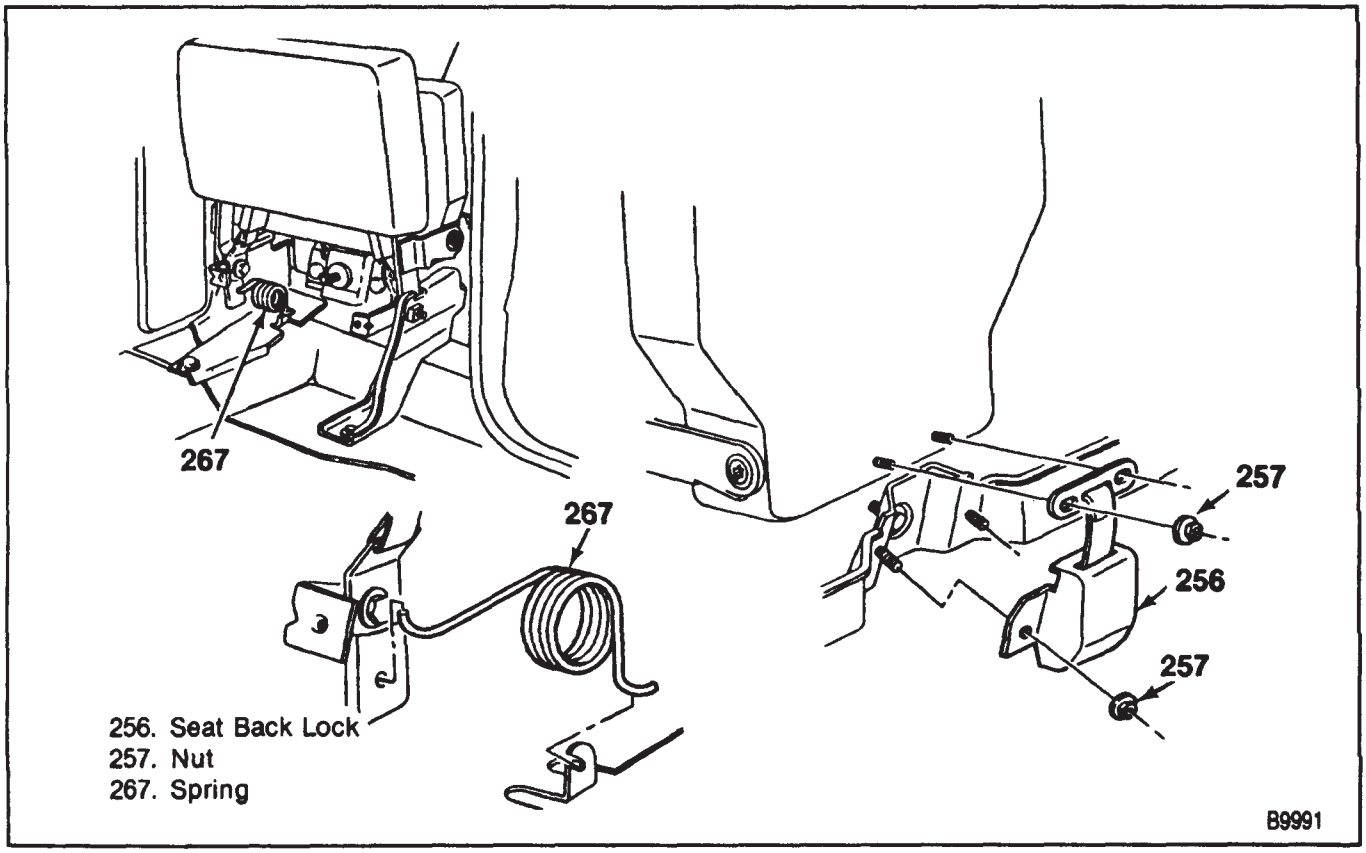
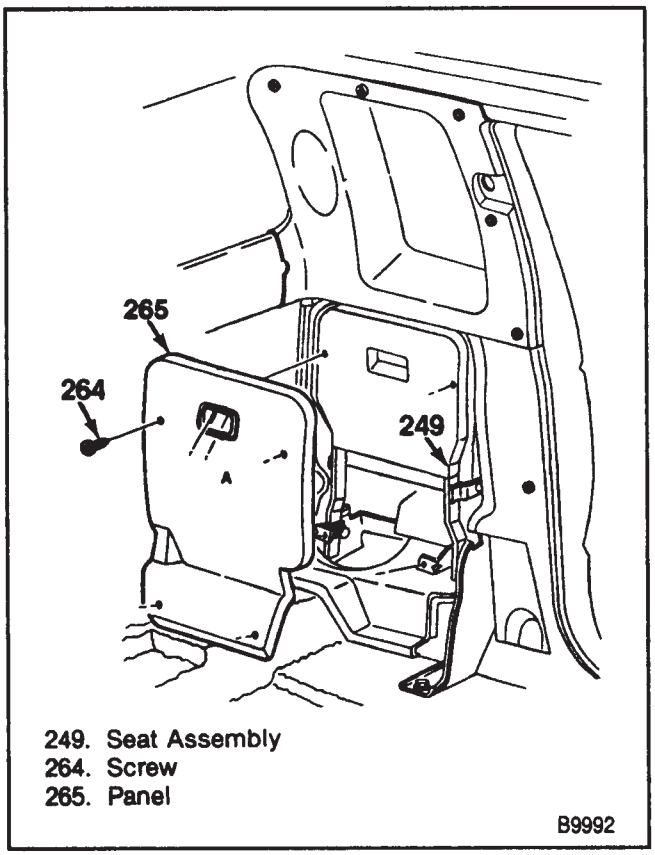


Figure 15—Seat Back Lock



249. Seat Assembly
264. Screw
265. Panel

Figure 16—Jump Seat Trim Panel

SEAT BELTS

NOTICE: See "Notice" on page 10A2-1 of this section.

Before servicing or replacing lap and shoulder belts, including single loop belt systems, refer to the following precautionary items:

1. Lap and shoulder belts will be serviced as follows:
   a. All belts will be serviced in complete sets.
   b. Do not intermix standard and deluxe belts on front or rear seats.
2. Keep sharp edges and damaging objects away from belts.
3. Avoid bending or damaging any portion of the belt buckle or latch plate.
4. Do not bleach or dye belt or strap webbing (clean with a mild soap solution and water.
5. When installing lap or shoulder belt anchor bolt, start bolt by hand to assure that bolt is threaded straight.
6. Do not attempt repairs on lap or shoulder belt retractor mechanisms to lap belt retractor covers. Replace defective assemblies with new service replacement parts.
7. Do not attempt to remove seat belt retractor cover. The cover and the long rivet securing the cover to the retractor are not available as service replacement parts.

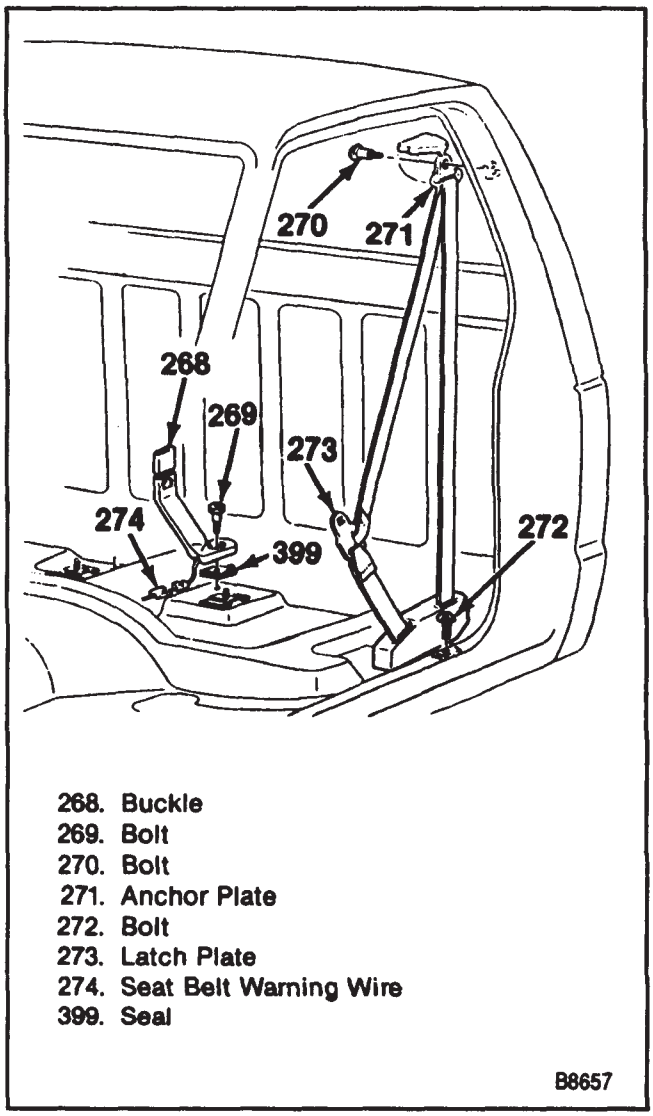
FRONT SEAT BELT REPLACEMENT

Remove or Disconnect (Figures 17, 18, and 19)

1. Cover from the door pillar anchor plate.
2. Bolt, anchor plate, and washer from the door pillar.
3. Bolt cover from the rear of the retractor assembly.
4. Bolt retaining the retractor to the floor panel.
5. Retractor from the vehicle.
6. Buckle assembly from the floor panel.
7. Cap from the buckle assembly which conceals the bolt.
8. bolt from the buckle assembly.
   - On "Regular Cab" vehicles, remove seal between the buckle assembly and the floor (figure 17).
9. Seat belt warning wire from the buckle assembly (driver's side only).
10. Buckle assembly from the vehicle.

Install or Connect (Figures 17, 18, and 19)

NOTICE: For steps 3, 6 and 8, refer to "Notice" on page 10A2-1 of this section.



268. Buckle
269. Bolt
270. Bolt
271. Anchor Plate
272. Bolt
273. Latch Plate
274. Seat Belt Warning Wire
399. Seal

Figure 17—Regular Cab Front Seat Belt

1. Buckle assembly to the floor panel.
   - On "Regular Cab" vehicles, install seal between the buckle assembly and the floor panel.
2. Seat belt warning wire to the buckle assembly (driver's side only).
3. Bolt through the buckle assembly and into the floor panel weld nut.

Tighten

- Bolt to 53 N·m (39 ft. lbs.).

4. Cap into the buckle assembly above the bolt head.
5. Blade and belt with the retractor.
6. Bolt through the retractor and into the floor panel weld nut.

Tighten

- Bolt to 53 N·m (39 ft. lbs.).

7. Cover to the rear of the retractor assembly.
8. Bolt through the anchor plate and washer, and into the door pillar weld nut.

Tighten

- Bolt to 53 N·m (39 ft. lbs.).

9. Cover over the door pillar anchor plate.

REAR SEAT BELT REPLACEMENT

Remove or Disconnect (Figure 20)

- Fold the seat forward.

1. Rear seat belt retractor.
   - Nuts retaining the seat belt retractor to the floor panel.
   - Seat belt retractor from the vehicle.
2. Seat from the vehicle. Refer to "Rear Seat Replacement" in this section.
3. Buckle assembly from the seat.

Install or Connect (Figure 20)

NOTICE: For step 3 see the "Notice" on page 10A2-1.

1. Buckle assembly to the seat.
2. Seat to the vehicle. Refer to "Rear Seat Replacement" in this section.

- Fold the seat forward.

3. Rear seat belt retractor.
   - Retractor onto the studs on the floor panel.
   - Nuts retaining the seat belt retractor to the floor panel.

Tighten

- Nuts to 38 N·m (28 ft. lbs.).

- Fold the seat back.

JUMP SEAT BELT REPLACEMENT

Remove or Disconnect (Figure 21)

- Seat belts. Refer to "Rear Folding Jump Seat Disassembly" in this section.

Install or Connect (Figure 21)

NOTICE: Refer to "Notice" on page 10A2-1 of this section.

- Seat belts. Refer to "Rear Folding Jump Seat Disassembly" in this section.

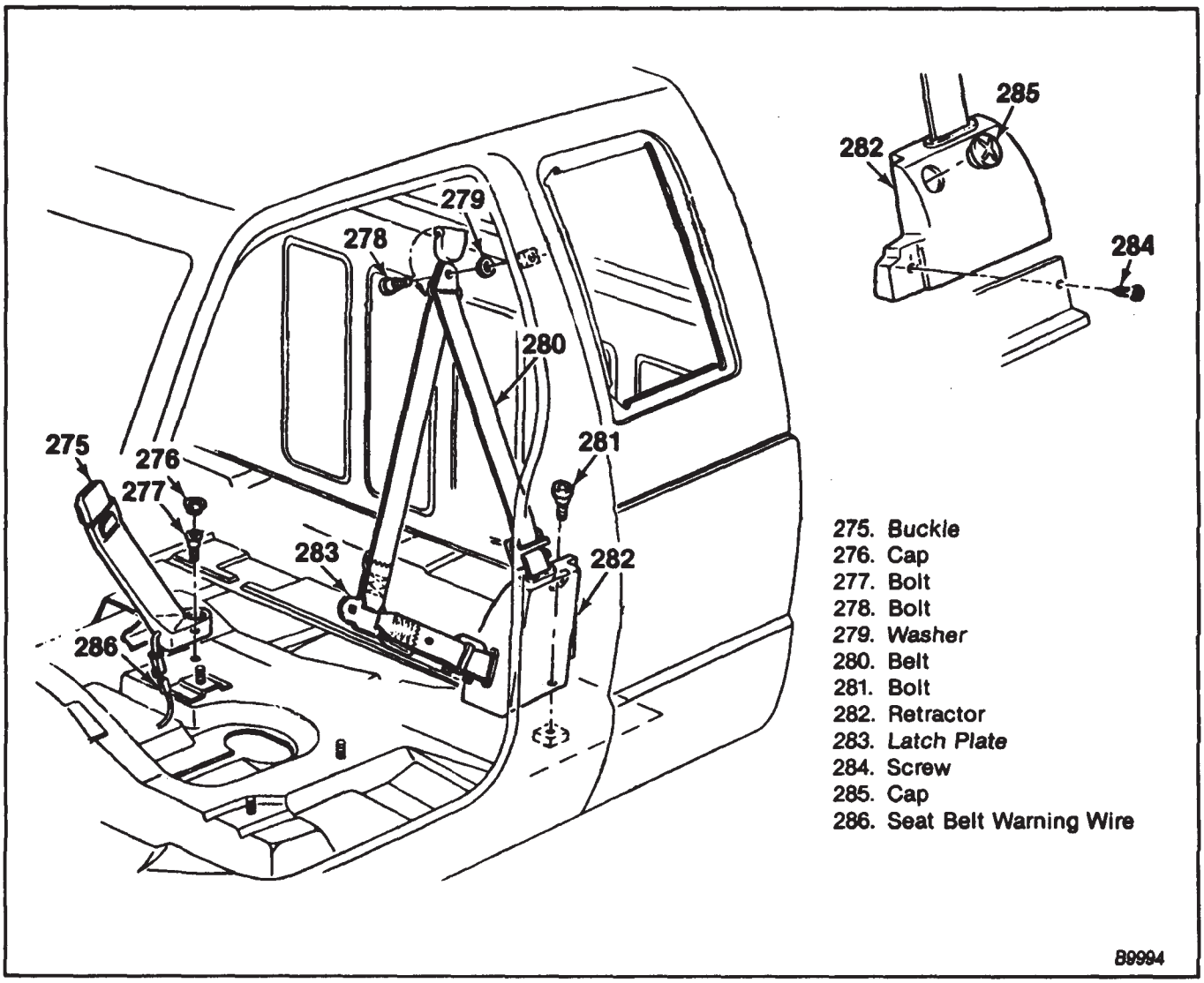


Figure 18—Extended Cab Front Seat Belt

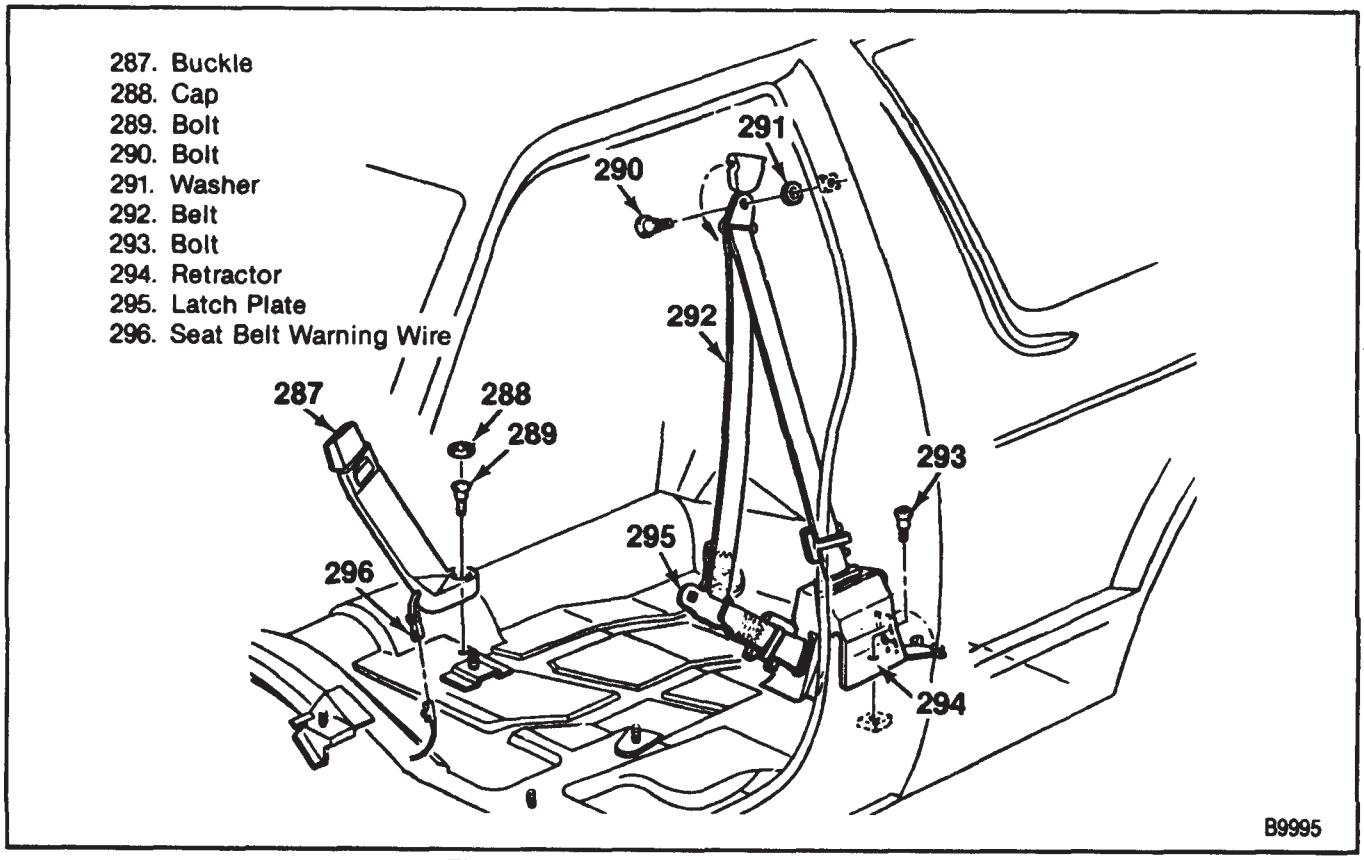


Figure 19—Utility Cab Front Seat Belt

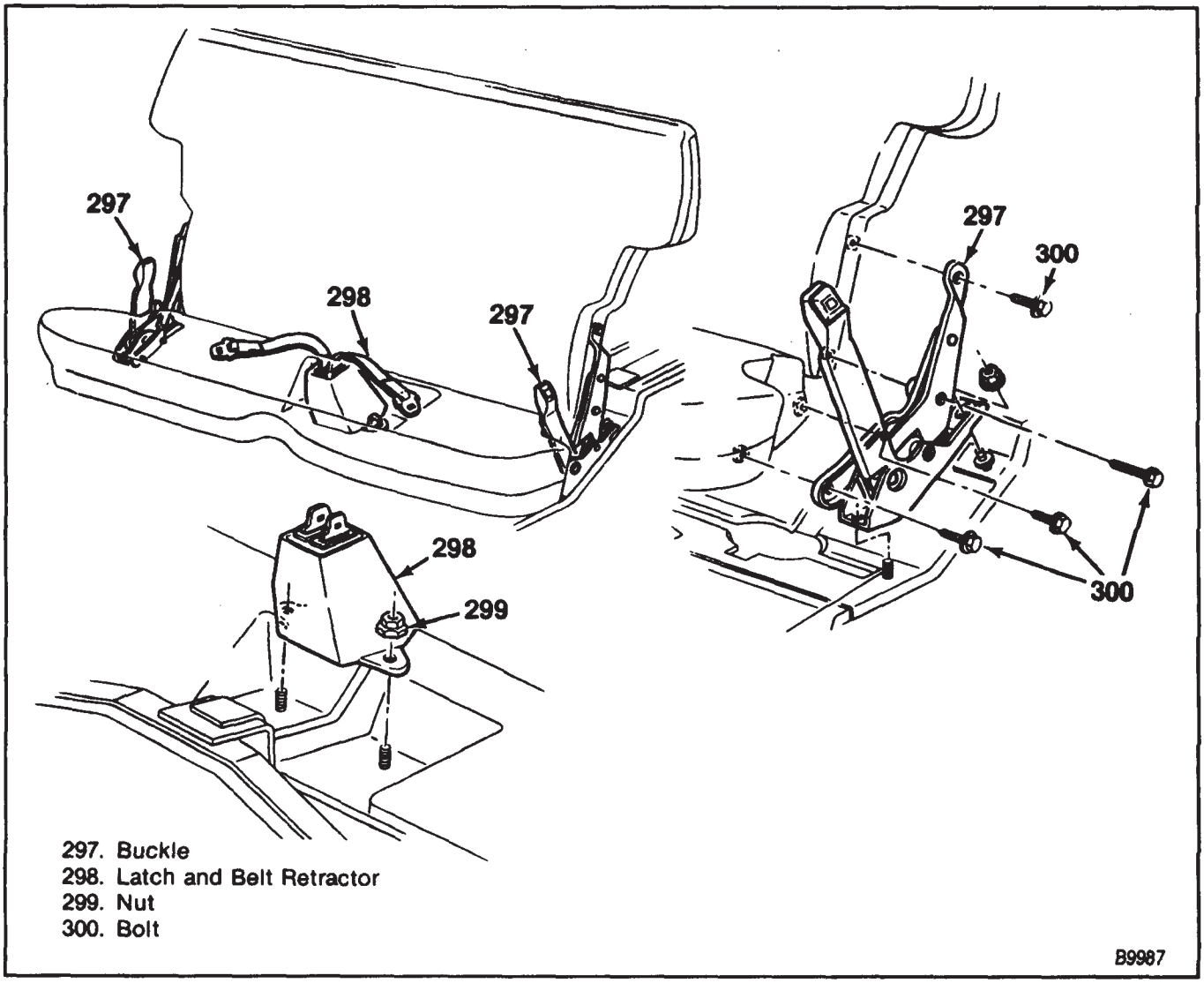


Figure 20—Rear Seat Belt Components

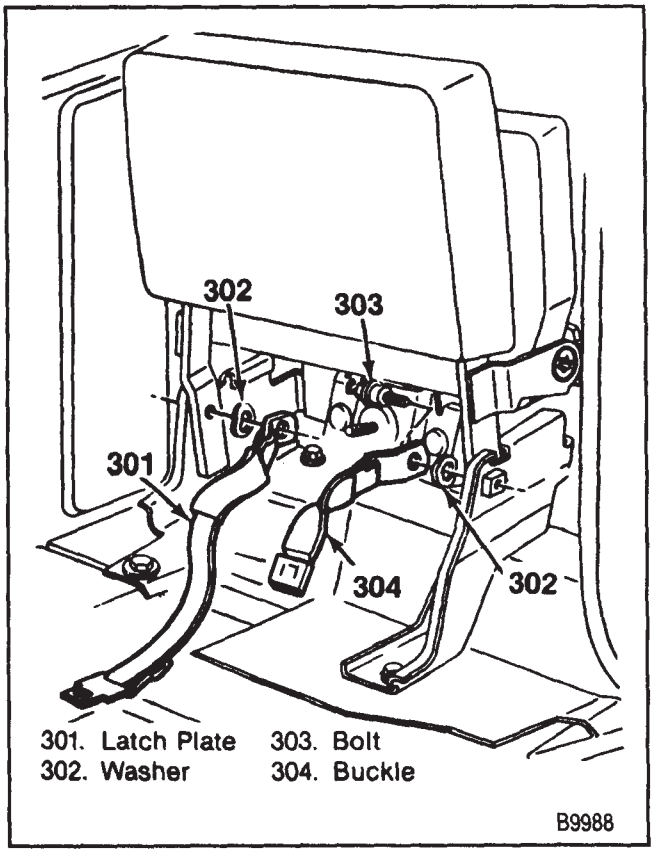


Figure 21—Jump Seat Belts

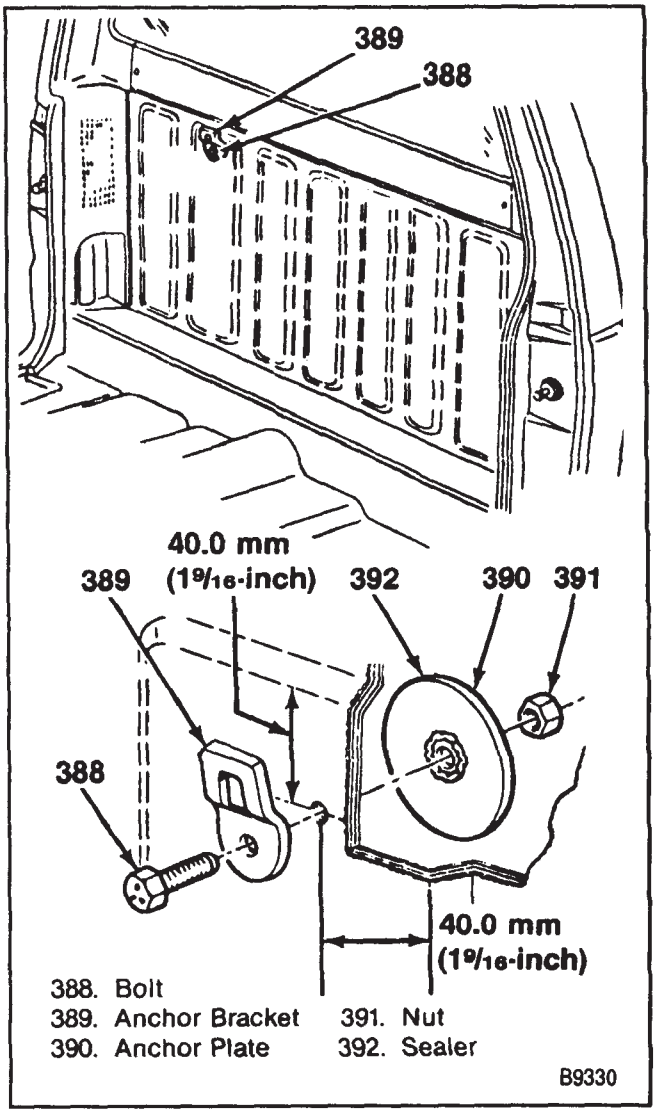


Figure 22—Pickup and Extended Cab Anchor Installation Points

TOP STRAP CHILD RESTRAINT

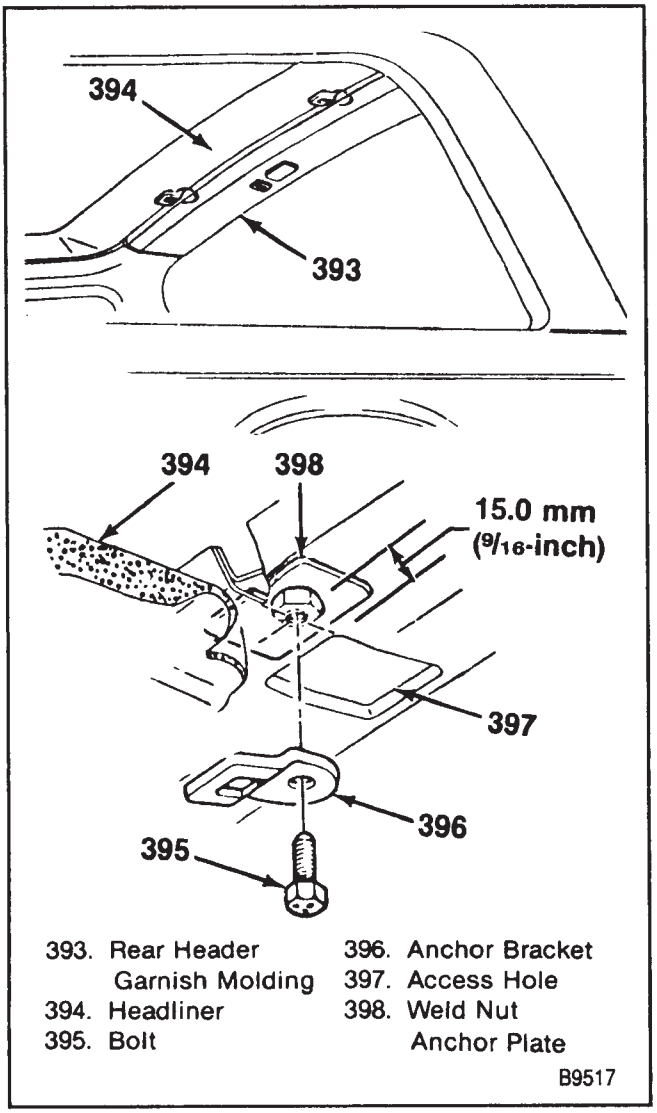
TOP STRAP RESTRAINT INSTALLATION (PICKUP AND EXTENDED CAB MODELS)

NOTICE: For steps 6 and 7, refer to "Notice" on page 10A2-1 of this section.

1. Remove the rear carpet panel (figure 22).
2. Drill a 9.0 mm (3/8 inch) hole in the second embossment from the right side of the vehicle. Locate the hole 40.0 mm (1 9/16 inch) from the top and the right edge of the embossment. Use a drill stop in order to prevent damage to the pickup box.
3. Install the rear carpet panel.
4. Pierce a hole through the rear carpet trim panel at the location of the drilled hole.
5. Place a medium bodied sealer around the hole of the anchor bracket.
6. Install a M8 x 1.25 x 25.0 bolt through the anchor bracket (389), the back panel, the anchor plate (390) and into the nut (391).
7. Tighten the bolt to 25 N·m (19 ft. lbs.). Note: In the event the child seat anchorage is removed, the 9.0 mm (3/8 inch) diameter hole must be properly resealed.

TOP STRAP RESTRAINT INSTALLATION (UTILITY VEHICLE MODELS)

NOTICE: For steps 7 and 8, refer to "Notice" on page 10A2-1 of this section.



393. Rear Header Garnish Molding
394. Headliner
395. Bolt
396. Anchor Bracket
397. Access Hole
398. Weld Nut Anchor Plate

B9517

Figure 23—Utility Vehicle Top Belt Anchor Installation Points

1. Remove the rear header garnish molding (figure 23).
2. Turn down the headliner.
3. Locate the position of the hole by measuring 15 mm (9/16 inch) up the roof panel from the inner upper corner of the access hole. Mark the position for the hole.
4. Drill a 9.0 mm (3/8-inch) hole in the roof panel bow at the location of the mark. Use a drill stop in order to prevent damage to the outer roof panel.
5. Obtain a weld nut anchor plate from dealer stock, and install it through the access hole.
6. Put the headliner into position, and pierce through the headliner into the drilled hole.
7. Install a M3 x 1.25 x 25.0 bolt through the anchor bracket (396), the headliner, and into the anchor plate (398).
8. Tighten the bolt to 25 N·m (19 ft. lbs.).

SPECIFICATIONS

	N·m	Ft. Lbs.
Seat Mounting Nuts	32	24
Seat Adjuster Bolts	24	18
Bench Seat Pivot Bolts	47	35
Rear Support Bracket Bolts	38	28
Front Support Bracket Bolts	47	35
Jump Seat Support Bolts		
Front	47	35
Rear	27	20
Front Seat Belt Bolts	53	39
Rear Bench Seat Belt Nuts	38	28
Rear Jump Seat Belt Bolts	47	35

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SECTION 10A3

WINDOWS

CAUTION: When replacing stationary glass; such as a windshield, back window, or hatch roof window, urethane adhesive (part no. 12345633 or equivalent) must be used to maintain original installation integrity. Failure to use urethane adhesive will result in poor retention of the windshield which may allow unrestrained occupants to be ejected from the vehicle with resulting personal injury.

CONTENTS

WINDOWS

WINDSHIELD REPLACEMENT

CAUTION: Always wear heavy gloves when handling glass to minimize the risk of injury.

Remove or Disconnect (Figure 1)

Tools Required:
J 24709-1, Urethane Window Sealant Remover (Hot Knife-115 Volt)
J 24402-A, Window Sealant Removal Knife

- Place protective coverings around the window removal area.

1. Cowl vent grille. Refer to "Cowl Vent Grille Replacement".
2. Lower window stops (figure 2).
3. Vinyl reveal molding. Refer to "Windshield Reveal Molding Replacement."
4. Excess urethane adhesive from the cavity between the window edge and the window frame (figure 3).
   - Use a razor or utility knife to trim the adhesive.

NOTICE: If a window is cracked but still intact, it should be crisscrossed with masking tape to reduce the risk of damage to the vehicle.

5. Windshield glass using J 24709-1, or J 24402-A.
   - Insert the blade between the window and the urethane.
   - Keep the blade against the window edge, and cut the sealant from the windshield (figure 4).

Two methods of window replacement may be used. The first of these methods is called the short method. This method can be used when the original adhesive is left on the window opening pinchweld flange after the window has been removed. The old adhesive serves as a base for the new glass.

The second method is the extended method. This is used when the original adhesive cannot be used as a base for the new glass. The original adhesive is removed and replaced with new adhesive. When repair to the sheet metal or window opening is required, the extended method must be used.

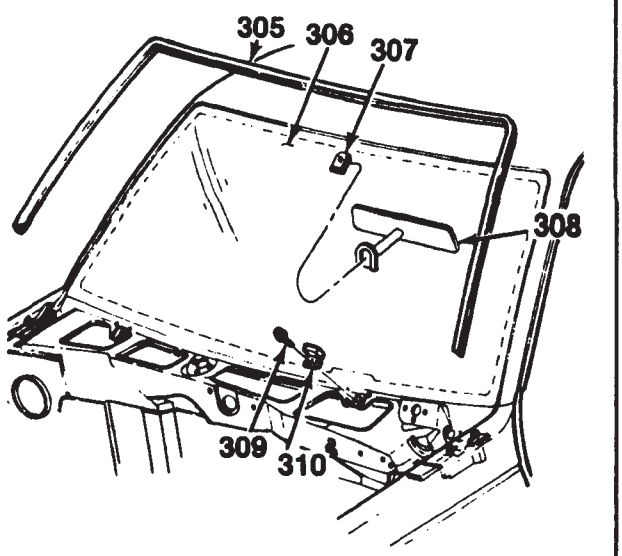
SHORT METHOD

Clean

1. Loose material from the window frame opening.
2. Edge of the window with alcohol or equivalent.

Install or Connect (Figure 5)

1. Foam sealing strip to the inside edge of the window 6 mm (1/4 inch) from the edge. Trim off any excess sealing strip with scissors or a sharp knife.



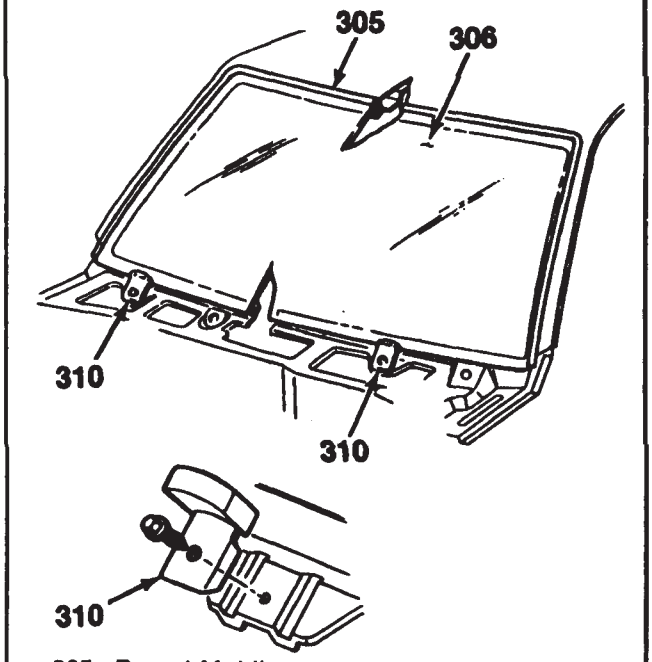
305. Reveal Molding
306. Glass
307. Rear View Mirror Support
308. Rear View Mirror
309. Screw
310. Support

Figure 1—Windshield Components

2. Lower support spacers (figure 2).
3. Window glass.
   - Position the window on the support spacers.
   - Apply masking tape across the windshield pillar to the windshield.
   - Cut the tape, and remove the windshield from the vehicle. This will aid in aligning the window when the urethane adhesive is applied.
4. Masking tape to the window inner surface 10.5 mm (7/16 inch) from the edge. The tape will aid in cleaning the window after installation.
5. Primer to the inner surface of the window along the outer edge, and inboard to the masking tape. Allow 5 minutes for the primer to dry.

CAUTION: When replacing stationary glass; such as a windshield, back window, or hatch roof window, urethane adhesive (part no. 12345633 or equivalent) must be used to maintain original installation integrity. Failure to use urethane adhesive will result in poor retention of the windshield which may allow unrestrained occupants to be ejected from the vehicle with resulting personal injury.

6. Urethane adhesive to the primed areas.
   - Apply a smooth continuous bead of adhesive, tipping the bead towards the center of the window (figure 5).
7. Windshield (figure 6).
   - With the aid of a helper, place the window on the lower supports.
   - Align the tape lines on the window glass and the body pillar.
   - Center the window to leave an even gap around the edge of the window for the reveal molding.
   - Apply a light hand pressure to the window to wet-out the adhesive and bond the glass to the window frame.
   - Work the adhesive material into the gap between the window edge and the pinchweld flange using a flat-bladed tool to insure a water-tight seal. Apply additional adhesive if necessary (figure 7).



305. Reveal Molding
306. Glass
310. Support

Figure 2—Windshield Stops

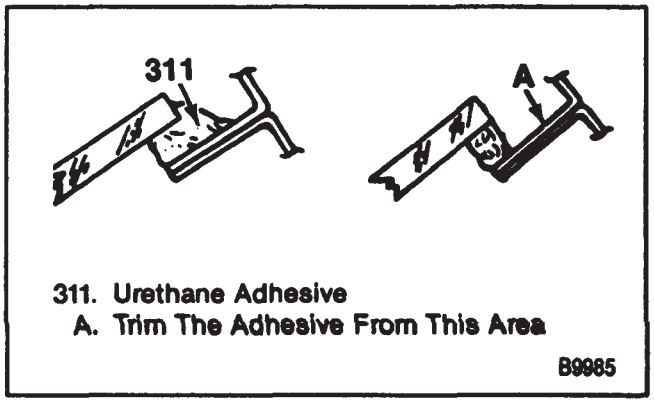


Figure 3—Reveal Molding Cavity Trim Points

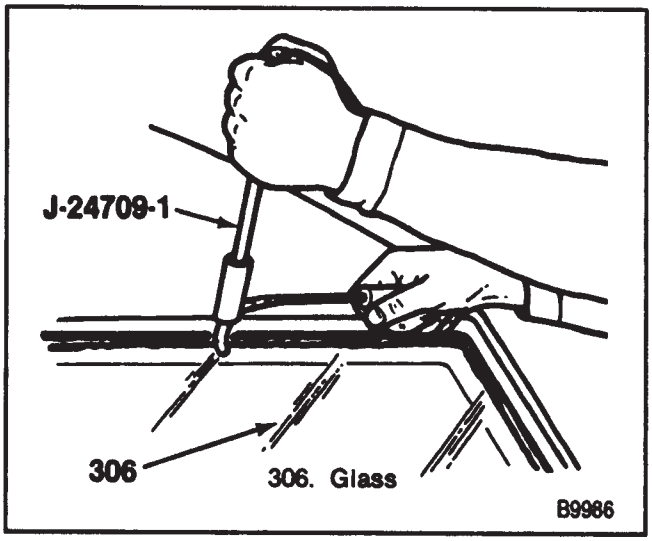


Figure 4—Cutting Windshield from Window Frame

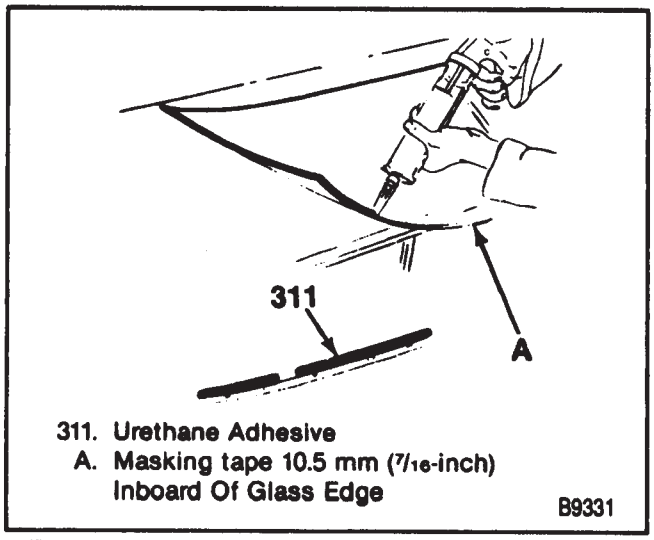


Figure 5—Adhesive Applications—Short Method

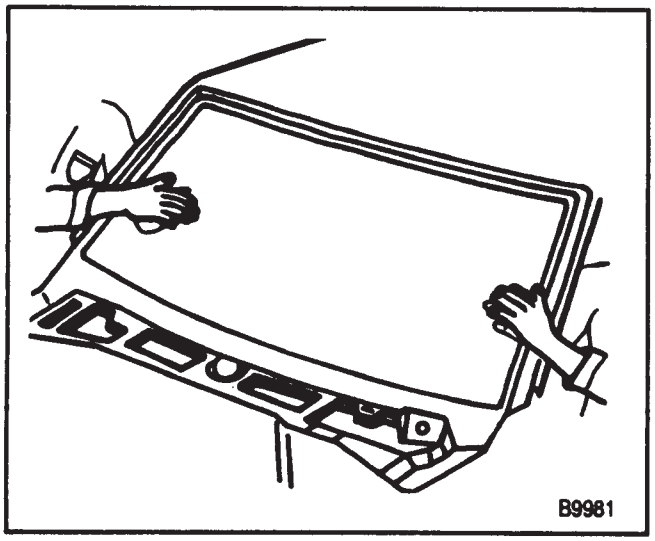


Figure 6—Window Installation

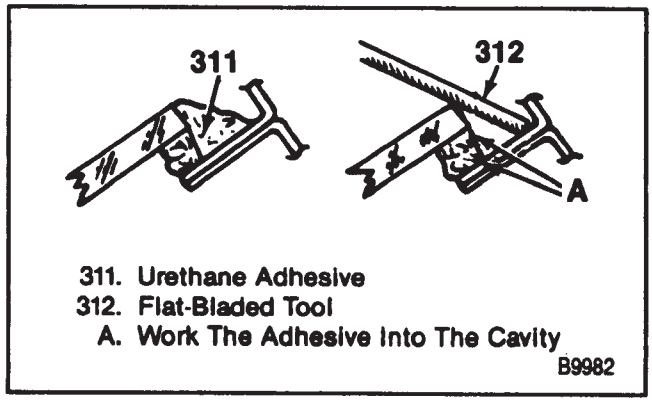


Figure 7—Sealing the Adhesive

- Test the window for leaks with a light steady stream of warm or hot water. Do not run a heavy stream of water directly onto the freshly applied adhesive. If any leaks are found, work additional adhesive material into that area.

8. Window reveal molding. Refer to "Stationary Window Reveal Molding Replacement."
9. Cowl vent grille. Refer to "Cowl Vent Grille Replacement."

- Remove the masking tape from the inner surface of the glass.
- The vehicle must remain at normal room temperature for six hours to complete the proper cure of the adhesive.

EXTENDED METHOD

Clean

- The old adhesive from the pinchweld flange using a sharp scraper or chisel.

Install or Connect (Figure 8)

1. Primer to the window frame opening.
2. GM part no. 1689958 Strip Filler or equivalent to the windshield inner surface. Place the strip 10.5 mm (7/16 inch) inboard from the edge of the window along the entire perimeter of the glass. Trim

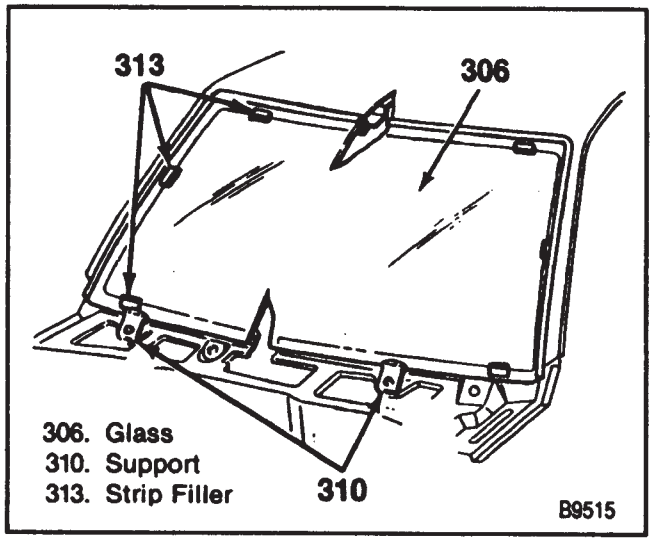


Figure 8—Windshield Strip Filler

off any excess sealing strip with scissors or a sharp knife. The sealing strip must not obstruct the view of the VIN from the outside of the vehicle.

3. Lower support spacers (figure 2).
4. Windshield.
   - Position the window on the support spacers.
   - Apply masking tape across the windshield pillar to the windshield.
   - Cut the tape, and remove the windshield from the vehicle. This will aid in aligning the window when the urethane adhesive is applied.
5. Masking tape inboard from the strip filler along the top and down each side of the glass. The tape will aid in cleaning the window after installation.

Clean

- Inner surface of the window with a clean alcohol dampened cloth. Allow the window to air dry.

6. Primer to the inner surface of the window along the outer edge, and inboard to the strip filler. Allow 5 minutes for the primer to dry.

CAUTION: When replacing stationary glass; such as a windshield, back window, or hatch roof window, urethane adhesive (part no. 12345633 or equivalent) must be used to maintain original installation integrity. Failure to use urethane adhesive will result in poor retention of the windshield which may allow unrestrained occupants to be ejected from the vehicle with resulting personal injury.

7. Urethane adhesive to the primed area (figure 9).
   - The nozzle furnished in the adhesive kit is designed for the short method only. For the extended method, the nozzle opening must be enlarged by removing the material within the score lines on the nozzle. Do not notch the nozzle beyond the score lines.
   - Apply a smooth continuous bead of adhesive, 10 mm (3/8 inch) high.
   - Tip the bead towards the center of the glass.
8. Windshield (figure 6).
   - With the aid of a helper, place the window on the lower supports.
   - Align the tape lines on the window window and the body pillar.
   - Center the window to leave an even gap around the edge of the window for the reveal molding.
   - Apply a light hand pressure to the window to wet out the adhesive and bond the window to the pinchweld flange.
   - Work the adhesive material into the gap between the window edge and the pinchweld flange using a flat-bladed tool to insure a watertight seal. Apply additional adhesive if necessary (figure 7).
   - Test the window for leaks with a light steady stream of warm or hot water. Do not run a heavy stream of water directly onto the freshly applied adhesive. If any leaks are found, work additional adhesive material into that area.
9. Window reveal molding. Refer to "Stationary Window Reveal Molding Replacement".
10. Cowl vent grille. Refer to "Cowl Vent Grille Replacement".

- Remove the masking tape from the inner surface of the glass.
- The vehicle must remain at normal room temperature for six hours to complete the proper cure of the adhesive.

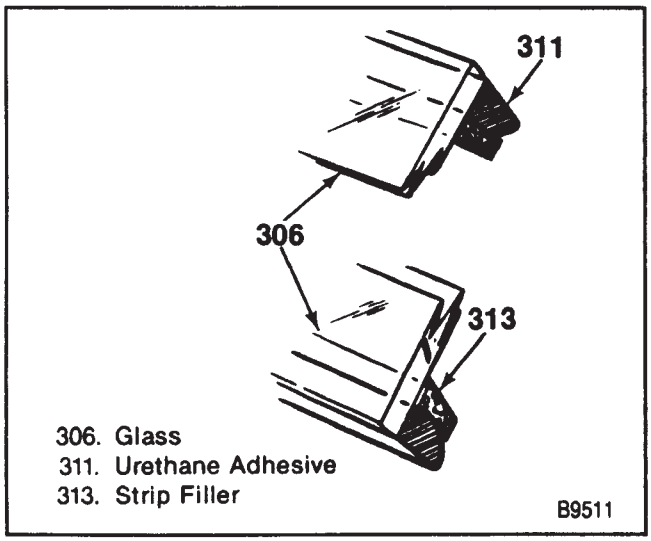


Figure 9—Adhesive Application—Extended Method

WINDSHIELD REVEAL MOLDING REPLACEMENT

The windshield reveal molding is made of vinyl and retained to the body by urethane adhesive.

Remove or Disconnect

- Vinyl reveal molding.
  - Use a flat-bladed tool to carefully pry one end of the molding 76 mm (3 inch) away from the body.
  - Grasp the molding and slowly pull it away from the body until the entire molding has been removed.

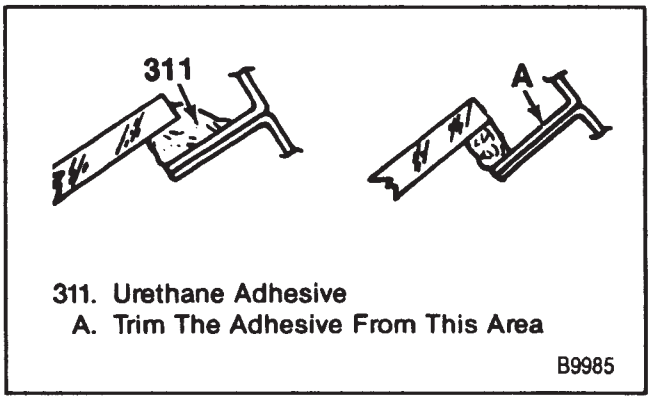


Figure 10—Reveal Molding Cavity

Clean (Figure 10)

- Excess urethane from the reveal molding cavity. Cut the urethane from the cavity with a razor or utility knife. Do not cut between the window and the pinchweld flange.

Install or Connect (Figure 11)

- Service molding has a shorter shank than the original molding. This shorter shank does not allow the molding to bottom-out in the molding cavity. Service molding must be prefit to the molding cavity before installation.

1. Apply primer to the reveal molding cavity (figure 12).

CAUTION: See "Caution" on page 10A3-1 of this section.

2. Urethane adhesive into the reveal molding cavity around the entire window glass edge.
   - Apply urethane to the reveal molding cavity.
   - Float the reveal molding cavity with low pressure lukewarm water. This aids in the adhesive curing time.
3. Reveal molding (figure 13).
   - Start at the top of the window centerline and press the molding into place.
   - Apply a second application of water on top of the molding.

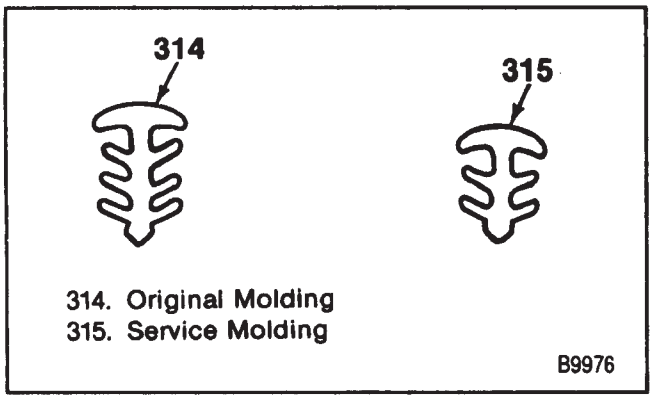


Figure 11—Original and Service Moldings

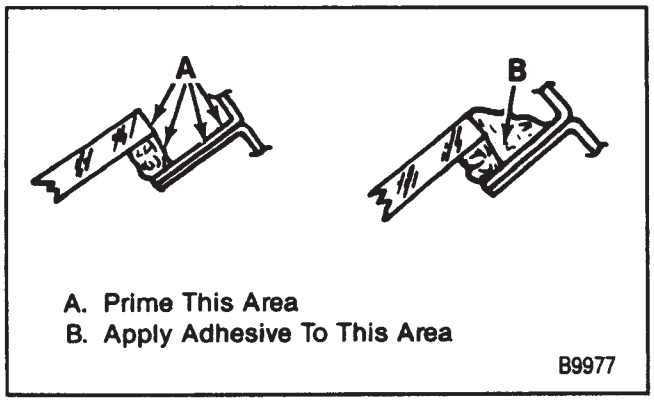


Figure 12—Reveal Molding Cavity

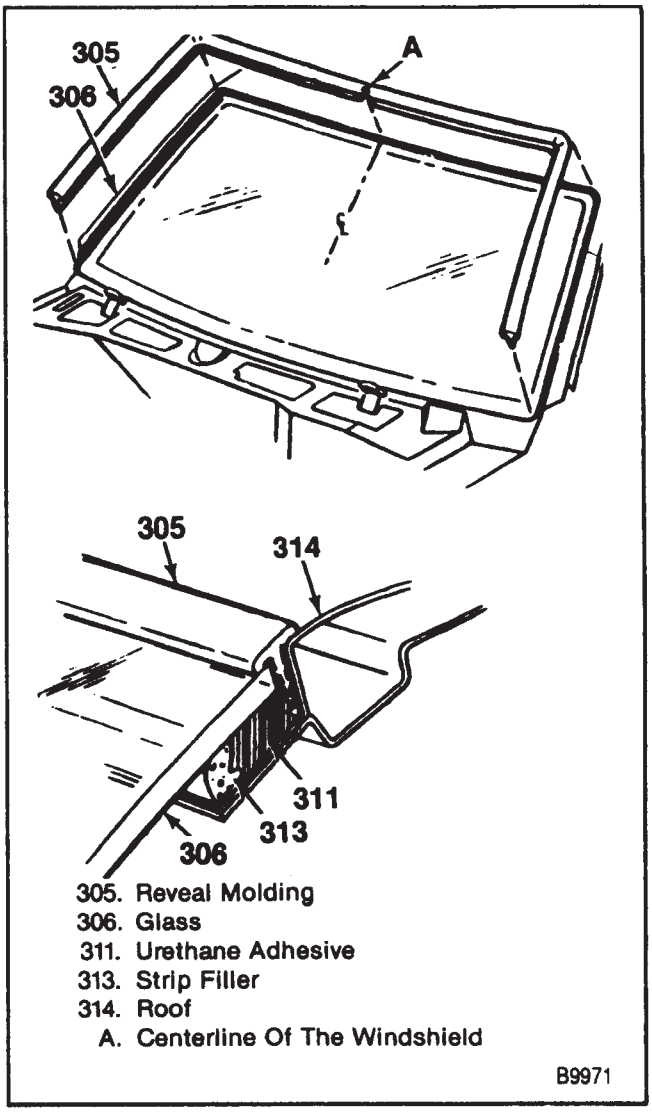


Figure 13—Reveal Molding

- Apply tape over the molding to keep the molding flush with the window while the adhesive cures.

BODY SIDE WINDOW REPLACEMENT (UTILITY VEHICLE)

Both the body side glass and the body side sliding window are replaced with the same procedure.

Remove or Disconnect (Figure 14)

Tools Required:
J 24709-1, Urethane Window Sealant Remover (Hot Knife—115 volt)
J 24402-A, Window Sealant Remover Knife.

- Place protective coverings around the window removal area.

1. Vinyl reveal molding.
   - Use a razor or utility knife to cut the molding from around the window.
2. Urethane adhesive from the cavity between the glass edge, and the window frame (figure 3).

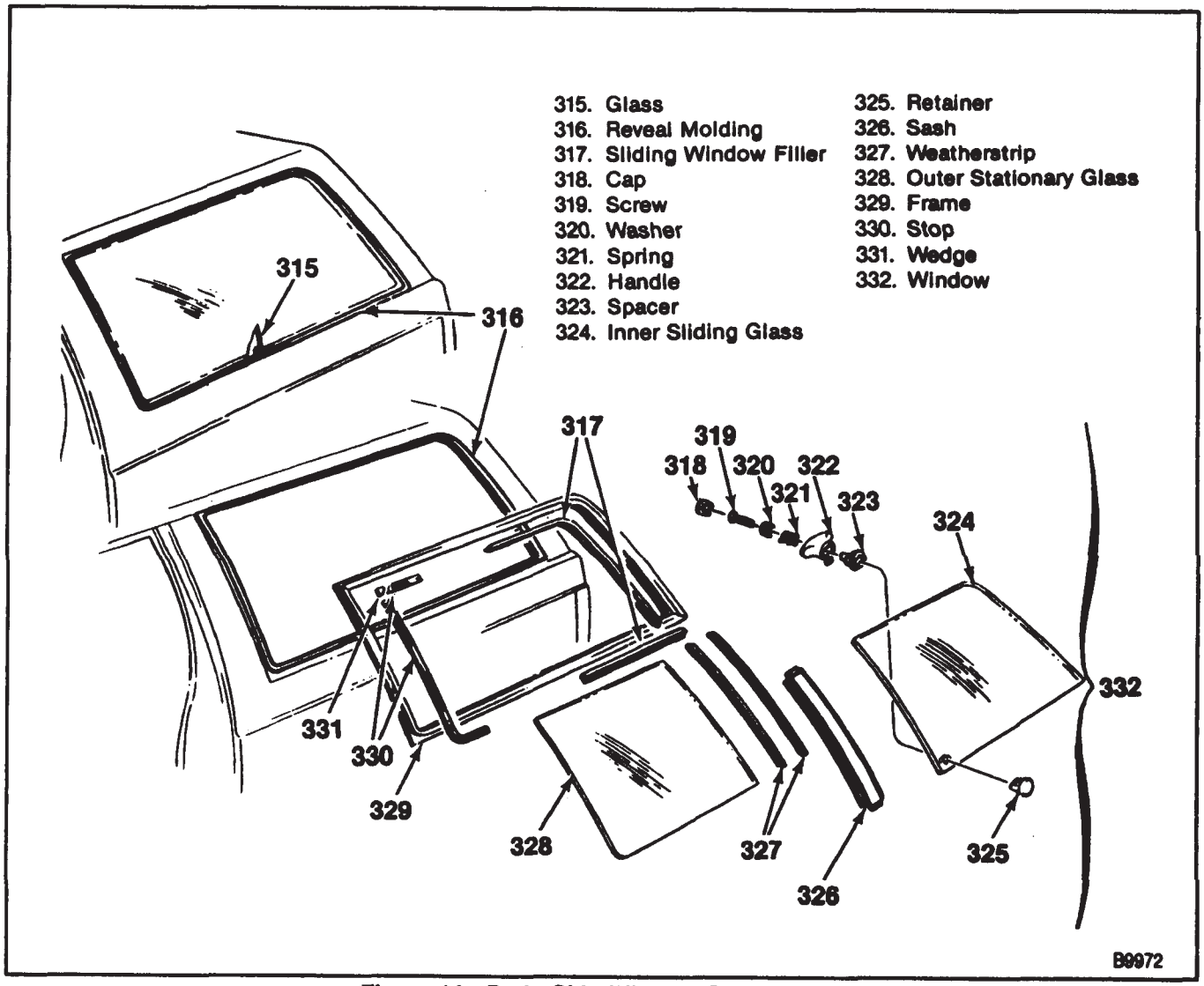


Figure 14—Body Side Window Components

- Use a razor or utility knife to trim the adhesive.

NOTICE: If a window is cracked but still intact, it should be crisscrossed with masking tape to reduce the risk of damage to the vehicle.

3. Body side window (figure 4).
   - Use hot knife J 24709-1, or, cold knife J 24402-A, or equivalent.
   - Insert the blade between the window and the urethane.
   - Keep the blade against the window edge, and cut the sealant from the windshield.
   - Keep the blade against the glass edge, and cut the sealant from the windshield.

Two methods of window replacement may be used. The first of these methods is called the short method. This method can be used when the original adhesive is left on the window opening pinchweld flange after the glass has been removed. The old adhesive serves as a base for the new glass.

The second method, is the extended method. This is used when the original adhesive cannot be used as a base for the new glass. The original adhesive is removed and replaced with new adhesive. When repair to the sheet metal or window opening is required, the extended method must be used.

SHORT METHOD

Clean

1. Loose material from the window frame opening.
2. Edge of the window with alcohol or equivalent.

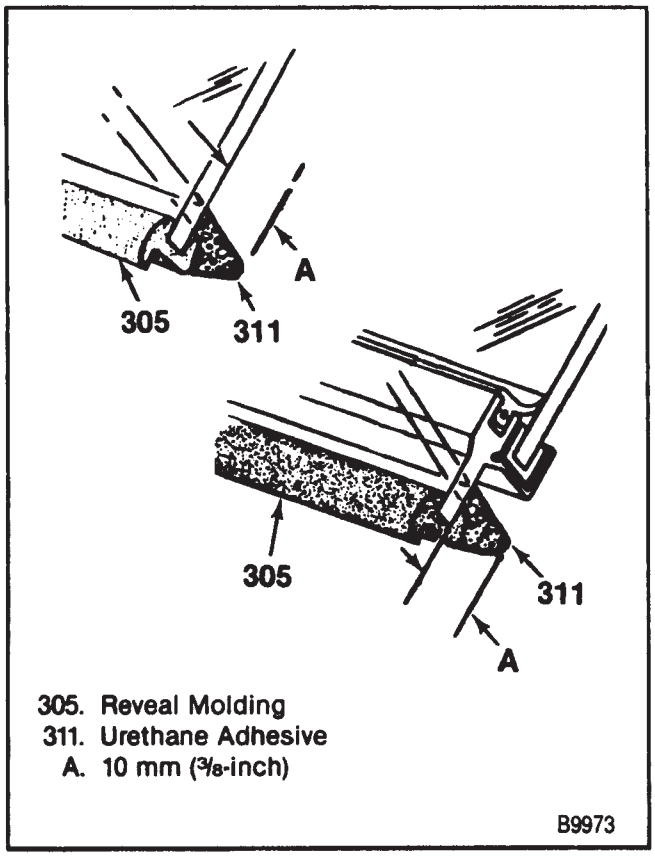
Install or Connect

1. Window.
   - Position the glass in the window frame.
   - Apply masking tape from the window glass to the body side sheet metal horizontally.
   - Cut the tape, and remove the windshield from the vehicle. This will aid in aligning the window when the urethane adhesive is applied.

2. Masking tape 22 mm (7/8 inch) inboard of the window edge along the entire perimeter of the glass.
3. GM part no. 14073860 Window Reveal Molding.
   - Press the molding against the window (or aluminum frame on the sliding glass windows) to bond the adhesive to the window (figure 15).
4. Primer to the inner face of the reveal molding, and along the window edge to the masking tape. Allow 5 minutes for the primer to dry.

CAUTION: When replacing stationary glass; such as a windshield, back window, or hatch roof window, urethane adhesive (part no. 12345633 or equivalent) must be used to maintain original installation integrity. Failure to use urethane adhesive will result in poor retention of the windshield which may allow unrestrained occupants to be ejected from the vehicle with resulting personal injury.

5. Urethane adhesive to the primed areas.
   - Apply a smooth continuous bead of adhesive, tipping the bead toward the center of the glass.
6. Window (figure 16).
   - With the aid of a helper, align the tape lines on the glass, and the body side sheet metal, and place the glass in the window frame.
   - Apply a light hand pressure to the window to wet-out the adhesive and bond the glass to the window frame.
   - Test the window for leaks with a light steady stream of warm or hot water. Do not run a heavy stream of water directly onto the freshly applied adhesive. If any leaks are found, work additional adhesive material into that area.
   - Remove the masking tape from the inner surface of the glass.
   - The vehicle must remain at normal room temperature for six hours to complete the proper cure of the adhesive.



305. Reveal Molding
311. Urethane Adhesive
A. 10 mm (3/8-inch)

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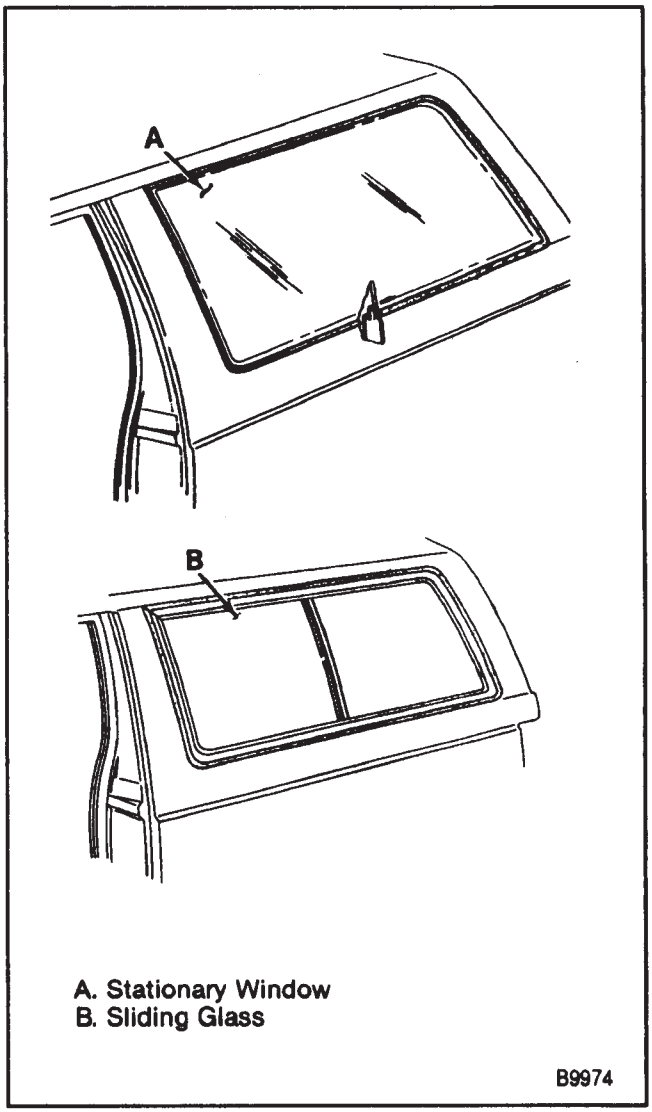
Figure 15—Reveal Molding with Urethane Adhesive



A. Stationary Window
B. Sliding Glass

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Figure 16—Body Side Window

EXTENDED METHOD

Clean

- The old adhesive from the pinchweld flange using a sharp scraper or chisel.

Install or Connect

1. Window.
   - Position the glass in the window frame.
   - Apply masking tape from the window glass to the body side sheet metal horizontally.

- Cut the tape, and remove the windshield from the vehicle. This will aid in aligning the window when the urethane adhesive is applied.

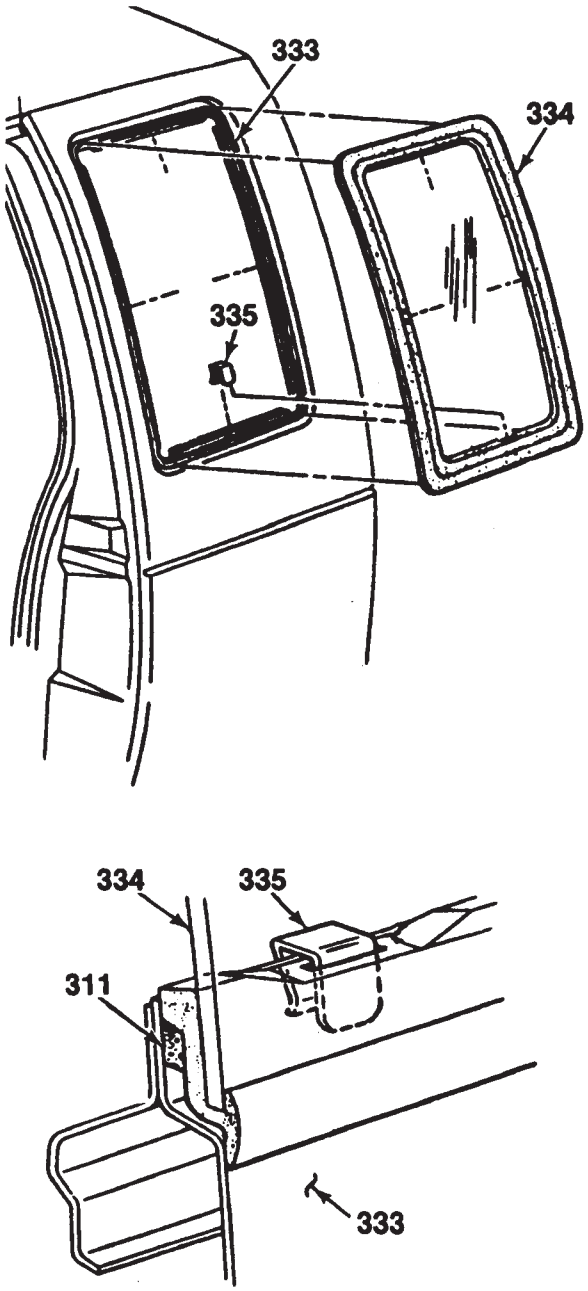
2. Masking tape 22 mm (7/8 inch) inboard of the glass edge along the entire perimeter of the glass.
3. GM Part no. 14073860 Window Reveal Molding.
   - Press the molding against the window (or aluminum frame on the sliding window) to bond the adhesive to the window (figure 15).
4. Primer to the inner face of the reveal molding, and along the window edge to the masking tape. Allow 5 minutes for the primer to dry.
5. Primer to the window glass pinchweld frame. Allow 5 minutes for the primer to dry.

CAUTION: When replacing stationary glass; such as a windshield, back window, or hatch roof window, urethane adhesive (part no. 12345633 or equivalent) must be used to maintain original installation integrity. Failure to use urethane adhesive will result in poor retention of the windshield which may allow unrestrained occupants to be ejected from the vehicle with resulting personal injury.

6. Urethane adhesive to the primed areas of the glass.
   - The nozzle furnished in the adhesive kit is designed for the short method only. For the extended method, the nozzle opening must be enlarged by removing the material within the score lines on the nozzle. Do not notch the nozzle beyond the score lines.
   - Apply a smooth continuous bead of adhesive to the molding and the window (or aluminum frame on the sliding glass window) 10 mm (3/8 inch) high.
   - Tip the bead towards the center of the glass.
7. Window (figure 16).
   - With the aid of a helper, align the tape lines on the glass, and the body side sheet metal, and place the glass in the window frame.
   - Apply a light hand pressure to the glass to wet-out the adhesive and bond the glass to the window frame.
   - Test the window for leaks with a light steady stream of warm or hot water. Do not run a heavy stream of water directly onto the freshly applied adhesive. If any leaks are found, work additional adhesive material into that area.
   - Remove the masking tape from the inner surface of the glass.
   - The vehicle must remain at normal room temperature for six hours to complete the proper cure of the adhesive.

STATIONARY BODY SIDE WINDOW REPLACEMENT (EXTENDED CAB MODELS)

CAUTION: Always wear heavy gloves when handling glass to minimize the risk of injury.



311. Urethane Adhesive
333. Window Frame Pinchweld
334. Glass Assembly
335. Clip

Figure 17—Extended Cab Stationary Body Side Window

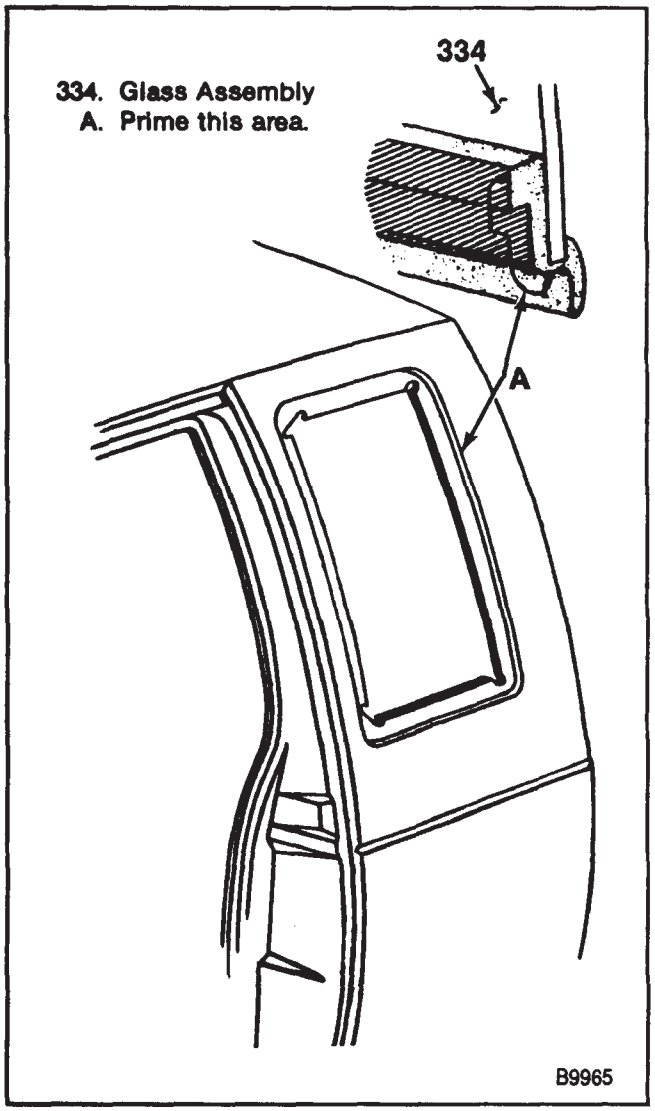


Figure 18—Primer Application Points

Remove or Disconnect (Figure 17)

Tools Required:
J 24709-1, Urethane Window Sealant Remover-Hot Knife.
J 24402-A, Window Sealant Remover Knife.

1. Upper rear quarter trim molding.
2. Window retaining clips.

NOTICE: If a window is cracked but still intact, it should be crisscrossed with masking tape to reduce the risk of damage to the vehicle.

3. Window glass and molding using J 24709-1, or J 24402-A (figure 4).
   - Working from inside the cab, insert the blade between the pinchweld flange, and the molding and urethane adhesive.
4. Molding and the glass from the window frame.
5. Adhesive from the pinchweld flange using a sharp scraper or chisel.
   - Be sure to remove all mounds or loose adhesive.

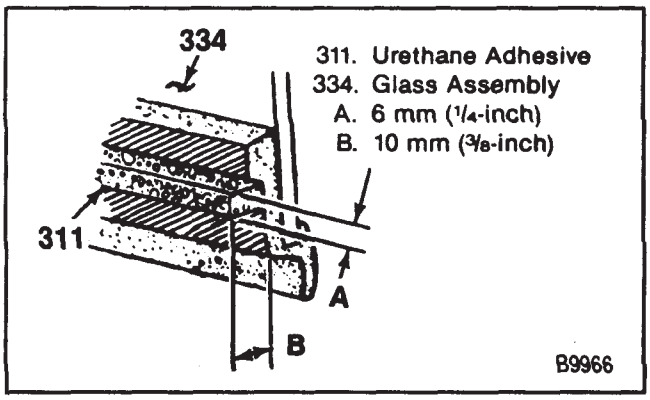


Figure 19—Adhesive Application Points

The window glass and the molding are replaced as a single unit. Whenever the window is removed for any reason, the entire must be replaced.

Clean

- Pinchweld flange and the window molding with a clean alcohol dampened cloth. Allow the parts to air dry.

Install or Connect

1. Primer from the adhesive kit to the pinchweld flange and the window molding. Allow 5 minutes for the primer to dry (figure 18).

CAUTION: When replacing stationary glass; such as a windshield, back window, or hatch roof window, urethane adhesive (part no. 12345633 or equivalent) must be used to maintain original installation integrity. Failure to use urethane adhesive will result in poor retention of the windshield which may allow unrestrained occupants to be ejected from the vehicle with resulting personal injury.

2. Urethane adhesive to the window molding.
   - Apply a bead 10 mm (3/8 inch) high and 6 mm (1/4 inch) wide along the entire inner edge of the molding (figure 19).
3. Window and molding assembly onto the pinchweld flange.
4. Window retaining clips.
   - Apply a light hand pressure to the window to wet-out the adhesive, and bond the window to the pinchweld.
   - Test the window for leaks with a light stead stream of warm or hot water. Do not run a heavy stream of water directly onto the freshly applied adhesive. If any leaks are found, work additional adhesive into that area.
5. Upper rear quarter trim molding.

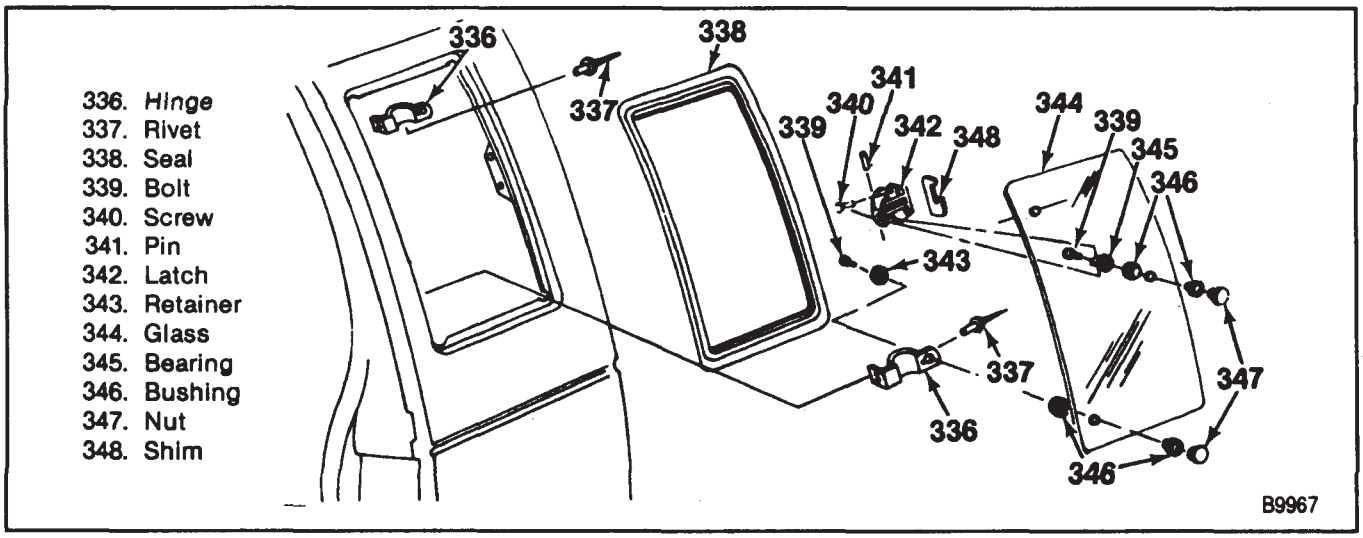


Figure 20—Body Side Latched Window Components

BODY SIDE LATCHED WINDOW REPLACEMENT (EXTENDED CAB MODELS)

Remove or Disconnect (Figure 20)

1. Latch pin (figure 21).
   - Carefully drive the pin from the latch.
2. Window retaining screws.
3. Glass.

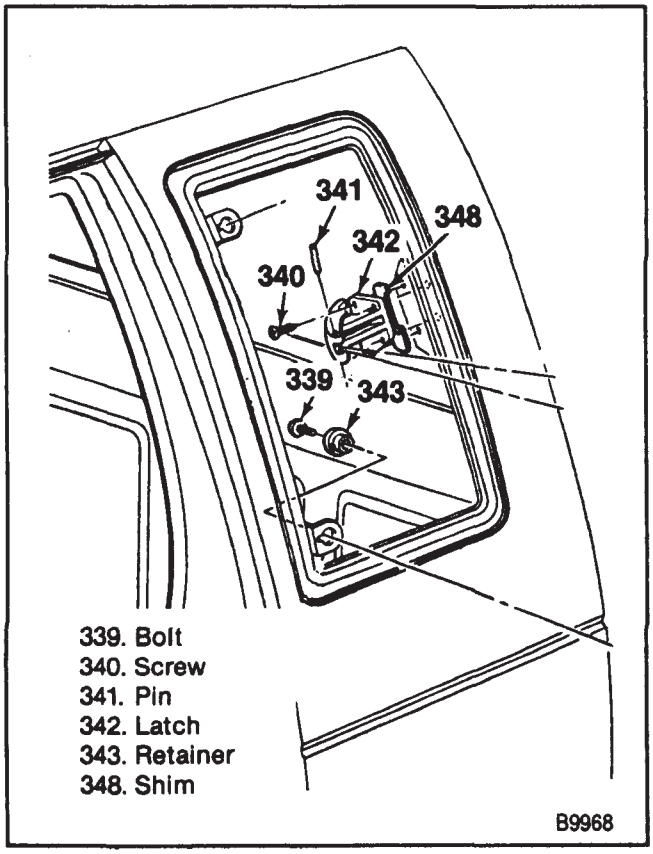


Figure 21—Latch Components

4. Hinge hole bushings.
5. Window hole bushings and nuts.
6. Bearing screws from the window.
7. Bearing, bushings, and nut from the latch side window hole.
8. Latch screws.
9. Latch.

Install or Connect (Figure 20)

1. Latch.
2. Latch screws.
3. Bushings into the latch side window hole.
4. Screw through the bearing.
5. Screw and bearing through the window hole and into the nut.
6. Hinge side bushings and nuts to the window.
7. Window to the hinges.
8. Screws and bushings through the hinges, and into the window.
9. Latch pin.
   - *Align the latch and the bearing.*
   - Carefully drive the pin into the latch.

REAR WINDOW REPLACEMENT

Remove or Disconnect

CAUTION: Always wear heavy gloves when handling glass to minimize the risk of injury.

NOTICE: If a window is cracked but still intact, it should be crisscrossed with masking tape to reduce the risk of damage to the vehicle.

1. Weatherstrip seal by running a putty knife between the flange and weatherstrip (inside and outside the cab).
   - Have an assistant outside the cab by the window.
2. Weatherstrip and window from the flange.

- Force the weatherstrip from the flange from the inside with a putty knife.

3. Window.

To ease installation, the weatherstrip can be heated with a non-flame source. At higher temperatures, the weatherstrip is more pliable. Do not heat above 52°C (125°F), or for more than 1-1/2 hours.

Avoid hitting the glass on anything that may chip its edges. Pressure on the glass will tend to concentrate at the chipped areas, causing cracks. If the glass is accidentally chipped, the edge should be ground smooth.

Install or Connect (Figure 22)

CAUTION: Always wear heavy gloves when handling glass to minimize the risk of injury.

1. Weatherstrip to the glass.
2. A 6 mm (1/4 inch) cord in the weatherstrip groove. The ends should overlap about 15 cm (6 inches) at the window bottom.
3. Window and weatherstrip on the flange from outside the cab.
   - Brush soapy water on the flange.
   - Have an assistant pull the cord from inside the cab to seat the lip of the weatherstrip on the flange.

ROOF VENT WINDOW REPLACEMENT

Remove or Disconnect (Figures 23 and 24)

- Raise the window.

1. Stays from the handle brace (figure 24).
2. Brace from the upper frame hinge by sliding catches up (figure 24).
3. Hinge caps and screws.
4. Vent window.

Install or Connect (Figures 23 and 24)

1. Vent window to the opening.
2. Hinge screws and caps.

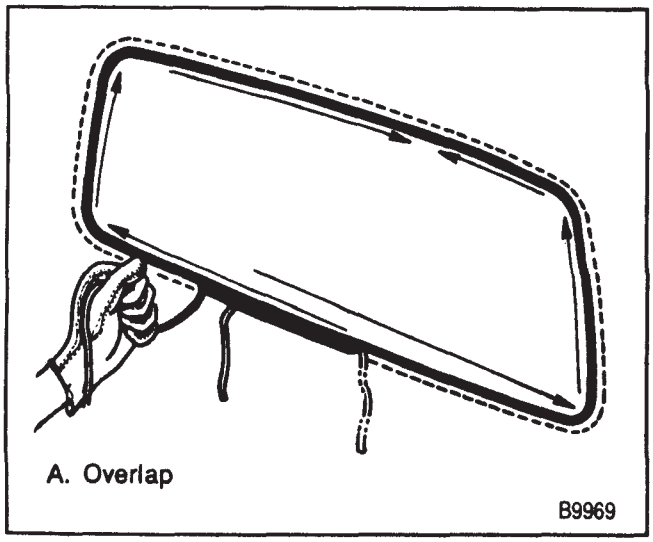


Figure 22—Rear Window Components

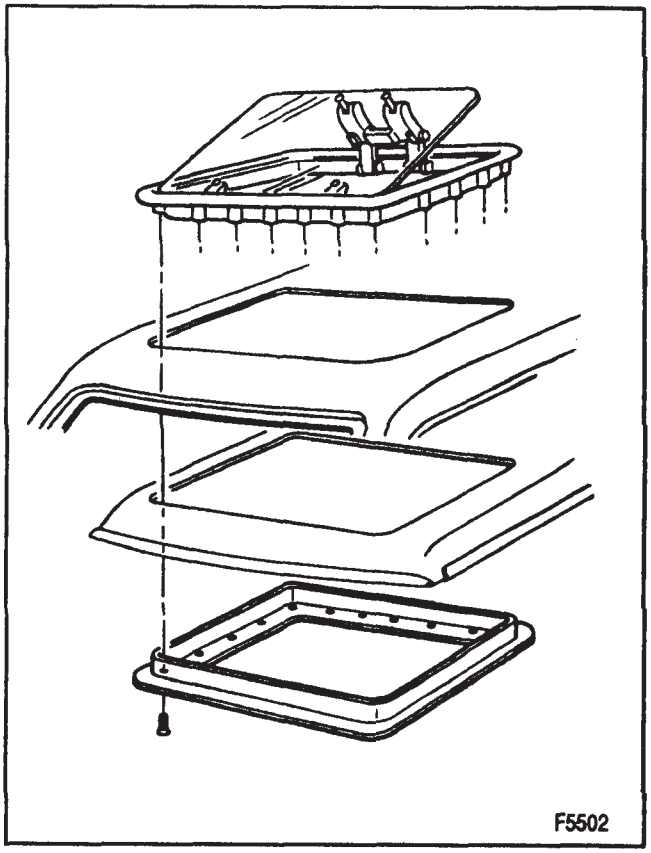


Figure 23—Roof Vent Window

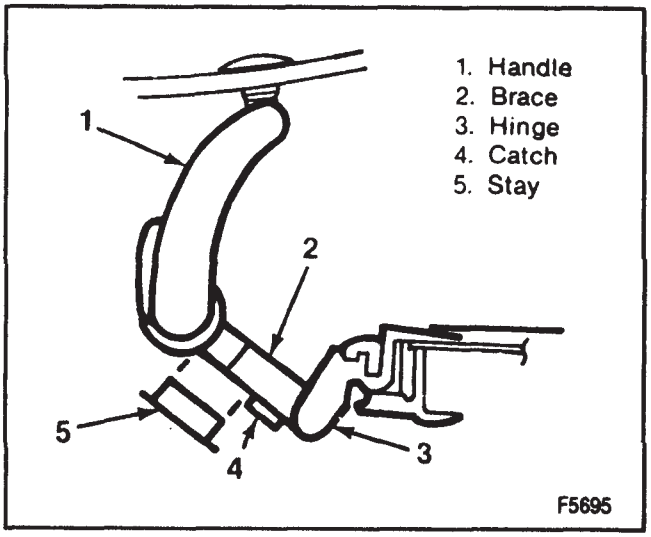


Figure 24—Handle Catch and Stay

3. Handle brace to the upper frame hinge.
   - Slide the catches up, set the brace on the hinge pin, then release the catches (figure 24).
4. Handle brace stays (figure 24).

ROOF VENT WINDOW ASSEMBLY REPLACEMENT

Remove or Disconnect (Figure 23)

1. Window.
2. Screws from the lower frame and the lower frame.

3. Frame assembly. It may be necessary to cut the frame seal from the roof and the upper frame.

Clean

- Old seal from the roof and frame.

Install or Connect (Figure 23)

1. New seal to the upper frame.
2. Frame assembly to the roof.
3. Retainer and screws.
4. Window.

WATER LEAK CORRECTION (URETHANE ADHESIVE)

1. Trim the reveal molding from the shank in the area of the leak. Tape the molding to the window away from the leak area.
2. Apply water to the leak area to determine the extend of the leak.
   - Carefully push the glass outward in the location of the leak.
   - Mark the location of the leak on the glass with a grease pencil.

Clean

- Dirt or foreign material from the leak area with water. Dry the area with an air hose.

3. Trim the uneven edge of the adhesive material from the pinchweld flange at the leak point, and 8 mm (3 1/2 inches) on both sides of the leak (figure 3).
   - Using a sharp knife, keep the blade of the knife flat against the glass edge, and bottomed out on the pinchweld flange to trim the adhesive.
4. Prime the affected area with the primer supplied in GM Urethane Kit no. 9636067. Agitate the primer prior to use (figure 12).

CAUTION: See "Caution" on page 10A3-1 of this section.

5. Apply the adhesive material to the pinchweld in the area that was trimmed.
6. Work the adhesive material into the joint of the leak area using a flat-bladed tool.
7. Test the area for leaks using a light steady stream of warm or hot water. Do not run a heavy stream of water directly onto the freshly applied adhesive. If any leaks are found, work additional adhesive into that area.
8. Reinstall the reveal molding by embedding the bottom of the molding in the urethane. Tape the molding into place until the adhesive is completely cured.

BONDED REARVIEW MIRROR SUPPORT REPLACEMENT

1. Determine the location of the rearview mirror support (figure 25).

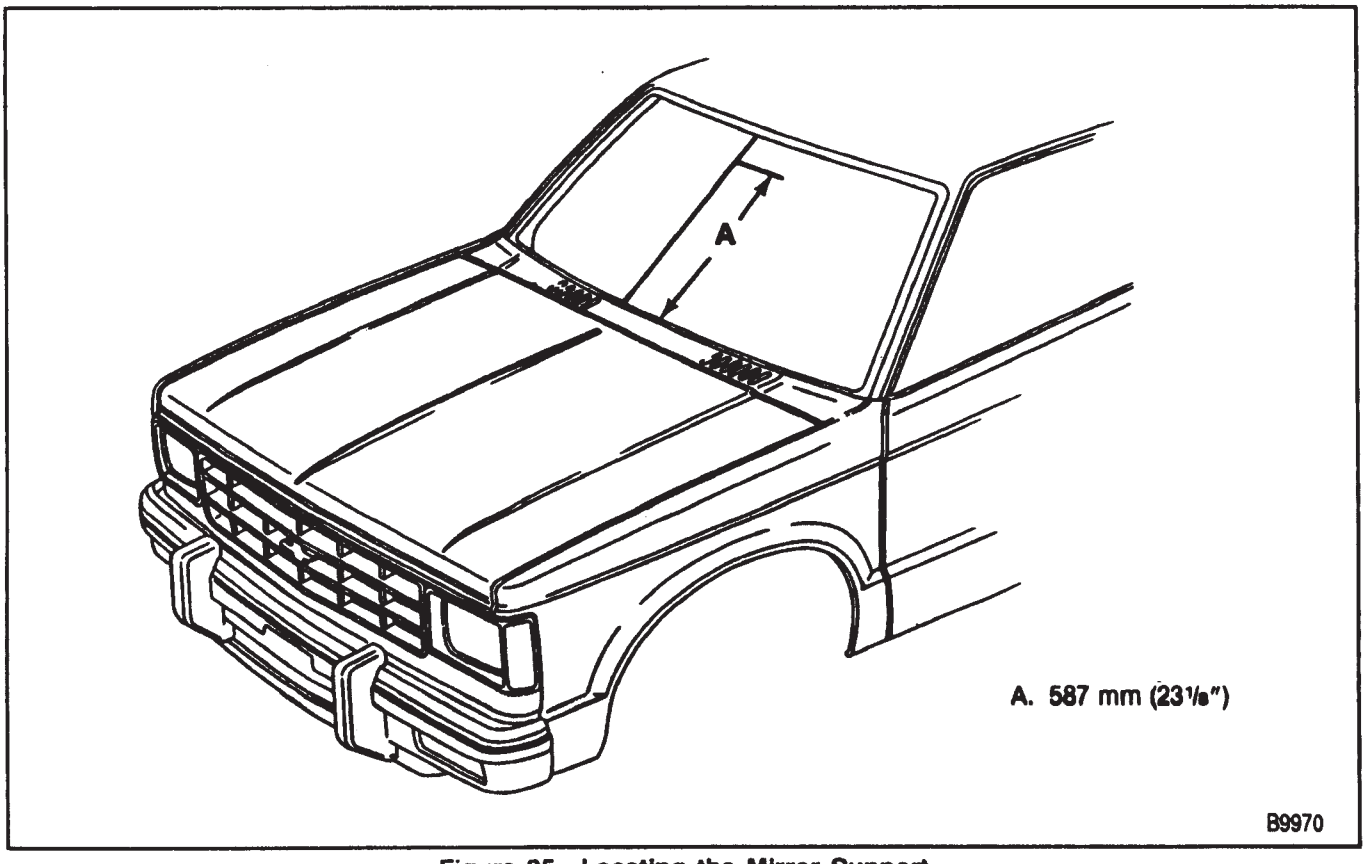


Figure 25—Locating the Mirror Support

- Using a wax pencil, draw a centerline on the outside of the glass from the roof panel to the windshield base.
- Draw a line intersecting the centerline 587 mm (23 1/8 inches) from the base of the glass. The base of the support will be located at the intersection of these lines.

Clean

- The inside glass surface within 75 mm (3 inches) of the intersecting lines. Using a glass cleaning solution, rub the area with a paper towel until it is completely clean and dry.
- Remove all traces of the cleaning solution from the glass with an alcohol saturated paper towel.

2. Rearview mirror support.
   - Sand the bonding surface of the rearview mirror support with no. 320 or no. 360 fine grit emory cloth or sandpaper. If the original rearview mirror support is reused, all traces of the factory installed adhesive must be removed.
   - Wipe the sanded mirror support with a clean alcohol saturated paper towel. Allow the alcohol to dry.
3. Apply Loctite Minute-Bond Adhesive 312, or equivalent to the rearview mirror support. Follow the manufacturers instructions.
4. Position the bottom of the support at the premarked line. The rounded edge of the support should face upward.
5. Press the support against the glass for 30 to 60 seconds with a steady pressure. Allow the adhesive 5 minutes to dry before cleaning.

Clean

- Any excess adhesive from around the mirror support with an alcohol moistened paper towel.
- Wax marks from the windshield with an alcohol moistened paper towel.

WINDOW POLISHING

MINOR SCRATCH AND ABRASION REMOVAL

Minor scratches and abrasions can be removed or reduced by following the procedure outlined below. Precautions must be taken, however, to prevent distortions of vision; double vision may result if an attempt is made to remove deep scratches. Deep scratches should not be removed from an area in the driver's line of vision; in such cases, the glass should be replaced.

The procedure that follows was developed using a cerium oxide compound. Follow manufacturer's directions if other materials are used.

Recommended Equipment

1. A low speed (600-1300 rpm) rotary polisher.
2. A wool felt, rotary polishing pad 7 mm (three inches in diameter and 51 mm (two inches) thick.
3. Powdered cerium oxide mixed with water. This is the abrasive compound.
4. A wide mouth container to hold the abrasive compound.

Polishing Procedure (Figure 26)

1. Mix at least 44 ml (1.5 oz.) of cerium oxide with enough water to obtain a creamy consistency. (If the mixture is too thick it will cake on the felt pad more quickly. If it is too runny, more polishing time will be needed.)
2. Draw a circle around the scratches on the opposite side of the glass with a marking crayon, or equivalent.
3. Draw a line directly behind the scratch(es) to serve as a guide for locating the scratch while polishing.
4. Cover the surrounding area with masking paper to catch the drippings or spattered polish.
5. Dip the felt pad attached to the polisher into the mixture. Do not submerge the pad or allow the pad to stay in the mixture as it may loosen the bond between the pad and the metal plate.

NOTICE: Never hold the tool in one spot or operate the tool on the glass any longer than 30 to 45 seconds. If the glass becomes hot to touch, let it air cool before proceeding further. Cooling with cold water may crack heated glass. Avoid excessive pressure. It may cause overheating of the glass.

6. Polish the scratched area, but note the following:
   - — Agitate the mixture as often as needed to maintain the creamy consistency of the compound.
   - — Use moderate but steady pressure.
   - — Hold the pad flat against the glass.
   - — Use a feathering-out motion.
   - — Dip the pad into the mixture every 15 seconds to ensure that the wheel and the glass are always wet during the polishing operation. (A dry pad causes excessive heat to develop.)
   - — Keep the pad free of dirt and other foreign substances.
7. After removing the scratch, wipe the area clean of any polish.
8. Clean the polishing pad.

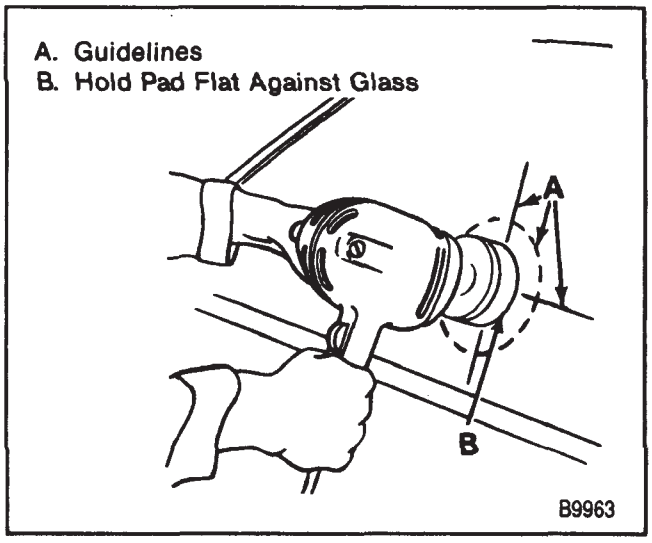


Figure 26—Window Polishing

SPECIAL TOOLS

349. Glass Sealant Removal Knife
350. Urethane Glass Sealant Remover

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SECTION 10A4

INTERIOR TRIM

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

CONTENTS (cont'd)

UTILITY VEHICLE TRIM

INSTRUMENT PANEL COMPARTMENT LOCK REPLACEMENT

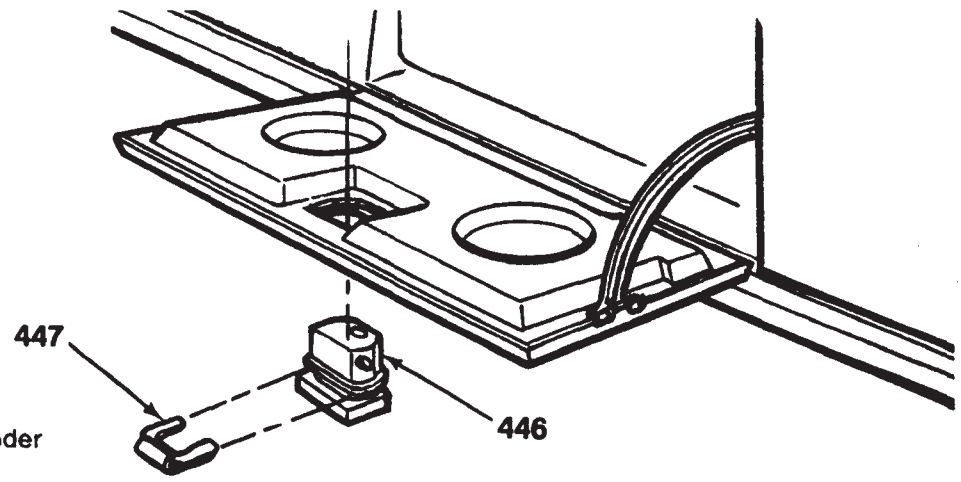
Remove or Disconnect (Figure 1)

- Open the instrument panel compartment.

1. Retainer clip from the back of the lock.
2. Lock.
   - Push the lock buttons together.
   - Pull the lock from the panel.

Install or Connect (Figure 1)

1. Lock.
   - Push the lock buttons together.
   - Push the lock into the panel.
2. Retainer clip to the back of the lock.



446. Lock Cylinder
447. Clip

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Figure 1—Instrument Panel Compartment Lock

349. Roof Inner Trim Panel
350. Rear Quarter Trim Upper Panel
351. Rear Roof Garnish Molding
352. End Gate Trim Panel
353. Carpet
354. Rear Scuff Plate
355. Rear Quarter Trim Lower Rear Panel
356. *Jack Stow Cover*
357. Fastener
358. Insulator
359. Rear Ash Tray
360. Rear Quarter Trim Panel Pocket
361. Front Door Sill Plate
362. Carpet
363. Rear Quarter Trim Lower Front Panel
364. Cowl Side Vent Cover
365. Radio Rear Speaker Cover
366. Rear Quarter Trim Panel Insert
367. Plate
368. Rear Seat Arm Rest
369. Windshield Garnish Molding
370. *Assist Handle Cover*
371. Assist Handle
372. Sunshade
373. Vanity Mirror
374. Assist Strap Handle
375. Coat Hook

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Figure 2—Utility Vehicle Components

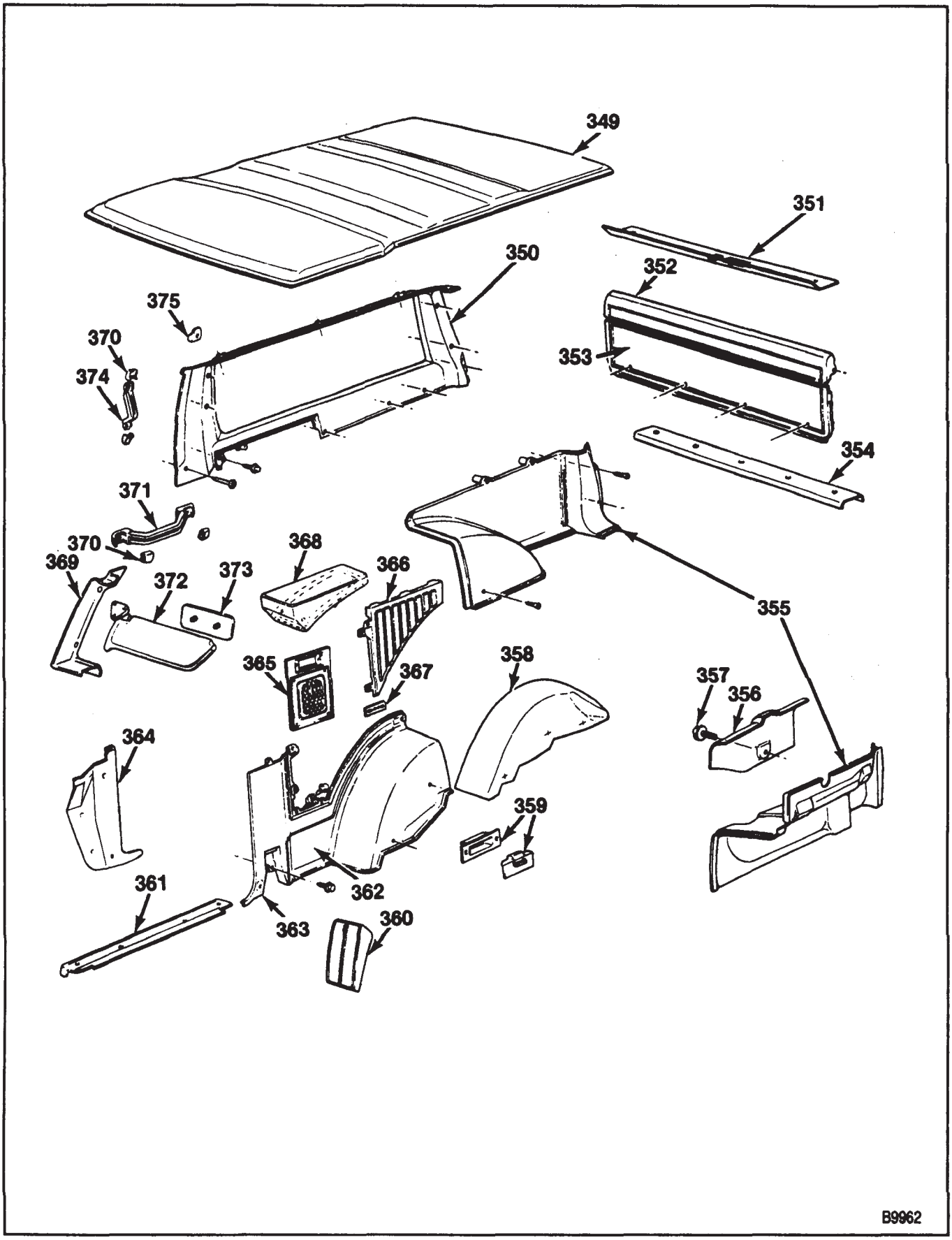


Figure 3—Utility Vehicle Trim Components

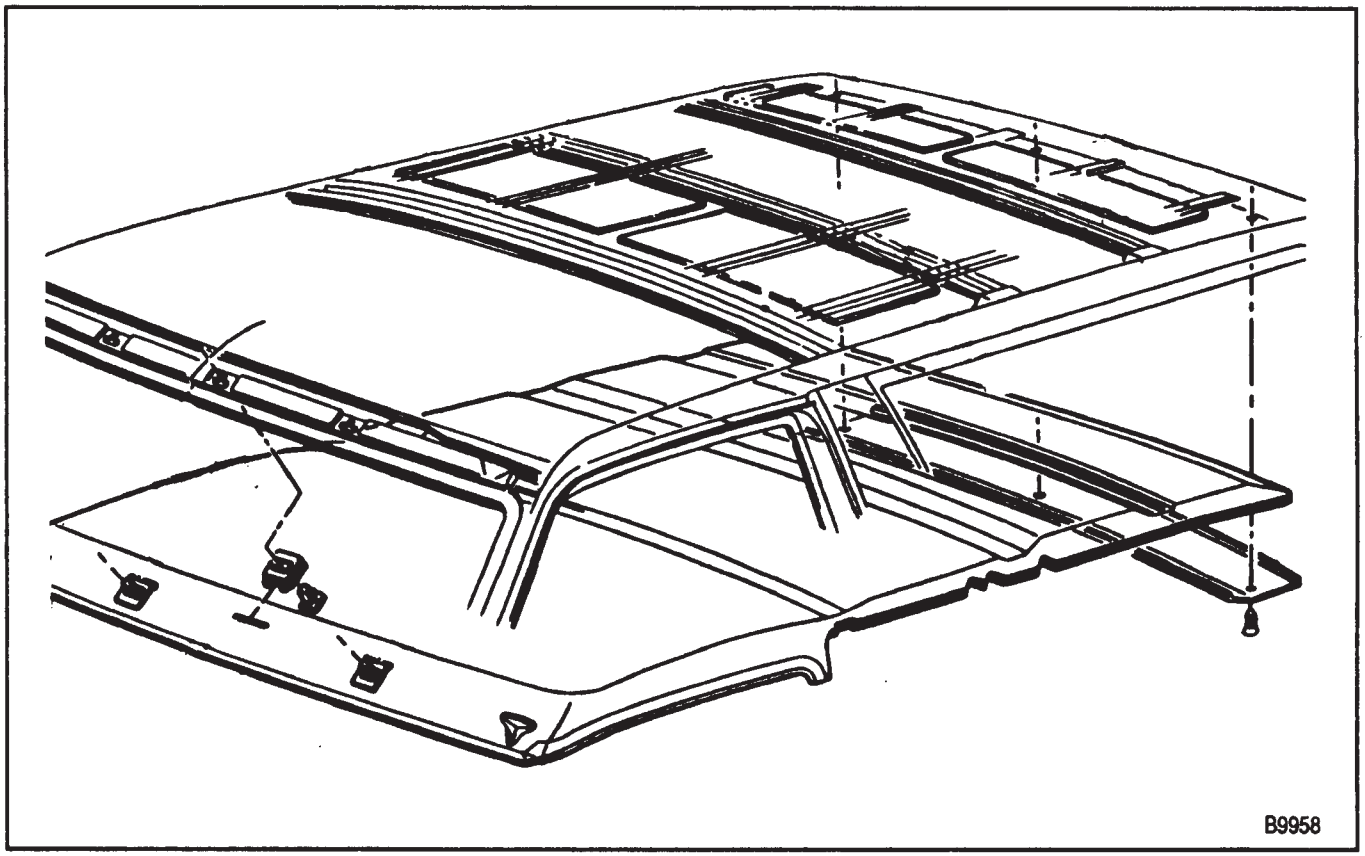


Figure 4—Roof Inner Trim Panel

ROOF INNER TRIM PANEL REPLACEMENT

Remove or Disconnect (Figures 2, 3, and 4)

1. Right and left windshield garnish moldings.
2. Right and left sunshades.
3. Rear roof garnish molding.
4. Right and left rear quarter trim upper panels.
5. Dome lamp.
6. Roof vent lower frame, if used.
7. Roof inner trim panel from the vehicle.
   - Grasp the panel on the left and right sides.
   - Shift the panel from side to side while lightly pulling down on the panel to disengage the panel from the roof.
8. Retainers from the trim panel.

Install or Connect (Figures 2, 3, and 4)

1. Retainers to the trim panel.
2. Roof inner trim panel to the vehicle.
   - Push the retainers into the slots in the roof panel.
3. Dome lamp.
4. Right and left rear quarter trim upper panels.
5. Rear roof garnish molding.
6. Right and left sunshades.
7. Right and left windshield garnish moldings.
8. Roof window vent lower frame, if used.

REAR QUARTER TRIM UPPER MOLDING REPLACEMENT

Remove or Disconnect (Figure 5)

1. Rear roof garnish molding.
2. Front seat belt upper anchor plate.
3. Panel screws.
4. Panel from the vehicle.

Install or Connect (Figure 5)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Panel to the vehicle.
2. Panel screws.
3. Front seat belt upper anchor plate.
4. Rear roof garnish molding.

REAR ROOF GARNISH MOLDING REPLACEMENT

Remove or Disconnect (Figure 6)

1. Garnish molding screws.
2. Garnish molding from the vehicle.

Install or Connect (Figure 6)

NOTICE: For step 2 see "Notice" on page 10A4-1.

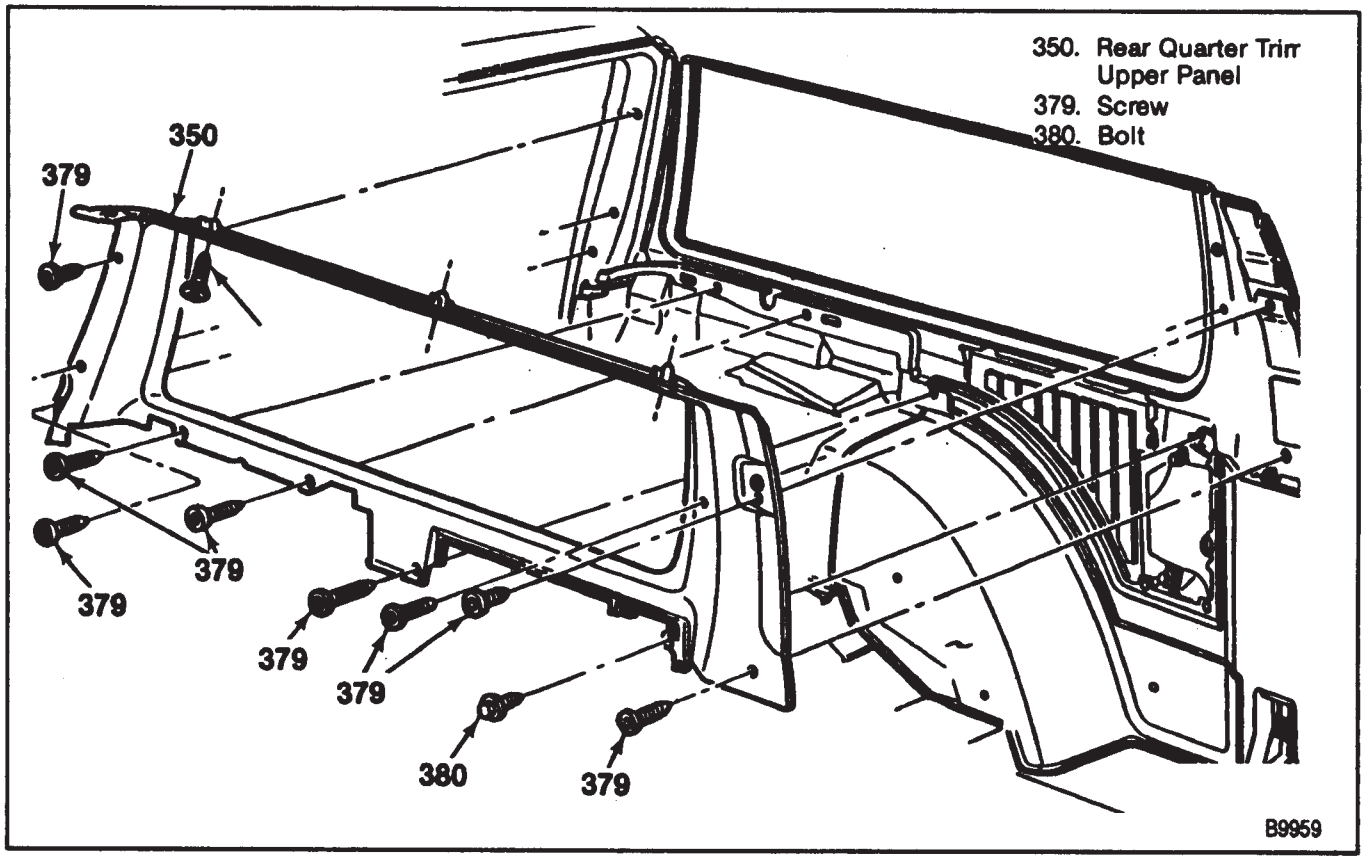


Figure 5—Rear Quarter Trim Upper Panel

1. Garnish molding to the vehicle.
2. Garnish molding screws.

REAR FLOOR PANEL SCUFF PLATE REPLACEMENT

Remove or Disconnect (Figure 7)

1. Scuff plate screws.
2. Scuff plate from the vehicle.

Install or Connect (Figure 7)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Scuff plate to the vehicle.
2. Scuff plate screws.

REAR QUARTER TRIM LOWER REAR PANEL REPLACEMENT

Remove or Disconnect (Figure 8)

1. Floor panel rear scuff plate.
2. Jack cover and jack (left side only).
3. Trim panel screws.

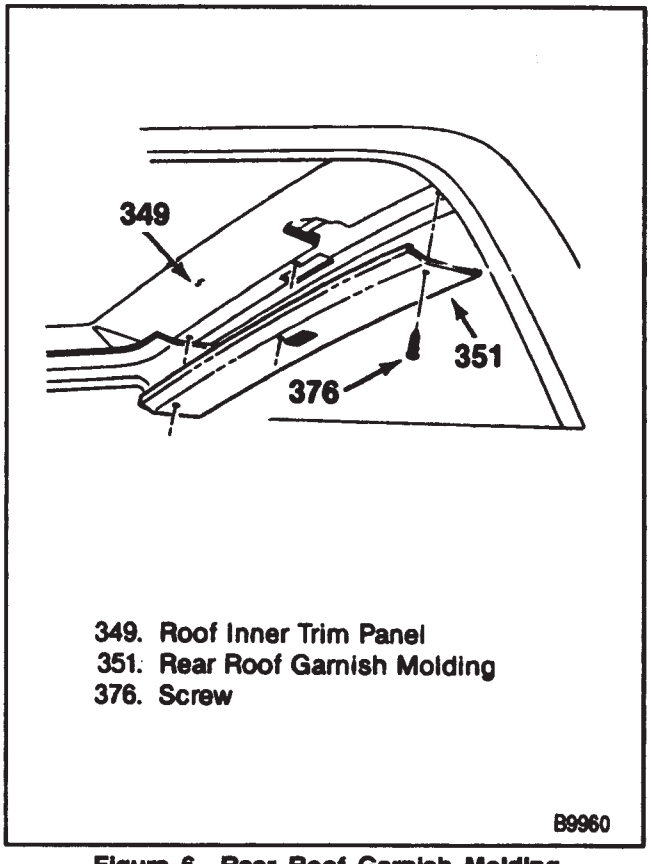


Figure 6—Rear Roof Garnish Molding

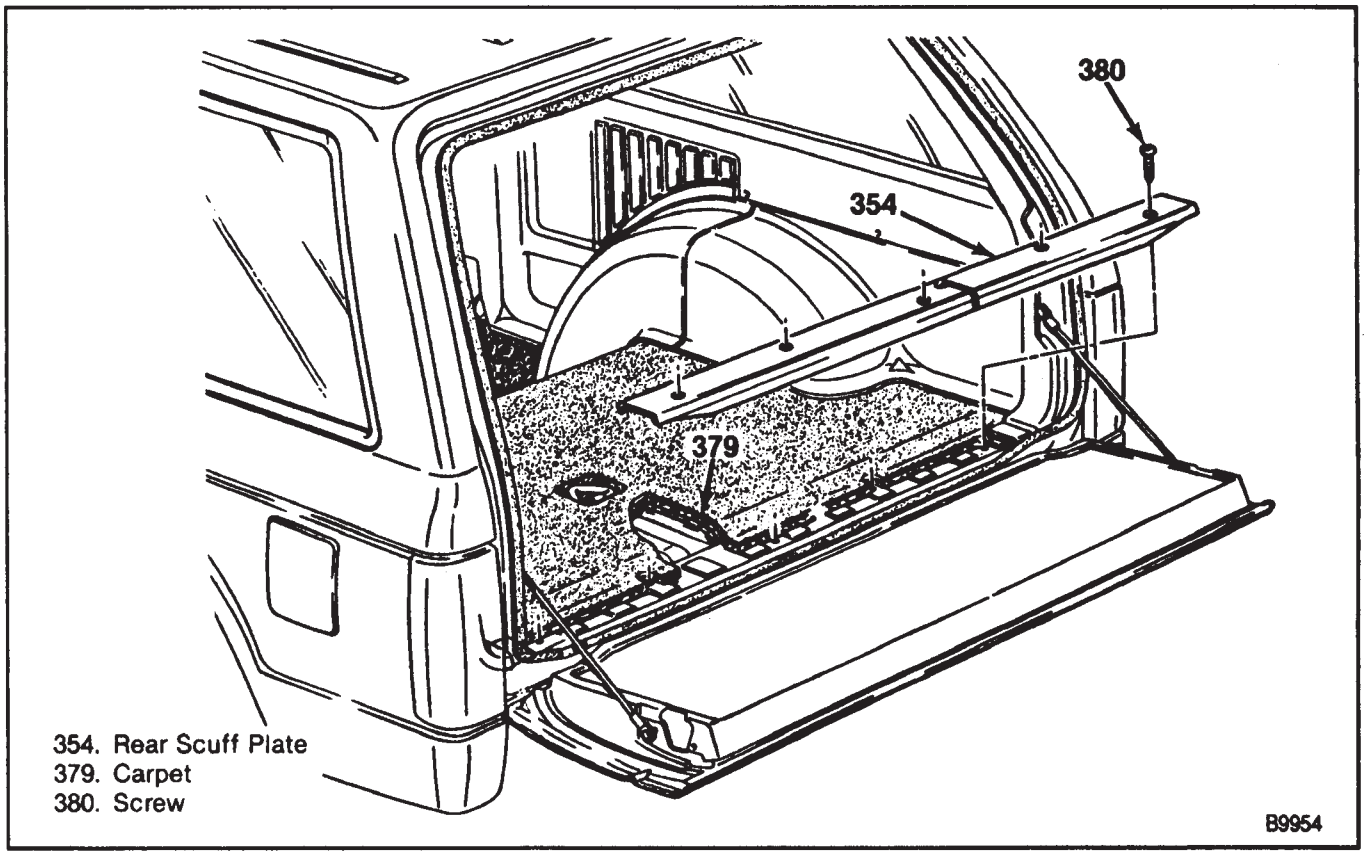


Figure 7—Rear Floor Panel Scuff Plate

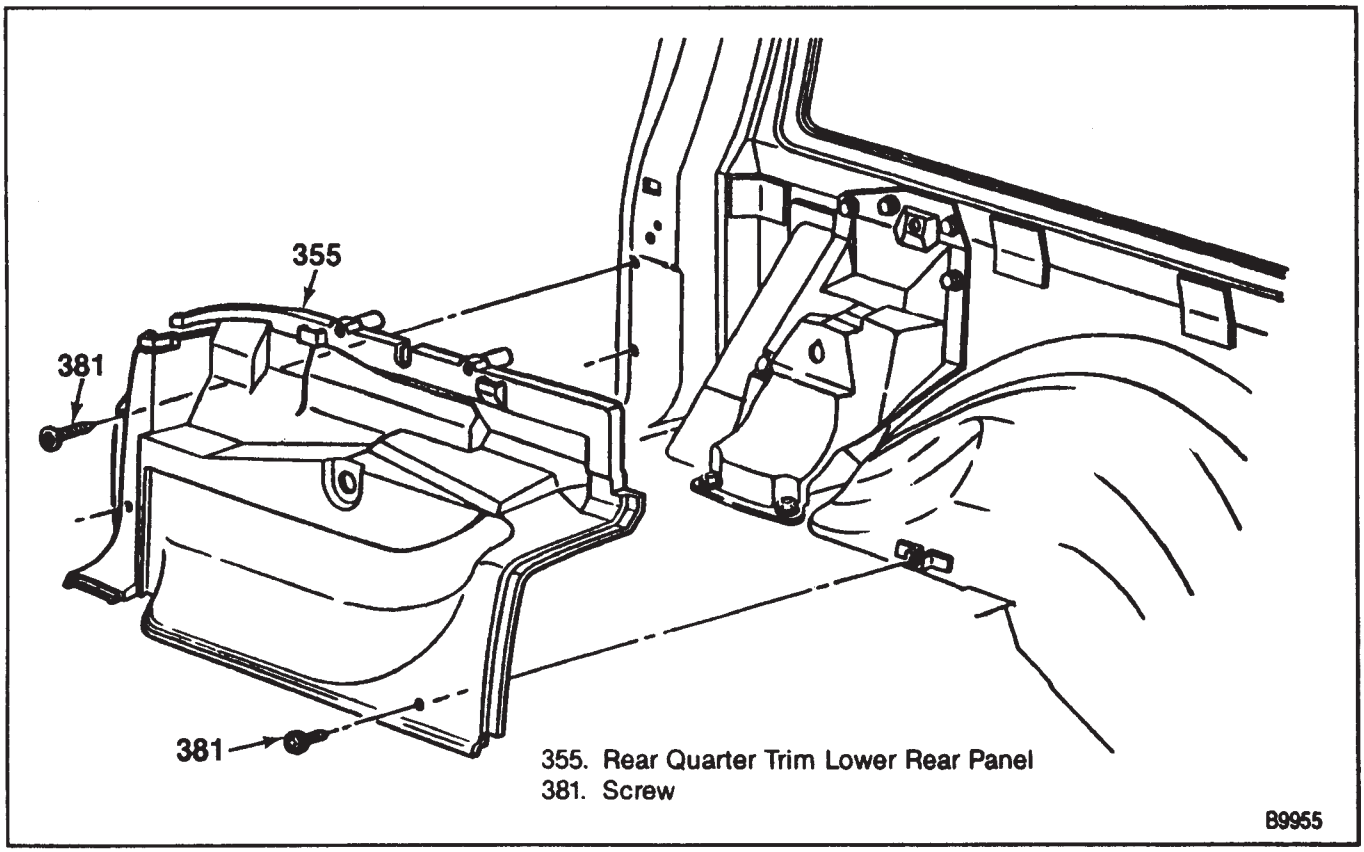


Figure 8—Rear Quarter Trim Lower Rear Panel

4. Trim panel from the vehicle.

Install or Connect (Figure 8)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Trim panel to the vehicle.
2. Trim panel screws.
3. Jack cover and jack (left side only).
4. Floor panel rear scuff plate.

REAR QUARTER TRIM LOWER FRONT PANEL REPLACEMENT

Remove or Disconnect (Figure 9)

1. Front seat belt retractor at the floor panel.
2. Rear speaker cover.
3. Rear seat front pivot bolts.
   - Lift the front of the seat.
4. Trim panel screws.
5. Trim panel bolts.
6. Trim panel from the vehicle.

Install or Connect (Figure 9)

NOTICE: For steps 2, 3 and 4 see "Notice" on page 10A4-1.

1. Trim panel to the vehicle.
2. Trim panel bolts.
3. Trim panel screws.
4. Rear seat front pivot bolts.
5. Rear speaker cover.
6. Front seat belt retractor at the floor panel.

TRIM PANEL POCKET REPLACEMENT

Remove or Disconnect (Figure 2)

1. Rear quarter trim lower front panel.
2. Pocket retaining nuts from the underside of the trim panel.
3. Trim panel pocket from the trim panel.

Install or Connect (Figure 2)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Trim panel pocket to the trim panel.
2. Pocket retaining nuts to the pocket studs on the underside of the trim panel.
3. Rear quarter trim lower front panel.

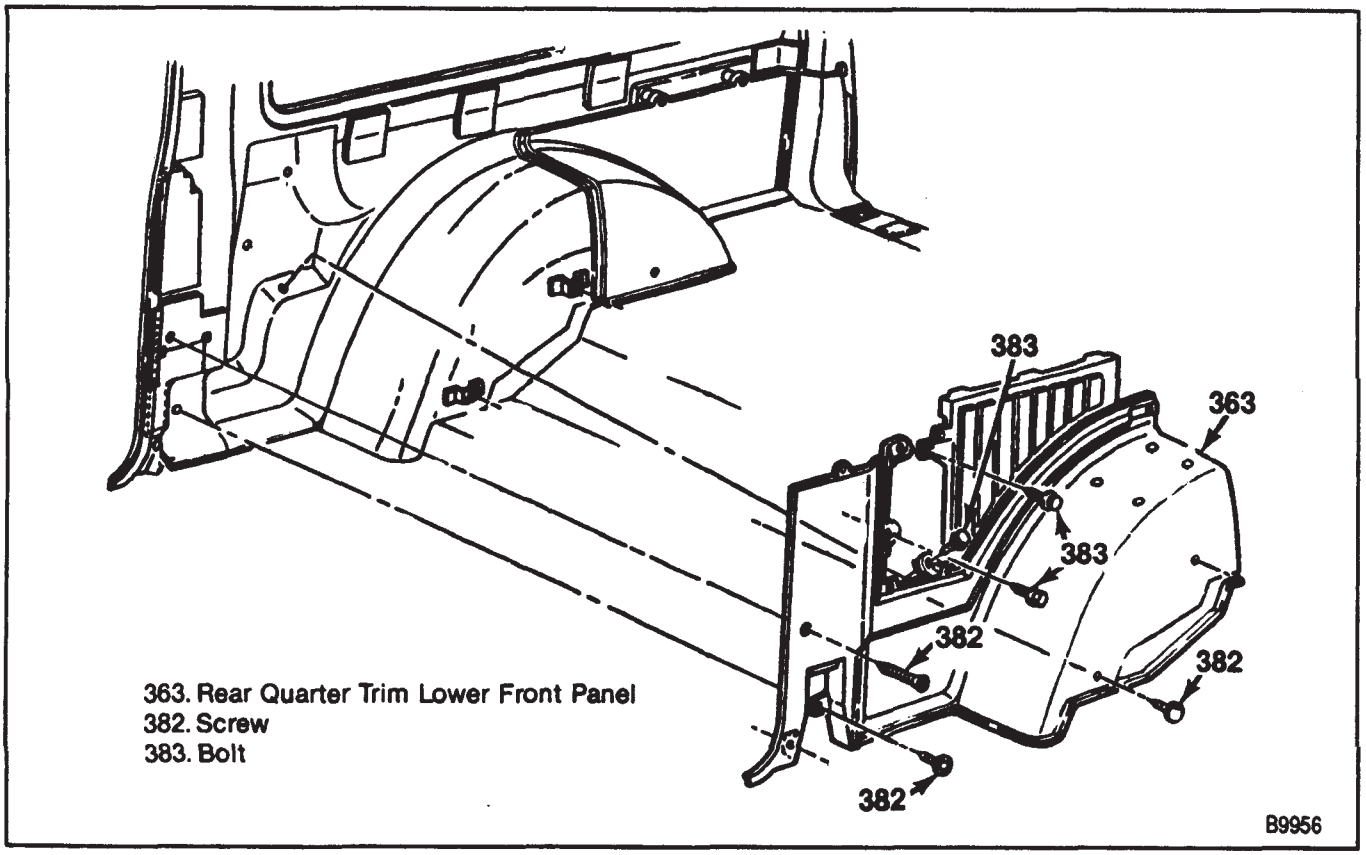


Figure 9—Rear Quarter Trim Lower Front Panel

REAR SEAT ARM REST REPLACEMENT

Remove or Disconnect (Figure 10)

1. Rear quarter trim lower front panel from the vehicle.
2. Arm rest nuts from the underside of the panel.
3. Arm rest from the panel.

Install or Connect (Figure 10)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Arm rest to the panel.
2. Arm rest nuts onto the arm rest studs under the panel.
3. Rear quarter trim lower front panel to the vehicle.

RADIO REAR SPEAKER COVER REPLACEMENT

Remove or Disconnect (Figure 2)

1. Ash tray bracket.
2. Rear speaker cover screws.
3. Rear speaker cover from the vehicle.

Install or Connect (Figure 2)

NOTICE: For step 2 see "Notice" on page 10A4-1.

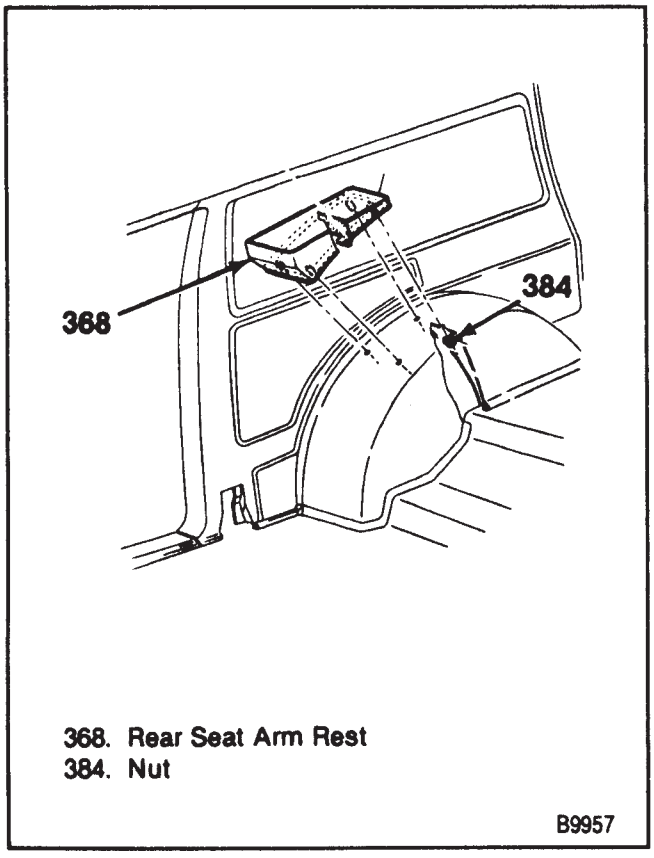


Figure 10—Rear Seat Arm Rest

1. Rear speaker cover to the vehicle.
2. Rear speaker cover screws.
3. Ash tray bracket.

REAR ASH TRAY REPLACEMENT

Remove or Disconnect (Figure 11)

1. Ash tray from the ash tray bracket.
   - Depress the tang and pull the ash tray from the bracket.
2. Screws retaining the bracket to the rear speaker cover.
3. Bracket from the rear speaker cover.

Install or Connect (Figure 11)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Ash tray bracket to the rear speaker cover.
2. Screws retaining the bracket to the rear speaker cover.
3. Ash tray to the ash tray bracket.

REAR QUARTER TRIM PANEL INSERT REPLACEMENT

Remove or Disconnect (Figure 2)

1. Radio rear speaker cover.
2. Rear quarter trim upper panel.
3. Insert panel screws.
4. Trim panel insert from the vehicle.

Install or Connect (Figure 2)

NOTICE: For step 2 see "Notice" on page 10A4-1.

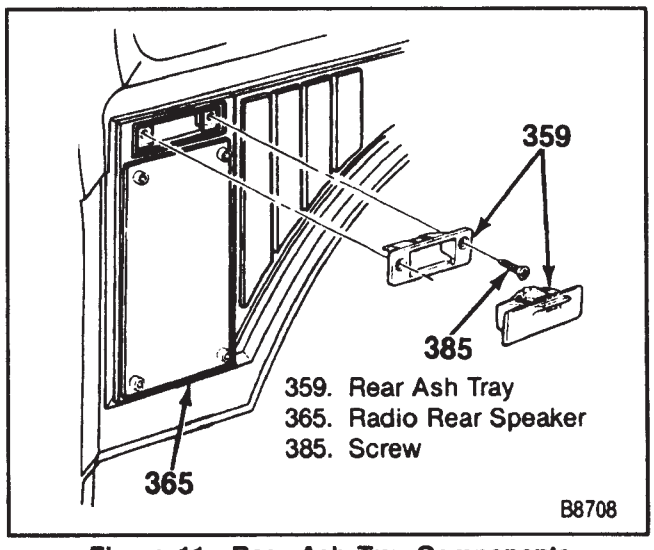


Figure 11—Rear Ash Tray Components

1. Trim panel insert to the vehicle.
2. Insert panel screws.
3. Rear quarter trim upper panel.
4. Radio rear speaker cover.

FRONT DOOR SILL PLATE REPLACEMENT

Remove or Disconnect (Figure 12)

1. Sill plate screws.
2. Sill plate from the vehicle.

Install or Connect (Figure 12)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Sill plate to the vehicle.
2. Sill plate screws.

COWL SIDE VENT COVER REPLACEMENT

Remove or Disconnect (Figure 2)

1. Front door sill plate.
2. Cowl side vent cover screws.
3. Cowl side vent cover from the vehicle.

Install or Connect (Figure 2)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Cowl side vent cover to the vehicle.
2. Cowl side vent cover screws.
3. Front door sill plate.

FLOOR CARPET OR MAT REPLACEMENT

Remove or Disconnect (Figures 13 and 14)

1. Front seat or seats.
2. Rear seat.
3. Front door sill plates.
4. Front floor console (where used).
5. Floor panel rear scuff plate.
6. Front and rear seat belt blades and retractors from the floor panel.
7. Right and left rear quarter trim lower front panels.
8. Right and left rear quarter trim lower rear panels.
9. Right and left cowl side vent covers.
10. Rear seat floor opening filler panel.
11. Carpet or mat from the vehicle.

Install or Connect (Figures 13 and 14)

1. Carpet or mat to the vehicle.
2. Rear seat floor opening filler panel.
3. Right and left cowl side vent covers.
4. Right and left rear quarter trim lower rear panels.
5. Right and left rear quarter trim lower front panels.
6. Front and rear seat belt blades and retractors to the floor panel.
7. Floor panel rear scuff plate.

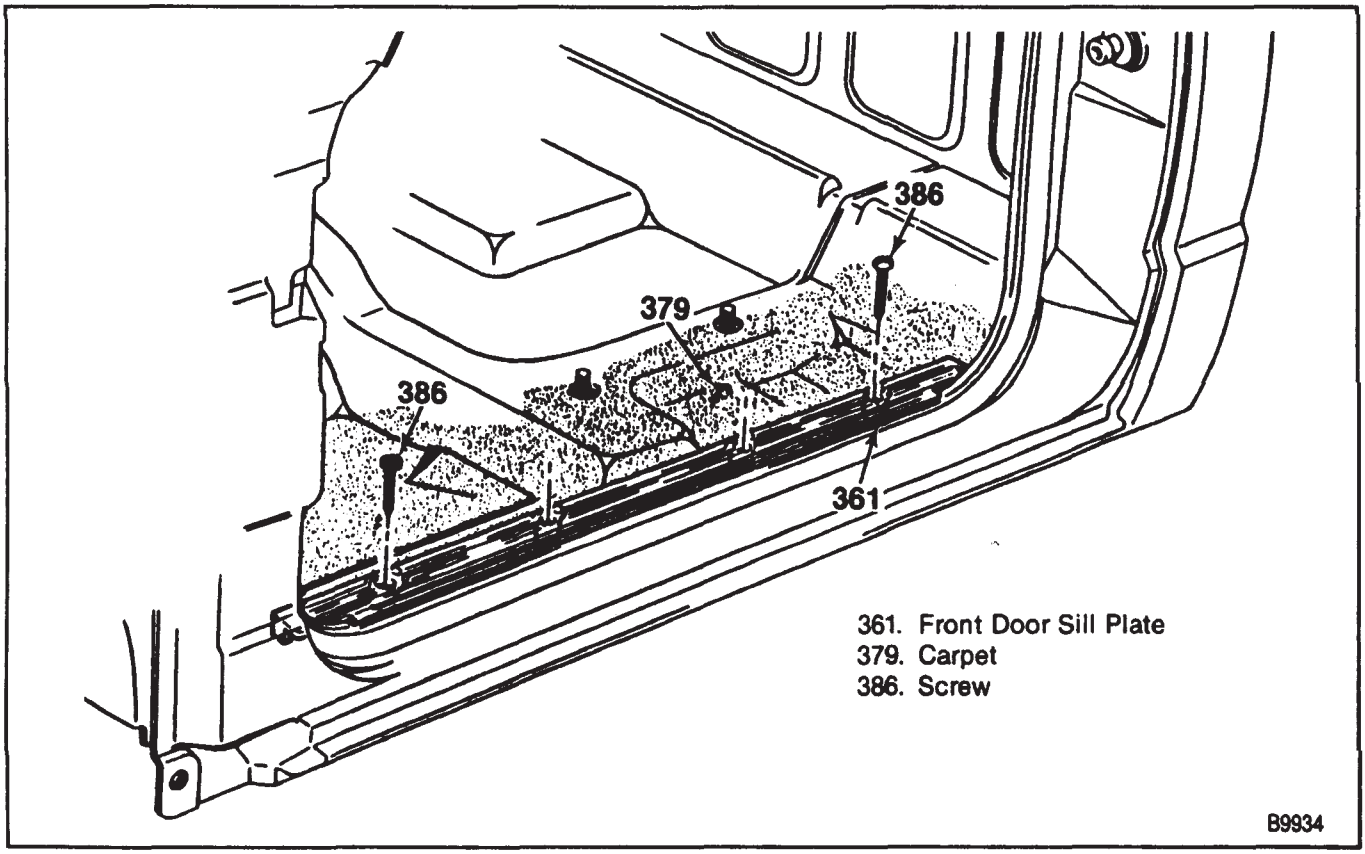


Figure 12—Front Door Sill Plate

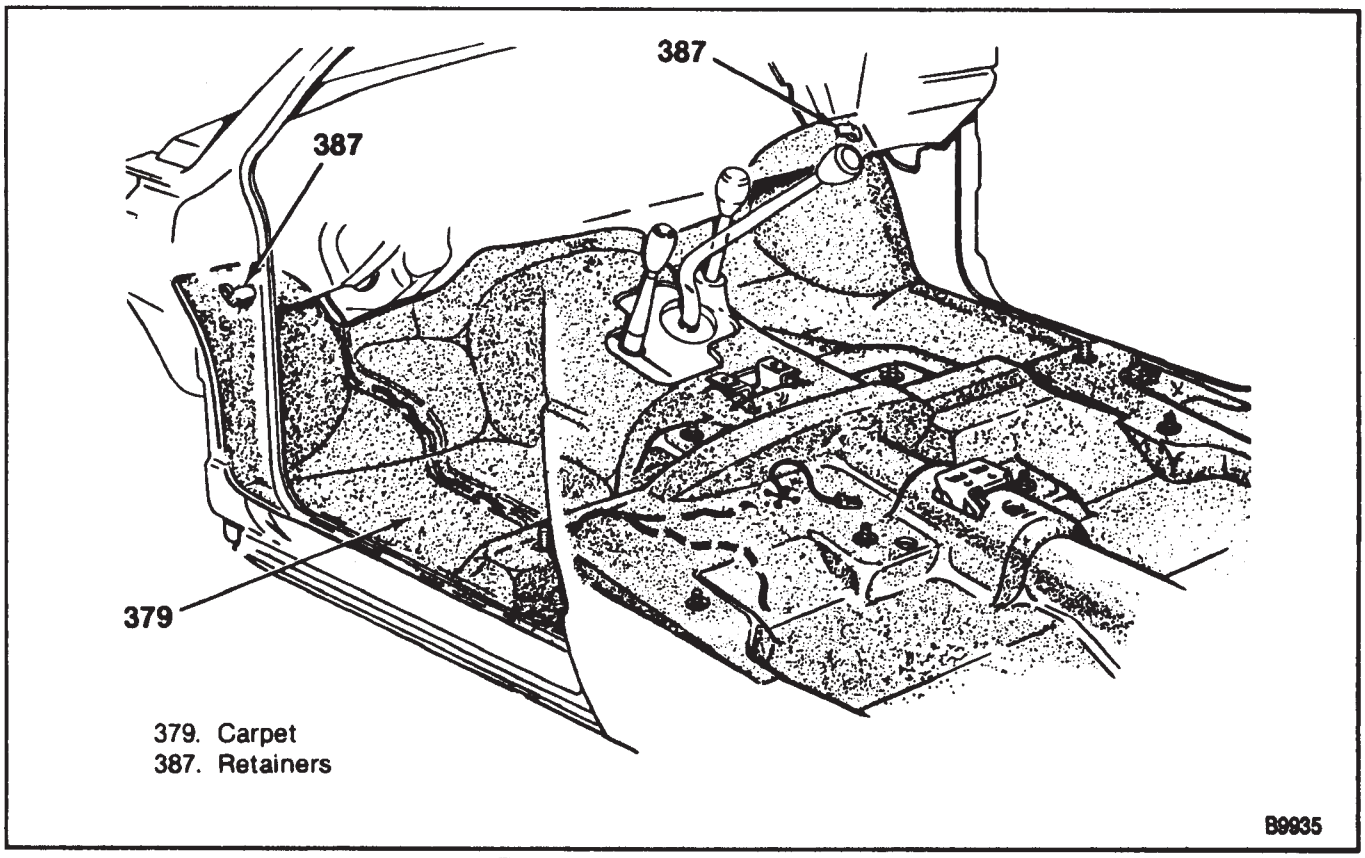


Figure 13—Front Floor Carpet

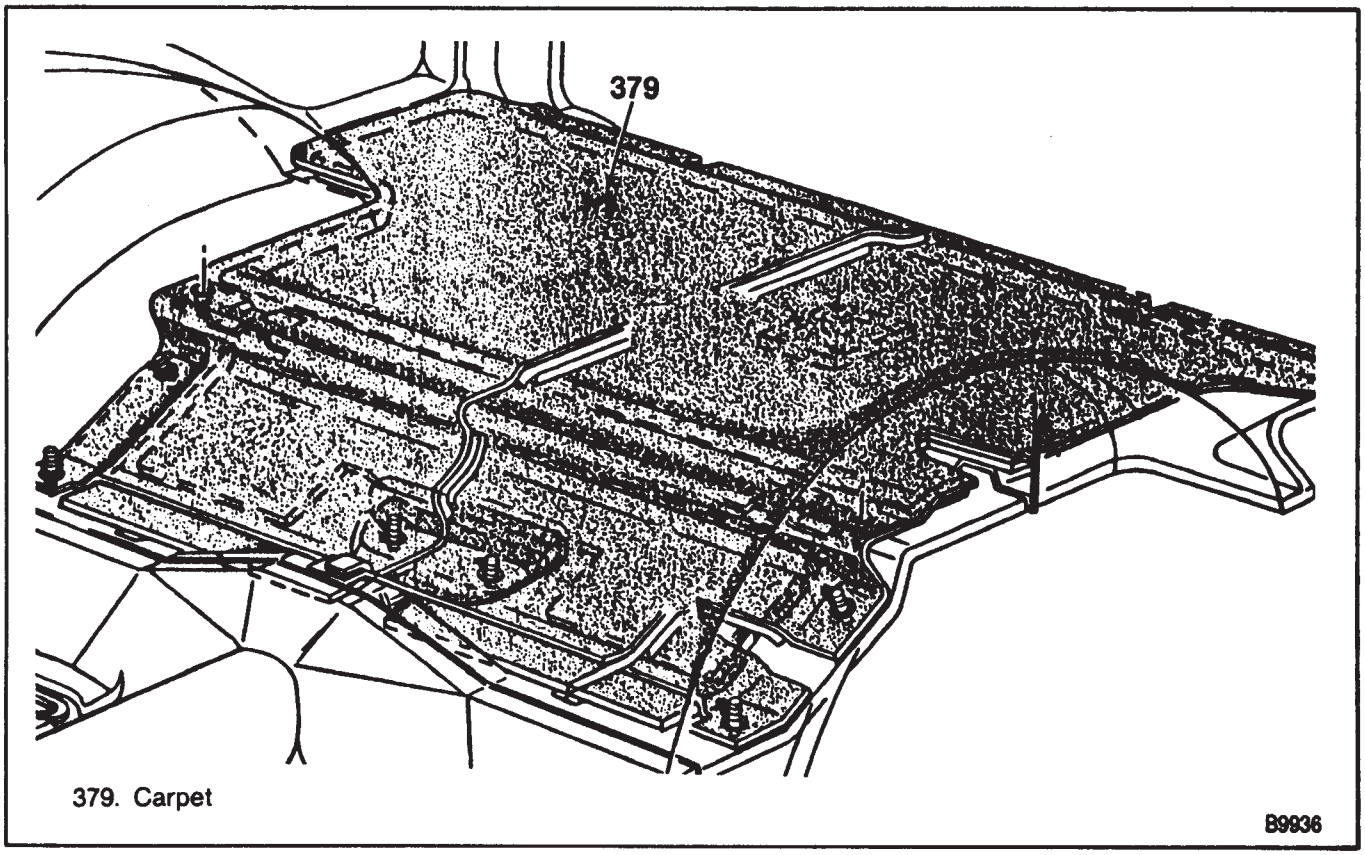


Figure 14—Rear Floor Carpet

8. Front floor console (where used).
9. Rear seat.
10. Front seat(s).

WINDSHIELD GARNISH MOLDING REPLACEMENT

Remove or Disconnect (Figure 2)

1. Screws attaching the molding to the pillar.
2. Molding from the windshield pillar.
   - Pull it upwards to remove.

Install or Connect (Figure 2)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Molding to the windshield pillar.
2. Screws attaching the molding to the pillar.

SUNSHADE REPLACEMENT

Remove or Disconnect (Figure 15)

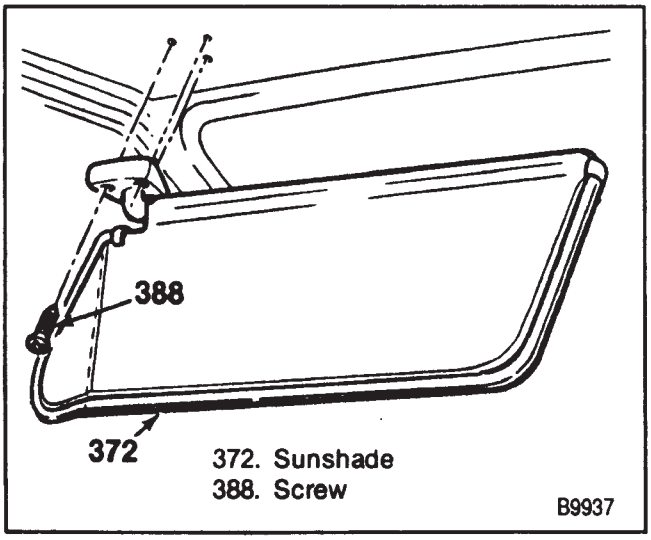
Tool Required:
J 24595-B Garnish Cip Remover

1. Sunshade screws.
2. Sunshade from the roof.
3. Vanity mirror (if used) from the sunshade using J 24595-B.

Install or Connect (Figure 15)

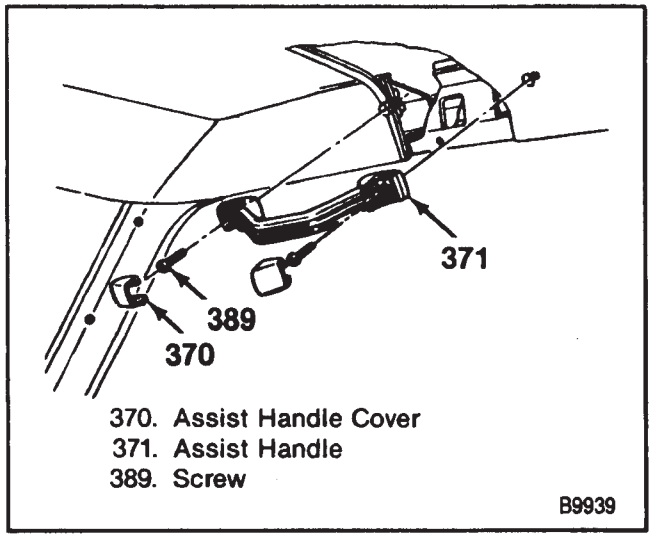
NOTICE: For step 3 see "Notice" on page 10A4-1.

1. Vanity mirror to the sunshade.
2. Sunshade to the roof.
3. Sunshade screws.



372. Sunshade
388. Screw
B9937

Figure 15—Sunshade Components



370. Assist Handle Cover
371. Assist Handle
389. Screw
B9939

Figure 16—Assist Handle Components

ASSIST HANDLE REPLACEMENT

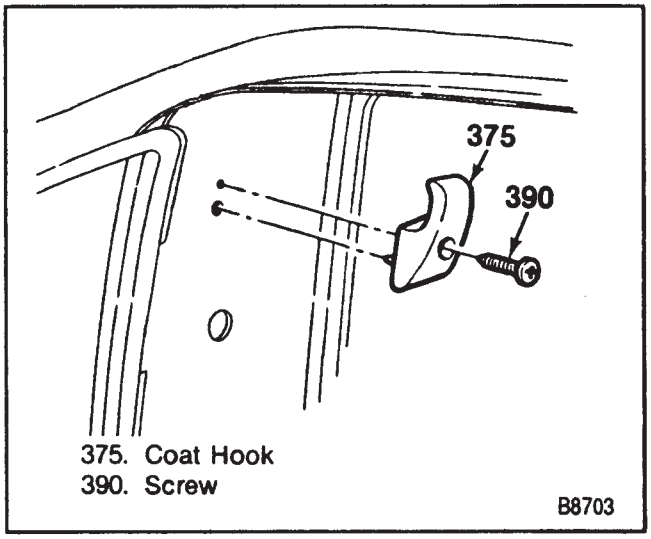
Remove or Disconnect (Figure 16)

1. Assist handle covers.
   - Insert a flat-bladed tool between the cover and the handle. Tap the end of the tool with the palm of the hand to remove.
2. Assist handle screws.
3. Assist handle from the vehicle.

Install or Connect (Figure 16)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Assist handle to the vehicle.
2. Assist handle screws.
3. Assist handle covers.
   - Snap the covers into place.



375. Coat Hook
390. Screw
B8703

Figure 17—Coat Hook Components

COAT HOOK REPLACEMENT

Remove or Disconnect (Figure 17)

1. Coat hook screw.
2. Coat hook from the vehicle.

Install or Connect (Figure 17)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Coat hook to the vehicle.
2. Coat hook screw.

EXTENDED CAB TRIM

ROOF TRIM PANEL REPLACEMENT

Remove or Disconnect (Figures 18 and 19)

1. Rear quarter trim panel garnish molding.
2. Right and left rear quarter trim upper moldings.
3. Right and left windshield garnish moldings.
4. Right and left sunshades.
5. Roof vent window lower frame, if used.
6. Roof trim panel from the vehicle.
   - Grasp the panel on the left and right sides near the front of the cab.
   - Shift the panel from side to side while lightly pulling down on the panel to disengage the front of the panel from the roof.
7. Retainers from the trim panel.
   - Slide the retainer from the slit at the front of the trim panel.

Install or Connect (Figures 18 and 19)

1. Retainers to the trim panel.
   - Slide the retainer into the slit at the front of the trim panel.
2. Roof trim panel to the vehicles.
   - Insert the retainers into the windshield frame.
3. Right and left sunshades.
4. Right and left windshield garnish moldings.
5. Right and left rear quarter trim upper moldings.
   - Lift the roof trim panel into place, and install the moldings over the panel.
6. Rear quarter trim panel garnish molding.
7. Roof vent window lower frame, if used.

UPPER REAR QUARTER TRIM MOLDING REPLACEMENT

Remove or Disconnect (Figure 20)

1. Rear quarter trim panel garnish molding.
2. Seat belt anchor bolt.
3. Trim molding screws.
4. Trim molding from the vehicle.

Install or Connect (Figure 20)

NOTICE: For steps 2 and 3 see "Notice" on page 10A4-1.

1. Trim molding to the vehicle.
2. Trim molding screws.
3. Seat belt anchor bolts.

Tighten

- Anchor bolt to 53 N.m (39 ft. lbs.).

4. Rear quarter trim panel garnish molding.

REAR QUARTER TRIM PANEL GARNISH MOLDING REPLACEMENT

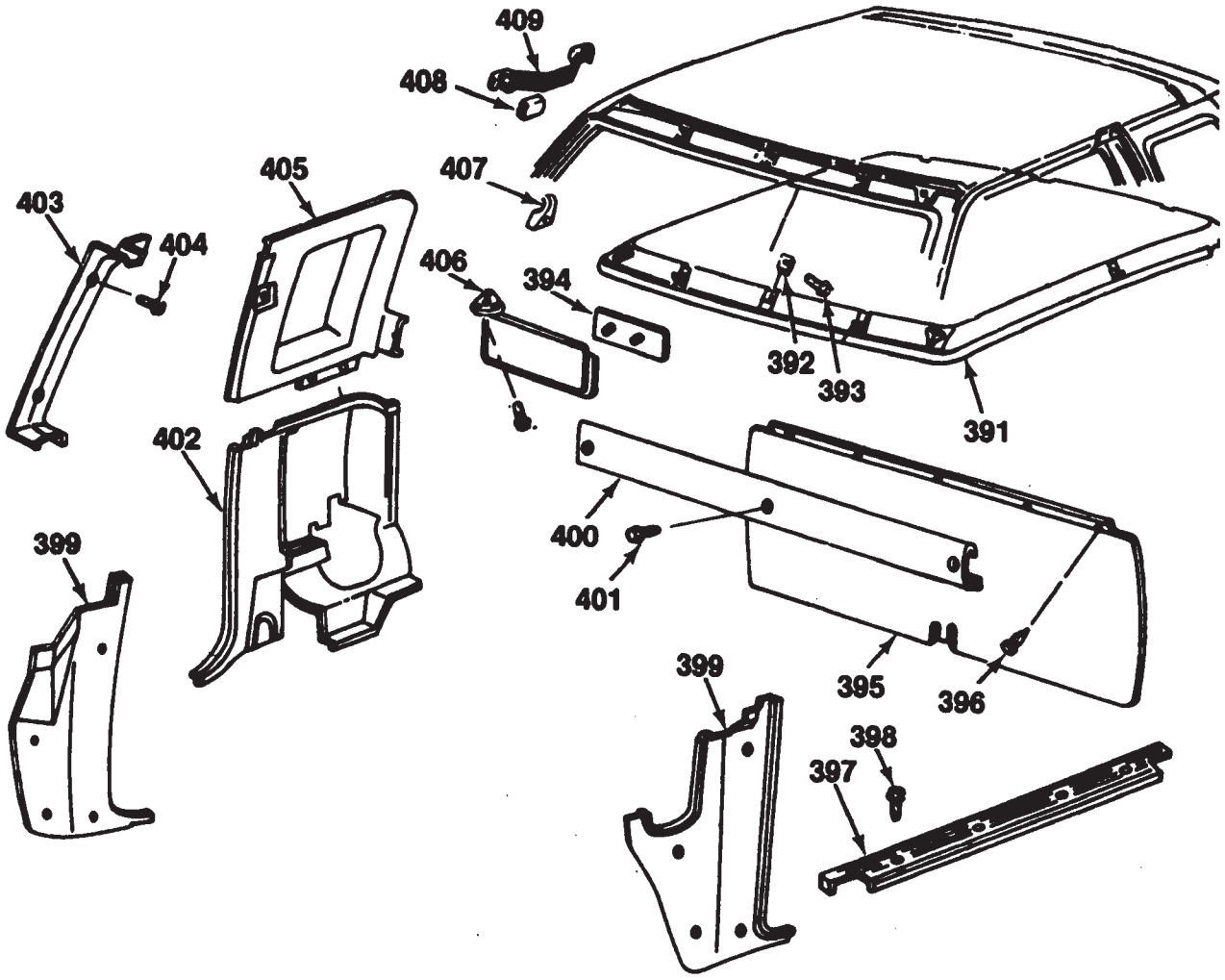
Remove or Disconnect (Figure 21)

1. Garnish molding screws.
2. Garnish molding from the vehicle.

Install or Connect (Figure 21)

NOTICE: For step 2 see "Notice" on page 10A4-1.

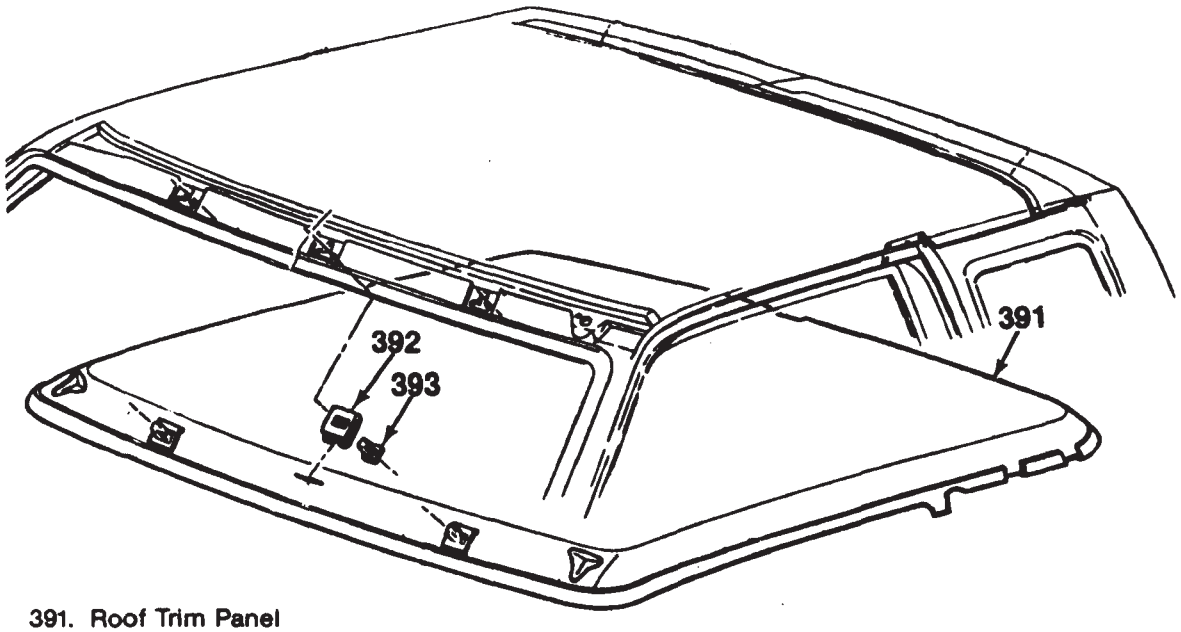
1. Garnish molding to the vehicle.
2. Garnish molding screws.



391. Roof Trim Panel
392. Roof Trim Panel Retainer
393. Trim Fastener
394. Vanity Mirror
395. Rear Carpet Panel
396. Retainer
397. Door Sill Plate
398. Screw
399. Cowl Side Vent Cover
400. Rear Quarter Trim Panel Molding
401. Screw
402. Rear Quarter Trim Lower Panel
403. Windshield Garnish Molding
404. Screw
405. Rear Quarter Trim Upper Molding
406. Sunshade
407. Coat Hook
408. Assist Handle Cover
409. Assist Handle

B9929

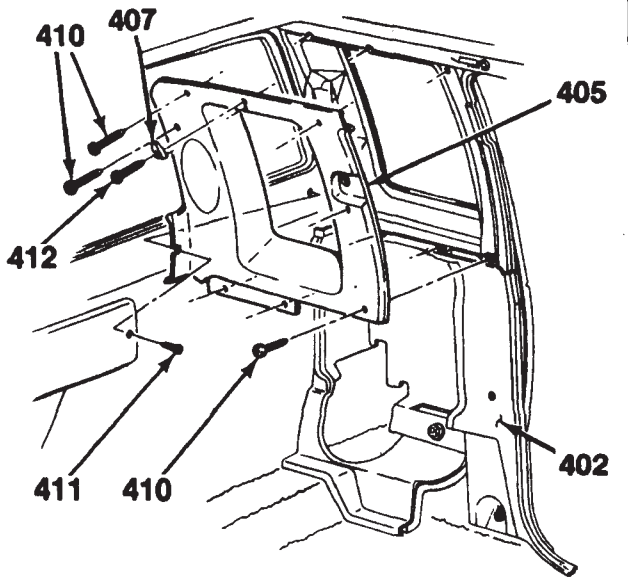
Figure 18—Extended Cab Trim Components



391. Roof Trim Panel
392. Roof Trim Panel Retainer
393. Trim Fastener

B9930

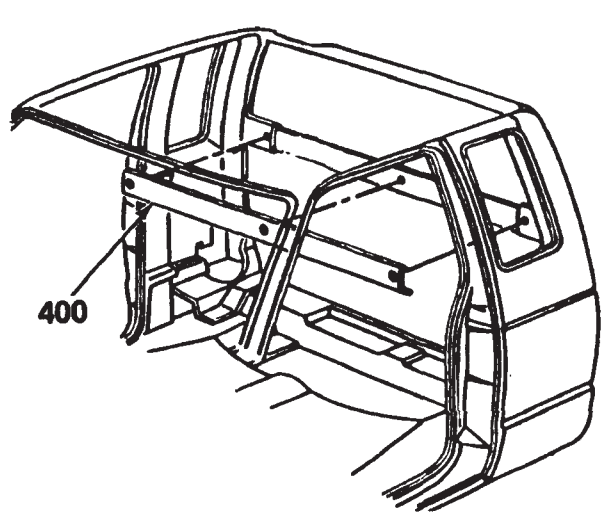
Figure 19—Roof Inner Trim Panel



402. Rear Quarter Trim Lower Panel
405. Rear Quarter Trim Upper Molding
407. Coat Hook
410. Screw
411. Screw
412. Screw

B9931

Figure 20—Upper Rear Quarter Trim Molding



400. Rear Quarter Trim Panel Molding

B9925

Figure 21—Rear Quarter Trim Panel Garnish Molding

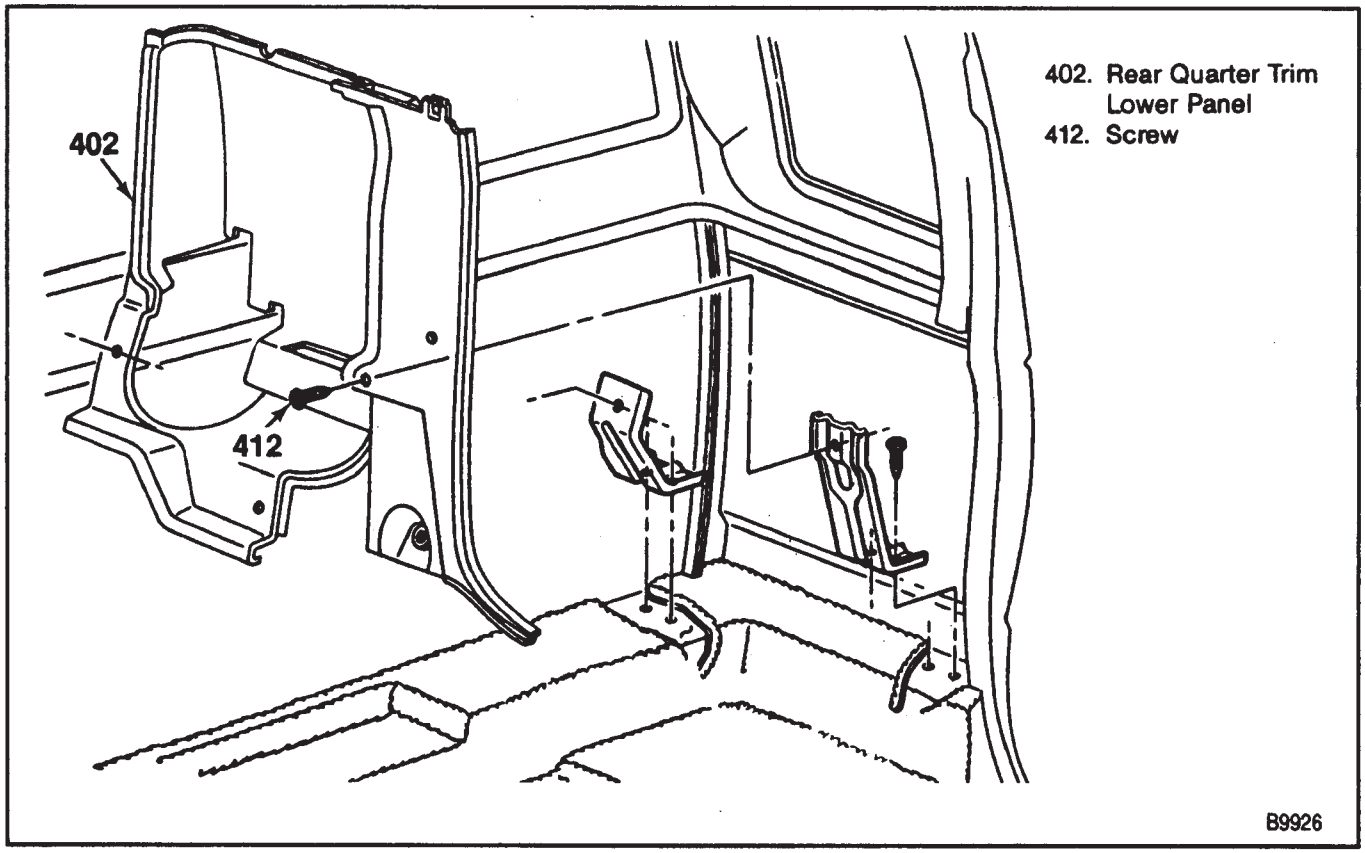


Figure 22—Rear Quarter Trim Lower Panel

REAR QUARTER TRIM LOWER PANEL REPLACEMENT

Remove or Disconnect (Figure 22)

1. Door sill plate.
2. Lower trim panel screws.
3. Lower trim panel from the vehicle.
   - Slide the top edge of the lower trim panel from under the upper trim panel.

Install or Connect (Figure 22)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Lower trim panel to the vehicle.
   - Slide the top edge of the lower trim panel under the upper trim panel.
   - Align the holes in the two panels.
2. Lower trim panel screws.
3. Door sill plate.

REAR CARPET PANEL REPLACEMENT

Tools Required:
J 24595-B, Garnish Clip Remover

Remove or Disconnect (Figure 23)

1. Rear quarter trim panel garnish molding.
2. Right and left rear quarter trim upper molding.
3. Right and left rear quarter trim lower panel.
4. Rear carpet panel retainers using J 24595-B.
5. Rear carpet panel from the lower hook and loop retainers.
6. Rear carpet panel from the vehicle.

Install or Connect (Figure 23)

1. Rear carpet panel to the vehicle.
2. Rear carpet panel to the lower hook and loop retainers.
   - Press on the carpet panel in the area of the hook and loop retainers to secure the panel.
3. Rear carpet panel retainers through the panel, and into the body rear inner panel.
4. Right and left rear quarter trim lower panel.
5. Right and left rear quarter trim upper molding.
6. Rear quarter trim panel garnish molding.

FRONT DOOR SILL PLATE REPLACEMENT

Remove or Disconnect (Figure 12)

1. Sill plate screws.
2. Sill plate from the vehicle.

Install or Connect

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Sill plate to the vehicle.
2. Sill plate screws.

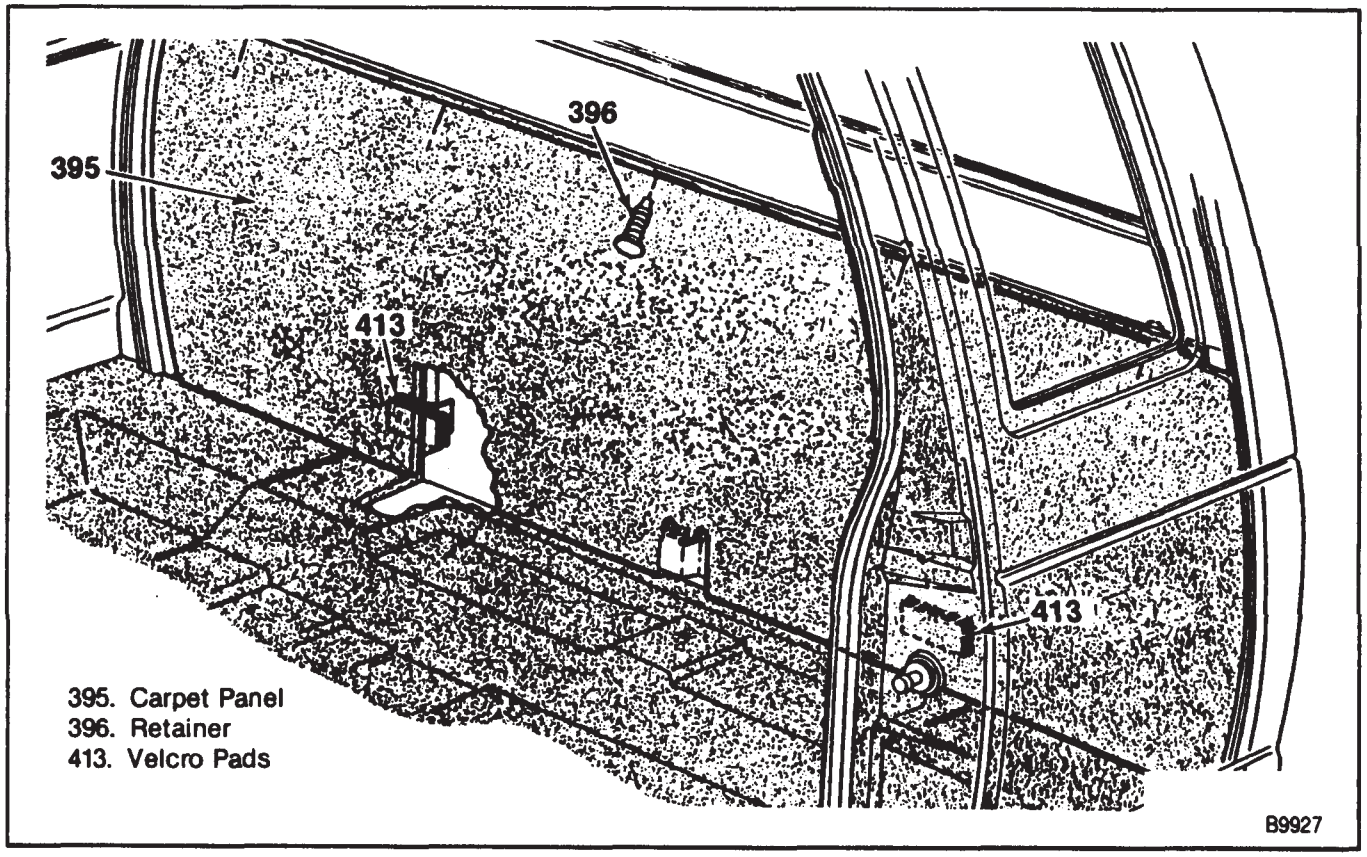


Figure 23—Rear Carpet Panel

COWL SIDE VENT COVER REPLACEMENT

Remove or Disconnect (Figure 18)

1. Front door sill plate.
2. Cowl side vent cover screws.
3. Cowl side vent cover from the vehicle.

Install or Connect

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Cowl side vent cover to the vehicle.
2. Cowl side vent cover screws.
3. Front door sill plate.

FLOOR CARPET OR MAT REPLACEMENT

Remove or Disconnect (Figure 24)

1. Front seat or seats.
2. Front door sill plates.
3. Front floor console (where used).
4. Front seat belt blades and retractors from the floor panel.
5. Right and left rear quarter trim lower panels.
6. Right and left cowl side vent covers.
7. Rear carpet panel.
8. Carpet or mat from the vehicle.

Install or Connect (Figure 24)

1. Carpet or mat to the vehicle.
2. Rear carpet panel.
3. Right and left cowl side vent covers.
4. Right and left rear quarter trim lower panels.
5. Front seat belt blades and retractors from the floor panel.
6. Front floor console (where used).
7. Front door sill plates.
8. Front seat or seats.

WINDSHIELD GARNISH MOLDING REPLACEMENT

Remove or Disconnect (Figure 18)

1. Screws attaching the molding to the pillar.
2. Molding from the windshield pillar.
   - Pull it upwards to remove.

Install or Connect (Figure 18)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Molding to the windshield pillar.
2. Screws attaching the molding to the pillar.

SUNSHADE REPLACEMENT

Tools Required:
J 24595-B, Garnish Clip Remover

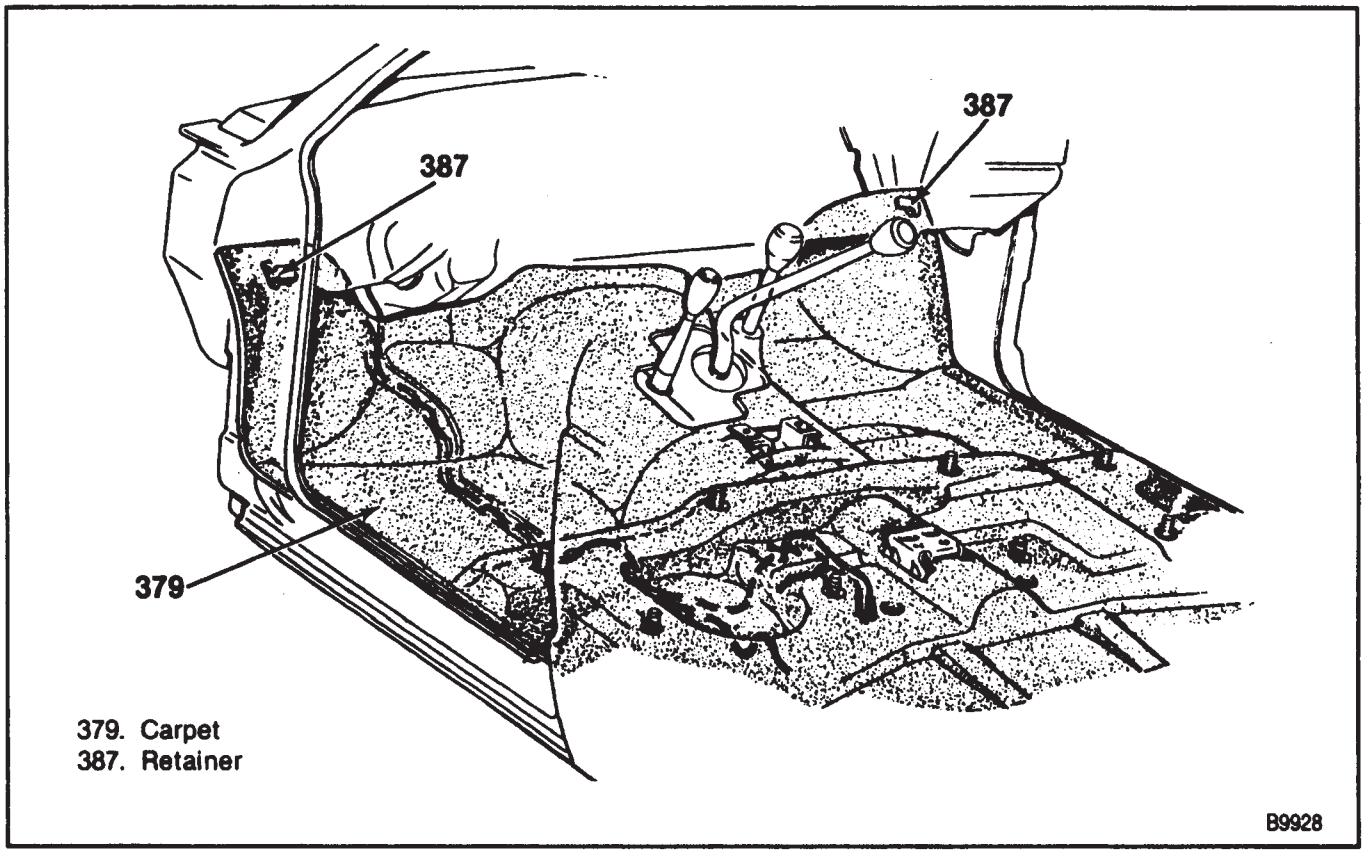


Figure 24—Floor Carpet

Remove or Disconnect (Figure 15)

1. Screws retaining the sunshade assembly.
2. Sunshade from the roof.
3. Vanity mirror from the sunshade.
   - Use J 24595-B.

Install or Connect (Figure 15)

NOTICE: For step 3 see "Notice" on page 10A4-1.

1. Vanity mirror to the sunshade.
2. Sunshade to the roof.
3. Screws retaining the sunshade assembly.

ASSIST HANDLE REPLACEMENT

Remove or Disconnect (Figure 16)

1. Assist handle covers.
   - Insert a flat bladed tool between the cover and the handle. Tap the end of the tool with the palm of the hand to remove.
2. Assist handle screws.
3. Assist handle from the vehicle.

Install or Connect (Figure 16)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Assist handle to the vehicle.
2. Assist handle screws.
3. Assist handle covers.
   - Snap the covers into place.

COAT HOOK REPLACEMENT

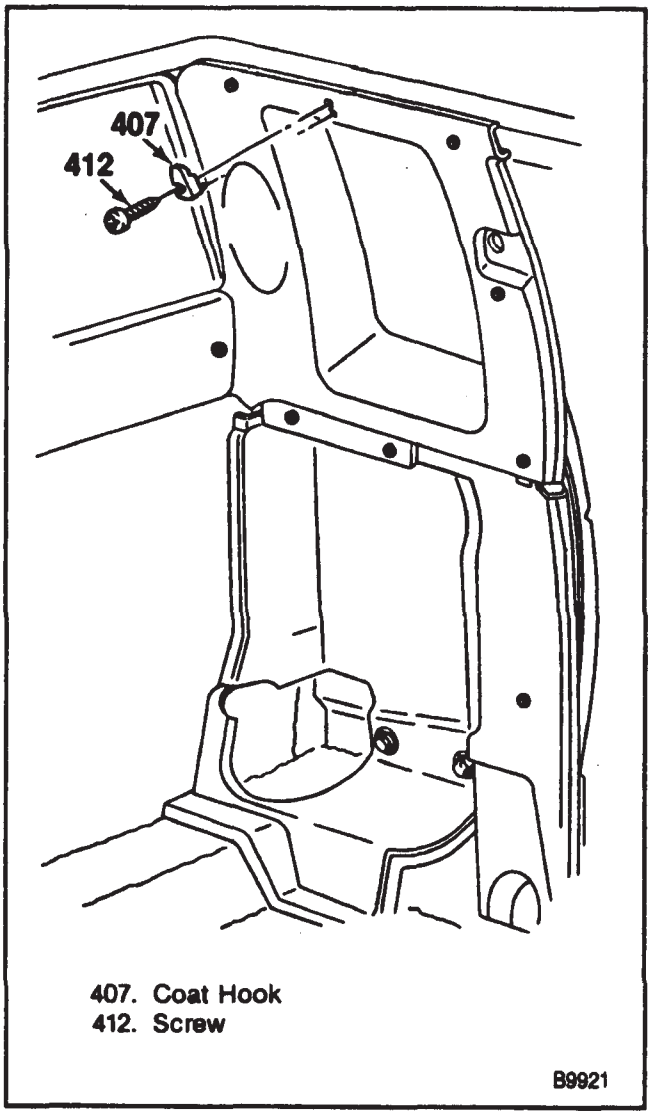
Remove or Disconnect (Figure 25)

1. Coat hook screw.
2. Coat hook from the vehicle.

Install or Connect (Figure 25)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Coat hook to the vehicle.
2. Coat hook screw.



407. Coat Hook
412. Screw

Figure 25—Coat Hook Components

REGULAR CAB TRIM

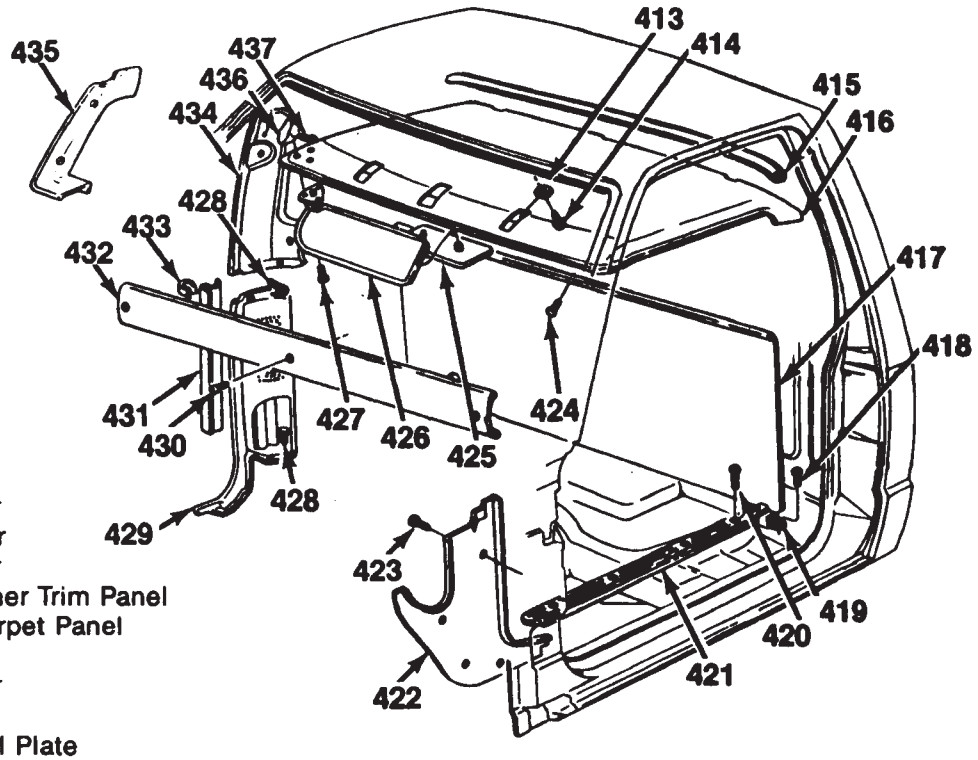
ROOF INNER TRIM PANEL REPLACEMENT

Remove or Disconnect (Figure 26)

1. Right and left windshield garnish moldings.
2. Right and left sunshades.
3. Right and left rear quarter trim upper molding.
4. Roof vent window lower frame, if used.
5. Roof inner trim panel from the vehicle.
   - Grasp the panel on the left and right sides near the front of the cab.
   - Shift the panel from side to side while lightly pulling down on the panel to disengage the front of the panel from the roof.
   - Pull the panel forward to disengage it from the retainer on the rear inner body panel.
6. Retainers from the trim panel.
   - Slide the retainer from the slit at the front of the trim panel.

Install or Connect (Figure 26)

1. Retainers to the trim panel.
   - Slide the retainer into the slit at the front of the trim panel.
2. Roof inner trim panel to the vehicle.
   - Push the rear edge of the panel into the retainer on the rear inner body panel.
   - Insert the retainers into the windshield frame.
3. Right and left rear quarter trim upper molding.
4. Right and left sunshade.
5. Right and left windshield garnish molding.
6. Roof vent window lower frame, if used.



413. Retainer
414. Fastener
415. Retainer
416. Roof Inner Trim Panel
417. Rear Carpet Panel
418. Screw
419. Retainer
420. Screw
421. Door Sill Plate
422. Cowl Side Vent Cover
423. Screw
424. Retainer
425. Vanity Mirror
426. Sunshade
427. Screw
428. Screw
429. Rear Quarter Trim Lower Panel
430. Screw
431. Rear Quarter Trim Panel Filler
432. Rear Quarter Trim Panel Molding
433. Retainer
434. Rear Quarter Trim Upper Molding
435. Windshield Garnish Molding
436. Coat Hook
437. Screw

B9922

Figure 26—Regular Cab Inner Trim Components

REAR QUARTER TRIM UPPER MOLDING REPLACEMENT

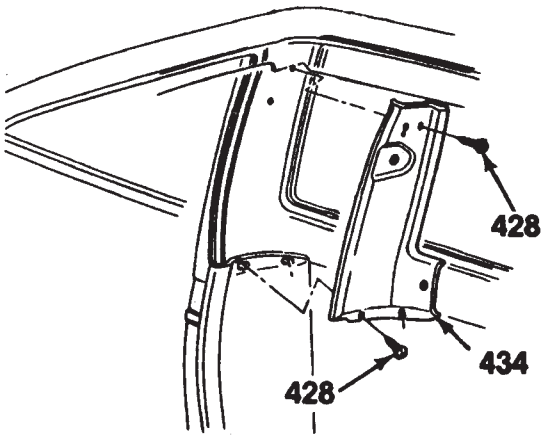
Remove or Disconnect (Figure 27)

1. Rear quarter trim panel garnish molding.
2. Seat belt anchor bolts.
3. Trim molding screws.
4. Trim molding from the vehicle.

Install or Connect (Figure 27)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Trim molding to the vehicle.
2. Trim molding screws.
3. Seat belt anchor bolts.



434. Rear Quarter Trim Upper Molding
428. Screw

B9923

Figure 27—Rear Quarter Trim Upper Molding

Tighten

- Anchor bolts to 53 N.m (39 ft. lbs.).

4. Rear quarter trim panel garnish molding.

REAR QUARTER TRIM PANEL GARNISH MOLDING REPLACEMENT

Remove or Disconnect (Figure 28)

1. Garnish molding screws.
2. Rear quarter trim panel garnish molding.

Install or Connect (Figure 28)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Rear quarter trim panel garnish molding.
2. Garnish molding screws.

REAR QUARTER TRIM LOWER PANEL REPLACEMENT

Remove or Disconnect (Figure 29)

1. Door sill plate.
2. Lower trim panel screws.
3. Lower trim panel from the vehicle.
   - Slide the top edge of the lower trim panel from under the upper trim panel.
4. Quarter filler retainers from the rear quarter trim panel filler, and the lower trim panel flange.
5. Rear quarter trim panel filler from the lower trim panel flange.

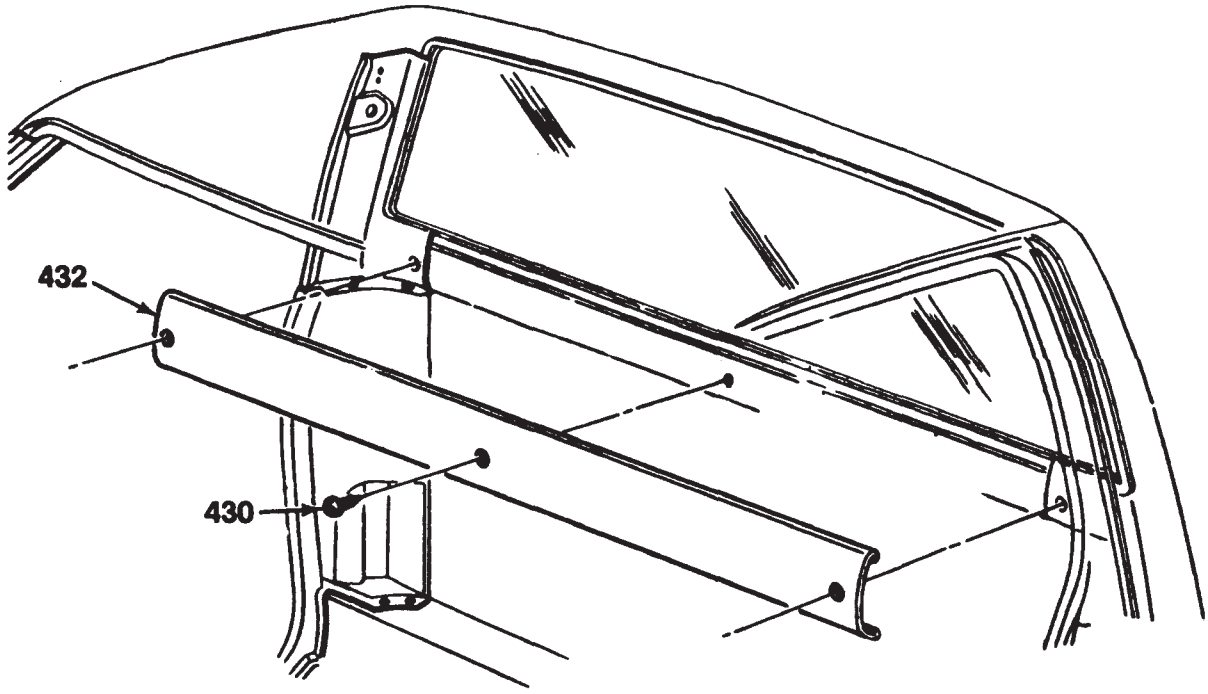
Install or Connect (Figure 29)

NOTICE: For step 4 see "Notice" on page 10A4-1.

1. Rear quarter trim panel filler to the lower trim panel flange.
2. Quarter filler retainers over the rear quarter trim panel filler, and the lower trim panel flange.
3. Lower trim panel to the vehicle.
   - Slide the top edge of the lower trim panel under the upper trim panel.
   - Align the holes in the two panels.
4. Lower trim panel screws.
5. Door sill plate.

REAR CARPET PANEL REPLACEMENT

Tools Required:
J 24595-B, Garnish Clip Remover



430. Screw
432. Rear Quarter Trim Panel Molding

B9924

Figure 28—Rear Quarter Trim Panel Garnish Molding

Remove or Disconnect (Figure 30)

1. Rear quarter trim panel garnish molding.
2. Rear quarter trim upper molding.
3. Rear quarter trim lower panel.
4. Rear carpet panel retainers using J 24595-B.
5. Rear carpet panel from the vehicle.

Install or Connect (Figure 30)

1. Rear carpet panel to the vehicle.
   - Center the panel in the middle of the retainers located on the floor panel.
2. Rear carpet panel retainers through the panel, and into the body rear inner panel.
3. Rear quarter trim lower panel.
4. Rear quarter trim upper molding.
5. Rear quarter trim panel garnish molding.

FRONT DOOR SILL PLATE REPLACEMENT

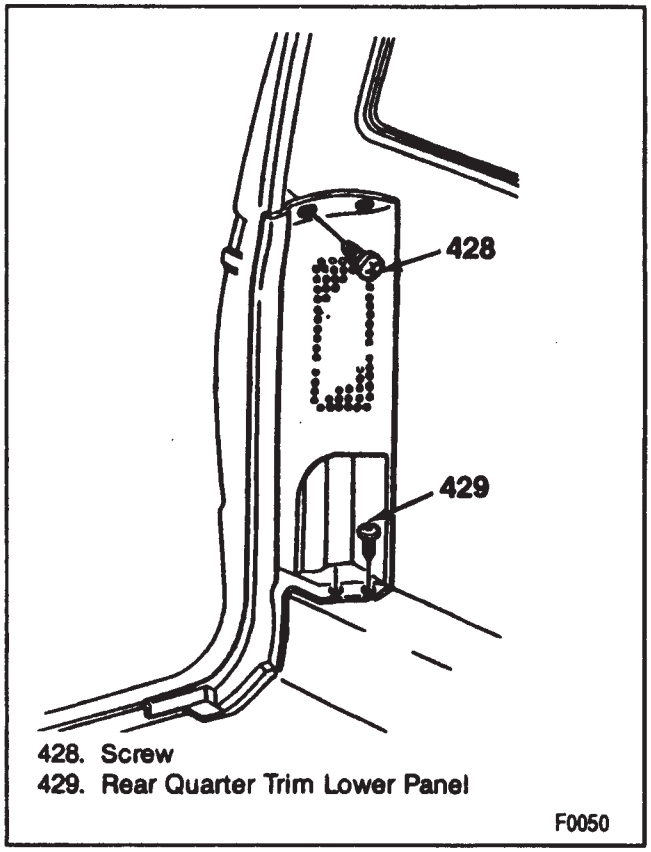
Remove or Disconnect (Figure 12)

1. Sill plate screws.
2. Sill plate from the vehicle.

Install or Connect

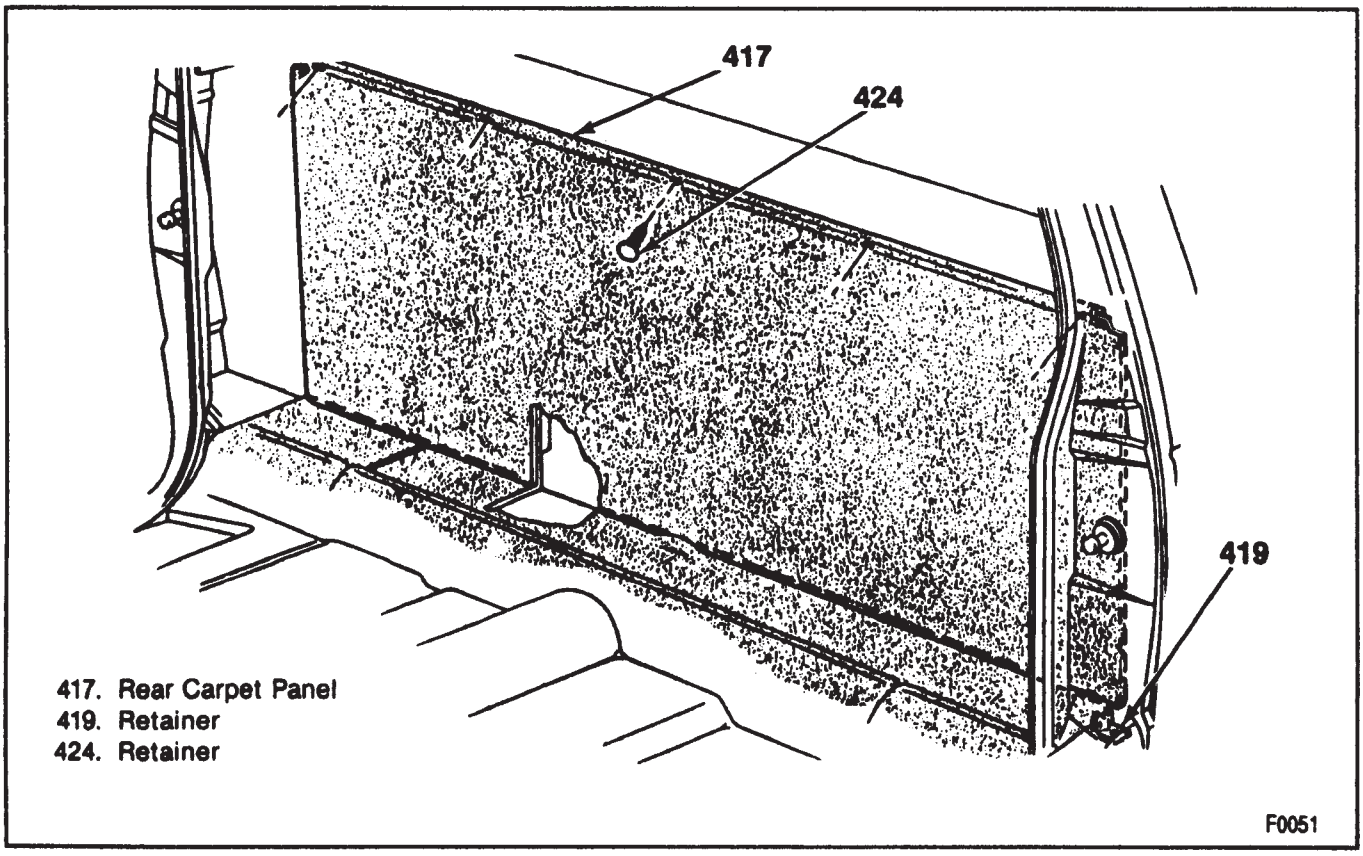
NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Sill plate to the vehicle.
2. Sill plate screws.



428. Screw
429. Rear Quarter Trim Lower Panel

Figure 29—Rear Quarter Trim Panel



417. Rear Carpet Panel
419. Retainer
424. Retainer

Figure 30—Rear Carpet Panel Replacement

COWL SIDE VENT COVER REPLACEMENT

Remove or Disconnect (Figure 26)

1. Front door sill plate.
2. Cowl side vent cover screws.
3. Cowl side vent cover from the vehicle.

Install or Connect

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Cowl side vent cover to the vehicle.
2. Cowl side vent cover screws.
3. Front door sill plate.

FLOOR CARPET OR MAT REPLACEMENT

Remove or Disconnect (Figure 31)

1. Front seat or seats.
2. Front door sill plates.
3. Front floor console (where used).
4. Front seat belt blades and retractors from the floor panel.
5. Right and left rear quarter trim lower panels.
6. Right and left cowl side vent covers.
7. Rear carpet panel.
8. Carpet or mat from the vehicle.

Install or Connect (Figure 31)

1. Carpet or mat to the vehicle.
2. Rear carpet panel.
3. Right and left cowl side vent covers.
4. Right and left rear quarter trim lower panels.
5. Front seat belt blades and retractors from the floor panel.
6. Front floor console (where used).
7. Front door sill plates.
8. Front seat or seats.

WINDSHIELD GARNISH MOLDING REPLACEMENT

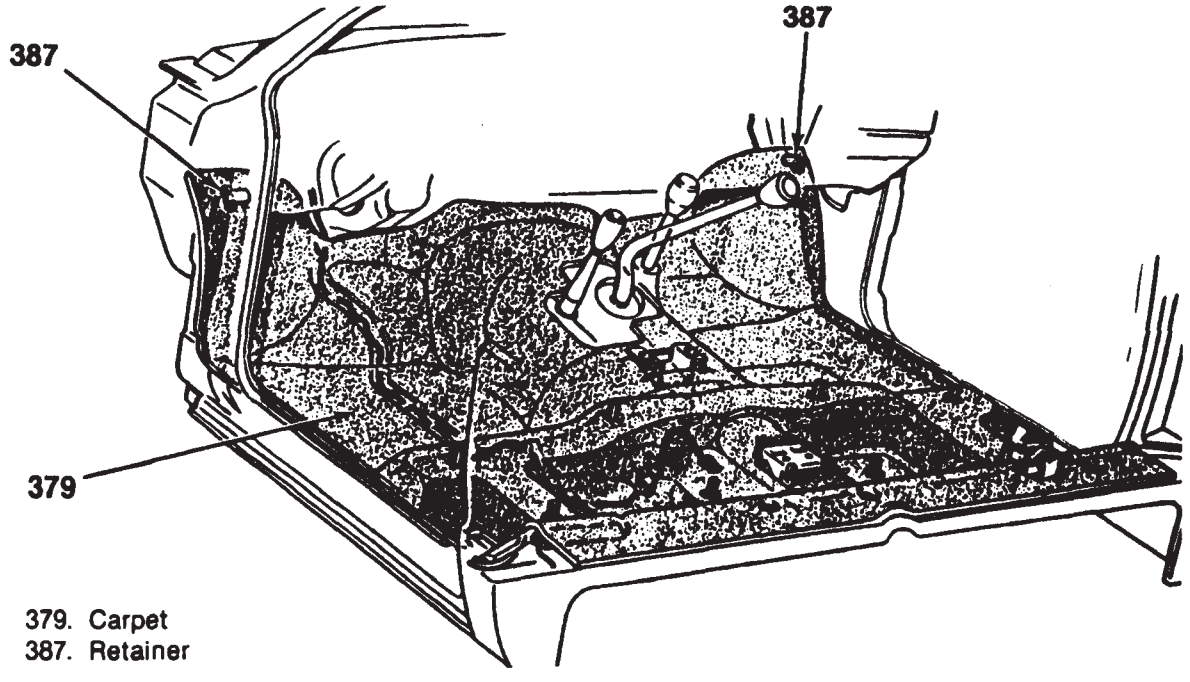
Remove or Disconnect (Figure 26)

1. Screws attaching the molding to the pillar.
2. Molding from the windshield pillar.
   - Pull it upwards to remove.

NOTICE: For step 2 see "Notice" on page 10A4-1.

Install or Connect (Figure 26)

1. Molding to the windshield pillar.
2. Screws attaching the molding to the pillar.



379. Carpet
387. Retainer

F0052

Figure 31—Floor Carpet

SUNSHADE REPLACEMENT

Remove or Disconnect (Figure 15)

1. Screws retaining the sunshade assembly.
2. Sunshade from the roof.
3. Vanity mirror from the sunshade.
   - Use J 24595-B.

Install or Connect (Figure 15)

NOTICE: For step 3 see "Notice" on page 10A4-1.

1. Vanity mirror to the sunshade.
2. Sunshade to the roof.
3. Screws retaining the sunshade assembly.

ASSIST HANDLE REPLACEMENT

Remove or Disconnect (Figure 16)

1. Assist handle covers.
   - Insert a flat bladed tool between the cover and the handle. Tap the end of the tool with the palm of the hand to remove.
2. Assist handle screws.
3. Assist handle from the vehicle.

Install or Connect (Figure 16)

NOTICE: For step 2 see "Notice" on page 10A4-1.

1. Assist handle to the vehicle.
2. Assist handle screws.
3. Assist handle covers.
   - Snap the covers into place.

INTERIOR COLORS

NOTE: GM code numbers * indicates 12% gloss and 5% gloss available. DuPont paints must have a vinyl resin added to obtain the required gloss. All other companies use a two number system. The top number indicates a 12% gloss and the bottom number indicates a 5% gloss which is used only on the instrument panel.

GM Code	Fisher Code	Color	DuPont No.	PPG Ditzler No.	Martin Senour	Sherwin Williams Acme/Rogers	BASF
13AN*	9653	Light Gray	C9109	**	44438	44438	21029
				**	44437	44437	21026
13BN	9654	Medium Gray	C9110	**	44439	44439	21027
				**	45940	45940	22281
13CN	9655	Dark Gray	C9111	**	45941	45941	22282
				**	44440	44440	21028
18DN	9655	Dark Gray	C8575	**	16851	31901	12730
				**	16851	31901	12730
24CN*	9059	Dark Blue	C8792	**	36478	36478	17124
				**	39838	39838	19021
24EN*	9541	Midnight Blue	C9006	**	42599	42599	20066
				**	42600	42600	20065
47CN*	9104	Dark Red	C9007	**	42602	42602	20061
				**	42601	42601	20062
47DN*	9253	Very Dark Red	C9008	**	42604	42604	20063
				**	42603	42603	20064
64AN	9776	Light Beige	C9202	**	45942	45942	22275
				**	45943	45943	22276
64BN	9777	Medium Beige	C9203	**	45944	45944	22277
				**	45945	45945	22278
64DN	9778	Dark Beige	C9204	**	45946	45946	22279
				**	45947	45947	22280

**Not available at time of printing.

T2738

SPECIAL TOOL

J 24595-B

Garnish Clip Remover

SECTION 10A5

END GATE

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

GENERAL DESCRIPTION/UTILITY VEHICLE END GATE

The utility vehicle end gate consists of an end gate window hinged at the roof line, and an end gate hinged at the base of the end gate frame opening. Both the window and the end gate are locked with locking mechanisms within the end gate. The end gate window is supported by two gas-filled cylinders. The end gate is supported by two cables attached to the end gate frame opening, and the end gate. A built-in lock-out feature prevents the gate from unlocking before the glass is released.

ON-VEHICLE SERVICE

END GATE REPLACEMENT

Remove or Disconnect (Figures 1 and 2)

1. Torque rod.
   - Open the gate to a horizontal position.
2. Rear window actuator release wire (when used).
   - Trim panel.
   - Wire from the actuator.
   - Harness clip and wire from the panel.
   - Harness wire and grommet from the end gate.
   - Ground wire.
   - Support the end gate in a horizontal position with a table or other suitable support.
3. Cable support bolts.
4. Hinge pin "barrel" clips.
   - Spread the clip enough to move the clip above the recess in the pin.
   - As the pin is removed, the clip will ride on the pin, and fall free of the pin.
5. Hinge pins from the right and left hinges.
6. End gate.

Install or Connect (Figures 1 and 2)

1. End gate.
   - Support the end gate in a horizontal position with a table or other suitable support.

NOTICE: For steps 2 and 5 see "Notice" on page 10A5-1 of this section.

2. Hinge pin clips to the hinge pins.
3. Pins into the left and right hinges.
4. Cable support.
5. Cable support bolts.
6. Rear window actuator release wire.
   - Harness wire and grommet to the gate.
   - Harness clip and wire to the panel.
   - Wire to the actuator.
   - Trim panel.
   - Ground wire.
7. Torque rod.

END GATE HINGE REPLACEMENT

Remove or Disconnect (Figure 3)

1. End gate.
2. Bumper.
3. Bumper filler pan.
4. Weatherstrip from the lower frame opening pinchweld.
5. Body side hinge (figure 4).
   - Scribe the location of the existing body side hinge on the frame opening.
   - Center punch each weld mark on the original hinge base.
   - Drill a 3 mm (1/8-inch) pilot hole through the welds. Drill only deep enough to penetrate the hinge base, and release the hinge from the frame opening.
   - Drive a chisel between the frame opening panel, and hinge base to separate the hinge from the panel if any welds remain.

Install or Connect (Figure 3)

1. Hinge to the frame opening panel.
   - Dress and prepare the frame opening for the replacement hinge.
   - Position and retain the replacement hinge on the scribe marks that were made when the hinge was removed.
   - Plug weld the replacement hinge to the frame opening at the original weld locations.
   - Paint the hinge to match the body.
2. Weatherstrip to the lower frame opening pinchweld flange.
3. Bumper filler pan.
4. Bumper.
5. End gate.
   - Align the gate for proper fit.

END GATE TORQUE ROD REPLACEMENT

Remove or Disconnect (Figure 5)

1. Bolts retaining the torque rod to the end gate.
   - Gain access to the bolts from under the vehicle.
   - With the gate in the closed position, the bolts are accessible between the bumper filler pan, and the frame.

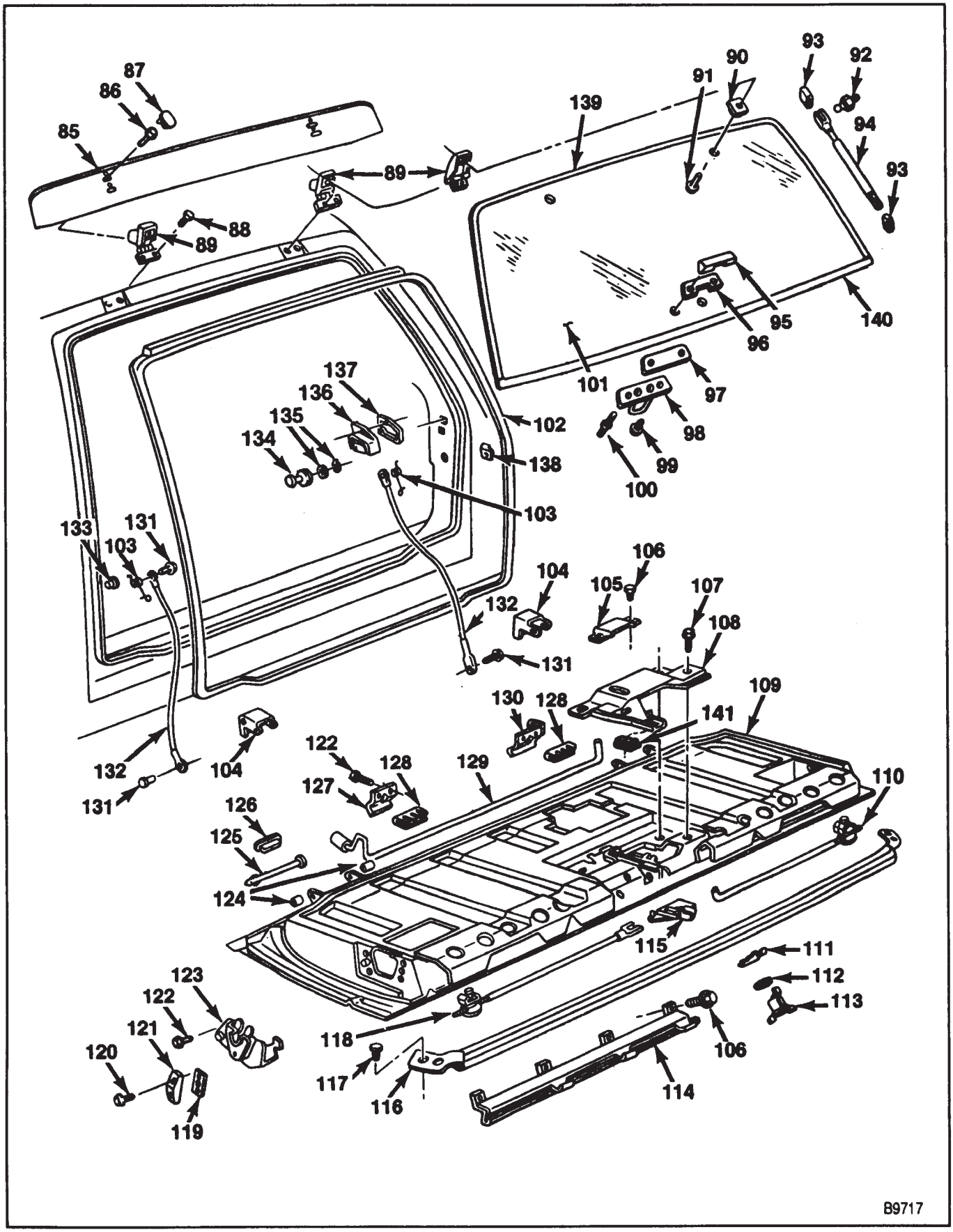


Figure 1—End Gate Components

85. Rear Air Deflector
86. Screw
87. Cap
88. Screw
89. Window Hinge
90. Gasket
91. Screw
92. Window Cylinder Stud
93. Clip
94. Support
95. Window Glass Handle
96. Gasket
97. Gasket
98. Window Striker
99. Window Striker Bolt
100. Window Pin
101. Glass
102. Weatherstrip
103. Spring
104. Hinge
105. Access Hole Cover
106. Screw
107. Screw
108. Inner Panel Reinforcement
109. End Gate
110. Lock Rod
111. Retainer
112. Gasket
113. Lock Cylinder
114. Panel Molding
115. Window Latch
116. Weatherstrip
117. Fastener
118. Lock Rod
119. Shim
120. Screw
121. Wedge Plate
122. Bolt
123. Latch
124. Bushing
125. Hinge Pin
126. Plug
127. Retainer
128. Insulator
129. Torque Rod
130. Retainer
131. Bolt
132. Support
133. Plug
134. End Gate Striker
135. Washer
136. Wedge
137. Spacer
138. Bumper
139. Upper Molding
140. Lower Molding
141. Bushing

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Figure 2—End Gate Components

2. Torque rod and brackets.

Install or Connect (Figure 5)

1. Torque rod and brackets to vehicle.
   - With the gate in the closed position, place the torque rod and brackets onto the vehicle.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Bolts to the torque rod brackets.

Tighten

- Bolts to 10 N·m (89 in. lbs.).

END GATE INNER TRIM PANEL REPLACEMENT

Remove or Disconnect (Figure 6)

- Open the end gate to the horizontal position.

1. Screws securing the panel to the end gate.
2. Panel from the end gate.

Install or Connect (Figure 6)

1. Trim panel to the end gate.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Screws securing the panel to the end gate.

HINGE ACCESS HOLE COVER REPLACEMENT

Remove or Disconnect (Figure 7)

1. Access hole bolts.
2. Access hole cover.

Install or Connect (Figure 7)

1. Access hole cover.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Access hole bolts.

END GATE WINDOW LOCK ASSEMBLY REPLACEMENT

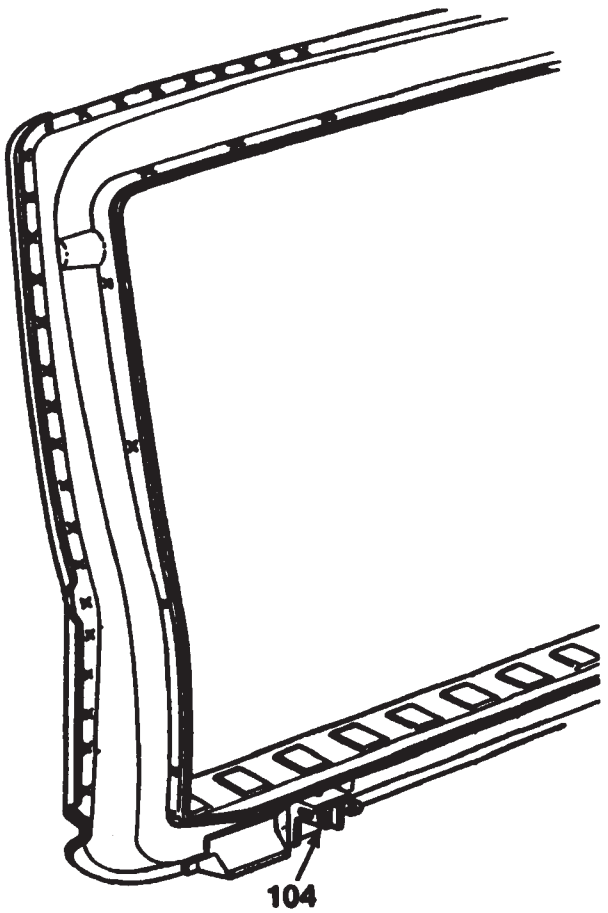
Remove or Disconnect (Figure 8)

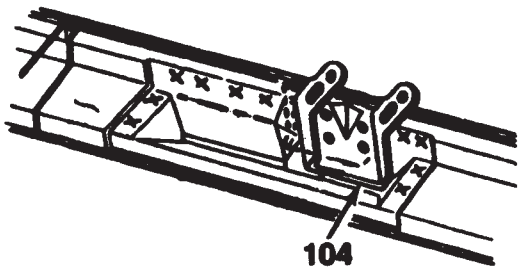
- Open the end gate to the horizontal position.

1. Inner trim panel.
2. Bolts retaining the end gate inner panel.
3. End gate inner panel reinforcement from the end gate.
4. Right and left locking rods from the window lock assembly (figure 9).

- Mark the location of the lock assembly on the end gate.

5. Nuts securing the lock assembly to the end gate.
6. Lock assembly from the end gate.
7. Actuator cable, if used.





104. Hinge

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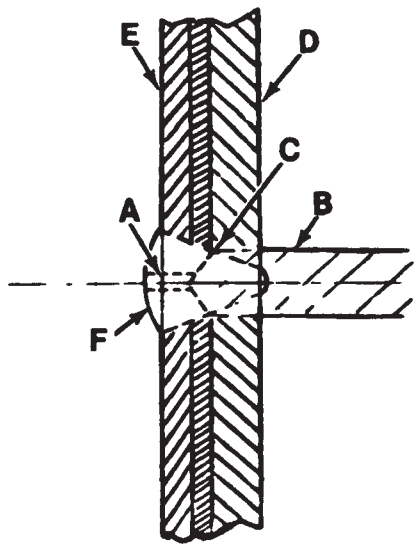
Figure 3—Replacement Hinges



A. Pilot Hole
B. Drill Bit, 13 mm (1/2-Inch)
C. Drill The Hole Deep Enough To Penetrate The Hinge Base Only
D. Hinge Base
E. Body Pillar
F. Weld

B9744

Figure 4—Drilling the Spot Weld

Install or Connect (Figure 8)

1. Actuator cable, if used.
2. Lock assembly to the end gate.
   - Align the assembly to the marks on the end gate inner panel.
3. Nuts securing the lock assembly to the end gate.
4. Right and left locking rods to the window lock assembly.
5. End gate inner panel reinforcement to the end gate.

NOTICE: See "Notice" on page 10A5-1 of this section.

6. Bolts retaining the end gate inner panel reinforcement to the end gate.
7. Inner trim panel.

END GATE LOCK CYLINDER REPLACEMENT

Remove or Disconnect (Figure 10)

- Open the end gate to the horizontal position.
  1. Inner trim panel.
  2. End gate inner panel reinforcement from the end gate (figures 8 and 9).
  3. End gate lock rods.
  4. Lock cylinder retainer.
     - Work through the access hole.

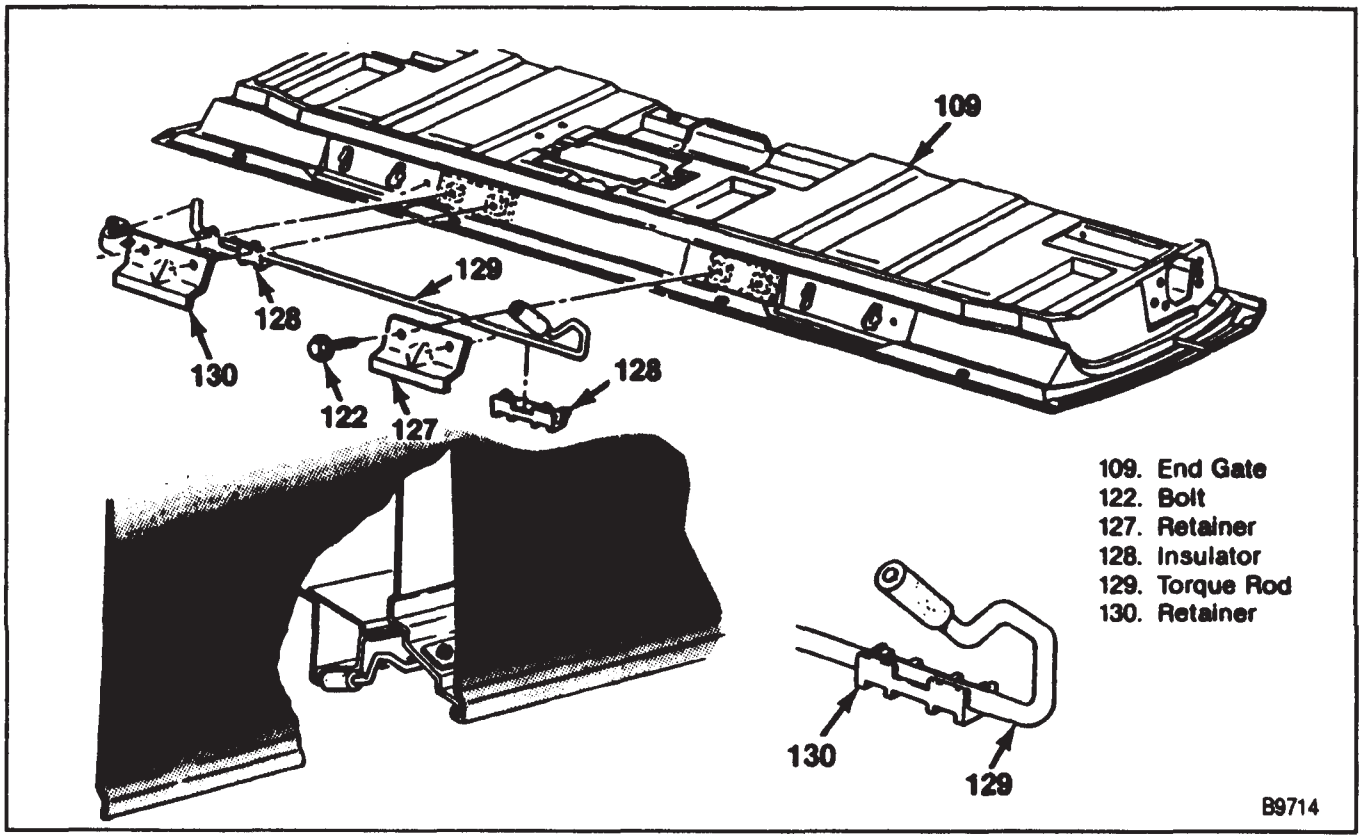


Figure 5—End Gate Torque Rod

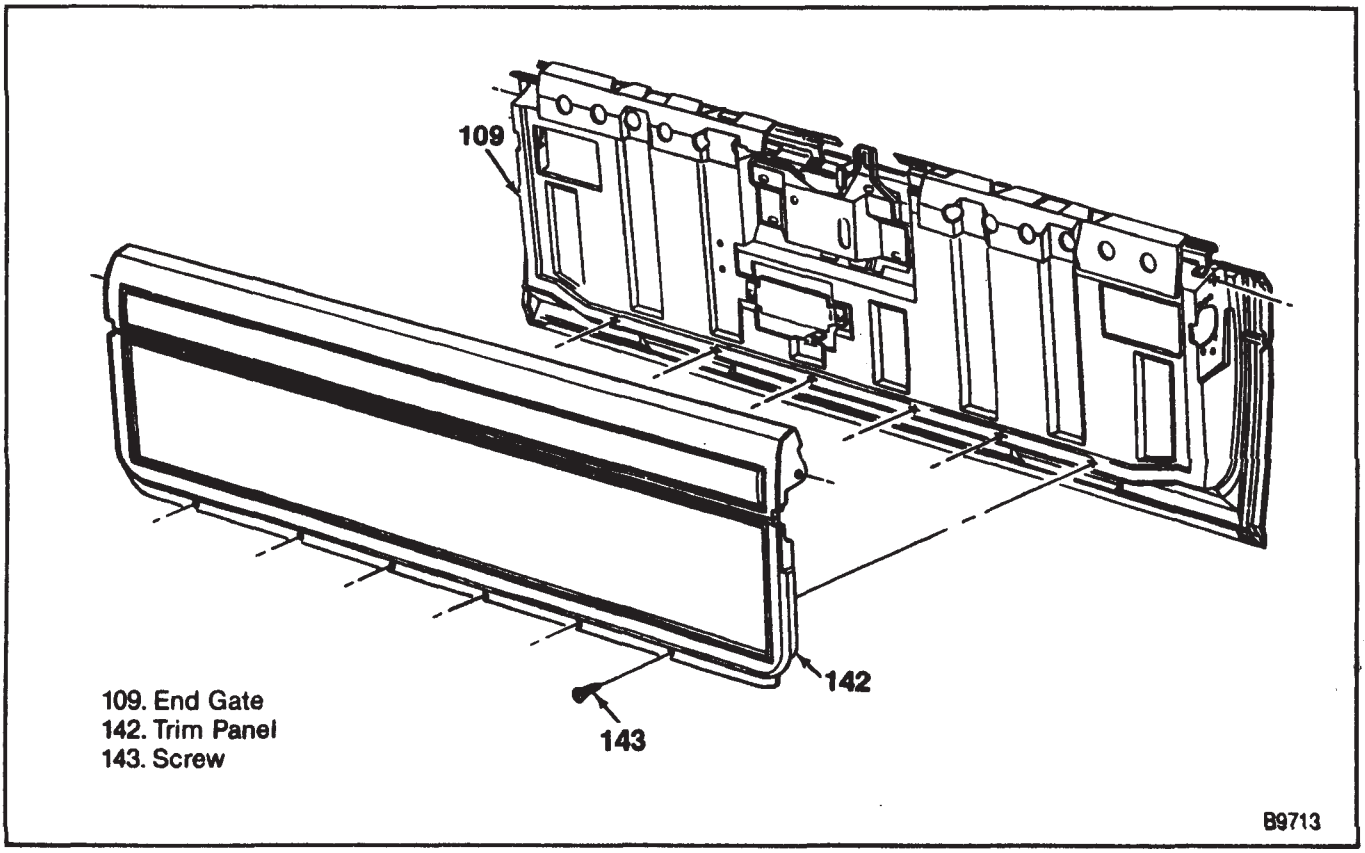


Figure 6—End Gate Trim Panel

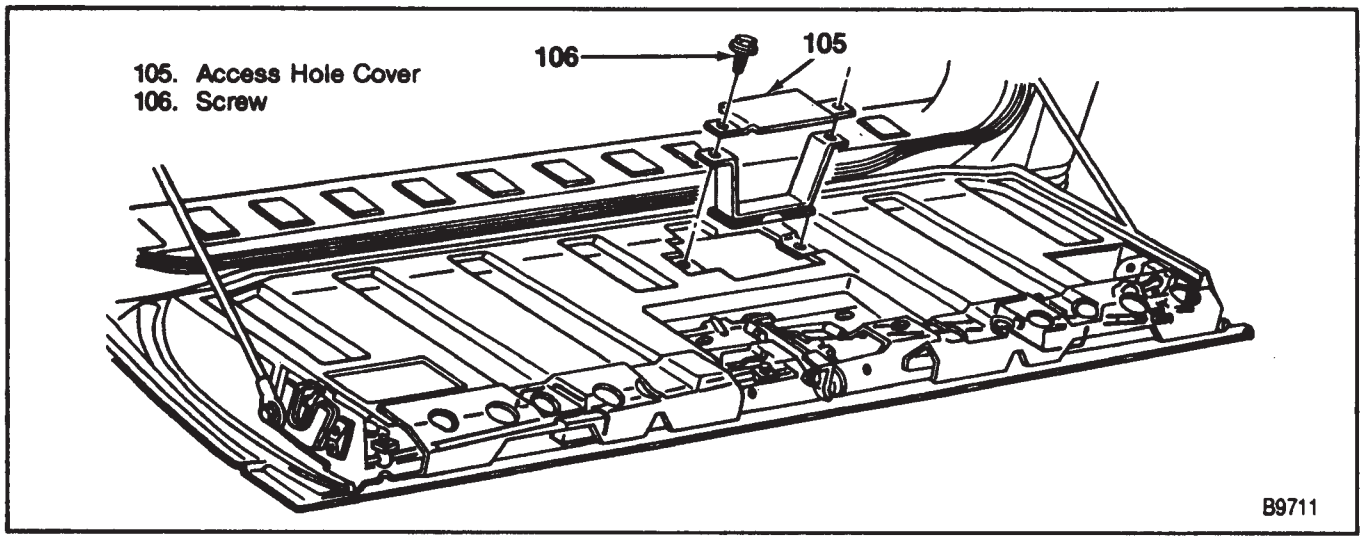


Figure 7—Access Hole Cover

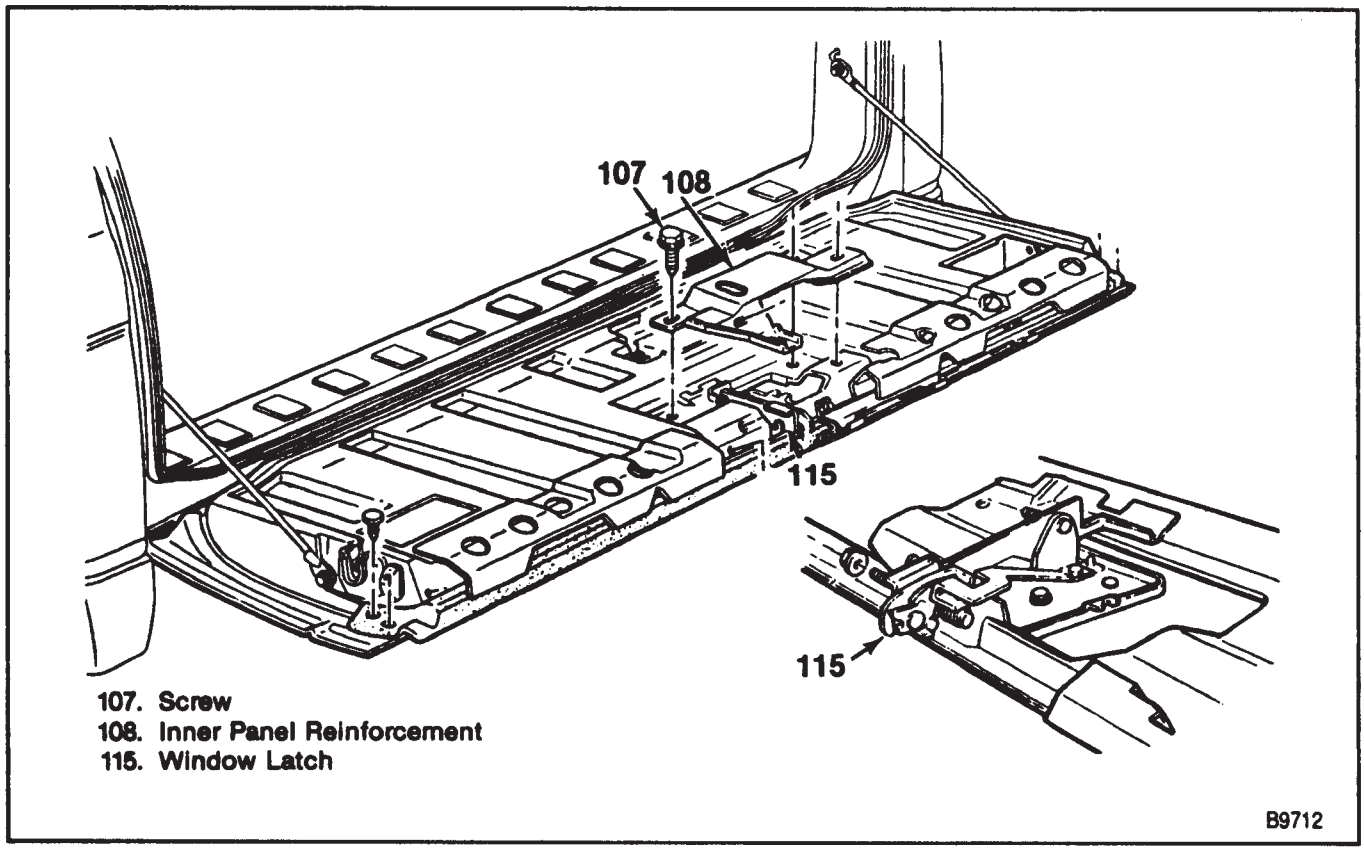


Figure 8—End Gate Window Lock

5. Lock cylinder through the outer panel.

Install or Connect (Figure 10)

1. Actuator cable, if used.
2. Lock cylinder through the outer panel.
3. Lock cylinder retainer.
4. End gate lock rods.
5. End gate inner panel reinforcement to the end gate.
6. Inner trim panel.

REAR WINDOW ACTUATOR REPLACEMENT

Remove or Disconnect (Figures 1 and 11)

- Open the end gate to the horizontal position.

1. Inner trim panel.
2. Reinforcement plate (108).
3. Access cover (105).
4. Actuator bolts and washers.
5. Electrical connector from the actuator.

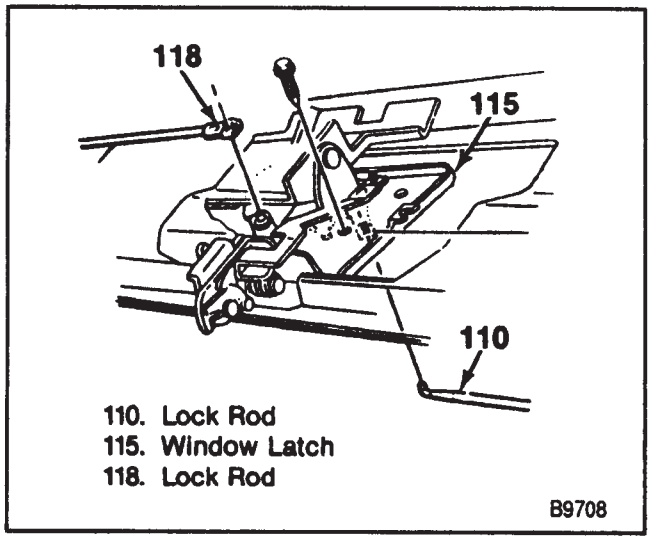


Figure 9—End Gate Lock Rods

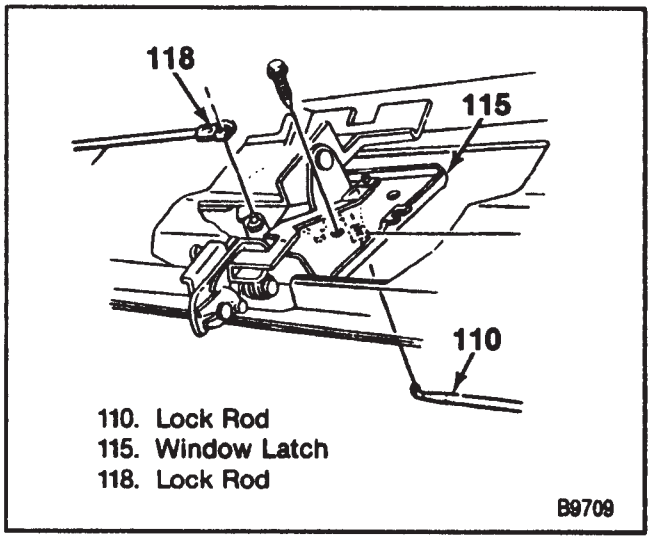


Figure 10—End Gate Lock Cylinder

6. Clip under the lock retaining the actuator cable to the lock assembly.
   - If the clip is difficult to remove, take out the lock assembly first. Refer to "End Gate Window Lock Assembly Replacement" earlier in this section.
7. Actuator cable from the lock assembly.
8. Actuator from the end gate.

Install or Connect (Figures 1 and 11)

1. Actuator to the end gate between the sheet metal panels.
   - Do not connect it.
2. Actuator cable to the lock assembly.

NOTICE: For steps 3, 5, and 8 see "Notice" on page 10A5-1 of this section.

3. Clip over the cable to the lock assembly.

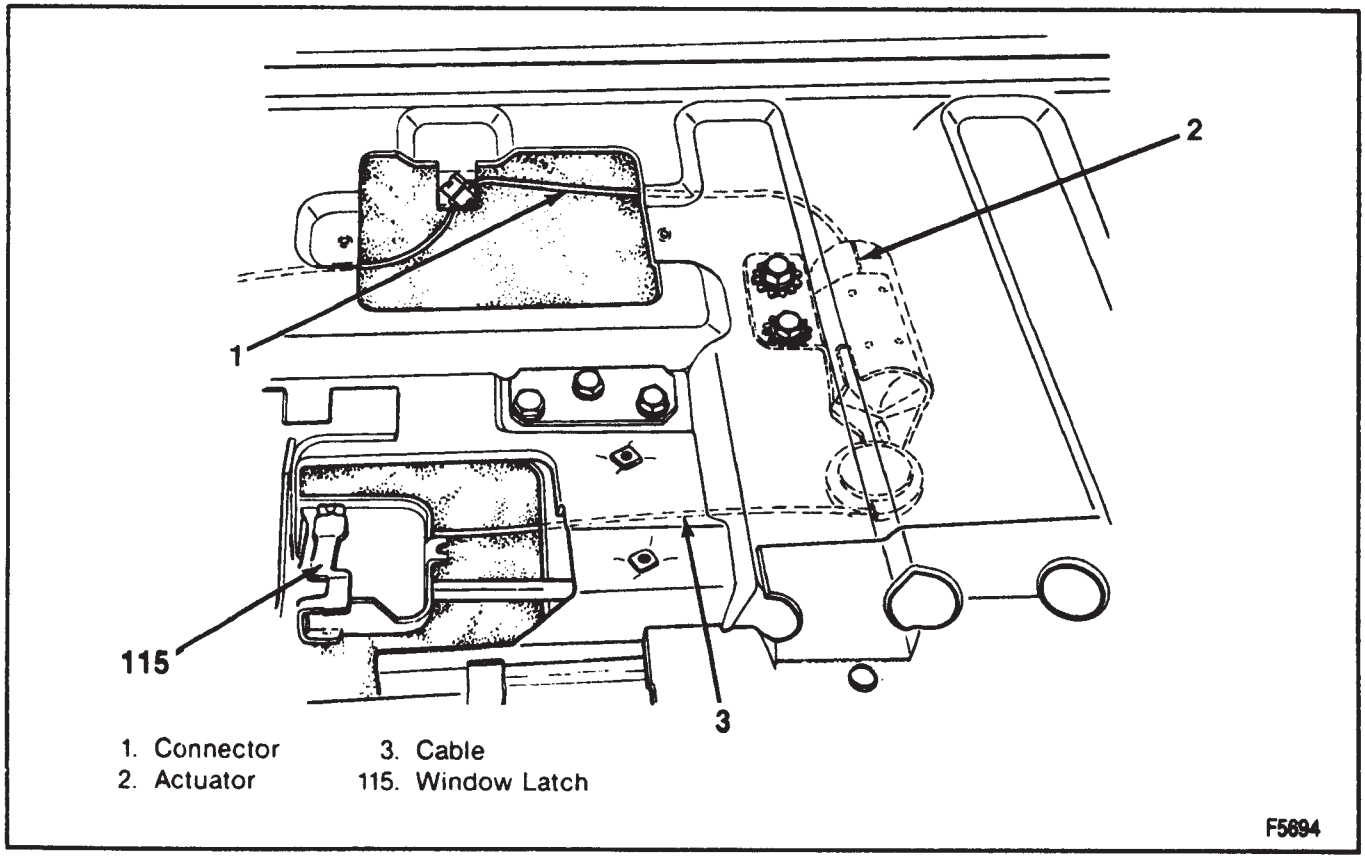


Figure 11—Rear Window Release Actuator

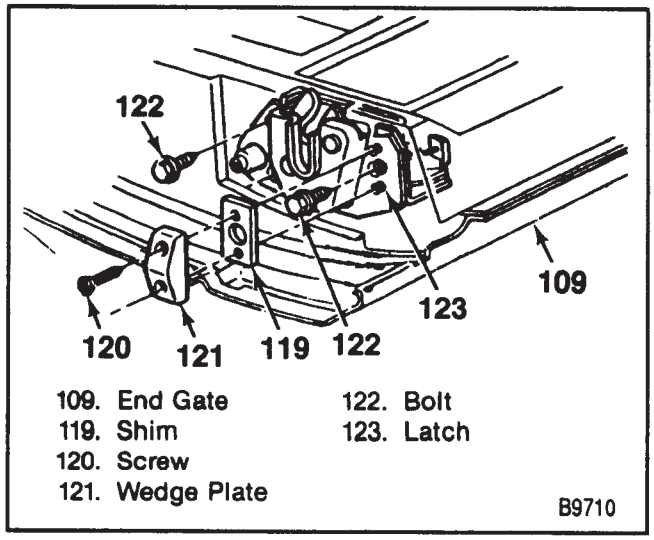


Figure 12—End Gate Lock Assembly

4. Lock assembly to the end gate if it was removed.
5. Reinforcement plate (108) with four bolts.
6. Electrical connector to the actuator.
7. Access cover (105) over the actuator.
8. Two bolts and star washers through the sheet metal, and actuator bracket.
9. Inner trim panel.

END GATE LOCK ASSEMBLY REPLACEMENT (RIGHT OR LEFT)

Remove or Disconnect (Figure 12)

- Open the end gate to the horizontal position.

1. Trim panel.
2. Inner panel reinforcement (figures 8 and 9).
3. Locking rod from the center window lock.
4. Screws securing the wedge plate and shim to the end gate.
5. Wedge plate and shim from the end gate.
6. Bolts securing the lock to the gate.
7. Lock from the gate.

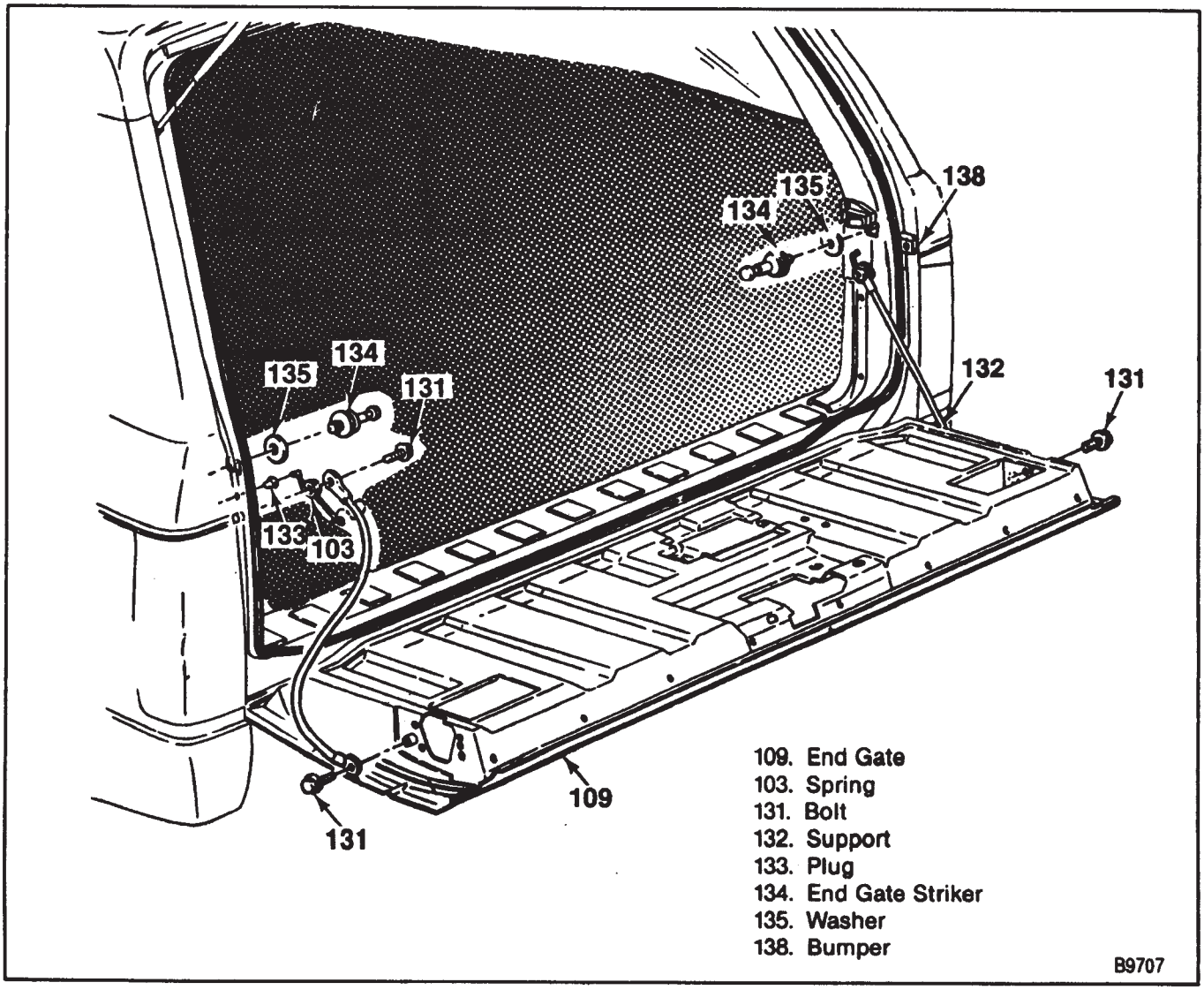


Figure 13—End Gate Striker Bolts

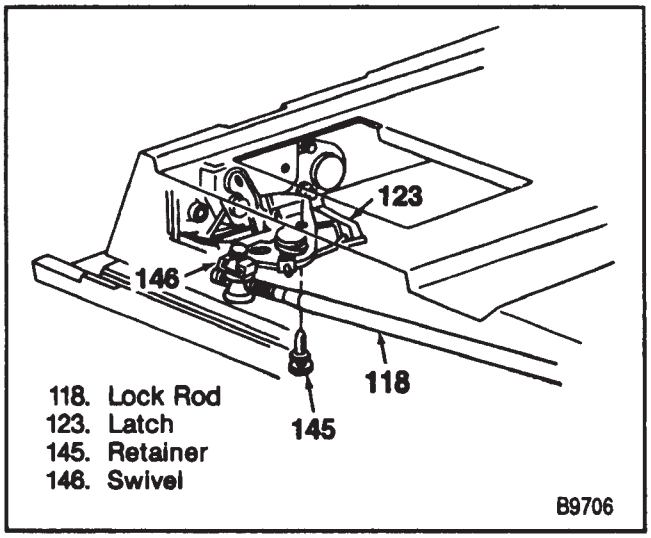


Figure 14—Locking Rod Swivels

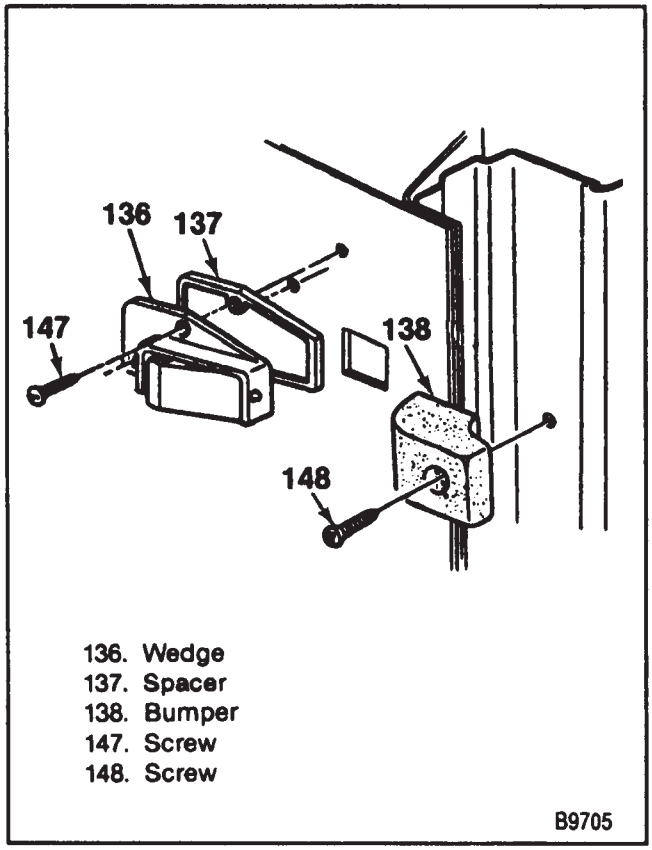


Figure 15—Wedge Assembly

Install or Connect (Figure 12)

1. Lock to the gate.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Bolts securing the lock to the gate.
3. Wedge plate and shim to the end gate.
4. Screws securing the wedge plate and shim to the end gate.

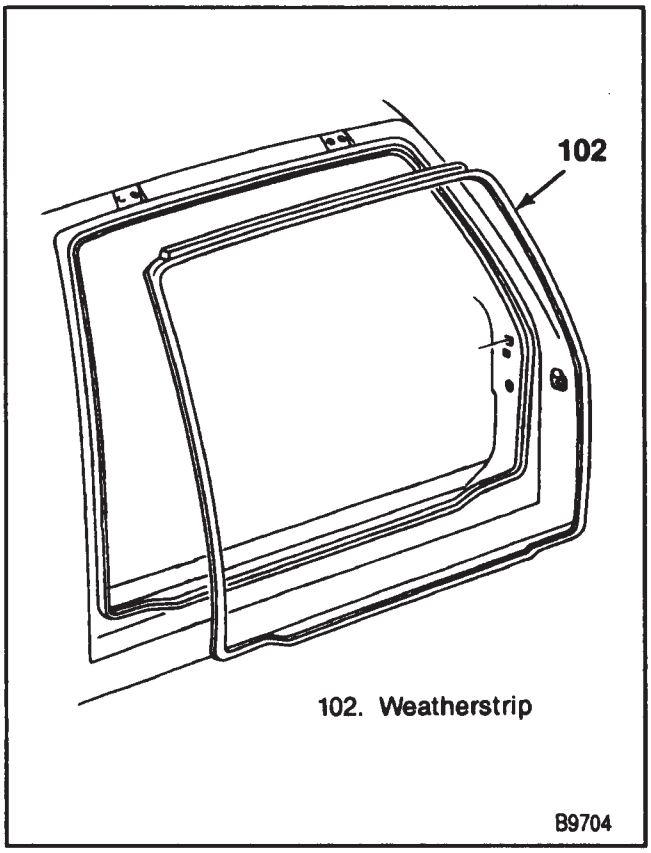


Figure 16—End Gate Weatherstrip

5. Locking rod to the window lock.
6. Inner panel reinforcement.
7. Trim panel.

END GATE LOCK STRIKER ADJUSTMENT

Adjust (Figure 13)

NOTICE: See "Notice" on page 10A5-1 of this section.

- End gate lock strikers up or down, forward or backward, to obtain the proper close of the end gate. The end gate should seal completely with a minimum of closing effort.

Tighten

- Striker bolts to 63 N·m (47 ft. lbs.).

END GATE LOCK SYNCHRONIZATION

End gate lock synchronization prevents the end gate from unlatching while the lift glass is down and locked.

Inspect

- End gate locks for synchronization.
  — Close the end gate and glass, and remove the key.

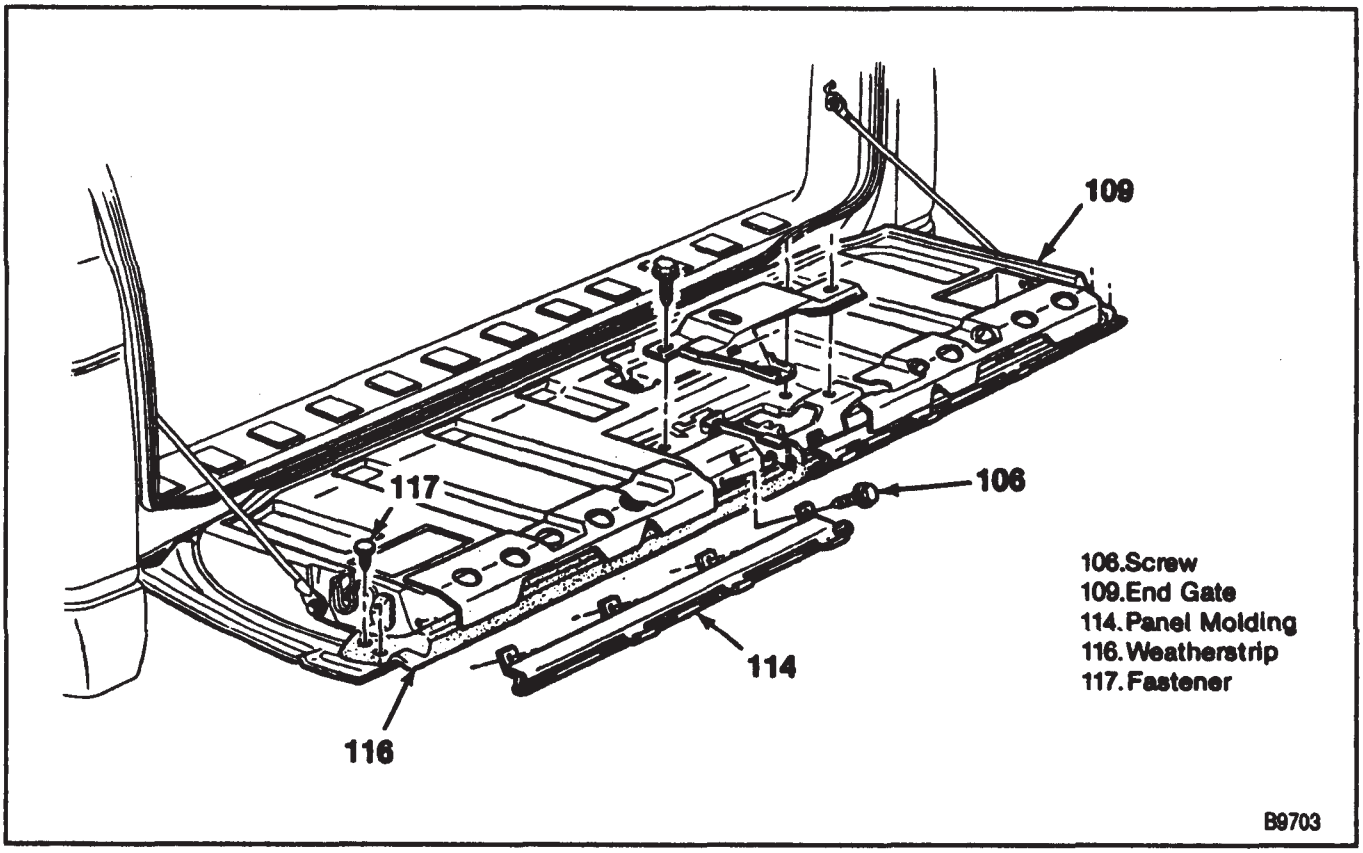


Figure 17—End Gate Weatherstrip Molding

— Rotate the lock cylinder assembly clockwise to attempt to release the gate. If the gate unlocks, synchronization is required.

Install or Connect (Figure 14)

- Open the end gate to the horizontal position.
  1. End gate inner trim panel.
- Manually lock the lift glass lock, and both left and right end gate locks.
  2. Locking rods from the center end gate window lock assembly.

Adjust

- Locking rods by threading the rods in or out to align with the center lock levers.

Install or Connect (Figures 9 and 14)

1. Locking rods to the center end gate window lock assembly.
2. Key into the lock, and rotate it counterclockwise and clockwise to release the locking mechanism.

- Close the end gate and the lift glass.

Inspect

- End gate locks for synchronization.
  — Use procedure described previously.
- Open the lift glass and the end gate.
  3. Inner trim panel.

WEDGE ASSEMBLY REPLACEMENT

Remove or Disconnect (Figure 15)

1. Wedge assembly screws.
2. Wedge assembly.
3. Gasket.

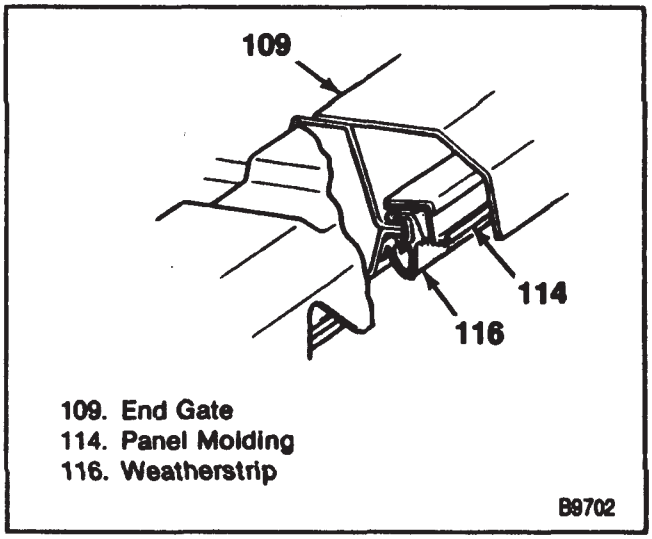


Figure 18—End Gate Belt Weatherstrip

Install or Connect (Figure 15)

1. Gasket.
2. Wedge assembly.

NOTICE: See "Notice" on page 10A5-1 of this section.

3. Wedge assembly screws.

END GATE WEATHERSTRIP REPLACEMENT

Remove or Disconnect (Figure 16)

- Weatherstrip from the pinchweld flange.
  — Use 3M Release Agent No. 08971 or equivalent to dissolve the weatherstrip adhesive.

Install or Connect (Figure 16)

1. 3M Weatherstrip Adhesive No. 08011 or equivalent to adhere and seal the weatherstrip to the pinchweld flange.
2. Weatherstrip to the pinchweld flange.
   - Start at the top of the end gate opening, and push the weatherstrip onto the pinchweld flange.
   - Completely seat the weatherstrip around the end gate opening.

WEATHERSTRIP MOLDING REPLACEMENT

Remove or Disconnect (Figure 17)

1. Weatherstrip molding bolts.
2. Weatherstrip molding.

Install or Connect (Figure 17)

1. Weatherstrip molding.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Weatherstrip molding bolts.

END GATE BELT WEATHERSTRIP REPLACEMENT

Remove or Disconnect (Figure 18)

- Open the end gate to the horizontal position.
  1. Trim panel.
  2. End gate weatherstrip molding.
  3. Weatherstrip from the pinchweld flange.
     - Weatherstrip fasteners using J 24595.
     - Use 3M Release Agent No. 08971 or equivalent to dissolve the weatherstrip adhesive.

Install or Connect (Figure 18)

1. Weatherstrip.
   - Apply 3M Weatherstrip Adhesive No. 08011 or equivalent to adhere and seal the weatherstrip to the pinchweld flange.
   - Push the weatherstrip onto the pinchweld flange.
2. Weatherstrip fasteners.
3. End gate weatherstrip molding.
4. End gate trim panel.

END GATE WINDOW REPLACEMENT

Remove or Disconnect (Figure 19)

- Open the end gate.
- Mark the location of the hinge on the outside surface of the glass with a grease pencil.
  1. Rear window defogger wire from the window (when used).
  2. Gas support assemblies from the glass side attachments.
     - Carefully pry the gas support ball socket from the ball. Insert a small screwdriver between the ball and socket, and pull the gas support from the window.
  3. Bolts retaining the end gate glass to the hinges.
  4. End gate glass from the vehicle.

Install or Connect (Figure 19)

1. End gate glass to the vehicle.
   - Align the glass to the marks that were made when the glass was removed.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Bolts retaining the end gate glass to the hinges.

Tighten

- Bolts to 6 N.m (54 in. lbs.).

3. Gas support assemblies to the glass side attachments.
4. Rear window defogger wire to the window (when used).

END GATE WINDOW SUPPORT REPLACEMENT

CAUTION: Do not attempt to remove or loosen gas support assembly attachments with glass in any position other than fully open as personal injury may result.

Do not intermix original quality gas supports with other quality supports, since not all supports have the same output level.

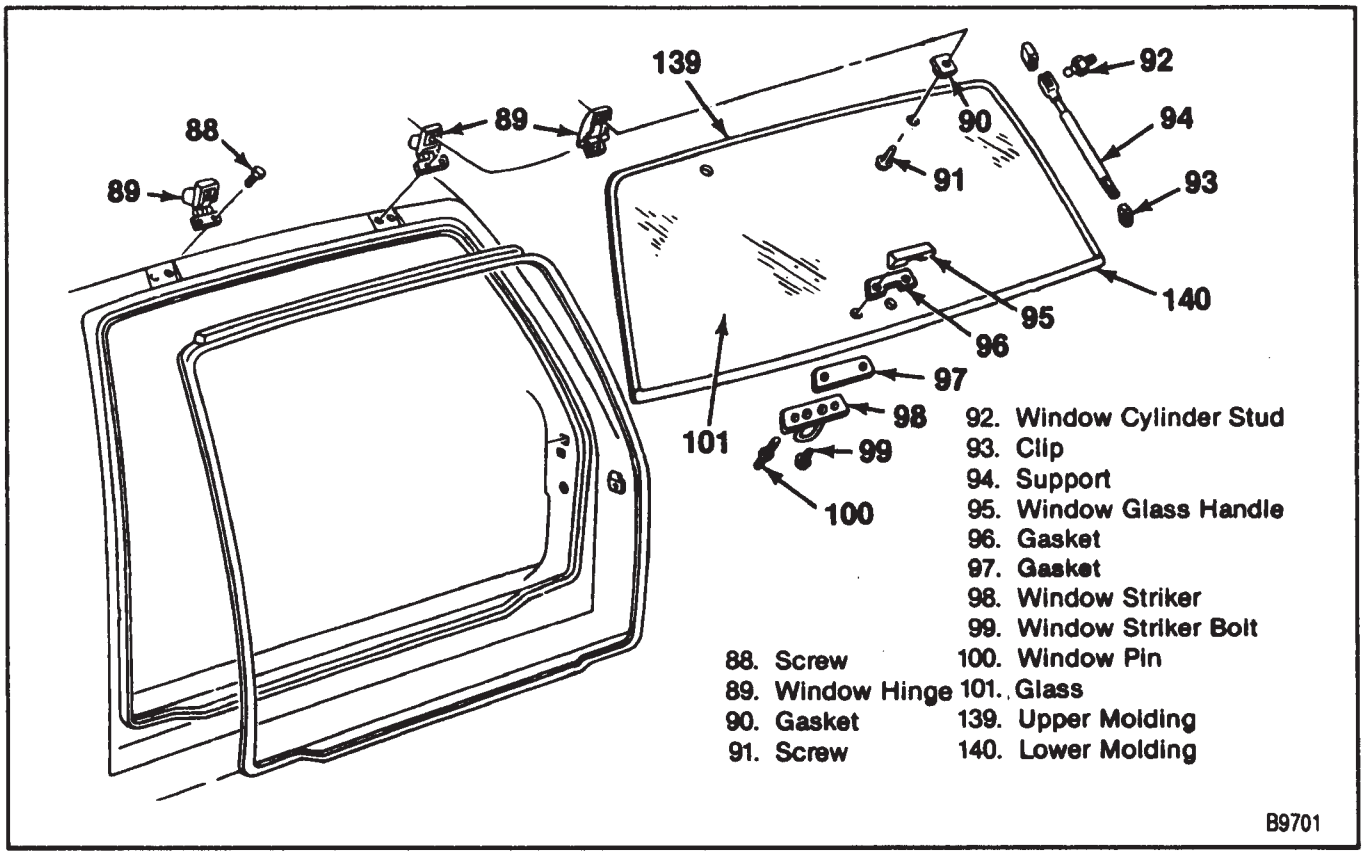


Figure 19—End Gate Window Components

Remove or Disconnect (Figure 19)

1. Rear window defogger wires attached to the gas supports (when used).
2. Ball sockets from the glass side.
   - Carefully pry the gas support ball socket from the ball. Insert a small screwdriver between the ball and the ball socket, and pull the gas support from the window.
   - Support rear window glass.
3. Ball sockets from the body side.

Install or Connect (Figure 19)

1. Gas support ball socket to the body and glass sides.
   - Push the ball socket onto the ball.
2. Rear window defogger wires to the gas supports (when used).

END GATE WINDOW OUTSIDE HANDLE REPLACEMENT

Remove or Disconnect (Figure 19)

1. Guide pin and bolt securing the striker and handle to the end gate glass.
2. Striker from the window.
3. Handle from the window.
4. Gaskets from each side of the window.

Install or Connect

1. Gaskets to each side of the window.
2. Handle to the window.
3. Sticker to the window.

NOTICE: See "Notice" on page 10A5-1 of this section.

4. Guide pin and bolt securing the striker and handle to the end gate glass.

REAR AIR DEFLECTOR REPLACEMENT

Remove or Disconnect (Figure 20)

1. Air deflector caps.
2. Air deflector bolts.
3. Air deflector.

Install or Connect (Figure 20)

1. Air deflector.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Air deflector bolts.
3. Air deflector caps.

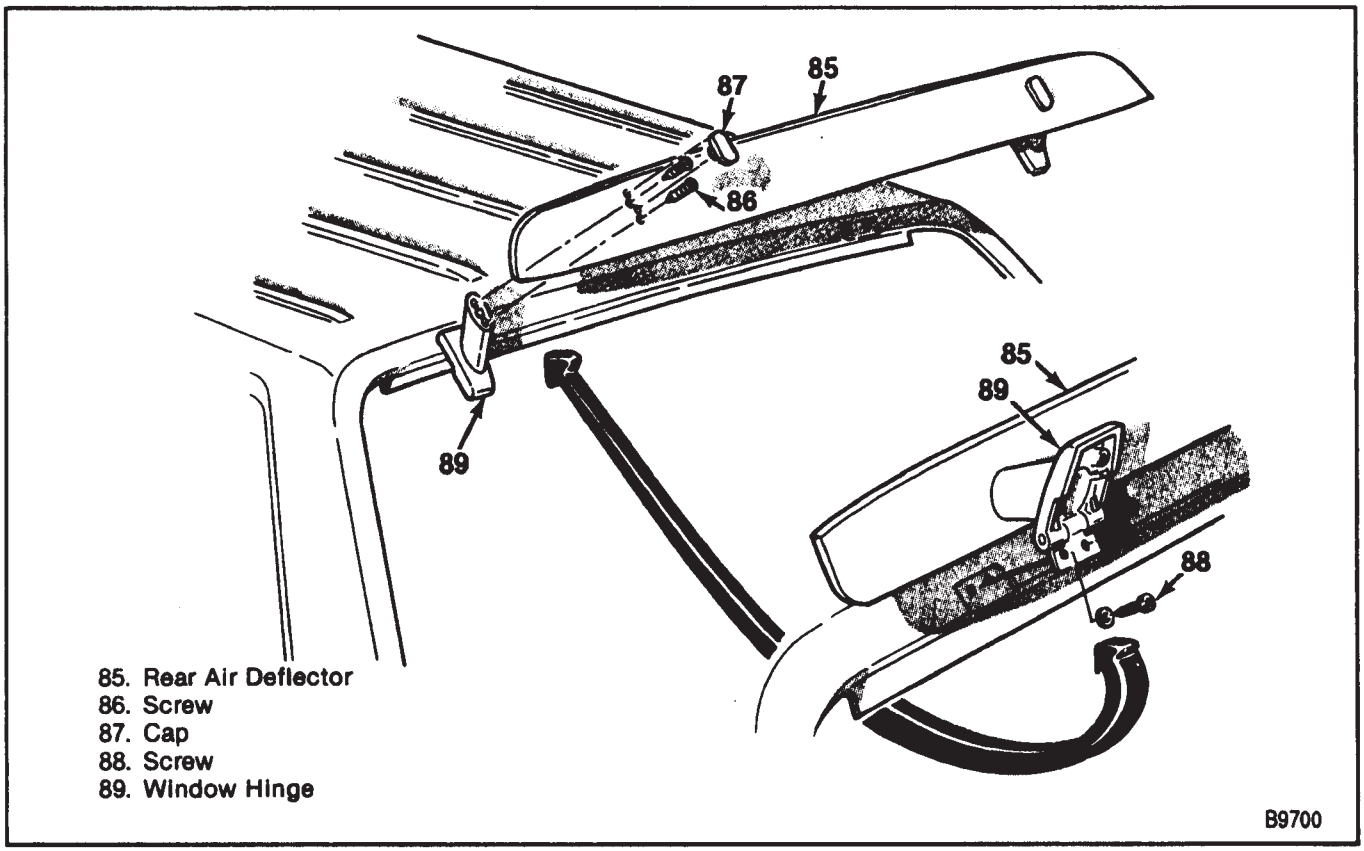


Figure 20—Rear Air Deflector

PICK-UP END GATE

END GATE REPLACEMENT

Remove or Disconnect (Figures 21 and 22)

- Lower and support the end gate with a table or other suitable support.

1. Right and left end gate striker bolts.
2. Right and left end gate side hinge bolts.
3. End gate.

Install or Connect (Figures 21 and 22)

1. End gate.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Right and left end gate side hinge bolts.

Tighten

- Bolts to 27 N·m (20 ft. lbs.).

3. Right and left striker bolts through the end gate links and into the end gate striker plate.

Tighten

- Bolts to 27 N·m (20 ft. lbs.).

END GATE LATCH OPERATING HANDLE REPLACEMENT

Remove or Disconnect (Figure 23)

1. Latch operating handle bolts.
2. Latch operating rods from the handle.
   - Slide the lower rod from the retaining clip.
   - Separate the upper clip from the upper rod by prying the clip apart at the head of the rod.
   - Slide the upper rod from the retaining clip.
3. Latch operating handle.

Install or Connect (Figure 23)

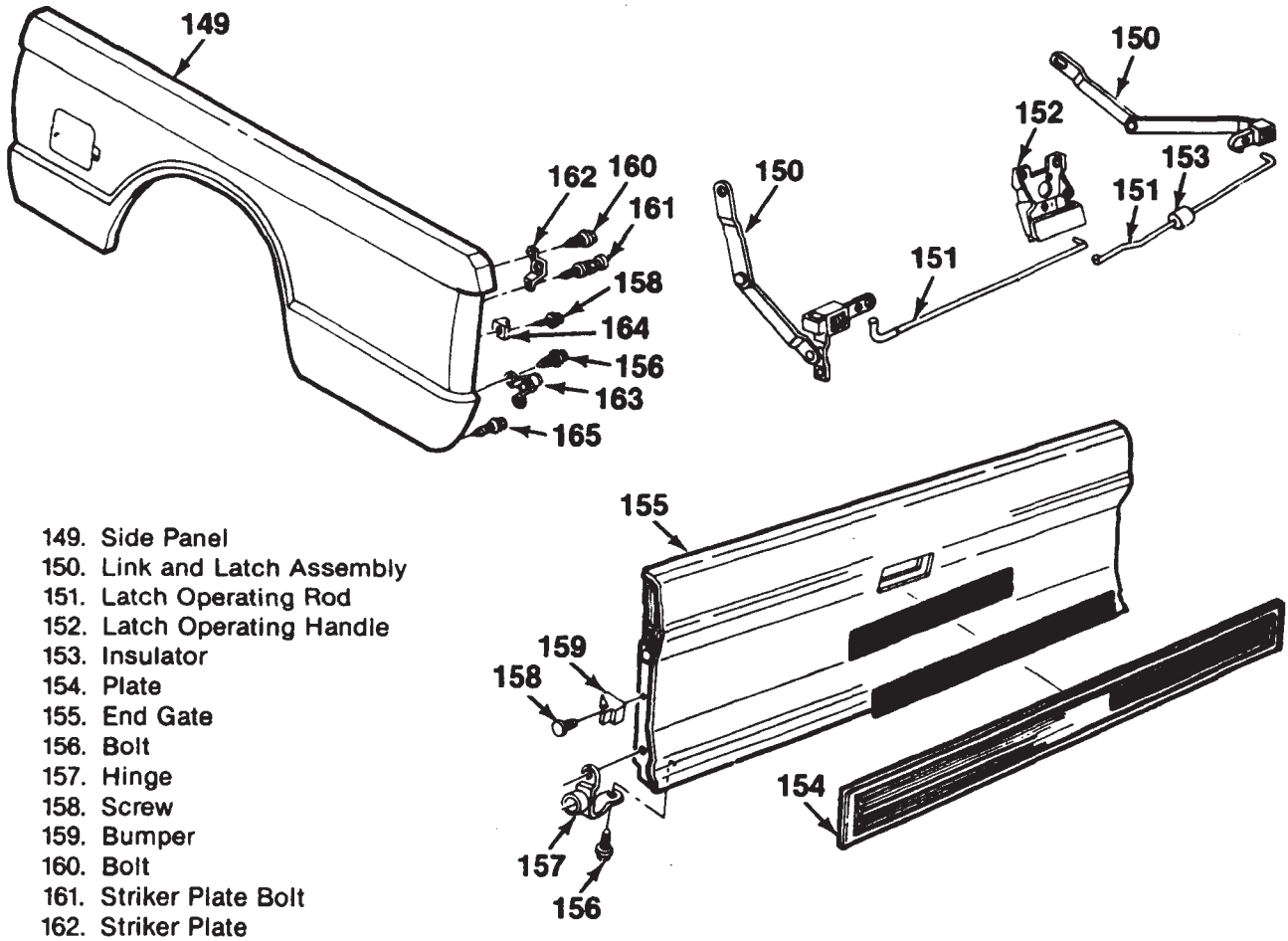
1. Latch operating handle.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Upper latch operating rod into the handle upper retaining clip.
3. Lower latch operating rod into the handle lower retaining clip.
4. Latch operating handle bolts.

Tighten

- Bolts to 27 N·m (20 ft. lbs.).



149. Side Panel
150. Link and Latch Assembly
151. Latch Operating Rod
152. Latch Operating Handle
153. Insulator
154. Plate
155. End Gate
156. Bolt
157. Hinge
158. Screw
159. Bumper
160. Bolt
161. Striker Plate Bolt
162. Striker Plate
163. End Gate Hinge
164. Bumper
165. Screw

Figure 21—Pick-Up Bed Components

END GATE LATCH AND LINK REPLACEMENT

Remove or Disconnect (Figures 22 and 23)

- Lower and support the end gate.

1. Latch operating handle.
2. End gate striker bolt.
3. Latch and link bolts.
4. Latch and link with the latch operating rod.

Install or Connect

1. Latch and link with the latch operating rod.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. Latch and link bolts.

Tighten

- Bolts to 27 N·m (20 ft. lbs.).

3. End gate striker bolt through the end gate link and into the striker plate.

Tighten

- Bolt to 27 N·m (20 ft. lbs.).

4. Latch operating handle.

END GATE HINGE REPLACEMENT

Remove or Disconnect (Figure 22)

1. End gate. Refer to "End Gate Replacement".
2. Body side hinge bolts.
3. Hinges.

Install or Connect (Figure 22)

1. Body side hinge.

NOTICE: See "Notice" on page 10A5-1 of this section.

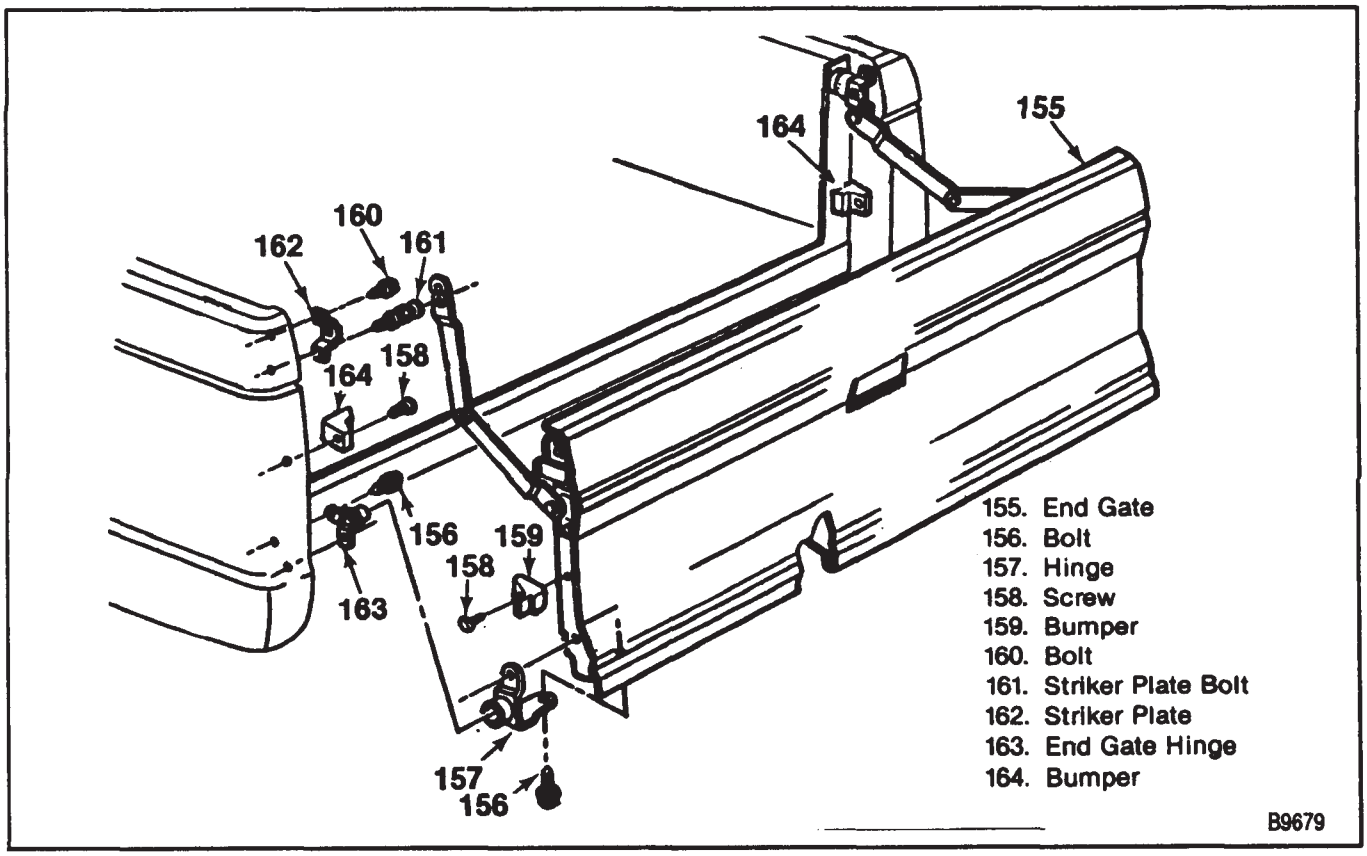


Figure 22—End Gate Components

2. Body side hinge bolts.

Tighten

- Bolts to 27 N·m (20 ft. lbs.).

3. End gate side hinge over the body side hinge.
4. End gate. Refer to "End Gate Replacement".

END GATE STRIKER PLATE REPLACEMENT

Remove or Disconnect (Figure 22)

1. End gate striker bolt.
2. End gate striker plate bolt.
3. End gate striker plate.

Install or Connect (Figure 22)

1. End gate striker plate.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. End gate striker plate bolt.
3. End gate striker bolt.

Tighten

- Both bolts to 27 N·m (20 ft. lbs.).

END GATE BUMPER REPLACEMENT

Remove or Disconnect (Figure 22)

1. Body side bumper screws.
2. Body side bumpers.
3. End gate side bumper screws.
4. End gate side bumpers.

Install or Connect (Figure 22)

1. End gate side bumpers.

NOTICE: See "Notice" on page 10A5-1 of this section.

2. End gate side bumper screws.

Tighten

- Screws to 19 N·m (14 ft. lbs.).

3. Body side bumpers.
4. Body side bumper screws.

Tighten

- Screws to 19 N·m (14 ft. lbs.).

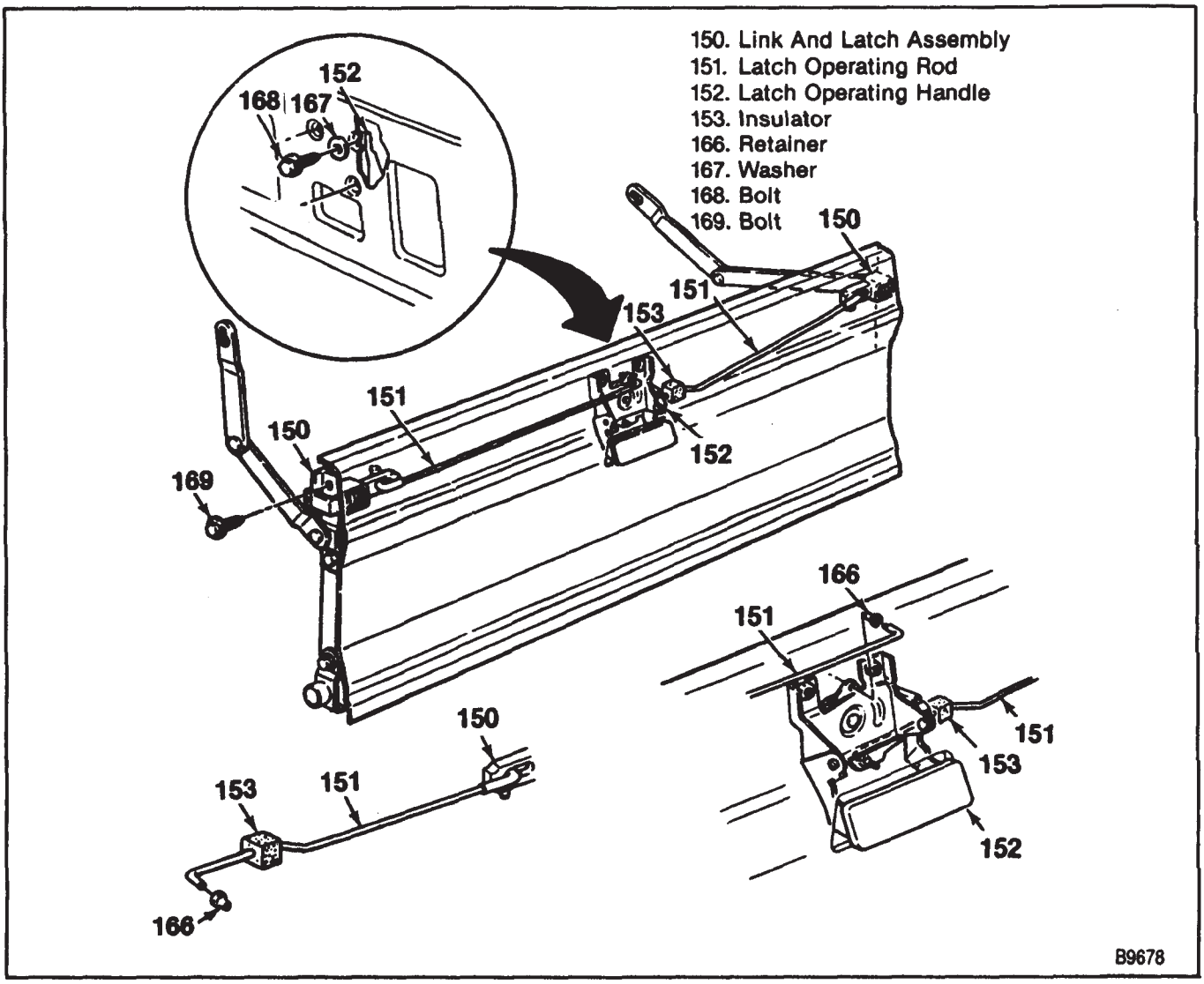


Figure 23—End Gate Handle Assembly

SPECIFICATIONS

Fastener	N·m	Ft. Lbs.	In. Lbs.
Torque Rod Bracket Bolts	10	—	89
Window Hinge Bolts	6	—	54
End Gate Hinge Bolts	27	20	—
End Gate Striker Bolts	27	20	—
End Gate Latch Handle Bolts	27	20	—
Weatherstrip Adhesive	3M No. 08011 or Equivalent		
Weatherstrip Adhesive Disolver	3M No. 0897 or Equivalent		

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SPECIAL TOOLS

433.

J-24595-B

433. Trim Pad Remover

B8638

SECTION 10B

CAB AND BODY MAINTENANCE

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

CONTENTS

GENERAL DESCRIPTION

The steel conventional cab is made of several large, one-piece steel panels which reduce the number of weld joints and improve the sealing and strength. Double wall construction is used for the cowl, roof panel, rocker panels and upper rear panel.

A four-point mounting system is used.

DIAGNOSIS OF CAB

PROBLEM	POSSIBLE CAUSE	CORRECTION
Cab Is Not Level	1. Worn cushion(s) in one of the cab mounts. 2. Collapsed spacer(s). 3. Missing mount components. 4. Weak or broken suspension spring. 5. Twisted frame.	1. Replace the cushion(s). 2. Replace the spacer(s). 3. Replace the components. 4. Refer to FRONT SUSPENSION AND AXLE (SECTION 3C). 5. Refer to FRAME AND BODY MOUNTS (BUMPERS) (SECTION 2A).
Water Leaks Into Cab	1. Leak between body panels. 2. Leaking windows. 3. Leaking doors. '	1. Locate leak and repair. 2. Refer to GLASS (SECTION 10A3). 3. Refer to DOORS (SECTION 10A1).
Dust Leaks Into Cab	1. Leak between body panels.	1. Locate leak and repair.
Excessive Interior Nois Level	1. Loose or broken seat mounts or components. 2. Door out of alignment. 3. Loose or broken door components. 4. Leaking doors. 5. Leaking windows. 6. Loose instrument panel bezel.	1. Refer to SEATS (SECTION 10A2). 2. Refer to DOORS (SECTION 10A1). 3. Refer to DOORS (SECTION 10A1). 4. Refer to DOORS (SECTION 10A1). 5. Refer to GLASS (SECTION 10A3). 6. Refer to INSTRUMENT PANEL AND GAGES (SECTION 8C).
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CAB MAINTENANCE

INTERIOR CLEANING

CAUTION: Follow the manufacturers advice when cleaning agents or other chemicals are used inside the vehicle. Some cleaners may be poisonous or flammable, and improper use may cause personal injury or damage. When cleaning the interior of the vehicle, do not use volatile cleaning solvents such as acetone, lacquer thinners, enamel reducers, nail polish removers or cleaning materials such as laundry soaps, bleaches or reducing agents, except as noted in the fabric cleaning advice on stain removal which follows. Never use carbon tetrachloride, gasoline, benzene, or naptha for any cleaning purpose.
Open all vehicle doors for ventilation when any cleaning agents or other chemicals are used inside the vehicle. Overexposure to some vapors, which is more likely to occur in small, unventilated spaces, may result in a health problem.

NOTICE: To avoid possible permanent discoloration of light colored seats, do not let materials with non-fast colors come in contact with seat trim materials until these materials are totally dry. This includes certain types of clothing, such as colored denims, corduroys, leathers and suedes.

Use the proper cleaning techniques and cleaners on the first cleaning to avoid water spots, spot rings, or settling of stains or soilage—all of which are more difficult to remove in a second cleaning.

Remove dust and loose dirt often that collect on interior fabrics with a vacuum cleaner or soft bristle brush. Wipe vinyl trim regularly with a clean damp cloth.

BASIC STEPS BEFORE CLEANING

1. Remove stains as quickly as possible before they set.
2. Use a clean cloth or sponge, and change to a clean area often. A soft brush may be used if stains persist.
3. Use solvent-type cleaners only in a well ventilated area. D not saturate the stained area.
4. If a ring forms after spot cleaning, clean the entire area immediately.
5. Follow manufacturer instructions for all cleaning agents.

CLEANING VINYL TRIM

Ordinary soilage can be removed from vinyl with warm water and mild soap or oil soap, or an equivalent.

Apply a small amount of soap solution and let it soak for a few minutes to loosen dirt; then rub briskly with a clean, damp cloth to remove dirt and traces of soap. This may be repeated several times, if needed.

Soilage such as tars, asphalts, shoe polish, etc. will stain if left on trim. Wipe off these compounds as quickly as possible and clean the area with a clean cloth dampened with GM Vinyl/Leather Cleaner or equivalent.

Wipe vinyl trim with soft clean cloths to dry and restore sheen or luster.

SPOT CLEANING FABRIC TRIM

Before trying to remove a spot or stain from fabric, try to determine the type and age of the spot or stain. Some spots or stains or soilage such as lipstick, inks and grease, are very difficult (sometimes impossible) to remove completely. When cleaning this type of stain or soilage, do not enlarge the soiled area. Use GM Fabric Cleaner (Solvent Type) or equivalent for spot cleaning grease, oil, or fat stains.

Gently scrape excess stain from the trim material with a clean, dull knife or scraper. Use very little cleaner, light pressure, and clean cloths, preferably cheesecloth. Start cleaning at the outside of the stain and feather toward the center. Keep changing to a clean section of the cloth.

After the stain has been removed, immediately dry the area with an air hose, heat dryer, or heat lamp to help prevent a cleaning ring. Use caution with heat dryer or lamp to help prevent fabric damage.

If a ring forms, immediately repeat the cleaning operation over a slightly larger area with emphasis on feathering toward its center. If a ring still remains, mask off surrounding trim sections and clean the entire area with GM Multi-Purpose Powdered Cleaner or equivalent as explained later in this section.

GENERAL CLEANING OF FABRIC TRIM

Use GM Multi-Purpose Powdered Cleaner or equivalent for this type of cleaning and for cleaning panel sections where small cleaning rings may be left from spot cleaning.

Vacuum and brush the area to remove any loose dirt and mask surrounding trim along stitch or welt lines.

Clean a whole trim panel or section. Mix cleaner following the directions on the container label. Mix in proportion for smaller quantities. Use suds on a clean sponge. Do not saturate the material or rub it harshly. Remove suds with a sponge and rinse with a clean wet sponge. Wipe off remaining residue with a slightly damp absorbant towel or cloth. Dry the material with an air hose. A heat dryer or heat lamp may be used. Use care with a heat dryer or lamp to help prevent damage.

REMOVAL OF SPECIFIC STAINS

Grease Or Oily Stains

These include grease, oil, butter, margarine, shoe polish, coffee with cream, chewing gum, cosmetic creams, vegetable oils, wax crayon, tar and asphalts.

- Carefully scrape off excess stain, then use GM Fabric Cleaner or equivalent as explained earlier in this section.
- Shoe polish, wax crayons, tar and asphalts will stain if left on trim; they should be removed as soon as possible. Use care as cleaner will dissolve the stains and may cause them to bleed.

Non-Greasy Stains

These include catsup, black coffee, egg, fruit, fruit juice, milk, soft drinks, wine, vomit, blood and urine.

1. Carefully scrape off excess stain, then sponge the stain with cool water.
   - If a stain remains, use GM Multi-Purpose Powdered Cleaner (Foam Type) or equivalent as explained earlier in this section.
   - If an odor lingers after cleaning vomit or urine, treat the area with a water/baking soda solution of 5 ml (1 teaspoon) of baking soda to 250 ml (1 cup) of lukewarm water.
   - Finally, if needed, clean lightly with GM Fabric Cleaner (Solvent Type) or equivalent.

Combination Stains

Include candy, ice cream, mayonnaise, chili sauce and unknown stains.

- Carefully scrape off excess stain. Clean with cool water and allow to dry.
- If a stain remains, clean it with GM Fabric Cleaner (Solvent Type) or equivalent.

SEAT BELT CARE

CAUTION: Do not bleach or dye seat belts since this may severely weaken them. Damaged seat belts are a safety hazard.

- Keep belts clean and dry.
- Clean lap belts only with mild soap and lukewarm water.

GLASS SURFACES

Glass surfaces should be cleaned on a regular basis. Use GM Glass Cleaner or equivalent to remove normal tobacco smoke and dust films.

Do not use abrasive cleaners on any vehicle glass. Abrasive cleaners will scratch glass.

EXTERIOR CLEANING:

CAUTION: Follow the manufacturers advice when cleaning agents or other chemicals are used on the exterior of the vehicle. Some cleaners may be poisonous or flammable, and improper use may cause personal injury or damage. When cleaning the exterior of the vehicle, do not use volatile cleaning solvents such as: acetone, lacquer thinners, enamel reducers, nail polish removers; or cleaning materials such as laundry soaps, bleaches or reducing agents. Never use carbon tetrachloride, gasoline, benzene, or naptha for any cleaning purpose.

WASHING AND WAXING

Wash the vehicle in lukewarm or cold water. Do not use hot water or wash the vehicle in the direct rays of the sun. Do not use strong soap or chemical detergents. All cleaning agents should be promptly flushed from the surface and not allowed to dry on the finish.

Painted body surfaces and chrome plating should be protected by a coating of wax. Any good body wax can be used for both painted and chrome surfaces. Wax should be applied immediately after the vehicle has been cleaned. Periods between applications should be short enough to assure continuous protection of the finish.

FOREIGN MATERIAL DEPOSITS

Calcium chloride and other salts, ice melting agents, road oil and tar, tree sap, bird droppings, chemicals from industrial chimneys, and other foreign matter may damage vehicle finishes if left on painted surfaces.

Prompt washing may not completely remove all of these deposits. Other cleaners may be needed. Use chemical cleaners that are safe for use on painted surfaces.

CLEANING THE OUTSIDE OF WINDSHIELD

If the windshield is not clear after using the windshield washer, or if the wiper blade chatters when running, wax or other material may be on the blade or windshield.

Clean the outside of the windshield with a non-abrasive cleaner. The windshield is clean if beads do not form when rinsing with water.

Clean the blade by wiping with a cloth soaked in a solution of one-half water and one-half GM Optikleen or equivalent. A solution of one-half water and one-half methanol alcohol may also be used. Rinse the blade with water.

CLEANING BRIGHT METAL PARTS

Clean bright metal parts regularly. Washing with water is all that is usually needed. Use GM Chrome Polish or equivalent on chrome or stainless steel trim, if necessary.

Use special care with aluminum trim. Do not use auto or chrome polish, steam or caustic soap to clean aluminum. A coating of wax, rubbed to a high polish, is recommended for all bright metal parts.

WEATHER STRIP LUBRICATION

Use silicone grease to lengthen weather strip life to help sealing and to help eliminate squeaks. Lubricate all weather strips with GM silicone grease or equivalent. Use a clean cloth to apply a thin film of silicone grease.

WATER LEAKS

If water has leaked into the cab, test for the leakage points. Spray water under pressure against the cab in the general area where the leak is believed to be located. Have an assistant inside the cab locate and mark the point(s) where any water appears.

Water which appears at a certain place inside the cab may actually be entering the cab from another point. It may be necessary to remove the floor mat, insulation, dash pad, instrument carrier, etc. Backtrack the path of water to point of entry. If it is still not possible to locate the point of entry, do the following:

1. Close all windows and vents.
2. Turn the fan lever to the "Hi" position.
3. Place the air lever in position to use outside air.
4. Close the doors.
5. Run a small stream of water over the suspected area of leakage.
6. Check for pressure bubbles that indicate air is escaping from the cab.
7. Turn off the air conditioning or heater blower.

CORRECTIVE MEASURE

If the leak is between body panels, use an air drying body sealing compound.

If the leak is around a door, it may be because the door is not properly aligned. Align the door. Refer to DOORS (SEC. 10A1). If the door is contacting the weatherstrip correctly, make sure the weatherstrip is not damaged and is properly seated on the opening flange. If the weatherstrip is not properly seated, rubber cement can be used to hold it in place. If the weatherstrip is damaged, replace it.

If the leak is around a window held by a weatherstrip, completely dry the area and apply rubber cement between the glass and the weatherstrip and the body and weatherstrip. If leaks continue, remove the window and check the weatherstrip. If the weatherstrip is damaged, it should be replaced. Check the flange that holds the weatherstrip for any nicks or burrs that may have caused the damage.

DUST LEAKS

Dust will leak into a cab where water will not, particularly in the lower portion of the cab. Forward motion of the vehicle can create a slight vacuum which pulls air and dust into the cab.

To determine the location of dust leaks:

1. Remove the mats and insulation from the floor and toe panel.
2. Drive the vehicle on a dusty road.
3. Examine the interior of the cab. Dust in the shape of a small cone or slit will usually be fond at the point of leakage.
4. Mark the points of leakage.

With cab in a dark area, shine bright lights on the underside of floor and cowl, and have an assistant check inside the cab for any points where the light shines through. Mark the leakage points. Check weld joints and cab mounting areas.

Sealing of leaks should be done with an air drying body sealing compound.

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