

SECTION : 9Q

ROOF

CAUTION : *Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in LOCK unless otherwise noted.*

TABLE OF CONTENTS

SPECIFICATIONS	9Q-2	FORMED HEADLINER	9Q-10
FASTENER TIGHTENING SPECIFICATIONS .	9Q-2	SUN VISORS WITH VANITY MIRROR	9Q-12
SPECIAL TOOLS	9Q-2	PASSENGER ASSIST HANDLES	9Q-13
SPECIAL TOOLS TABLE	9Q-2	POWER SUNROOF CONTROL SWITCH ...	9Q-14
SCHEMATIC AND ROUTING DIAGRAMS	9Q-3	GENERAL DESCRIPTION AND SYSTEM	
POWER SUNROOF SYSTEM	9Q-3	OPERATION	9Q-15
DIAGNOSIS	9Q-4	ROOF	9Q-15
POWER SUNROOF	9Q-4	POWER SUNROOF/SUNROOF	
MAINTENANCE AND REPAIR	9Q-7	CONTROL SWITCH	9Q-15
ON-VEHICLE SERVICE	9Q-7	SUN VISORS WITH VANITY MIRROR	9Q-15
POWER SUNROOF	9Q-7	PASSENGER ASSIST HANDLES	9Q-15
		COAT HOOKS	9Q-15

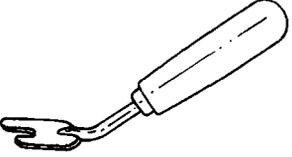
SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	N•m	Lb-Ft	Lb-In
Power Sunroof Control Switch Screws	2	–	18
Passenger Assist Handle Screws	3	–	27
Sun Visor Screws	4	–	35
Sun Visor Support Screw	1.5	–	13
Sunroof Housing Bolts	10	–	89
Sunroof Motor Screws	3	–	27

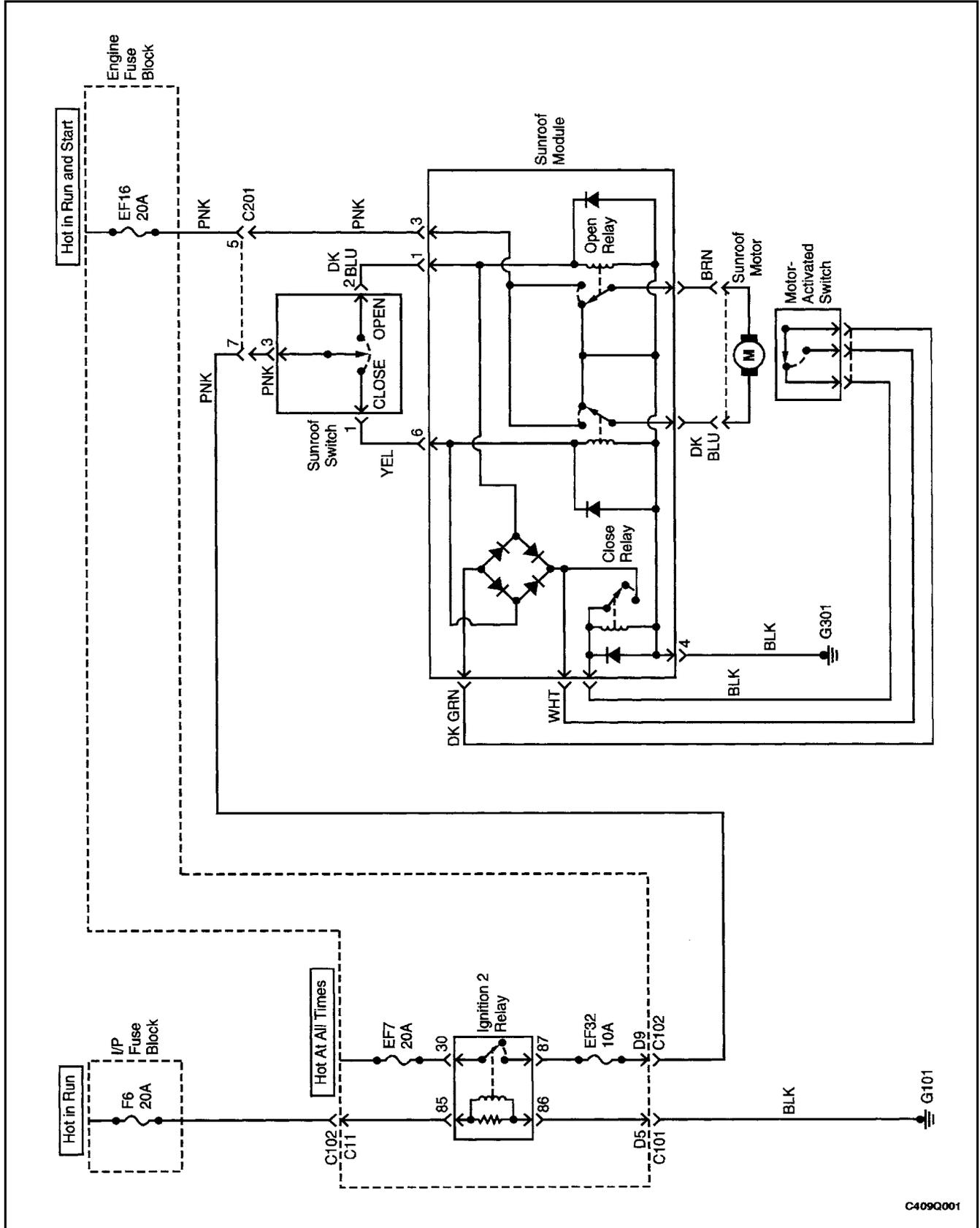
SPECIAL TOOLS

SPECIAL TOOLS TABLE

 <p>A109G029</p>	<p>KM-475-B Trim Remover</p>
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SCHEMATIC AND ROUTING DIAGRAMS

POWER SUNROOF SYSTEM



DIAGNOSIS

POWER SUNROOF

Test Description

The numbers below refer to steps on the diagnostic table.

3. The terminals are not marked on the relay socket,

but the terminals are marked on the underside of the relay.

20. The meter will show the same voltage at both switch positions, but one of the switch positions will show reverse polarity.

Power Sunroof Does Not Work

Step	Action	Value(s)	Yes	No
1	Check fuses F6, EF7, EF32, and EF16. Is any fuse blown?		Go to Step 2	Go to Step 3
2	1. Check for a short circuit and repair it, if necessary. 2. Replace the fuses, as necessary. Is the repair complete?		System OK	
3	1. Remove the Ignition 2 relay. 2. Turn the ignition ON. 3. Check the voltage at the Ignition 2 relay socket, terminals 30 and 85. Does the voltmeter indicate the specified value at both locations?	11–14 v	Go to Step 5	Go to Step 4
4	Repair the power supply to the Ignition 2 relay. Is the repair complete?		System OK	
5	1. With the Ignition 2 relay removed, use the underside of the relay to identify the location of terminal 86 and terminal 30 of the relay socket. 2. Connect a voltmeter between terminal 30 and terminal 86 of the relay socket. Does the voltmeter indicate the specified value?	11–14 v	Go to Step 7	Go to Step 6
6	Repair the open circuit between ground and terminal 86 of the ignition 2 relay. Is the repair complete?		System OK	
7	1. Temporarily substitute a known good relay for the Ignition 2 relay. 2. Turn the ignition ON. 3. Attempt to operate the sunroof. Does the sunroof operate?		Go to Step 9	Go to Step 8
8	1. Return the substituted relay to its original position. 2. Replace the Ignition 2 relay. Is the repair complete?		System OK	
9	1. Turn the ignition ON. 2. At the lamp/sunroof switch, check the voltage terminal 3 of the switch connector. Does the voltmeter indicate the specified value?	11–14 v	Go to Step 11	Go to Step 10
10	Repair the open circuit between fuse EF7 and the sunroof switch. Is the repair complete?		System OK	

Step	Action	Value(s)	Yes	No
11	<ol style="list-style-type: none"> 1. Turn the ignition ON. 2. With the sunroof switch connected, turn the switch to the closed position. 3. Check the voltage at terminal 1 of the switch connector. 4. With the sunroof switch connected, turn the switch to the open position. 5. Check the voltage at terminal 2 of the switch connector. <p>Are both voltages equal to the specified value?</p>	11–14 v	Go to <i>Step 13</i>	Go to <i>Step 12</i>
12	<p>Replace the sunroof switch.</p> <p>Is the repair complete?</p>		System OK	
13	<ol style="list-style-type: none"> 1. Disconnect the sunroof module six-pin electrical connector. 2. Use an ohmmeter to measure the resistance between terminal 4 and ground. <p>Is the resistance within the specified value?</p>	$\approx 0 \Omega$	Go to <i>Step 15</i>	Go to <i>Step 14</i>
14	<p>Repair the open circuit between ground and terminal 4 of the sunroof module connector.</p> <p>Is the repair complete?</p>		System OK	
15	<ol style="list-style-type: none"> 1. With the sunroof module still disconnected, turn the ignition ON. 2. Check the voltage at terminal 3 of the connector for the sunroof module. <p>Does the voltmeter indicate the specified value?</p>	11–14 v	Go to <i>Step 17</i>	Go to <i>Step 16</i>
16	<p>Repair the open circuit between fuse EF16 and terminal 3 of the sunroof module.</p> <p>Is the repair complete?</p>		System OK	
17	<ol style="list-style-type: none"> 1. With the sunroof module still disconnected, turn the ignition ON. 2. Check the voltage at terminal 6 of the sunroof module with the sunroof switch in the CLOSE position. <p>Does the voltmeter indicate the specified value?</p>	11–14 v	Go to <i>Step 19</i>	Go to <i>Step 18</i>
18	<p>Repair the open circuit between the sunroof switch and the sunroof module.</p> <p>Is the repair complete?</p>		System OK	
19	<ol style="list-style-type: none"> 1. With the sunroof module still disconnected, turn the ignition ON. 2. Check the voltage at terminal 1 of the sunroof module with the sunroof switch in the OPEN position. <p>Does the voltmeter indicate the specified value?</p>	11–14 v	Go to <i>Step 20</i>	Go to <i>Step 18</i>
20	<ol style="list-style-type: none"> 1. Reconnect the sunroof module. 2. Remove the sunroof motor, but leave the connectors attached. 3. Attempt to operate the motor in both directions by using the sunroof switch. <p>Does the motor operate?</p>		Go to <i>Step 21</i>	Go to <i>Step 22</i>
21	<p>Repair the jammed sunroof mechanism.</p> <p>Is the repair complete?</p>		System OK	

9Q – 6 ROOF

Step	Action	Value(s)	Yes	No
22	1. Disconnect both of the one-wire connectors at the sunroof motor. 2. Connect a voltmeter between the two one-wire connectors. 3. Turn the ignition ON. 4. Turn the sunroof switch to the CLOSE position and observe the voltmeter reading. 5. Turn the sunroof switch to the OPEN position and observe the voltmeter reading. Does the voltmeter indicate the specified value when the switch is each position (OPEN and CLOSE)?	11–14 v	Go to <i>Step 24</i>	Go to <i>Step 23</i>
23	Replace the sunroof module. Is the repair complete?		System OK	
24	Replace the sunroof motor. Is the repair complete?		System OK	

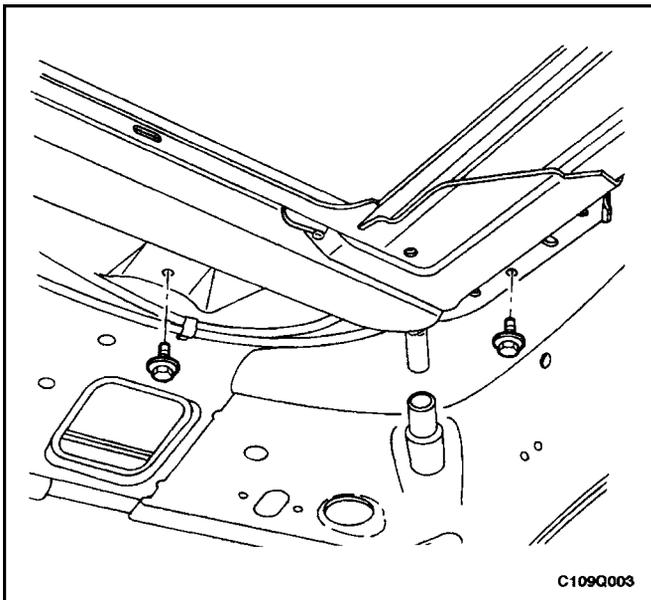
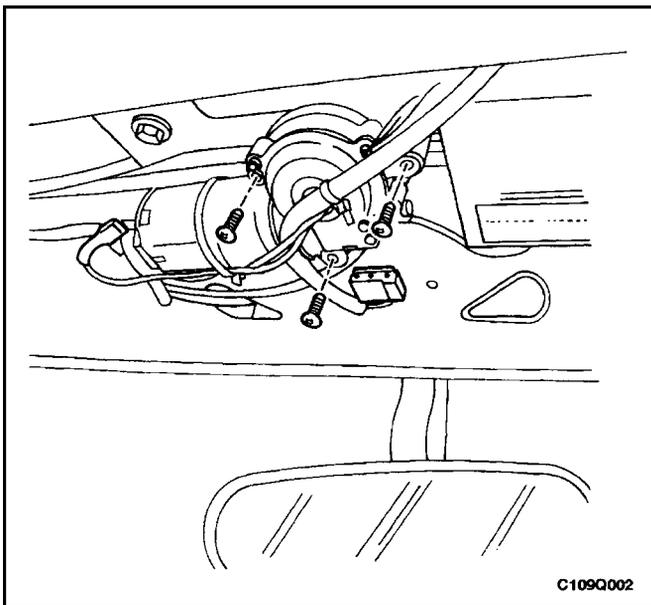
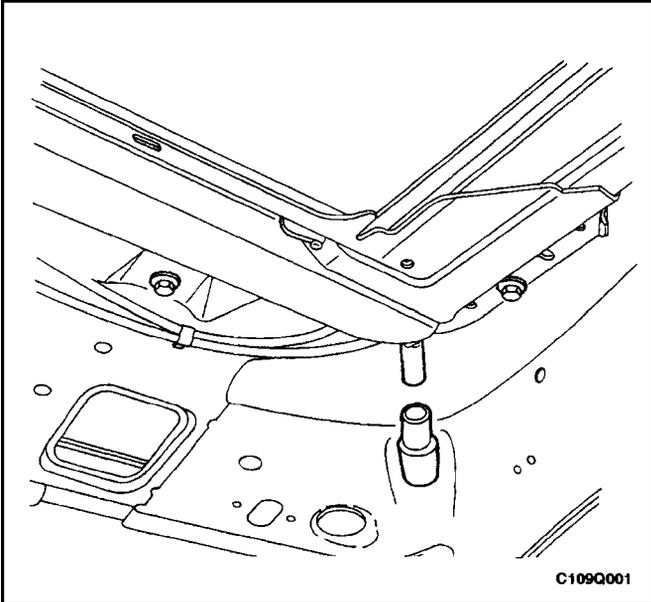
MAINTENANCE AND REPAIR

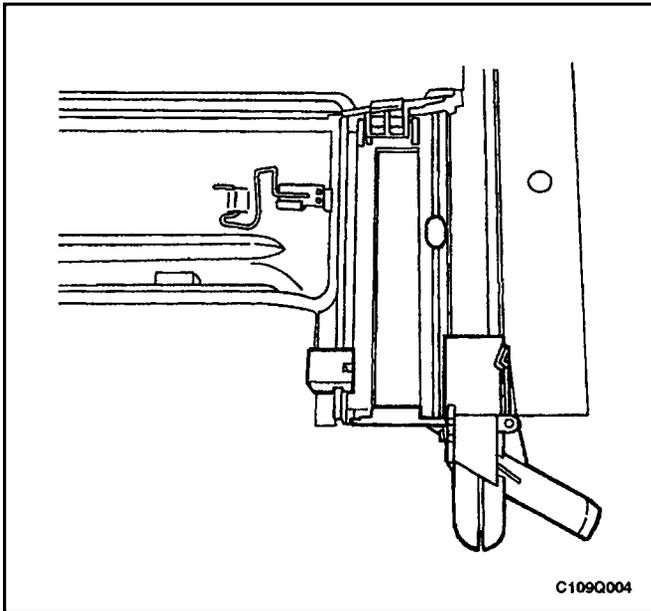
ON-VEHICLE SERVICE

POWER SUNROOF

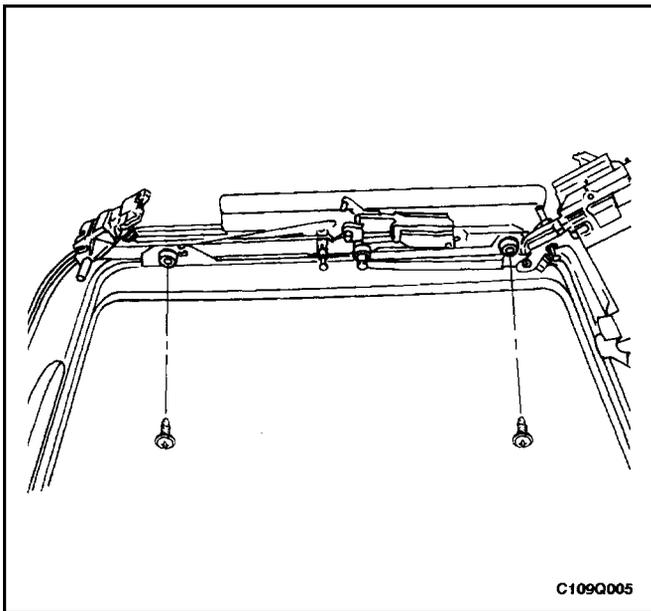
Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the headliner. Refer to "Formed Headliner" in this section.
3. Remove the drain hoses.
4. Disconnect the electrical connectors.
5. Remove the screws and the motor.
6. Remove the motor control module.
7. Remove the bolts and the housing from the vehicle.

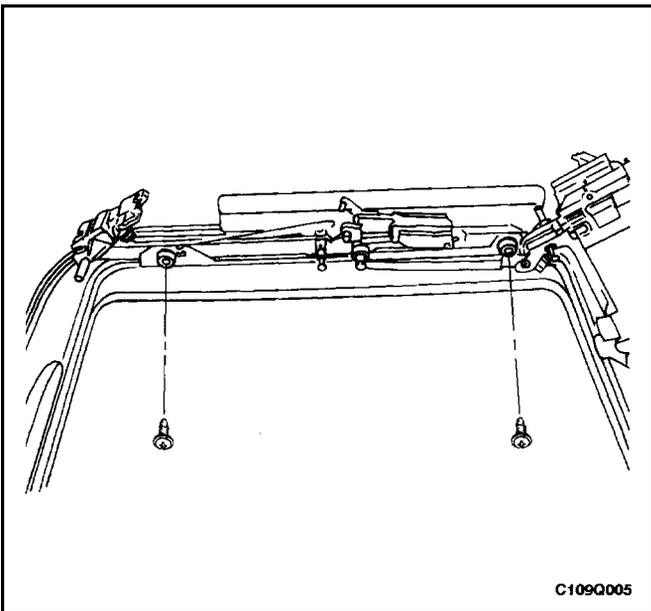




8. Remove the rubber end caps.
9. Remove the drain nozzles.
10. Remove the shade stops.
11. Remove the glass stops.



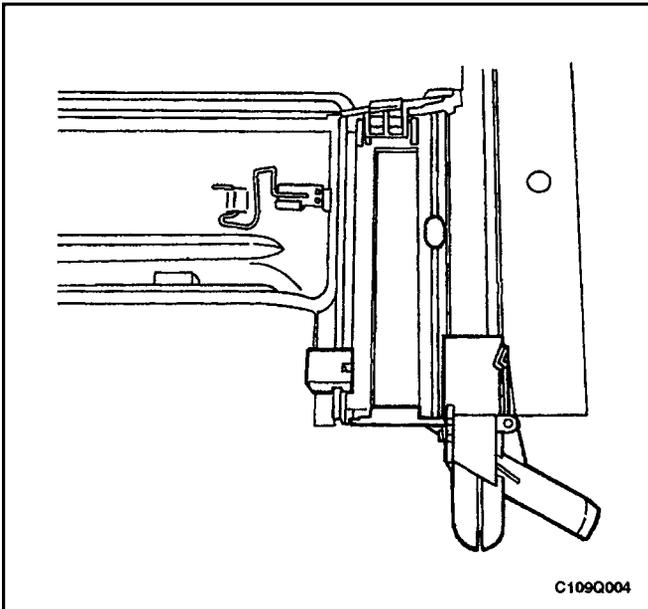
12. Remove the shade.
13. Remove the glass and the frame from the housing.
14. Remove the plastic trim.
15. Remove the screws and the glass from the frame.



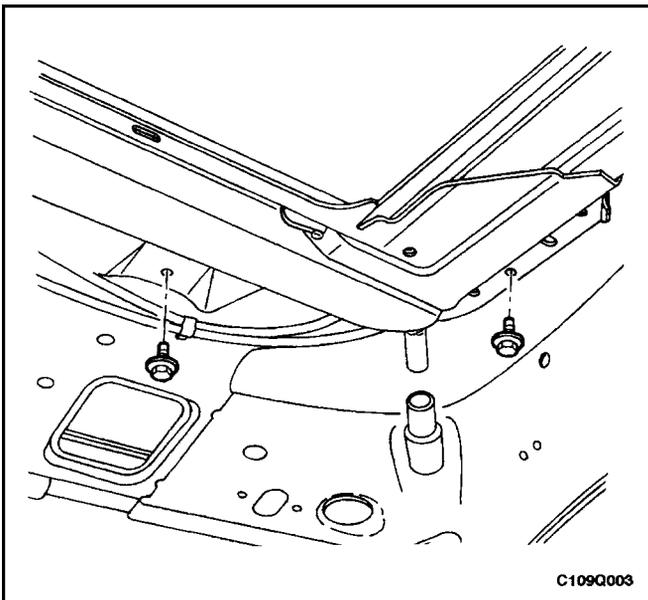
Installation Procedure

Notice : Dissimilar metals in direct contact with each other may corrode rapidly. Make sure to use the correct fasteners to prevent premature corrosion.

1. Install the glass to the frame with the screws.



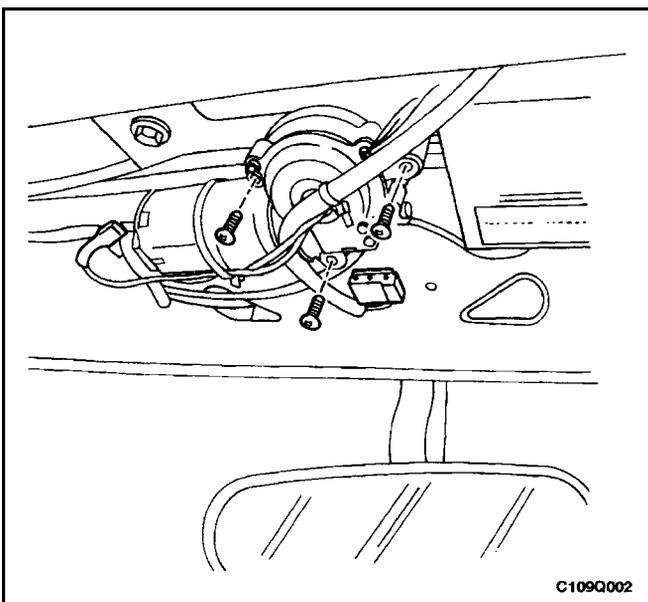
2. Install the plastic trim.
3. Install the glass and the frame to the housing.
4. Install the shade.
5. Install the glass stops.
6. Install the shade stops.
7. Install the drain nozzles.
8. Install the rubber end caps.



9. Install the housing to the roof of the vehicle with the bolts.

Tighten

Tighten the sunroof housing bolts to 10 N•m (89 lb-in).

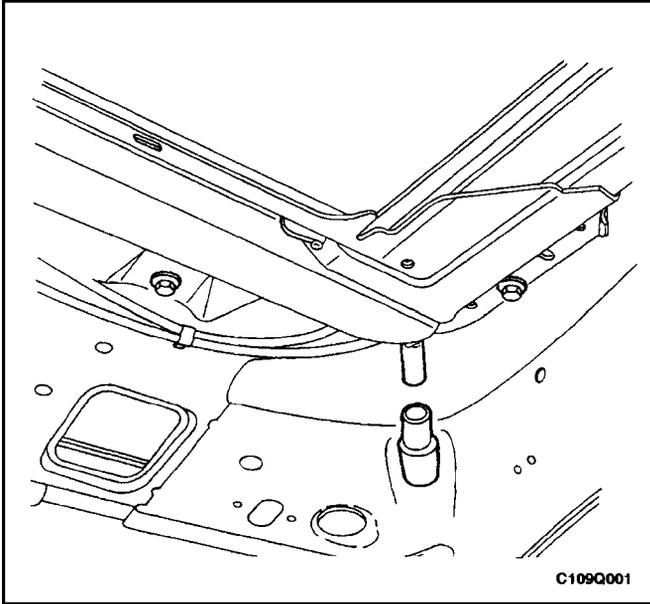


10. Install the motor control module.
11. Install the motor with the screws.

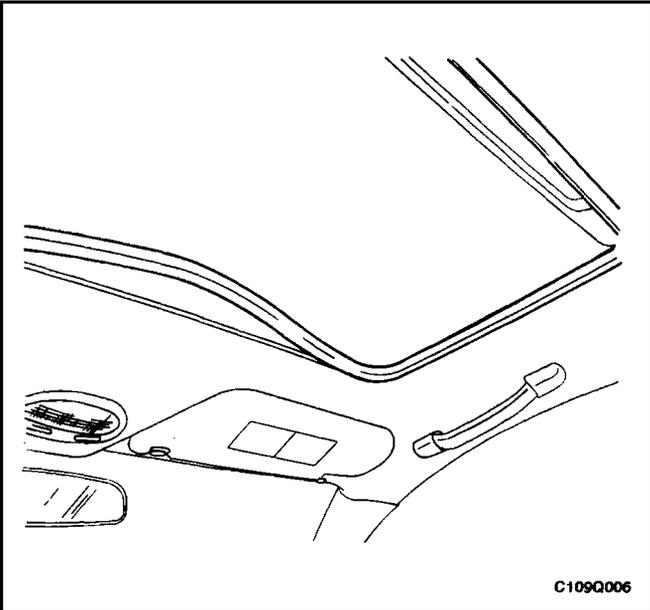
Tighten

Tighten the sunroof motor screws to 3 N•m (27 lb-in).

12. Connect the electrical connectors.



13. Install the drain hoses.
14. Install the headliner. Refer to "Formed Headliner" in this section.
15. Connect the negative battery cable.



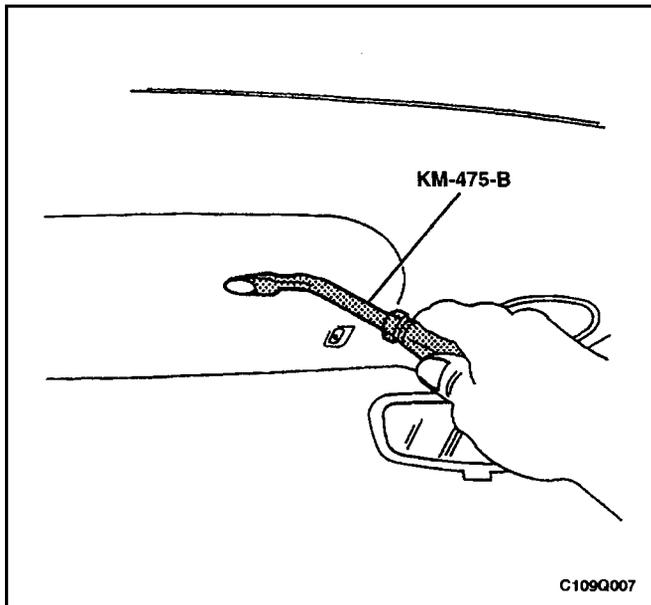
FORMED HEADLINER

Tools Required

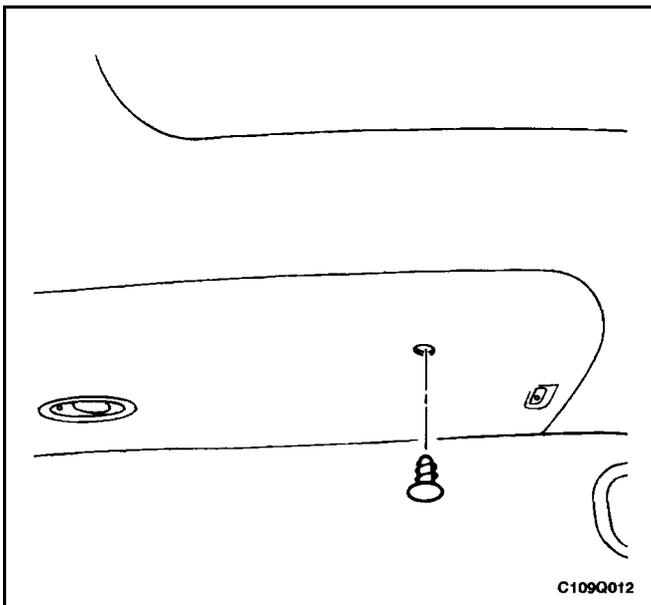
KM-475-B Trim Remover

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the sunroof molding, if equipped.
3. Remove the passenger assist handles. Refer to "Passenger Assist Handles" in this section.
4. Remove the plastic retaining clips in the headliner on the driver's side.
5. Remove the sun visors. Refer to "Sun Visors with Vanity Mirror" in this section.
6. Remove the power sunroof control switch, if equipped. Refer to "Power Sunroof Control Switch" in this section.
7. Remove the ultrasonic sensor. Refer to *Section 9T, Remote Keyless Entry and Anti-Theft System*.
8. Remove the A-, B-, and C-pillar trim panels. Refer to *Section 9G, Interior Trim*.

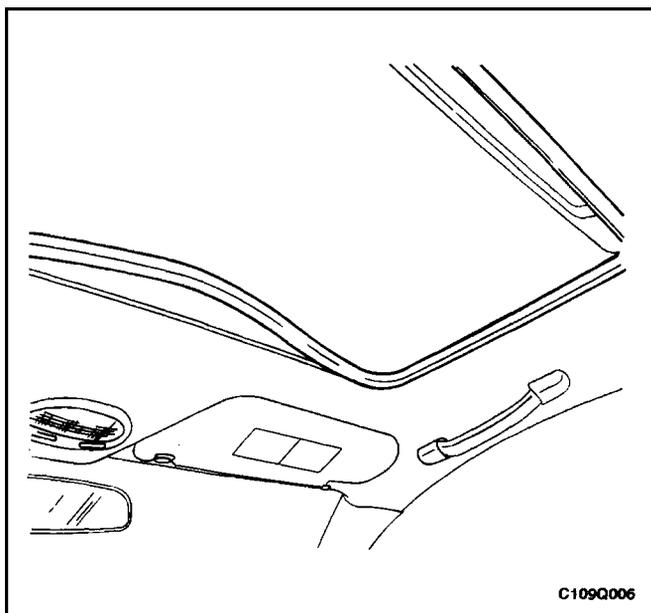


9. Remove the plastic retainers in the headliner using the trim remover KM-475-B.
10. Recline both front seats.
11. Remove the headliner through a rear door.



Installation Procedure

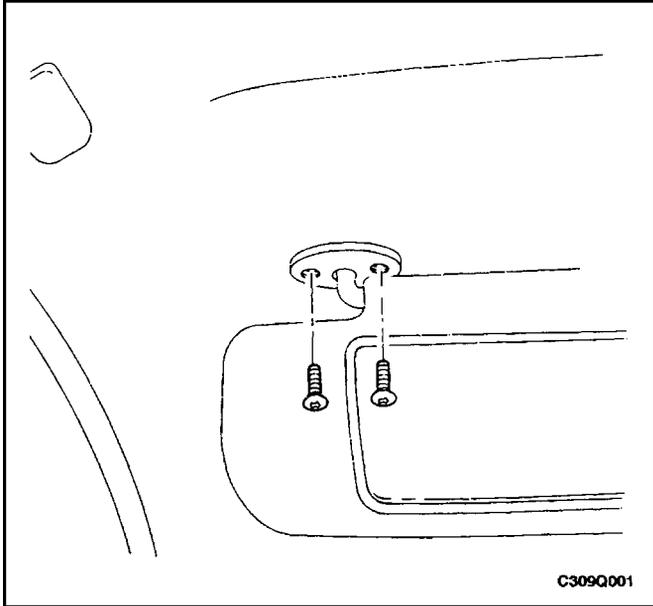
1. Recline both front seats.
2. Insert the headliner through a rear door.
3. Install the headliner behind the seals around the doors.
4. Install the plastic retainers.
5. Install the A-, B-, and C-pillar trim panels. Refer to *Section 9G, Interior Trim*.
6. Install the power sunroof switch, if equipped. Refer to "Power Sunroof Control Switch" in this section.
7. Install the sun visors. Refer to "Sun Visors with Vanity Mirror" in this section.
8. Install the plastic retainers in the headliner on the driver's side.
9. Install the passenger assist handles. Refer to "Passenger Assist Handles" in this section.
10. Install the ultrasonic sensor. Refer to *Section 9T, Remote Keyless Entry and Anti-Theft System*.
11. Install the sunroof molding, if equipped.
12. Connect the negative battery cable.



SUN VISORS WITH VANITY MIRROR

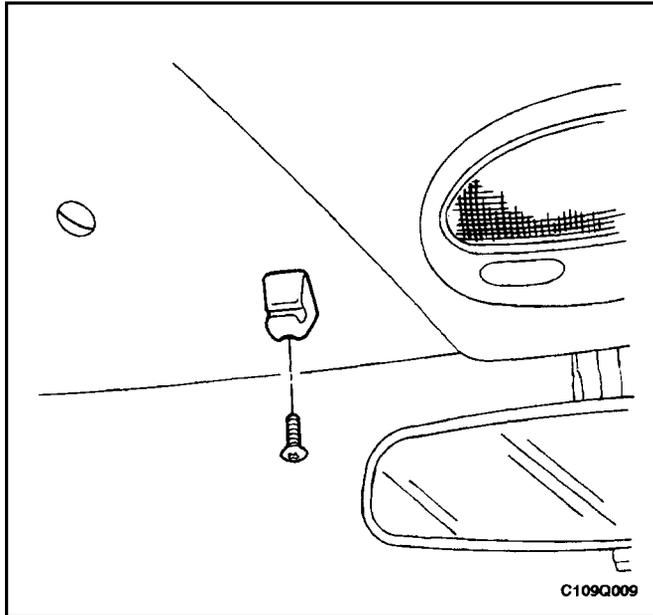
Removal Procedure

1. Remove the screws and the sun visor from the headliner.
2. Disconnect the vanity mirror electrical connector. Refer to *Section 9B, Lighting Systems*.



C309Q001

3. Remove the screw and the sun visor support from the headliner.



C109Q009

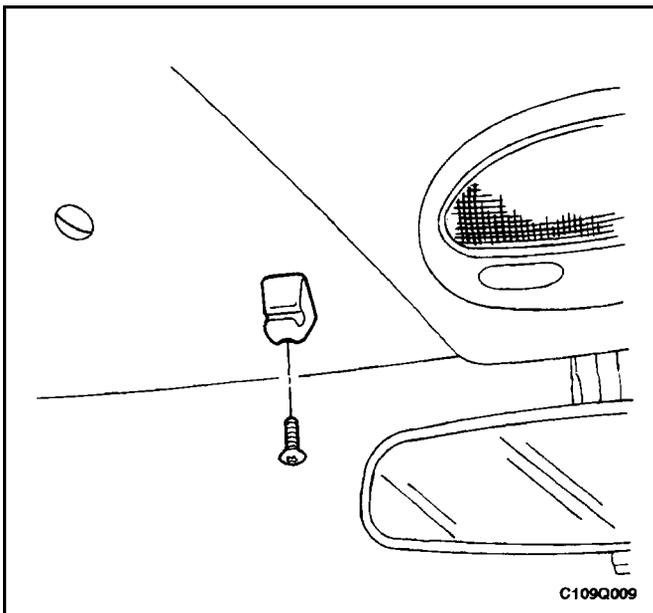
Installation Procedure

Notice : Dissimilar metals in direct contact with each other may corrode rapidly. Make sure to use the correct fasteners to prevent premature corrosion.

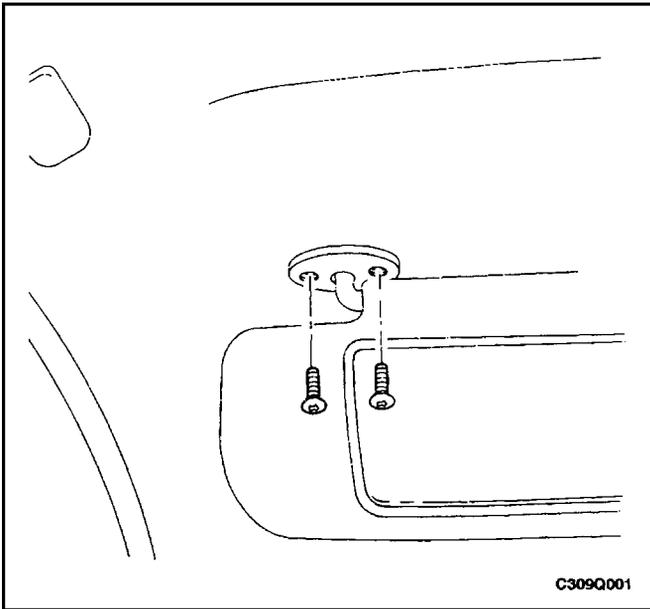
1. Install the sun visor support to the headliner with the screw.

Tighten

Tighten the sun visor support screw to 1.5 NSm (13 lb-in).



C109Q009

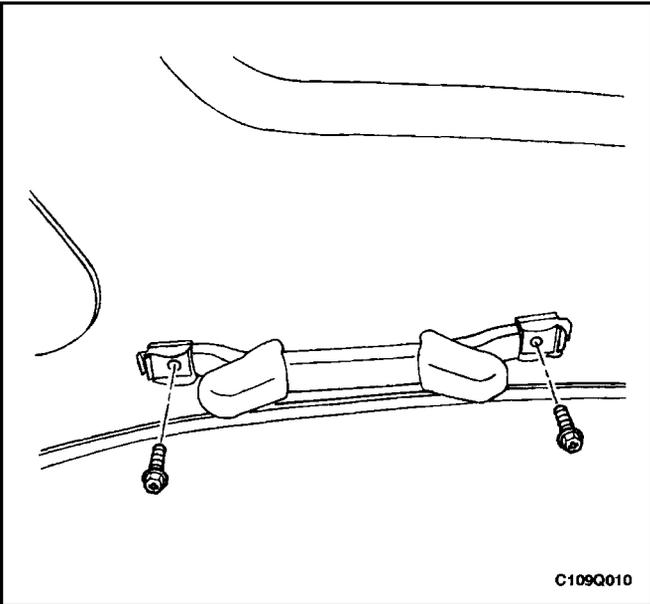


C309Q001

2. Connect the vanity mirror electrical connector. Refer to *Section 9B, Lighting Systems*.
3. Install the sun visor to the headliner with the screws.

Tighten

Tighten the sun visor screws to 4 N•m (35 lb–in).

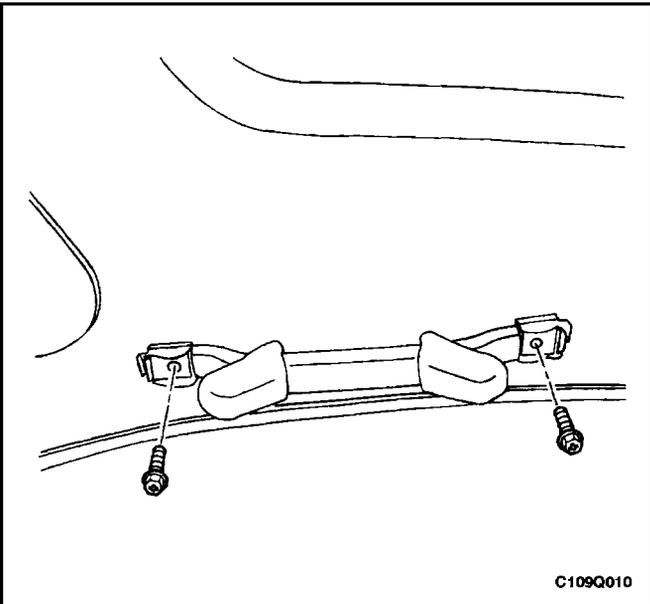


C109Q010

PASSENGER ASSIST HANDLES

Removal Procedure

1. Reposition the plastic caps to reveal the assist handle screws.
2. Remove the screws and the assist handle from the headliner.



C109Q010

Installation Procedure

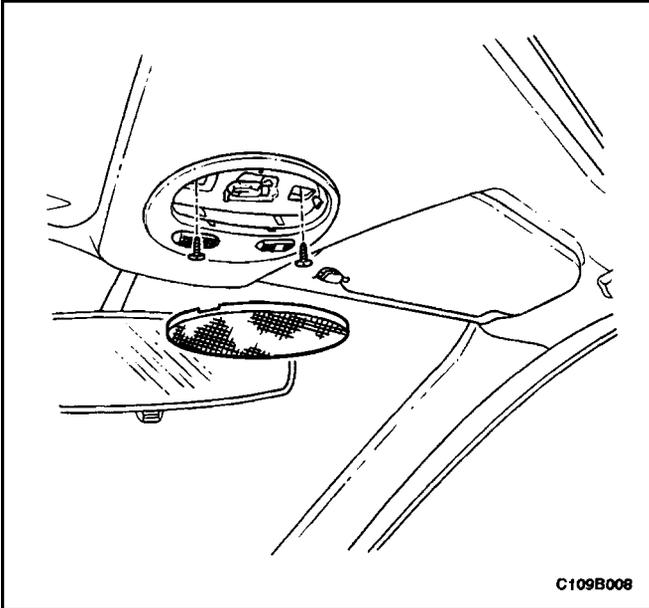
Notice : Dissimilar metals in direct contact with each other may corrode rapidly. Make sure to use the correct fasteners to prevent premature corrosion.

1. Install the assist handle to the headliner with the screws.

Tighten

Tighten the passenger assist handle screws to 3 N•m (27 lb–in).

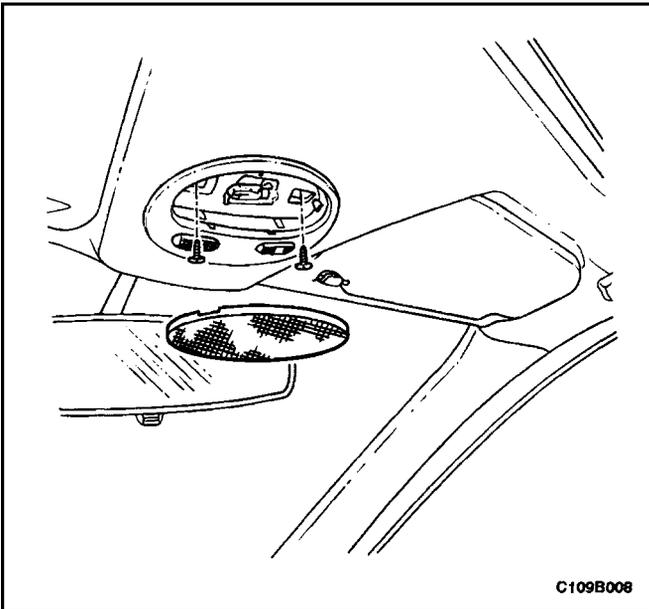
2. Install the plastic caps over the assist handle screws.



POWER SUNROOF CONTROL SWITCH

Removal Procedure

1. Disconnect the negative battery cable.
2. Pry off the interior courtesy lamp lens.
3. Remove the screws and the switch.
4. Disconnect the electrical connector.



Installation Procedure

1. Connect the electrical connector.
- Notice :** Dissimilar metals in direct contact with each other may corrode rapidly. Make sure to use the correct fasteners to prevent premature corrosion.
2. Install the sunroof control switch with the screws.
- Tighten**
Tighten the power sunroof control switch screws to 2 N•m (18 lb-in).
3. Install the interior courtesy lamp lens.
 4. Connect the negative battery cable.

GENERAL DESCRIPTION AND SYSTEM OPERATION

ROOF

The roof is a one-piece painted metal unit which incorporates a single solid headliner. There are two moldings, one per side on the vehicle's roof, which enclose and hide the roof rail seams. The roof moldings are serviceable as individual units.

The one-piece formed headliner consists of a molded substrate covered with a foam-backed cloth facing. The one-piece construction requires that the headliner be serviced as a complete assembly.

POWER SUNROOF/SUNROOF CONTROL SWITCH

The sunroof has the following characteristics:

- Intended to provide light and air through the roof of the vehicle.
- Built into the roof.
- Made of glass.
- Equipped with a sunshade that opens and closes manually.
- Powered by an electric motor. seat and for the front passenger seat. Passengers
- Controlled by a toggle switch built into the interior courtesy lamp assembly.

The sunroof control switch is a toggle button located on the right side of the interior courtesy lamp assembly.

To operate the sunroof, the ignition must be ON.

Tilting the Sunroof, Open and Closed

To tilt open the rear end of the sunroof, press and hold the forward portion of the toggle button until the sunroof tilts open.

To close the sunroof from a tilted-open position, press and hold the rear portion of the toggle button until the sunroof tilts closed.

Sliding the Sunroof, Open and Closed

To slide open the sunroof, press the rear portion of the toggle button until the sunroof slides. If the sun shade is closed, the sunroof will pull the sunshade open when the sunroof slides open.

To close the sunroof from a slid-open position, press the forward portion of the toggle button until the sunroof slides closed.

SUN VISORS WITH VANITY MIRROR

The sun visors swing down in order to block out glare. They also swing to the side when they are released from the support. To replace the vanity mirror lamp, refer to *Section 9B, Lighting Systems*.

PASSENGER ASSIST HANDLES

There is a passenger assist handle for each rear outboard seat and for the front passenger seat. Passengers can use these handles to assist in keeping their balance over rough roads or during sharp turns.

COAT HOOKS

The coat hooks are located on the left and the right rear passenger assist handles.