



MG31

Sun- And Moon-Roof

**Uniform
Procedures For
Collision Repair
UPCR**

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v.4.0



1. Description

This procedure describes replacement, inspection, and testing requirements for manual and power sun- and moon-roof glass systems. Methods for correcting air and water leaks are also included.



2. Purpose

The purpose of this procedure is to provide industry-accepted requirements for performing high-quality replacement of sun- and moon-roofs. This procedure is intended for use by professionals who are qualified through training and experience.



3. Referenced Documents

The following documents are considered part of this procedure by reference.

3.1 Procedures

- EL01 Wire Repair
- EL11 Troubleshooting
- HM01 Hazardous Materials
- PS01 Personnel Safety
- RF01P Surface Preparation
- RF01S Surface Preparation

3.2 Other Information

- Equipment-specific information
- National Auto Glass specifications
- Product-specific information
- Recycled parts information
- Vehicle specific repair information

Note: The National Glass Association (NGA) acknowledges the role of both the vehicle and adhesive makers in the replacement of glass parts. At times, their published replacement procedures may conflict.

The NGA does not warrant published adhesive procedures by either the vehicle or adhesive maker, but acknowledges the validity of both in the replacement of vehicle glass. It is the responsibility of the business owner and installing technician to determine applicability of published information to the installation and business environment.



4. Equipment And Material Requirements

4.1 Glass Equipment

The use of this equipment is included in this procedure:

- caulking gun
- finger rack
- plastic paddle
- vacuum or suction cups

4.2 Power Tools

The use of these power tools is included in this procedure:

- drill
- vacuum cleaner

4.3 Electronic Equipment

The use of this electronic testing equipment is included in this procedure:

- digital volt-ohmmeter (DVOM)
- jumper wires
- electronic leak detector

4.4 Materials

The use of these materials is included in this procedure:

- adhesives and primers
- glass cleaners
- clips and fasteners
- lubricants
- protective covers
- razor blades
- wire nuts



5. Damage Analysis

5.1 Glass And Mounting Parts

Inspect the glass and mounting parts for these conditions:

- visible damage
- improper previous installation
- misaligned guide rails
- damaged weatherstrip
- damaged or missing clips or other hardware
- improperly routed drain hoses
- damaged wires, switches, cables or gears

Plan to replace the glass if it is damaged. Determine if the mounting parts will be replaced or reused. Plan to replace any missing parts. Verify the availability of replacement parts.

5.2 Electrical Parts

If the power roof does not function properly, troubleshoot the power roof circuit to isolate the cause. See **EL11**. Determine the parts that will be replaced and the wiring that will be repaired. See **EL01**. Verify the availability of replacement parts.

Inspect power roof electrical parts for these conditions:

- blown fuses
- loose or corroded grounds, connectors, switches, or terminal pins
- damaged wiring or connectors
- inoperative or misaligned motors
- improper previous repairs

5.3 Roof Panel

Inspect the roof panel for these conditions:

- visible damage
- corrosion
- improper previous repairs

5.4 Adjacent Areas

Inspect adjacent areas, such as headliners, garnish moldings, seats, compartment lights, overhead center consoles, electrical wiring, etc. for damage and proper operation. Determine if the parts will be repaired, replaced, or reused. Verify the availability of replacement parts.



6. Personnel Safety

6.1 General Safety

General safety information is in **PS01**.

6.2 Glass Safety

To avoid injury when handling glass, follow these safety precautions:

- Wear the appropriate eye and skin protection.
- Inspect the edges for slivers and rough or sharp edges before handling.
- Never carry glass under your arm or over your head. Hold the glass with palms outward so that it can only fall away from you. Keep your pathway free of obstacles.
- When carrying glass with vacuum cups, stay on the side with the vacuum cups. Keep vacuum cups clean.

6.3 Electrical Safety

Electrical testing safety information is in **EL11**.



7. Environmental Safety

Hazardous material safety information is in **HM01**.



8. Vehicle Protection

8.1 Glass And Adjacent Surfaces

To protect the glass and adjacent surfaces when replacing moon- and sun-roofs:

- Place protective coverings around the work area, including the roof, instrument panel, air ducts, seats, carpet, etc.
- Remove any jewelry or belt buckles which may cause damage to the vehicle.

8.2 Electronic Parts

- Make sure the ignition switch is in the LOCK position, and the key is removed. Open a window in the vehicle to prevent lockout.
- Protect modules, connectors, and wiring from dirt, heat, static electricity, and moisture.
- Loosen or remove any wiring harnesses or electrical parts that could be damaged during the repair process.



9. Replacement Procedure

Plan the replacement based upon fastener design, molding type, hardware and regulator accessibility, use of adhesives, etc. Follow the roof or vehicle maker's recommendations.

Climatic conditions could affect the outcome of some adhesive installations. Follow the adhesive maker's recommendations for product use in the temperature and humidity conditions during installation.

9.1 Glass Removal

To remove a sun- or moon-roof glass:

- 1. Remove, loosen, or reposition parts, as required for access to the glass parts, such as sunshades, headliner, overhead console, interior moldings, etc. Position the roof glass in the opening, following the vehicle or roof makers' recommendations.
- 2. Remove the mounting hardware and cut through any adhesive, if applicable, to remove the glass.
- 3. Remove the glass from the roof panel and store it in a protected area. If the glass is to be reused, store it properly to prevent damage.
- 4. Check the alignment and operation of the sun- or moon-roof regulator. Replace any worn or damaged parts. Replace the drive motor or run guides, if required, following the roof or vehicle maker's recommendations.
- 5. Vacuum any broken glass from the vehicle interior.

9.2 Glass Installation

To install sun- or moon-roof glass:

- 1. Attach all fasteners to the glass that will be inaccessible after the glass is inside the roof cavity, such as run guide clips, channels, stabilizers, etc.
- 2. Install the glass into the roof cavity and attach it to the regulator using the proper fasteners. Lubricate the regulator, if required.
- 3. Inspect the operation of the movable glass in the roof cavity.
- 4. Verify the proper operation of the drain hoses.
- 5. Reinstall any parts previously removed or repositioned for access, duplicating the original mounting method.
- 6. Check the installation for water and air leaks. See **11.2** and **11.3**.
- 7. Continue vehicle reassembly.



10. Use Of Recycled (Salvage) Parts

10.1 Condition Of Salvage Parts

Do not install salvage mounting hardware or moldings having visible damage.

Do not install salvage glass parts having any of these conditions:

- visible damage
- optical distortion
- improper tint or shade



11. Inspection And Testing

11.1 Appearance And Performance

Inspect replaced sun- or moon-roofs for these conditions:

- optical distortion
- pits, scratches, or cracks in the glass
- improper tint or shade
- improper alignment
- improper operation of the latching mechanism and electrical system
- improper range of travel
- improper drainage
- improper installation and operation of interior trim parts
- water or air leaks

Correct any defects.

11.2 Water-Leak Test

To test for water leaks:

- 1. Protect the vehicle interior.
- 2. Apply water at low pressure around the perimeter of the sun- or moon-roof from outside of the vehicle.
- 3. Look for water leaks on the inside.
- 4. Verify that water drains through the drain hoses, if applicable.

Correct any water leaks by adjusting the drain hoses, weatherstrip, or glass assembly.

(cont'd)



11. Inspection And Testing (cont'd)

11.3 Air-Leak Tests

To test for air leaks using compressed air:

- 1. Apply a mixture of liquid soap and water or foam glass cleaner around the perimeter of the glass and gasket, from outside of the vehicle.
- 2. Use a NIOSH-approved air nozzle to apply compressed air around the perimeter of the glass and gasket from inside the vehicle.

Note: Bubbles appearing on the outside indicate leak areas.

To test for air leaks using internal pressure:

- 1. Close all windows.
- 2. Cover air exhausts or pressure-relief vents with masking tape.
- 3. Set the heater or air conditioner to the highest fan speed.
- 4. Start the engine to move any vacuum-operated air doors into position.
- 5. Turn the ignition to ACCESSORY to keep the blower running while the engine is shut off.
- 6. Close the doors and allow the pressure to build up.
- 7. Slowly feel around the perimeter of the glass for air leaks outside the vehicle. A short length of hose or a stethoscope can be used to listen for leaks.
- 8. Mark any locations where air is escaping.
- 9. Uncover the relief vents.

To test for air leaks using an ultrasonic leak detector:

- 1. Place the signal transmitter inside the closed vehicle.
- 2. Use the detecting unit to probe around the perimeter of the glass and gasket on the outside of the vehicle.
- 3. Mark any locations where leaks are detected by the probe.

Correct any air leaks by adjusting the T-top at the leak area, and repeat the test.