



MG01

Movable Glass

**Uniform
Procedures For
Collision Repair
UPCR**

© Copyright 1999 National Glass Association

v.4.0



1. Description

This procedure describes replacement, inspection, and testing requirements for movable 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 movable glass. 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
- Motor Vehicle Safety Standards
- 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 the applicability of published information to the installation and business environment.



4. Equipment And Material Requirements

4.1 Equipment

The use of this equipment is included in this procedure:

- door handle spring clip tool
- door panel tool
- finger rack
- glass stand
- 6 mm ($\frac{1}{4}$ ") rivet gun
- rivet head removal tool
- window retaining-nut removal tool
- 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 equipment is included in this procedure:

- digital volt-ohmmeter (DVOM)
- electronic leak detector
- jumper wires
- express power window bypass

4.4 Materials

The use of these materials is included in this procedure:

- adhesives and primers
- channels
- glass cleaners
- clips and fasteners
- lubricants
- protective covers
- razor blades
- packing tape



5. Damage Analysis

5.1 Glass

Inspect the glass for these conditions:

- visible damage
- improper previous installation
- signs of water leakage

Plan to adjust or replace the glass, or replace the water shield, if any of these conditions are present.

5.2 Vertical Glass Run

Inspect the vertical glass run and mounting parts for these conditions:

- visible damage
- corrosion
- improper previous repairs
- binding or improper alignment
- damage from door-mounted side-airbag deployment

Determine if the parts will be replaced or reused. Plan to replace any missing parts. Verify the availability of replacement parts.

5.3 Electrical Parts

If the power window does not function properly, troubleshoot the power window 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 window electrical parts for these conditions or types of damage:

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



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 hand 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**.

6.4 Express Power Window Safety

Disconnect the power window switch before working inside doors equipped with power windows.

6.5 Door-Mounted Airbag Safety

Follow the vehicle maker's recommendations for disarming door-mounted airbags, before starting glass removal procedures.



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 movable glass:

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

8.2 Electronic Parts

To protect computers and other sensitive parts from damage:

- 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.
- Disable side-impact airbags, if required, following the vehicle maker's recommendations.



9. Replacement Procedure

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

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

9.1 Glass Removal

To remove movable glass for replacement:

- 1. Remove parts such as trim panels, water shields, arm rests, handles, run guides, etc., if required for access.
- 2. Remove the glass from the panel cavity and store it in a protected area. Vacuum any broken glass from inside the door, regulator, channels, and the vehicle interior.
- 3. Check the alignment and operation of the window regulator. Replace any worn or damaged mechanical parts.
- 4. Check the vertical glass run and regulator to ensure no glass is left behind.
- 5. Check the run guide to determine if it is reusable.

(cont'd)



9. Replacement Procedure (cont'd)

9.2 Mechanically Fastened Movable Glass Installation

To install movable glass that is mechanically fastened to the channel:

- 1. Attach any hardware to the glass before the glass is placed inside the panel cavity, such as run guide clips, channels, stabilizers, etc.
- 2. Check for proper tint or shade before installing glass.
- 3. Install the glass into the panel cavity and attach it to the regulator using the proper fasteners.
- 4. Inspect the operation of the movable glass in the panel cavity. Lubricate the regulator, if required.
- 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.

9.3 Bonded Or Pressure-Fit Movable Glass Installation

To install movable glass that is bonded to the channel or pressure-fit with packing material:

- 1. Remove broken glass, adhesive, or packing material from the lower glass channel. Refinish the channel, if required.
- 2. Dry-set the glass in the panel cavity. Align the replacement glass in the lower glass channel and mark the proper position. Remove the glass and channel.
- 3. For adhesive applications, apply adhesive into the lower glass channel and install the channel to the regulator rollers. For packing material applications, attach the lower glass channel to the bottom of the glass using packing tape.
- 4. Install the glass into the panel cavity. If adhesive is used, align the marks and press the glass into position.
- 5. Inspect the operation of the movable glass in the panel cavity. See **11.1**. Lubricate the regulator, if required.
- 6. Reinstall any parts previously removed or repositioned for access, duplicating the original mounting method.
- 7. Vacuum the vehicle interior to ensure that no adhesive or glass is left behind.
- 8. Check the installation for water and air leaks. See **11.2** and **11.3**.
- 9. Continue vehicle reassembly.
- 10. Advise the vehicle owner of glass use, according to the adhesive maker's cure time specifications, if applicable.



10. Use Of Recycled (Salvage) Parts

10.1 Condition Of Salvage Parts

Do not install salvage mounting hardware or moldings having any of these conditions:

- visible damage
- distortion
- deterioration

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

- visible damage
- optical distortion
- delamination
- improper tint or shade



11. Inspection And Testing

11.1 Appearance And Performance

Inspect the replaced glass for these conditions:

- optical distortion
- improper tint or shade
- binding
- improper alignment
- improper range of travel
- improper operation of electrical parts

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 glass from the outside of the vehicle, starting at the bottom and working up.
3. Look for water leaks on the inside.

Correct any water leaks, and repeat the test.

(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.