



# SG01

# Adhesively Bonded

**Uniform  
Procedures For  
Collision Repair  
UPCR**

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v.4.0



## 1. Description

This procedure describes replacement, inspection and testing requirements for adhesively bonded stationary glass. 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 adhesively bonded stationary 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

- CP01A Corrosion Protection
- CP01S Corrosion Protection
- HM01 Hazardous Materials
- PS01 Personnel Safety
- RF01S Surface Preparation
- RF01P Surface Preparation
- RF41 Finish Application

#### 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 both the role of 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:

- bama knife
- caulking gun
- cutout knife (cold knife)
- cutting table
- finger rack
- glass cutters
- glass pliers
- glass stand
- hook tool
- long-reach utility knife
- molding release tool
- vehicle-specific rear-view mirror tools
- vacuum or suction cups
- windshield wire handles
- cutout wire
- digital volt-ohmmeter (DVOM)
- approved air nozzle
- electronic leak detector

### 4.2 Power Tools

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

- adhesive cutout knife
- heat gun
- caulking gun
- vacuum cleaner

### 4.3 Materials

The use of these materials is included in this procedure:

- adhesives and primers
- glass cleaners
- clips and fasteners
- dam material
- lubricants
- china pencil
- leak-trace powder



## 5. Damage Analysis

### 5.1 Glass

Inspect the glass for these conditions:

- visible damage
- damaged integrated radio antenna
- damaged defroster grid
- delamination
- optical distortion
- improper tint or shade
- improper previous installation

Plan to reinstall or replace the glass if any of these conditions are present.

### 5.2 Pinchweld

Inspect the pinchweld area for these conditions:

- visible damage
- corrosion
- paint failure
- improper previous repairs

It may not be possible to do a complete inspection of the pinchweld until the damaged glass has been removed.

All above-mentioned conditions must be corrected before installing the replacement glass.

### 5.3 Mounting Hardware

Inspect mounting hardware such as clips, moldings, setting blocks, etc. Determine if the parts will be replaced or reused.

### 5.4 Adjacent Areas

Inspect the operation and condition of adjacent areas, such as instrument panels, body panels, seats, wiper arms and blades, antennas, electrical wiring, etc. Determine if the parts will be repaired, replaced, or reused.

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



## 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.



## 7. Environmental Safety

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



## 8. Vehicle Protection

### 8.1 Adjacent Surfaces

To protect the glass and adjacent surfaces when replacing adhesively bonded stationary glass:

- Place protective coverings around the work area, including fenders, hood, roof, instrument panel, air ducts, floor, seats, etc.
- Remove any jewelry or belt buckles which may cause damage to the vehicle.
- Lubricate the gasket, if necessary, with clean water only.

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## 8. Vehicle Protection (cont'd)

### 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.
- 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.
- Examine the pinchweld to ensure that there are no hidden electrical parts.
- Some vehicles may require the use of a non-conductive urethane adhesive to prevent corrosion or radio interference. Follow the vehicle maker's recommendations.



## 9. Replacement Procedure

### 9.1 Bonded Glass Replacement

Climatic conditions will affect the outcome of any installation. Follow the vehicle and adhesive makers' recommendations for product use in the temperature and humidity conditions at the installation site.

Upgrade the adhesive to an automotive-grade urethane adhesive or equivalent, if the original adhesive was not urethane.

To replace adhesively bonded stationary glass:

- 1. Remove or reposition parts, as necessary for access to the glass parts and to prevent damage.
- 2. Remove the moldings, if applicable, using the proper tool. Set them aside for reinstallation.
- 3. Tape off the vents to prevent glass and adhesive from entering.
- 4. Cut the adhesive bond between the pinchweld and the glass, using the appropriate cutout tool. Determine if the full or close cutout method will be used. Note: Some vehicle and adhesive makers recommend using only the full cutout method.
- 5. Lift the glass assembly away from the vehicle. If the glass is to be reused, store it properly to prevent damage. If the glass is being replaced, remove any parts, labels, stickers, etc., if possible, for later transfer.
- 6. Use a dry brush to clean the pinchweld and remaining urethane adhesive thoroughly to remove loose adhesive, dirt, glass fragments, corrosion, etc. Follow the adhesive maker's recommendations for the application of any activators to the urethane adhesive bed.

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## 9. Replacement Procedure (cont'd)

- 7. Using the full cutout method requires the removal of all but 1–2 mm ( $\frac{1}{16}$ " ) of the original adhesive from the pinchweld. Avoid any paint damage. Before using the close cutout method, make sure the original bead of adhesive is bonded to the pinchweld, and that the condition of the adhesive is not compromised. It should be strong and securely adhered to the pinchweld, with no loose areas. Using the close cutout method requires leaving as much of the original adhesive as possible.
- 8. Repair any damage to the pinchweld, and refinish as necessary, following the vehicle maker's recommendations. Do not apply body fillers to the pinchweld where glass will be installed.
- 9. Remove any adhesive and primer from the glass assembly.
- 10. Dry-set the glass assembly. Replace and adjust any setting blocks. Make sure the VIN notch is positioned properly, if required.
- 11. Mark the glass position with masking tape or a china pencil. Remove the glass and place it on a stand.
- 12. Clean the glass thoroughly, removing grease, wax, etc. Follow the adhesive maker's recommendation for the type of cleaner. Make sure there is no remaining adhesive or primer on the glass.
- 13. Replace any missing parts, such as electrical connectors, etc. Note: In some installations, the molding must be installed before the glass is installed.
- 14. Vacuum the repair area thoroughly, if required to remove all traces of adhesive or glass.
- 15. Apply replacement foam damming tape if recommended by the vehicle maker.
- 16. Apply adhesive primer to the pinchweld following the adhesive maker's recommendations.
- 17. Apply a triangular bead of urethane adhesive around the outer edge of the glass or on the pinchweld. If applied to the pinchweld, position the new bead directly on top of the original, trimmed adhesive.
- 18. Install the glass assembly into the pinchweld opening. Apply pressure around the edge of the glass to assure complete contact with the adhesive.
- 19. Install the moldings, if applicable.
- 20. Clean any excess adhesive from the glass or surrounding area. Follow the adhesive maker's recommendation for the type of cleaner.
- 21. Reinstall any parts previously removed or repositioned, duplicating the original mounting method.
- 22. As soon as possible, check the installation for water and air leakage. See **11.2** and **11.3**. Do not wait for the adhesive to cure.
- 23. Transfer any previously removed parts, labels, stickers, etc. Give the vehicle owner a list of any items that could not be transferred.
- 24. Release the vehicle to the owner only after the adhesive maker's recommended safe driveaway time.



## 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

All adhesive primer must be removed from glass parts before installation.



## 11. Inspection And Testing

### 11.1 Appearance And Performance

Inspect the replaced glass for these conditions:

- optical distortion
- improper tint or shade
- pits or scratches
- VIN notch improperly positioned
- delamination

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 dripping in the interior.

Correct any water leaks, and repeat the test.

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## 11. Inspection And Testing (cont'd)

### 11.3 Air-Leak Tests

Caution: Use extreme care when testing for air leaks using compressed air or internal pressure. Wait a sufficient cure time, as recommended by the adhesive maker, to prevent pushing the glass out of position. If no recommendations are available, wait at least four hours.

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 trim molding, from outside of the vehicle. A leak-trace powder may also be used.
- 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 or powder movement 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 and trim molding for air leaks outside the vehicle. A short length of hose or a stethoscope may 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 generator unit inside the closed vehicle.
- 2. Use the detecting unit to probe around the perimeter of the glass and trim molding on the outside of the vehicle.
- 3. Mark any locations where a leak is detected by the probe.

Correct any air leaks, and repeat the test.