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# The Importance of Proper Stationary Glass Installation

By **Larry Montanez III, CDA and Jeff Lange, PE**

Front windshields, backlights (rear glass) and quarter glasses are generally bonded to the vehicle structure with structural bonding adhesive. OEMs utilize various strengths of adhesive based on the vehicle construction and the material chosen. Collision repair professionals must install replacement glass utilizing the recommended adhesive and according to adhesive manufacturers' specific procedures to ensure proper bonding to the vehicle and glass. Bonded glass is considered a structural component, due to the strength of the adhesive.

Years ago, most OEMs would deflect the passenger airbag upward into the windshield glass, and deflect rearward towards the passenger. This design generally caused multiple brittle fractures to the glass, which would then require replacement. Although some OEMs still deflect the passenger airbag off the windshield, most OEMs have changed the position of the passenger airbag from the top area of the dashboard to the *front area* of the dashboard.

As time passed and OEMs started to design vehicles utilizing Advanced High Strength Steels (AHSS) around the passenger compartment for occupant safety due to stricter Federal Motor Vehicle Safety Standard (FMVSS) requirements, the strength of the adhesive bonding material of the stationary glass to the structure also changed. Most front and rear stationary glass assists the roof structure in resisting and transferring applied force during a rollover. In frontal and rear collision events, the glass assists the structural components in the passenger compartment in transferring the collision pulse around it.

There are multiple associations today that certify glass technicians, and even some OEMs teach glass installations in their collision repair programs. The Auto Glass Replacement Safety Standards Council (AGRSS) is North America's only auto glass replacement standard. AGRSS has approved multiple glass installation company training programs as part of their certification program. AGRSS also has its standards and "Seven Steps of Installation" on its website, [www.AGRSS.com](http://www.AGRSS.com). Additionally, Auto Glass University ([www.autoglassuniversity.com](http://www.autoglassuniversity.com)) has online self-study training programs on glass installation procedures and safety.

Let's look at some of the requirements to install bonded glass. When installing any stationary glass, there are some important procedures to follow:

1. Have an installation checklist and information sheet available. The installation checklist will ensure that you have all the necessary tools and products for a proper installation. The information checklist is for your liability protection and warranty information. The information checklist will include the customer name, installation date, ambient temperature, product used, lot number, product number, drive-away times, any damage to the flange area, important notes and the installer's name and signature.
2. This may seem like an obvious thing to do, but check the new replacement glass for correctness and any damage. Check if there is a molding on the glass. Additionally, make sure that you have the required adhesive and instructions.
3. Determine the root cause of the damage. Is the damage from road debris impacting the glass, or is the glass fractured from a collision event that may have caused misalignment of the glass opening? Did the glass fracture from the passenger airbag deflecting off the glass? If so, this may require performing repairs prior to installation.
4. Wash the vehicle to remove all wax, dirt, grease and any debris from the work area. Make sure to clean out the areas under the glass moldings. Always work on clean surfaces.
5. Ensure that all tools are clean and sharp.
6. On front windshields, mask and cover the dashboard and left and right A-Pillar trim panels. Mark the left and right side wiper arms and remove the cowl panel trim. Mask and cover the in-cabin filter opening, if equipped. On backlights, mask and cover the rear package tray trim and remove the left and right quarter trim panels. On quarter glass, just remove the quarter trim panels.
7. Use protective tape on susceptible painted surfaces in the work area. The best tape to use is a heavy fabric tape, such as duct tape. A hot tip is to use a folded towel to lay tools on, so as not to scratch the vehicle.
8. Cut the glass out using the full cutout method. Start with the shortest blade first. If using an electric battery or pneumatic cutting tool, use plain water as a lubricant.
9. After removal of the glass, place it in a safe spot for disposal. Vacuum any debris and check all bonding surfaces for signs of corrosion. If corrosion is present, it must be repaired prior to installation.
10. Dry set (trial fit) the glass and the moldings. Performing this procedure ensures the proper positioning of the glass and the flush fit of the moldings. Additionally, check the condition of the gravity stops and/or setting blocks. They may have to be replaced, added or repositioned. Prepare both bonding surfaces and plan for any other procedural conditions.
11. Use one adhesive system. It is extremely important to use the preparation material, primers and cleaners recommended by the adhesive manufacturer. DO NOT mix and match brands. Improper preparation of the surfaces may cause a failure of the bond, resulting in leaks or the glass part separating from the mating flange.

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12. Check the procedures for prepping the glass in all situations, such as fritless glass, encapsulation bonding and Pre-Applied Adhesive System (PAAS) bonding.

13. Clean the glass bonding flange with the adhesive manufacturer's approved cleaners, and use a separate lint-free towel. Use foaming glass cleaner to clean the glass. The separation of the foam assists in locating any contaminated areas. Once you locate the area of contamination, wipe or scrub it and retest the area to ensure that the surface is clean and contaminant-free. Remember to always check with the adhesive manufacturer's recommendations for cleaning the glass.

14. Only use the adhesive manufacturer's approved applicators.

15. While all preps and primers dry thoroughly, you can prep the pinchweld flange area.

16. Trim the adhesive material on the pinchweld flange down to one or two millimeters. Remember that urethane-to-urethane is the best bond.

17. After removing the excess urethane, check all surface areas for corrosion and repair according to the adhesive manufacturer's recommendations. Urethane cannot adhere to corrosion or shiny areas. Corrosion must be removed and prepared correctly, and shiny areas must be sanded and primed.

18. Clean all dust, dirt, oils and greases from the pinchweld mating flange surface.

19. It is extremely important to remember to only prime scratches or unprimed surfaces, and avoid getting primer on the urethane adhesive. If installing glass after repairs are completed, ensure that there are no topcoats on the mating flange; if there is, sand the area flat prior to applying urethane primer.

20. Now you are ready to install the glass. Use a triangular adhesive bead. Most applicator tips have two to three cut lines for different heights of the flange. You can cut it with a razor blade, but there are cutting pliers (available through Equalizer, [www.equalizer.com](http://www.equalizer.com)) specially made for cutting the applicator tips. A triangular bead ensures a smooth and solid bond to the glass, at the proper height with no bubbles or air spaces.

21. It is extremely important to remember to NEVER use butyl tape as a dam. Butyl is not compatible with urethane adhesive and will suffocate it, causing it to not cure. If a dam is desired and/or required, only use open-celled foam dams recommended for automotive use. Replace acoustical dams, which are mostly located at the bottom of the pinchweld area and are there to muffle the engine noises that filter up from the engine compartment.

22. Urethane cannot adhere to wet or cold surfaces.

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This includes condensation due to cold weather. Installation should take place indoors in the recommended temperatures during the winter; it can be performed outdoors in the summer, but only in a shaded area. Follow the adhesive manufacturer's specific temperatures for the application, drive away times and drying times.

23. Always use suction cups (when setting the glass) and Nitrile gloves. The suction cups ensure easy control over large pieces of glass, and the Nitrile gloves ensure that the oils present in the hands are not contaminating the bonding surfaces.

24. As soon as the glass is installed, perform a water test, which will search for leaks and help in curing the adhesive. If a leak is detected, you may be able to apply pressure to the area to ensure a better seal.

25. After the water test, dry the vehicle and examine the work area for any excess urethane. Only use approved solvents. If the vehicle was recently refinished, check with the shop as to what can be applied to freshly-painted surfaces. Most adhesive manufacturers produce a solvent for clean up, specially designed to be used with their adhesives. It is adhesive-friendly and will not contaminate the bond. Be cautious of release agents, as they are NOT adhesive-friendly and can break down the seal and cause failure of the adhesive bond. Never apply solvents directly to the vehicle; apply the solvent to a rag or towel and then wipe the surface. Solvent-soaked rags or towels can cause too much solvent to penetrate the adhesive. Install any positioning tape, if required or desired.

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