

C.R. LAURENCE CO., INC.

CRL POWR PRIMERLESS URETHANE ADHESIVE SYSTEM

Guide to Proper Installation



Preparation

Prior to beginning make sure you have the correct glass and moldings, as required, and all the tools and supplies you will need for the vehicle being serviced. Make sure the urethane system being used is current.

Inspect the area where the service work will be conducted and make sure it is free from obstacles that would create safety concerns, is well lit and that the ambient temperature is in keeping with the limits of the urethane system being used.

Pre-Inspection

Inspect the car; closely inspect the area of the vehicle you will be working on for existing damage. Using the CRL Inspection Checklist (Appendix "A") make a note of pre-existing damage. If the customer is there, show the damage to the customer and note the location. Do not engage in automotive glass replacement when any related condition would compromise the retention system and notify the owner/operator.

Post-Inspection

After installation of the replacement glass do a post inspection; using the CRL Inspection Checklist (Appendix "A") make note that the service work and paperwork is complete and correct. Clean the vehicle and the work area and inspect the area for any new damage to the vehicle or glass.

Cover the front seats, floorboards, dashboard and steering wheel with a clean drop cloth or disposable plastic covers. Cover the hood, roof, and fender with a protective material to protect against possible damage to the vehicle. Tape up any vulnerable areas on the vehicle to protect against possible damage from power tools and cold knives during the cutout process.

Safety

Always wear personal protection equipment:

- Wear proper eye protection
- Wear powder free Nitrile, chemical-resistant gloves
- Additional safety equipment as required by your employer or safety regulations

Make sure all electrical equipment is properly grounded and in proper working condition to protect you from electrical shock.

Quality Conformance

All POWR Primerless products are produced under strict, documented quality assurance standards that are registered to ISO/TS-16949. Furthermore, performance characteristics of all POWR Primerless urethane adhesives meet or exceed criteria established by Original Equipment Manufacturer's (OEM's) and Federal Motor

Vehicle Safety Standard 212 (FMVSS 212). When properly used all POWR Primerless products will restore vehicles to OEM design specifications for structural integrity and aesthetics.

Use only glass parts that meet the requirements of ANSI Z26 as specified by FMVSS 225.

Keep a copy of and follow our step by step installation guide for proper installation procedures to assure the integrity of the vehicle and the safety of the passengers. These instructions contain the proper use of the retention system storage specifications, minimum drive-away time charts containing temperature and humidity variables if applicable, and any special procedures required for adverse weather conditions.

Record the lot numbers and expiration dates printed on our products. Follow all safe drive away times and procedures to assure you are following the government regulations and the safety of the customer is assured.

CRL POWR Primerless Glass Preparation

All glass parts must be traceable to the installation by a DOT number and part number. This information should be recorded on the CRL Inspection Checklist (Appendix "A"). Inspect the glass for any scratches or imperfections that would make it unacceptable. After installation of the replacement glass do a post inspection; using the CRL Inspection Checklist (Appendix "A") and make sure the DOT number for all replacement glass is recorded. Note that all other paperwork is complete and correct.

Clean the glass using the CRL POWR Cleaner glass cleaner. Spray the glass with the CRL POWR Cleaner glass cleaner and using an abrasive pad (Cat. No. NP48) "wet-scrub" the frit-band. Wipe off the band area and then re-spray the glass and clean from the outside toward the center of the glass with a lint free cloth.

If the glass has an attached molding or if you are attaching a molding to the glass apply CRL POWR 300 PP3UV primer to the edges of the molding that will contact the POWR Primerless urethane.

- Shake the POWR 300 PP3UV for at least one minute before use
- Tightly seal container immediately after use
- Use a clean unused dauber each time the POWR 300 PP3UV is used
- Allow 10 minutes to dry (May require longer dry time in very low temperature, low humidity conditions)

Glass Preparation should be complete at least 10 minutes before the application of POWR Primerless urethane to the vehicle pinchweld; this will allow sufficient time for POWR 300 PP3UV to dry. Do not touch the bonding area of the glass after cleaning, prepping or priming as this could contaminate the bond line and thereby weaken the adhesion.

NOTE: POWR PP301HV, POWR PP302MV, and POWR PP303HL products are “Self Priming” to both glass & frit. Use of POWR 300 PP3UV primer on glass and frit is optional.

Glass Removal

Carefully remove all trim and moldings. Remove all interior panels, pillar covers and wipers as necessary and place them in a secure area.

Cut out the windshield or body glass using your preferred method and follow all manufacturers' recommendations. Once the windshield has been removed remove contaminants such as dirt, moisture and debris from the pinchweld and clean the dashboard.

Dry fit the new windshield into the opening and mark its position with a grease pencil or molding-retention tape.

Evaluate the pinchweld area of the vehicle. The condition of the adhesive system that was used and the condition of the pinchweld must be examined to determine if the ANSI approved Full Cut Method can be used for the replacement glass. Check the condition of the pinchweld to make sure it is structurally sound and free of defects. If the OEM installation was butyl, polysulfide, or other non- polyurethane, and the vehicle is licensed for highway use, adhesive bonded stationary glass installations shall be performed using urethane or an equivalent retention system unless in conflict with current OEM specifications, such as rubber gasket installations. Check the retention system on the vehicle to see if the OEM installation was urethane, if urethane then the glass must be replaced with polyurethane or an equivalent adhesive bonding system.

No automotive glass replacement shall be undertaken using an adhesive glass retention bonding system that would not achieve minimum drive-away strength by the time the vehicle may be reasonably expected to be operated.

When inappropriate replacement materials or methods are detected, report your findings to the vehicle owner/operator.

Pinchweld Preparation

Clean the pinchweld area of all dirt and loose debris, clean the dashboard; check that previous glass replacement procedures and products were correct and the condition of the pinchweld has the appropriate integrity to support the bond of new urethane to the existing bead of urethane:

- Confirm that the existing bead of urethane is well bonded to the pinchweld and is in excellent shape
- Make sure the pinchweld is structurally sound and free of defects
- The pinchweld is not corroded
- The pinchweld is undamaged and has not been repainted

NOTE: If old urethane demonstrates any signs of peeling, or if corrosion is apparent, remove all material down to the pinchweld and refer to the vehicle manufacturers recommendations for pinchweld restoration – See “Corrosion of the Pinchweld” below for further instructions

Using a pinchweld-perpetration tool, trim the original bead of urethane, leaving 1/16 – 1/8 of an inch (1 – 2 millimeters) of the original urethane bead on the pinchweld. Make sure there are no contaminants and do not touch the pinchweld after prepping the area.

- Short cutting a windshield will void all Safe Drive Away Time guidelines and can cause possible loss of glass adhesion and potential serious personal injury. Since too little space has been created to allow enough urethane to be applied between the new windshield and old bead of urethane, the application will not pass all applicable FMVSS regulations, and may fail during vehicle operation.

Corrosion of the Pinchweld

Automotive OEMs have issued guidelines for addressing the proper preparation of the pinchweld in the event there is corrosion present. First identify the type and amount of corrosion present. Four levels of corrosion have been recognized by automotive OEMs and are as follows:

Type:

- 1.) **Light** – Light, orange discoloration of the metal
- 2.) **Moderate** – Moderate, orange with red spots, discoloration of the metal
- 3.) **Severe** – Severe, Deep “pitting”, dark red spots and raised edges
- 4.) **Perforation** – Perforation includes small holes to large losses of metal

Amount:

- a.) **Light to Moderate**, less than **1 square inch (25 square millimeters)**, follow Corrosion Removal procedures as outlined below
- b.) **Severe to Perforation**, CRL recommends that treatment of these and **any area of corrosion greater than 1 square inch (25 square millimeters) only be performed by a body shop trained in metal restoration.**

Corrosion Removal

NOTE: Any time a technician is working with chemicals and power tools, always follow manufacturers recommendations. Appropriate safety equipment and protective gear should always be worn.

Remove the corrosion to obtain a bright, corrosion free, metal surface. Ideally, this should be done prior to trimming the remaining intact and well bonded adhesive bead, but if this is not possible, clean the freshly cut original urethane bead after removing the corrosion, The method used to remove the corrosion

will depend on the type of corrosion present and are consistent with automotive OEM recommendations:

Type:

- 1.) **Light** – Light, orange discoloration of the metal
Use 80 grit sand paper
- 2.) **Moderate** – Moderate, orange with red spots, discoloration of the metal
Use sanding wheel, sand blasting or chemical rust remover. Care must be taken when using a sanding wheel so that the thickness of the metal is not significantly reduced
- 3.) **Severe** – Severe, deep “pitting”, dark red spots and raised edges
Send to a body shop for removal and replacement by personal trained in metal restoration.
- 4.) **Perforation** – Perforation includes small holes to large losses of metal
Send to a body shop for removal and replacement by personal trained in metal restoration.

After removal of the corrosion the area to be used for the bead of urethane is to be rust free, smooth and clean.

Corrosion Treatment

- 1.) **Light** – Light, orange discoloration of the metal
Apply POWR 300 PP3MP primer
- 2.) **Moderate** – Moderate, orange with red spots, discoloration of the metal
Apply POWR 300 PP3MP primer
- 3.) **Severe** – Severe, Deep “pitting”, dark red spots and raised edges
- 4.) **Perforation** – Perforation includes small holes to large losses of metal

For corrosion of the pinchweld described as either **Severe** or with **Perforations**, or any area of corrosion greater than 1 square inch (25 square millimeters) we recommend removal and replacement by personnel trained in metal restoration. If all of the corrosion is completely gone and you have a bare metal surface apply a coat of POWR 300 PP3MP and allow 10 minutes to dry, then apply a second coat of POWR 300 PP3MP. **NOTE: Prime bare metal spots and repaired rust areas larger than 1 square inch (25 square millimeters) with an OEM approved paint primer prior to applying the POWR 300 PP3MP on the pinchweld.**

Perforation corrosion located in the windshield mounting area of a vehicle’s pinchweld, just like perforation corrosion located in any structural area of a vehicle, requires replacement of the entire section of metal. Filling these types of areas with body filler is not acceptable. Furthermore, I-CAR has made recommendations that state “do not use body filler on the pinchweld where glass urethane adhesive will be applied.” This recommendation was taken from the March - April 2000 I-CAR Advantage and this document also states that, “small irregularities in the flange surface will be filled when the adhesive bead is applied.” Keep in mind that the glass bonding area of a pinchweld does not require a “Class A” appearance and, if required, welded areas can be sanded smooth prior to POWR 300 PP3MP primer application.

Again, do not apply body filler in areas where glass bonding adhesive will be applied.

Application of POWR 300 Primers

- Shake the POWR 300 Primer for at least one minute before use
- Tightly seal container immediately after use
- Use a clean unused dauber each time the POWR 300 Primer is used
- For best results, CRL recommends that this product be used at temperatures of 40° F (4°C) and above
- Allow 10 minutes to dry after each application (May require longer dry time in very low temperature, low humidity conditions), this will allow sufficient time for POWR 300 Primers to dry

Using a pinchweld-perpetration tool, trim the original bead of urethane leaving 1/16 – 1/8 of an inch (1 – 2 millimeters) of the original urethane bead on the pinchweld or clean the previously trimmed bead. Make sure there are no contaminates and do not touch the pinchweld after prepping the area.

CRL POWR Primerless Urethane Application and Glass Installation

1. Cut the tip off the nozzle. With the cut nozzle measure to the top of the roofline and make a mark on the nozzle with a pen or marker, 1/16" (1.5 millimeters) higher than the roofline. Cut a "V-notch" in the nozzle up to the marked line; the "V-notch" should be 1/2 " to 5/8 " (12 millimeters to 15 millimeters). This will give you the appropriate triangular bead.
2. Hold the applicator 90° from the pinchweld or glass and dispense a bead of POWR Primerless urethane adhesive with a continuous motion around the entire perimeter. In the case of applying onto the pinchweld apply the POWR Primerless urethane directly on top of the freshly trimmed existing bead of urethane.
3. The POWR Primerless urethane adhesive must be applied so that the finished bead cross section profile and dimensions meet or exceed original equipment configuration. Use a paddle stick or other tool to make sure there are no gaps and all seams and corners are even.
4. Using protective gloves take glass from stand or workstation.
5. Lay glass directly down on the bead of urethane; line up the glass with the dry-fit marks made earlier.
6. Apply even pressure around perimeter of glass to assure seal and level of set.
7. Check for leaks; with a leak-detector check the entire perimeter of the windshield. If a leak exists-
 1. Apply pressure to the spot to ensure the glass makes contact with the POWR Primerless urethane adhesive
 2. Dispense a small bead of urethane in the area between the glass and the pinchweld.
8. If you have a push-in molding to set, be sure the urethane is visible around the perimeter of the pinchweld. If the molding will not touch the POWR Primerless urethane shoot a small bead of urethane in the area between the glass and the pinchweld and reapply pressure to the molding.
9. Reinstall the removed parts in reverse order.
10. Complete the paperwork recording the lot numbers for the POWR Primerless urethane adhesive system used.
11. Allow the POWR Primerless urethane to cure according to product specifications before returning the vehicle to the owner/operator.

Complete Adhesive Removal

Complete adhesive removal is required for repaired, newly painted pinchwelds and when OEM urethane has poor adhesion.

If the technician discovers the previous installation used improper methods or sealants, the pinchweld must be completely cleaned of substance. If the old bead of urethane is not adhering to the pinchweld and would compromise the integrity of the new installation, it must be removed.

A complete adhesive removal requires the total removal of existing material down to the pinchweld. In a complete removal, the pinchweld must be cleaned of all products and materials other than the clean weld and the original paint. This method must be used when:

- The pinchweld has been repainted for any reason (i.e. body shop corrosion treatment)
- The pinchweld is damaged
- The existing urethane adhesive is loose or deteriorated
- An improper product was previously used (i.e. – butyl, silicone, etc.)

After exposing the original paint, using an abrasive pad carefully scuff the paint on the pinchweld, abrading the clear coat and or topcoat, exposing the OEM paint. Care must be taken so that the e-coat and phosphate coatings, which lie beneath the OEM paint, are not removed. The e-coat and phosphate coatings are essential part of the OEM corrosion inhibiting system and it is not possible to replace these in the after market. Apply POWR 300 PP3MP according to the instructions in this guide and allow 10 minutes for it to dry. Then follow the **CRL POWR Primerless Urethane Application and Glass Installation** procedures found on page #8..

In the special case of a newly painted pinchweld, one of the following four options may be selected.

Option 1: Whenever possible, remove the windshield, by cutting the adhesive as close to the glass as possible, and leave the entire remaining urethane adhesive bead in place. Do not trim the adhesive bead until the vehicle has been painted and the new windshield is ready to be installed. In this case, it is not necessary to tape or otherwise protect the existing urethane. After the vehicle is repaired and painted, remove most of the existing urethane leaving 1/8 inch on the pinchweld and install the windshield (full cut method).

Option 2: If the pinchweld area is to be repaired and painted by a body shop, remove the section of metal to be repaired, repair pinchweld and apply an epoxy etch primer coat. Allow the epoxy etch primer coat to cure for at least as long as would be required prior to applying topcoat over the epoxy etch primer coat, following manufacturer's recommendations. If topcoat is to be applied to

remainder of the vehicle, mask off the bond area of the pinchweld with masking tape. Continue painting the vehicle as required. If a forced drying process is to be used, remove the tape prior to baking the topcoat. Next, lightly abrade the primer surface using an abrasive pad. Apply POWR 300 PP3MP Primer according to the instructions in this guide and allow it to cure for at least 10 minutes. Then set the windshield using the appropriate CRL POWR Primerless adhesive for the vehicle type and required drive away time.

Option 3: If a freshly primed pinchweld has already been color coated and allowed to cure the proper time required by the manufacturer then Option 2 is possible, follow instructions posted under Option 2.

Option 4: If the vehicle's OEM urethane bead has poor adhesion and easily peels away from pinchweld to reveal unblemished original paint, begin by scuffing with an abrasive pad. If the clear coat and basecoat pulled away from the vehicle with the original urethane bead then lightly abrade the exposed area using an abrasive pad; apply POWR 300 PP3MP according to the instructions in this guide and allow 10 minutes drying time. Set the windshield using the appropriate CRL POWR Primerless adhesive for the vehicle type and required drive away time.

***IMPORTANT NOTE:** Options 2, 3, and 4 above call for the use of POWR 300 PP3MP primer. If any of these procedures are to be performed at temperatures below 40°F (4°C), then please refer to the special low temperature precautions for these products, which can be found in the **Installation in Adverse Seasonal Conditions** section of the manual on page 12.

Aluminum Pinchweld and FRP Bonding Flanges

On occasion an auto glass technician will come across vehicles that have aluminum pinchwelds or FRP (Fiber Reinforced Plastic) bonding flanges where a glass part is bonded with a urethane adhesive. Fiberglass is an example of an FRP. In these cases, if the technician finds that some of the original urethane bead is not properly adhered to the substrate, the following process should be followed to prepare the substrate for bonding.

1. Lightly abrade the area of the aluminum or FRP using an abrasive pad.
2. Apply a thin coat of POWR 300 PP3MP primer as per **Application of POWR 300 PP3MP** instructions on page #7.
3. Set the glass part using the appropriate POWR Primerless PP303HL, non-conductive adhesive and follow the **CRL POWR Primerless Urethane Application and Glass Installation** procedures.

Rubber Gaskets

If the OEM utilizes the combination of a rubber gasket and polyurethane as a retention system, an equivalent adhesive bonding system must be used in the installation. In cases when the OEM didn't include polyurethane or an equivalent adhesive system, such systems shall be used if later production models included the addition of adhesive systems without body style modification. If the OEM gasket installation did not include adhesive and the vehicle is licensed for highway use, the installation shall include polyurethane or an equivalent adhesive bonding system. The following are permissible exceptions: egress applications, antique restorations, or in cases in which this practice conflicts with current vehicle manufacturer specifications. When sealing air or water leaks within a rubber gasket/polyurethane only compatible polyurethane shall be used. (No silicone or butyl may be used). When sealing air or water leaks within a rubber gasket/sealant system only OE compatible sealant shall be used.

Installation in Adverse Seasonal Conditions

High Temperature Instructions:

During the summer months, extremely high temperatures may be encountered that can present unique concerns for auto glass technicians. Urethane adhesives can be both inconsistent and softer than in normal temperatures and gassing from the pinchweld can create bubbles in the urethane. To avoid these occurrences CRL recommends that when ambient temperatures are greater than 90°F (32°C) that the replacement glass, POWR Primerless Urethane adhesive system and the vehicle's pinchweld not be exposed to direct sunlight during the replacement process. If proper shade cannot be provided then CRL recommends rescheduling the installation for in shop work or cooler temperatures.

Low Temperature Conditions:

Where ambient temperatures are at or below 40°F (4°C), CRL recommends use of **POWR BOND One Hour Urethane Adhesive**. This product is designed to be used in temperatures as low as 0°F (-17°C). To facilitate ease of use when ambient temperatures are 0°F (-17°C) we recommend keeping the **POWR BOND One Hour** urethane above 50°F. If using POWR BOND One Step Primer at temperatures below 40°F (4°C), drying times will be extended to a minimum of 25 minutes. Heating the application area for a minimum of 5 minutes prior to applying the POWR BOND One Step Primer will facilitate faster dry times and is recommended as a second option.

Additional considerations when doing an R&R (Remove and Replacement using the same glass):

Follow the applicable indications outlined in the “**CRL Guide to Proper Installation**” for **CRL POWR Primerless Urethane Application and Glass Installation**.

In addition to the **CRL POWR Primerless Glass Preparation** instructions, perform a final trim of the urethane (on both the glass and the pinchweld) prior to reinstalling the glass being sure to follow the instructions for **Pinchweld Preparation** leaving a bed of 1/16 to 1/8 inch thick or 1-2 millimeters.

If there is not enough urethane to make a fresh cut, then clean the urethane beds on the glass and on the pinchweld with CRL POWR Cleaner glass cleaner and a Scotch-Brite® pad to remove any contamination and scuff the surface, this also creates a fresh cut type surface for the urethane adhesion to work well. **This step (cleaning both urethane beds with an abrasive pad) is mandatory. If you do not have an abrasive pad then clean the surface and apply POWR 300 PP3MP primer over the old bead of urethane.**

Proceed to **CRL POWR Primerless Urethane Application and Glass Installation** procedures. Immediately after the urethane has been applied, install the glass!

Complete the paperwork recording the lot numbers for the CRL POWR Primerless urethane adhesive system used.

The failure of any product used in the glass installation process that the installer believes could jeopardize customer safety shall be reported promptly to the manufacturer or supplier of the product. All stationary bonded parts on all vehicles licensed for highway use are to be attached to the vehicle with urethane unless in conflict with current OEM specifications. All mechanically attached glass parts are to be attached based on OEM specifications. Technicians engaged in automotive glass replacement shall not introduce any chemical agents, such as cleaners, solvents, lubricants, release agents, or utilize any installation practice, which will adversely affect the glass retention system. Documentation shall be maintained to demonstrate compliance with this standard.

CRL POWR Primerless - The Right Urethane For The Right Time

CRL gives you the ability to choose the right urethane to fit your business and the car. We have 3 urethanes to choose from:

POWR Primerless PP301HV

Normal application

- o 40°F - 130°F (4°C – 54°C) application
 - o High humidity
 - o Low humidity
- 3 hour Drive Away
 - o Primerless Adhesion to Auto Glass Frit
 - o High Viscosity
 - Rates Non Conductive
 - Rates High Modulus
 - High decking strength
 - Strong surface tension
 - o Holds glass in place, allowing no or minimal movement from gravity after you laid the glass on the bead.

POWR Primerless PP302MV

Normal application

- o 40°F - 130°F (4°C – 54°C) application
 - o High humidity
 - o Low humidity
- 4 hour Drive Away
 - o Primerless Adhesion to Auto Glass Frit
 - o Medium Viscosity

POWR Primerless PP303HL

- Normal application
 - o 40°F - 130°F (4°C – 54°C) application
 - o High humidity
 - o Low humidity
- 3 hour Drive Away
 - o Primerless Adhesion to Auto Glass Frit
- Non Conductive
 - o Use on Mercedes, BMW, all cars with electronics in the glass
 - o Aluminum bodies
- High Modulus
 - o Use on VW Beetles, any car needing extra support to reduce vibration
- Medium high decking strength
- Strong surface tension
 - o Holds glass in place, allowing no or minimal movement from gravity after you laid the glass on the bead

CRL POWR 300 PP3UV Primer Procedures

1. Primer usage:
 - a. Use on glass when there is no paint band to block to block the UV rays of the sun, such as off road equipment, etc.
 - b. Use on moldings or encapsulation to assure adhesion if the urethane ends up beneath this area when installing
 - c. Use on push in moldings for good adhesion
2. Shake the can vigorously for 60 seconds
3. Apply to the area needed with a dauber
4. Allow to flash and dry for 10 - 15 minutes on substrates before allowing contact with wet urethane adhesive
5. Use a applicator each time the primer is applied
6. Replace inner and outer caps on the primer bottles immediately after use to insure freshness and storage stability
7. Re-prime after 8 hours if required. Only re-prime the glass one time.

CRL POWR 300 PP3MP Primer Procedures

1. Primer usage:
 - a. Use on scratches to the metal pinchweld where the scratch bares the metal surface
 - b. Use on bare metal in the adhesion area of 1 square inch or less
 - c. Follow usage procedures in the corrosive section above for other metal use
2. Shake the can vigorously for 60 seconds
3. Apply to the area needed with a Q-tip, dauber or small paint brush
4. Allow to flash and dry for 10 - 15 minutes on substrates before allowing contact with wet urethane adhesive
5. Use a fresh applicator each time the primers are applied
6. Replace inner and outer caps on the primer bottles immediately after use to insure freshness and storage stability
7. Re-priming substrates after 8 hours is required

Miscellaneous Procedures & Handling

1. Always wear nitrile gloves when applying or handling primer and urethane products.
2. Follow instructions as outlined on product technical data sheets or in this manual.
3. Read and adhere to the material safety data sheet (MSDS) information.
4. Be aware of and record expiration dates and lot numbers shown on all products.
 - a. This information should also be recorded on the customer invoice.
5. Never use any CRL products past the expiration date shown on the package.
6. Always store CRL products as outlined on the technical data sheets.
7. Always adhere to published CRL **Drive-Away Recommendations** and notify vehicle owner/operator.
8. Date codes and batch numbers appear imprinted on the top perimeter of the urethane tube, on the label of the primer can, and on the boxes they are packed within.
9. All glass parts must be traceable to the installation by a DOT number and part number.
10. All supplemental mechanical glass retention devices must be replaced to original equipment specifications.
11. All mechanically-fastened automotive glass parts shall be replaced according to original equipment specifications.
12. Glass parts, including custom cut parts, must be marked in compliance with the certification requirements specified in FMVSS 205 and the marking requirements of ANSI Z26.1 incorporated by reference therein for those vehicles licensed for highway use.

Common Industry Terminology

Viscosity

Refers to the flow properties or thickness of the adhesive in its uncured or gunning state.

Modulus

Refers to the rigidity or the ratio of stress to strain of the adhesive in its cured state.

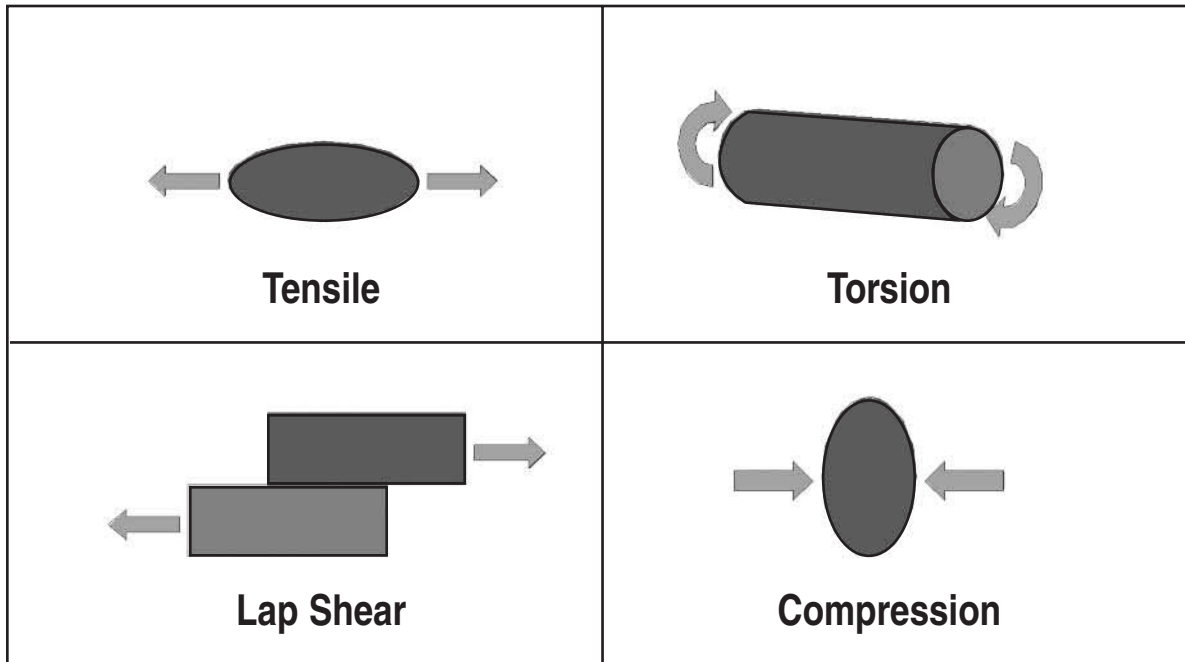
Decking

Refers to the ability of the adhesive to support a windshield in the pinchweld opening in its uncured or gunning state.

Low Conductive or Non Conductive

Refers to the electrical conductance, capacitance, & dielectric constant of the adhesive. Used as an insulator between the pinchweld and glass on vehicles that encapsulate the electronics into the glass.

Types of Stress CRL Urethane Adhesives Must Endure To Fulfill FMVSS Standards



FMVSS Requirements

Federal Motor Vehicle Safety Standards

FMVSS 212 & 216

FMVSS 212 & 216 are the performance standards the government has set for windshield retention and roof support. They apply to stationary glass in passenger vehicles produced or sold in the US.

These standards do **NOT** make reference to **ANY** one urethane adhesive. They refer only to the retention of the glass as part of total glass opening.

FMVSS Requirements

Federal Motor Vehicle Safety Standards

FMVSS 212 Measures windshield retention in a frontal barrier crash. Minimum requirements call for 50% windshield retention @ 30 MPH

FMVSS 216 Measures roof crush such as in a rollover accident. Minimum requirements call for the roof not to crush more than (5) inches when force is applied to the roof at 1.5 times the vehicles weight.

URETHANE ADHESIVES ARE VITAL TO THE SUCCESS OF THESE TESTS

INSPECTION CHECKLIST

Invoice No. _____

Customer _____

License Plate _____

VIN No. _____

Technician _____

Date _____

Vehicle Type

- 2-Door
- 4-Door
- SUV
- Van
- Truck
- Station Wagon
- Passenger Air Bag

Year _____

Make _____

Adhesive & Primer System

- PP301HV Lot No. _____
- PP302MV Lot No. _____
- PP303HL Lot No. _____
- PP3UV Lot No. _____
- PP3MP Lot No. _____

Adhesive Exp. Date _____

Primer Exp. Date _____

Time Glass Set _____

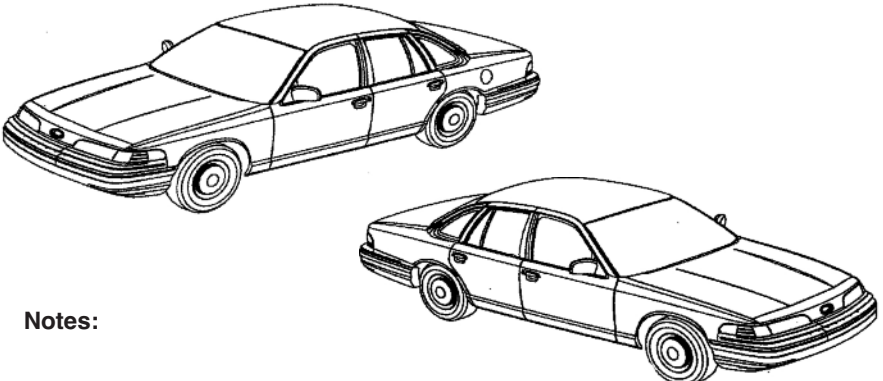
Temperature _____

Humidity % _____

Vehicle Release Time _____

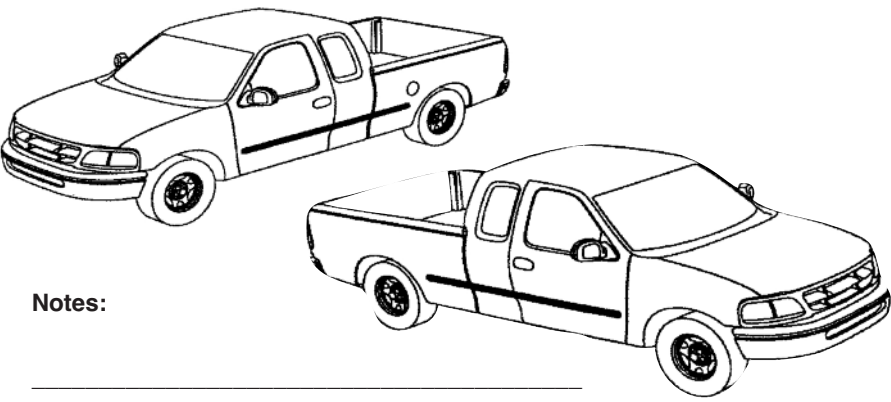
After Installation

- Wipers/Cowl/Mirror Installed
- Stickers & Tags
- Trim Installed
- Radio/Rain Sensor Checked
- Glass Cleaned
- Vacuumed
- Mirror Hanger
- Present SDAT



Notes:

NOTE VEHICLE CONDITION ABOVE



Notes:

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Inspect the area where the service work will be conducted and make sure it is free from obstacles that would create safety concerns, is well lit and that the ambient temperature is in keeping with the limits of the urethane system being used.

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Inspect the car; closely inspect the area of the vehicle you will be working on for existing damage. Using the CRL Inspection Checklist (Appendix "A") make a note of pre-existing damage. If the customer is there, show the damage to the customer and note the location. Do not engage in automotive glass replacement when any related condition would compromise the retention system and notify the owner/operator.

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After installation of the replacement glass do a post inspection; using the CRL Inspection Checklist (Appendix "A") make note that the service work and paperwork is complete and correct. Clean the vehicle and the work area and inspect the area for any new damage to the vehicle or glass.

Cover the front seats, floorboards, dashboard and steering wheel with a clean drop cloth or disposable plastic covers. Cover the hood, roof, and fender with a protective material to protect against possible damage to the vehicle. Tape up any vulnerable areas on the vehicle to protect against possible damage from power tools and cold knives during the cutout process.

Safety

Always wear personal protection equipment:

- Wear proper eye protection
- Wear powder free Nitrile, chemical-resistant gloves
- Additional safety equipment as required by your employer or safety regulations

Make sure all electrical equipment is properly grounded and in proper working condition to protect you from electrical shock.

Quality Conformance

All POWR BOND products are produced under strict, documented quality assurance standards that are registered to ISO/TS-16949. Furthermore, performance characteristics of all POWR BOND urethane adhesives meet or exceed criteria established by Original Equipment Manufacturer's (OEM's) and Federal Motor

Vehicle Safety Standard 212 (FMVSS 212). When properly used all POWR BOND products will restore vehicles to OEM design specifications for structural integrity and aesthetics.

Use only glass parts that meet the requirements of ANSI Z26 as specified by FMVSS 225.

Keep a copy of and follow our step by step installation guide for proper installation procedures to assure the integrity of the vehicle and the safety of the passengers. These instructions contain the proper use of the retention system storage specifications, minimum drive-away time charts containing temperature and humidity variables if applicable, and any special procedures required for adverse weather conditions.

Record the lot numbers and expiration dates printed on our products. Follow all safe drive away times and procedures to assure you are following the government regulations and the safety of the customer is assured.

CRL POWR BOND Glass Preparation

All glass parts must be traceable to the installation by a DOT number and part number. This information should be recorded on the CRL Inspection Checklist (Appendix "A"). Inspect the glass for any scratches or imperfections that would make it unacceptable. After installation of the replacement glass do a post inspection; using the CRL Inspection Checklist (Appendix "A") and make sure the DOT number for all replacement glass is recorded. Note that all other paperwork is complete and correct.

Clean the glass using the CRL POWR Cleaner glass cleaner. Spray the glass with the CRL POWR Cleaner glass cleaner and using an abrasive pad (Cat. No. NP48) "wet-scrub" the frit-band. Wipe off the band area and then re-spray the glass and clean from the outside toward the center of the glass with a lint free cloth.

If the glass has an attached molding or if you are attaching a molding to the glass apply CRL POWR BOND One Step Primer to the edges of the molding that will contact the POWR BOND urethane.

- Shake the POWR BOND One Step Primer for at least one minute before use
- Tightly seal container immediately after use
- Use a clean unused dauber each time the POWR BOND One Step Primer is used
- Allow 10 minutes to dry (May require longer dry time in very low temperature, low humidity conditions)

Glass Preparation should be complete at least 10 minutes before the application of POWR BOND urethane to the vehicle pinchweld; this will allow sufficient time for POWR BOND One Step Primer to dry. Do not touch the bonding area of the glass after cleaning, prepping or priming as this could contaminate the bond line and thereby weaken the adhesion.

Glass Removal

Carefully remove all trim and moldings. Remove all interior panels, pillar covers and wipers as necessary and place them in a secure area.

Cut out the windshield or body glass using your preferred method and follow all manufacturers' recommendations. Once the windshield has been removed remove contaminants such as dirt, moisture and debris from the pinchweld and clean the dashboard.

Dry fit the new windshield into the opening and mark its position with a grease pencil or molding-retention tape.

Evaluate the pinchweld area of the vehicle. The condition of the adhesive system that was used and the condition of the pinchweld must be examined to determine if the ANSI approved Full Cut Method can be used for the replacement glass. Check the condition of the pinchweld to make sure it is structurally sound and free of defects. If the OEM installation was butyl, polysulfide, or other non- polyurethane, and the vehicle is licensed for highway use, adhesive bonded stationary glass installations shall be performed using urethane or an equivalent retention system unless in conflict with current OEM specifications, such as rubber gasket installations. Check the retention system on the vehicle to see if the OEM installation was urethane, if urethane then the glass must be replaced with polyurethane or an equivalent adhesive bonding system.

No automotive glass replacement shall be undertaken using an adhesive glass retention bonding system that would not achieve minimum drive-away strength by the time the vehicle may be reasonably expected to be operated.

When inappropriate replacement materials or methods are detected, report your findings to the vehicle owner/operator.

Pinchweld Preparation

Clean the pinchweld area of all dirt and loose debris, clean the dashboard; check that previous glass replacement procedures and products were correct and the condition of the pinchweld has the appropriate integrity to support the bond of new urethane to the existing bead of urethane:

- Confirm that the existing bead of urethane is well bonded to the pinchweld and is in excellent shape
- Make sure the pinchweld is structurally sound and free of defects
- The pinchweld is not corroded
- The pinchweld is undamaged and has not been repainted

NOTE: If old urethane demonstrates any signs of peeling, or if corrosion is apparent, remove all material down to the pinchweld and refer to the vehicle manufacturers recommendations for pinchweld restoration – See “Corrosion of the Pinchweld” below for further instructions

Using a pinchweld-perpetration tool, trim the original bead of urethane, leaving 1/16 – 1/8 of an inch (1 – 2 millimeters) of the original urethane bead on the pinchweld. Make sure there are no contaminates and do not touch the pinchweld after prepping the area.

- Short cutting a windshield will void all Safe Drive Away Time guidelines and can cause possible loss of glass adhesion and potential serious personal injury. Since too little space has been created to allow enough urethane to be applied between the new windshield and old bead of urethane, the application will not pass all applicable FMVSS regulations, and may fail during vehicle operation.

Corrosion of the Pinchweld

Automotive OEMs have issued guidelines for addressing the proper preparation of the pinchweld in the event there is corrosion present. First identify the type and amount of corrosion present. Four levels of corrosion have been recognized by automotive OEMs and are as follows:

Type:

- 1.) **Light** – Light, orange discoloration of the metal
- 2.) **Moderate** – Moderate, orange with red spots, discoloration of the metal
- 3.) **Severe** – Severe, Deep “pitting”, dark red spots and raised edges
- 4.) **Perforation** – Perforation includes small holes to large losses of metal

Amount:

- a.) **Light to Moderate**, less than **1 square inch (25 square millimeters)**, follow Corrosion Removal procedures as outlined below
- b.) **Severe to Perforation**, CRL recommends that treatment of these and **any area of corrosion greater than 1 square inch (25 square millimeters) only be performed by a body shop trained in metal restoration.**

Corrosion Removal

NOTE: Any time a technician is working with chemicals and power tools, always follow manufacturers recommendations. Appropriate safety equipment and protective gear should always be worn.

Remove the corrosion to obtain a bright, corrosion free, metal surface. Ideally, this should be done prior to trimming the remaining intact and well bonded adhesive bead, but if this is not possible, clean the freshly cut original urethane bead after removing the corrosion, The method used to remove the corrosion

will depend on the type of corrosion present and are consistent with automotive OEM recommendations:

Type:

- 1.) **Light** – Light, orange discoloration of the metal
Use 80 grit sand paper
- 2.) **Moderate** – Moderate, orange with red spots, discoloration of the metal
Use sanding wheel, sand blasting or chemical rust remover. Care must be taken when using a sanding wheel so that the thickness of the metal is not significantly reduced
- 3.) **Severe** – Severe, deep “pitting”, dark red spots and raised edges
Send to a body shop for removal and replacement by personal trained in metal restoration.
- 4.) **Perforation** – Perforation includes small holes to large losses of metal
Send to a body shop for removal and replacement by personal trained in metal restoration.

After removal of the corrosion the area to be used for the bead of urethane is to be rust free, smooth and clean.

Corrosion Treatment

- 1.) **Light** – Light, orange discoloration of the metal
Apply POWR BOND One Step Primer
- 2.) **Moderate** – Moderate, orange with red spots, discoloration of the metal
Apply POWR BOND One Step Primer
- 3.) **Severe** – Severe, Deep “pitting”, dark red spots and raised edges
- 4.) **Perforation** – Perforation includes small holes to large losses of metal

For corrosion of the pinchweld described as either **Severe** or with **Perforations**, or any area of corrosion greater than 1 square inch (25 square millimeters) we recommend removal and replacement by personnel trained in metal restoration. If all of the corrosion is completely gone and you have a bare metal surface apply a coat of POWR BOND One Step Primer and allow 10 minutes to dry, then apply a second coat of POWR BOND One Step Primer. **NOTE: Prime bare metal spots and repaired rust areas larger than 1 square inch (25 square millimeters) with an OEM approved paint primer prior to applying the POWR BOND One Step Primer on the pinchweld.**

Perforation corrosion located in the windshield mounting area of a vehicle’s pinchweld, just like perforation corrosion located in any structural area of a vehicle, requires replacement of the entire section of metal. Filling these types of areas with body filler is not acceptable. Furthermore, I-CAR has made recommendations that state “do not use body filler on the pinchweld where glass urethane adhesive will be applied.” This recommendation was taken from the March - April 2000 I-CAR Advantage and this document also states that, “small irregularities in the flange surface will be filled when the adhesive bead is applied.” Keep in mind that the glass bonding area of a pinchweld does not require a “Class A” appearance and, if required, welded areas can be sanded smooth prior to POWR BOND One Step Primer application.

Again, do not apply body filler in areas where glass bonding adhesive will be applied.

Application of POWR BOND One Step Primer

- Shake the POWR BOND One Step Primer for at least one minute before use
- Tightly seal container immediately after use
- Use a clean unused dauber each time the POWR BOND One Step Primer is used
- For best results, CRL recommends that this product be used at temperatures of 40° F (4°C) and above
- Allow 10 minutes to dry after each application (May require longer dry time in very low temperature, low humidity conditions), this will allow sufficient time for POWR BOND One Step Primer to dry

Using a pinchweld-perpetration tool, trim the original bead of urethane leaving 1/16 – 1/8 of an inch (1 – 2 millimeters) of the original urethane bead on the pinchweld or clean the previously trimmed bead. Make sure there are no contaminates and do not touch the pinchweld after prepping the area.

CRL POWR BOND Urethane Application and Glass Installation

1. Cut the tip off the nozzle. With the cut nozzle measure to the top of the roofline and make a mark on the nozzle with a pen or marker, 1/16" (1.5 millimeters) higher than the roofline. Cut a "V-notch" in the nozzle up to the marked line; the "V-notch" should be 1/2 " to 5/8 " (12 millimeters to 15 millimeters). This will give you the appropriate triangular bead.
2. Hold the applicator 90° from the pinchweld or glass and dispense a bead of POWR BOND urethane adhesive with a continuous motion around the entire perimeter. In the case of applying onto the pinchweld apply the POWR BOND urethane directly on top of the freshly trimmed existing bead of urethane.
3. The POWR BOND urethane adhesive must be applied so that the finished bead cross section profile and dimensions meet or exceed original equipment configuration. Use a paddle stick or other tool to make sure there are no gaps and all seams and corners are even.
4. Using protective gloves take glass from stand or workstation.
5. Lay glass directly down on the bead of urethane; line up the glass with the dry-fit marks made earlier.
6. Apply even pressure around perimeter of glass to assure seal and level of set.
7. Check for leaks; with a leak-detector check the entire perimeter of the windshield. If a leak exists-
 1. Apply pressure to the spot to ensure the glass makes contact with the POWR BOND urethane adhesive
 2. Dispense a small bead of urethane in the area between the glass and the pinchweld.
8. If you have a push-in molding to set, be sure the urethane is visible around the perimeter of the pinchweld. If the molding will not touch the POWR BOND urethane shoot a small bead of urethane in the area between the glass and the pinchweld and reapply pressure to the molding.
9. Reinstall the removed parts in reverse order.
10. Complete the paperwork recording the lot numbers for the POWR BOND urethane adhesive system used.
11. Allow the POWR BOND urethane to cure according to product specifications before returning the vehicle to the owner/operator.

Complete Adhesive Removal

Complete adhesive removal is required for repaired, newly painted pinchwelds and when OEM urethane has poor adhesion.

If the technician discovers the previous installation used improper methods or sealants, the pinchweld must be completely cleaned of substance. If the old bead of urethane is not adhering to the pinchweld and would compromise the integrity of the new installation, it must be removed.

A complete adhesive removal requires the total removal of existing material down to the pinchweld. In a complete removal, the pinchweld must be cleaned of all products and materials other than the clean weld and the original paint. This method must be used when:

- The pinchweld has been repainted for any reason (i.e. body shop corrosion treatment)
- The pinchweld is damaged
- The existing urethane adhesive is loose or deteriorated
- An improper product was previously used (i.e. – butyl, silicone, etc.)

After exposing the original paint, using an abrasive pad carefully scuff the paint on the pinchweld, abrading the clear coat and or topcoat, exposing the OEM paint. Care must be taken so that the e-coat and phosphate coatings, which lie beneath the OEM paint, are not removed. The e-coat and phosphate coatings are essential part of the OEM corrosion inhibiting system and it is not possible to replace these in the after market. Apply POWR BOND One Step Primer according to the instructions in this guide and allow 10 minutes for it to dry. Then follow the **CRL POWR BOND Urethane Application and Glass Installation** procedures found on page #8..

In the special case of a newly painted pinchweld, one of the following four options may be selected.

Option 1: Whenever possible, remove the windshield, by cutting the adhesive as close to the glass as possible, and leave the entire remaining urethane adhesive bead in place. Do not trim the adhesive bead until the vehicle has been painted and the new windshield is ready to be installed. In this case, it is not necessary to tape or otherwise protect the existing urethane. After the vehicle is repaired and painted, remove most of the existing urethane leaving 1/8 inch on the pinchweld and install the windshield (full cut method).

Option 2: If the pinchweld area is to be repaired and painted by a body shop, remove the section of metal to be repaired, repair pinchweld and apply an epoxy etch primer coat. Allow the epoxy etch primer coat to cure for at least as long as would be required prior to applying topcoat over the epoxy etch primer coat, following manufacturer's recommendations. If topcoat is to be applied to

remainder of the vehicle, mask off the bond area of the pinchweld with masking tape. Continue painting the vehicle as required. If a forced drying process is to be used, remove the tape prior to baking the topcoat. Next, lightly abrade the primer surface using an abrasive pad. Apply POWR BOND One Step Primer according to the instructions in this guide and allow it to cure for at least 10 minutes. Then set the windshield using the appropriate CRL POWR BOND adhesive for the vehicle type and required drive away time.

Option 3: If a freshly primed pinchweld has already been color coated and allowed to cure the proper time required by the manufacturer then Option 2 is possible, follow instructions posted under Option 2.

Option 4: If the vehicle's OEM urethane bead has poor adhesion and easily peels away from pinchweld to reveal unblemished original paint, begin by scuffing with an abrasive pad. If the clear coat and basecoat pulled away from the vehicle with the original urethane bead then lightly abrade the exposed area using an abrasive pad; apply POWR BOND One Step Primer according to the instructions in this guide and allow 10 minutes drying time. Set the windshield using the appropriate CRL POWR BOND adhesive for the vehicle type and required drive away time.

***IMPORTANT NOTE:** Options 2, 3, and 4 above call for the use of POWR BOND One Step Primer. If any of these procedures are to be performed at temperatures below 40°F (4°C), then please refer to the special low temperature precautions for these products, which can be found in the **Installation in Adverse Seasonal Conditions** section of the manual on page 12.

Aluminum Pinchweld and FRP Bonding Flanges

On occasion an auto glass technician will come across vehicles that have aluminum pinchwelds or FRP (Fiber Reinforced Plastic) bonding flanges where a glass part is bonded with a urethane adhesive. Fiberglass is an example of an FRP. In these cases, if the technician finds that some of the original urethane bead is not properly adhered to the substrate, the following process should be followed to prepare the substrate for bonding.

1. Lightly abrade the area of the aluminum or FRP using an abrasive pad.
2. Apply a thin coat of POWR 300 PP3MP primer as per **Application of POWR 300 PP3MP** instructions on page #7.
3. Set the glass part using the appropriate POWR Primerless PP303HL, non-conductive adhesive and follow the **CRL POWR Primerless Urethane Application and Glass Installation** procedures.

Rubber Gaskets

If the OEM utilizes the combination of a rubber gasket and polyurethane as a retention system, an equivalent adhesive bonding system must be used in the installation. In cases when the OEM didn't include polyurethane or an equivalent adhesive system, such systems shall be used if later production models included the addition of adhesive systems without body style modification. If the OEM gasket installation did not include adhesive and the vehicle is licensed for highway use, the installation shall include polyurethane or an equivalent adhesive bonding system. The following are permissible exceptions: egress applications, antique restorations, or in cases in which this practice conflicts with current vehicle manufacturer specifications. When sealing air or water leaks within a rubber gasket/polyurethane only compatible polyurethane shall be used. (No silicone or butyl may be used). When sealing air or water leaks within a rubber gasket/sealant system only OE compatible sealant shall be used.

Installation in Adverse Seasonal Conditions

High Temperature Instructions:

During the summer months, extremely high temperatures may be encountered that can present unique concerns for auto glass technicians. Urethane adhesives can be both inconsistent and softer than in normal temperatures and gassing from the pinchweld can create bubbles in the urethane. To avoid these occurrences CRL recommends that when ambient temperatures are greater than 90°F (32°C) that the replacement glass, POWR BOND Urethane adhesive system and the vehicle's pinchweld not be exposed to direct sunlight during the replacement process. If proper shade cannot be provided then CRL recommends rescheduling the installation for in shop work or cooler temperatures.

Low Temperature Conditions:

Where ambient temperatures are at or below 40°F (4°C), CRL recommends use of **POWR BOND One Hour Urethane Adhesive**. This product is designed to be used in temperatures as low as 0°F (-17°C). To facilitate ease of use when ambient temperatures are 0°F (-17°C) we recommend keeping the **POWR BOND One Hour** urethane above 50°F. If using POWR BOND One Step Primer at temperatures below 40°F (4°C), drying times will be extended to a minimum of 25 minutes. Heating the application area for a minimum of 5 minutes prior to applying the POWR BOND One Step Primer will facilitate faster dry times and is recommended as a second option.

Additional considerations when doing an R&R (Remove and Replacement using the same glass):

Follow the applicable indications outlined in the “**CRL Guide to Proper Installation**” for **CRL POWR BOND Urethane Application and Glass Installation**.

In addition to the **CRL POWR BOND Glass Preparation** instructions, perform a final trim of the urethane (on both the glass and the pinchweld) prior to reinstalling the glass being sure to follow the instructions for **Pinchweld Preparation** leaving a bed of 1/16 to 1/8 inch thick or 1-2 millimeters.

If there is not enough urethane to make a fresh cut, then clean the urethane beds on the glass and on the pinchweld with CRL POWR Cleaner glass cleaner and a Scotch-Brite® pad to remove any contamination and scuff the surface, this also creates a fresh cut type surface for the urethane adhesion to work well. **This step (cleaning both urethane beds with an abrasive pad) is mandatory. If you do not have an abrasive pad then clean the surface and apply POWR BOND One Step Primer over the old bead of urethane.**

Proceed to **CRL POWR BOND Urethane Application and Glass Installation** procedures. Immediately after the urethane has been applied, install the glass!

Complete the paperwork recording the lot numbers for the CRL POWR BOND urethane adhesive system used.

The failure of any product used in the glass installation process that the installer believes could jeopardize customer safety shall be reported promptly to the manufacturer or supplier of the product. All stationary bonded parts on all vehicles licensed for highway use are to be attached to the vehicle with urethane unless in conflict with current OEM specifications. All mechanically attached glass parts are to be attached based on OEM specifications. Technicians engaged in automotive glass replacement shall not introduce any chemical agents, such as cleaners, solvents, lubricants, release agents, or utilize any installation practice, which will adversely affect the glass retention system. Documentation shall be maintained to demonstrate compliance with this standard.

CRL POWR BOND Urethanes

CRL gives you the ability to choose the right urethane to fit your business and the car. We have 3 urethanes to choose from:

POWR BOND Hi-Viscosity (Cat. No. 1217349)

Normal application

- o 40°F - 130°F (4°C – 54°C) application
 - o High humidity
 - o Low humidity
- 3 hour Drive Away
 - o High Viscosity
 - High decking strength
 - Strong surface tension
 - o Holds glass in place, allowing no or minimal movement from gravity after you have laid the glass on the bead.

POWR BOND One Hour (Cat. No. 1214002)

All season application

- o Below freezing application
 - o 130°F (54°C) application
 - o High humidity
 - o Low humidity
- 1 hour Drive Away
 - High decking strength
 - Strong surface tension
 - o Holds glass in place, allowing no or minimal movement from gravity after you have laid the glass on the bead.

POWR BOND Heated (Cat. No. 1214001)

- All season application
 - o $\geq 10^{\circ}\text{F}$ - 130°F (-12°C – 54°C) application
 - o High humidity
 - o Low humidity

- 2 hour Drive Away
 - o Must be heated in urethane oven and then must be immediately extruded

- Medium high decking strength

- Strong surface tension
 - o Holds glass in place, allowing no or minimal movement from gravity after you have laid the glass on the bead

CRL POWR BOND One Step Primer Procedures

1. Primer usage:
 - a. Use on scratches to the metal pinchweld where the scratch bares metal surface
 - b. Use on bare metal in the adhesion area of 1 square inch or less
 - c. Follow usage procedures in the corrosive section above for other metal use
 - d. Use on moldings or encapsulation to assure adhesion if the urethane ends up beneath this area when installing.
 - e. Use on push in moldings for good adhesion
 - f. Use on glass when there is no paint band to block the UV rays of the sun, such as off road equipment, etc.
2. Shake the can vigorously for 60 seconds
3. Apply to the area needed with a Q-tip, dauber or small paint brush.
4. Allow to flash and dry for 10 - 15 minutes on substrates before allowing contact with wet urethane adhesive
5. Use a fresh applicator each time the primers are applied.
6. Replace inner and outer caps on the primer bottles immediately after use to insure freshness and storage stability.
7. Re-priming substrates after 8 hours is required. Only re-prime the glass one time.

Miscellaneous Procedures & Handling

1. Always wear nitrile gloves when applying or handling primer and urethane products.
2. Follow instructions as outlined on product technical data sheets or in this manual.
3. Read and adhere to the material safety data sheet (MSDS) information.
4. Be aware of and record expiration dates and lot numbers shown on all products.
 - a. This information should also be recorded on the customer invoice.
5. Never use any CRL products past the expiration date shown on the package.
6. Always store CRL products as outlined on the technical data sheets.
7. Always adhere to published CRL **Drive-Away Recommendations** and notify vehicle owner/operator.
8. Date codes and batch numbers appear imprinted on the top perimeter of the urethane tube, on the label of the primer can, and on the boxes they are packed within.
9. All glass parts must be traceable to the installation by a DOT number and part number.
10. All supplemental mechanical glass retention devices must be replaced to original equipment specifications.
11. All mechanically-fastened automotive glass parts shall be replaced according to original equipment specifications.
12. Glass parts, including custom cut parts, must be marked in compliance with the certification requirements specified in FMVSS 205 and the marking requirements of ANSI Z26.1 incorporated by reference therein for those vehicles licensed for highway use.

Common Industry Terminology

Viscosity

Refers to the flow properties or thickness of the adhesive in its uncured or gunning state.

Modulus

Refers to the rigidity or the ratio of stress to strain of the adhesive in its cured state.

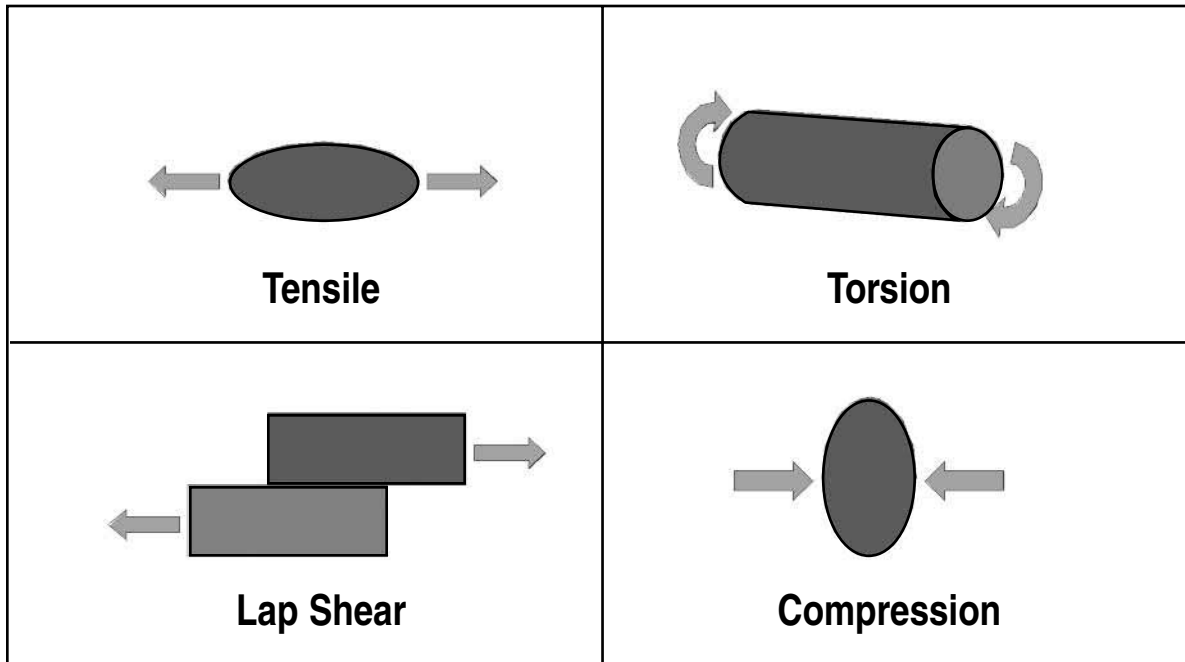
Decking

Refers to the ability of the adhesive to support a windshield in the pinchweld opening in its uncured or gunning state.

Low Conductive or Non Conductive

Refers to the electrical conductance, capacitance, & dielectric constant of the adhesive. Used as an insulator between the pinchweld and glass on vehicles that encapsulate the electronics into the glass.

Types of Stress CRL Urethane Adhesives Must Endure To Fulfill FMVSS Standards



FMVSS Requirements

Federal Motor Vehicle Safety Standards

FMVSS 212 & 216

FMVSS 212 & 216 are the performance standards the government has set for windshield retention and roof support. They apply to stationary glass in passenger vehicles produced or sold in the US.

These standards do **NOT** make reference to **ANY** one urethane adhesive. They refer only to the retention of the glass as part of total glass opening.

FMVSS Requirements

Federal Motor Vehicle Safety Standards

FMVSS 212 Measures windshield retention in a frontal barrier crash. Minimum requirements call for 50% windshield retention @ 30 MPH

FMVSS 216 Measures roof crush such as in a rollover accident. Minimum requirements call for the roof not to crush more than (5) inches when force is applied to the roof at 1.5 times the vehicles weight.

URETHANE ADHESIVES ARE VITAL TO THE SUCCESS OF THESE TESTS

INSPECTION CHECKLIST

Invoice No. _____

Customer _____

License Plate _____

VIN No. _____

Technician _____

Date _____

Vehicle Type

- 2-Door
- 4-Door
- SUV
- Van
- Truck
- Station Wagon
- Passenger Air Bag

Year _____

Make _____

Adhesive & Primer System

- 1217349 Lot No. _____
- 1214001 Lot No. _____
- 1214002 Lot No. _____
- 1214006 Lot No. _____

Adhesive Exp. Date _____

Primer Exp. Date _____

Time Glass Set _____

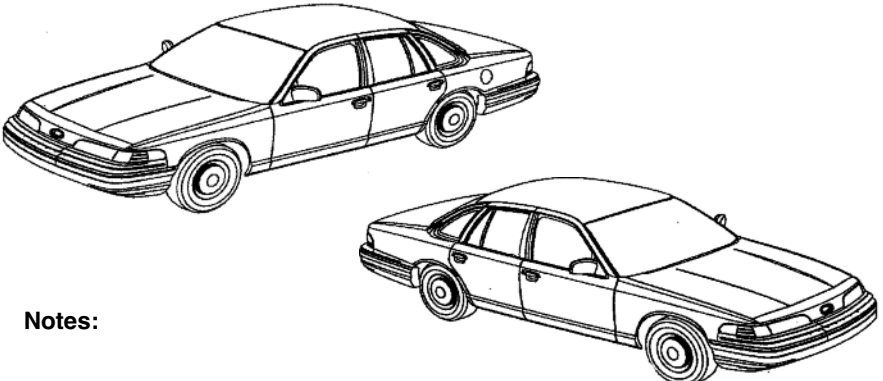
Temperature _____

Humidity % _____

Vehicle Release Time _____

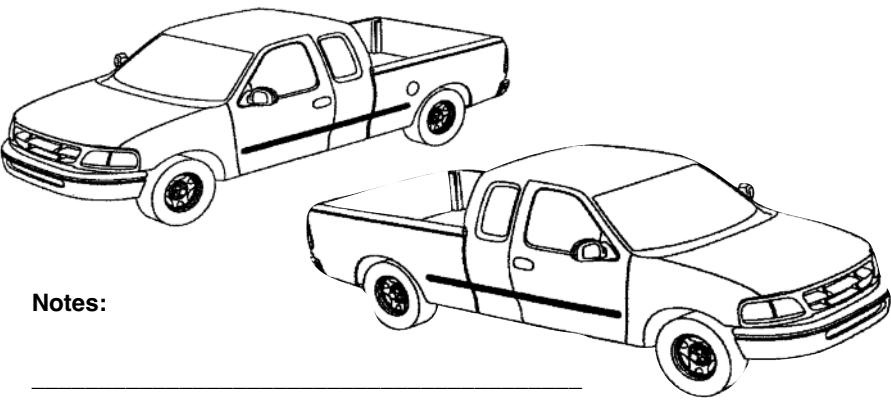
After Installation

- Wipers/Cowl/Mirror Installed
- Stickers & Tags
- Trim Installed
- Radio/Rain Sensor Checked
- Glass Cleaned
- Vacuumed
- Mirror Hanger
- Present SDAT



Notes:

NOTE VEHICLE CONDITION ABOVE



Notes:

NOTE VEHICLE CONDITION ABOVE