



AGR Technician Training Manual

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PINCHWELD PREPARATION

Technicians must make an assessment of the pinchweld area of the vehicle once the windshield has been removed. The condition of the old urethane and pinchweld will determine whether the ANSI approved full cut method can be used. The following guidelines are to be used.

Full Cut Method:

A Full Cut Method is defined as trimming the existing bead of urethane down to a height of approximately 1 to 2 millimeters (1/16") on the pinchweld when the residual bead is structurally sound and the substrate condition is not defective. Use the Full Cut Method when:

- The existing adhesive is urethane (i.e. - not butyl, silicone, etc.)
- The existing bead of urethane is well bonded to the pinchweld and is in excellent shape.
- Previous glass replacement procedures and products were correct and have the appropriate integrity to support the bond of new urethane under the Full Cut Method.
- The pinchweld is undamaged and has not been repainted.
- The pinchweld is not corroded.

SPECIAL NOTICE: Short Cuts (lightly trimming existing urethane beads and using a small amount of new urethane) are wrong and potentially very DANGEROUS. 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:

Corrosion of the pinchweld is a very serious issue and must be corrected properly. Automotive OEMs have issued guidelines for addressing this issue and these guidelines have been incorporated into the recommendations that follow.

To properly treat a pinchweld that is corroded it is important to first identify the type and the amount of corrosion that is present. The following will define these characteristics.

Corrosion Levels:

There are four levels of corrosion that have now been recognized by automotive OEMs. These are as follows:

- 1 = Light = Light metal discoloration; typically orange.
- 2 = Moderate = Moderate corrosion, typically has some red spots.
- 3 = Severe = This can be identified by deep "pitting", dark red spots and raised edges.
- 4 = Perforation = This level can vary from microscopic holes to loss of metal.

Amount:

In this manual, the amount of corrosion will be referred to in cumulative total area of corrosion in inch².

NOTE: C. R. Laurence recommends that treatment of Level 4 Corrosion, or perforation, only be performed by a body shop that is trained in metal restoration. Also, for any amount of corrosion greater than a cumulative total of 24 inch² of the pinchweld, C. R. Laurence recommends that this treatment only be performed by a body shop that is trained in metal restoration. C. R. Laurence's opinion is that any corrosion amount greater than 24 inch² constitutes a very severe and potentially dangerous corrosion condition, and should be addressed by a body shop.

After identifying the level and amount of corrosion, a technician should follow the recommendations outlined below for removal of the corrosion and treatment.

Corrosion Removal:

NOTE: Many of the following procedures involve actions that will require a technician to wear appropriate personal protective equipment (PPE) to avoid personal injury. Technicians performing these procedures should be sure to wear safety glasses or goggles, gloves (to protect hands from chemicals and other types of physical injury), and in some cases hearing protection, such as earplugs or ear muffs. In some cases, other types of PPE may also be required.

The first step in corrosion treatment will always be to 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, then be sure to clean the freshly cut original urethane bead using CRL9GC Glass Primer as described below to ensure that the fresh urethane will be able to bond well to the original bead.

The method used to remove the corrosion will depend on the type of corrosion that is present. The guidelines on the next page are consistent with automotive OEM recommendations and should be followed for removing corrosion.

- 1 = Light = Remove corrosion with 80 grit sand paper or wire wheel.
- 2 = Moderate = Remove corrosion with wire wheel, media blast or chemical rust remover.
- 3 = Severe = Remove corrosion with media blast or chemical rust remover.
- 4 = Perforation = The panel must be replaced and treated by a body shop.

In addition to a wire wheel, 3M™ Radial and Roloc Bristle Discs (Cat. No's. 3M4094, 3M7530) or CRL Paint Prep Pen (Cat. No. P3437), corrosion of Levels 1 and 2 can also be removed with a CRL Cat. No. D750, Dremel Tool and a grinding stone. The Dremel® Flex-Shaft attachment is also recommended because it makes precise corrosion removal easier. Care must be taken when using a Dremel Tool or wire wheel so that the thickness of the metal is not significantly reduced. A spot sand blaster would be considered a media blast. Products that contain phosphoric acid (such as Dupont's Metal Conditioner #5717, PPG's DX 579, and similar products) would be considered to be a chemical rust remover.

The remaining recommendations for corrosion treatment are shown below.

Corrosion Treatment:

For treatment of fresh scratches or bright metal rubs and scrapes that are 1 inch² in area or less, C. R. Laurence recommends that the technician cover these areas with CRL9P Pinchweld Primer from a 250 ml (8.3 Fl. Oz.) can as directed in the procedures outlined in this manual under the section titled “Primers”. However, these fresh scratches, rubs, and scrapes can also be treated using this corrosion treatment procedure.

The technician should use the procedure outlined below for treatment of the following scenarios.

- For fresh rubs and scrapes that are greater than 1 inch² in area.
 - For covering bright metal of the pinchweld that has been exposed following the corrosion removal recommendations that were previously outlined, as long as there is not significant metal loss or perforation of the metal and this area does not encompass greater than a cumulative total of 24 inch² of the pinchweld.
1. Remove the corrosion as outlined on the previous page.
 2. Wipe the bright metal with CRL9GC Glass Primer from a 250 ml (8.3 Fl. Oz.) can and wipe off with a clean towel. Repeat this step as necessary until all contaminants (both chemical and particle) have been removed. Wait a minimum of 10 minutes. If this procedure is being performed at temperatures below 40°F (4°C), then warm the area of the pinchweld that is to be treated for a minimum of five minutes using a heat gun prior to the CRL9GC Glass Primer application.
 3. If the adhesive bead was trimmed prior to removal of the corrosion, clean the contaminated areas of the trimmed original urethane bead by wiping with CRL9GC Glass Primer and then wiping off with a clean dry wipe.

NOTE: Allow at least 10 minutes for the CRL9GC Glass Primer to cure on the original urethane bead. If the air temperature is less than 40°F (4°C), then allow at least 30 minutes. These cure times will not be an issue if this step is done at the same time as step 2 above.

4. Apply CRL9P Pinchweld Primer, using a brush (CRL Cat. No. 1AB) or a dauber (CRL Cat. No. PT1U409), making sure that the primer overlaps onto the surrounding intact paint by a minimum of 1/8" (3 mm). Allow a minimum of 10 minutes for the primer to dry before proceeding to the next step. If this procedure is to be performed at temperatures below 40°F (4°C), then allow a minimum of 25 minutes.
5. Apply a second coat of CRL9P Pinchweld Primer over the first coat, using a brush or a dauber. Allow a minimum of 10 minutes for the primer to dry before proceeding to the next step. If this procedure is to be performed at temperatures below 40°F (4°C), then allow a minimum of 25 minutes.
6. Proceed with the remainder of the Full Cut Method by trimming the original urethane bead and apply C. R. Laurence Urethane Windshield Adhesive as required.



(Level 2-3 corrosion of pinchweld)



(Same area treated using treatment process)

Complete Adhesive Removal:

If the technician discovers that either improper procedures and products (such as butyl or silicone) were used on previous glass replacements, or that the existing pinchweld and urethane conditions would compromise the retention system, they are NOT to use the Full Cut Method. Instead, they are to fully correct any adverse glass installation related condition(s), leaving a clean and sound substrate for bonding.

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, carefully scuff the paint on the pinchweld to remove the clear coat and or topcoat, exposing the OEM primer. Care must be taken so that the e-coat and phosphate coatings, which lie beneath the OEM primer, 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 aftermarket. Apply CRL9GC Glass Primer according to the instructions in this guide and allow it to cure for at least ten minutes. Paint a thin coat of CRL9P Pinchweld Primer and allow it to dry for at least an additional ten minutes. Then set the windshield using the appropriate C. R. Laurence windshield adhesive for the vehicle type and required drive away time.

Note: See low temperature instructions, found in Section titled “Seasonal Concerns” for details on the use of primers and adhesives below 40 °F (4°C).

Repaired or Newly Painted Pinchwelds, and When OEM Urethane has Poor Adhesion:

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 and leave the entire bead of existing urethane in place. 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 to 2 millimeters (1/16") on the pinchweld. Install the windshield using the Full Cut Method.

Option 2. If the pinchweld area is to be repaired and painted, remove all urethane, repair pinchweld, and paint on the primer coat. Allow the primer to fully cure, according to the paint manufacturer's recommendations, and mask off the bond area with automotive masking tape. Continue painting the vehicle. Remove the tape, lightly abrade the primer with a Scotchbrite® or similar abrasive pad. Apply CRL9GC Glass Primer according to the instructions in this guide and allow it to cure for at least ten minutes. Paint a thin coat of CRL9P Pinchweld Primer and then allow at least ten minutes for this product to dry. Then set the windshield using the appropriate C. R. Laurence windshield adhesive for the vehicle type and required drive away time.

Option 3: If a freshly primed pinchweld has already been color coated and Option 1 is not possible, then the top coat, base coat, and clear coat (if used), must be removed to expose the primer coat. Once completed, follow instructions posted under Option 2. If the primer coat is removed during this procedure, exposing bare metal, then the body shop must re-apply the primer coat and allow this newly applied primer coating to fully cure, according to the paint manufacturer's recommendations, prior to application of any C. R. Laurence urethane product (refer to option 2).

Option 4: If the vehicle's OEM urethane bead has poor adhesion and easily peels away from the pinchweld to reveal unblemished original paint, begin by removing the clear coat and/or base coat from the bond area with a Scotchbrite® or similar abrasive pad. If the clear coat and base coat pulled away from the vehicle with the original urethane bead then lightly abrade the exposed primer using a Scotchbrite® or similar abrasive pad. Apply CRL9GC Glass Primer according to the instructions in this guide and allow it to cure for at least ten minutes. Paint on a thin coat of CRL9P Pinchweld Primer and then allow at least ten minutes for this product to dry. Set the windshield using the appropriate C. R. Laurence windshield adhesive for the vehicle type and required drive away time.

***IMPORTANT NOTE:** Options 2, 3, and 4 above call for the use of CRL9GC Glass Primer and CRL9P Pinchweld 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 section of the manual on "Seasonal Concerns."

Aluminum Pinchwelds 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. On aluminum bodied vehicles, use either CRL950FC or CRL700 Urethanes. Do NOT use CRL900HV on aluminum bodied vehicles.

1. Lightly abrade the area of the aluminum or FRP with a Scotchbrite® or similar abrasive pad.
2. Apply CRL9GC Glass Primer according to the instructions in this guide and allow it to cure for at least ten minutes. If this operation is to be performed at temperatures below 40°F (4°C), then this area must be heated with a heat gun for a minimum of five minutes prior to CRL9GC Glass Primer's application.
3. Apply a thin coat of CRL9P Pinchweld Primer, using a brush or a dauber, and then allow at least ten minutes for this product to dry. Allow 25 minutes for the primer to dry if it is below 40°F (4°C).
4. Set the glass part using the appropriate C. R. Laurence windshield adhesive for the vehicle type and needed drive away time.

GLASS PREPARATION

Each time you perform a windshield installation you are providing a windshield retention system. An essential part of the retention system is the bond between the adhesive and the glass. This critical area can cause leaks and other problems when there are contaminants between the adhesive and the glass. Cleaning the glass with C. R. Laurence's recommended products is the most important step to safe and leak-free installations.

Most new cars have a frit band near or along the edge of the glass, which also needs to be cleaned. As you might expect, through the course of the manufacturing process and distribution of the windshield to your location, many people and items have come into contact with the edge of the glass, leaving behind solvents, grease, oily fingerprints, silicones, and other materials which can reduce the performance of the adhesives you will apply, possibly with serious consequences.

CRL9GC Glass Primer will help you deal with this problem. It is a critical part of the C. R. Laurence Adhesive System. The CRL9GC has been designed to ensure a strong, durable bond between the adhesive and the windshield. **CRL9GC must be used on every windshield before applying the adhesive.** Windshields installed without the use of CRL9GC may be subject to leaks, stress cracks, and retention problems. The loss of windshield retention can cause serious and possibly fatal injuries. Therefore, the use of CRL9GC Glass Primer cannot be over emphasized. After using CRL9GC the windshield installation must be completed within eight hours or the primer must be re-applied. Please review the following section on CRL9GC Glass Primer for more detailed instructions and precautions.

Used correctly, CRL9GC Glass Primer will remove the small particles of dust, oil, and other contaminants, which could cause a bond to fail. Unlike some other glass primers, CRL9GC Glass Primer will not harm the top coats of car finishes.

Warning: DO NOT use glass that was previously prepared with non-C. R. Laurence glass preparation materials.

CRL9GC Glass Primer Application Guidelines:



CRL9GC

PWR22

1. First, thoroughly clean the glass with C. R. Laurence PWR22 Glass Cleaner. Do not use other glass cleaners as they may contain anti-static ingredients or high concentrations of ammonia and/or surfactants. When cleaning the glass, make sure glass is fully cleaned and no moisture is left on the glass.
2. Next apply CRL9GC Glass Primer, available in 250 ml (8.3 Fl. Oz.) cans. ALWAYS use chemical resistant gloves (Cat. No. 7005NG) and safety glasses (Cat. No. CL0210). DO NOT SMOKE while applying CRL9GC Glass Primer. Read and follow all precautionary instructions and warnings on the product.
3. Wet a clean, lint free towel (Cat. No. 1550) with CRL9GC Glass Primer, but do not soak it, and then wipe the towel in one direction around the perimeter of the glass (on bonding area only).
4. The towel should be continually turned to expose a clean surface to the CRL9GC Glass Primer can. If the towel requires re-wetting, turn a clean surface to the can to avoid contaminants on the towel (from the glass) mixing with the pure CRL9GC Glass Primer in the can.
5. Using a separate clean lint-free towel, wipe off the chemically reacted surface immediately after applying CRL9GC Glass Primer. Dispose of towel after each use.
6. Apply CRL9GC Glass Primer at or above 40°F (4°C), and allow to cure a minimum of ten (10) minutes (but not more than eight hours) before applying adhesive. If temperatures where glass installation is to occur are below 40°F (4°C), please refer to the Section titled “Seasonal Concerns”, located on page 13 of this manual.
7. If the prepared surface becomes contaminated or the open time is missed, then CRL9GC Glass Primer can be re-applied to the glass part up to three additional times, or a total of four applications. After CRL9GC Glass Primer has been applied more than four times to the same glass part, the adhesion characteristics may be compromised and the glass part should be discarded.
8. When CRL9GC Glass Primer is properly applied to “non-fritted” surfaces, the prepared surface will have a “greasy” appearance.

GASKET SET, PAAS, and REAR SLIDERS

Gasket Set Windshields:

For vehicles that have windshields set with a gasket and require that the gasket be bonded to the pinchweld and to the glass with a urethane adhesive, C. R. Laurence recommends the following procedure:

1. Use appropriate personal protective equipment when performing the following tasks.
2. Remove original windshield and gasket.
3. Use a new gasket if the original has been damaged.
4. Clean the glass with an approved glass cleaner as defined on page 9 of this manual.
5. Remove contaminants from the pinchweld and the inside of the gasket where the pinchweld and glass will sit by cleaning these areas with a clean lint free towel and water. An approved glass cleaner may be used to clean these areas if necessary.
6. Allow water and glass cleaner to thoroughly dry before proceeding.
7. Prepare all areas of the glass that will sit in the gasket with CRL9GC Glass Primer as described on page 9 of this manual and be sure to adhere to the special low temperature instructions when performing this task at temperatures below 40°F (4°C). The low temperature instructions and precautions for CRL9GC Glass Primer can be found on page 13 of this manual.
8. Apply CRL9GC Glass Primer to the pinchweld where the gasket will sit, and to the inside of the channels of the gasket, as described on page 9 of this manual. Allow at least 15 minutes for the CRL9GC Glass Primer to cure on both the gasket and the pinchweld. The technician may disregard the special low temperature instructions for CRL9GC Glass Primer applied to the gasket and the pinchweld.
9. Apply the desired C. R. Laurence windshield adhesive into the channels of the gasket as required and set the windshield.
10. Clean up of uncured urethane can be performed using CRL General Purpose Solvent & Adhesive Cleaner (Cat. No. CRL2032) and a clean towel or CRL Wipes in a Bucket (Cat. No. CRL99W).

PAAS (Pre-Applied Adhesive System):

Modern PAAS glass parts are designed to act as a height-guide when installing fresh adhesive. However, a PAAS system can also get easily contaminated from shipping and handling. To prepare a PAAS windshield, wipe the bond area of the pre-applied adhesive with CRL9GC Glass Primer. Immediately wipe off and wait ten minutes. This procedure must take place above 40°F (4°C). If this process cannot be performed at or above 40°F (4°C), then follow the low temperature instructions for CRL9GC Glass Primer found in this manual. After preparing the windshield with CRL9GC Glass Primer it can be installed by following the remainder of the typical C. R. Laurence guidelines for installation.

In some cases the pre-applied adhesive may need to be trimmed down to allow room for the new urethane adhesive. In these cases, it is not necessary to apply CRL9GC Glass Primer to the freshly cut bonding area exposed by the trimming of the pre-applied urethane adhesive.

Rear Sliders and PVC Encapsulated Glass Parts:

Most, if not all, aftermarket rear sliders for pickup trucks are manufactured using a painted aluminum extrusion frame. Follow the procedure detailed below in order to properly prepare this painted aluminum frame for installation.

1. Lightly abrade the bond area of the painted aluminum extrusion with a Scotchbrite® or similar abrasive pad.
2. Apply CRL9GC Glass Primer according to the instructions in this guide and allow it to cure for at least ten minutes. If this operation is to be performed at temperatures below 40°F (4°C) follow the procedures outlined in the low temperature instructions found in this manual.
3. Apply a thin coat of CRL9P Pinchweld Primer, using a brush or a dauber, and then allow at least ten minutes for this product to dry. Allow 25 minutes for the primer to dry if it is below 40°F (4°C).
4. Set the glass part using the appropriate C. R. Laurence windshield adhesive for the vehicle type and required drive away time.

When preparing an encapsulated part that requires bonding urethane to PVC, or for preparing a rear slider frame that has been confirmed to be made of PVC and NOT of a painted aluminum extrusion, the technician should follow the procedure detailed below:

1. Make sure that the bond area of the glass part is clean and contaminant free. Clean the area with an approved glass cleaner if required and allow to completely dry.
2. Apply a thin coat of CRL9EP EPDM/PVC Primer to the bond area of the glass part, using a brush or a dauber, and then allow at least ten minutes for this product to dry. If it is below 40°F (4°C), then allow at least 25 minutes for the primer to dry.
3. Set the glass part using the appropriate C. R. Laurence windshield adhesive for the vehicle type and required drive away time.

"V" BEAD APPLICATIONS

C. R. Laurence Windshield Adhesives are supplied with a pre-cut triangular V-Cut Nozzle. This is the recommended nozzle tip that must be used in order to apply the proper bead size. A round bead traps air in all four corners when compressed between the glass and pinchweld. This is a potential cause of leaks. However, when a triangular shaped bead is compressed, no air is trapped, and the bead squeezes down to a rectangular dimension.

Conventional, un-cut cone nozzles are also provided for backfilling use, sealing gaskets, and other custom applications.

Make sure that the depth of the "V" notched nozzle is the same as the height between the pinchweld mounting surface and roof of the car. This can be checked by simply placing the nozzle on the pinchweld near the roofline and viewing to see that the top of the "V" matches the height of the roof. If it is short, simply cut a deeper and wider "V" in the nozzle with CRL V-Notch (Cat. No. VNT306) or CRL X-TRA Large V-Notch (Cat. No. VNT306XL) Cutters. This step helps ensure that enough urethane is applied to the pinchweld to prevent the glass sagging below the roofline of the vehicle.

Do note that pre-cut "V" nozzles come with a stem guide. This stem is to provide a guide for installers choosing to install the urethane on the glass instead of the pinchweld. If you apply the urethane to the pinchweld, simply clip the stem from the end of the nozzle and discard.

"WET" ADHESIVE STRENGTH PROPERTIES

When a windshield has been recently installed using CRL products, and then is later removed, it is not unusual to find the center of the adhesive bead is wet. This situation is normal and does NOT affect the performance characteristics of the adhesive.

Some technicians have asked how a "fast curing" adhesive can still be wet after several days. This is because all one-part adhesives cure from the outside to the inside, developing a partially cured skin that gradually thickens until the bead has reached full cure. The "doughnut" affect that this creates still represents enough cured material and strength throughout the bead to meet all strength retention requirements mandated by FMVSS regulation.

SEASONAL CONCERNS

High Temperature Instructions:

When performing mobile glass replacements during the summer months the technician must be concerned with the temperatures of the substrates that are to be bonded. In auto glass replacement (AGR) the substrates are the glass part and the pinchweld. If the temperature of these substrates is too high, the AGR urethane can cure / react too quickly and experience what is called “gassing”. “Gassing” results when the urethane adhesive skins over and carbon dioxide is generated faster than it can be released. The carbon dioxide then builds up inside the adhesive bead and gives the adhesive a “Swiss cheese” appearance. If this phenomenon occurs in very small amounts there is little reason for concern. If it occurs significantly, then adhesion and long-term durability of the bonded system may be compromised. To avoid this C. R. Laurence recommends that, when replacing glass parts at temperatures greater than 90°F (32°C), the technician should be sure that the glass part(s) and vehicle's pinchweld not be exposed to direct sunlight during the replacement process. If temperatures are extremely high, or proper shade cannot be provided then C. R. Laurence recommends the following maximum substrate temperatures:

<u>C. R. Laurence AGR Adhesive</u>	<u>Maximum Substrate Temperature (°F)</u>
CRL900HV/CRL915HV	110 (43°C)
CRL950FC	100 (38°C)
CRL700	130 (54°C)

Low Temperature Instructions:

CRL9GC Glass Primer:

After applying CRL9GC Glass Primer according to the recommendations found in this manual, it must have a minimum of 10 minutes to cure at or above 40°F (4°C). The “preferred” method of application is to prepare the glass part with CRL9GC Glass Primer on site and allow 10 minutes for cure. If this method is not possible because the glass installation is to occur below 40°F (4°C) there are several options available. These options are as follows:

- Clean the glass part with a suitable glass cleaner and then apply CRL9GC Glass Primer, according to the instructions found in this manual, ahead of time in the shop, and complete the installation within eight hours. At low temperatures the “chemically reacted” surface remains active for eight hours, but must be kept free of contamination.
- Clean the glass part on site with PWR22 Glass Cleaner and then apply CRL9GC Glass Primer. Place the glass part in a heated van, with all doors and windows closed and the heater running, and then allow the product to cure for 20 minutes prior to installation. This is assuming that the area of the van where the glass part will be stored is above 50°F (10°C).
- Warm the surface to be prepared with a heat gun to above 40°F (4°C) for five minutes and immediately apply CRL9GC Glass Primer. Use caution when using heat gun. Make sure not to heat CRL9GC Glass Primer or speed cure time by heating surface after applying CRL9GC Glass Primer. In specific cases this option is suitable for pinchweld preparation, as mentioned in the sections of the manual on “Corrosion of the Pinchweld” and “Aluminum Pinchwelds and FRP Bonding Flanges.” However, if this is the case, it is suggested that the vehicle be moved to an environment where the temperature exceeds 40°F (4°C).

CRL9P Pinchweld Primer:

There are no special low temperature requirements for CRL9P Pinchweld Primer that is being used outside the bond area of the pinchweld, to cover fresh bright metal scratches or fresh bright metal rubs and scrapes that are less than 1 inch² in area. Extra dry time is required if CRL9P Pinchweld Primer is used below 40°F (4°C) in all other situations, such as to prepare the pinchweld as outlined in various recommendations found in the “Pinchweld Preparation” section of this manual. Specific examples would be if CRL9P Pinchweld Primer is being used below 40°F (4°C) for a complete adhesive removal or the pinchweld is newly painted. Under these circumstances the primer must be allowed to completely dry, which may require as long as 25 minutes. To determine if the primer is completely dry, it may be touched 10 minutes after application, in areas that will not directly receive adhesive, using a clean nitrile glove. As an alternative, it is suggested that the vehicle be moved to an environment where the temperature exceeds 40°F (4°C).

CRL700 Heated Windshield Adhesive at 15°F to 40°F (-9.4°C to 4°C):

Due to the unique strength development characteristics of CRL700 this product can be used in low temperature situations, but special care must be used when temperatures are below 40°F (4°C). This product develops very high green (initial set-up) strength within minutes of application.

For optimal results, be sure to set the glass within five minutes of beginning application of the adhesive. The glass can be set as long as 10 minutes after application of adhesive, but positioning the glass may be difficult. Consider use of the following points to help ensure a problem free installation:

1. Remove original windshield and clean the pinchweld thoroughly with a brush to remove all contaminants.
2. Dry set glass and mark alignment points.
3. Trim old adhesive to a height of 1-2 mm (1/16")
4. Glass should be cleaned and prepared with CRL9GC Glass Primer before applying adhesive to either pinchweld or glass (see pages 8 - 11 for more details).
5. Have enough adhesive heated and prepared to complete the job.
6. Have second cartridge open with nozzle installed. Place the second cartridge close to the vehicle for quick changeover. (If you have two guns, have one tube in each gun)
7. Set the glass immediately after adhesive is applied.
8. Position glass before pressing it into place.
9. Refer to C. R. Laurence's Safe-Drive-Away-Time-Chart (found in the Spec Data for each product online) to determine the minimum hold time for the vehicle at the measured environmental conditions. **DO NOT RELEASE VEHICLE UNTIL HOLD TIME HAS LAPSED.**
10. Use extra care while removing and replacing the cowl cover and trim pieces.

THE ADHESIVE SYSTEM

Glass shops can adapt the specific safe drive away times of the various AGR C. R. Laurence Windshield Adhesives to their customer's needs. The speed with which a customer needs to return their vehicle to service will dictate the kind of adhesive to use for windshield replacement. Quicker setup and bond strength generally are achieved by use of the more expensive high performance products, which increase the overall cost of installation. Other factors affecting drive away time include application temperature, humidity, and the presence of passenger side air bags on the vehicle. Refer to the C. R. Laurence's Safe Drive Away Time Chart for a complete listing of products and safe drive away times.

SPECIAL NOTES:

- A. CRL700 Heated Windshield Adhesive must be heated, at minimum, one-hour prior to use. These products can be heated a total of 10 hours (either consecutively or in shorter periods adding up to a total of 10 hours). After this total heating time without use the product must be discarded.
- B. Do not heat products that are designed to be cold applied, because the product will not perform properly.
- C. In many cases, partial tubes can be reheated and reused.
- D. Urethanes should be stored at temperatures under 75°F (24°C) to maximize shelf life.
- E. Use V-Cut Nozzles when applying beads of adhesives for auto glass installation.
- F. For every windshield installation, regardless of adhesive used, the installer MUST use CRL9GC Glass Primer to prepare all glass or fritted surfaces that will be in contact with the adhesive.
- G. Certain installations will also require the use of CRL9P Pinchweld Primer to prepare the glass and pinchweld for adhesive application. Some installations will require CRL9EP EPDM/PVC Primer to prepare PVC and EPDM parts that will receive adhesive application. For rear sliders and PVC encapsulated glass parts, refer to page 11 of this manual. Be sure to also review the section on "Priming" in this manual (pages 17-19) for detailed instructions on application of CRL9P Pinchweld Primer and CRL9EP EPDM/PVC Primer.

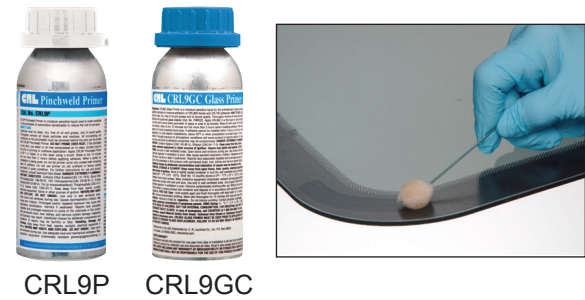
DATE CODES

All C. R. Laurence products have a shelf life or period after production within which the product must be used. After the expiration of the product shelf life without use, the product **MUST** be discarded. Old or expired product performance is not warranted, and the product may not properly adhere, causing loss of glass retention and possible personal injury. Humidity, temperature, and sunlight can affect the shelf life. It is important to keep the products stored correctly. Make sure you rotate your stock and use it on a "first in, first out" basis. This will ensure that you always use fresh material. If you ever have problems with the materials, the first thing you should check is the date code to determine if the product shelf life has expired. Date codes are located both on the shipping box and individual container. **IF THE SHELF LIFE HAS LAPSED, DO NOT USE THE PRODUCT.**

- Each C. R. Laurence Windshield Adhesive has a nine month shelf life.
- CRL9P Pinchweld Primer has a nine month shelf life.
- CRL9GC Glass Primer and CRL9EP EPDM/PVC Primer have a 12 month shelf life.
- Once CRL9GC Glass Primer is opened the shelf life is reduced, but not expired. With proper storage conditions they will remain usable up to six months after opening, or until the expiration date, whichever comes first. Always tightly replace both the inner liner and outer cap after each use. If the product becomes thick or cloudy discontinue use immediately.
- C. R. Laurence Urethane Adhesives should not be stored above 75°F (24°C). If properly stored in cool, dry conditions, the unopened adhesive cartridges have a shelf life of nine months. If the product is exposed to freezing conditions (<32°F (0°C)) the product will not be damaged, but it will require additional time to acclimate to the optimal application temperature. For optimal application characteristics, C. R. Laurence's cold applied adhesives (CRL900HV and CRL950FC) should be applied when the adhesive is between 60°F (15.5°) and 90°F (32°C). CRL700 Heated Windshield Adhesive will require additional heating time if the product is stored at or below freezing. For additional information on the optimal application temperature of the heated products, please review the section on "Hot Applied Adhesives" located on page 20 of this manual.
- For products that have expiration dates, or "Best Before" dates, that are given only in month and year (without a specific day), please remember that these products can be used until the end of the month that is listed.

PRIMING

CRL9P Pinchweld Primer:



CRL9P Pinchweld Primer is a moisture sensitive black liquid to be applied to glass or bare metal. CRL9P Pinchweld Primer is packaged in 250 ml (8.3 Fl. Oz.) cans and is predominantly used for covering bright metal scratches, rubs, and scrapes.

- Use CRL9P Pinchweld Primer to cover bright metal scratches on the pinchweld in order to reduce corrosion. Fresh, bright, metal rubs and scrapes, up to 1 inch² in area, may also be covered with one coat of CRL9P Pinchweld Primer.
- In some cases, CRL9P Pinchweld Primer can be used on glass to create a frit band appearance and/or provide supplemental UV protection for the ceramic frit found on present day windshields. The product IS NOT intended for use as the only protector against UV rays.
- C. R. Laurence Windshield Adhesives are designed to bond aggressively to the existing freshly trimmed urethane bed. For this reason, do **NOT** apply CRL9P Pinchweld Primer to the existing trimmed urethane bed when performing a full cut.

Important Note: Currently, there is no aftermarket coating available that can restore the automotive OEM corrosion protection system that today's vehicles are manufactured with. Therefore, care must be taken when removing glass parts so that little or no damage is incurred to the paint.

All pre-existing corrosion conditions on the pinchweld must be removed and prepared with CRL9GC Glass Primer before the area can be treated using two coats of CRL9P Pinchweld Primer. Severe rust conditions, as defined in the section of this manual on "Pinchweld Corrosion", must be brought to the customer's attention and possibly remedied by a body shop. Please review this section of the manual for a detailed explanation of how this issue should be addressed. NEVER apply CRL9GC Glass Primer or CRL9P Pinchweld Primer over rust.

CRL9P Pinchweld Primer Application Guidelines:

- Shake the bottle vigorously until you hear the mixing ball rattle and then continue shaking for an additional 10 seconds.
- Apply CRL9P Pinchweld Primer using a brush (CRL Cat. No. 1AB), dauber (CRL Cat. No. PT1U409), or a cotton swab (CRL Cat. No. 1CS) to cover any bare metal areas, that are within the limits defined above, trying not to get any primer on remaining bed of urethane (when a Full-Cut is being performed).
- Allow primer to dry for a minimum of 10 minutes before applying adhesive. The primer must be completely dry prior to adhesive application.
- For complete adhesive removals at temperatures lower than 40°F (4°C) more than 10 minutes may be required for the primer to completely dry. To determine if the primer is completely dry it may be touched 10 minutes after application, in areas that will not directly receive adhesive, using a clean nitrile glove (CRL Cat. No. 7005NG).
- CRL9P Pinchweld Primer can be used to create a frit band appearance around the perimeter of the windshield, but it does not act as a primary UV protector for the urethane. If the windshield to be installed does not already have a frit band, first apply CRL9GC Glass Primer around perimeter of glass and then let the CRL9GC Glass Primer cure for a minimum of 10 minutes. Then apply CRL9P Pinchweld Primer and let dry an additional 10 minutes. Generally, in these cases, the urethane is protected from UV rays by a trim molding.

There are no special low temperature requirements for CRL9P Pinchweld Primer that is being used outside the bond area of the pinchweld to cover fresh bright metal scratches or fresh bright metal rubs and scrapes that are less than 1 inch² in area. Extra dry time is required if CRL9P Pinchweld Primer is used below 40°F (4°C) in all other situations, such as to prepare the pinchweld as outlined in various sections of the “Pinchweld Preparation” section of this manual. Specific examples would be if CRL9P Pinchweld Primer is being used below 40°F (4°C) for a complete adhesive removal, or if the pinchweld is newly painted. Under these circumstances, the primer must be allowed to completely dry which may require as long as 25 minutes. Again, as stated above, to determine if the primer is completely dry, it may be touched 10 minutes after application in areas that will not directly receive adhesive, using a clean nitrile glove. As an alternative, it is suggested that the vehicle be moved to an environment where the temperature exceeds 40°F (4°C).

If the pinchweld is very dirty, and requires clean up, use a brush (CRL Cat. No. LAB2634) and or towels to clear away debris prior to trimming existing urethane. If additional cleaning is necessary use water or oil free compressed air to clean the surface. Make sure the surface is dry prior to priming or urethane application. If after using the above cleaning methods the pinchweld is still not completely clean and dry, then CRL9GC Glass Primer can be used as long as it is sufficiently wiped off and allowed to thoroughly dry prior to trimming the existing urethane bead.

Always use chemical resistant gloves and safety glasses when applying CRL9P Pinchweld Primer. DO NOT SMOKE during use. Follow all warnings and instructions on product container.

CRL9EP EPDM/PVC Primer:



CRL9EP

CRL9EP EPDM/PVC Primer is used to prepare PVC and EPDM encapsulated parts, moldings, and plastic door glass fasteners if these parts are to be bonded using one of C. R. Laurence's Urethane Adhesives. For additional information, please review the section on “Rear Sliders and PVC Encapsulated Glass Parts” found in this manual. Also, be sure to follow all safety instructions on container.

Application Guidelines:

- Use brush or dauber to apply a thin, continuous coat of CRL9EP EPDM/PVC Primer to the surface area to be bonded.
- Allow a minimum of 10 minutes to dry prior to adhesive application. The primer must be completely dry prior to adhesive application.
- If below 40°F (4°C) the primer may take as long as 25 minutes to dry. As with the CRL9P Pinchweld Primer, to determine if the primer is completely dry it may be touched 10 minutes after application in areas that will not directly receive adhesive, using a clean nitrile glove.

HOT APPLIED ADHESIVES

Use of Ovens to Heat C. R. Laurence Adhesives:

CRL700 Heated Urethane Windshield Adhesive must be heated in a C. R. Laurence approved heating oven for a minimum of one hour, which is necessary to ensure the product reaches a temperature range of 158°F - 194°F (70°C - 90°C) before it is used. This product can be heated a total of 10 hours, either consecutively or in shorter periods adding up to a total of 10 hours. After this total heating time without use the product must be discarded.

Heating this adhesive not only allows it to be gunnable; this also improves the application characteristics. If this product is not heated properly it will be very stringy.

You should ALWAYS wear protective gloves and safety glasses while handling heated adhesives. The product is HOT when applied and can cause burns. Exposure to urethanes may have health risks. See warnings on product container.

PRODUCT NOTE: The one hour heating requirement assumes urethane stored at 32°F (0°C) or higher. Urethane stored below 32°F (0°C) (such as overnight in a mobile vehicle) will require additional oven time to reach the 158°F - 194°F (70°C - 90°C) range. Fifteen minutes of extra heating time is satisfactory.

IMPORTANT: Heaters are for use with CRL700 Heated Urethane Windshield Adhesive only. Never place any other adhesive, including any other C. R. Laurence Adhesive, in a heater for any reason.

Special Notes about Hot Applied C. R. Laurence Adhesives:

- Only heat recommended C. R. Laurence Adhesives. Never heat cold applied adhesives or other brands of products.
- Allow heated products at least one hour in oven to reach application temperature.
- Over-heating product can cause **PERSONAL INJURY**. Use protective gloves when handling heated cartridges.
- Only use approved heat oven referenced above. **NEVER** use a different heat source to heat C. R. Laurence products.

CRL Urethane Ovens:



Cat. No. E9006
120V AC Two Cartridge Urethane Oven



Cat. No. E9007
12V DC Two Cartridge Urethane Oven



Cat. No. E9011
120V AC Six Cartridge Urethane Oven

Oven Usage Tips:

12 Volt Ovens

- Make sure plug end is pushed all the way into lighter receptacle.
- Operate engine (outdoors or with adequate ventilation) during oven use to prevent drain on battery.
- Remove plug at end of business day and turn off heater.
- Keep debris away from operating heater.
- Never pull on cord to remove plug end; grasp plug to remove from receptacle.
- Keep heating chambers clean and free of debris.

110 Volt Ovens

- Turn off ovens at end of every day and remove all cartridges.
- Keep heating chambers clean and free of debris.

NON-CONDUCTIVE URETHANES

The subject of "conductivity" is not a new one in the field of polyurethane adhesives. Being non-conductive is an important part of successful urethane design and production because this quality resolves several problems of automotive design and manufacture. Not every brand of polyurethane adhesive is non-conductive. CRL makes several adhesives that are rated non-conductive to address certain problem applications.

Conductivity is a measure of the ability of a material to conduct electrical current. If a material is non-conductive, the material acts as an insulator preventing the flow of electricity, much like the plastic surrounding the exterior of a lamp cord. Due to the physical positioning of a urethane adhesive between two surfaces, in order to seal or bond them together, engineers and designers have found the urethane bead to be in an excellent location to prevent several potential electrical-related problems.

PROBLEM 1: The prevention of electrical current flow between an exposed electrically charged wire and non-targeted area of the vehicle.

CONCERN: If such wiring is not insulated, the consequences could be electrical shorts, potential fire hazard and operative equipment due to disruption of power. Examples of this situation include heating/defrosting elements in front and rear glass. These electrically charged elements need to be isolated/insulated from the rest of the vehicle. The non-conductive urethane adhesive bead serves this need.

PROBLEM 2: To prevent signal loss as a result of induced current, which impairs the performance of aerial receivers located in the windshield glass.

CONCERN: Unblocked channels of electrical conductivity create static interference and weakened reception. A non-conductive adhesive isolates the windshield receiver from the rest of the vehicle.

PROBLEM 3: The prevention of electro-chemical or galvanic corrosion between two different types of metal that comes into contact through seal, bond or mechanical fasteners.

CONCERN: In the presence of moisture and air, galvanic corrosion will occur at the contact point of two different types of metals. The result will be oxidation of the metal and formation of rust. An insulator must be installed between the different metals to block the conductive exchange. Non-conductive polyurethane adhesive is a great insulator for this purpose.

PROBLEM 4: To prevent corrosion of aluminum in contact with the carbon black within the adhesive.

CONCERN: Because the conductive component in some black polyurethane adhesives is carbon black, there is a possibility of galvanic corrosion leading to the destruction of the aluminum.

NOTE: CRL950FC Fast Cure and CRL700 Heated Urethanes are rated "non-conductive". Use these products in ALL non-conductive urethane applications, except if a "high modulus" adhesive is needed for certain vehicle applications. CRL Cat. No. PP303HL is both Non-Conductive and High Modulus.

QUESTIONS AND ANSWERS

1. Can CRL Adhesives be installed onto wet surfaces? *No urethane can be applied to a wet surface because the water causes the urethane to ball up and lift from the surface, compromising the adhesion. All surfaces must be clean and dry.*
2. How do I install a gasket set windshield? *Clean the glass gasket slots with CRL9GC Glass Primer. The gasket must then be bonded, with urethane, to the pinchweld and the glass must be bonded to gasket with urethane. Please refer to page 10 for additional information.*
3. How do I use your urethane on a "Pre-Applied Adhesive System (PAAS)" windshield? *Modern PAAS systems are designed to act as a height-guide when installing fresh adhesive. However, a PAAS system can also get easily contaminated from shipping and handling. To prep a PAAS windshield, wipe the pre-applied adhesive with CRL9GC Glass Primer. Immediately wipe off and wait ten minutes. The windshield is now ready to be installed. Refer to pages 10 and 11 for additional information. Follow normal CRL guidelines for the remainder of the installation.*
4. Can I apply your heated products cold? *No, CRL700 Heated Urethane must be applied hot in order to achieve acceptable gunning characteristics and cure.*
5. Sometimes my push-in moldings do not stay down. What causes this, and what would you recommend to address the problem? *CRL950FC Fast Cure stiffens rapidly, and by the time you get to setting an old style push-in molding the foot of the molding may not penetrate the bead. IF this does happen, a great remedy is to simply slice through the surface of urethane with some form of narrow blade, and back fill with a small portion of fresh CRL950FC Fast Cure. You'll find this to be the best remedy and urethane to use in getting those moldings to stay down. Be reminded that a little CRL9EP Primer is a great product to use when really needing to get urethane to stick to either PVC or EPDM rubber.*
6. What glass cleaner can I use? *PRW22 Glass Cleaner is the preferred cleaner to use. Do not use other glass cleaners as they may contain anti-static ingredients or high concentrations of ammonia and/or surfactants. Make sure that all cleaner is removed from the glass surface prior to applying CRL9GC Glass Primer.*
7. How long are primers and cleaners good for after they have been opened? *CRL Primers have a limited shelf life when opened. With proper storage conditions they will remain usable up to six months after opening, or until the expiration date, whichever comes first. Always tightly replace both the inner liner and outer cap after each use. If the product becomes thick or cloudy, discontinue use immediately.*

8. I've always used a round bead and never had a problem. Why do you recommend a triangle bead?
When compressed, a triangle is the only dimension that will not trap air. Round beads tend to trap air in all four corners, creating air pockets that vibrate through the bead, creating leaks. Triangle beads, when applied correctly, create less squeeze-out and clean up as well. Always remember to trowel all wet seams of urethane together, using a windshield stick or blade.
9. You recommend not applying CRL9GC Glass Primer when temperatures are under 40°F (4°C). Why?
The issue is cure or reaction of the adhesion promoters that are in CRL9GC. All brands of preps and primers require enormous amounts of time to cure when temperatures fall into this range. If faced with mobile work and the temperature is below 40°F (4°C), try preparing your glass in the shop prior to departure. As long as the surface does not get contaminated it will remain active for up to eight hours. If that is not possible, please refer to the section on "Seasonal Concerns" on page 13 of this manual for additional ideas.
10. What risks do I take if I use a high modulus urethane on a vehicle that only requires non-conductive urethane?
The windshield could develop stress cracks during vehicle operation.
11. What risks do I take if I don't use a high modulus urethane on a vehicle that does require it?
After the windshield is replaced, the vehicle might not have the its original level of stiffness. The windshield could break as a result of moving beyond the limits of the window opening during operation of the vehicle.