Overview

The Blue Bird All American's body structure consists of Blue Bird's one piece bow construction and body sections built in 28 and 35 inch increments that run the entire length of the bus. The roof has one piece roof sheets which extend from one side to the other. The body is insulated with mineral wool insulation and 16 gauge rubrails extending from front to rear help ensure structural integrity. Body joint structure is riveted with adhesive and meets all applicable state and Federal Motor Vehicle Safety Standards.

Appendixes In This Chapter

Appendix 1. Sika AGR Technician Training Manual 2008. This manual from Sika includes full details and technician training instructions on the replacement of bonded glass systems using the Sika line of products.

Body Glass

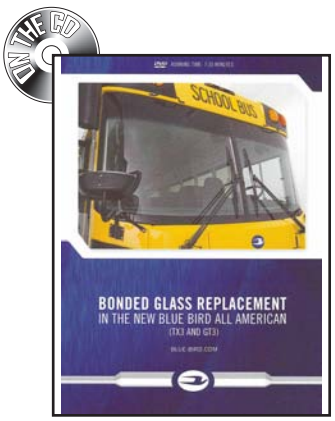
Glass replacement should meet standards in specification FMVSS 205 and 217.

WARNING ***When replacing broken or damaged glass, use extreme care at all times to prevent personal injury. Use proper replacement parts, tools and personal protective equip-ment, such as gloves and safety goggles.***

Windshield Glass Replacement

The all new look of the 2010 D3 All American represents more than just a cosmetic facelift. One of the more noticeable differences is more glass on the front and rear of the bus. Not only does the windshield have 33 percent more glass area, the method of fastening the windshield to the bus is different. The windshield is bonded to the front structure of the bus with an adhesive retention system.

Fastening glass to the body of automobiles using adhesives has proven to be a very reliable time tested method of glass installation. The automotive industry has been using adhesive retention systems for installing windshields, rear glass and other glass components on automobiles for years.



Bonded Glass Replacement
In The New Blue Bird All American
(VIDEO)

Using adhesives to install glass has a number of advantages over other methods of retention. Most important, adhesive retention systems provide a positive means of fastening the windshield to the front structure of the bus. Raising the standard for safety, bonded windshields provide an increased resistance against forces that may be applied directly or indirectly to the glass depending on the environment or unforeseen conditions the bus may encounter. Although the windshield is not considered a component required for structural integrity, the 9mm thick laminated windshield is very rigid and when installed by Automotive Glass Replacement Safety Standards (AGRSS) standards using Sika brand retention products, the windshield becomes a part of the structure adding strength and integrity to the body.

D3 Bonded Glass Windshield

Other advantage of using a bonded retention system is its ability to not only act as a fastener but its ability to act as a sealer. Adhesives and sealants have similar characteristics but in very general terms adhesives do not require mechanical fasteners. A properly installed windshield by AGRSS standards using Sika retention products will provide a positive seal against wind noise and water leakage.

Using an adhesive retention system to install the windshield and rear glass provides an advantage from a cosmetic viewpoint, by adding to the aesthetic appearance of the bus.

Blue Bird engineering has selected Sika brand adhesive retention products for bonding the windshield and rear glass to the bus during the manufacturing process. Sika products have been used in the automotive industry for over 25 years and they are time tested proven reliable products. The following Sika products are used during the manufacturing process.

Sika Products

Product Name	Description
Sika® Aktivator UH-2 LUM	Adhesion Promoter
Sika® Primer – 206 G + P	Primer
Sikaflex® – 255FC	Direct Glazing Adhesive

Regardless of who installs the windshield on a D3 All American it is the responsibility of those who place the bus in operation to insure the vehicle is safe for over the road operation and most importantly the bus is safe for transporting passengers. With this in mind it becomes the responsibility of those who place the bus in operation to select who will replace bonded glass that has been damaged on the bus.

There are a numerous considerations that need specific attention when bonded glass needs replacing. One example, of many, is the purchase and storage of adhesive retention products. Like most adhesives, some of the Sika products have a shelf life that needs to be monitored and documented at the point of installation. If a windshield or other bonded glass is installed with adhesive products having an expired shelf life, even though the installation procedures may seem normal and successful, proper bonding of the glass to the bus body may not have occurred. This may result in the glass de-bonding in some areas causing wind noise and water leakage or the glass may separate from the bus body. All of the products used in the installation process and the technician conducting the installation of bonded glass on a D3 All American must comply with AGRSS and Federal Motor Vehicle Safety Standard (FMVSS) standards. *Contact your Blue Bird Dealer for assistance.*

CAUTION ***Blue Bird strongly recommends only Sika brand adhesive retention products be used when replacing the windshield or other bonded glass on the bus and the installation should be conducted by an AGRSS® certified installer following all AGRSS and FMVSS requirements. Failure to do so could result in the replaced glass de-bonding and separating from the bus.***

The **AGR Technician Training Manual 2008 Appendix 1** is provided as a reference for the certified installer to assure proper use of Sika brand adhesive retention products. Also see: **Bonded Glass Rplacement in the New Blue Bird All American** on the CD/DVD.

Terms

ANSI/AGRSS 002-2002: American National Standards Institute/Auto Glass Replacement Safety Standard 002-2002

The AGRSS Council: The Automotive Glass Replacement Safety Standards Council Inc, AGRSS is a not-for-profit organization dedicated to the safe replacement of auto glass. AGRSS was founded and is supported by companies in the auto glass replacement industry that keep safe installation as their primary goal.

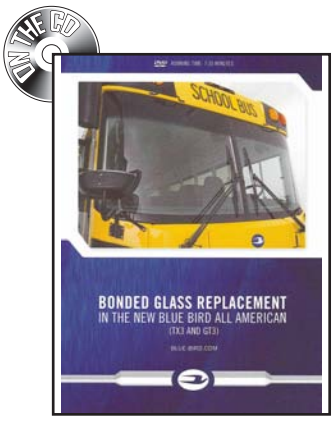
AGRSS: an accredited American National Standards Institute (ANSI) standards development organization. It has developed the North American's only auto glass replacement standard, the AGRSS standard (ANSI/AGRSS 002-2002 Automotive Glass Replacement Safety Standard). The AGRSS Standard addresses procedures, education and product performance.

IGA: Independent Glass Association

Rear Vision Glass Replacement

Rear vision glass and rear emergency door glass is removed and installed using the same specifications as outlined for windshield glass replacement. This glass is also installed using a bonded glass installation procedure. Refer to **Windshield Glass Replacemen**t and **Appendix 1 AGR Technician Training Manual 2008.** Also see: **Bonded Glass Rplacement in the New Blue Bird All American** on the CD/DVD.

D3 Rear Vision Bonded Glass

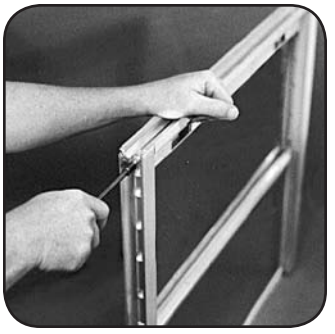


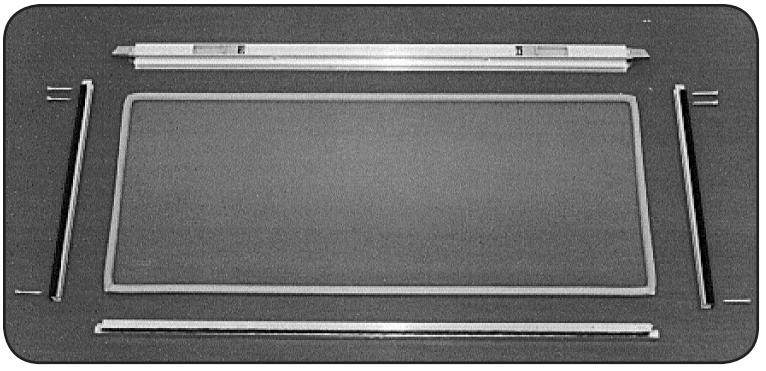
Bonded Glass Replacement
In The New Blue Bird All American
(VIDEO)

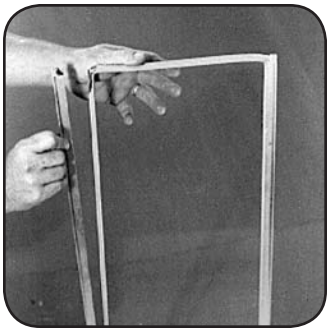
Split Sash Window and Glass Replacement

The glass used in the Blue Bird bus meets FMVSS 205 and 217. When a glass is broken, it should be replaced with identical glass.

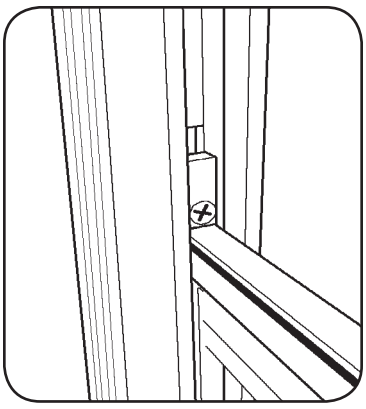
1. Remove four screws securing window frame to bow.
2. Pull window to inside of body and remove.
3. Remove six screws (three on each side of window) holding assembly together.
4. On bottom glass, simply pull aluminum channel off top and bottom of glass.
5. To remove glass from top part of window, remove 6 screws holding frame around glass.
6. Reassemble window by reversing above procedure.
7. Apply weather seal caulking around window frame to prevent leaking.

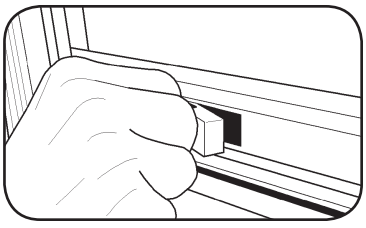






Window Latch Replacement





1. Remove screw and block located in side channel directly above stationary glass.
2. Lower sliding sash so that latch enters notch covered by block removed in Step 1.
3. With latch in large notch, push finger holes outward until inside edge is exposed. Pull latch out of finger hole opening.
4. Finger latch is pried off attached metal latch with any tool that provides leverage. Latch may now be removed and replaced.
5. Reassemble by reversing procedure.

Lubricate latches and sliding seal of top window with silicon spray every 30 days. See decal on driver's window.

Rear Vision Glass Replacement

Rear vision glass and rear emergency door glass is removed and installed using the same specifications as outlined for windshield glass replacement. This glass is also installed using a bonded glass installation procedure. Refer to **Windshield Glass Replacemen**t and **Appendix 1 AGR Technician Training Manual 2008.** Also see: **Bonded Glass Rplacement in the New Blue Bird All American** on the CD/DVD.

Transit Sliding Window Removal

1. Remove screws in outside aluminum extrusion.

2. Loosen sealer between window frame with putty knife.

CAUTION ***Do not pry window frame from body without loosening sealer. Unless sealer is loosened, window frame will be bent.***

3. Pry out using screwdriver.

4. Reverse procedure for installation.

Transit Window Glass Replacement

On push out windows, when hinge screws are removed and interior latch released, window sash may be removed from frame.

1. Release window lever (1) located inside the bus at the bottom of each push-out window.

2. Remove hinge screws (2) on outside of body.

3. Lift and pull window out of section.

4. To remove stationary transit sliding window, remove all screws between inner frame (4) and outer frame (5).

5. Lift and pull window out of section.

6. Remove four screws and take out vertical brace (6) located in the center of the window.

7. Remove two window stops (one on each side of the top of window).

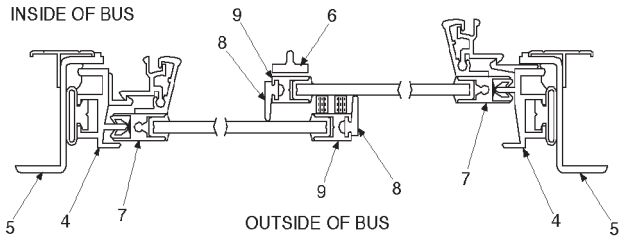
8. Slide glass to the center of the window. Spread apart the inner frame (4) just enough to lift glass frame (7) out.

9. To remove glass from frame, slide rubber seal (8) out of vertical rail (9) exposing two screws. Window glass is removable after screws are removed. Remove glass.

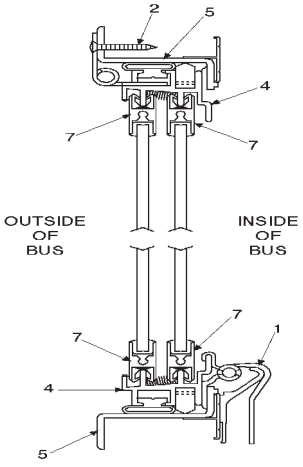
10. To replace glass, slip glazing vinyl seal around glass and slide into frame.

11. Reassemble by reversing procedure.

Transit Sliding Window

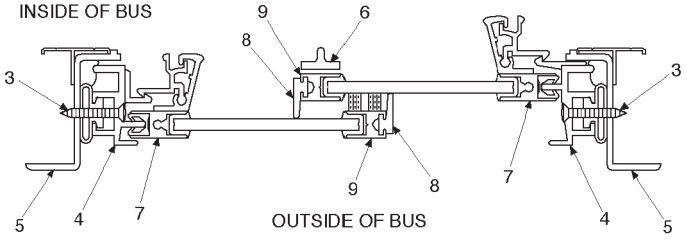


**HORIZONTAL SECTION THRU
TRANSIT SLIDING WINDOW PUSH OUT WINDOW**

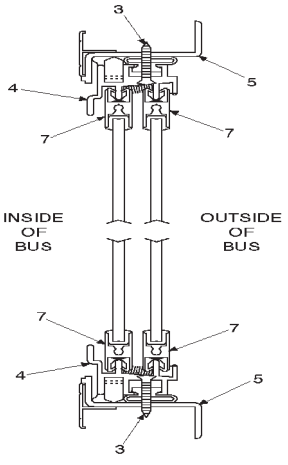


**VERTICAL SECTION THRU
TRANSIT SLIDING
PUSH OUT WINDOW**

Pushout Transit Sliding Window



**HORIZONTAL SECTION THRU
TRANSIT SLIDING WINDOW**



**VERTICAL SECTION
THRU TRANSIT
SLIDING WINDOW**

Outward Opening Entrance Door

The outward opening door panels are hung in a prefabricated framework before mounting into the body construction. The doors are suspended from sealed ball bearings located at the upper corners of the door. These components are accessible only from inside the body.

The bronze bearings at the lower corners of the door assembly are not weight bearing, but serve to hold the bottom of the assembly in position. These bronze bearing are permanently lubricated and should require little maintenance during the service life of the door assembly, which exceeds 300,000 cycles.

The interlink between the door panels is installed as a single assembly in the door header, and is adjustable for maintaining proper opening/closing tension.

Interlink Adjusment

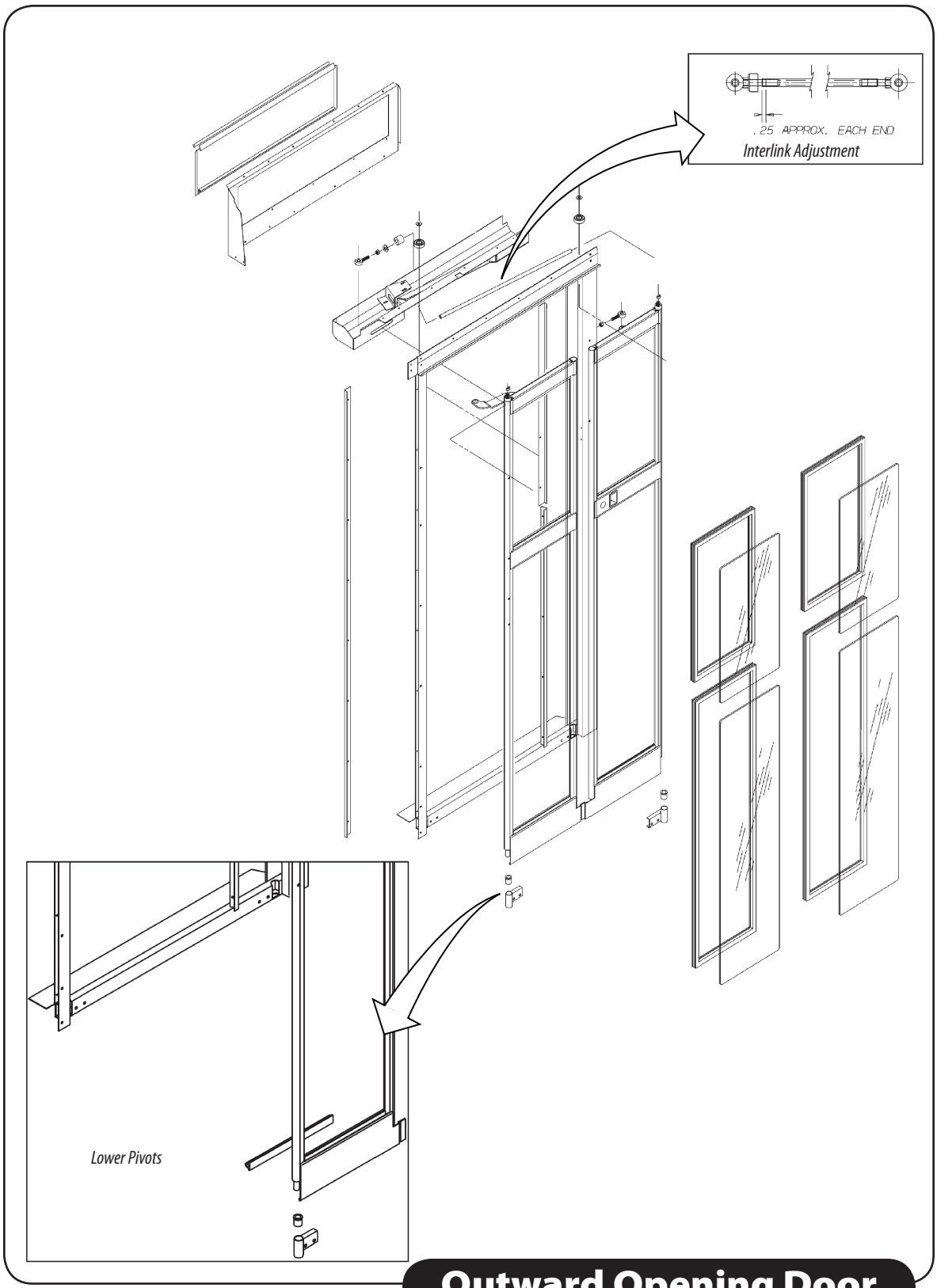
The mechanical link between the doors (the interlink rod) should be adjusted so that the rearward door closes and seats first. One of the spherical bearing, rod end connectors has a right-hand thread; the other has a left-hand thread. This allows for length adjustment by simply turning the interlink rod. The forward door panel then closes with an overlap to the rear of the bus, helping to reduce the intrusion of outside air while the bus is in motion. The forward door pivots across the centerline of a cam, thus locking the rear door panel in position.

When properly adjusted, the door should begin to require more energy to close as the trailing edge of the front door panel gets to within 2 or 3 inches of the closed position. When the mechanism is properly adjusted, you should only be able to push the door open by pressing on the forward door panel from the inside. The rearward panel should be locked into position and will not move until the forward panel moves.

1. With the doors open, loosen the jam nut at the forward end of the interlink rod. The jam nut on the rearward end of the interlink assembly is to hold the bumper in position and is located inside the access panel over the door.

2. Turn the interlink tube until, by trial and error, the door mechanism operates properly.

3. Tighten the jam nut securely.



Outward Opening Door

Manual Door Control

Manual Door Control Arm Removal

The manual door control rod does not need to be removed to adjust or remove the door panel assemblies. However, the clevis pin must be removed when removing the door panels.

1. Remove the cotter pin and clevis pin securing the control arm to the door.

2. If the control arm is in the way of your work, remove it by removing the pivot bolt, nut, and spacer from the handle.

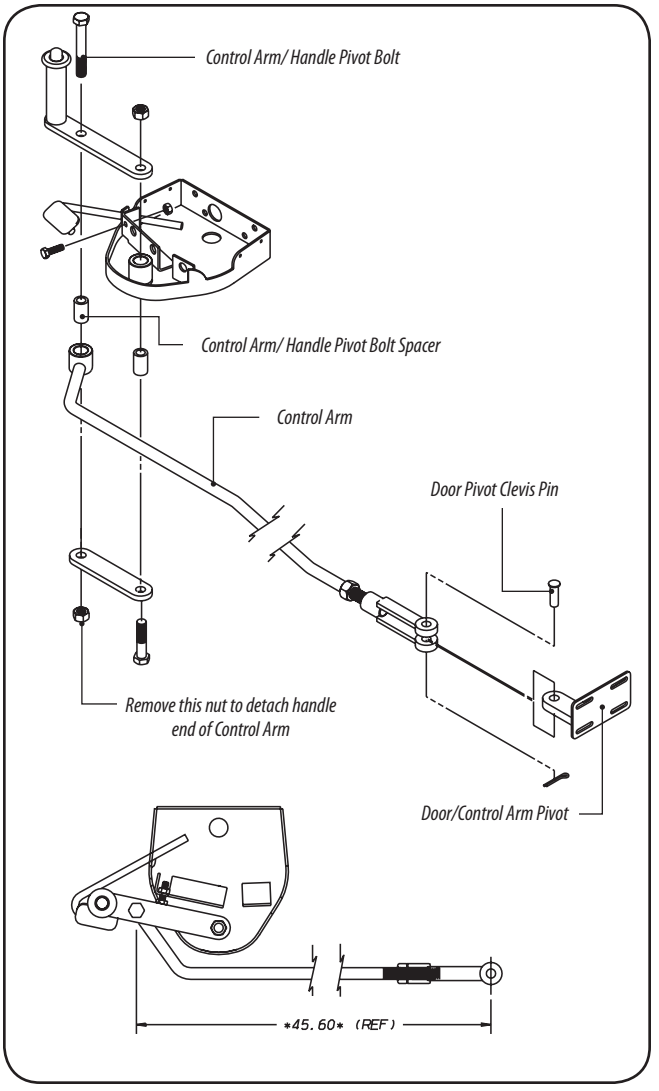
Manual Door Control Reinstallation

If the length of the manual control rod assembly is moved, the nominal length for outward opening doors should be set to 45.60 inches (115.82 cm). Then adjust to close with proper tension. When the door operates satisfactorily, tighten all hardware securely.

1. If necessary, install the door/control arm pivot. Snug up so it will not move. Do not tighten securely at this time.

2. With the doors in the closed position, pre-assemble the control arm to the approximate length required.

3. Attach the clevis to the door pivot and insert the clevis pin. Do not install the cotter pin at this time.



4. Assemble the opposite end of the control arm to the handle and tighten the locknut securely.

7. By trial and error, adjust the length of the rod assembly by removing the clevis pin and turning the clevis. Adjust the rod assembly length so that the control assembly handle passes through the center of the control assembly's cam action as the doors reach the fully open position.

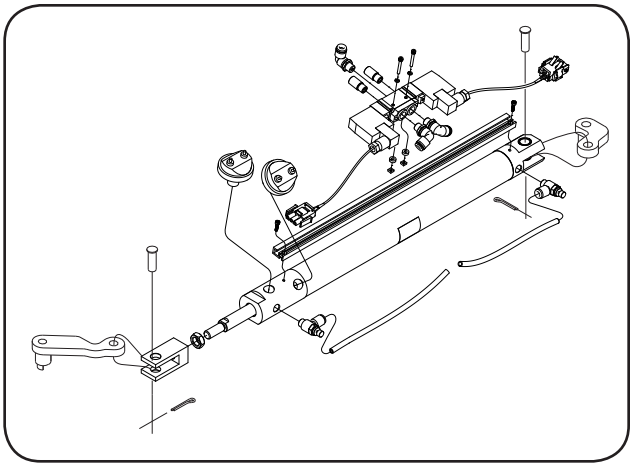
8. When the door opening mechanism operates properly, tighten all hardware securely. Install the cotter pin into the clevis pin. Tighten the jam nut at the clevis in the rod assembly.

Pneumatic Door Opener

The pneumatically operated outward opening door operates similarly to the manual door described above but uses an air cylinder mechanism located inside the door header to actuate the door.

Pneumatic Door Opener Removal

1. Remove the cotter pins and clevis pins from each end of the actuator.
2. Disconnect the electrical connectors.
3. Remove the pneumatic tubing. Identify the tubing as you remove it and replace it in the same positions.
4. Carefully remove the actuator from the compartment.

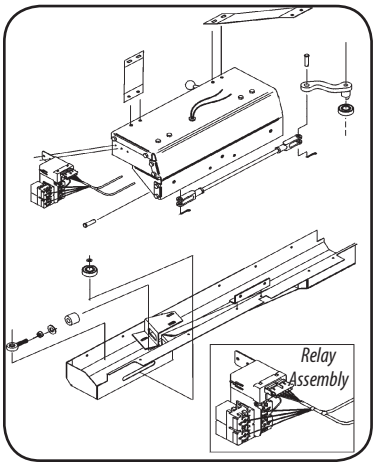


Pneumatic Door Opener Reinstallation

Installation of the pneumatic door actuator is accomplished in the reverse order of the removal instructions, above.

An air flow control valve located at each end of the actuator assembly allows adjustment of the speed of the door operation. Properly operating doors should cycle open or close in 3 seconds. If the doors do not operate properly, refer to "Adjustment of Outward Opening Door Mechanism", above.

Electric Door Opener



Electric Door Opener Removal

1. Remove hardware holding access panel over the door assembly.
2. Remove the nut and capscrew assembly from 10 places.
3. Disconnect electrical connectors at the relay assembly.
4. Remove the clevis pin from forward door lever.
5. Remove the clevis pin from rearward door lever.
6. Remove the actuator assembly.

Electric Door Opener Reinstallation

Install the electrically operated door actuator in the reverse order of the removal instructions above.

1. Pre-install the relay assembly on the actuator housing.
2. Preset the length of the actuator rod assembly to 18.50 inches (46.99 cm). Be sure the clevis pinholes are properly oriented.
3. Install the actuator assembly by installing bolt and locknut in 10 places. Tighten securely.
4. Install the actuator rod assembly clevis to the lever on the electrically operated actuator.
5. Install the actuator rod clevis to the forward door operating lever.
6. Check for proper operation of the actuator. It may be necessary to adjust the length of the actuator rod assembly so the door will stop before the motor crosses center.
7. If necessary, install the emergency release lever.
8. Move the open position stop to its rearmost position to prevent the motor driven actuator from rotating too far rearward.
9. After adjusting for proper operation, position cam on the rotating shaft to operate limit switch when the door is in the open position.

Door Panels

Door Panels Removal

If so equipped, optional safety equipment attached to the door panel's assembly must be disconnected and/or removed before continuing. Access to the door mechanism is provided over the door opening, inside the bus.

1. Remove the access panel cover or header.
2. If equipped with pneumatic door actuator, refer to Removal of Optional Pneumatic Door Opener above.
3. If equipped with electrically operated door actuator, disconnect the actuator rod clevis from the front door operating lever.
4. Remove Allen head machine screws and lock nuts from spherical bearing (at each end of the connector link).
5. Remove the connecting link.
6. Remove the nut, lock washer and flat washer from the bearing at the top outside corners of the door panels.
7. Support the door panels and remove two carriage bolts from the lower outside corner of each door panel.
8. Lift the door panel and slide the bottom, with bracket and bronze bushing attached, away from the stepwell. Some manipulation of the rearward door panel may be necessary to remove the door lever from the header.
9. Lower the door panel until it clears the header.
10. Set the door panel aside and remove the forward door panel in the same manner.
11. Remove the sealed ball bearings from the outside corners of the door header.
12. Remove the flanged bronze bearing and bracket from the bottom of each door panel.

Door Panels Reinstallation

Installation of the outward opening door panels is accomplished, in the reverse order of the removal instructions above.

1. Install the sealed ball bearings at two places in the header, at the outside corners.

2. Install the bronze bearings and brackets at the bottom outside corner of each door panel.

3. Install the rearmost door panel first. Some manipulation may be necessary to install the rear door panel control lever into the header.

4. Support the door panel and install the lower door pivot bracket and bronze bearing.

5. Install two carriage bolts to secure the pivot assembly in the stepwell.

6. Install the upper spacer.

7. Install the upper pivot through the upper support bearing. Install flat washer. Wipe pivot threads clean and coat the bottom 3 to 5 threads with Loctite™. Install lock washer and nut to hang door panel in frame. Torque to 30 ft-lbs (3.38 Nm).

8. Install forward door panel bronze bearing and bottom pivot bracket onto the door panel.

13. Install the upper pivot through the sealed ball bearing.

14. Lift and support the door panel while installing two carriage bolts to secure the bottom pivot to the stepwell. Install the flat washer. Wipe top pivot threads clean and apply Loctite™ to the bottom 3 to 5 threads. Install lock washer and nut. Torque to 30 ft-lbs (3.38 Nm).

Door Panel Glass Replacemement

With the old glass and the rubber gasket removed, clean the inside edges of the door panel opening. Using a new rubber gasket of the proper size:

1. Install a new rubber gasket onto the new glass.

2. Place a sash cord, or other suitable string, around the outside groove of the glass assembly.

3. Pull the string tight to make sure it seats fully into the groove. Leave the ends of the sash cord hanging down from bottom corners of new glass assembly. Do not lubricate the new gasket material.

4. Install the glass assembly into the door panel, from the inside, placing the bottom groove of the rubber gasket properly straddling the bottom of the opening in the door panel. Be sure the ends of the sash cord are on the outside of the door panel, protruding from the lower corners of the opening.

5. From the inside of the door assembly, press and hold the glass assembly securely into the hole.

6. From the outside of the door assembly, carefully pull the sash cord, causing the outer edge of the gasket to pop into place.

Stop Arms

Federal Motor Vehicle Safety Standard 131 requires all school buses in the United States to be equipped with a Stop Arm. The specific requirements for the blade, lights, lettering and reflectivity of the Stop Arms vary from state to state. Blue Bird provides Stop Arms as kits to match requirements for each state from which the school bus was ordered. Stop arms are available as either electric or air-operated.

Usually, the Stop Arm is located on the left side of the bus, at the front under the driver's window. In some cases, there is another Stop Arm on the left, toward the rear of the bus.

The driver most commonly controls Stop Arms manually via a switch. Some states require that Stop Arms be operated in concert with the Warning Lights when the bus is preparing to stop. Some states allow the lights to be on while the Stop Arm is retracted. In such case, the electronic controls are wired into the lighting system, and operation is automatic when the driver activates the warning light switch. In these cases, the driver will be alerted by an audible signal.

Air Operated Stop Arm

For pneumatically operated (air pressure) Stop Arms, the electric control switch operates an air valve solenoid which controls the flow of air to operate the Stop Arm. The air-operated system is dependant on the air brake system for pressure to operate.

The air stop arm may require periodic air pressure adjustment. The air regulator is accessible from the electrical panel located under the driver's window at the outside of the bus. To adjust the air pressure, remove the wire retaining clip and pull downward on the red lock ring. Turn the knob counterclockwise to decrease the airflow, and then slowly increase the air pressure until the Stop Arm is fully extended. Push the red lock ring upward and install the wire retaining clip.

Electric Stop Arm

Stop Arms may also be electrically operated. There may be a discrete switch for the driver, or the system may be wired into the warning light circuit.

Stop Arm Maintenance

Monthly, lubricate the breakaway hinge at the four pivot points using a high performance penetrating lubricant such as Triflow™ with Teflon.™ Ensure that the Stop Arm moves freely. Check all the fasteners for security and tighten as necessary. Quarterly, remove the covers (both front and rear) to inspect the security of the internal fasteners. Tighten as necessary.

AGR Technician Training Manual 2008

(Including Aktivator PRO Updates)

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Revised 8/01/2008

(Supersedes manual dated 5/22/2008)

1.0 Quality Installation Guidelines

Don't ever underestimate the importance of your job in protecting the welfare of your customer and the integrity of their car! Use of the wrong products and poor workmanship can and has resulted in fatal accidents that have cost the glass industry millions of dollars. Make sure to follow every step as prescribed by this manual as well as training that you will receive from Sika personnel. ***You participate in a very important profession in that the quality of your work could seriously affect both the people and the cars they drive.*** **Demonstrate your pride by delivering a safe and quality proven installation 100% of the time. Anything less may be fatal!**

TIP 1: MANAGE YOUR INVENTORY

All too often, technicians get carried away with the inventory they have open either in the shop or truck. It pays great dividends to have specific locations set aside to store product. This promotes a good system of opening only what products are needed, helps ensure that products are used prior to expiration and protects the packaging of the products.

TIP 2: ALWAYS START WITH THE GLASS

Never begin work on the vehicle prior to cleaning and inspecting the glass part that is to be installed. Inspect both the quality and the suitability of the selected glass part for installation on the vehicle you are working on. There have been occasions, especially in mobile work, where the glass part may have a small scratch or blemish that went undetected in the shop and was not discovered until after the new glass was installed on the vehicle. There have been other incidences when the technician didn't realize he had the wrong part; he prepared the glass and applied the adhesive, and only when he tried to install it on the vehicle, did he learn of his mistake. Pre-inspection and cleaning of the glass helps to avoid these two time-consuming errors.

TIP 3: VEHICLE PRE-INSPECTION

Before working on any vehicle, take a moment to inspect for pre-existing damage. While looking for damage, which might prevent the proper installation of the new glass, also inspect the vehicle and make notes as to any scratches or dents that exist in the areas that you will be working. This step can save thousand of dollars in pre-existing damage claims and is a professional courtesy that the insurance industry respects. *Section 3 of the AGRSS Standard requires that a vehicle is pre-inspected to determine if any condition exists that may jeopardize the retention system. Make sure to keep written records of all pre-inspections and notify the owner/operator of the vehicle if any pre-existing damage or condition is discovered.*

TIP 4: PROTECT VULNERABLE AREAS OF THE VEHICLE

It is advisable to use fender and hood covers as well as some form of seat covering before working on a vehicle. Taping vulnerable paint areas to protect them from becoming scratched is also a good idea. Never leave tools or equipment on painted surfaces, seats or dashboards. Such mistakes result in many needless damage claims. When removing cowls, wipers and other equipment from the vehicle, store in a safe area to eliminate the risk of damage from inadvertent contact.

TIP 5: POST-INSPECT ALL VEHICLES

After installation is complete, inspect and clean all areas affected by the performance of your work. Glass, carpets, seats, dashes and all painted surfaces around new glass parts must be cleaned and, or vacuumed. To avoid injury to the vehicle owner, defroster ducts must be blown out and cleared of any possible glass fragments. Blow out ducts by running the vehicle's defroster on high for at least one minute. Tapping on the dashboard while the defroster is running may also help loosen glass fragments from the ducts. The technician should also wear appropriate eye protection while clearing the defroster ducts to avoid injury. All airbags and safety belts must be in place and operative.

TIP 6: FOLLOW SAFE-DRIVE-AWAY-TIME (SDAT) PROCEDURE

Federal law requires that the strength of the adhesive system must be adequate to retain the windshield glass in the event of a mishap whenever the vehicle is operated. To allow adequate time for the adhesive to set up and secure the windshield, the adhesive manufacturer's installation procedures and prescribed SDATs must be followed at all times. The vehicle must remain out of service and NOT be operated until the appropriate SDAT has been reached**.** This is your legal obligation to help ensure the vehicle complies with all applicable FMVSS regulations.

TIP 7: FOLLOW ALL SAFETY AND HAZARD WARNING INSTRUCTIONS AND CAUTIONS

The most important part of any job is the need to work safely and carefully. Follow all manufacturer's instructions and warnings. Follow all advice for personal safety and hygiene. Always use common sense and decide before acting as to whether a particular action could cause unwanted consequences.

2.0 Glass Removal

Sika®-Slick

Sika has found that the removal of glass parts from vehicles is often the most difficult step in the replacement process. In the past, the only lubricant recommended for use during a cut out was water. While water is still an acceptable cut out lubricant, Sika has developed Sika®-Slick, an improved water based cut out lubricant for use in AGR applications. **Tests have shown that some glass cleaners can negatively affect the integrity of the urethane bond, therefore glass cleaner should never be used as a cut-out lubricant.** Sika®-Slick can significantly reduce the forces required to cut out a glass part and extend blade life. The following recommendations must be followed when using this product.

- Sika®-Slick is only designed for use with Sika's AGR adhesives. Alternative AGR urethane adhesive manufacturers will most likely view this product as incompatible with their adhesive systems.
- Sika®-Slick is best suited for use with reciprocating cutting motions, such as the cutting motion of a reciprocating power cut out tool or a long knife cutting a windshield's bottom bead.
- In some cases Sika®-Slick is capable of reducing forces associated with the use of a cold knife, specifically when the friction forces between the upper leg of the cold knife blade and the edge of the glass part or trim are high.
- Sika also recommends that the technician test the color-fastness of any interior component that Sika®-Slick may come into contact with during use. This is especially important if the interior components are aged or when contact with water may affect their appearance. To test color-fastness, apply a small drop of Sika®-Slick to an inconspicuous area of the interior component and allow it to dry. If any discoloration occurs, protect these interior components from any Sika®-Slick overspray or dripping.
- After the glass part has been completely removed, immediately clean up excess Sika®-Slick from any areas where it has come in contact with interior components of the vehicle, such as the dash board, to further avoid the possibility of staining. Cutting blades should be wiped clean with a wet towel and then dried to prevent corrosion.
- Prior to trimming the existing urethane bead, the pinchweld must be cleaned and dried to prevent dirt and debris from contaminating the bonding surface.
- If the Sika®-Slick comes in direct contact with the bonding surface (freshly trimmed existing urethane bead), then clean the bonding surface using the following method.
- **Dry wipe the trimmed existing urethane bead with a clean lint-free towel until all visible traces of Sika®-Slick have been removed.**
- **Apply Sika® Aktivator PRO from a 250 ml can to the trimmed existing urethane using a clean lint-free towel and the wipe-on wipe-off method.**
- **Allow Sika® Aktivator PRO 10 minutes to dry / react. Since Sika® Aktivator PRO is being applied to a freshly trimmed urethane, there are no temperature restrictions on this step and 10 minutes is sufficient down to 0°F.**
- If the Sika®-Slick does NOT come in contact with the bonding surface (freshly trimmed urethane), then no extra steps are required and you may proceed to the next step.
- Apply fresh Sika AGR urethane of choice and install glass part. Please be sure to adhere to all of Sika's AGR guidelines and SDAT recommendations for the specific product being used.

3.0 Pinchweld Preparation

Technicians must make an assessment of the pinchweld area of the vehicle once the windshield has been removed. If the pinchweld is exceptionally dirty and requires clean up, use a brush 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 methods, the pinchweld is still not completely clean and dry, then Sika® Aktivator PRO can be used as long as it is sufficiently wiped off and allowed to thoroughly dry prior to trimming the existing urethane bead. In this case, the solvent in Sika® Aktivator PRO acts as a drying agent. The condition of the old urethane and pinchweld will determine whether the ANSI approved full cut method can be used.

3.1 Full Cut Method:

A full cut method is trimming the existing bead of urethane down to a height of approximately 1 to 2mm (0.04”-0.08”) on the pinchweld when the residual bead and pinchweld are structurally sound. 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.
- The pinchweld is not corroded.
- Previous glass replacement procedures and products were correct and have the appropriate integrity to support the bond of new urethane, under the fullcut method.
- The pinchweld is undamaged and has not been repainted (For scratches and nicks see pages 25-26).

SPECIAL NOTICE: **Short cuts (lightly trimming existing urethane beads and using little new urethane) are wrong and potentially very DANGEROUS.** Short cutting a windshield will void all SDAT 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.

3.2 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.

Type:
There are four levels of corrosion that have now been recognized by automotive OEMs.
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 $inch^2$.

NOTE: Sika 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 inch^2 of the pinchweld, Sika recommends that this treatment only be performed by a body shop that is trained in metal restoration. Sika Corporation's opinion is that any corrosion amount greater than 24 inch^2 constitutes a very severe and potentially dangerous corrosion condition and should be addressed by a reputable body shop.

Example of Level 4 or Perforating Corrosion
MUST BE TREATED BY BODY SHOP

Photo courtesy of Visions autoglass, Byron Center, MI

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

3.3 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.

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. However, if this is not possible, then be sure to clean the freshly cut original urethane bead, using Sika® Aktivator PRO to ensure that the fresh urethane will be able to sufficiently bond 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, corrosion of levels 1 and 2 can also be removed with a Dremel® 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 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 or PPG's DX 579, would be considered chemical rust removers.

Prior to treating the areas where corrosion has been removed, make sure that these areas are smooth, uniform, and completely rust free. The remaining recommendations for corrosion treatment are shown on the next page.

3.4 Corrosion Treatment:

For treatment of **fresh scratches or bright metal rubs and scrapes** that are **1 inch^2** in area or less, Sika recommends that the technician cover these areas with Sika®Primer-206 G+P, from a 250 ml can or from the new Sika®Primer-206 Stix applicators, as directed in the procedures outlined in this manual under ~~the~~ Section 13.0 Priming (page 24).

Corroded areas of the pinchweld that are **less than 1 inch^2** can be treated by using the following procedure:

1. Remove the corrosion as outlined on the previous page.
2. Abrade the paint edges around the corroded area. This will ensure that the surrounding paint provides a sound bonding surface and will also improve the adhesion durability of the treatment system, helping to keep moisture from reaching the bare metal areas.
3. Wipe the debris away with a clean dry towel. Sika® Aktivator PRO may also be used to clean the area, although the installer must be sure to follow all Sika® Aktivator PRO procedures given in Section 6.0 (page 15) of this manual.
4. Apply a single coat of Sika® Primer-206 G+P as directed in the procedures outlined in this manual under Section 13.0 Priming (page 24).

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

- For **fresh rubs and scrapes** that are **greater than 1 inch^2** 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 is **greater than 1 inch^2** but less than a cumulative total of **24 inch^2** of the pinchweld.

1. Remove the corrosion as outlined on the previous page.
2. Abrade (using Scotch-brite™ or Norton Bear-Tex® abrasive pads) the intact paint 1/8” from the paint edges surrounding the fresh bright metal area(s) where the corrosion was removed around the corroded area.
3. Wipe the bright metal with Sika® Aktivator PRO from a 250 ml can. Repeat this step as necessary until all contaminants (both chemical and particle) have been removed. Be sure to follow all Sika® Aktivator PRO procedures given in Section 6.0 (page 15).
4. 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 Sika® Aktivator PRO. NOTE: Be sure to follow all Sika® Aktivator PRO procedures given in Section 6.0 (page 15) of this manual.
5. Apply Sika® Primer-206 G+P, using a brush or a dauber, making sure that the primer overlaps onto the surrounding intact and paint by a minimum of 1/8”. 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, then allow up to 25 minutes for primer to flash. A Sika® Primer-206 Stix applicator may be used for this application; but due to its limited coverage and the need for a second coat of primer in the following step, the Sika® Primer-206 Stix may be impractical for this application.

6. Apply a second coat of Sika®Primer-206 G+P 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, then allow the primer to flash up to 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. Before and after pictures are shown below. A Sika®Primer-206 Stix applicator may be used for this application, however, due to its limited coverage, the Sika®Primer-206 Stix may be impractical for this application.
7. Proceed with the remainder of the full cut method by trimming the original urethane bead and apply Sika AGR urethane adhesive as required.

(Level 2 – 3 corrosion of pinchweld)

(Same area treated using treatment process)

3.5 Complete Adhesive Removal:

If the technician discovers that either improper procedures or 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, it is recommended to fully correct any adverse glass installation related condition(s), providing a clean and sound substrate for bonding.

A complete adhesive removal requires the total removal of existing material down to the pinchweld. During 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 after market. Apply Sika® Aktivator PRO according to the instructions given in Section 6.0 (page 15) of this manual. Paint a thin coat of Sika® Primer-206 G+P and allow it to dry for at least an additional ten minutes. Then set the windshield using the appropriate Sika adhesive for the vehicle type and required drive away time. In most instances, Sika® Primer-206 G+P from a 250ml will be the best option for this type of application, but a Sika® Primer-206 Stix applicator may also be used. However, please keep in mind that, due to the limited coverage of the Sika®Primer-206 Stix, a can of Sika® Primer-206 G+P will most likely be the more convenient option.

NOTE: See low temperature instructions, found in Section titled "Seasonal Concerns" for details on the use of primers and adhesives below 40°F.

3.6 Repaired, newly painted pinchwelds, and when OEM urethane has poor adhesion:

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

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 1-2 mm on the pinchweld and install the windshield.

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 or etch primer coat. Allow the primer to cure for at least as long as would be required prior to applying topcoat over the primer, following the paint 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. Remove the masking tape. If a forced drying process is to be used, remove the tape prior to baking the topcoat. Next, lightly abrade the primer with a Scotchbrite® or similar abrasive pad. Apply Sika® Aktivator PRO according to the instructions in this guide and allow it to cure according to the instructions given in Section 6.0 (page 15) of this manual. Paint a thin coat of Sika® Primer-206 G+P and then allow at least ten minutes for this product to dry. Then set the windshield using the appropriate Sika 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 topcoat, basecoat, 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 Sika product.

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 removing the clearcoat and or basecoat from the bond area with a Scotchbrite® or similar abrasive pad. If the clearcoat and basecoat pulled away from the vehicle with the original urethane bead then lightly abrade the exposed primer using a Scotchbrite® or similar abrasive pad. Apply Sika® Aktivator PRO according to the instructions in this guide. Paint on a thin coat of Sika®Primer-206 G+P and then allow at least ten minutes for this product to dry. Set the windshield using the appropriate Sika adhesive for the vehicle type and required drive away time.

IMPORTANT NOTE: Options 2, 3, and 4 above call for the use of current Sika® Aktivator PRO and Sika® Primer-206 G+P. If any of these procedures are to be performed at temperatures below 40°F, 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 for Hot and Cold Weather.* Also, please note that when these recommendations call for Sika® Primer-206 G+P, a Sika®Primer-206 Stix applicator may be used. However, due to the limited coverage of the Sika® Primer-206 Stix, a can of Sika® Primer-206 G+P will most likely be the more convenient option.

3.7 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.

1. Lightly abrade the area of the aluminum or FRP with a Scotchbrite® (or similar) abrasive pad.
2. Apply Sika® Aktivator PRO according to the instructions provided in Section 6.0 (page 15) of this manual.
3. Apply a thin coat of Sika® Primer-206 G+P, using a brush or dauber, and then allow at least ten minutes for this product to dry. Allow up to 25 minutes for the primer to dry if it is below 40°F. Please note that a Sika® Primer-206 Stix applicator may be used for this application, however, due to its limited coverage, a can of Sika® Primer-206 G+P will most likely be the more convenient option.
4. Set the glass part using the appropriate Sika adhesive for the vehicle type and needed drive away time. Generally, on aluminum pinchwelds a non-conductive urethane will be required. For additional information on non-conductive urethanes, please review the section on page 31.

NOTE: At this time, Sika has identified one exception to this recommendation and this is the Freightliner Century Class with an aluminum pinchweld. The recommendation for treating any exposed aluminum on the pinchweld of this vehicle is to prepare it with an appropriate aftermarket epoxy or etch primer. Allow the primer to cure for at least as long as would be required prior to applying topcoat over the primer, following the paint manufacturer's recommendations. Then lightly abrade the bond area surfaces of the primer and follow steps 2 through 4 above.

4.0 Glass Preparation

Each time you perform a windshield installation you are providing a vital component of the vehicle's retention system. An essential part of the retention system is the bond between the adhesive and the glass. This critical area can experience leaks and problems if there are contaminants between the adhesive and the glass. Cleaning the glass with Sika'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, and other materials which can reduce the performance of the adhesives you will apply; possibly with serious consequences.

Sika® Aktivator PRO has been designed not only to remove these types of contaminants but also to ensure a strong, durable bond between the adhesive and the windshield. **Sika® Aktivator PRO must be used on every windshield before applying the adhesive.** Windshields installed without the use of Sika® Aktivator PRO may be subject to leaks, stress cracks and retention problems. The loss of windshield retention can cause serious injuries. Therefore, the use of Sika® Aktivator PRO cannot be over emphasized. After Sika® Aktivator PRO application, the windshield installation must be completed within 8 hours or Sika® Aktivator PRO must be re-applied. Please review the following section on Sika® Aktivator PRO, Section 6.0 (page 15), for more detailed instructions and precautions.

Used correctly, Sika® Aktivator PRO will remove the small particles of dust, oil and other contaminants, which could cause a bond to fail. Unlike some other glass primers, Sika® Aktivator PRO will not harm the topcoats of car finishes. Occasionally some windshields are supplied to the AGR market with contaminants that are difficult to remove using Sika's standard recommendations. Sika Cleaner S is designed to treat excessive contamination. More details of this product are available on page 13.

Occasionally, some windshields are supplied to the automotive aftermarket with a factory pre-applied black primer. Over a period of many years, Sika has thoroughly investigated many of these situations by performing adhesion tests in our laboratory using our adhesive systems. The results of these investigations have indicated that these windshields should be prepared using Sika's standard surface preparation recommendation of glass cleaner and Sika® Aktivator PRO, just as if the black primer was not present. Please keep in mind that all application recommendations for Sika® Aktivator PRO are still necessary and must be followed in accordance to instructions given on page 15 of this manual.

Additionally it should be noted that this recommendation is being made only after an extensive investigations that included laboratory adhesion testing and with consideration that the primer has been applied to the windshield in a controlled factory setting, ensuring both sufficient adhesion of the factory applied black primer to the glass part's bond area and consistent application from part to part. It is due to these factors that Sika can endorse the use of Sika® Aktivator PRO and Sika adhesives with the factory pre-applied primer that is found on these particular windshields. **In no other instance should a customer interchange primers, glass activators and/or adhesives from different adhesive suppliers.** If the installation technician is unable to determine if the primer has been applied by an automotive OEM, then Sika recommends that the part is not installed and is returned to the distributor.

5.0 Traditional and Non-Traditional Contamination

Sika approved glass cleaners work very well to remove traditional forms of contaminants that may be found on an auto glass part prior to the application of Sika® Aktivator PRO. The following is a list of what Sika considers to be the most common examples of these types of (traditional) contaminants:

- Dirt
- Dust
- Skin Oils

However, with the introduction of many new glass suppliers, installation technicians have witnessed increased occurrences of non-traditional contaminants (NTC) on windscreen frits that can greatly affect adhesion. It has been Sika's experience that the type and severity of non-traditional contamination can vary significantly. Generally, the source of non-traditional contamination is the manufacturing process, specifically from one of two processes, which Sika now uses to categorize NTCs:

1. Mold release agents (most common in the U.S. market)
   - Associated with encapsulated parts (where trim is bonded to part)
2. Silicone residue from a vacuum tube laminating process
   - Results from the use of silicone based vacuum tubes that remove air from between the inorganic glass lites and the inner PVB layer during the lamination process
   - Not applicable to tempered (non-laminated) auto glass parts

While many incidents of contamination are clearly visible to the naked eye, some NTCs are not as easy to observe without instituting additional procedures. To verify the existence of NTCs, Sika recommends that the auto glass Technician be trained to inspect the bond areas of each part for inconsistent areas of surface tension after glass cleaner has been applied to the frit and before the glass cleaner has been wiped off the part. The Technician should observe whether the glass cleaner migrates or changes appearance along the contaminated areas.

Recommended Treatment for all Types of Contamination:
Once it has been determined that the bond area of a glass part has been contaminated, Sika offers a UNIVERSAL treatment through the following recommended procedure:

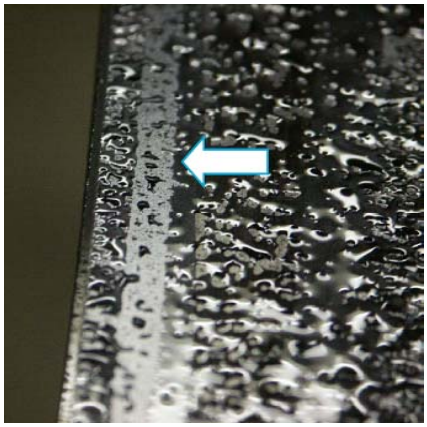
Sika® Cleaner S method – *Sika® Cleaner S is an organic solvent based cleaning agent specifically designed for use on heavily soiled surfaces.*

- Clean bonding surface with glass cleaner.
- Shake Sika® Cleaner S can for 10 seconds.
- Applying from a distance of approximately 2 inches, spray a light coat of Sika® Cleaner S around the entire perimeter of the glass part.
- Lightly "wet-scrub" the affected area with a fine weave abrasive pad (i.e.; Scotch-brite™ or Norton Bear-Tex®) using small circular motions.
- Remove the Sika® Cleaner S using a clean lint free towel.
- Re-clean the glass part as needed using glass cleaner.
- Allow the surface to completely dry before applying Sika® Aktivator PRO according to the instructions provided in Section 6.0 (page 15) of this manual.

Alternative Method for Removing VACUUM TUBE SILICONE Contamination ONLY:

Although the Sika® Cleaner S method given above will treat all KNOWN types of windscreen contamination, Sika also offers a procedure specifically designed for treating silicone oil residue derived from a vacuum tube lamination process. A NTC can be categorized as a silicone residue if the glass cleaner reveals an area of low surface tension in a relatively straight line that runs parallel to the edge of the glass (see photo below). If the glass cleaner migrates or changes appearance and the installation technician suspects silicone contamination, then the area can be treated using the Sika® Cleaner S method above or using the glass cleaner "wet scrub" methods given below. If the technician observes contamination but is unsure if it is silicone then the recommendation is to follow the Sika® Cleaner S method on page 13.

This photo is an example of an auto glass part contaminated with silicone residue resulting from the glass manufacturer's lamination process and after the application of a non-foaming glass cleaner. The area of contamination has a significantly lower surface energy than the surrounding non-contaminated areas and this affects the "wet out" of the glass cleaner in a way that allows one to observe a distinct lineal pattern of contamination. If this form of silicone contamination is not properly removed from the part, it can have a deleterious affect on adhesion.



Glass Cleaner Wet-Scrub method

- Apply glass cleaner to the frit and lightly "wet-scrub" the affected area with a fine weave abrasive pad (i.e.; 3M Scotch-brite™ or Norton Bear-Tex®) using small circular motions
- Care should be taken not to scratch the glass or frit
- After the "wet-scrub" has been completed, clean the frit area with glass cleaner and a clean paper towel
- Allow the surface to completely dry before applying Sika® Aktivator PRO
- IMPORTANT NOTE: This method is only recommended for removing silicone residue resulting from the glass manufacturer's laminating process and is NOT to be used to remove silicone contamination that originated from a glass manufacturer's encapsulation process

It must be restated that the glass cleaner "wet scrub" method given above is ONLY for silicone oil contamination and not mold release agents, which must be treated using Sika® Cleaner S.

6.0 Sika® Aktivator PRO; (orange cap)

First, thoroughly clean the glass. Any glass cleaner can be used, as long as it has been confirmed that it does NOT contain anti-static ingredients. Use another brand of cleaner if these kinds of ingredients are used. When cleaning the glass, make sure glass is fully cleaned and no moisture is left on the bonding surface.

- **Next apply Sika® Aktivator PRO**. Sika® Aktivator PRO is available in 250 ml cans and easy to use single application pads. With either product, ALWAYS use chemical resistant gloves and safety glasses. DO NOT SMOKE while applying Sika® Aktivator PRO. Read and follow all precautionary instructions and warnings on the product.
- **For the cans**, use a clean, lint-free towel. With Sika® Aktivator PRO wetting the towel, but not soaking it, drag the towel in one direction around the perimeter of the glass (on bonding area only).
- **For Sika® Aktivator PRO use on pinchwelds, in cases where the pinchweld has been painted or repaired;** Use the above method when applying Sika® Aktivator PRO to a pinchweld.
- The towel should be continually turned to expose a clean surface to the Sika® Aktivator PRO can**.** When re-wetting the towel, turn a clean surface to the can to avoid dirt and other contaminants on the towel from mixing with the pure Sika® Aktivator PRO in the can.
- **For the single application pads**, take one (1) Sika® Aktivator PRO Pad from box, hold the pad directly against the bond area of the glass part, and with pad handle between thumb and forefinger, pinch to break the internal ampoule to release contents to the fabric pad. Holding the pad flat against the glass part, draw the pad around the perimeter (bond area) of the glass part in one direction. Dispose the Sika® Aktivator PRO Pad after each use.

- **With either application system,** apply Sika® Aktivator PRO at, or above 15°F and allow Sika® Aktivator PRO to cure a minimum of three (3) minutes (but not more than eight hours) before applying adhesive. If temperatures where glass installation is to occur are below 15°F, but above 0°F, then the flash-off / cure time needs to be increased to a minimum of ten (10) minutes.
- If the "Aktivated" surface becomes contaminated or the open time is missed, then Sika® Aktivator PRO can be re-applied to the glass part up to three additional times, or a total of four applications. After Sika® Aktivator PRO 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.
- When Sika® Aktivator PRO is properly applied to "non-fritted" substrates, the "Aktivated" surface will be observed to have a thin prismatic film.

7.0 Removal and Replacement

Note: This procedure is not recommended for use with glass parts that have been previously installed with a non-urethane adhesive. Under these circumstances, the glass part should be discarded and, in most cases, the new glass part should be installed following the *Complete Adhesive Removal* method described in this manual. If the original urethane on the glass part does not have good adhesion around the entire perimeter of the part or was not originally adhered using urethane, then Sika does NOT recommend installation of the part.

Use the following guidelines in cases where a glass part is removed for later use as a replacement.

Remove the glass part using standard removal tools, taking care to avoid damaging the frit. Try to cut through the middle of the existing urethane bead. Set the glass aside until it is time to replace it.

Following removal of the part that is to be reinstalled, begin by cleaning the glass part with an appropriate glass cleaner. Next, using your preferred urethane-trimming tool, trim the existing bead of cured urethane and examine to confirm that the remaining urethane is sufficiently bonded to the glass. Generally, Sika recommends that the bead of urethane on these parts be trimmed just prior to reinstallation, but if this is not possible, the trimmed bead should be "cleaned" using Sika® Aktivator PRO according to the instructions given in Section 6.0 (page 15) of this manual. **One of the following two options MUST be followed when performing a removal and replacement:**

1. If the remaining layer of urethane adhesive has good adhesion to the entire perimeter of the glass part, it does not matter which adhesive company manufactured the remaining layer of adhesive, and this part can be installed using the standard procedures described in this manual.

2. If the original urethane on the glass part does not have good adhesion around the entire perimeter of the part then Sika does NOT recommend installation of the part.

8.0 Special Sets

8.1 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, Sika 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 15 of this manual.
5. Remove contaminants from the pinchweld and the inside of the gasket, where the pinchweld and glass will sit, using a clean 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 Sika® Aktivator PRO as described on page 15 of this.
8. Apply Sika® Aktivator PRO to the pinchweld, where the gasket will sit, and to the inside of the channels of the gasket, as described on page 15 of this manual. Allow at least 15 minutes for the Sika® Aktivator PRO to cure on both the gasket and the pinchweld.
9. Set the windshield, making sure that the gasket is fully seated on the pinchweld, and be sure to apply the desired Sika AGR adhesive into the channels of the gasket at the appropriate time.
10. Clean up of uncured urethane can be performed using mineral spirits and a towel or Scrubs®.

8.2 PAAS

(PAAS on Saint Gobain FW02072 for New Beetle)

PAAS stands for Pre-Applied Adhesive System and an example of one of these types of parts is shown above. 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 Sika® Aktivator PRO. 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 Sika® Aktivator PRO to the freshly cut bonding area exposed by the trimming of the pre-applied urethane adhesive.

8.3 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.

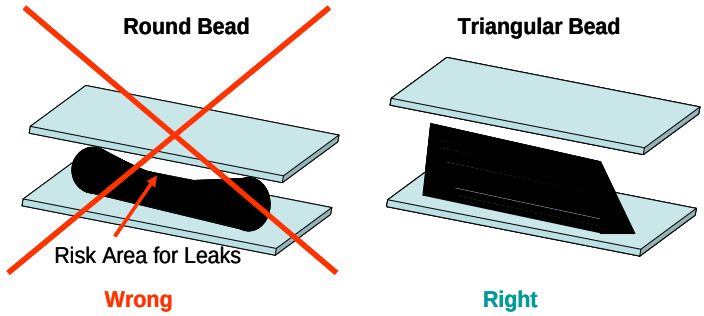
1. Lightly abrade the bond area of the painted aluminum extrusion with a Scotchbrite® (or similar) abrasive pad.
2. Apply Sika® Aktivator PRO according to the instructions in this guide and allow it to flash for at least three (3) minutes. If this operation is to be performed at temperatures below 15°F, but above 0°F, then the flash time must be increased to ten (10) minutes.
3. Apply a thin coat of Sika® Primer-206 G+P, using a brush or a dauber, and then allow at least ten minutes for this product to dry. Allow up to 25 minutes for the primer to dry if it is below 40°F. Please note that a Sika® Primer-206 Stix applicator may be used for this application, however, due to its limited coverage, a can of Sika® Primer-206 G+P will most likely be the more convenient option.
4. Set the glass part using the appropriate Sika 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 Sika® Primer-215 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, then allow at least 25 minutes for the primer to dry.
3. Set the glass part using the appropriate Sika adhesive for the vehicle type and required drive away time.

9.0 "V" Bead Applications

Sika adhesives are supplied with a pre-cut triangular "V" notched nozzle. This is the recommended nozzle tip that must be used in order to apply the proper bead size. A round bead can trap air in all four corners when compressed between the glass and pinchweld. A round bead is also more difficult to uniformly compress during windshield decking which may result in voids and leak points across the entire width of the bead (see figure). However, when a triangular shaped bead is compressed, no air is trapped and the bead squeezes down to a rectangular dimension.



Conventional, un-cut 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. This step helps ensure that enough urethane is supplied to the pinchweld to prevent the glass from sagging below the roofline of the vehicle.

When applying Sika AGR urethanes it is imperative for the fresh adhesive to match or exceed the width of the trimmed OEM bead on the pinchweld. This will ensure that there is a sufficient amount of new adhesive available to meet FMVSS standards for safety. Sika's recommendation is that the fresh adhesive bead may be applied either to the trimmed OEM urethane bead located on the pinchweld of a vehicle or to the glass. Sika's only requirement with regard to the fresh adhesive bead placement location is that the installer ensures that the fresh adhesive bead makes good contact with both the trimmed bead and the glass part that has been prepared using Sika® Aktivator PRO, whether the adhesive is applied directly to the glass part or to the trimmed adhesive bead. When deciding the most appropriate location to apply the AGR adhesive bead for a specific installation Sika offers the following considerations:

- If the vehicle's OEM bead pattern is non-uniform and proper fresh adhesive bead placement / alignment will be difficult if applying to the glass, the better option may be to apply the adhesive to the vehicle's pinchweld.

- When the OEM bead pattern is uniform and the proper bead location on the glass can be easily identified, the better option may be to apply the fresh adhesive bead to the glass part. One reason is that applying the bead to the glass part is considered to be more ergonomically friendly. Also, this can make it easier for the installer to hold the application gun at the proper 90° angle when applying the adhesive to the entire perimeter of the part, which can result in more consistent and uniform bead dimensions.

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

10.0 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. If temperatures are extremely high and or proper shade cannot be provided then Sika recommends the following maximum substrate temperatures, by product.

Sika AGR Adhesive	Maximum substrate temperature (°F)
Sikaflex® 220+	130
SikaTack®-COOL	170
SikaTack®-Ultrafast II	170
SikaTack®-ASAP	170
SikaTack®-MOVE^{IT}	170

Low Temperature Instructions

Sika® Aktivator PRO:

Above 15°F, Sika® Aktivator PRO has a flash-off time of 3 minutes, however, when the temperature is between 0° and 15°F, the recommendation is to allow the product to flash-off for 10 minutes.

Sika®Primer-206 G+P and 206 Stix:

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There are no special low temperature requirements for Sika®Primer-206 G+P, either from a 250 ml can or from a 206 Stix applicator, 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 inch^2 in area. Extra dry time is required if Sika®Primer-206 G+P is used below 40°F 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 Sika®Primer-206 G+P is being used below 40°F 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 up to 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.

SikaTack®-Ultrafast II (15° TO 40°F)
SikaTack®-ASAP (0° TO 40°F)

Due to the unique strength development characteristics of SikaTack®-Ultrafast II and SikaTack®-ASAP, these products can be used in low temperature situations but special care must be used when temperatures are below 40°F. These products develop extremely high green (initial set-up) strength within minutes of application.

For optimal results, be sure to set the glass within 5 minutes of beginning application of the adhesive. The glass can be set as long as 10 minutes after applications of adhesive, but positioning the glass will be difficult. Consider use of the following points to help ensure a problem free installation:

- Remove original windshield and clean the pinchweld thoroughly with a brush to remove all contaminants.
- Dry set glass and mark alignment points.
- Trim old adhesive to a height of 1 - 2 mm.
- Glass should be cleaned and prepared with Sika® Aktivator PRO before applying adhesive to either pinchweld or glass (see pages 12 – 15 for more details).
- Have enough adhesive heated and prepared to complete the job.
- Have second cartridge or unipac open with nozzle installed. Put it on car or in your pocket for quick changeover. If you have two guns, have one tube in each gun.
- Set the glass immediately after adhesive is applied.
- Position glass before pressing it into place.
- Refer to Sika's SDAT chart to determine the minimum hold time for the vehicle at the measured environmental conditions. **DO NOT RELEASE VEHICLE UNTIL HOLD TIME HAS LAPSED.**
- Use extra care while removing and replacing the cowl cover and trim pieces.

11.0 The Adhesive System

Glass shops can select a Sika AGR urethane to suit the specific SDAT needs of their customer. The speed with which a customer needs to return their vehicle to service will dictate the kind of adhesive to use for windshield replacement. Factors affecting drive away time include application temperature, humidity, and the presence of passenger side airbags on the vehicle. For every installation, please refer to the Sika SDAT chart for a complete listing of products and safe drive away times. *Section 5 of the AGRSS Standard requires that the vehicle owner / operator is advised of the minimum safe-drive-away time under the circumstances of the replacement.*

SPECIAL NOTES:

A. Heated products must be warmed for a minimum of one-hour in a Sika approved oven 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 in ovens that are designed to be dispensed at ambient temperature. Instead of speeding adhesion, the product will not properly perform.
C. In many cases, partial tubes can be reheated and reused.
D. It is recommended that urethanes are stored at temperatures under 75°F to maximize shelf life.
E. Use "V" notched nozzles when applying beads or adhesives for auto glass sets.
F. For every windshield installation, regardless of adhesive used, the installer MUST use Sika® Aktivator PRO to prepare all glass or fritted surfaces that will be in contact with the adhesive.
G. Certain installations will also require the use of Sika®Primer-206 G+P to prepare the glass and pinchweld for adhesive application. Some installations will require Sika®Primer-215 to prepare PVC and EPDM parts that will receive adhesive application. For rear sliders and PVC encapsulated glass parts, refer to page 18 of this manual. Be sure to also review the section on *Priming* in this manual for detailed instructions on application of Sika®Primer-206 G+P and Sika®Primer-215.

11.1 Unipacs:

In 2007, Sika Corporation began offering its customers the option of using Sikaflex®-220+, SikaTack®-COOL and SikaTack®-MOVE^{IT} in 600 ml unipacs. Because of the packaging and dispensing efficiency, this design allows for greater waste savings of adhesive material and will save the installation technician time by reducing the frequency of changing out 300 ml cartridge material.

Sika Corporation will also begin to offer SikaTack®-ASAP in 465 ml unipacs by the fourth quarter of 2008. At present, 465 ml SikaTack®-ASAP unipacs, being about 2” longer than cartridges, can only be heated in PURfect Heater ovens and Hydrotherm^{TM} ovens that have been modified with aluminum sleeves, developed specifically for use with this oven (see page 29 for more information).

NOTE: All Sika AGR unipacs require dispensing guns that have been equipped with unipac conversion kits. Please contact your local Sika Sales Representative for further details.

12.0 Date Codes

All Sika 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. 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.**

A. All Sika AGR adhesives have a 9 month shelf life, with the exception of SikaTack®-Sierra which has a 6 month shelf life, when stored below 75°F.
B. Sika® Primer-206 G+P in a 250 ml can has a 9 month shelf life. Sika® Primer-206 G+P packaged in the Sika® Primer-206 Stix format has a 13-month shelf life.
C. Sika® Aktivator PRO in 250 ml cans and Sika®Primer-215 in 30ml cans have a 12-month shelf life. Sika® Aktivator PRO packaged in a Sika® Aktivator PRO Pad has an 18 month shelf life.
D. Once Sika® Aktivator PRO and/or a Sika primer is opened, the shelf life is reduced, but not destroyed. 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.
E. The published shelf life of all Sika cleaners, primers and urethanes will be realized when the product is stored below 75°F. If properly stored in cool, dry conditions, the unopened adhesive cartridges or unipacs have a shelf life of 9 months (SikaTack®-Sierra is 6 months). Long-term storage of the product at higher temperatures will affect the handling characteristics and shorten the shelf life. Typically, chemical reactions double for every 18°F increase in ambient temperature. Therefore, product stored continuously at 93°F would be expected to have a shelf life of four-and-a-half months, while product stored at 111°F would have approximately 2 months left.. Short-term storage, say over a several day period in a hot vehicle, will have relatively very little affect on the shelf life of the adhesive. If the product is exposed to freezing conditions (<32°F) the product will not be damaged, but it will require additional time to acclimate to the optimal application temperature. For optimal application characteristics, SikaTack®-COOL and SikaTack®-MOVE^{IT} should be applied when the adhesive is between 50°F and 120°F and Sikaflex® 220+ when the product temperature is between 40°F and 110°F. Heated products (SikaTack®-Ultrafast II and SikaTack®-ASAP) 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 27 of this manual.
F. 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.

13.0 Priming

Sika® Primer-206 G+P: (black cap)

Sika® Primer-206 G+P is a moisture sensitive black liquid to be applied to glass or bare metal**.** Sika® Primer-206 G+P is packaged in 250 ml cans as well as in single-use applicators called, "Sika® Primer-206 Stix." Each Sika®Primer-206 Stix applicator contains 1.4ml of Sika®Primer-206 G+P and are best suited for covering bright metal scratches, rubs, and scrapes.

- Use Sika® Primer-206 G+P to cover bright metal scratches on the pinchweld in order to reduce corrosion**.** Fresh, bright, metal rubs and scrapes, up to 1 inch^2 in area, may be covered with one coat of Sika® Primer-206 G+P. Sika® Primer-206 Stix are designed specifically for these applications.
- In some cases, Sika® Primer-206 G+P 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.
- Sika adhesives are designed to bond aggressively to the existing freshly trimmed urethane bead. For this reason, do **NOT** apply Sika® Primer-206 G+P to the existing trimmed urethane bead when performing a full cut.

IMPORTANT NOTE: Currently, there is no after-market coating available that can restore the automotive OEM corrosion protection system that todays 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 Sika® Aktivator PRO before the area can be treated using two coats of Sika® Primer-206 G+P. Severe rust conditions, as defined in the section of this manual on *Corrosion of the Pinchweld*, must be brought to the customer's attention and possibly remedied by a body shop. Please review Sections 3.2 – 3.4 (pages 5 - 8) of this manual for a detailed explanation of how this issue should be addressed. NEVER apply Sika® Aktivator PRO or Sika® Primer-206 G+P over rust.

Sika® Primer-206 G+P and Sika®Primer-206 Stix Application Guidelines:

- Shake the bottle vigorously until you hear the mixing ball rattle and then continue shaking for an additional 10 seconds.
- Apply Sika® Primer-206 G+P from a can using a brush, dauber, or a cotton swab to cover any bare metal areas, that are within the limits defined above, trying not to get any primer on remaining bead of urethane (after a FULL-cut has been performed).
- If using the Sika® Primer-206 Stix, shake the applicator for a minimum of 30 seconds prior to use. To begin priming with the Sika®Primer-206 Stix, point the tip toward the ground and pinch tube just above the tip with the thumb and forefinger to break the internal vial and release the Sika® Primer-206 G+P into the tip. With the tip down, gently squeeze the Stix applicator to wet out the tip, being careful not to squeeze too hard creating a drip. When the tip is fully saturated, begin priming the pinchweld immediately. Allow gravity to feed the tip, but you may gently squeeze the Stix applicator if more primer is needed. After application, 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, up to 25 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. Please note that Sika® Primer-206 Stix applicator(s) may be used for these applications; but due to its limited coverage, a can of Sika® Primer-206 G+P will most likely be the more convenient option.
- Sika® Primer-206 G+P 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 Sika® Aktivator PRO around perimeter of glass and allow to flash-off according to the procedures given in Section 6.0 (page 15) of this manual. Then apply Sika® Primer-206 G+P and let dry an additional 10 minutes. Generally, in these cases, the urethane is protected from UV rays by a trim molding. Please note that Sika® Primer-206 Stix applicator(s) may be used for these applications, however, due to its limited coverage, a can of Sika®Primer-206 G+P will most likely be the more convenient option.

There are no special low temperature requirements for Sika®Primer-206 G+P 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 inch^2 in area. Extra dry time is required if Sika®Primer-206 G+P is used below 40°F in all other situations, such as to prepare the pinchweld as outlined in Section 3.0 “Pinchweld Preparation” (page 5) of this manual. Specific examples would be if Sika®Primer-206 G+P is being used below 40°F 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 up to 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.

Always use chemical resistant gloves and safety glasses when applying Sika®Primer-206 G+P. DO NOT SMOKE during use. Follow all warnings and instructions on product container.

Sika® Primer-215: (white cap)

Sika® Primer-215 is used to prepare PVC and EPDM encapsulated parts, moldings and plastic door glass fasteners if these parts are to bonded using one of Sika's urethane adhesives. For additional information, please review Section 8.3 (page 18) in this manual. Also, be sure to follow all safety instructions on container.

Application Guidelines:

- Make sure that the bond area of the glass part or molding is clean and contaminant free. Clean the area with an approved glass cleaner if required and allow to completely dry. Sika® Aktivator PRO may also be used to clean the bond area of the glass part or molding prior to Sika® Primer-215 application, but, if this process is used, be sure to adhere to all Sika® Aktivator PRO applications guidelines given in Section 6.0 (page 15) of this manual.
- Use brush or dauber to apply a thin, continuous coat of Sika® Primer-215 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, the primer may take up to 25 minutes to dry. As with the Sika® Primer-206 G+P, 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.

14.0 Hot Applied Adhesives

Use of Ovens to Heat Sika Adhesives:

SikaTack®-Ultrafast II, SikaTack®-Sierra and SikaTack®-ASAP must be heated in a Sika approved oven for a minimum of one hour**.** One hour is necessary to ensure the product reaches a temperature range of 75°C - 90°C (167°F - 194°F) before it is used. These products can be heated a total of 10 hours (either consecutively or cumulatively for a total of 10 hours). After this total heating time without use, the product must be discarded. If not heated properly problems with gunnability, decking, and adhesion may occur.

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

Special Notes about Hot Applied Sika Adhesives:

- Only heat recommended Sika Adhesives. Never heat cold applied adhesives or other brands of products.
- Allow heated products at least one hour in oven to reach application temperature, 30 minutes if PRE-HEATED in a Hydrotherm ™ system. (See Section 14.3 for additional information).
- Use protective gloves when handling heated cartridges.
- Only use approved cartridge ovens referenced below. **NEVER** use a different heat source to heat Sika products. Over heating product can cause **PERSONAL INJURY.**

PRODUCT NOTE: The one hour heating requirement assumes urethane stored at 32°F or higher. Urethane stored below 32°F. (such as overnight in a mobile vehicle) will require additional oven time to reach the 167°F – 194°F range. Fifteen minutes of extra heating time is satisfactory.

EQUIPMENT NOTE: Only PURfect Heater, Intertech, and Pragmatech, Inc.'s Hydrotherm™ adhesive heaters (vehicle coolant system heaters) are recommended by Sika Corporation and of these only the PURfect Heater and the Hydrotherm Oven, outfitted with aluminum sleeves, are approved for heating SikaTack®-ASAP in 465 ml unipacs. For PURfect Heater, Intertech and Pragmatech ovens, please contact these manufacturers directly for heater warranties and usage instructions. Please also note that you can have your Aztech ovens refurbished through Intertech. The Vulkan oven has a one-year limited warranty, and if you have performance issues with these ovens please contact your local Sika Sales Representative or Sika's Customer Service Department at (800) 688 – 7452.

- **PURfect Heater by Mycon Industries, 10488 U.S. 12, Brooklyn, MI 49230, Phone (517) 467-6887**
- **Intertech Associates International, Inc., 120 Stryker Lane, Suite 209, Hillborough, New Jersey 08844, Phone (908) 284-9098, FAX (908) 284 – 9448, Website www.eintertech.com.**
- **Hydrotherm™ by Pragmatech, Inc., W4015 876th Ave., Spring Valley, WI 54767, Phone (715) 688 – 6177 or (877) 244-3961, FAX (267) 790 - 4884.**

IMPORTANT: Ovens are for use with SikaTack®-Ultrafast II and SikaTack®-ASAP adhesive only. Never place any other adhesive including any other Sika adhesive in an oven for any reason.

14.1 PURfect Heater – 4 hole (120 VAC) Oven (Part # COV00PH)

- Accepts 465 ml unipacs and 300 ml cartridges (cartridges work best with pedestals – see below)
- Solid State Thermostat is pre-programmed for accuracy and reliability
- Works well with mobile power inverters
- Operates equally well in the vertical or horizontal position
- Turn off heater at the end of every work day and remove urethane
- Keep heating chambers clean and free of debris

Cartridge Pedestals for PURfect Heater

- Pedestals are designed to fit into the PURfect Heater cylinders, properly positioning Sika cartridges for easy removal
- Sold separately from PURfect Heater oven (4 to a box)

14.2 Intertech 2-hole Dual Volt (12 VDC / 120VAC) Cartridge Oven (Part # COV0030)

- Make sure plug end is pushed all the way into lighter receptacle
- Operate engine 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

14.3 Pragmatech Hydrotherm™ - 4 hole - Oven (Part # COV00P1)

- Follow installation procedures carefully and without deviation.
- Load oven holes with cartridges or unipacs**.** Additional cartridges or unipacs may be pre-heated by placing them inside the cooler and around the perimeter of the heater.
- The engine is not required to be continually operated at the job site once sufficient product has been heated to the 167 – 194°F. range. The insulated container and residual heat will keep the adhesive hot. Engine coolant, which supplies heat to the heater, will remain hot for quite some time.
- Keep cooler lid closed at all times when oven is in operation.
- Since the urethane may only be heated for a total of 10 hours it is recommended to remove all urethane from the oven at the end of the day

Hydrotherm Oven Sleeves

- Aluminum sleeve converts your existing Hydrotherm Oven from 300 ml cartridge to 465 ml unipac capability
- Two lateral slots are designed for easy installation into the Hydrotherm™ oven holes
- Simply insert the aluminum sleeve, slotted end down, into the Hydrotherm™ oven cylinders and gently push down with the palm of your hand until the bottom of the sleeve is even with the bottom of the oven
- Care should be taken to not damage the top edge of the aluminum sleeve. Burrs and other imperfections may be snag points for the aluminum foil of the unipacs
- Sold separately from Hydrotherm™ Oven

APPLICATION TIP: Cartridges or unipacs set inside the Hydrotherm™ cooler, but outside of the oven, will be preheated. Urethane that's been preheated for a minimum of one hour, will only require 30 minutes within the heater cylinder to reach application temperature. To ensure a ready supply of heated product, remember to pre-heat additional tubes to reduce the required heater time.

15.0 "Wet" Adhesive Strength Properties

When a windshield has been recently installed using Sika products and 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.

16.0 Traceability of AGR Super Kit Components

Since Sika introduced Auto Glass Replacement (AGR) Super Kits, traceablity of Sika® Aktivator PRO Pads and Sika® Primer-206 Stix has been achieved by adhering individual stickers to the insurance documentation. Now, the Lot Number which is located on the white Batch Code Sticker adhered on all AGR cartridges and unipacs, on separate sheets of sticker available in all AGR Super Kits, or on the white Corner Label located on the outside of the Super Kit Boxes, is sufficient to track all of the components within a Super Kit. This means that Sika customers do not need to place Sika® Aktivator PRO Pad and Sika® Primer-206 Stix stickers on their insurance documentation. The Sika® Aktivator PRO Pad and Sika® Primer-206 Stix stickers will continue to be available in each Super Kit for usage on documentation. If desired, the customer can decide to continue to use these stickers on their documentation, but if the required information is needed, our polyurethane Lot Number allows us to track all components of the specific Super Kit in question.

Section 5 of the AGRSS Standard requires that all adhesive system components are traceable to each job.

Important Note: For the traceability system listed above to work effectively, it is imperative that the urethane, Sika® Aktivator PRO Pads and Sika® Primer-206 Stix contained within the same Super Kit are used on the same installations. Sika® Aktivator PRO Pads or Sika® Primer-206 Stix leftover from previous Super Kits would need to have their lot numbers recorded on all insurance documentation with the corresponding stickers that will still be provided.

17.0 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. Sika 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 inoperative 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: As 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: SikaTack®-COOL, SikaTack®-MOVE^{IT}, SikaTack®-Ultrafast II and SikaTack®-ASAP are all rated non-conductive. The most recently published complete list of non-conductive applications is given in Sika Marketing Bulletin #X07-11, which is available from your Sika Sales Representative. Use any of these four products in ALL non-conductive urethane applications except when a "high modulus" adhesive is required. SikaTack®-COOL and SikaTack®-MOVE^{IT} are both Non-Conductive and recommended for High Modulus applications.

18.0 High Modulus Urethanes

Some automotive OEMs (Original Equipment Manufacturers) use windshield bonding urethane adhesives that have a slightly higher modulus, compared to that of conventional urethane adhesives. The modulus of an adhesive indicates how much joint movement is to be expected when a given amount of force is applied to the bonded joint. If the same amount and type of force is applied to two separate bonded joints, of the same dimensions, one being bonded with a high modulus (HM) urethane and the other with a conventional urethane, the HM bond will have less movement.

This characteristic of high modulus urethane adhesives has allowed some automotive OEMs to increase the overall stiffness of their vehicles simply by bonding the windshield with this type of adhesive. If a windshield that was originally installed with an HM urethane is replaced using a conventional urethane, the vehicle might not retain its original level of stiffness. In this case, it may also be possible for the windshield to move, during operation, beyond the limits of the window opening, causing the windshield to break. Conversely, if an HM urethane is used for a windshield replacement that does not require HM, stress cracking of the windshield may occur.

SikaTack®-COOL and SikaTack®-MOVE^{IT} are designed to be what Sika calls an “All-In-One” modulus adhesive. SikaTack®-COOL and SikaTack®-MOVE^{IT} have a shear modulus that is on the high-end of the range for conventional polyurethane adhesives as defined in the requirements outlined in the North American automobile manufacturer’s direct glazing specifications. Extensive field testing performed by Sika in the United States, Europe, Australia, and Canada over a two and a half year period has shown that an adhesive with this level of shear modulus is suitable for replacement of all glass parts, even those that were originally installed in vehicles using a high modulus adhesive. When used for high modulus AGR applications, SikaTack®-COOL and SikaTack®-MOVE^{IT} will be able to maintain the vehicle’s original level of stiffness.

Please remember that high modulus and non-conductive are not distinctly related. While many vehicles require non-conductive adhesives, very few legitimately require high modulus. At the time of this publication, Sika endorses the use of SikaTack®-COOL and SikaTack®-MOVE^{IT} on 1995 and later Audis, 1996 and later Volkswagen models, 2004 and later Mercedes models, and 2004 and later Porsche models. The most recently published complete list of applications can be found in Sika Marketing Bulletin #X07-10, which is available from your Sika Sales Representative. This “All-In-One” modulus adhesive provides a stiffer cured product, but it can be used for all auto glass replacement applications. If you run into a requirement for this type of product, SikaTack®-COOL and SikaTack®-MOVE^{IT} can be ordered through your local distributor.

19.0 FMVSS 111

Subject: Passenger and Commercial Vehicle Side and Rear View Mirror Replacements

Auto glass replacement technicians, being trained and certified through Sika Corporation and in accordance to the current AGR Technician Training Manual, are required to follow this addendum instruction as it pertains to the proper replacement of side and rear view mirrors in both passenger and commercial vehicles:

1) Sika training personnel will refer to the FMVSS 111 specification in order to alert auto glass technicians to the importance of properly installing approved mirror products and how they must be installed. Below you will find the website address for the FMVSS 111 specification. It is critical that each technician fully comply with each section, namely S-1 through S-12 in that each defines all types of vehicles requiring special attention.
2) Sika can endorse the use of Sika non-conductive AGR urethanes for the installation of side view mirrors provided the mirrors pass FMVSS 111 and the bonding surface of the mirror has no exposed silvering or paint on the bonding surface. The integrity of such surfaces may be compromised if exposed to urethane systems and related cleaners and primers. The bonding surface of the mirror should be cleaned with an appropriate glass cleaner and then Sika® Aktivator PRO needs to be applied in accordance with the procedures given on page 15 of this manual. Next, use a brush or dauber to apply Sika® Primer-206 G+P according to the procedures provided on page 25 of this manual. The bonding surface of the mirror mounting bracket, contained inside the mirror housing, can be prepared with Sika® Aktivator PRO and Sika® Primer-206 G+P, following the guidelines provided in this manual. At this point any of Sika's non-conductive urethanes can be used for bonding in the mirror. Care should be taken that urethane does not contact the motor mount, impeding the ability of the motor to adjust the mirror.

Website Address to FMVSS 111:

http://frwebgate.access.gpo.gov/cgi-bin/get-cfr.cgi?TITLE=49&PART=571&SECTION=111&YEAR=1998&TYPE=TEXT

20.0 Sika AGRSS Tool Kit 2008

Sika
AGRSS
Tool Kit
2008

AGRSS™
Auto Glass Replacement Safety
Standards Council

Sika Corporation

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Sika Corporation

AGRSS Tool Kit Instructions

Sika has assembled this AGRSS tool kit to assist in your awareness and compliance to the current AGRSS Standard. These documents are designed to assist you with completion of portions of five of the eight new self-assessment deliverable requirements for registration with AGRSS[1]. Sika recommends that you log onto www.agrss.com and read the AGRSS standards and registration requirements. Within the contents of this tool kit you will find:

A. AGRSS Declaration of Standard Conformance – Deliverable 4.01

To be copied and stapled to the DECLARATION CHECK-LIST- SHEET to cover Deliverable 4.01 of your self- assessment.

B. AGRSS Declaration of Standard Conformance – Deliverable 4.03

To be copied and stapled to the DECLARATION CHECK-LIST- SHEET to cover Deliverable 4.03 of your self- assessment.

C. AGRSS Declaration of Standard Conformance – Deliverable 4.04

To be copied and stapled to the DECLARATION CHECK-LIST- SHEET to cover Deliverable 4.04 of your self- assessment.

D. AGRSS Declaration of Standard Conformance – Deliverable 5.03

To be copied and stapled to the DECLARATION CHECK-LIST- SHEET, along with a copy of Sika's current safe-drive-away time chart, to cover Deliverable 5.03 of your self- assessment.

E. AGRSS Declaration of Standard Conformance – Deliverable 8.02

To be copied and stapled to the DECLARATION CHECK-LIST- SHEET, along with a copy of Sika's current certificate of training for at least one of your technicians, to cover Deliverable 8.02 of your self-assessment.

F. AGRSS Safety Bulletin – Corrosion Treatment

To be copied and provided to any customer that is experiencing corrosion damage in order that they understand what repair practices are permissible under the AGRSS Standard and that you must adhere to required safe auto glass installation practices to protect the integrity of the vehicle and occupant safety.

G. AGRSS Safety Bulletin – Removal and Replacement of Automobile Glass Parts

To be copied and provided to any customer or body shop requesting the removal and replacement of a stationary bonded glass part. This document defines what is permissible and what the auto glass technician, customer and body shop must do to remain compliant within section 7 of the AGRSS Standard.

H. AGRSS Safety Bulletin – Pinchweld Restoration Considerations

To be copied and provided to any body shop performing a pinchweld repair or repainting a vehicle that involves a glass replacement. This document defines what is permissible and what the auto glass technician and body shop must do to remain compliant within section 7 of the AGRSS Standard.

[1] The language contained in the response section to each of the declaration documents listed above is by way of example only and should not be used if it does not accurately depict the prospective registrant's conduct or practices. This AGRSS Tool Kit is intended as a guide only and is not a guarantee or warranty by Sika to prospective registrant of its successful registration with the Auto Glass Replacement Safety Standards Council, of compliance with AGRSS Standards, or of compliance with Sika handling use and application instructions or applicable local, state or federal law. Sika is not however responsible for nor does Sika guarantee any installation technician's compliance with Sika's guidelines for handling and use of its products or its training instructions. TRAINING BY SIKA AS WELL AS A CERTIFICATION OF TRAINING COMPLETION SHALL NOT CONSTITUTE A WARRANTY OF ANY KIND BY SIKA OF AN INSTALLATION TECHNICIAN'S WORKMANSHIP OR THE HANDLING, USE, STORAGE AND APPLICATION OF SIKA'S PRODUCTS. SIKA GIVES NO WARRANTY OR GUARANTEE OF ANY KIND EXPRESS OR IMPLIED WITH RESPECT TO THE INFORMATION AND/OR ANY GUIDANCE WHICH MAY BE PROVIDED HEREIN OR ITS USE. SIKA SHALL NOT UNDER ANY CIRCUMSTANCES BE RESPONSIBLE FOR CONSEQUENTIAL DAMAGES OF ANY KIND UNDER ANY LEGAL THEORY ARISING FROM THE USE OF OR RELIANCE UPON THE INFORMATION AND/OR GUIDANCE PROVIDED HEREIN.

Sika AGRSS Tool Kit:

- Registration Values
- Registration Preparation
- Self-Assessment Preparation
- Sika Self-Assessment Assistance Program

Registration Values:

The AGRSS Registration Program provides two distinct values for participating companies: first, the ability to differentiate oneself from the competition and, second, the ability to validate safe auto glass installation practices that leads to increased revenue and reduced liability risks, respectively.

Registration Preparation:

The following instructions need to be followed in order to properly be prepared for AGRSS registration:

A. Go to www.agrss.com to access forms.

B. Under the left tab, click on “REGISTRATION”.

C. Click on “Invitation Letter” and copy.

D. Close “Invitation Letter” and then click on “Application Documents”.

E. Once opened, download and copy the “Application”, “STANDARD part A”, and “Standard part B” (note that these forms are made available in either a Microsoft Word or Acrobat format).

F. You now should have 4 documents in your possession for review and use.

G. Now read the “Invitation Letter” that provides a cordial welcome, a brief outline of each of the remaining 3 documents, a 7-point instruction-step guideline and a random sampling chart to calculate how many store locations need to be assessed.

H. Next, review the Application in order to understand the contents of agreement, payment information, and how to submit the registration documents.

I. Make copies of “STANDARD part A” and circulate copies to every employee for their review. This part of the registration packet is the current AGRSS Standard.

AGRSS Self-Assessment Preparation:

When in receipt of the AGRSS Registration packet, you'll note within the instructions that a 90 day registration period is provided. The reason for this extended period of time is to allow for a thorough self-assessment of the required number of store locations of your company, and the ability to correct and re-assess any non-compliance issues.

What has proven beneficial, in terms of time efficiency and elimination of non-compliances, is the pre-work done prior to the conducting of your official self-assessment. To help ensure a smooth and hassle-free self-assessment, utilize the following instructions:

1 Understand that the square root of your total store location count must be assessed (look to the chart provided as part of the "Invitation Letter" to learn how many store locations, or functional units, are to be involved).
2 The element of "random sampling" means that the store locations to be assessed, if more than one is to be involved, must be selected randomly, such as drawing locations from a hat. Conduct some form of lottery to identify the store locations to be assessed.
3 "STANDARD part B" is the key document used for conducting the self-assessment. Understand that each of the store locations being assessed must have their own copy of "STANDARD part B" completed and submitted back to your management team for review. For example, if the company had 10 store locations, 3 would need to be assessed. The management team would be in receipt of 3 "STANDARD part B" forms that were fully completed.
4 There are 8 deliverables required as part of the self-assessment. These deliverables play an enormous role in validating conformance to the AGRSS Standard. Each store location completing their own STANDARD part B must also attach the 8 deliverables to the back "DELIVERABLE CHECK-LIST-SHEET".
5 Company management must review each of the completed STANDARD part B forms and deliverables making sure that each question is marked "Yes" and that 8 acceptable deliverables are attached. If this level of accuracy occurs, then management has validated that acceptable and consistent policies and procedures are in place to best ensure compliance to the AGRSS Standard. Management then is to complete one corporate registration packet that is to include one STANDARD part B with one set of deliverables, and one Application Form (along with proper payment, notarization and instructed submission of additional locations requiring website posting and certificates). While a copy should be maintained, the original set is to be mailed to the AGRSS Secretary as indicated on the Application Form. It may take up to 6 weeks for return registration approval.
6 If any store location has either indicated "No" on STANDARD part B, or fails to understand the question, management must assess those specific subjects, correct the situation and then reassess the situation as soon as possible. Note that only those specific questions not being adequately answered need to be re-assessed and only for those store locations having indicated such. Once all assessed locations are deemed to be in compliance, then final corporate registration forms are ready for completion and submission. Registration is by company, which is why only one properly completed registration packet is required.
7 On deliverables, note that 8 are required. If one form is being used to cover more than one deliverable, make sure to include the appropriate number of extra copies, highlighting the area on that document that pertains to the deliverable required.
8 From these instructions, it makes sense for management to make sure that all store locations conduct business in the same way, using the same policies, procedures and documents long before the self-assessment is completed. This practice eliminates much of the risk of discovering non-compliances, which add much additional work and time to the registration process.

Sika Self-Assessment Assistance Program:

Sika, as your preferred retention system provider, has taken great strides in assisting with your successful completion of becoming an AGRSS Registered company. Sika has been an "originator" and leader of many of the AGRSS related projects and, largely because, we believe AGRSS to be one of the greatest and most important subjects ever developed for the AGR Industry.

One such proof of our commitment to the AGRSS process has been the provision of Sika's AGRSS Tool Kit that provides 5 of the 8 required Deliverables that must be submitted with your properly completed registration packet. This Tool Kit is updated each year and provided to you as a Sika-trained and certified glass shop.

The basis of our new "Sika-Self-Assessment Assistance Program" is that one of our full-time, factory trained personnel will literally assist your management team in conducting your self-assessment process. Through our field trials of this new program, glass shop customers have found this support to be rewarding due to the expertise we bring to the process, the knowledge we have within many of the topics and deliverables measured, and the streamlined approach we have developed to ensure the best use of your time and effort in completing AGRSS registration.

Following are the steps that you need to take in order to utilize this new program:

1 Complete all steps outlined in the "Registration Preparation" box.
2 Read through and understand the self-assessment process outlined in the "Self-Assessment Preparation" box.
3 Representing the management of your company, create, what we refer to as, the "Model" STANDARD part B, which means type out each question and then write your preferred answer to each, understanding that "Yes" would be the expected box checked. This document becomes your company's targeted script and answer sheet that your Sika representative would use in assessing each of your assessed locations. Along with this document, include the 8 deliverable documents that are representative of what should be used by each technician when conducting business. Note that Sika provides 5 of the 8 deliverables through this Kit and that you will need to provide the documents used to record pre-inspection conditions, safe-driveaway time and traceability of lot numbers, DOT numbers and part numbers. Make sure to review this Model from with your Sika representative prior to assessing any locations.
4 Do your best to teach each technician and store location the policies, procedures and documents that are to be used in order to be compliant to AGRSS and do so prior to your scheduled time of assessment. This prevents much of the risk of having to conduct more than one assessment per location due to a non-compliance issue.
5 Once steps 1-4 are complete, call your local Sika Territory Account Manager to schedule time to conduct your self-assessment. Once the schedule is set, be sure that all pertinent locations and personnel are properly notified and committed to the schedule.
6 Sika personnel will complete one STANDARD part B for each store locations that they are able to assess (depending on schedules and number of locations, Sika personnel may only be available to complete a portion of the assessments while your people complete the balance). If any non-conformances are discovered, they will be reported on part B and discussed. It will be the responsibility of your management to correct and re-assess such issues in order for the non-compliant issue to be amended to "Yes".
7 Upon the successful completion of the self-assessment, it will be the responsibility of your management team to properly complete the Application Form, the corporate STANDARD part B and required attachments, then submit it for approval to AGRSS.

Sika Corporation

AGRSS Declaration of Standard Conformance

DELIVERABLE 4.01

Section 4.01 of ANSI/AGRSS 002-2002:

"Those engaged in automotive glass replacement shall use retention systems that are produced under documented quality assurance standards."

Sika Response:

Each of Sika's AGR adhesives and primers is manufactured according to our documented quality assurance procedures. These internal quality assurance procedures have been certified by a third party approved ISO registrar to meet the requirements of ISO 9001:2000.

ISO (International Organization for Standardization) is the world's largest developer of standards. For more information on ISO and this standard you can log onto its website using the following address.

www.iso.org

John King Vice President –
Aftermarket Sika Corporation

Sika Corporation

AGRSS Declaration of Standard Conformance

DELIVERABLE 4.03

Section 4.03 of ANSI/AGRSS 002-2002:

"Those engaged in automotive glass replacement must use either an OEM approved retention system or equivalent retention system as certified in writing by the equivalent retention system manufacturer directly or through a private labeler."

Sika Response:

Sika Automotive OEM direct glazing polyurethane adhesive systems are used by a number of automobile manufacturers, such as Audi, BMW, DaimlerChrysler, Volkswagen, and others. This fact validates Sika's ability to produce qualified adhesive systems that meet or exceed the stringent OEM specifications for quality and performance for automobiles produced in the United States as well as worldwide.

When used as directed, each of Sika's AGR adhesives meets or exceeds the strength requirements outlined in the direct glazing specifications of all automobile manufacturers.

John King Vice President –
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Sika Corporation

AGRSS Declaration of Standard Conformance

DELIVERABLE 4.04 Section 4.04 of ANSI/AGRSS 002-2002

"Those engaged in automotive glass replacement shall obtain and follow written comprehensive and current application instructions from the retention systems manufacturer or private labeler."

Registrant Response:

The attached diagram represents the current cover of the Sika Technician Training Manual and represents comprehensive application instructions covering all requirements stated within Section 4 of the AGRSS Standard. This manual is currently used by the registrant.

Sika Corporation

AGRSS Declaration of Standard Conformance

DELIVERABLE 5.03

Section 5.03 of ANSI/AGRSS 002-2002:

"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."

Registrant Response:

Sika measures the strength build up rates of each AGR adhesive under varying weather conditions using proprietary Safe Drive Away Time (SDAT) determination test methods. The resulting SDATs are then validated under the supervision of a third party crash test facility using the FMVSS 212 standard in its most severe interpretation. This process provides a reliable means to establish SDAT charts for each of Sika's AGR adhesives. The information published in the SDAT chart for each AGR adhesive allows an auto glass technician to determine how long the vehicle must remain out of service prior to use. Such time allowances depend on which product is being used, temperature, humidity and the presence of a passenger side airbag.

The registrant has provided each of its installation technicians with the Sika SDAT charts for the Sika AGR adhesives that they use. The registrant has also provided training to each of its technicians to ensure that they are able to interpret this information properly and inform the vehicle owners of this information when necessary.

NOTE: See attached chart utilized for SDAT calculations.

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Sika Corporation

Sika Corporation, 30800 Stephenson Highway, Madison Heights MI 48071, USA
Tel: 248 577 0020, Fax: 248 577 0810, www.sikaindustry.com
www.sikaindustry.com

Safe Drive Away Time Charts – *The fastest, most reliable and cost effective adhesive system available.*

Based on temperature and humidity, these charts indicate when Sika polyurethanes reach FMVSS 212/208 windshield retention requirements for both dual airbag and non-dual airbag automobiles. Follow all product installation instructions and recommendations given in the Sika AGR Technician Training Manual.

Hot-Applied Adhesives

SikaTack®-ASAP (suitable for non-conductive)

Relative Humidity	Temperature					
	>0°F	>25°F	>35°F	>55°F	>72°F	>95°F <120°F
Without Airbag						
> 90%	30 min	30 min	30 min	30 min	30 min	30 min
> 70%	30 min	30 min	30 min	30 min	30 min	30 min
> 40%	30 min	30 min	30 min	30 min	30 min	30 min
> 20%	30 min	30 min	30 min	30 min	30 min	30 min
> 0%	30 min	30 min	30 min	30 min	30 min	30 min
With Passenger Airbag						
> 90%	45 min	45 min	1 hr	1 hr	1.25 hr	1.75 hr
> 70%	45 min	45 min	1 hr	1 hr	1.5 hr	1.75 hr
> 40%	45 min	45 min	1 hr	1 hr	1.75 hr	2 hr
> 20%	45 min	45 min	1 hr	1.5 hr	2 hr	2 hr
> 0%	45 min	45 min	1 hr	1.5 hr	2 hr	2 hr

SikaTack®-Ultrafast *II* (suitable for non-conductive)

Relative Humidity	Temperature					
	>15°F	>25°F	>35°F	>55°F	>72°F	>95°F <120°F
Without Airbag						
> 90%	30 min	30 min	30 min	30 min	30 min	2 hr
> 70%	30 min	30 min	30 min	30 min	30 min	2 hr
> 40%	30 min	30 min	30 min	30 min	30 min	2 hr
> 20%	30 min	30 min	30 min	30 min	30 min	2 hr
> 0%	2 hr	2 hr	2 hr	2 hr	2 hr	2 hr
With Passenger Airbag						
> 90%	2 hr	2 hr	2 hr	2 hr	2 hr	4 hr
> 70%	2 hr	2 hr	2 hr	2 hr	2 hr	4 hr
> 40%	2 hr	2 hr	2 hr	2 hr	2 hr	4 hr
> 20%	2 hr	2 hr	2 hr	2 hr	2 hr	4 hr
> 0%	4 hr	4 hr	4 hr	4 hr	4 hr	4 hr

SikaTack®-Sierra (suitable for non-conductive)

Relative Humidity	Temperature					
	>0°F	>25°F	>55°F	>72°F	>85°F	>95°F <120°F
Without Airbag						
> 75%	NR	NR	30 min	30 min	NR	NR
> 40%	NR	NR	30 min	30 min	30 min	NR
> 20%	NR	NR	30 min	30 min	30 min	30 min
> 10%	NR	NR	30 min	30 min	30 min	30 min
> 0%	NR	NR	30 min	30 min	30 min	30 min
With Passenger Airbag						
> 75%	NR	NR	1 hr	1 hr	NR	NR
> 40%	NR	NR	1 hr	1 hr	1 hr	NR
> 20%	NR	NR	1 hr	1 hr	1 hr	1 hr
> 10%	NR	NR	1 hr	1 hr	1 hr	1 hr
> 0%	NR	NR	1 hr	1 hr	1 hr	1 hr

NR = Not Recommended

Cold-Applied Adhesives

SikaTack®-MOVE^{IT} (suitable for non-conductive & high modulus)

Relative Humidity	Temperature					
	>0°F	>25°F	>35°F	>52°F	>72°F	>90°F <120°F
Without Airbag						
> 90%	30 min	30 min	30 min	30 min	30 min	30 min
> 70%	30 min	30 min	30 min	30 min	30 min	30 min
> 40%	30 min	30 min	30 min	30 min	30 min	30 min
> 10%	30 min	30 min	30 min	30 min	30 min	30 min
> 0%	30 min	30 min	30 min	30 min	30 min	30 min
With Passenger Airbag						
> 90%	1 hr	1 hr	1 hr	1 hr	1 hr	1 hr
> 70%	1 hr	1 hr	1 hr	1 hr	1 hr	1 hr
> 40%	1 hr	1 hr	1 hr	1 hr	1 hr	1 hr
> 20%	1 hr	1 hr	1 hr	1 hr	1 hr	1 hr
> 0%	1 hr	1 hr	1 hr	1 hr	1 hr	1 hr

SikaTack®-COOL (suitable for non-conductive & high modulus)

Relative Humidity	Temperature					
	>0°F	>32°F	>40°F	>52°F	>72°F	>90°F <120°F
Without Airbag						
> 90%	NR	45 min	30 min	30 min	30 min	30 min
> 70%	NR	45 min	30 min	30 min	30 min	30 min
> 40%	NR	60 min	45 min	30 min	30 min	30 min
> 20%	NR	60 min	45 min	45 min	45 min	30 min
> 0%	NR	60 min	45 min	45 min	45 min	45 min
With Passenger Airbag						
> 90%	NR	4 hr	2 hr	2 hr	2 hr	2 hr
> 70%	NR	4 hr	2 hr	2 hr	2 hr	2 hr
> 40%	NR	6 hr	4 hr	2 hr	2 hr	2 hr
> 20%	NR	6 hr	4 hr	4 hr	4 hr	2 hr
> 0%	NR	6 hr	4 hr	4 hr	4 hr	4 hr

NR = Not Recommended

(Will transition to the name SikaTack®-Drive New by the end of 2007)

Sikaflex® 220+

Relative Humidity	Temperature					
	>15°F	>25°F	>40°F	>50°F	>72°F	>95°F <110°F
Without Airbag						
> 90%	24 hr	24 hr	4 hr	3 hr	2 hr	2 hr
> 70%	24 hr	24 hr	4 hr	3 hr	2 hr	2 hr
> 40%	NR	24 hr	24 hr	4 hr	2 hr	2 hr
> 10%	NR	NR	24 hr	24 hr	4 hr	2 hr
> 0%	NR	NR	NR	NR	4 hr	4 hr
With Passenger Airbag						
> 90%	NR	NR	16 hr	12 hr	8 hr	8 hr
> 70%	NR	NR	16 hr	12 hr	8 hr	8 hr
> 40%	NR	NR	NR	16 hr	8 hr	8 hr
> 10%	NR	NR	NR	NR	16 hr	8 hr
> 0%	NR	NR	NR	NR	NR	NR

NR = Not Recommended

Sika Corporation

AGRSS Declaration of Standard Conformance

DELIVERABLE 8.02

Section 8.0 of ANSI/AGRSS 002-2002:

"Technicians installing replacement automotive glass shall be fully qualified for the tasks they are required to perform. Such qualifications shall include, at a minimum, completion of a comprehensive training program with a final exam and a continuing education component. The program shall include, among other things: AGR safety issues, an understanding of OEM installation standards and procedures, relevant technical specifications, comprehensive retention system specific training and the opportunity to apply and demonstrate the skills technicians learn."

Registrant Response:

Sika offers training covering the proper use of Sika products when used as the retention system of any automobile. Such training includes the provision and study of the current Sika Auto Glass Replacement Technician Training Manual, skill development through Sika personnel's' observance of technician installations during the training session and a comprehensive test at the conclusion of the training to ascertain the technician's knowledge base of proper product usage. Each technician who successfully completes Sika training receives a certificate of training completion, along with an identification card to carry with them.

Attached to this document is a copy of our training completion certificate. We retain copies of the training completion certificates issued by Sika for our technicians who have successfully completed the course.

John King Vice President –
Aftermarket Sika Corporation

Sika Corporation, 30800 Stephenson Highway, Madison Heights MI 48071, USA
Tel: 248 577 0020, Fax: 248 577 0810, www.sikaindustry.com

AGR Authorization Form

Urethane Label	Aktivator PRO Label
Batch No. _____	Batch No. _____
Exp. Date _____	Exp. Date _____
Safe Drive Away Time	**206 G+P Label**
AM _____ **PM**	Batch No. _____
	Exp. Date _____
	215 Primer Label
	Batch No. _____
	Exp. Date _____

EXTERIOR

Mark all Damages as Followed:

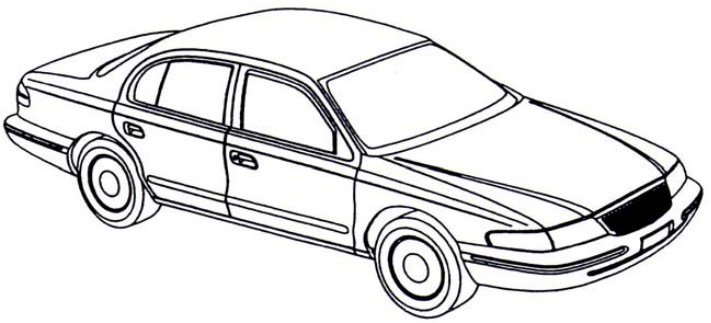
"S" = Scratched
"P" = Peeled Paint
"D" = Dented
"C" = Chipped
"M" = Missing Parts
"R" = Rusted Spots
"O" = Other: _____

INTERIOR

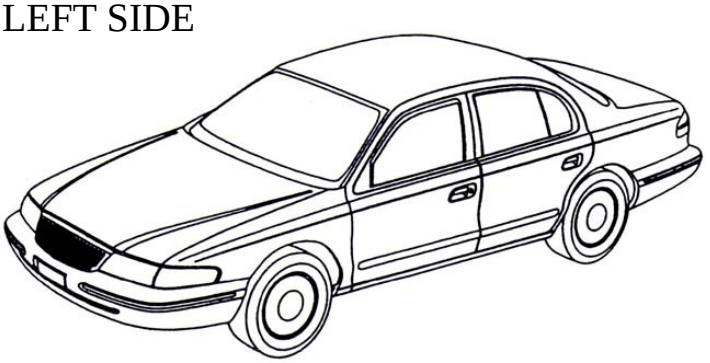
Mark all Damages as Followed:

	Tears	Stains	Area
Headliner:	_____	_____	_____
Seats:	_____	_____	_____
Dash:	_____	_____	_____
Door Panels:	_____	_____	_____
Floor-Front:	_____	_____	_____
Floor-Rear:	_____	_____	_____

RIGHT SIDE



LEFT SIDE



BEFORE RETURNING TO CUSTOMER

Circle the following that has been checked and or completed:

Vacuumed:	**yes/no**
Trim Secure:	**yes/no**
Glass Clean:	**yes/no**
Wipers ok:	**yes/no**
Air Condition Run:	**yes/no**
Radio:	**yes/no**

Customer Name: _____ **Date:** _____

Phone: _____ **Color Vehicle:** _____

Type Vehicle: _____ **VIN #:** _____

Glass DOT Number: _____ **Glass Part Number:** _____

Urethane System Used: _____ **Car Inspected By:** _____

I hereby have read the inspection sheet, authorization and agreement, before affixing my signature below, and warrant that I fully understand the contents thereof.

Customer Signature: _____ **Date:** _____

Sika Corporation

AGRSS Safety Bulletin

August 26, 2005 X05-25

Attention: Automobile Owner /Operator Subject: Corrosion Treatment; Section 3, ANSI/AGRSS Standard 002-2002

Section 3, *Vehicle Assessment Before Replacement,* of the American National Standards Institute/Auto Glass Replacement Safety Standard 002-2002 states that, "those engaged in automotive glass replacement shall not undertake or complete such installation when any related condition would compromise the retention system and the owner/operator shall be so notified." One condition which may exist within the mounting area of a glass part that fits this description is corrosion (rust). All auto glass technicians must abide by the specific instructions of the auto glass replacement adhesive supplier in evaluating the severity of corrosion and, its proper removal and pinchweld restoration.

When one of Sika Corporation's auto glass replacement adhesive systems is used as the glass replacement retention system, the following recommendations for corrosion treatment should be followed in order to be compliant with the ANSI/AGRSS Standard:

1 If any level of corrosion is found in or around the mounting area of the glass part, such corrosion must be fully removed down to bare metal and the bare metal must be properly primed prior to application of the adhesive in accordance with Sika's documented instructions set forth in Sika's Auto Glass Technician Training Manual available by calling 1-888-832-7452 or at www.sikaindustry.com[1].

2 In accordance with Sika's instructions, up to an accumulated maximum of 24 square inches of corrosion in the entire glass part mounting area can be properly restored by the auto glass technician, as long as there is no perforation (holes) in the mounting surface. If either of these parameters is not met, the vehicle must be restored by an authorized auto body repair facility.

If these practices are not followed, an auto glass replacement company may be in violation of the ANSI/AGRSS Standard 002-2002.

Recommendation: Since automotive glass parts are an integral part of a vehicle's overall passenger protection system, vehicle owners should only utilize the services of auto glass technicians who follow a comprehensive automotive glass replacement protocol which includes, but is not limited to, corrosion treatment procedures that comply with ANSI/AGRSS standards. Failure to comply with these recommendations may pose a risk to your personal safety.

Best regards,

Jeffry A. Woodford
Sr. Product Engineer
Sika Corporation

[1] The information and recommendations contained herein and any other advice given by Sika are provided in good faith based on Sika's current knowledge and experience of its products when properly stored, handled and applied within shelf life under normal conditions in accordance with Sika's instructions. **SIKA DOES NOT UNDER ANY CIRCUMSTANCES WARRANT OR ASSUME LIABILITY UNDER ANY LEGAL THEORY IN CONNECTION WITH THE USE OR APPLICATION OF ITS PRODUCTS BY ANY THIRD PARTY.**

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Sika Corporation

AGRSS Safety Bulletin

August 26, 2005 X05-24

Attention: Auto Body Repair Facility Subject: Pinchweld Restoration Considerations for Direct Glazing Applications Section 7, ANSI/AGRSS Standard 002-2002

Section 7 of the ANSI-AGRSS Standard 002-2002 states that "those engaged in automobile 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." The ANSI/AGRSS standard can be obtained via the Internet by first logging on to www.agrss.com and then by clicking on "The Standard."

The aftermarket application of basecoat and or clearcoat to an automotive glass part's mounting area (commonly referred to as a vehicle's pinchweld in the auto glass replacement industry) prior to installation of a polyurethane direct-glazed stationary auto glass part is an installation practice that can adversely affect the glass retention system. When one of Sika Corporation's auto glass replacement adhesive systems is used as the glass retention system during a replacement, the recommendations that follow must be used in order to remain compliant with Section 7 of the ANSI/AGRSS Standard. More importantly, any glass part installation performed without following the procedures set forth below (as well as the comprehensive application instructions contained in Sika's Auto Glass Technician Training Manual) could cause possible loss of glass adhesion and potential serious personal injury.

Recommendation: Since automotive glass parts are an integral part of a vehicle's overall passenger protection system, vehicle repair businesses should only utilize the services of auto glass technicians that are aware of and follow pinchweld preparation procedures that comply with the ANSI/AGRSS Standard. Your customer, whether it is the vehicle owner or the insurance company, will expect you to meet these requirements and return the vehicle with all safety related features in an operable condition. Failure to comply with these recommendations may pose a risk to your customer's safety. The instructions that follow have been taken from Sika's Auto Glass Technician Training Manual available at www.sikaindustry.com or by calling 1-888-832-7452. Any body shop work that involves glass replacement using Sika's AGR urethane systems must be conducted in accordance with all of the instructions in the Auto Glass Technician Training Manual for Sika's warranty to apply[1]. Please take the time to familiarize yourself with and comply with Sika's Auto Glass Technician Training Manual as they pertain to the work you perform.
The following information has been taken from the Pinchweld Preparation Section of Sika's Auto Glass Technician Training Manual:

AGR / body shop instructions for repaired pinchwelds and vehicles to be repainted[2]

Perforation corrosion located in a glass part's 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

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

For glass replacements involving a body shop repaired pinchweld or repainting of a vehicle, one of the following two options should be selected.

Option 1. Whenever possible, remove the glass part, 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 glass part 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 1-2 mm on the pinchweld and install the glass part (full cut method).

Option 2. If the pinchweld area is to be repaired and painted, remove the section of metal to be repaired, repair pinchweld and apply an epoxy or etch primer coat. Allow the primer to cure for at least as long as would be required prior to applying topcoat over the primer, following the paint 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. Remove the masking tape. If a forced drying process is to be used, remove the tape prior to baking the topcoat. Next, lightly abrade the primer with a Scotchbrite® or similar abrasive pad. Apply Sika® -Aktivator according to the instructions in this guide and allow it to cure for at least ten minutes. Paint a thin coat of Sika® Primer-206 G+P and then allow at least ten minutes for this product to dry. Then set the glass part using the appropriate Sika adhesive for the vehicle type and required drive away time.

*IMPORTANT NOTE: Option 2 above calls for the use of Sika® -Aktivator and Sika® Primer-206 G+P. If any of these procedures are to be performed at temperatures below 40°F, then please refer to the special low temperature precautions for these products, which can be found in the “Seasonal Concerns” section of Sika’s Auto Glass Technician Training Manual. Also, please note that when these recommendations call for Sika® Primer-206 G+P, a Sika® Primer-206 Stix applicator may be used. However, due to the limited coverage of Sika® Primer-206 Stix, a can of Sika® Primer-206 G+P will most likely be the more convenient option.

Best regards,

Jeff Woodford

Jeffry A. Woodford
Sr. Product Engineer
Sika Corporation

[1] Sika warrants its products for one year from date of installation to be free from manufacturing defect and to meet the technical properties on the current Technical Data Sheet(s) when used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer’s sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor. **NO OTHER WARRANTY EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTIBILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.**

[2] The information and recommendations contained herein and any other advice given by Sika are provided in good faith based on Sika’s current knowledge and experience of its products when properly stored, handled and applied within shelf life under normal conditions in accordance with Sika’s instructions. **SIKA DOES NOT UNDER ANY CIRCUMSTANCES WARRANT OR ASSUME LIABILITY UNDER ANY LEGAL THEORY IN CONNECTION WITH THE USE OR APPLICATION OF ITS PRODUCTS BY ANY THIRD PARTY.**

20.0 Questions & Answers

1. Can Sika adhesives be installed onto wet surfaces? *No. 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 dry.*

2. How do I install a gasket set windshield? *Clean the glass, gasket slots with Sika® Aktivator PRO. 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 17 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 Sika® Aktivator PRO. Immediately wipe off and wait ten minutes. The windshield is now ready to be installed. Follow normal Sika guidelines for the remainder of the installation.*

4. Can I apply your heated products cold? *No, SikaTack®-Ultrafast II, SikaTack®-Sierra and SikaTack®-ASAP must be applied hot or else problems with gunnability, decking, and or adhesion may occur.*

5. Sometimes my push-in moldings do not stay down. What causes this and what would you recommend to address the problem? *SikaTack®-Ultrafast II, SikaTack®-Sierra and SikaTack®-ASAP stiffen rapidly and by the time you get to setting an old styled 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 SikaTack®-Ultrafast II, SikaTack®-Sierra or SikaTack®-ASAP. 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 Sika® Primer-215 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? *Any type of glass cleaner is acceptable as long as the product doesn't contain any anti-static additives. Make sure that all cleaner is removed from the glass surface prior to applying Sika® Aktivator PRO.*

7. How long are primers and cleaners good for after they have been opened? *Sika® Aktivator PRO and Sika 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. What risks do I take if I use a high modulus urethane on a vehicle that only requires non-conductive urethane? *The windshield could stress crack during vehicle operation. Please remember that the "All-In-One" modulus SikaTack®-COOL and SikaTack®-MOVE^{IT} is now recommended for high modulus applications and this product can be used for all applications without concern for stress cracking.*

9. What risks do I take if I don't use a high modulus or an "All-In-One" 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 and the windshield could break as a result of moving beyond the limits of the window opening during operation of the vehicle.*

10. 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.*

11. Explain your oven kit program. *Retail glass shops can obtain free ovens by purchasing a kit through Sika distributors. Along with the free oven they purchase a specified number of cases of urethane, primer and cleaner that help offset the cost of the oven. Both Sika Corporation and Sika distributors share in the cost of the oven through reduced margins. While Sika Corporation picks up the largest portion of the oven cost, distributors sell the kits at a predetermined price and make a 20% gross margin. Kits are usually special ordered after the retail glass shop makes a commitment to the Sika line of products and determines which type of oven would best serve their business. Shops doing the math can determine that they are only paying for the urethane, primer and cleaner portion of the kit, which is a billable product to their customers.*

12. When uncertain of how to bond glass parts, is it best to always use a Sika adhesive system? *While urethane satisfies most vehicle needs for installing glass parts, there are some exceptions that may be encountered. Most notable is when the OE glass part utilizes a mechanical fastening system, which provides the required retention strength, and calls for a sealant to prevent water and sound penetration. When this is the case, it is always best to follow current OEM specifications for installing a replacement part. Where a model vehicle has been upgraded, it is recommended that only the most current specified retention system should be used. An example would be a vehicle model transitioning from a gasket set to a urethane set glass part.*

976

21.0 2008 Sika Auto Glass Technician Test

_____
(Printed name of Technician)

_____ _____
(Technician Signature) **(Date)**

_____ _____
(Sika Trainer) **(Date)**

Technician Mailing Address:

_____

_____

_____

_____

TECHNICIAN TRAINING TEST

Section 1

Please determine if each statement is TRUE or FALSE

1. When preparing a glass part using Sika® Aktivator PRO (orange cap) at a temperature of 30°F, there are special low temperature precautions to be concerned with.

   A) TRUE
   B) FALSE

2. A complete adhesive removal is required if the bonded glass part was installed using a non-urethane adhesive.

   A) TRUE
   B) FALSE

3. There is no reason to worry about scratching the paint of a vehicle because Sika® Primer-206 G+P (black cap) can be used to restore the corrosion protection system back to the OEM level.

   A) TRUE
   B) FALSE

4. It is acceptable to apply Sika® Primer-206 G+P over rust.

   A) TRUE
   B) FALSE

5. Sika's hot applied (or heated) urethane adhesives must be heated, prior to use, in a Sika approved oven for a minimum of 1 hour, or 30 minutes if preheated in the cooler of a Pragmatech oven.

   A) TRUE
   B) FALSE

6. SikaTack®-COOL is rated non-conductive.

   A) TRUE
   B) FALSE

7. A bonded glass part that was previously installed with a silicone can be re-installed if properly prepared using Sika® Aktivator PRO.

   A) TRUE
   B) FALSE

8. A glass part that was prepared properly using Sika® Aktivator PRO (orange cap) can be installed 12 hours after the Aktivator PRO's application.

   A) TRUE
   B) FALSE

9. A high modulus urethane may be considered to be stiffer than a conventional urethane with a normal modulus.

   A) TRUE
   B) FALSE

10. If a 250 ml can of Sika® Aktivator PRO (orange cap) expires 8 months from today and you open this same can today, it can be used for the next 6 months or until it becomes "cloudy".

    A) TRUE
    B) FALSE

TECHNICIAN TRAINING TEST

Section 2

Please determine the BEST answer to each question

11. The "full-cut" method requires trimming the existing bead of urethane down to a height of

A) ¼ to ½ inch
B) 1 to 2 millimeters
C) 1 to 2 centimeters

12. The factors affecting safe-drive-away-time are

A) when the customer wants their car put back into service
B) temperature, humidity and presence of passenger side airbag
C) following the proper application procedures specified by the adhesive manufacturer

13. One reason to apply Sika® Primer-206 G+P (black cap) to the pinchweld of the vehicle is to

A) provide a UV barrier for the paint of the vehicle
B) provide coverage for bare metal in order to reduce future corrosion
C) to cover the existing urethane bead for improved adhesion

14. When installing a gasket set windshield the preparation of the gasket requires

A) removal of contaminants from within both slots of the gasket utilizing a towel and water. An approved glass cleaner may be used for additional cleaning power. After fully dry, apply Sika® Aktivator PRO to both slots and allow a minimum of 15 minutes before proceeding
B) removal of contaminants from within both slots of the gasket utilizing Sika® Primer-206 G+P and allow to dry for 10 minutes. Then apply Sika® Aktivator PRO per normal application procedures and allow to cure for 15 minutes
C) removal of contaminants from within both sides of the gasket utilizing compressed air. Do not apply any form of liquid due to rubber contamination

15. When applying Sika® Aktivator PRO (orange cap) to the windshield it is critical to

A) apply a thick, heavy layer to ensure a significant application of adhesion promoters
B) apply in one direction and then wait 3 minutes flash time for ambient temperatures above 15°F, 10 minutes when temperature is between 0°F and 15°F
C) apply in one direction, wait 10 minutes, and then wipe-off using a clean, lint-free towel

16. Any glass cleaner is acceptable to use as long as

A) there is no alcohol or ammonia contained within the product
B) the glass cleaner utilizes either a mint or winter fresh fragrance
C) the glass cleaner does not contain anti-static ingredients

17. Hot applied (or heated) Sika adhesives can be heated for a cumulative total period of

A) 1 hour
B) 10 hours
C) 9 months

18. Which of the following Sika urethane adhesives is **NOT** rated non-conductive?

A) SikaTack®-Ultrafast II
B) Sikaflex® 220+
C) SikaTack®-ASAP

19. The shelf life of Sika® Aktivator PRO (orange cap) and Sika® Primer-215 (white cap) is

A) 9 months
B) 12 months
C) 6 months

TECHNICIAN TRAINING TEST

Section 2 (continued)

Please determine the BEST answer to each question

20. The reason for applying adhesive using a "V" cut nozzle is

A) to prevent air from being trapped between the adhesive bead and the glass
B) to prevent the adhesive from "skinning over" too quickly
C) to provide an OEM appearance

21. The "short-cut" method of removing existing urethane is wrong because

A) it won't allow for enough time for the new urethane system to reach it's SDAT strength
B) it doesn't provide a bondable surface for the new urethane
C) it doesn't provide enough space for the proper amount of new urethane to be applied

22. The proper procedure for cleaning a dirty pinchweld is to

A) remove loose debris using a towel and water or oil-free compressed air if necessary. For heavy cleaning Sika Aktivator PRO can be used. Then trim the existing urethane bead.
B) blow out lose debris after trimming urethane to ensure all contaminants are removed. If additional cleaning is required, use alcohol or acetone
C) remove lose debris prior to trimming bead. After trimming the existing urethane bead, clean the opening with 3M adhesive cleaner

23. To properly prepare a rear slider, with a frame constructed of a painted aluminum extrusion, you must

A) abrade the bonding surface, apply Sika® Aktivtor PRO and then apply Sika® Primer-215, following the specific applications instructions of each product
B) abrade the bonding surface, apply Sika® Aktivtor PRO and then apply Sika® Primer-206 G+P, following the specific applications instructions of each product
C) apply Sika® Primer-215, following the specific applications instructions for the product

24. The procedure to use when installing a glass part with a "Pre-Applied-Adhesive-System" (PAAS) is to

A) apply Sika® Primer-215 to the bonding surfaces of the pre-applied adhesive following normal application procedures
B) apply Sika® Primer-206 G+P to the bonding surfaces of the pre-applied adhesive following normal application procedures
C) apply Sika® Aktivator PRO to the bonding surfaces of the pre-applied adhesive following normal application procedures

25. To maximize shelf life, Sika urethanes should be stored

A) at temperatures above 75°F
B) at temperatures below 75°F
C) it doesn't matter, Sika urethanes are usable for 9 months no matter what the storage condition

26. The special precaution for technicians to take when installing a glass part using SikaTack®-ASAP below 40°F is

A) to heat the adhesive for an additional 30 minutes to be sure that it will be at least 167°F
B) to apply the urethane and set glass part away from direct sunlight which will shorten the working time of the adhesive
C) to set the glass within five minutes of the adhesive application because at low temperatures repositioning the glass part will be difficult

27. The shelf life of Sika® Primer-206 G+P (black cap), packaged in 250 ml cans is

A) 9 months
B) 6 months
C) 13 months

TECHNICIAN TRAINING TEST

Section 2 (continued)

Please determine the BEST answer to each question

28. When applying Sika® Primer-206 G+P (black cap) at temperatures below 40°F

A) confirm dryness of the primer by touching a non-bonding area with a clean nitrile glove. It may take up to 25 minutes to dry
B) dry the primer with a heat gun and test with a nitrile glove to assure that it is dry
C) lightly spray wet primer surfaces with warm water to speed up the cross-linking of the urethane polymer that is in the primer

29. When applying the "V" bead to the pinchweld, the height of the bead should

A) exceed the roofline of the vehicle by ½ inch
B) not exceed the pre-cut dimensions of the provided Sika nozzle
C) match the height of the vehicle's roofline

30. When replacing a windshield in a vehicle that just had the pinchweld repaired and repainted by a body shop, which of the following is the proper procedure to prepare the fully cured etch primer (i.e; PPG DP-40) prior to adhesive application?

A) Lightly abrade and apply Sika® Aktivator PRO
B) Lightly abrade, apply Sika® Aktivator PRO and one coat of Sika® Primer-206 G+P
C) Lightly abrade and one coat of Sika® Primer-206 G+P

31. Preparation of the pinchweld for gasket set windshields requires

A) application of acetone to cut all foreign adhesive material and ensure a clean metal surface for bonding
B) application of Sika® Aktivator PRO, allowing 15 minutes flash-off / cure time, in order to clean and prepare the pinchweld for bonding
C) apply Sika® Primer-215, following the specific applications instructions for the product

32. It is acceptable to treat up to 24 in^2 of corrosion on the pinchweld using which of the following procedures, assuming that the corrosion has not perforated the metal?

A) Remove all corrosion, abrade the paint edges, apply Sika Aktivator PRO and then 1 coat of Sika® Primer-206 G+P according the recommended application procedures
B) Remove all corrosion, abrade the paint edges, apply Sika Aktivator PRO and then 1 coat of Sika® Primer-215 according the recommended application procedures
C) Remove all corrosion, abrade the paint edges, apply Sika Aktivator PRO and then 2 coats of Sika® Primer-206 G+P according the recommended application procedures

33. Under which of the following circumstances may a "removed" glass part be reinstalled using Sika's AGR adhesive systems?

A) The adhesive that remains on the glass part is a polyurethane and does not have good adhesion around the entire perimeter
B) The adhesive that remains on the glass part has good adhesion around the entire perimeter, but it cannot be confirmed to be a polyurethane
C) The adhesive that remains on the glass part is a polyurethane that has good adhesion around the entire perimeter

34. The reason for using a lint free paper towel and rotating to a clean side when re-applying Sika® Aktivator PRO from a 250 ml can is

A) to guarantee a good and professional appearance of the application
B) to avoid allowing contaminants from the towel to mix with the contents of the can
C) to make sure to lower costs per installation by not having to purchase extra daubers

35. Windshields that are supplied with a black primer can be installed

A) if prepared with an additional coat of Sika® Primer-206 G+P
B) by removing the primer down to the frit and applying Sika® Aktivator PRO
C) if the primer has been factory applied, is sound, and by preparing the bonding surface with Sika® Aktivator PRO