



**Ricon**<sup>®</sup>

*A Wabtec subsidiary*

## ***BUS WINDOWS***

**CityView<sup>®</sup> Standard Frame & Hidden Frame Windows**  
**CityView<sup>®</sup> II Hidden Frame Windows**



## **Service Manual**

This Ricon service manual is for use by qualified service technicians, and is not intended for use by non-professionals (do-it-yourselfers). The manual provides essential instructions and reference information, which supports qualified technicians in the correct installation and maintenance of Ricon products.

Qualified service technicians have the training and knowledge to perform maintenance work properly and safely. For the location of a service technician in your area, call Ricon Product Support at 1-800-322-2884.

Customer Name: \_\_\_\_\_  
Installing Dealer: \_\_\_\_\_  
Date Installed: \_\_\_\_\_  
Serial Number: \_\_\_\_\_

**REVISION RECORD**

REV	PAGES	DESCRIPTION OF CHANGE	ECO
32DWIN02. B	Cvr	Update to logo.	
	1-2	Update to Limited Warranty verbiage.	
	1-7	Added Figure 1-4 (Hopper Fixed Hidden Frame Window).	
	1-8	Added Figure 1-5 (Hopper 3/4 Egress Frameless Window).	
	2-3	Update to verbiage in Section A.13.a.	
	2-4	Update to verbiage in Section A.13.b.	
	2-4	Update to verbiage in Section A.14.a.	
	2-5	Added Section A.16 (Filler Plate Aesthetic/Appearance Inspection	
	2-6	Update to Section B.3 Window Installation	
	2-7	Added Figure 2-6. Torque Sequence	
	3-16	Added Section C.7 Cityview II Hidden Frame Top Hopper and Full Fixed Glazing Replacement	

REV	PAGES	DESCRIPTION OF CHANGE	ECO
32DWIN02.C	VARIOUS	Update Liner Verbiage to Glass Guard	91813

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# I. INTRODUCTION

The Ricon CityView® and CityView II® Standard Frame and Hidden Frame windows delivers a significant aesthetic statement that maximizes curb appeal. The sleek, seamless presentation of the glazing surface provides the advanced styling preferred by progressive transit agencies and the communities they serve. The integrated Ricon 3-Minute Window® design also allows for rapid glazing replacement.

The exclusive Ricon 3-Minute Window® saves time and money by allowing operators to replace glazing in approximately three minutes. There is no need to remove the frame from the vehicle because the rapid replacement design uses a unique patented metal retainer system to securely fix the window into the frame.

This manual contains installation instructions; inspection criteria; maintenance and replacement instructions. It is important to user safety that the operator and/or maintenance technician be completely familiar with the operating and replacement instructions. Once the window is installed, it is very important that the window be properly maintained by following the Ricon recommended cleaning, maintenance, and inspection instructions.



## A. RICON PRODUCT SUPPORT

If you have questions about this manual, or additional copies are needed, please contact Ricon Product Support at one of the following locations:

**Ricon Corporation**  
**1135 Aviation Place**  
**San Fernando, CA 91340** ..... (818) 267-3000  
**Outside (818) Area Code** ..... (800) 322-2884  
**Website** ..... [www.riconcorp.com](http://www.riconcorp.com)

**Vapor Ricon Europe Ltd.**  
**Meadow Lane**  
**Loughborough, Leicestershire** ..... 0044 (9) 1509 635 920  
**LE 1HS United Kingdom**  
**Website** ..... [www.riconcorp.com](http://www.riconcorp.com)

**B. RICON 3-MINUTE WINDOW LIMITED WARRANTY****RICON CORPORATION  
RICON WINDOW LIMITED WARRANTY**

**Ricon Corporation (Ricon)** warrants to the original purchaser of this product that Ricon will repair or replace, at its option, any part that fails due to defective material or workmanship as follows:

- Repair or replace parts for a period of two (2) years starting from the date the Window Assemblies have been installed, passed water and road test and meets the approval of the Property Designated inspector.
- Labor costs for specified parts replaced under this warranty for a period of two (2) years from the date of the Window Assemblies have been installed, passed water and road test and meets the approval of the Property Designated Inspector.

**If you need to return a product:** Return this product to Ricon, following the Ricon RMA procedure. Please give as much advance notice as possible, and allow a reasonable amount of time for repair.

**This warranty does NOT cover:** Improper use, faulty repairs made by maintenance, lack of preventative maintenance, lack of servicing, or improper Installation, inspection and/or testing practices. Malfunction or damage to product parts caused by accident, misuse, lack of proper maintenance, neglect, improper adjustment, modification, alteration, the mechanical condition of the vehicle, road hazards, overloading, failure to follow operating instructions, or acts of nature (i.e., weather, lightning, flood).

**Note:** Ricon recommends that this product be inspected by a Ricon dealer or qualified service technician at least once every six months, or sooner if necessary. Required maintenance should be performed at that time.

**! WARNING**

THIS PRODUCT HAS BEEN DESIGNED AND MANUFACTURED TO EXACT SPECIFICATIONS.  
ANY MODIFICATION OF THIS PRODUCT IN ANY RESPECT CAN BE DANGEROUS.

***This warranty is void if:***

- The product has been installed or maintained by someone other than a Ricon dealer or qualified service technician.
- The product has been modified or altered in any respect from its original design without written authorization by Ricon.

***Ricon disclaims liability for any personal injury or property damage that results from operation of a Ricon product that has been modified from the original Ricon design. No person or company is authorized to change the design of this Ricon product without written authorization by Ricon.***

***The Ricon obligation under this warranty is exclusively limited to the repair or exchange of parts that fail within the applicable warranty period.***

***Ricon assumes no responsibility for expenses or damages, including incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply.***

***The warranty gives specific legal rights. There may be other rights that vary in each state.***

### C. SHIPMENT INFORMATION

- When the product is received, unpack the product and check for freight damage. Claims for damage should be made to the freight carrier immediately.
- Please report any missing items immediately to Ricon Product Support.

**NOTE:** The Sales or Service personnel must review the Warranty and this Service Manual with the user to be certain that they understand how to safely operate the product and instruct the user to follow the operating instructions without exception.

### D. GENERAL SAFETY PRECAUTIONS

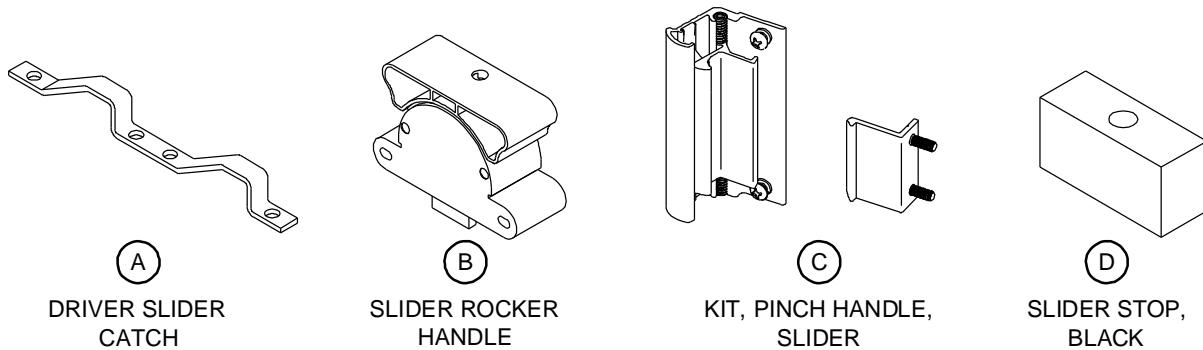
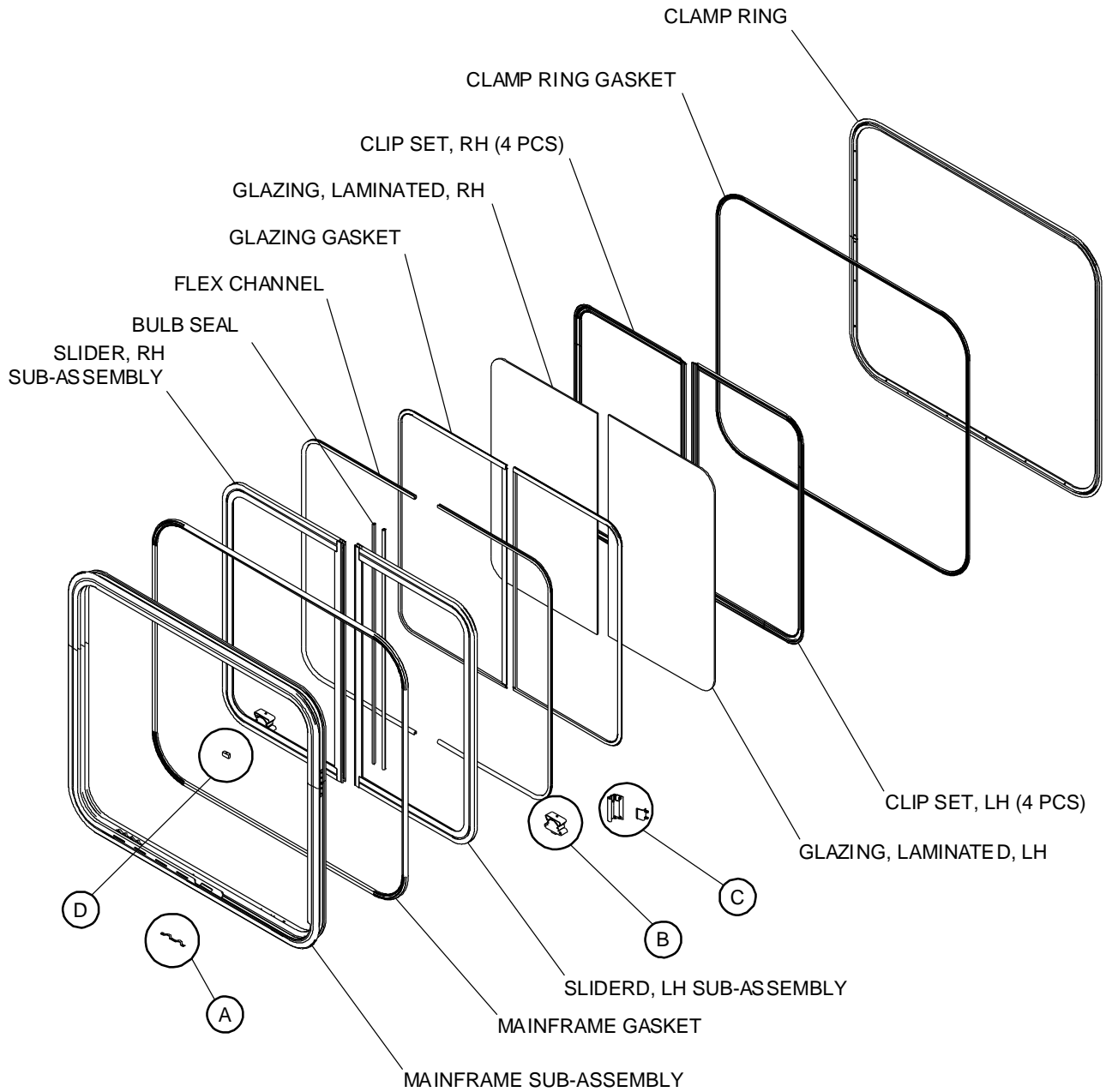
The following general safety precautions must be followed during installation, operation, and maintenance:

- Under no circumstances should installation, maintenance, repair, and adjustments be attempted without the immediate presence of a person capable of rendering aid.
- An injury, no matter how slight, should always be attended. Always administer first aid or seek medical attention immediately.
- Protective eyeshields and appropriate clothing should be worn at all times.
- To avoid injury, always exercise caution when operating and be certain that hands, feet, legs, and clothing are not in the path of product movement.
- Always work in a properly ventilated area.
- Read and thoroughly understand the operating instructions before attempting to operate.
- Inspect the product before each use. If an unsafe condition is noted, such as unusual noises or movements, do not use the window until the problem is corrected.
- Stand clear of doors and windows and keep others clear during operation.
- The product requires regular periodic maintenance. Inspections are recommended at the intervals prescribed in chapter three. The product must be maintained at the highest level of performance.



**E. MAJOR BUS WINDOW COMPONENTS**

The references used throughout this manual are illustrated in **Figures 1-1, 1-2, and 1-3**



RSM0057901

**FIGURE 1-1: STANDARD FRAME BUS WINDOW MAJOR COMPONENTS (DRIVER'S WINDOW SHOWN)**

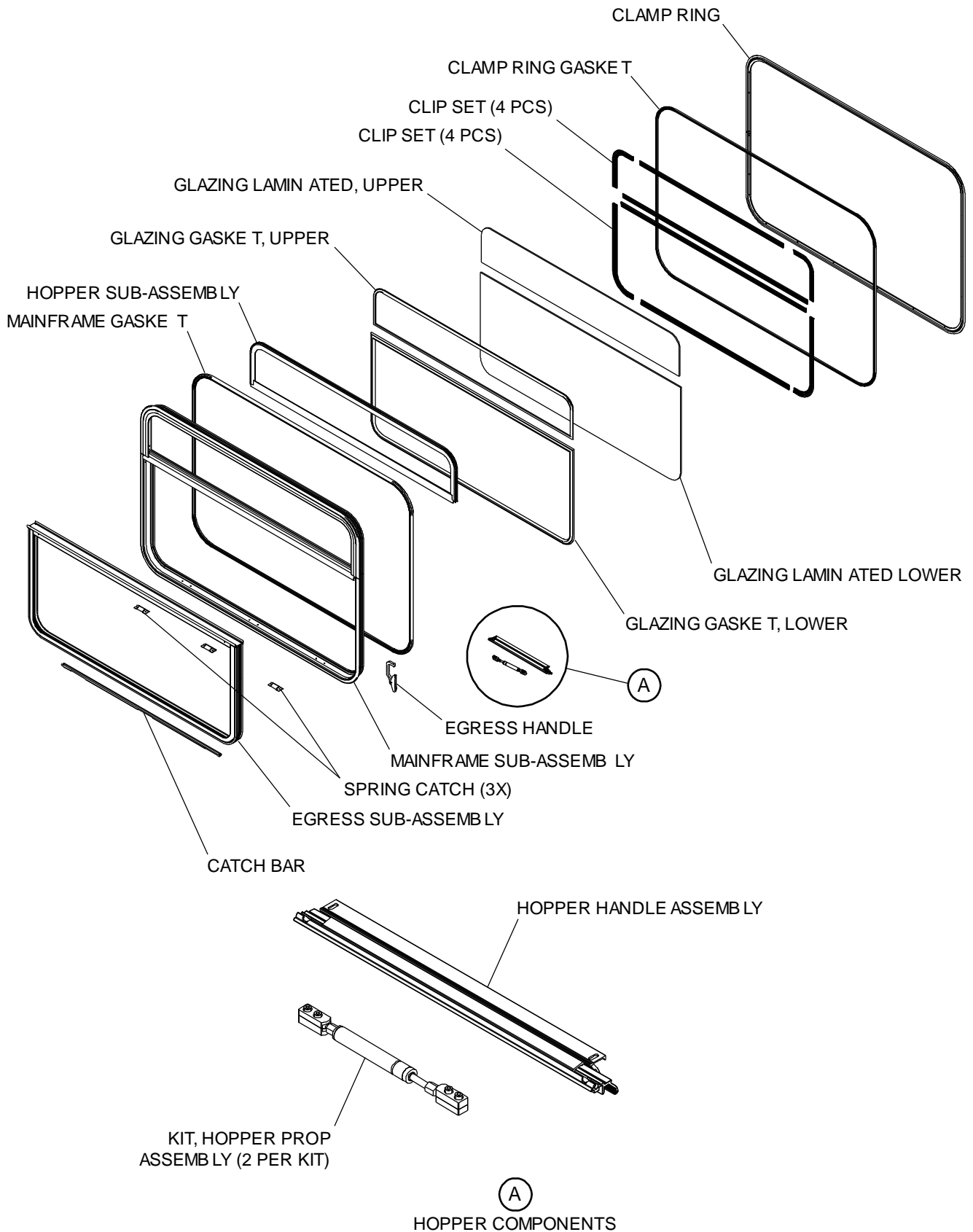


FIGURE 1-2: HIDDEN FRAME BUS WINDOW MAJOR COMPONENTS

RSM0058001

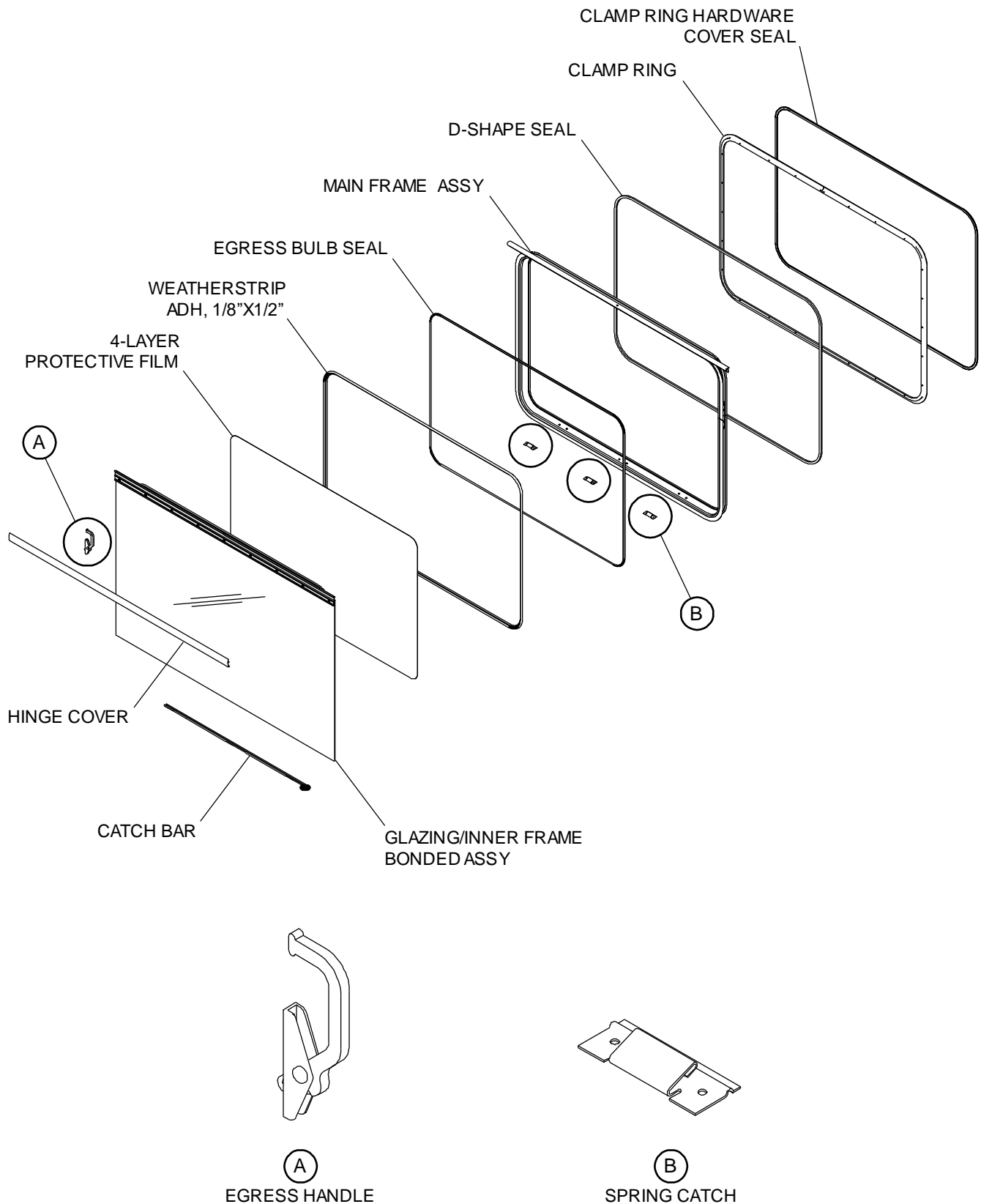


FIGURE 1-3: FULL FIXED HIDDEN FRAME BUS WINDOW MAJOR COMPONENTS

RSM0058300

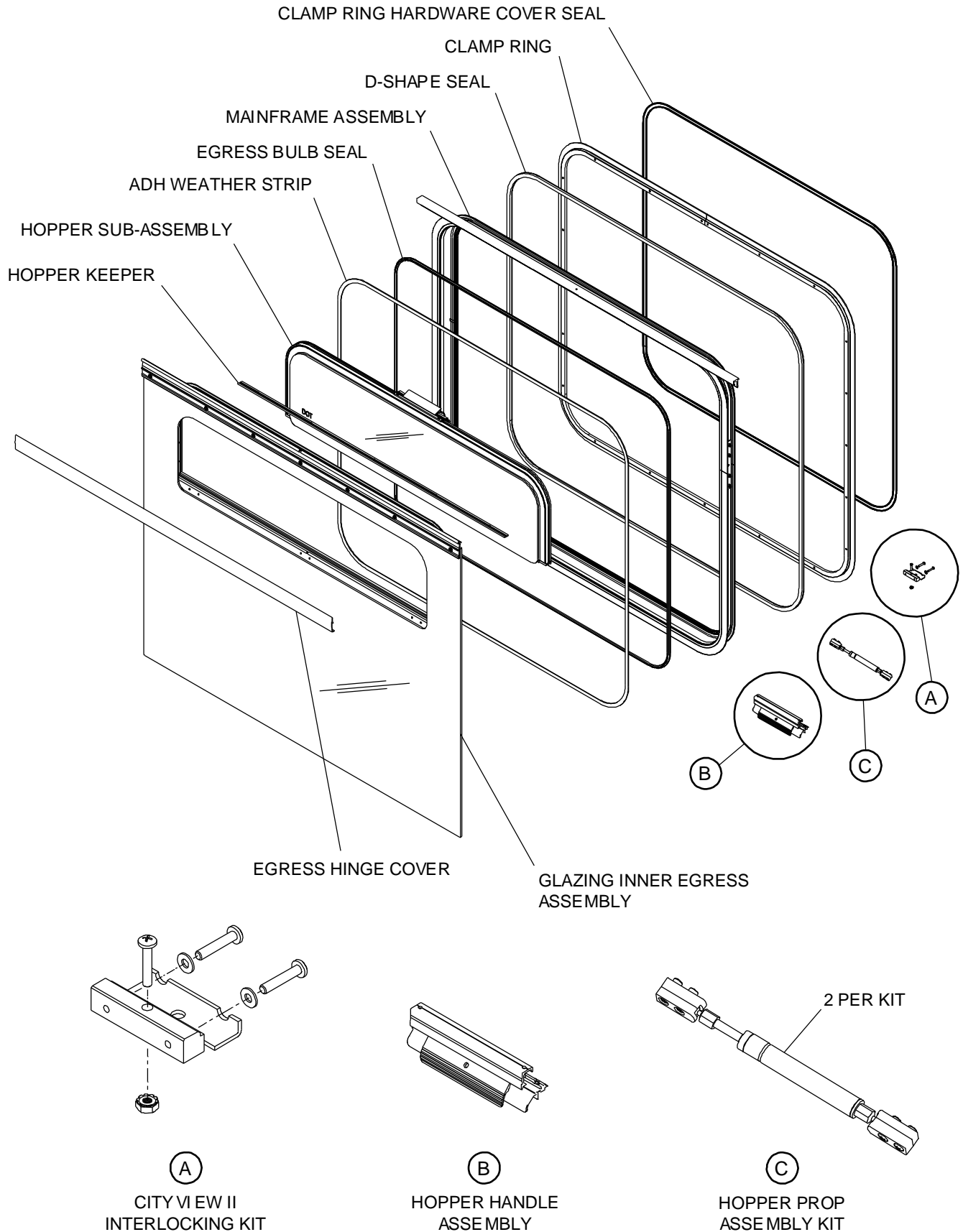


FIGURE 1-4: HOPPER FIXED HIDDEN FRAME BUS WINDOW MAJOR COMPONENTS

RSM0070100

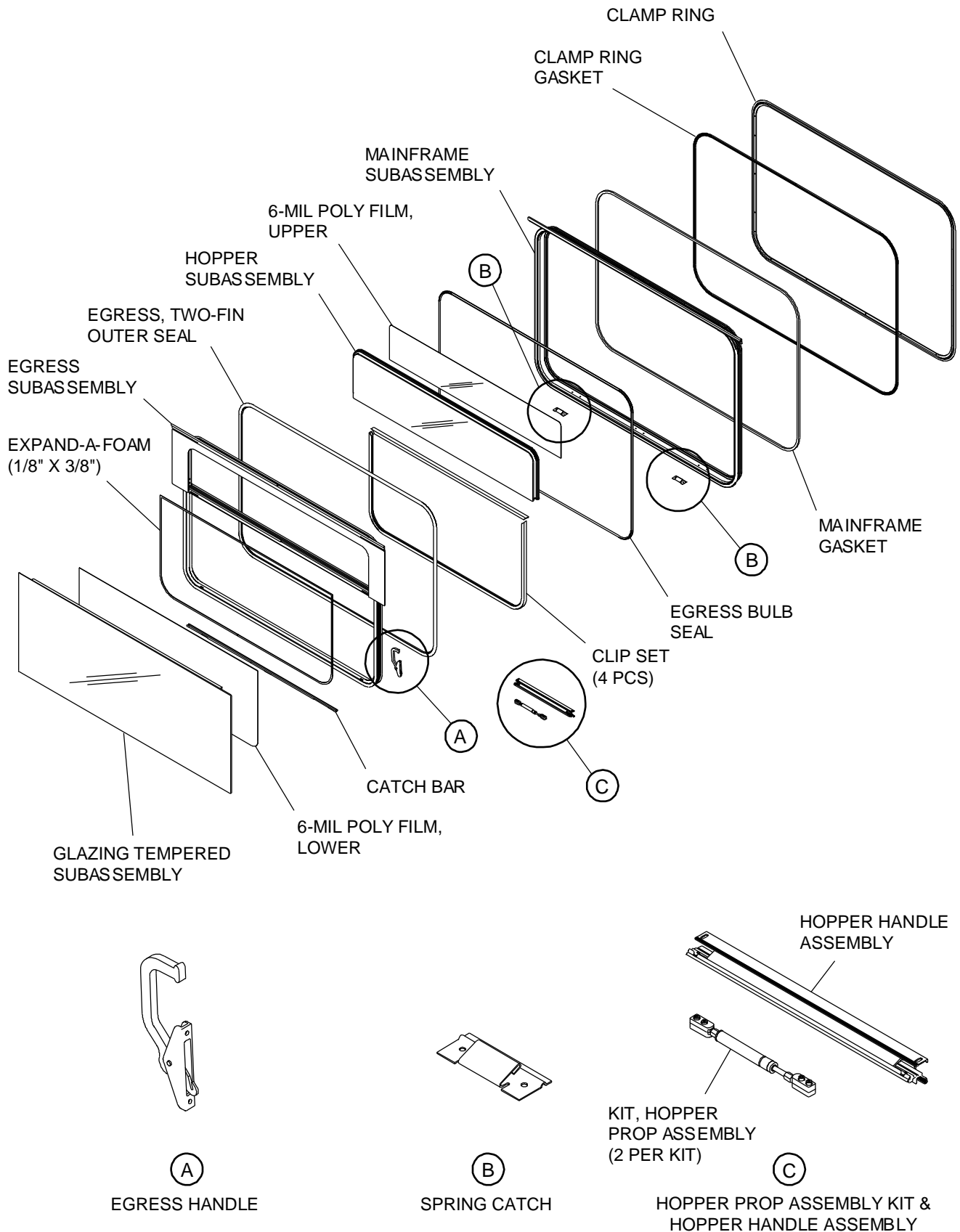


FIGURE 1-5: HOPPER 3/4 EGRESS FRAMELESS BUS WINDOW MAJOR COMPONENTS

RSM0070900

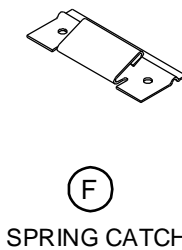
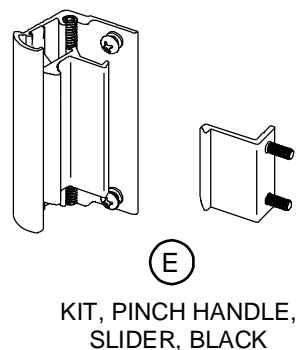
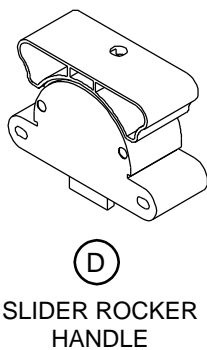
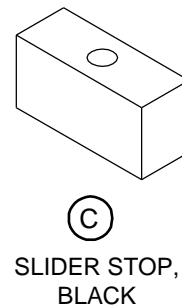
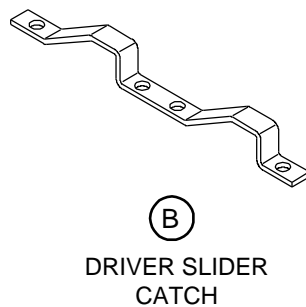
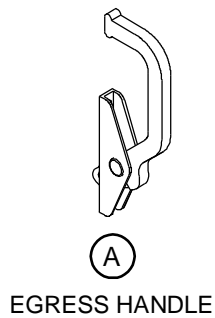
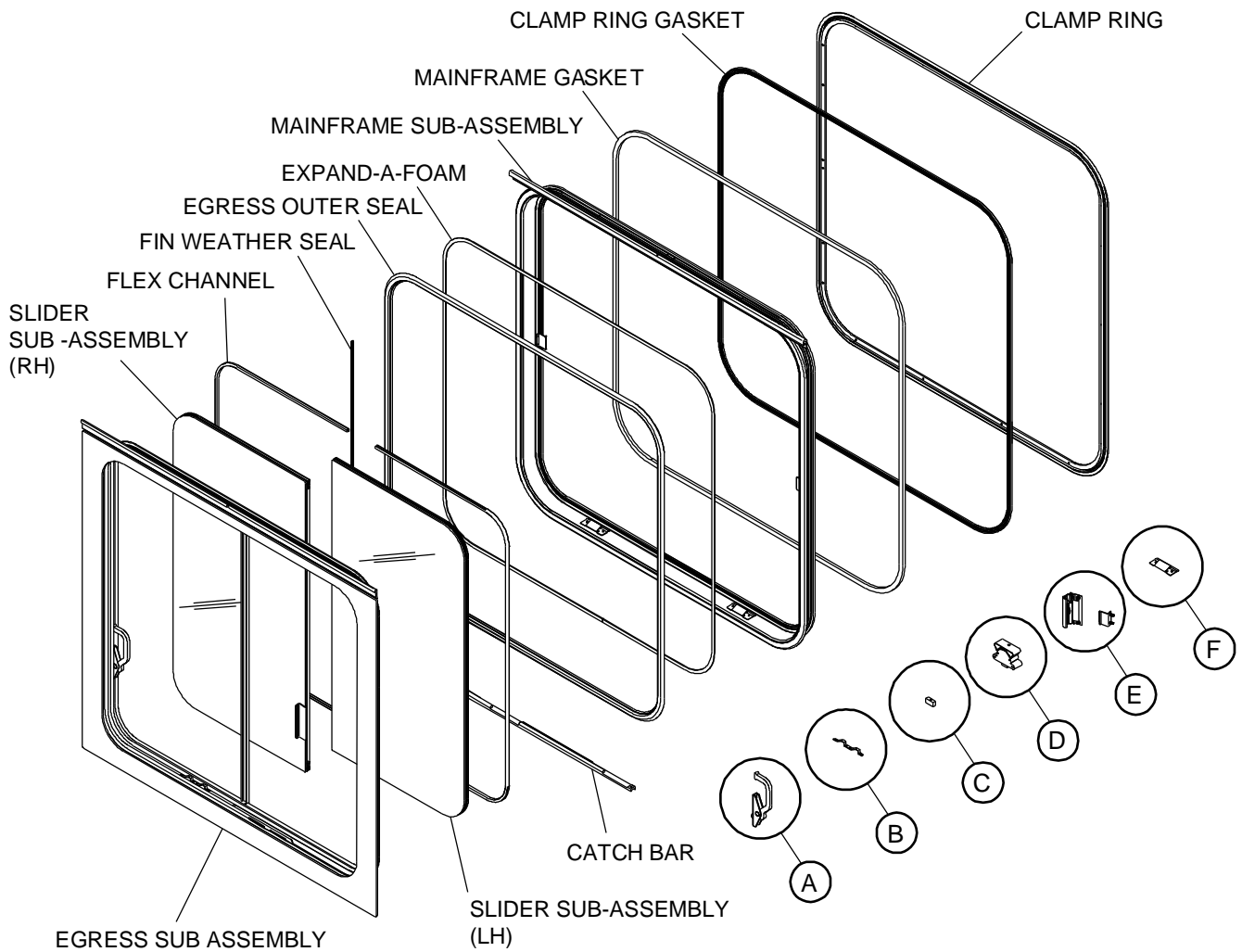
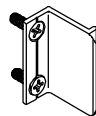
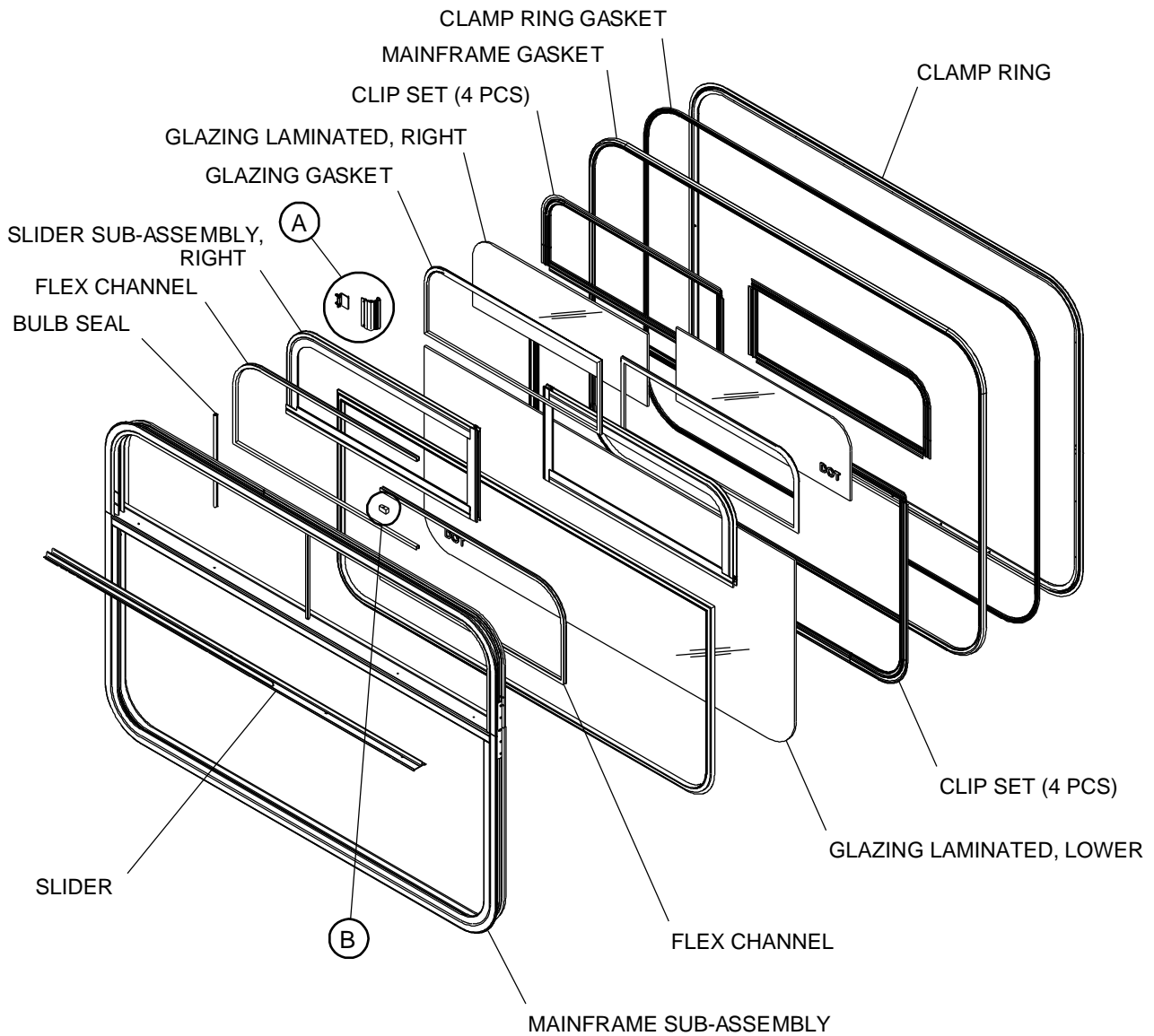


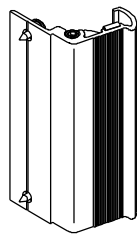
FIGURE 1-6: FRAMELESS, PASSENGER FULL EGRESS SLIDER BUS WINDOW MAJOR COMPONENTS

RSM0071000



(A)

KIT, SLIDER HANDLE ASSEMBLY



(B)

SLIDER STOP, BLACK

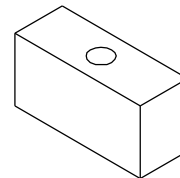


FIGURE 1-7: ROAD SIDE TOP SLIDER, FIXED BUS WINDOW MAJOR COMPONENTS

RSM007 1100

## II. INSTALLATION

This chapter contains instructions for installing most Ricon windows which can be installed in various types of bus vehicles. Due to the wide range of window applications, specific information for every possible application is not available. The following general procedures will apply to most installations. Contact Ricon Product Support for instruction concerning installations not covered. To install Ricon windows refer to following sections and perform procedures carefully and in the order that they are presented. Be certain that installation instructions are followed exactly and do not eliminate any steps or modify the product.

### A. INSPECTION CRITERIA

#### 1. GENERAL SPECIFICATIONS:

Inspection of windows and material used to construct the bus windows will show that the Glazing will be of tempered glass, meeting AS2 and AS3 Light Transmittance (LT) requirements. Driver's windows shall be supplied using tempered glass or laminated glass. The perimeter of all windows will be equipped with non-transparent band or frit on Hidden Frame windows.

#### 2. MATERIALS OF CONSTRUCTION:

Window frames and clips will be constructed of aluminum with a semi-gloss black, polyester powder coated finish. Other finish specifications may be available upon request. Screws shall be SST, Black Oxide. Clamp ring screws shall be low carbon steel, case hardened, with black zinc with clear chromate finish.

#### 3. PERFORMANCE CRITERIA:

The window glazing, if specified, shall be of a 3 minute replacement (with proper tools). This does not include the time it may take to overcome external interferences such as window bars or bus seating, etc. The window glass guard, if supplied, shall be of a 30 second removal replacement (with proper tools). This does not include the time it may take to overcome external interferences such as window bars or bus seating, etc.

#### 4. TOLERANCE CRITERIA:

Overall frame dimensions shall be sized so that the width and length is nominally less than the supplied nominal body opening dimensions, unless otherwise noted specifically.

**For Hidden Frame Windows:** "Z-Dimension" shall have a tolerance of +/- 0.120 in (3mm), as measured from the main frame surface that mates with the bus body seal (without measuring this seal) to the outside plane of the window glazing.

**For Hidden Frame Windows:** Glazing flatness for tempered glass shall be in compliance with *ASTM C 1048-92*.

#### 5. APPEARANCE CRITERIA:

Sealant in joints – Sealant shall be clean in appearance and not excessive, without compromising functionality.

**For Hidden Frame Windows:** Adhesive – Adhesive shall not impede into the frit (dot pattern). Windows shall be free of burrs and sharp edges.

**For Glazing Inspection:** Inspection criteria is based upon 36" inspection distance looking perpendicular to and through the glazing to determine if defects are present on the surface or within the glazing. Ambient light is generated using fluorescent bulbs to detect surface quality. The light source is not to be directly viewed through the glazing. The viewing area beyond the glazing should be kept clear of obstruction for a distance of 25'.

#### 6. SURFACE BLEMISH DEFINITIONS:

**Hairline scratch** (faint) - An extremely fine scratch, similar to a hair, not ragged and not discernable at distance of 36".

**Light Scratch** - A very fine scratch, similar to a hairline, but wider in width, and cannot be located with a fingernail or a razor blade cannot easily be seen at distance of 36".

**Medium Scratch** - A scratch that is wider and deeper than a light scratch and may be located with a fingernail, but is not readily visible at distance of 36".

**Heavy Scratch** - A scratch that is deeper than a medium scratch, can be located with a fingernail and is readily visible at a distance of 36".

**Bubble** - A gaseous bubble within the substrate.

**Dig** - A circular or semi-circular mark penetrating into the glazing surface.



**Rub** - A circular or semi-circular non-penetrating mark on the glazing surface.

**7. ACCEPTABLE GLASS (TEMPERED OR LAMINATED) SURFACE BLEMISH CRITERIA:**

**Hairline Scratch** (faint) – Passable

**Light Scratch** – Less than 6” in length. Multiple light scratches should be scattered.

**Medium Scratch** – Less than ½” in length. Multiple medium scratches to be separated 24” minimum.

**Heavy Scratch** – Not Allowed.

**Dig** - .090” maximum diameter. Multiple digs to be separated 24” minimum.

**Rub** - .250” maximum diameter. Light and non-penetrating. Multiple rubs to be separated 24” minimum.

**8. ACCEPTABLE PLASTIC (POLYCARBONATE) GLAZING SURFACE BLEMISH CRITERIA:**

**Hairline Scratch** (faint) – Passable

**Light Scratch** – Less than 8” in length. Multiple light scratches should be scattered.

**Medium Scratch** – Less than 2” in length. Multiple medium scratches to be separated 4” minimum; no more than 2 per 4 square feet

than 1 per 6 square feet

**Dig** - .090” maximum diameter. Multiple digs to be separated 12” minimum.

**Rub** - .250” maximum diameter. Light and no penetrating multiple rubs to be separated 12’ minimum

**Bubbles** – Maximum diameter .90” Multiple bubbles to be separated 4” minimum; no more than 2 per square feet.

**Chips, Pits, Contaminants** – Maximum diameter .125” multiples to be separated 4” minimum, no more than 2 per 4 square feet.

**9. ACCEPTABLE SECONDARY GLAZING (GLASS GUARD) SURFACE BLEMISH CRITERIA; 6” OR GREATER FROM EDGE:**

**Hairline Scratch** (faint) – Passable

**Light Scratch** – Less than 12” in length. Multiple light scratches should be scattered.

**Medium Scratch** – Less than 2” in length. Multiple medium scratches should be separated 4” minimum; no more than 2 per 4 square feet

**Dig** - .090” maximum diameter. Multiple digs to be separated 12” minimum.

**Rub** - .250” maximum diameter. Light and non-penetrating Multiple rubs to be separated 12” minimum.

**Bubbles** – Maximum diameter .90” Multiple bubbles to be separated 4” minimum; no more than 2 per square feet.

**Chips, Pits, Contaminants** – Maximum diameter .125” Multiples to be separated 4” minimum; no more than 2 per 4 square feet

**10. ACCEPTABLE SECONDARY GLAZING (GLASS GUARD) SURFACE BLEMISH CRITERIA; WITHIN 6” OF EDGE:**

**Hairline Scratch** (faint) – Passable

**Light Scratch** – Less than 18” in length. Multiple light scratches should be scattered.

**Medium scratch** – Less than 6” in length. Multiple medium scratches to be separated 3” minimum; no more than 4 per 4 square feet.

**Heavy Scratch** – Less than 2” in length Multiple heavy scratches to be separated 12” minimum; no more than 2 per 4 square feet.

**Dig** - .125” maximum diameter. Multiple digs to be separated 6” minimum.

**Rub** - .250” maximum diameter. Light and non-penetrating Multiple rubs to be separated 8” minimum.

**Bubbles** – Maximum diameter .90” Multiple bubbles to be separated 2” minimum; no more than 4 per 4 square feet.

**Chips, Pits, Contaminants** – Maximum diameter .125” Multiples to be separated 2” minimum; no more than 4 per square feet.

**11. ACCEPTABLE GRAFFITI FILM SURFACE BLEMISH CRITERIA; 6” OR GREATER FROM EDGE:**

**Hairline Scratch** (faint) – Passable

**Light Scratch** – Less than 12” in length. Multiple light scratches should be scattered.

**Medium Scratch** – Less than 2” in length. Multiple medium scratches should be separated 4” minimum; no more than 2 per 4 square feet

**Dig** - .090” maximum diameter. Multiple digs to be separated 12” minimum.

**Rub** - .250” maximum diameter. Light and non-penetrating Multiple rubs to be separated 12” minimum.

**Bubbles** – Maximum diameter .90” Multiple bubbles to be separated 4” minimum; no more than 2 per square feet.

**Chips, Pits, Contaminants** – Maximum diameter .125” Multiples to be separated 4” minimum; no more than 2 per 4 square feet

**12. ACCEPTABLE GRAFFITI FILM SURFACE BLEMISH CRITERIA; WITHIN 6” OF EDGE:**

**Hairline Scratch** (faint) – Passable

**Light Scratch** – Less than 18” in length. Multiple light scratches should be scattered.

**Medium scratch** – Less than 6” in length. Multiple medium scratches to be separated 3” minimum; no more than 4 per 4 square feet.

**Heavy Scratch** – Less than 2” in length Multiple heavy scratches to be separated 12” minimum; no more than 2 per 4 square feet.

**Dig** - .125” maximum diameter. Multiple digs to be separated 6” minimum.

**Rub** - .250” maximum diameter. Light and non-penetrating Multiple rubs to be separated 8” minimum.

**Bubbles** – Maximum diameter .90” Multiple bubbles to be separated 2” minimum; no more than 4 per 4 square feet.

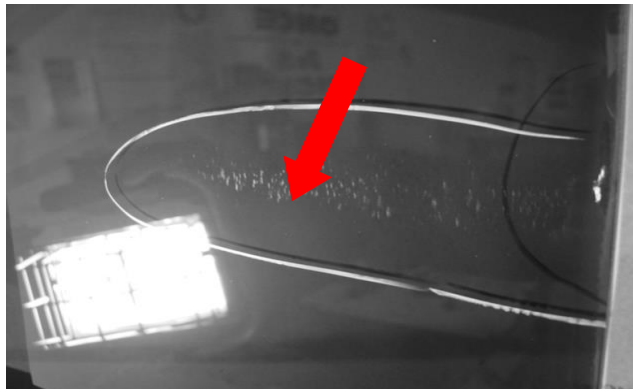
**Chips, Pits, Contaminants** – Maximum diameter .125” Multiples to be separated 2” minimum; no more than 4 per square feet

**NOTE: Graffiti Film may contain multiple Liquid-Filled Bubbles between the Primary Glazing and Graffiti Film upon receipt of windows. This is normal due to the installation method and should evaporate within approximately 2 weeks.**

Once Installed, Graffiti Film should have a maximum gap of .15” between the edges of the Graffiti Film and the Edges of the Window Clips/Frame. Edges and Corners of Graffiti Film must lay flat on the Glazing and in no way should be lifting or peeling.

**13. GLAZING**

- a. Refer to **Figure 2-1**. The shipping and handling packaging should maintain proper window spacing to prevent the windows from rasp/scratch by rubbing against eachother. The spacer blocks must be in good condition and of proper thickness to ensure a gap remains between each piece of glazing, even with heavy loads.



**FIGURE 2-1: DEFECTS IN THE GLAZING**

- b. No chips, cracks, scratches, gouges, etc...allowed on the edges or surface of glazing. Refer to **Figure 2-2**.

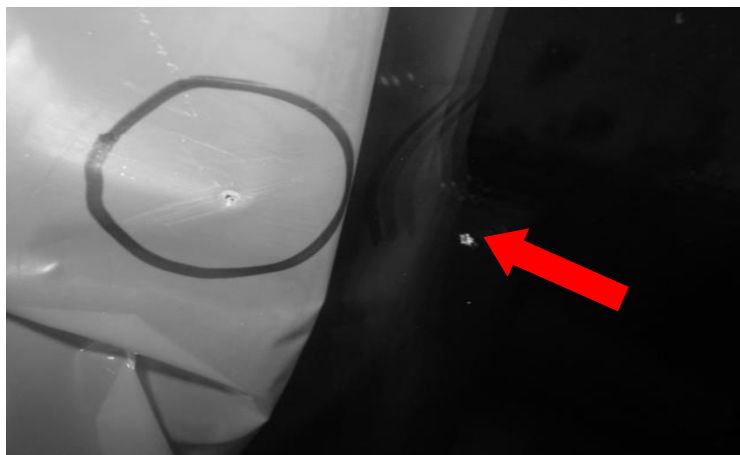


**FIGURE 2-2: DEFECTS IN THE GLAZING**

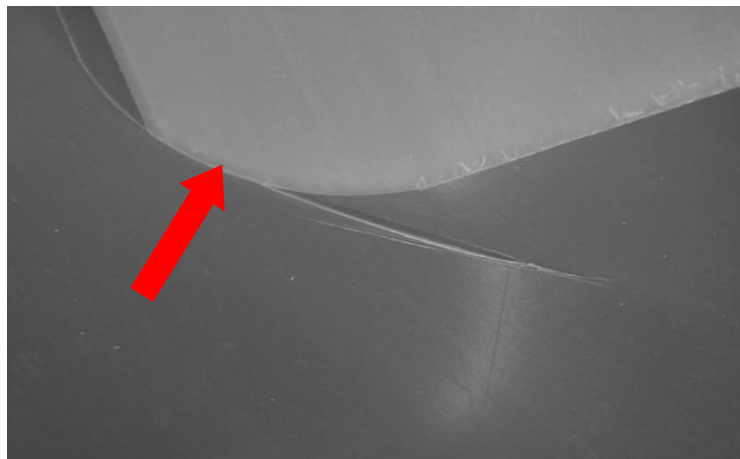
- c. If any conditions are found other than what is specified, material must be rejected, and placed in QC hold area waiting disposition.

**14. ACRYLIC (GLASS GUARD)**

- a. When the window is ordered with glass guard, the customer has the option of receiving the glass guard with or without protective film placed on the surface towards the interior of the bus. The protective film must be in good condition with no evidence of scratches, gouges or missing film coverage. Refer to **Figure 2-3** and **2-4**.




**FIGURE 2-3: DEFECTS THROUGH PROTECTIVE FILM AND ONTO GLASS GUARD SURFACE**



**FIGURE 2-4: SCRATCHED EDGE OF GLASS GUARD**

15. POWDER COAT/ANODIZE

 <b>CAUTION</b>
<p>Components that have a surface finish must be handled with extra care. It is easy to damage the surface of these parts. When handling these parts <b>DO NOT</b> allow part to make contact with each other.</p>

- a. Anodized thickness requirements are the same for both clear and black anodizing. The Minimum finish thickness is 0.7 mil. Use the CGX Thickness Gauge to verify this requirement.

16. FILLER PLATE AESTHETIC/APPEARANCE INSPECTION

- a. **Surface Blemish Definition:**

**Hairline Scratch** – An extremely fine scratch, similar to a hair, not ragged and not visually perceptible at distance of 36”.

**Light Scratch** – A similar scratch to a hairline but wider and cannot be detected with a fingernail or razor blade. Not easy to see at 36” distance.

**Medium Scratch** – A scratch that is wider and deeper than Light Scratch and may be detected with a finger nail. Not easy to see at 36” distance.

**Heavy Scratch** – A scratch that is deeper than a Medium Scratch. Can be detectable with finger nail and is readily visible at distance of 36”.

**Dig** – A circular or semi-circular mark penetrating in to the painted surface.

**Rub** – A circular or semi-circular non-penetrating mark in to the painted surface.

**Orange Peel** – Much like the skin of an orange which results from poor coalescence of atomized paint droplets (Wavy appearance of the painted surfaces). Poor flow, poor leveling, pebbling (grainy surface).

**Gloss** – Shininess of the painted surfaces.

**Bubble** – Moisture blistering caused by migration of water through interior wall to the exterior due to improper surface preparation prior to paint.

**Fish Eyes** – Paint coat pulls away from painted surface creating holes or Craters that look like a small white dot surrounded by a ring of paint.

- b. **Inspection Distance:** Inspection criteria is based upon 36” inspection distance looking perpendicular to the filler plate and using ambient light.

- c. **Acceptance Criteria:**

**Hairline Scratch** (faint) – Passable.

**Light Scratch** – Passable. Multiple scratches should be scattered.

**Medium Scratch** – Less than 1/2” in length is considered a pass. Multiple medium scratches to be separated 12” min. in order to pass.

**Heavy Scratch** – Not allowed.

**Dig** – Ø.090” max. diameter. Multiple digs to be separated 24” min.

**Rub** – Ø.250” max. diameter. Light and non-penetrating. Multiple rubs to be separated 24” minimum.

**Orange Peel** – If available inspect via optical evaluation using a BYK Gardner Wave-Scan and software. The scale used in this software is “rating” from ACT Laboratories Inc. This scale rates orange peel from 1-10 (1 being rough texture and 10 being a glass finish). The average on this painted part finish is 5. The requirement of orange peel with this method is ≥ 3.1. If no Optical equipment is available to inspect the Orange Peel, use acceptance panel sample piece approved by Ricon Corp for visual approval.

**Gloss** – To be inspected by matching it with acceptance panel sample piece approved by Ricon Corporation.

**Bubble** – No pass.

**Fish Eyes** – Maximum diameter 2mm (.080”), primer not exposed; less than 3 per Sq. Ft.

## B. GENERAL BUS WINDOW INSTALLATION

This section contains instructions for installing Ricon Bus Windows. The following general procedures apply to most installations. However, it is impractical to provide specific information in this manual for every possible application. Bus manufacturers have their own installation procedures or method of installing windows. Technical aspects of the processes covered in this section must be followed for any bus installation using Ricon Bus Windows. Please contact Ricon Engineering for support and assistance for your window configuration if your window application is not covered in this section.

### 1. EQUIPMENT, TOOLS, FIXTURES

The use of proper lighting and ventilation is recommended for proper installation and accurate visual inspection for Ricon bus windows. Follow all safety precautions before attempting to maintain or replace bus windows.

**NOTE:** Sealant (option-3M Auto bedding and glazing compound (3M P/N 08509) or equivalent, non-hardening) product is utilized in applications detailed in this section.

- a. Air Supply
- b. Drill
- c. Drill Bit T-20
- d. Seal Pick – blunt point, hook type

#### CAUTION

Wear safety glasses and use caution when working with air supply. Never use air supply to blow off debris from clothing or body parts. Pressure used to blow off window assemblies should not exceed 30 psi. Items such as flood lamps may cause burns from improper handling. Ensure that the light guard is over the lamp. Do not dispose of hazardous materials in drains. Check MSDS for proper disposal.

### 2. WINDOW PREPARATION

- d. Cut open the end of the shipping container leaving the container strapped to the pallet on the sides
- e. Using the bus layout, identify the first window to be installed. The window bus set is packed in individual boxes with labels on the end of each box identifying the window.
  1. Cut the end of the box and carefully pull the window out.
  2. Set the window on a bench with the outside of the window face down.
  3. Be careful not to damage the window.

**NOTE:** Remove one window at a time from the shipping container.

- f. Verify that the label at the top of the window matches the label on your layout sheet.
- g. Inspect for scratches and gouges in the frame, or glass guard film. If any are found in the glass guard film, pull the glass guard film back to inspect the covered area for defects.

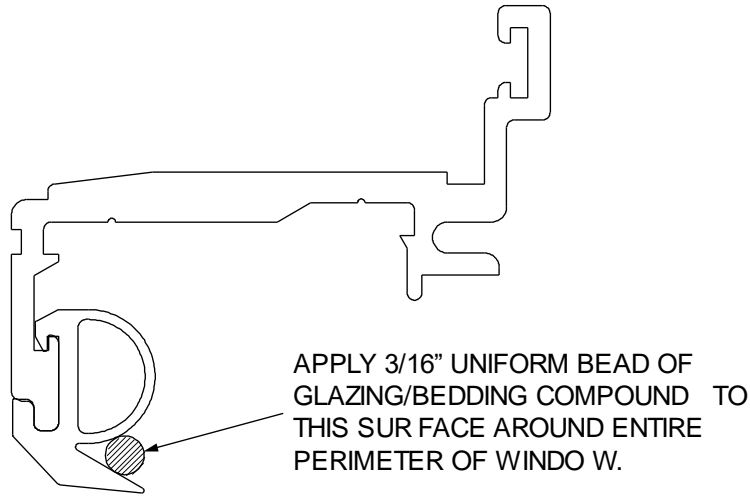
**NOTE:** Immediately notify Ricon of any defects before proceeding with installation.

- h. Remove clamp ring from window. Note where the clamp ring splice is in relation to the window. The window main frames are pre-drilled to match the clamp ring. This clamp ring must be installed the same way it was shipped.
- i. Inspect window main frame to ensure proper seal attachment.
  1. This can be done by slightly pulling on the blade of the seal
  2. When the seal has not been attached properly, the seal will pull away from the frame. Re-attach if needed.

**NOTE:** Improper attachment of main seal will cause installation problems and possible leaks.

**Optional** – The following step may be needed to achieve a watertight seat. This is not required for all installations.

- j. Refer to **Figures 2-5**. Apply a thin bead of sealant around the bulb part of the seal to achieve watertight seal.




RSM0023100

FIGURE 2-5: P/N 2062 SEAL OPTION – TRADITIONAL FRAME

**3. WINDOW INSTALLATION**


These instructions are for general window installations applicable to CityView® Standard Frame/Hidden Frame Windows and CityView® II Hidden Frame Windows. All window installations may vary according to vehicle manufacturer. All window applications are not covered in this general window installation. For more detailed information pertaining to window applications, contact Ricon Engineering.

 <b>CAUTION</b>
Latex gloves must be worn at all times. Constantly replace latex gloves when they become dirty and have holes.

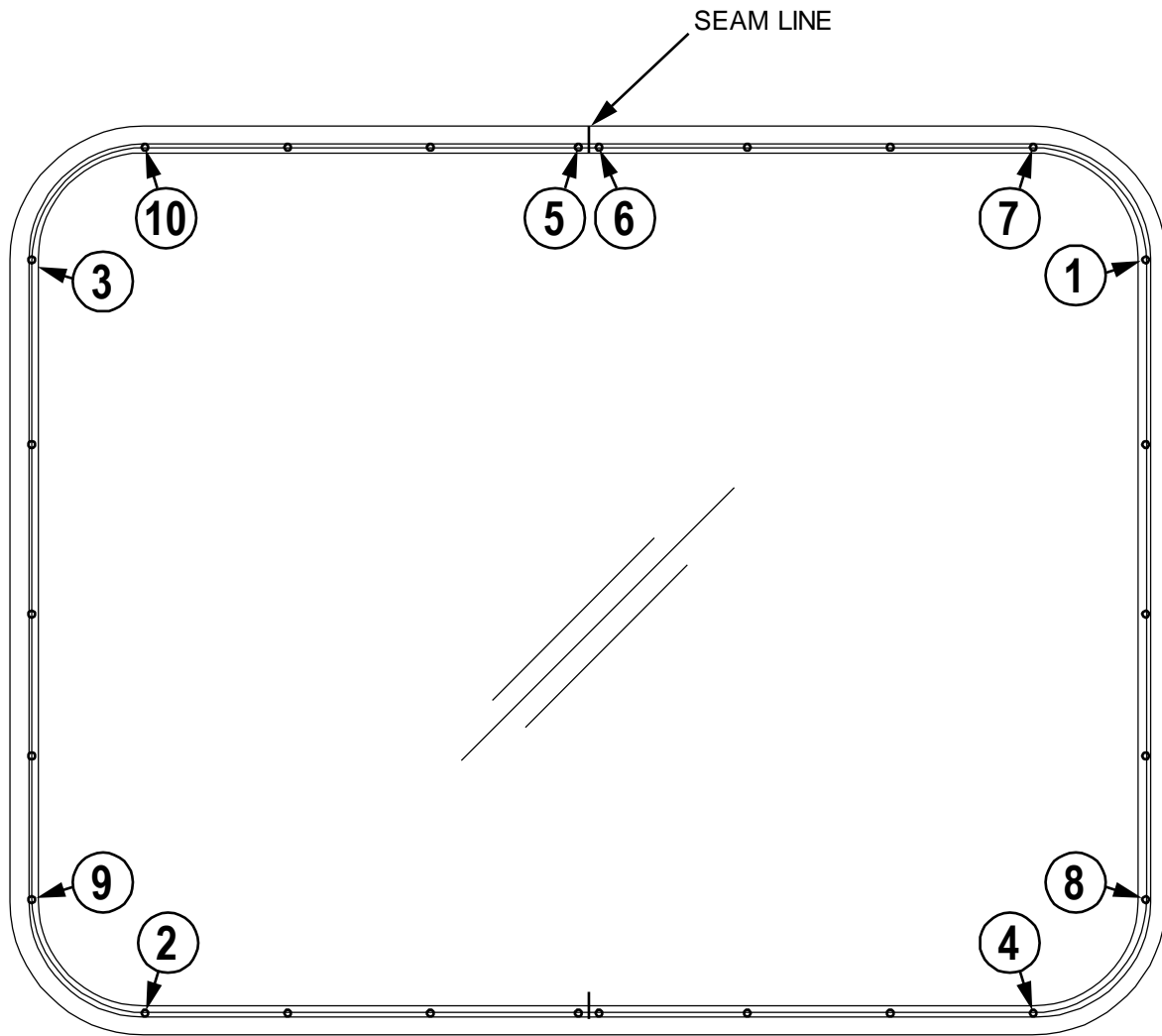
- a. Two technicians must pick-up window to place into bus window mainframe opening without knocking the main seal off the main frame.

**NOTE:** If seal comes off the main frame, place the window back on the bench and perform step 6 from the previous section.

- b. While one person is holding the window in place, install four clamp ring screws. To install a clamp ring screw, position with splice in the proper location.
  - 1. Refer to Figure 2-6. Install screws 1 through 10 into each pre-drilled hole, following the sequence order shown, inserting only up to 3/4 of the screw. Do not over tighten.
  - 2. Refer to Figure 2-6. Install all remaining screws all around, inserting only 3/4 of the screw.
  - 3. Attach clamp rings horizontally and vertically. Ensure that the clamp rings are properly aligned before continuing.
  - 4. After installing all screws, notify the person holding the window that it is ok to release it.

 <b>CAUTION!</b>
Use extreme caution not to damage seal when using seal pick.

- 5. Inspect the outside of the main seal to ensure it has not rolled under.
- 6. Refer to Figure 2-6. Begin to apply full torque of 45 inch-lbs to screws #1-10 using the diagram sequence.
- 7. Refer to Figure 2-6. Continue applying full torque of 45 inch-lbs. to the remaining screws.



RSM0070000

**FIGURE 2-6: TORQUE SEQUENCE**

8. Inspect window installation by testing the function of the window, egress, slider, hopper, etc. Make any required adjustments needed to ensure proper operation.
9. Inspect the outside and wipe off any visible sealant.
10. Installation on the first window is now complete. Follow the same procedures to install the rest of the windows. Install one window at a time.

**C. VERIFY INSTALLATION**

- Be certain that no vehicle components interfere with operation of windows.
- The vehicle structure must be capable of supporting window operations as well as forces caused by motion of vehicle when it is driven.
- Run windows through several complete cycles while checking for proper operation.

### III. MAINTENANCE AND REPAIR

**R**egular maintenance of the RICON Windows will help optimize performance and reduce the need for repairs. This chapter contains cleaning instructions, maintenance schedule, troubleshooting section, and maintenance diagrams where applicable.

#### A. CLEANING

Regular cleaning with mild soap (i.e. dish soap, car wash liquid) and drying thoroughly will protect painted surfaces. Cleaning is especially important in areas where roads are salted in winter. Make sure that window elements remain clear and clean.

#### B. MAINTENANCE SCHEDULE

Under normal operating conditions, maintenance inspections are required at least every six months and a thorough inspection should be performed at service intervals referenced in **Table 3-1**. Service should be increased under conditions of heavier use (more than 10 cycles per day).

TABLE 3-1: MAINTENANCE SCHEDULE	
SERVICE POINT	ACTION TO PERFORM
<b>DAILY</b>	
Overall condition	Listen for abnormal noises as window operates (i.e. grinding or binding noises.)
<b>WEEKLY</b>	
Latches	Inspect latches for loose hardware, brackets, etc.
Hardware	Verify that hardware fasteners are properly tightened.
Mounting points	<ul style="list-style-type: none"> <li>▪ Verify that window mounting and support points are undamaged.</li> <li>▪ Verify that mounting bolts are sufficiently tight and free of corrosion.</li> </ul>
Mechanical pivots	Verify that brackets are properly installed, free from damage, and locked in position.
Window pivot points	Verify that window moves freely, without binding, and does not wobble.
<b>30 DAYS</b>	
Egress Window Assy	<p>Regular maintenance is the responsibility of the owner/operator. Ricon recommends that all Egress Window Assemblies be inspected for proper operation at least every 30 days or more often as needed for proper compliance with FMVSS #217 requirements, but no later than 90 days per FMCSA 396.3, Inspection, repair and maintenance regulation.</p> <p>Regular maintenance of the Emergency Release Handle mechanism requires the operator to inspect, remove debris, and lubricate window components and test as part of a regular maintenance cycle.</p>
<b>END OF TABLE</b>	

#### C. WINDOW REPLACEMENT

This window replacement guide is designed to provide logical starting points to locate general problems that could occur with bus windows. Window glass guard removal is similar for Standard Frame and Hidden Frame Windows. Installation of Standard Frame and Hidden Frame Windows differ. Window glass guard is an option per window configuration. Contact Ricon Product Support for any details not covered in these guides.

 **WARNING**

THE TROUBLESHOOTING GUIDES DO NOT INCORPORATE ROUTINE SAFETY PRECAUTIONS OR PRELIMINARY PROCEDURES. DURING THE RICON WARRANTY PERIOD A TRAINED, RICON DEALER OR QUALIFIED SERVICE TECHNICIAN MUST PERFORM TROUBLESHOOTING. AFTER THE WARRANTY PERIOD, IT IS RECOMMENDED THAT TROUBLESHOOTING BE CONTINUED BY A QUALIFIED SERVICE TECHNICIAN.

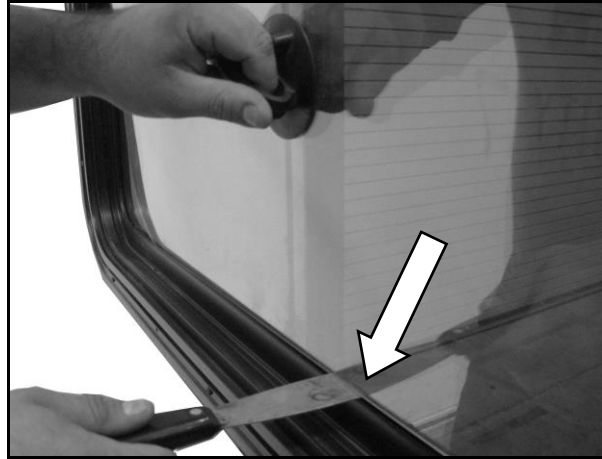
##### 1. STANDARD FRAME WINDOW GLASS GUARD REPLACEMENT

###### a. Standard Frame Window Glass Guard Removal

- 1) Refer to **Figure 3-1**. Move window glass guard upward. This will reveal bottom edge of window glass guard. This can be done by hand, simply pushing or “Popping” window glass guard up, or using a putty knife will pry window glass guard up.



**NOTE:** Window glass guard is optional per window configuration. If window glass guard is not installed, start with Standard Frame Window Glazing Replacement section.



**Figure 3-1. LIFT STANDARD FRAME WINDOW GLASS GUARD**

- 2) Refer to **Figure 2**. Once bottom edge of window glass guard clears clip, pull center area of window glass guard inward, away from window glazing using the suction cup (P/N 9109). Window glass guard will bow in the lower middle area allowing for removal of the lower corners and sides.



**Figure 3-2. PULL STANDARD FRAME WINDOW GLASS GUARD USING SUCTION CUP**

- 3) Remove both lower corners, one at a time.
- 4) Continue to pull window glass guard downward, working on removing one side out from the bottom up.
- 5) In doing this, window glass guard will clear top clip and should be able to bow the upper middle and remove one upper corner, then the other. Carefully remove window glass guard.

#### **b. Standard Frame Window Glazing Cleaning**

- 1) It is recommended that window technicians wear latex gloves at this time.
- 2) Window technician will blow out window insuring that all debris is removed.
- 3) **Glazing Cleaning.** Window glazing is cleaned using glass cleaner and wiped off with a paper towel to remove any grease, adhesive, labels, etc.
- 4) Window is blown off again to ensure all debris is removed.
- 5) Preparation of the window is complete and ready for installation of Anti-Graffiti Glass Guard.

**NOTE:** If any debris is found, repeat this process until all debris is removed.

- 6) **Glass Guard Cleaning.** The old window glass guard is reusable, if found to be in good condition. Clean window glass guard using a paper towel. Spray a small amount of glass cleaner onto paper towel then wipe window glass guard in one direction.

**NOTE:** Do Not spray glass cleaner directly onto window glass guard. Always spray glass cleaner onto paper towel then wipe.

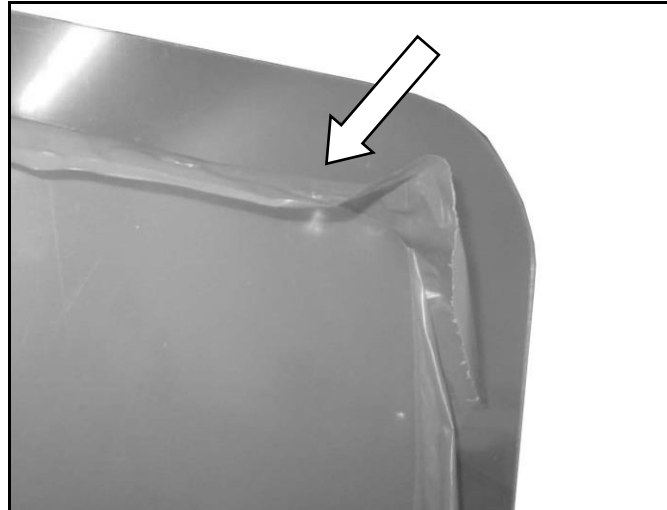
- 7) If replacing window glass guard, window technician will not need to clean it. Replacement glass guard comes with protective film on both sides.

**c. Standard Frame Window Glass Guard Installation**

It is recommended to wear latex gloves. Replace as needed throughout this process.

**NOTE:** Always hold window glass guard from the edges, trying not to touch either surface.

- 1) Completely remove film from one side of window glass guard.
- 2) Refer to **Figure 3-3**. Pull film back from edge of other side of window as needed. Approximately 2" is required of the window glass guard.



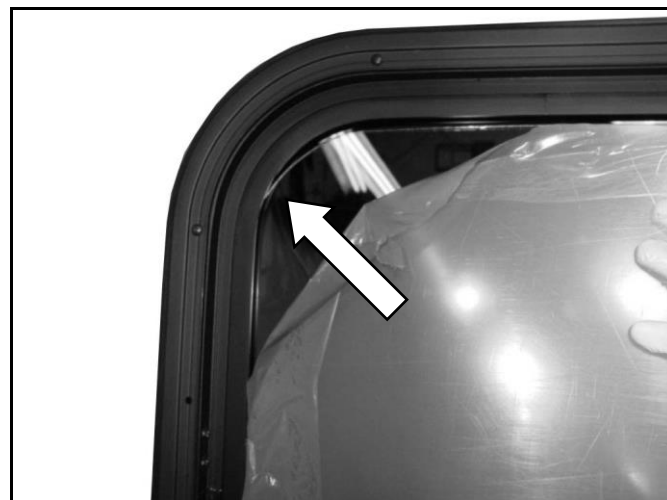
**FIGURE 3-3. PULL FILM FROM EDGE OF GLASS GUARD APPROXIMATELY 2"**

- 3) Blow off window glass guard with air.
- 4) Visually inspect for any debris that may still be attached to window glass guard.

**NOTE:** Clean window glass guard in an area away from window ready for glass guard installation. Make sure when blowing off glass guard with air, DO NOT blow air in direction of window frame with cleaned glazing.

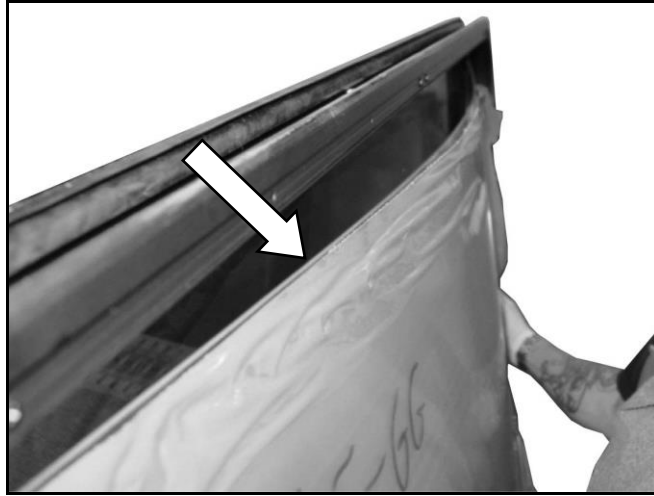
**NOTE:** Window glass guard will be installed with exposed side to window glazing.

- 5) Refer to **Figures 3-4** and **3-5**. Insert window glass guard into both upper corners and sides.



**FIGURE 3-4. INSTALL UPPER CORNERS**

- 6) Allow glass guard to bow in middle section to allow insertion of both sides, top first.



**FIGURE 3-5. BOW IN MIDDLE SECTION**

**NOTE:** When installing glass guard into Egress Windows, Always insert glass guard under Egress handle, first.

- 7) Window glass guard must be installed at sides and top first, as glass guard is inserted under the side and while pushing glass guard against Glazing.

**NOTE:** Always hold upward pressure. The Window Glass Guard will lay flat against the glazing, and the center bow of the glass guard, at the top will disappear.

- 8) Hold upward pressure on the glass guard keeping it installed under the clip, at the top and sides.
- 9) Lower corners are then installed which may require that window glass guard be bowed at bottom, center part of Glass Guard.
- 10) Insert one corner at a time into side clip, then onto other side. After both sides are installed, Glass Guard should lay flat against Glazing with no bow in window glass guard.

**NOTE:** Hopper window glass guard are inserted using same basic method. Insert in top, side then insert glass guard across the top working towards the opposite side until top is completely installed. Then insert glass guard into bottom on one side then the other.

**NOTE:** If window panel only has one radius corner, start with the squared off corner end first and the radius end last, using same basic method.

- 11) Move window glass guard downward into and under the lower clip.
- 12) Visually inspect Window along the top and sides of the clip area to verify window glass guard edge is not exposed.
- 13) Check movement of window glass guard and ensure it functions properly by moving window glass guard to the maximum upward position.

**NOTE:** Gap between window glass guard and the lower clip should be visible. Gap should allow window glass guard to be removed. Large visible gap will disengage at the top with window glass guard installed into the lower clip.

- 14) Move window glass guard back down and seat back into lower clip.
- 15) Verify that no debris is present between the window glass guard and Glazing by pulling back film then replacing it.

If any debris is found, remove window glass guard, repeat window glass guard installation process and ensure all debris is removed.

## 2. STANDARD FRAME GLAZING REPLACEMENT

### a. Standard Frame Glazing Removal

**NOTE:** If window is equipped with a glass guard, follow Standard Frame Window Glass Guard Removal Instructions in 32ii447e.

- 1) Refer to **Figure 3-6**. Remove clips to release window glazing.

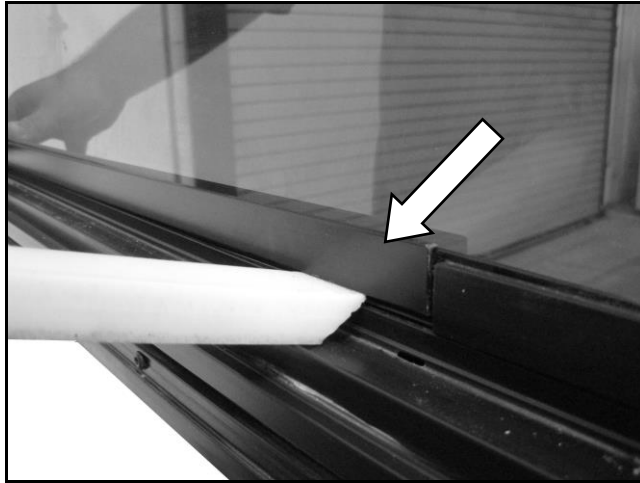


FIGURE 3-6. REMOVE CLIPS (STANDARD FRAME)

**NOTE:** Before accomplishing this remember how they come out, (mark if needed) because they are cut to fit only one-way. Clip will be removed using the “Glazing Stick” and the small mallet.

- 2) Refer to **Figure 3-7**. When removing clips, start with bottom clip first. Remove top clip last.

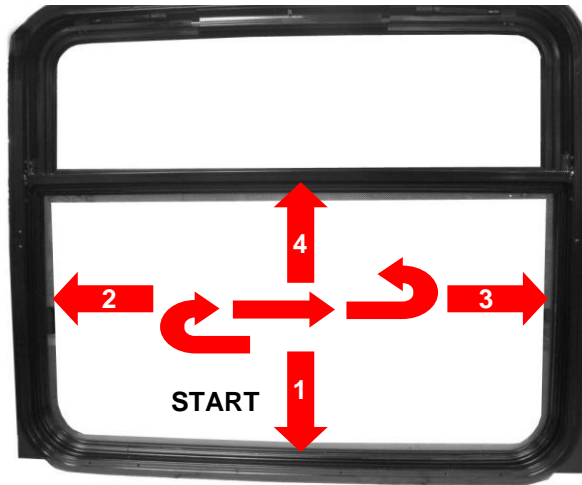


FIGURE 3-7. REMOVE CLIPS (IN ORDER SHOWN)

- 3) Refer to **Figure 3-6**. Place tapered end of glazing stick at the intersection (angle side to glazing) of the frame and the clip and tapping with the mallet until a gap appears.
- 4) Refer to **Figure 3-8**. Remove side clips in order shown. Top clip will be removed last.



FIGURE 3-8. REMOVE GLAZING

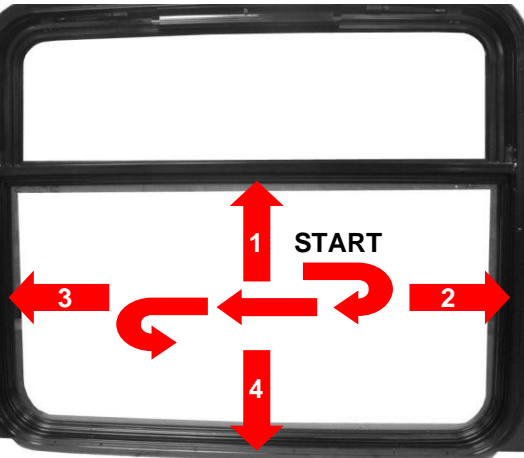
- 5) Refer to **Figure 3-8**. Carefully remove glazing from window frame.

**d. Standard Frame Glazing Installation**

- 1) Install replacement glazing in opening.

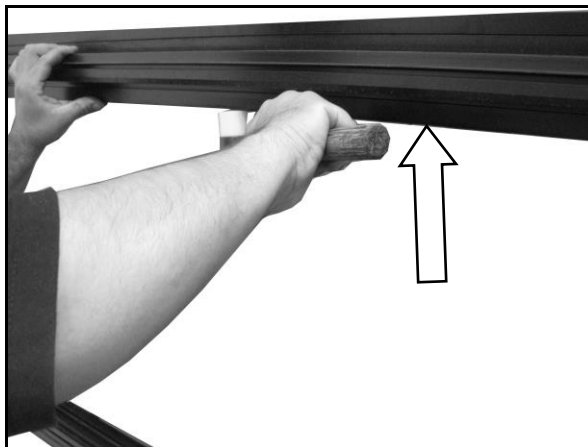
**NOTE:** Clips need to be tapped to close the channel for a tight fit.

- 2) Refer to **Figure 3-9**. Replace clips starting at top and work clockwise.



**FIGURE 3-9. REPLACE CLIPS (IN ORDER SHOWN)**

- 3) Refer to **Figure 3-10**. Verify that clips are securely fastened. Use a plastic tip mallet to lock clips in place. If clips are hand loose, new sets of clips must be ordered and installed.

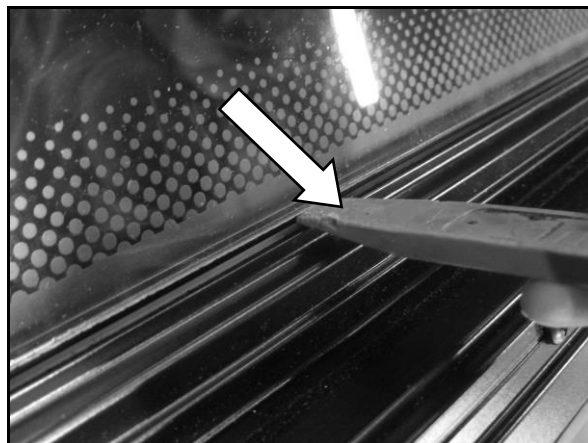


**FIGURE 3-10. INSTALL TOP CLIP FIRST**

- 4) Clean window glazing with window cleaner and clean cloth.

**3. HIDDEN FRAME WINDOW GLASS GUARD REPLACEMENT**

**a. Hidden Frame Window Glass Guard Removal**



**Figure 3-11. LIFT WINDOW GLASS GUARD**

**NOTE:** Window Glass Guard is optional per window configuration. If window glass guard is not installed, start with Hidden Frame Window Glazing Replacement section.

- 1) Refer to **Figure 3-11**. Move window glass guard upward. This will reveal bottom edge of window glass guard. This can be done by hand, simply pushing or “Popping” window glass guard up, or using a putty knife will pry window glass guard up.



**Figure 3-12. Pull Window Glass Guard Using Suction Cup**

- 2) Refer to **Figure 3-12**. Once bottom edge of window glass guard clears clip, pull center area of window glass guard inward, away from window glazing using the suction cup (P/N 9109). Window glass guard will bow in the lower middle area allowing for removal of the lower corners and sides.
- 3) Remove both lower corners, one at a time.
- 4) Continue to pull window glass guard downward, working on removing one side out from the bottom up.
- 5) In doing this, window glass guard will clear top clip and should be able to bow the upper middle and remove one upper corner, then the other

**b. Hidden Frame Window Glazing Cleaning**

- 1) It is recommended that window technicians wear latex gloves at this time.
- 2) Window technician will blow out window ensuring that all debris is removed.
- 3) **Glazing Cleaning.** Window glazing is cleaned using glass cleaner and wiped off with a paper towel to remove any grease, adhesive, labels, etc.
- 4) Window is blown off again to ensure all debris is removed.
- 5) Preparation of the window is complete and ready for installation of Anti Graffiti Glass Guard.

**NOTE:** If any debris is found, repeat this process until all debris is removed.

- 6) **Glass Guard Cleaning.** The old window glass guard is reusable, if found to be in good condition. Clean window glass guard using a paper towel. Spray a small amount of glass cleaner onto paper towel then wipe window glass guard in one direction.

**NOTE:** Do Not spray glass cleaner directly onto window glass guard. Always spray glass cleaner onto paper towel then wipe.

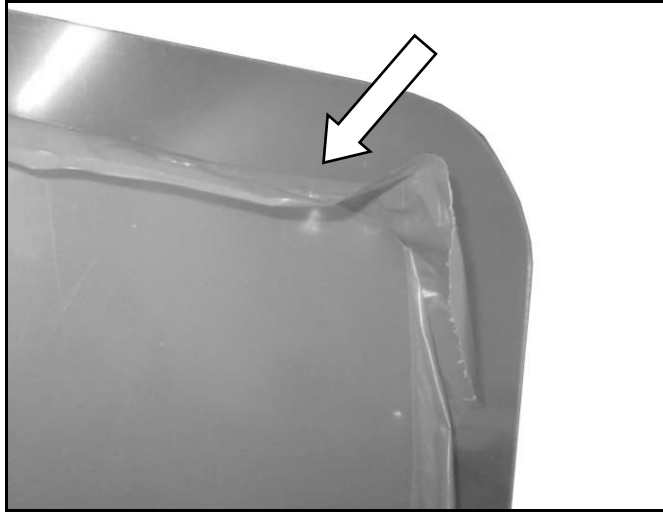
- 7) If replacing window glass guard, window technician will not need to clean it. Replacement glass guard comes with protective film on both sides.

**c. Hidden Frame Window Glass Guard Installation**

It is recommended to wear latex gloves. Replace as needed throughout this process.

**NOTE:** Always hold window glass guard from the edges, trying not to touch either surface.

- 1) Completely remove film from one side of window Glass Guard.
- 2) Refer to **Figure 3-13**. Pull film back from edge of other side of window as needed. Approximately 2” is required of the window glass guard.



**FIGURE 3-13. PULL FILM FROM EDGE OF GLASS GUARD APPROXIMATELY 2”**

- 3) Blow off window glass guard with air.
- 4) Visually inspect for any debris that may still be attached to window glass guard.

**NOTE:** Clean window glass guard in an area away from window ready for glass guard installation. Make sure when blowing off glass guard with air, DO NOT blow air in direction of window frame with cleaned glazing.

**NOTE:** Window glass guard will be installed with exposed side to window glazing.

- 5) Refer to **Figures 3-14** and **3-15**. Insert window spacers on lower horizontal clip.



**FIGURE 3-14. INSTALL WINDOW SPACERS**

- 6) Place each spacer approximately 2-3 inches from radius.
- 7) Refer to **Figure 3-15**. Insert window glass guard into both upper corners and sides.



**FIGURE 3-15. INSTALLING UPPER CORNERS**

- 8) Refer to **Figure 3-15**. Allow window glass guard to bow in the middle to allow insertion of both sides and top first.

**NOTE:** When installing window glass guard into egress windows, you must first, always insert window glass guard under Egress handle.

- 9) Window glass guard must be installed at the sides and top first. As window glass guard is inserted under the side and while pushing the glass guard against the glazing, always hold upward pressure. Window glass guard will lay flat parallel to window glazing, and the center bow of the glass guard, at the top will disappear.
- 10) Hold upward pressure on the glass guard keeping it installed under the clip, at the top and sides.
- 11) Refer to **Figure 3-15**. Lower corners are then installed which may require that window glass guard be bowed at bottom, center part of glass guard.
- 12) Insert one corner at a time into side clip, then onto other side. After both sides are installed, Glass Guard should lay flat against Glazing with no bow in window glass guard.

**NOTE:** Hopper window glass guard are inserted using same basic method. Insert in top, side then insert glass guard across the top working towards the opposite side until top is completely installed. Then insert glass guard into bottom on one side then the other.

**NOTE:** If window panel only has one radius corner, start with the squared off corner end first and the radius end last, using same basic method.

- 13) Move window glass guard downward into and under the lower clip.
- 14) Visually inspect Window along the top and sides of the clip area to verify window glass guard edge is not exposed.
- 15) Check movement of window glass guard and ensure it functions properly by moving window glass guard to the maximum upward position.

**NOTE:** Gap between window glass guard and the lower clip should be visible. Gap should allow window glass guard to be removed. Large visible gap will disengage at the top with window glass guard installed into the lower clip.

- 16) Move window glass guard back down and seat back into lower clip.
- 17) Verify that no debris is present between the window glass guard and Glazing by pulling back film then replacing it.
- 18) If any debris is found, remove window glass guard, repeat window glass guard installation process and ensure all debris is removed.



4. HIDDEN FRAME GLAZING REPLACEMENT

a. Hidden Frame Glazing Removal

- 1) Refer to **Figure 3-16**. Remove Hidden Frame clips to release window glazing. Place tapered end of glazing stick at the intersection (angle side to glazing) of the frame and the clip and tapping with the mallet until a gap appears.

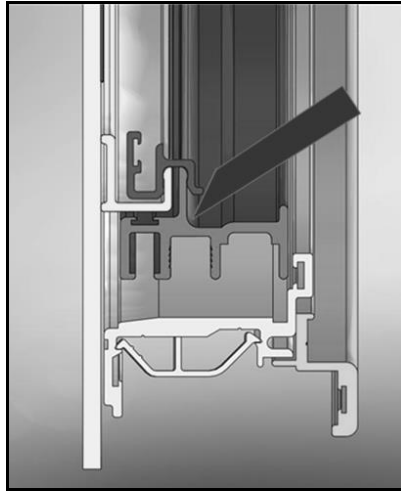


FIGURE 3-16. REMOVE CLIPS

**NOTE:** Before accomplishing this remember how they come out, (mark if needed) because they are cut to fit only one-way. Clip will be removed using the “Glazing Stick” and the small mallet.

- 2) Refer to **Figure 3-17**. When removing clips, start with bottom clip first.

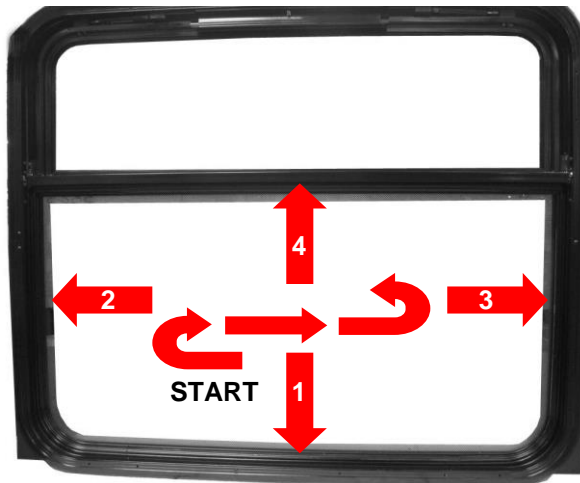


FIGURE 3-17. REMOVE CLIPS (CLOCKWISE)

- 3) Refer to **Figure 3-18**. One technician is required to secure window from exterior while one technician removes clips from inside vehicle, as shown in example.



FIGURE 3-18. (EXAMPLE) TWO TECHNICIANS REMOVING HIDDEN FRAME CLIPS

b. Hidden Frame Glazing Installation

- 4) Refer to **Figure 3-19**. If necessary replace foam.



FIGURE 3-19. REPLACE FOAM IF NECESSARY

- 5) Install replacement glazing in bus opening.
- 6) Refer to **Figure 3-20**. Replace clips starting at top and work clockwise.

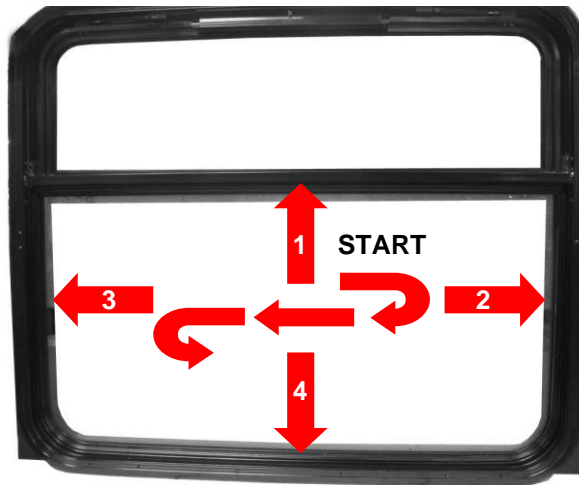


FIGURE 3-20. REPLACE CLIPS (CLOCKWISE)

**NOTE:** Refer to **Figure 3-18**. Technician is to continue holding glazing outside of the vehicle until all clips are installed by technician inside the vehicle.

- 7) Refer to **Figure 3-23**. Verify that clips are securely fastened. Use a plastic tip mallet to lock clips in place. If clips are hand loose, new sets of clips must be ordered and installed.



Figure 3-23. INSTALL HIDDEN FRAME CLIPS

- 8) Clean window glazing with window cleaner and clean cloth.

## 5. HOPPER ASSEMBLY REPLACEMENT

The purpose of these instructions is for removal and installation of the Hopper Assembly as shown in **Figure 3-24**. Standard Frame and Hidden Frame Hopper Assembly removal are similar.

### a. Hopper Assembly Removal

- 1) Completely close window to avoid any obstructions during removal procedures.
- 2) Refer to **Figure 3-24**. Remove and retain six screws that hold Hopper Keeper in place using a cordless driver with a Phillips driver bit (size P2).

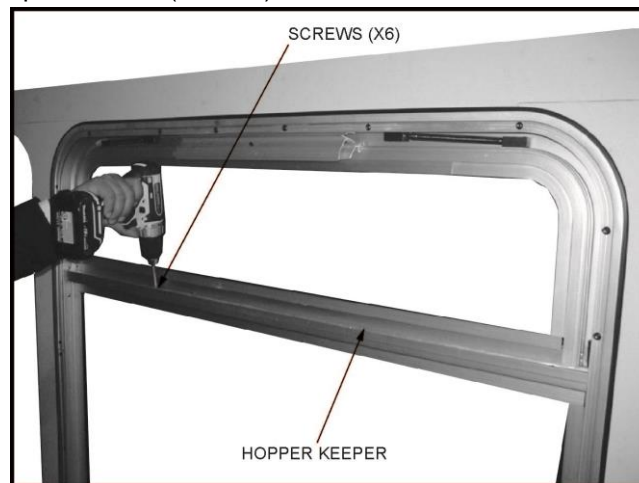
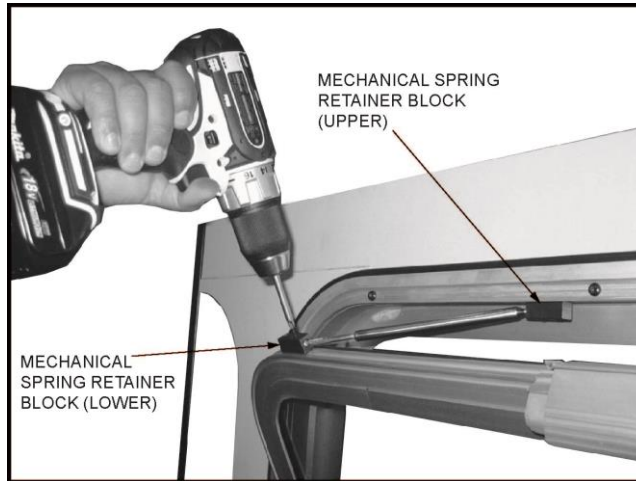


FIGURE 3-24. HOPPER KEEPER REMOVAL

- 3) Remove Hopper Keeper by using appropriate tool to pull hopper catch out of window track.
- 4) Refer to **Figure 3-25**. Remove screws that hold the (lower) Mechanical Spring Retainer Block onto Hopper Window, using a cordless driver with a Phillips driver bit (Size P2).



**FIGURE 3-25. HINGE BLOCK REMOVAL**

- 5) Repeat removal of (Lower) Mechanical Spring Retainer Block for opposite side of Hopper Window.
- 6) Carefully remove Hopper Window Assembly from window frame.
- 7) Remove screws and both (Upper) Mechanical Spring Retainer Blocks, as shown in **Figure 3-25**. Properly discard parts.

**NOTE:** (Upper) Mechanical Spring Retainer Blocks will be replaced with new Gas Spring Retainer Blocks (P/N 43786).

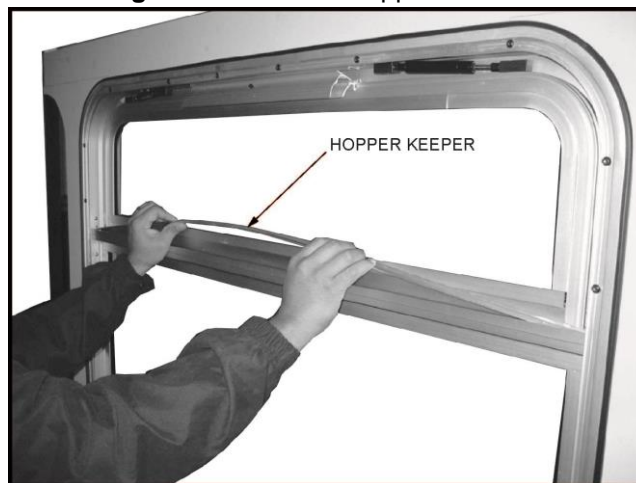
**b. Hopper Assembly Installation**

- 1) Refer to **Figure 3-26**. Carefully install Hopper Window Assembly.



**FIGURE 3-26: HOPPER WINDOW**

- 2) Refer to **Figure 3-27**. Close Hopper Window and install Hopper Keeper.



**FIGURE 3-27: HOPPER KEEPER**

- 3) Attach Hopper Keeper with six screws using a cordless drill with Phillips driver bit (Size P2).  
Adjust position of Hopper Catch by tapping Hopper Catch in place with appropriate tools until Hopper handle is catching properly.

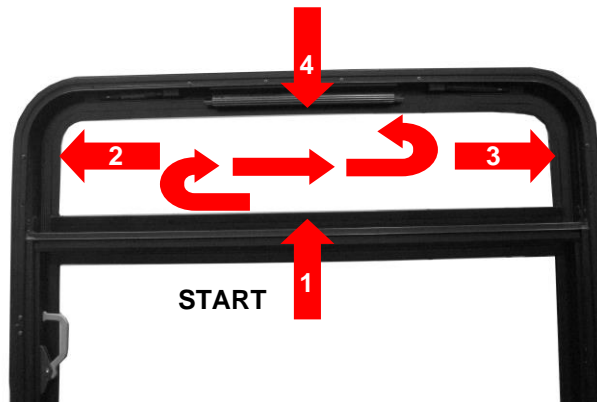
**c. Standard Frame Hopper Glazing Removal and Installation**

- 1) Refer to **Figure 3-28**. Remove Standard Frame Hopper Glazing clips to access glazing. Start with bottom clip first then remove side clips.



**FIGURE 3-28: STANDARD FRAME HOPPER GLAZING REMOVAL**

- 2) Refer to **Figure 3-29**. Remove clips starting at the bottom as shown.



**FIGURE 3-28: STANDARD FRAME HOPPER GLAZING REMOVAL**

- 3) Once clips are removed, carefully remove hopper window glazing.
- 4) Inspect window gasket from interior and exterior to ensure window gasket is not tweaked or misplaced.
- 5) Install standard frame hopper glazing.
- 6) Install standard frame hopper clips in reverse order.

**6. EGRESS WINDOW MAINTENANCE**

Regular maintenance is the responsibility of the owner/operator. Reference Egress Window Assembly maintenance (Table 3-1).

**NOTE:** Contamination and lack of lubrication are the most common and frequent cause of the pull force exceeding the FMVSS/CMVSS requirements.

**a. Egress Catch Bar**

- 1) From the outside of the vehicle, with the egress window open, check catch bar for dirt, foreign matter, debris or other contaminants that could restrict the catch bar sliding motion.

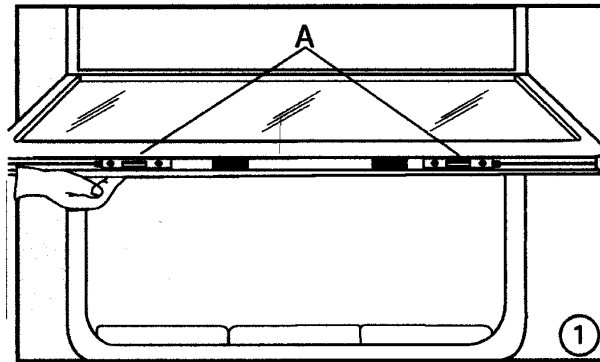


FIGURE 3-29: EGRESS CATCH BAR

2) Refer to **Figure 3-29**. Remove all debris.

**NOTE:** Ensure catch bar spacer blocks are securely in-place. Spacer blocks should be installed with point or angled side towards inside of mainframe. (Spacer blocks across the bottom also function as a retainer for the Catch Bar).

**b. Spacer Blocks**

- 1) With the window open, wipe the Egress Frame Seal with vinyl cleaner solution and clear any debris between the frames.
- 2) Visually inspect and ensure that all spacer blocks are securely in place and cannot slide on track.

**NOTE:** Refer to **Figure 3-30**. Spacer blocks should be installed a few inches down from the top and a second installed a few inches up from the bottom on each side of egress panel. If a spacer block is loose, remove it from the channel, clean the area and reapply a spacer block using Dolphin sealant.

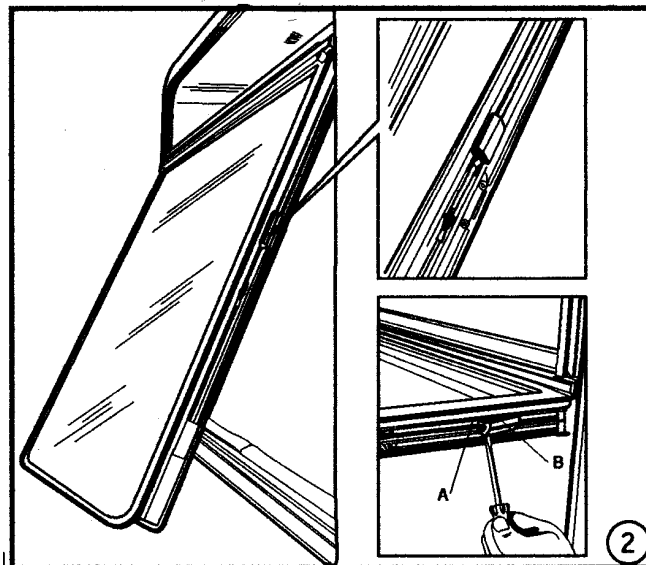


FIGURE 3-30: SPACER BLOCKS

**c. Cable and Spring**

- 1) Refer to **Figure 3-31**. Inspect the cable between the Egress Handle on the one end of the cable and the spring on the opposite end.

**NOTE:** Inspect where the cable tracks around the corner of the window, and inspect for any debris, loose cable retainer clips, or frayed cable. Frayed cables should be immediately replaced.

- 2) Clean any and all debris.

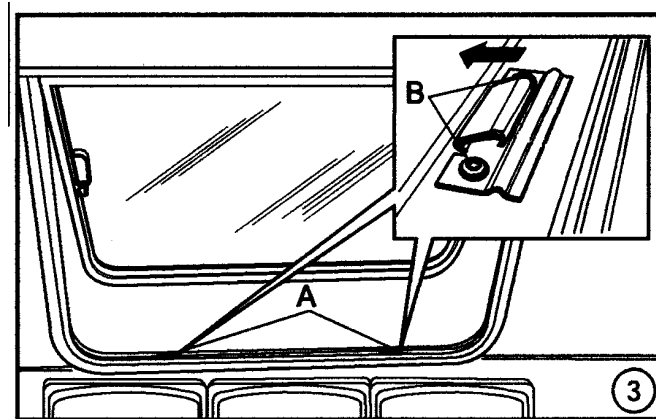
<b>CAUTION</b>
Use only white lithium grease. Other lubricants may carry solvents (chlorine or flourine compounds) that will damage the integrity of the catch bar or other window components.

- 3) Lubricate catch bar, channel area where the catch bar slide, and cable with white lithium grease.

4) Following lubrication, operate the handle several times to “wet out” components.

**d. Spring Catches**

1) Refer to **Figure 3-31**. From the inside, open the egress window and visually inspect the Spring Catches.



**FIGURE 3-31: SPRING CATCHES**

2) Refer to **Figure 3-31**. For proper spring catch alignment refer to detail B.

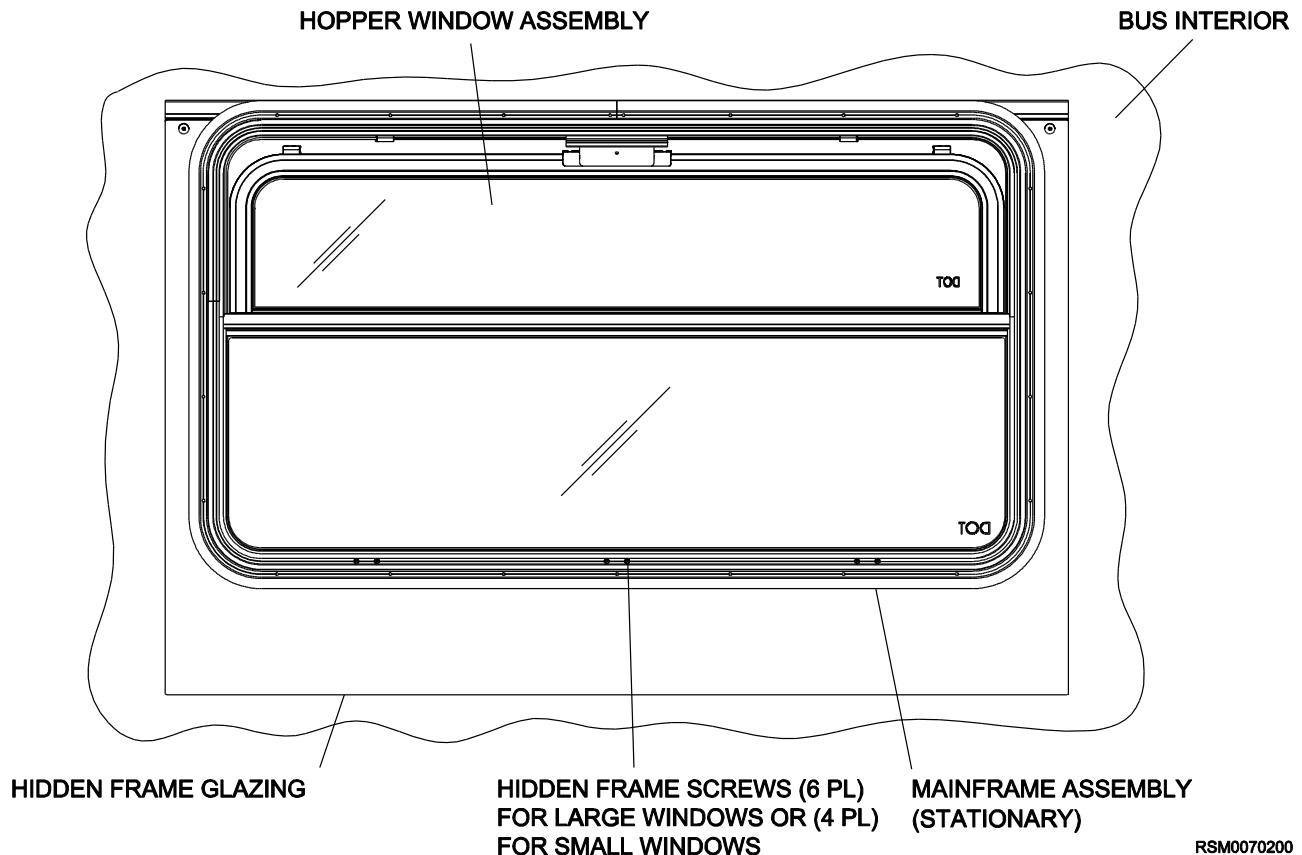
**7. CITYVIEW II HIDDEN FRAME TOP HOPPER AND FULL FIXED GLAZING REPLACEMENT**

Regular maintenance is the responsibility of the owner/operator.

**NOTE:** Contamination and lack of lubrication are the most common and frequent cause of the pull force exceeding the FMVSS/CMVSS requirements.

**a. Hidden Frame Hopper Glazing Removal**

1) Refer to Figure 3-32. From the inside of the vehicle, identify hopper assembly and locate all screws required to detach glazing from mainframe assembly.



**FIGURE 3-32: HIDDEN FRAME HOPPER**

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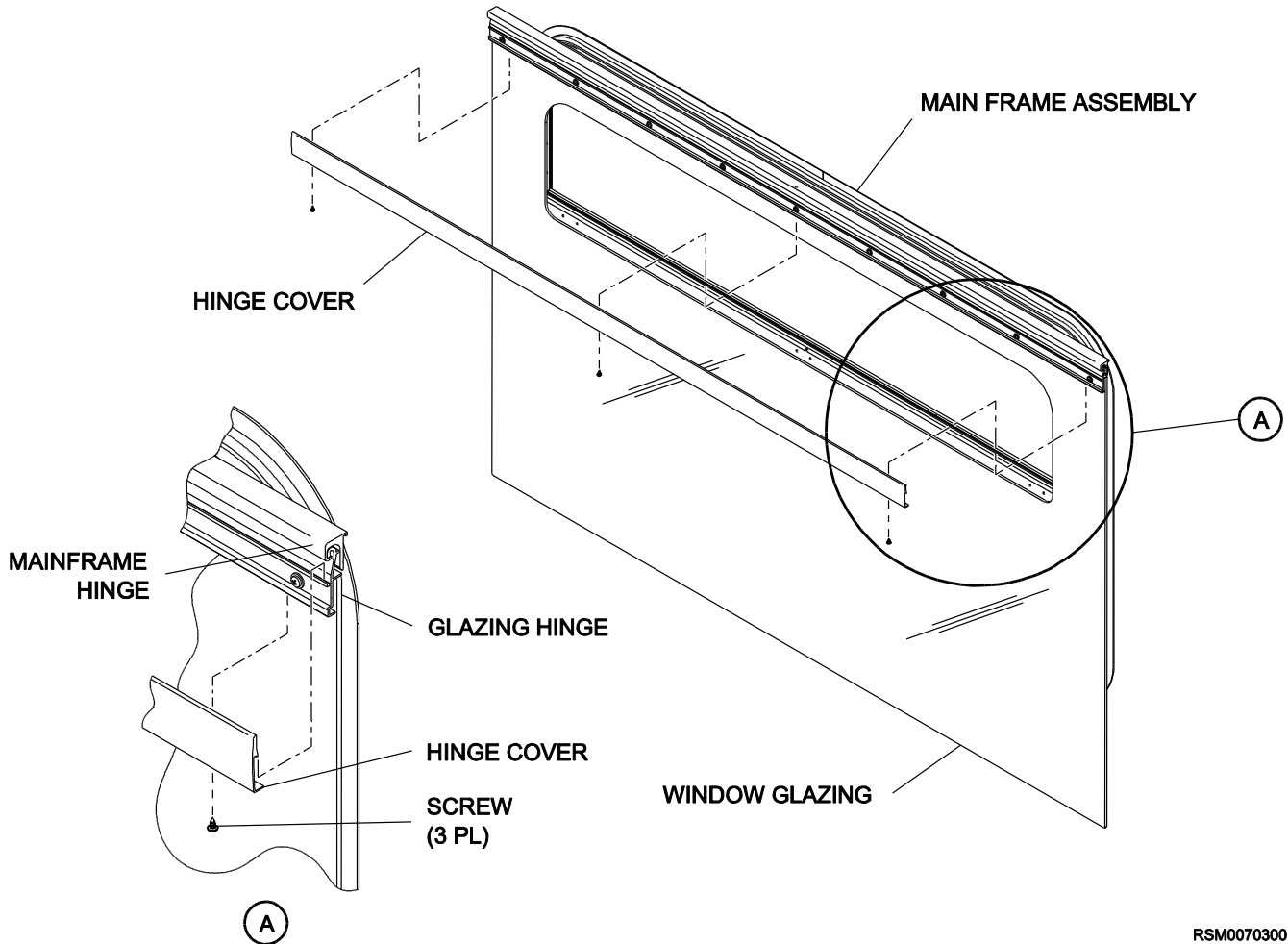
**NOTE:** Smaller hidden frame window assemblies may only use four (4) screws to detach glazing from mainframe.

**NOTE:** For windows assemblies that contain a hopper assembly, refer to Section 5, Hopper Assembly Replacement. For windows assemblies that contain an egress catch, refer to Section 6, Egress Windows Maintenance.

**NOTE:** For emergency windows, Step 1 is not required because window will have an egress handle to release window from mainframe.

- 2) Remove and retain Hopper assembly and hardware. If the Hopper window assembly is not damaged and will not be replaced with glazing, it is recommended that the Hopper window assembly be removed for installation onto new window glazing. Refer to Section 5.a, Hopper Assembly Removal.
- 3) Refer to Figure 3-33. From the exterior of bus, remove the outer hinge cover. Remove two (3) screws located under the hinge cover.

**NOTE:** Once the hinge cover is removed, the window glazing hinge will be exposed as shown in Figure 3-33.



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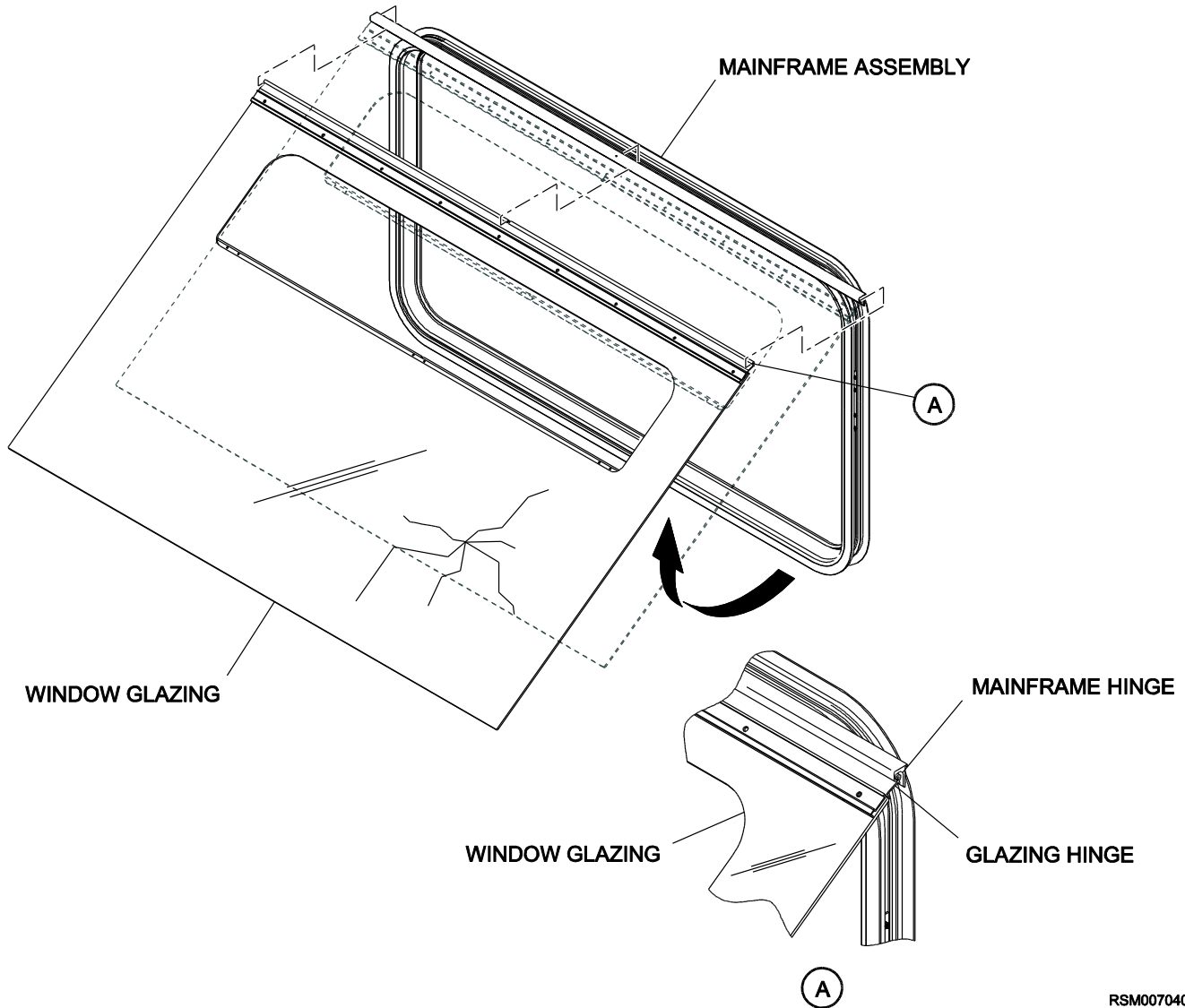
**FIGURE 3-33: HIDDEN FRAME HINGE COVER**

**⚠ CAUTION**

Window glazing hinge hangs on the mainframe hinge. Swinging the window glazing out from the bus will un-hinge the window glazing from the mainframe hinge. Two technicians are required to un-hinge the window glazing from the mainframe hinge.

- 4) Two technicians are required to un-hinge the window glazing from the mainframe hinge. Carefully swing the window glazing out from the bus as shown in Figure 3-34.
- 5) Refer to Figure 3-34. Remove the damaged window glazing from the bus.
- 6) Technicians may require work gloves to safely remove damaged window glazing when un-hinging from mainframe assembly.





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FIGURE 3-34: GLAZING HINGE AND MAINFRAME HINGE

7) Dispose of damaged window glazing.

**b. Hidden Frame Hopper Installation**

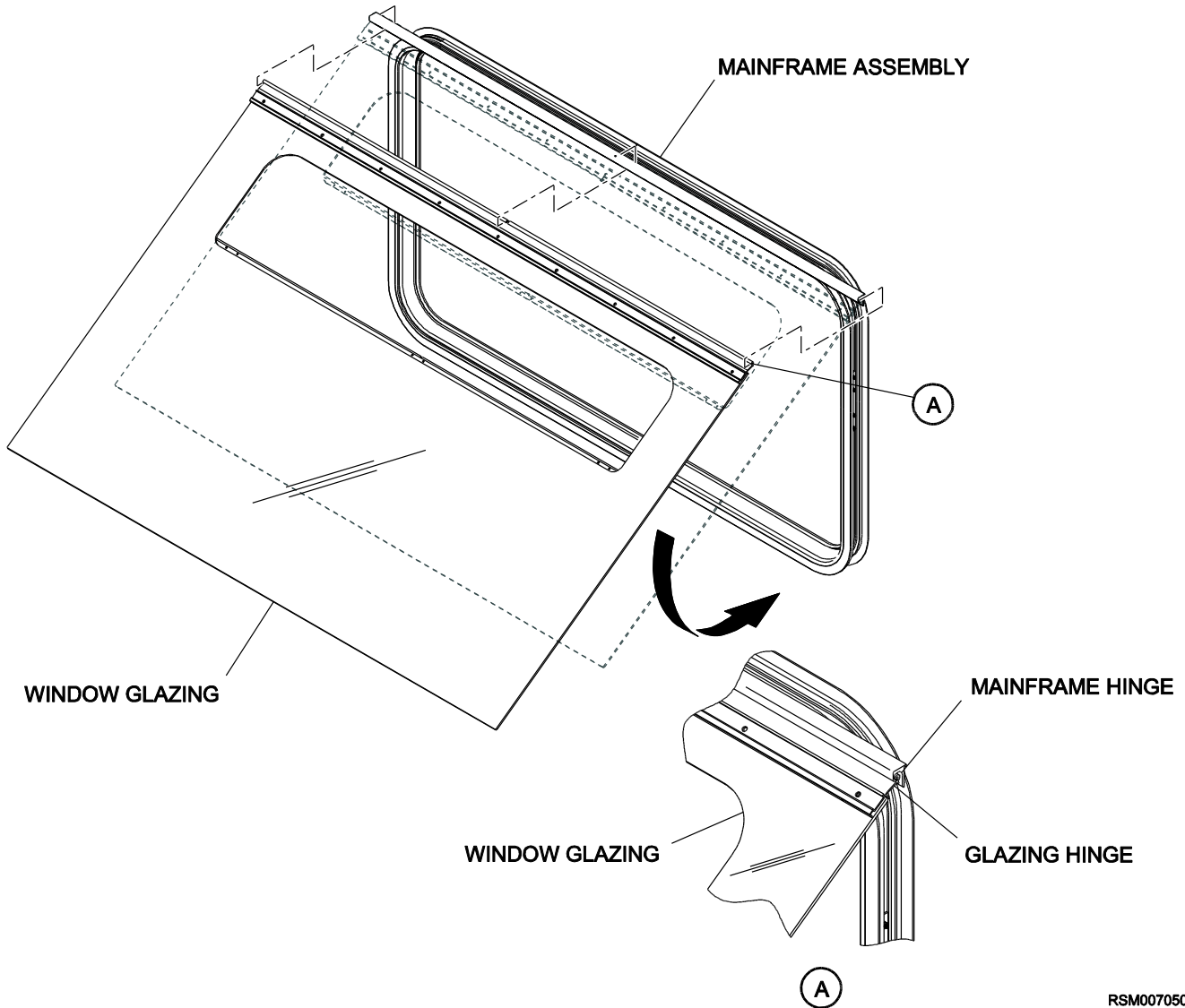
1) If necessary, clean out debris from window mainframe assembly and around bus opening before attempting to install hidden frame window assembly.

**NOTE:** For windows assemblies that contain a hopper assembly, refer to Section 5, Hopper Assembly Replacement. For windows assemblies that contain an egress catch, refer to Section 6, Egress Windows Maintenance.

**CAUTION**

Window glazing hinge hangs on the mainframe hinge. Swinging the window glazing out from the bus will un-hinge the window glazing from the mainframe hinge. Two technicians are required to un-hinge the window glazing from the mainframe hinge.

- 2) Two technicians are required to hang the window glazing hinge onto the mainframe hinge. Carefully hinge the window glazing hinge onto the mainframe hinge then swing the window glazing onto the bus as shown in Figure 3-35.
- 3) Technicians may require work gloves to safely install window glazing onto mainframe assembly.



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**FIGURE 3-35: INSTALLING GLAZING HINGE ONTO MAINFRAME HINGE**

- 4) Ensure that the window glazing is properly installed onto mainframe hinge.
- 5) Refer to Figure 3-33. From the exterior of bus, install the outer hinge cover with two (3) screws located under the hinge cover.

**CAUTION**

Window glazing hinge hangs on the mainframe hinge. Swinging the window glazing out from the bus will un-hinge the window glazing from the mainframe hinge. Two technicians are required to when installing window glazing and hinge onto the mainframe hinge.

- 6) From the interior of the bus vehicle, install screws to secure hidden frame fixed hopper into mainframe assembly. Refer to Figure 3-32.

**NOTE:** For windows assemblies that contain a hopper assembly, refer to Section 5, Hopper Assembly Replacement. For windows assemblies that contain an egress catch, refer to Section 6, Egress Windows Maintenance.

- 7) Install hopper window assembly. Refer to Section 5, Hopper Assembly Replacement.
- 8) Ensure that window egress and hopper are working properly.
- 9) Clean window using spray glass cleaner with paper towel.

**NOTE:** Do Not spray glass cleaner directly onto window glass guard. Always spray glass cleaner onto paper towel then wipe.

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