Modern Casement and Awning

Installation and Mulling for New Construction

ABSTRACT: Please read these instructions in their entirety before beginning to install your Marvin Modern Casement product. These installation instructions demonstrate the installation of a Marvin window in new wood frame construction using an industry approved water management system. For installation using other construction methods, such as remodeling, replacement, and recessed openings refer to the latest version of ASTM E2112, "Standard Practice for Installation of Exterior Windows, Doors and Skylights", for installation suggestions. The same information for ASTM E2112 can be found on the ASTM website, www.astm.org.

Regional standard practices, environmental conditions, and codes may vary and supersede the procedures contained within. The responsibility for compliance is yours: the installer, inspector, and owner(s).

The English language version of this instruction is the official version and shall take precedence over any translation.

These instructions are relevant for the following Casement product types:

- Casement Crank-out
- Casement Push-out
- Casement Picture
- Casement Automated
- Awning Crank-out
- Awning Push-out
- Awning Automated

Table of Contents

Automated Home Details

Throughout this instruction you will see additional steps for product equipped with automated home features. This content will be prefaced with the logo you see below and a lettered subset of each relevant step:

1. *Example: Install hardware with 2 - #8 x 3" screws.*

1.A. *Example: On automated casement windows, install hardware with 3 - #10 x 3" screws.*

Hazards and Warnings

NOTE: Numbers listed in parentheses () are metric equivalents in millimeters rounded to the nearest whole number.

⚠WARNING!

Do NOT lift or move without proper equipment. Read, understand, and follow all lift equipment manufacturers' instructions and safety information.

⚠WARNING!

This product can expose you to chemicals including titanium oxide, which is known to the state of California to cause cancer. For more information, go to www.P65Warnings.ca.gov.

⚠WARNING!

Older homes may contain lead-based paint, which may be disturbed when replacing windows or performing renovations. Consult state or local authorities for safe handling, disposal, or abatement requirements. For information, go to www.epa.gov/lead.

NOTE: Please consult with local waste management authorities regarding proper disposal and/or recycling of all waste materials generated during installation, including any product being replaced, packaging materials, and other waste.

⚠WARNING!

This product can expose you to chemicals including methanol, which is known to the state of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

⚠WARNING!

Always practice safety! Wear the appropriate eye, ear, and hand protection, especially when working with power tools.

⚠CAUTION!

Wear gloves and protective clothing when handling the frame components. Some high-density fiberglass surfaces are not coated and can leave splinters in bare skin.

IMPORTANT

Nailing fin is not designed to be a weatherproof flashing.

IMPORTANT

Flashing material must not contain asphalt and must be compatible with flexible PVC (vinyl) such as that found in Marvin vinyl nailing fin.

Protective Film

Some products feature a clear protective film adhered to the glass surfaces to protect them from construction debris, dust, dirt, stucco, etc. When construction is complete, simply peel the film off and dispose of it with other construction debris.

IMPORTANT

Do not use a razor blade to remove the protective film. Do not use a pressure washer to clean debris from the film. The film should be removed within nine months (typical) of application.

The use of high absorption coatings and tints, Neat+® coated glass, LoE-189® and other exposed Low-E coatings could affect adhesion and reduce the amount of time allowed to remove the film. Please refer to the manufacturer's website and bulletin for more information on the physical properties and usage of the protective film.

IMPORTANT

DO NOT place suction cups over seams in the protective film.

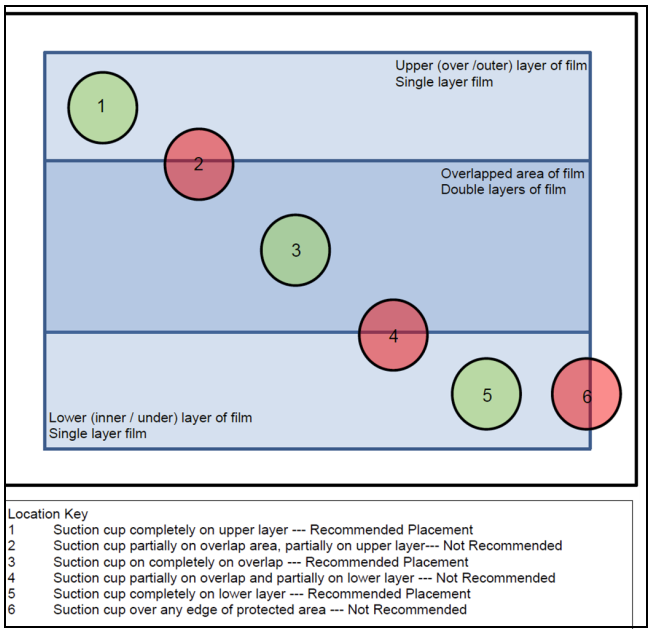

Figure 1 Do not put suction cups on seams or edges

What is Included in the Job Box

Refer to the content list included in your job box for specific items that are included with your order. Sealants, hardware, fasteners, and many installation related parts are included with the window. See Tools and Supplies Needed on page 5 for other items you will need to successfully install your Modern Casement and Awning window.

Installer and Builder Information

- Always provide a copy of these instructions for the current homeowner.
- Plan sizing of rough opening and clearance from exterior finishing systems to allow for normal materials shrinkage or shifting (e.g. wood structure with brick veneer; allow adequate clearance at the sill). Failure to do so can void the Marvin warranty coverage.
- Refer to the Technical Installation Specifications section for technical specifications regarding the installation of this product. These installation requirements as well as the details in the section must be followed to achieve the advertised Performance Grade (PG) rating of this product.
- It is the responsibility of the builder, installer, and subcontractors to protect the interior and exterior of windows or doors from contact with harsh chemical washes, construction material contamination and moisture. Damage to glazing, hardware, weather strip and cladding/wood can occur. Protect with painters tape and/or protective sheathing as required. Follow all guidelines regarding material use, preparation, personal safety and disposal.
- Contact your Marvin supplier if you have any questions regarding product and materials used in manufacturing or questions on replacement parts.
- Please refer to the PDF version of this instruction for further information regarding best practices installer and builder information, code, and other legal requirements. The PDF version is the official document of record.

After Market Products

Alterations to Marvin products including window films, insulating or reflective interior window treatments or additional glazings can cause excessive heat buildup and/or condensation. They may lead to premature failures not covered under warranty by Marvin Windows and Doors.

Before purchasing or applying any product that may affect the installation or performance of Marvin windows or doors, contact the manufacturer of after-market product/glazings that are not supplied by Marvin and request written product use, associated warranties and damage coverage. Provide this information and warranties to the end user and/or building owner for future reference.

Tools and Supplies Needed

- Drip Cap
- Flashing materials
- Backing material (foam backer rod)
- Shims (composite recommended)
- Perimeter sealant
- Insulation and/or low expansion foam insulation
- Tape Measure
- Speed square
- Power drill/driver
- Phillips and Torx® T20 bits
- Level/laser level
- Flat head screwdriver
- Temporary power supply (automated)
- 1/8" drill bit
- #29 or 9/64" drill bit (automated)

Parts Included in Job Box

NOTE: Parts are configuration dependent and may not be provided if they are not required. Extras may also be provided in some cases.

NOTE: Part or Kit descriptions included with figures may be generic, not including handing or color. Refer to Report Runner in Job Box for full descriptions.

- Fasteners for assembly and installation
- Construction crank handle
- Combination lock handle and hinge wrench
- Crank handle and cover
- Lock handle and covers
- Frame cover supports
- Mull fasteners

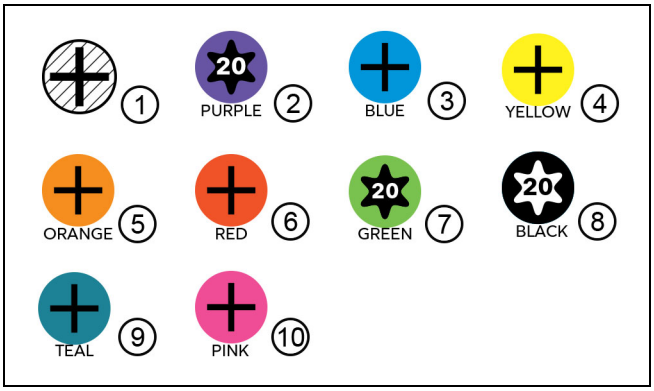

Figure 2

No	Color	Description
1	NA	Phillips head
2	Purple	#8 x 1/2" T-20 Torx head
3	Blue	#8 x 3" 2/4 thread Phillips head
4	Yellow	#8 x 2 1/2" 2/3 thread Phillips head
5	Orange	#8 x 7/16" self drilling Phillips pan head
6	Red	#8 x 1/2" Phillips flat head stainless screw
7	Green	#8 x 1 3/4" self drilling T-20 Torx pan head stainless steel
8	Black	#10 x 3"T-20 Torx 2/3 thread pan head
9	Teal	#8 x 1 1/4" Phillips head
10	Pink	#8-15 x 1/2" Phillips stainless steel flat head screw
Not all colors are used on every product or configuration.		

Preparing the Opening

Rough and Masonry Opening Requirements

1. Rough opening (RO) width may be up to 1 1/2" (38) wider (3/4" maximum on each side) than the outside measurement (OM) of the frame. The RO height may be a maximum of 3/4" taller than the OM of the frame. See Figure 3.

IMPORTANT

Rough openings are tested and certified at 3/4" on each side, and at the head jamb. Marvin Order Management System (OMS) will add 1 1/2" to the frame width ***but only*** 3/4" to the frame height when calculating the rough opening.

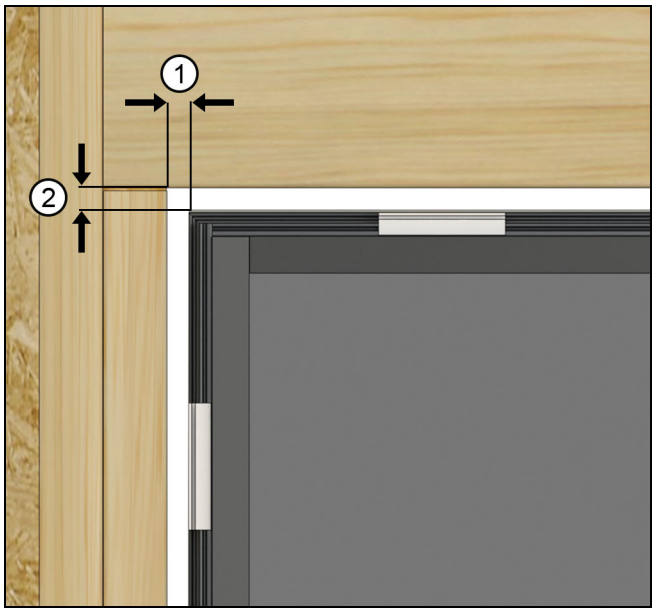

Figure 3 RO Width and Height clearance

1	RO Width (3/4" on each side)
2	RO Height (3/4" taller than OM of frame)

Brick Bind

On standard wood frame construction with brick veneer, make sure there is at least 1/2" (13) between the bottom of the window sill (or eventual placement of the window) and the top row of brick to avoid "brick bind". See Figure 4.

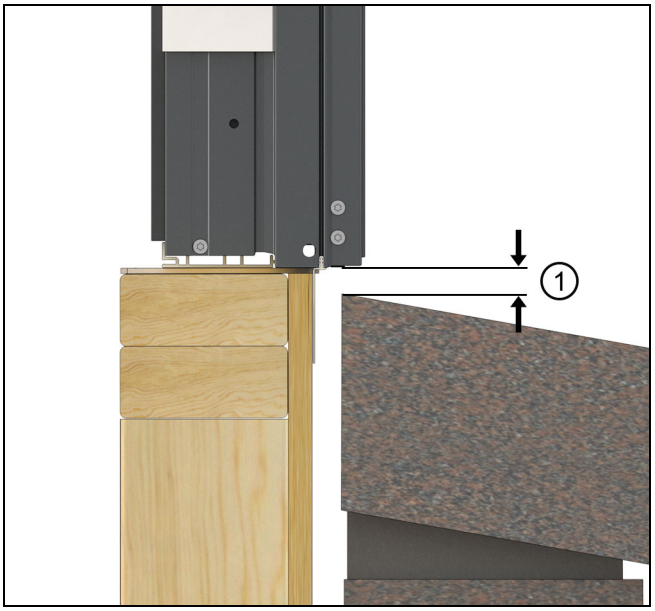

Figure 4 Avoid brick bind, maintain 1/2" gap

1	1/2" (13)

Cutting the Weather Resistive Barrier (WRB) and Pan Flashing

NOTE: This does not apply to self-adhering WRB sheathing systems.

1. Make horizontal cuts to the Weather Resistive Barrier (WRB) across the top and bottom of the Rough Opening. Make a vertical cut down the center of the RO. then make 45 degree cuts away from the corners of the top of the RO. See Figure 5.

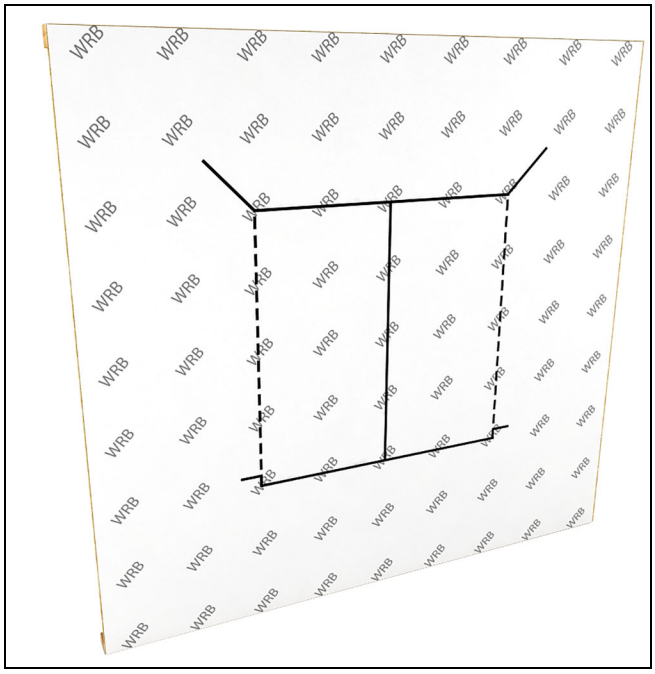

Figure 5

2. Trim up from the bottom corners about 2" (51) and then make an additional horizontal cut about 3 1/2" (89) wide. See Figure 6.

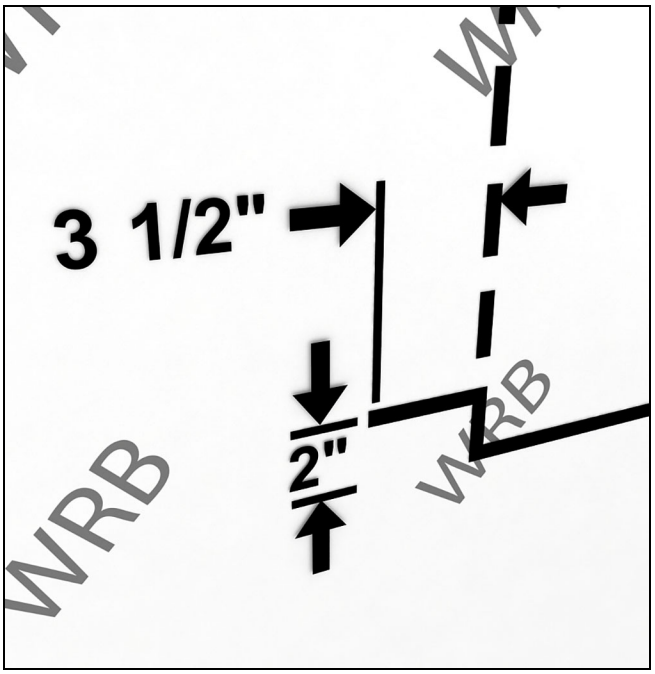

Figure 6

3. Flip the top up and side flaps away and tack temporarily. See Figure 7.

Figure 7

4. Optional: Add a continuous "Sill Wedge" out of cedar siding or similar water resistant material to create a positive drainage slope. Glue it to the RO sill with two beads of adhesive and screw in place. See Figure 8.

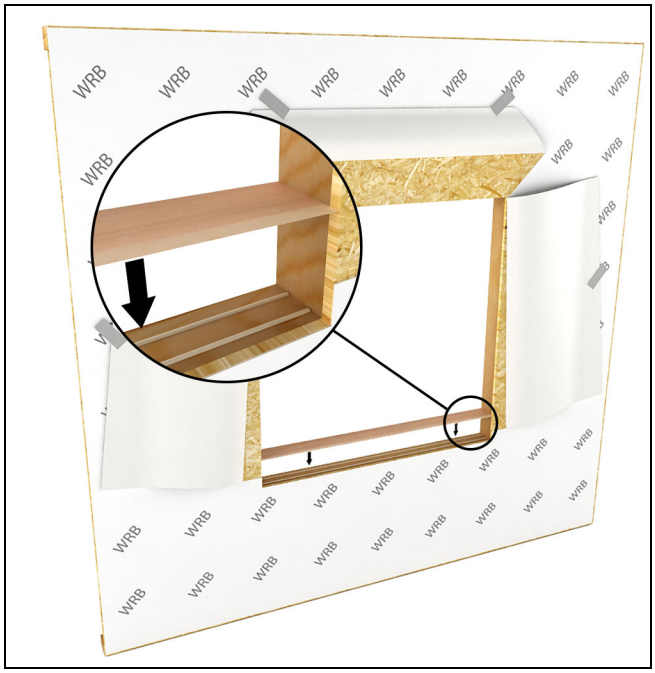

Figure 8

NOTE: This will affect your RO height, plan accordingly.

5. TYPE III Sill Pan Flash: Apply self sealing flexible membrane slope. See Figure 9.

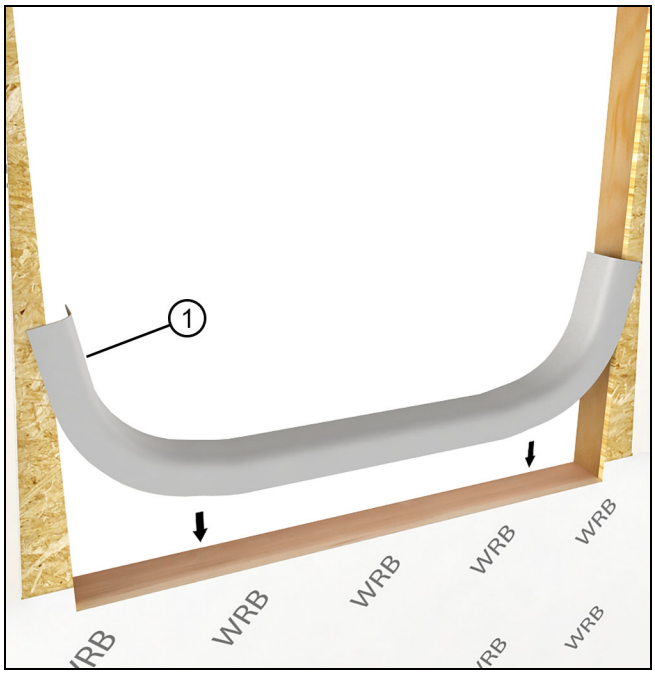

Figure 9

1	Flexible flashing membrane

NOTE: Some situations call for an upturned leg at the interior. If that is the case, do so using the excess sill flashing membrane to the interior.

6. Wrap side flaps to the interior and staple in place about 1 1/2" (38) from the interior edge of the opening. Cut the excess off near the staple so that a 1" -1 1/2" (25-38) strip of bare wood is exposed. Tape this edge with seam seal tape. See Figure 10.

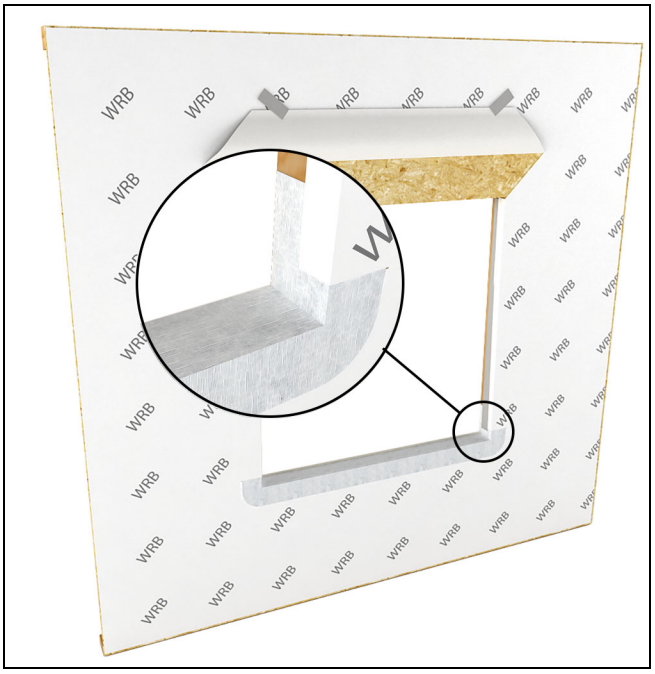

Figure 10

7. Apply seam seal tape over the corners. Place plastic or composite shims at the ends and in the middle of the RO to counter the slope of the sill wedge and support the unit. Fasten with adhesive or finish nails. If using finish nails, place adhesive under shim where the nail will penetrate. See Figure 11.

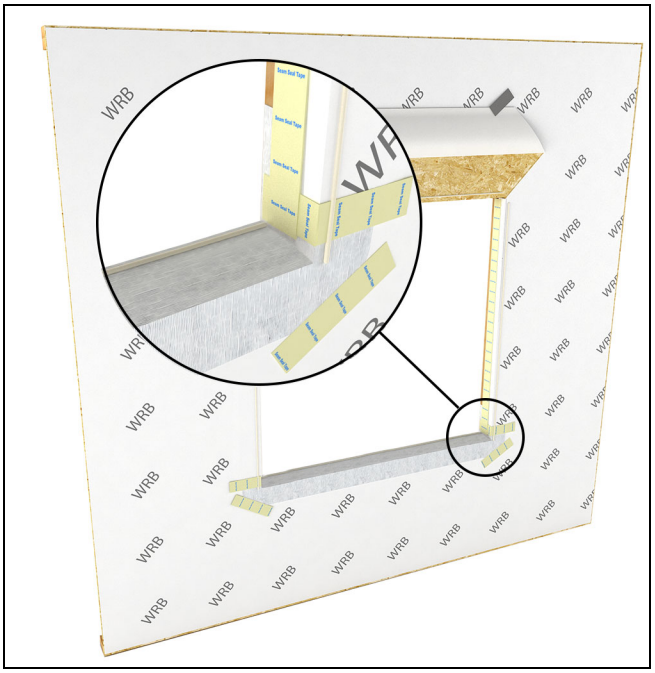

Figure 11

Installing the Window

⚠WARNING!

Do NOT lift or move without proper equipment. Read, understand, and follow all lift equipment manufacturers' instructions and safety information.

Seek Assistance

Some large windows and/or assemblies are very heavy. Avoid injury by getting help to lift and position the window into the rough opening.

Preparing the Window

1. Remove any packaging and pull the operator shipping cover with a pliers. Dispose of packaging properly.

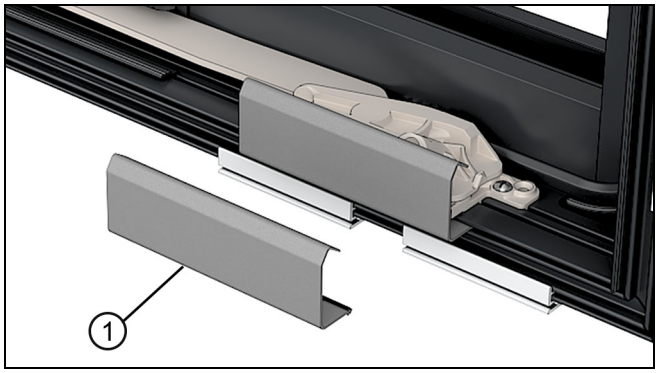

Figure 12

1	Operator shipping cover

2. On factory mulled units, remove and discard the small piece of mull pin and screws. This is used for shipping purposes only. Slide the shim blocks over and align with the installation holes.

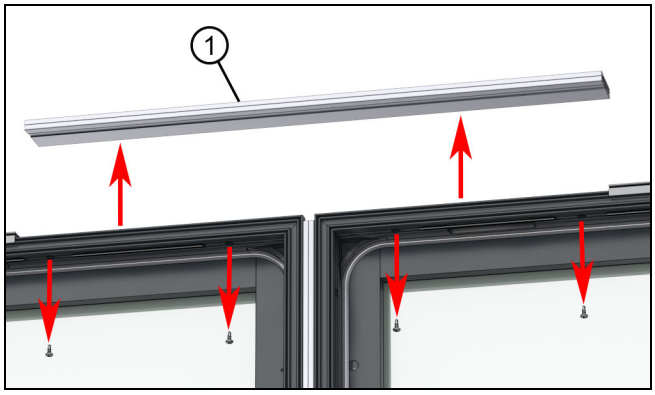

Figure 13

1	Mull support (mull pin material)

NOTE: Electronics shipping covers should not be discarded until final interior cover installation. Shipping covers may need to be removed for through jamb fastener installation. Covers should be reinstalled to protect electronics.

3. Make sure the shim blocks are centered on the installation hole.

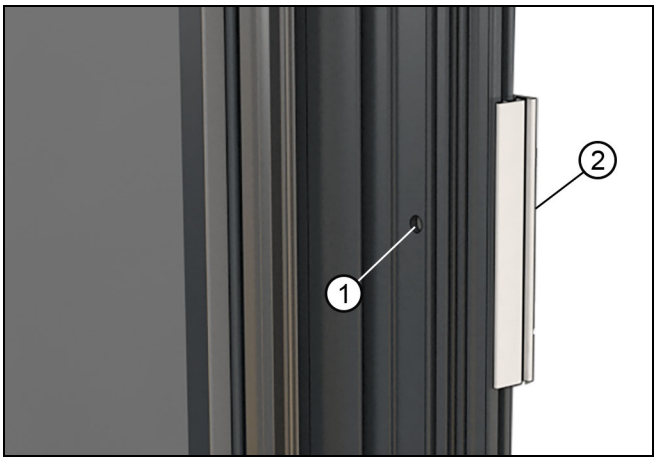

Figure 14

1	Installation hole
2	Shim block

NOTE: Nail fin is used for positioning only. It is not required that you fasten the nail fin to the wall. Through jamb installation is required using fasteners provided.

IMPORTANT

Shim blocks are required at every installation hole to provide a flat spot for shimming. **Do not remove the shim blocks.**

Level, Plumb, and Square

1. Check the sill for level and adjust if necessary. See Figure 15.

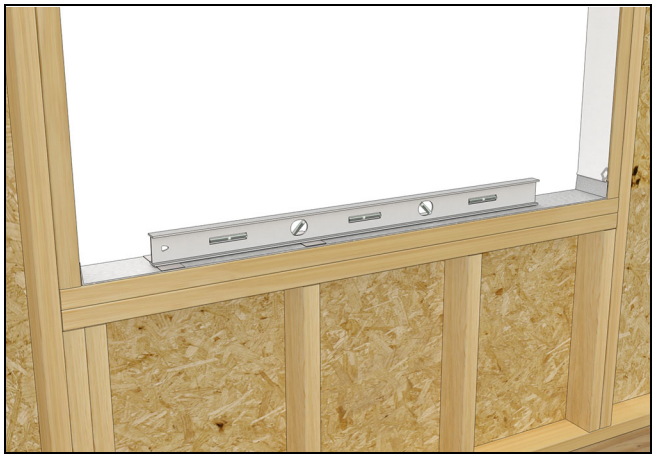

Figure 15

IMPORTANT

When using drywall return (or equivalent) at the sill greater than 1/2" thickness, you will need to shim beneath the sill to avoid interference with interior covers.

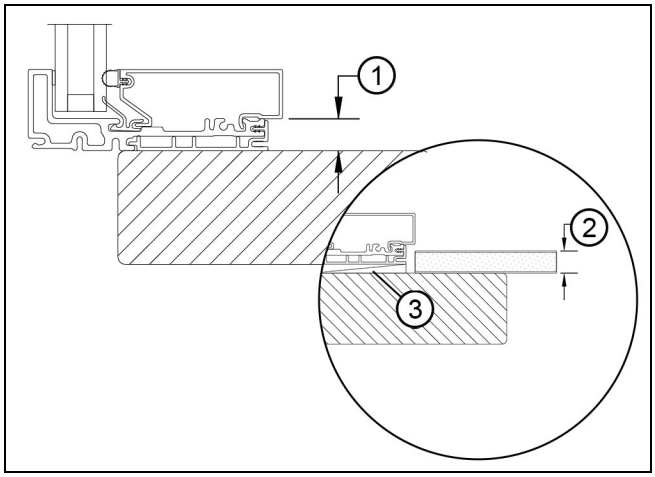

Figure 16

1	9/16" (14) gap between RO and cover (unshimmed)
2	5/8" (16) drywall and shimmed window
3	Shims

2. Make sure the shim blocks are centered on the installation hole.

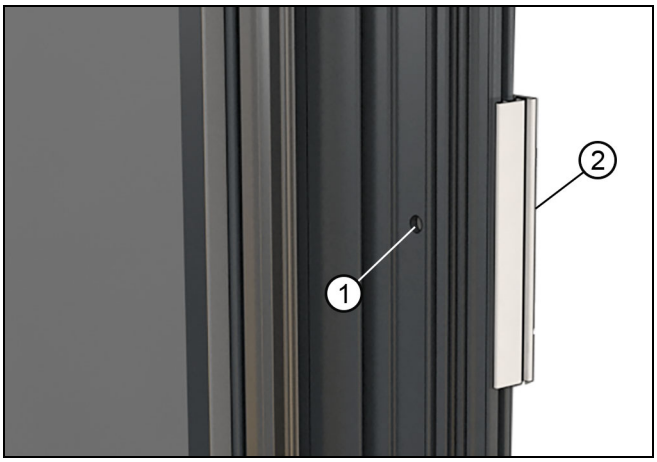

Figure 17

1	Installation hole
2	Shim block

3. Center the window in the opening. See Figure 18.

Figure 18

4. Tack the nailing fin on the top outside corners. See Figure 19.

Figure 19

5. Insert a backer rod between the frame and rough opening until it contacts the back side of the nail fin (or even with the exterior sheathing. See Figure 20.

Figure 20

6. Before installing installation screws be sure to pre-drill into the rough opening with a long 1/8" drill bit.

Figure 21

7. Shim and fasten at the bottom corners.See Figure 22 and Figure 23.

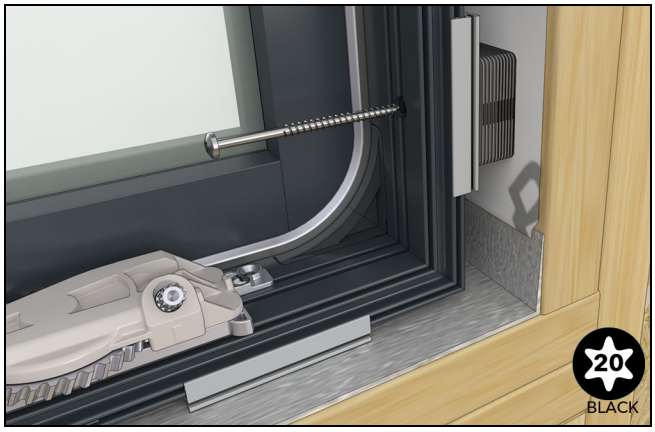

Figure 22

Figure 23

8. Plumb the unit so the frame is on the same plane (inside/out).See Figure 24.

Figure 24

9. Shim and tack one of the top corners with an installation screw. See Figure 25.

Figure 25

10. Check for square by measuring diagonals. See Figure 26.

Figure 26

11. Adjust shims if necessary and fasten the opposite top corner. See Figure 27.

Figure 27

12. Measure at the top and bottom. The measurements should be equal. Measure at the center and adjust shims/screws until they are equal to the top and bottom. See Figure 28.

Figure 28

13. Complete the fastening at all the pre-drilled holes in the jamb, head jamb and sill. See Figure 29.

Figure 29

IMPORTANT

If you are mulling windows proceed to Casement and Direct Glaze Field Mulling on page 29.

NOTE: On automated units, remove the motor control board (MCB) housing to apply through-jamb fasteners behind it. Reinstall the motor control board housing by lining up the arrow with the line on the and sliding to secure. When removing the MCB, make sure the connections do not become unplugged.

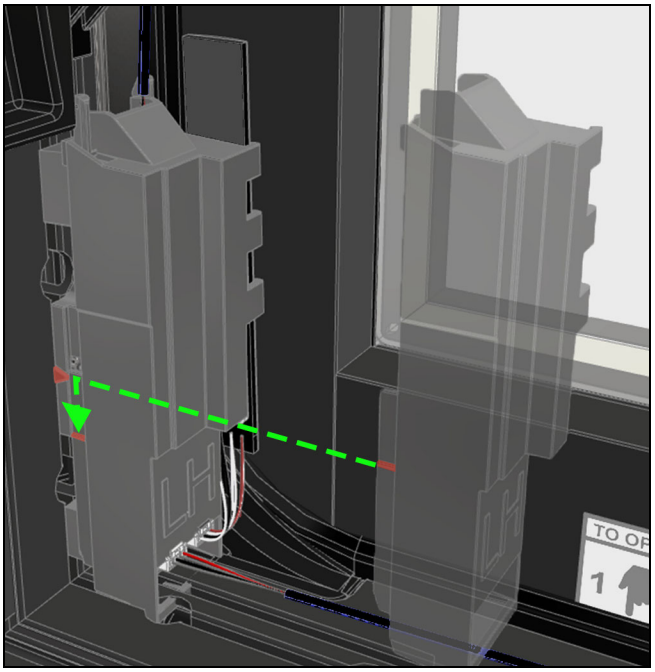

Figure 30 MCB housing

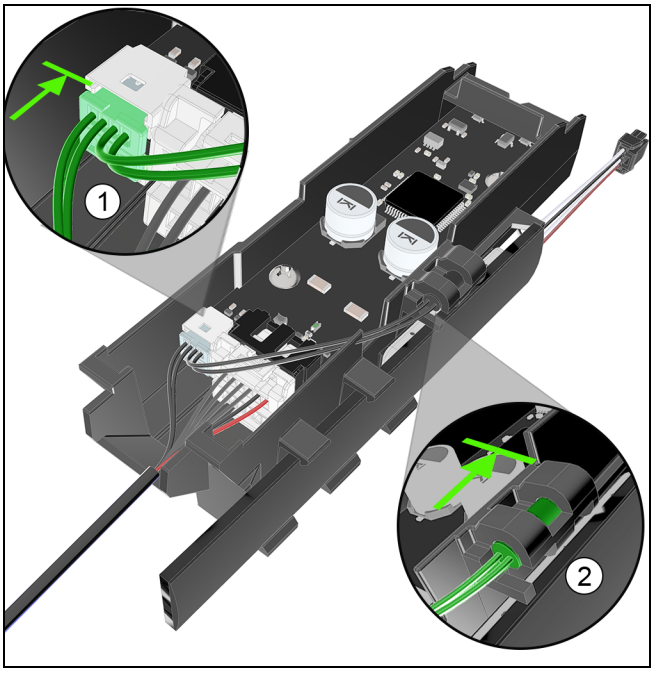

Figure 31 MCB Connections

1	Reed switch connector
2	Reed switch

Additional Fastening Details for Casement and Awning

IMPORTANT

When fastening into the rough opening sill, inject sealant into the holes prior to driving the fasteners. See Figure 32.

Figure 32 inject installation holes with sealant prior to fastening.

1. Crank open the sash and drive a screw into the hole in the base that is hidden under the crank arm. See Figure 33.

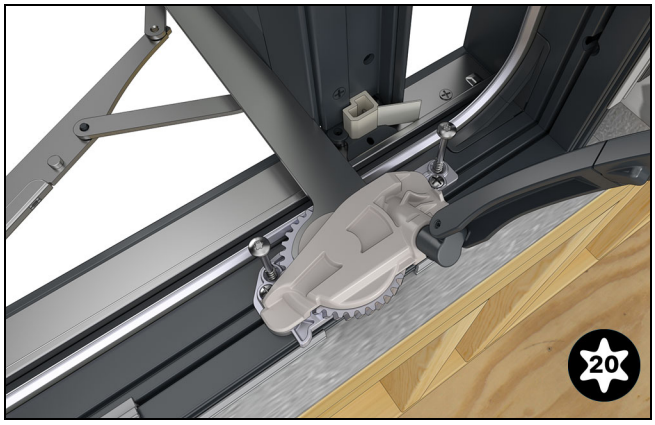

Figure 33

IMPORTANT

Do not use the 3" screws when mulled above another window. A 1 3/8" screw is installed at the factory when a field prepped window has the mull pin attached to the sill. In some cases you may need to install this screw in the field, refer to Additional Fastening for Some Horizontal Mulls on page 34.

1.A. On automated casement units with a **manual lock handle base,** use the construction lock wrench to unlock the window. On all other automated casements and awnings there are two different methods to unlock the sash.

Use a flat head screw driver to back drive the lead screw of the lock actuator or temporarily apply a power source to the unit. See Figure 34.

See the wiring guide for further instruction on using a temporary power supply to open the sash. If a power source is not used, press the red dot on the sash connector lever to dis-engage the sash actuator from the sash and open the sash.

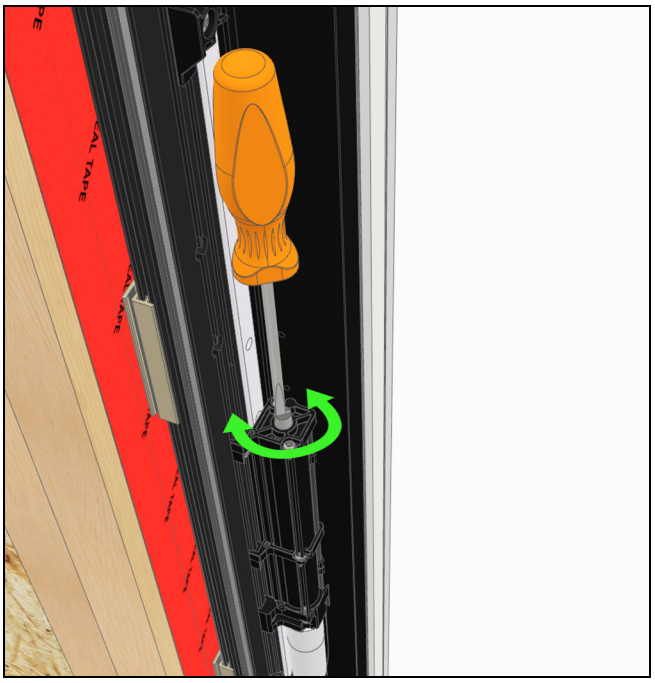

Figure 34

NOTE: On automated units, if the tie bar has a tie bar shipping clip, remove it.

1.B. Replace the two labeled short screws in the automated frame bracket with 3" screws. See Figure 35 and Figure 36.

NOTE: Awnings less than 20" tall will only have one screw replaced. If the frame bracket is next to a mull pin, refer to Additional Fastening for Some Horizontal Mulls on page 34.

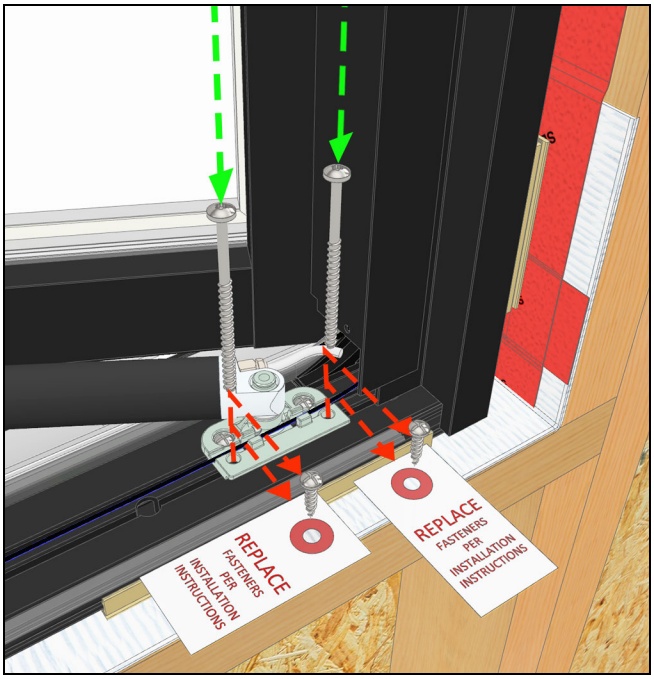

Figure 35 Automated frame bracket on Casement

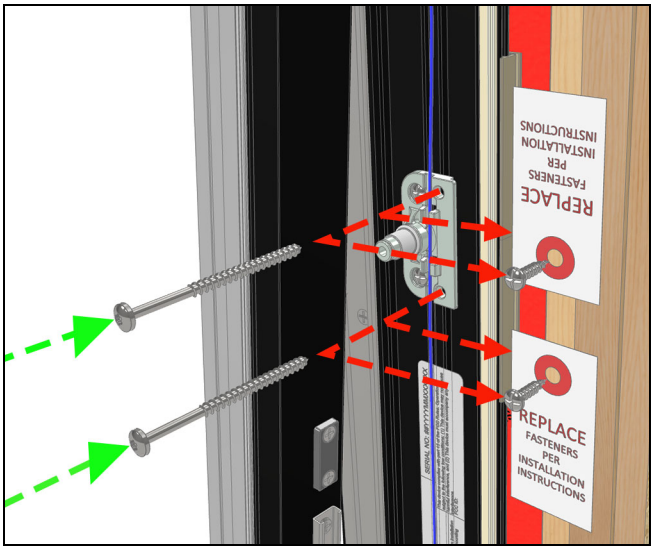

Figure 36 Automated frame bracket on Awning

2. With the sash open, remove the shipping blocks from the edges of the sash.See Figure 37.

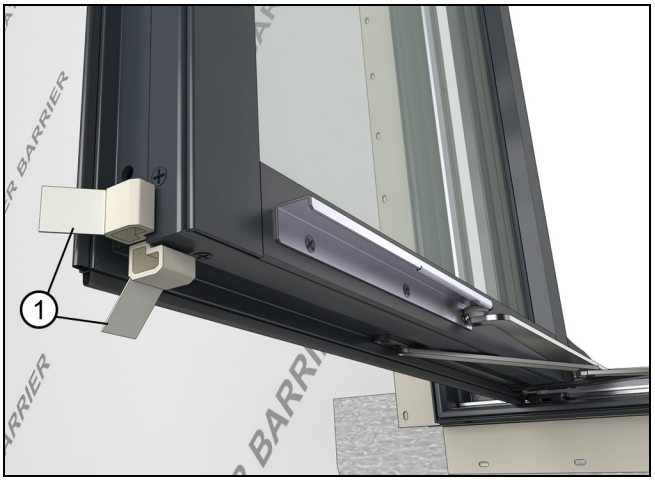

Figure 37 Shipping blocks are located at each corner.

Adjusting the Sash

IMPORTANT

At times you may need to adjust the sash hinges to obtain an even reveal between the sash and the frame. The cam found on the *sash track stud* provides minimal adjustment and is not intended to remedy a severely out of square frame installation.

1. To adjust the hinge without detaching the support arms use the adjustment wrench to move the cam up to 45 degrees left or right. Make small adjustments at the top and bottom to obtain an even reveal. See Figure 38.

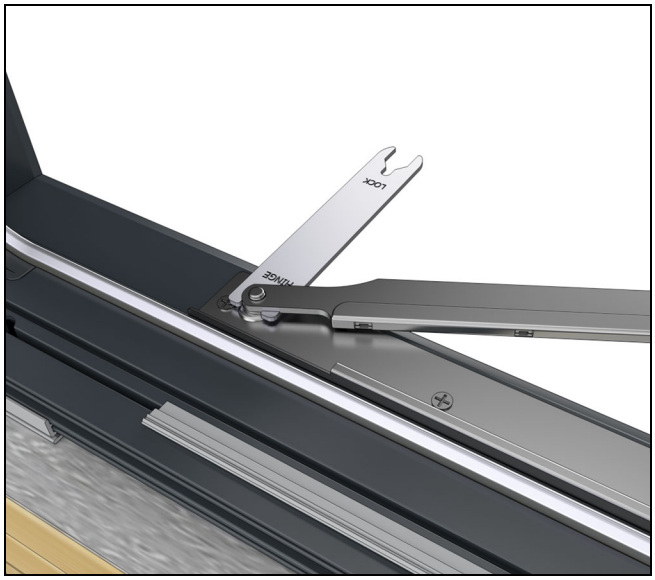

Figure 38

NOTE: A general rule of thumb is that the sash will move in the direction of the back of the wrench. In the illustration below as you move the wrench away from the sill track, the sash will move to the left (as seen from the interior) and vice versa.

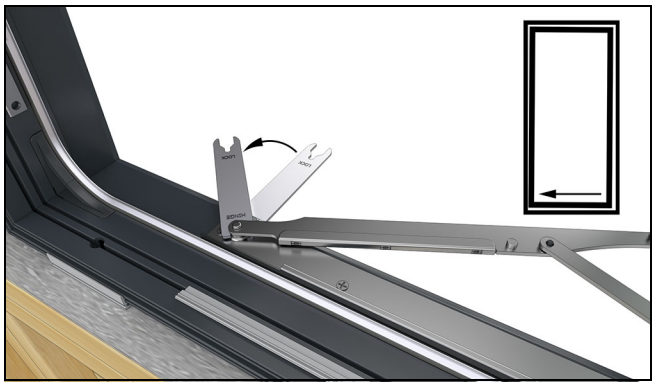

Figure 39

1.A. On automated units, if hinge adjustments are made and if power is applied, the actuators need to be re-homed. Press the top On Unit Control button 3 times followed by pressing the bottom On Unit Control button 3 times (3 up / 3 down). If power is not applied, the motors will automatically re-home when power is applied.

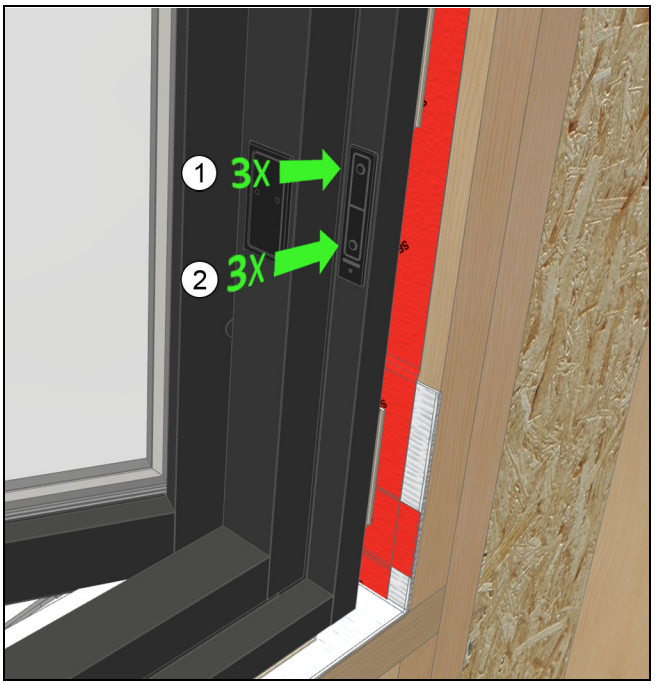

Figure 40

NOTE: Use the cadence of about 2 presses per second.

Install the Frame Cover Supports

Install frame cover supports on the jambs at all four corners of the window. The supports help to hold the jamb covers straight so they will line up with the head jamb and sill cover. After the window is installed the supports should fit tight to the head jamb and sill at all four corners.

IMPORTANT

Any awning unit with an **around the corner locking device** will not allow the use of supports at that corner.

1. Push the vinyl cover support into the jamb kerf as shown at the top and bottoms of both jambs.

Figure 41

2. Once the frame cover supports are seated properly, install the jamb, head jamb, and sill covers sequentially.

3. If there is a gap between the jamb covers and the head jamb or sill covers, a shim pushed between the frame cover support and the jamb covers as shown below will eliminate the gap. The shims can be a permanent part of the installation to keep the cover gaps tight.

IMPORTANT

The shim must not interfere with closing of the sash.

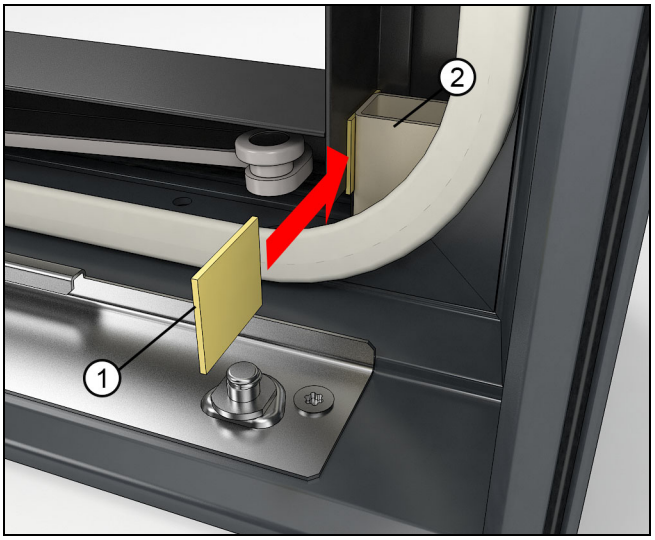

Figure 42

1	Shim (not supplied)
2	Cover support

NOTE: Some corners of automated units may not allow the use of the cover supports due to interference with the electronic components.

Installing Interior Frame Covers

NOTE: Covers are sent with fabricated cut ends.

NOTE: Removing the frame covers once they are installed may be difficult or cause damage to flexible barb. Ensure all previous installation and adjustment steps are complete before proceeding.

For Automated Windows: DO NOT install interior covers if wiring has NOT been pulled, connected to the window, and tested.

1. Install the jamb covers first. The connecting barb fits into the frame. Push the cover straight on. See Figure 43.

Figure 43

1	Jamb cover

2. Install the head jamb cover next. Start the cover a little higher than its final resting position to avoid scratching the jamb covers, then push it straight on. See Figure 44.

Figure 44

1	Head jamb cover

2.A. On automated jamb covers with the On Unit Control (OUC), pull the OUC through the back of the cover sideways, then turn, and snap into place. See Figure 45 and Figure 46.

NOTE: Do not disconnect the wire harness from the On Unit Control during this step.

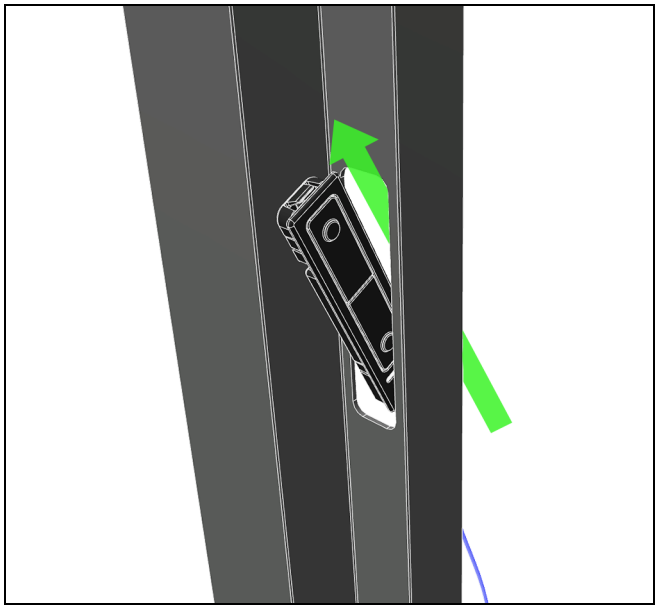

Figure 45

1	Head jamb cover

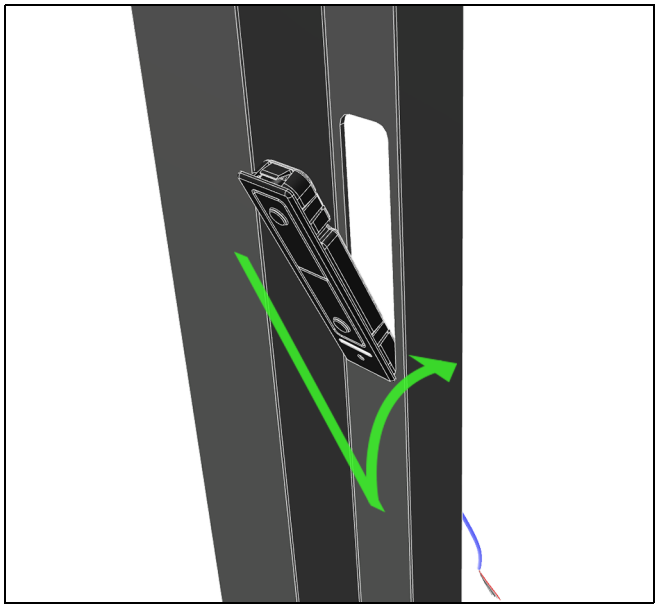

Figure 46

1	Head jamb cover

2.B. When installing the cover with the On Unit Control, take care not to pinch the wire harness between the cover and the side jamb

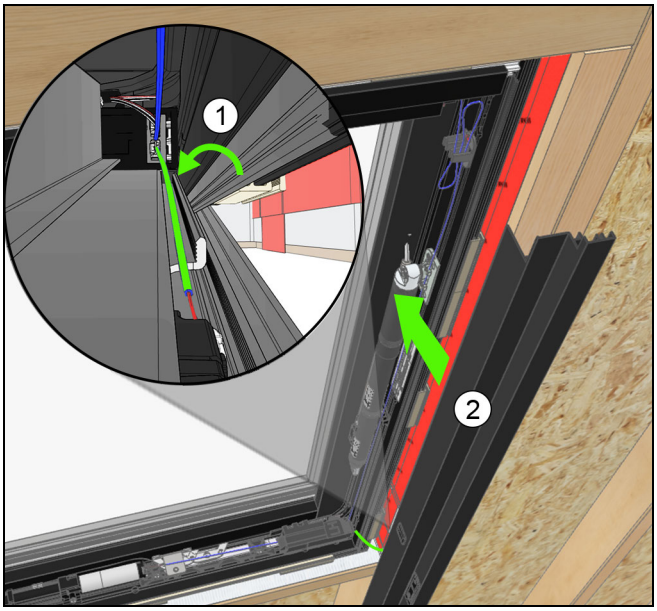

Figure 47

1	Take care not to pinch the wire outside of the channel in the jamb cover
2	Jamb cover with On Unit Control

3. Install the sill cover last. Rotate the cover around the crank operator, then push it straight on. Avoid scratching the jamb covers. See Figure 48.

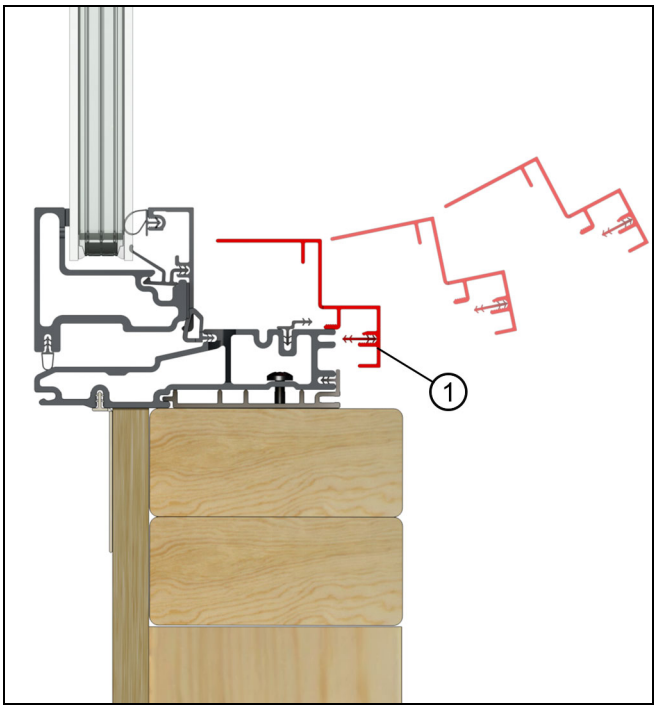

Figure 48

4. Install the crank hardware cover. Snap the cover on the base of the hardware. See Figure 49.

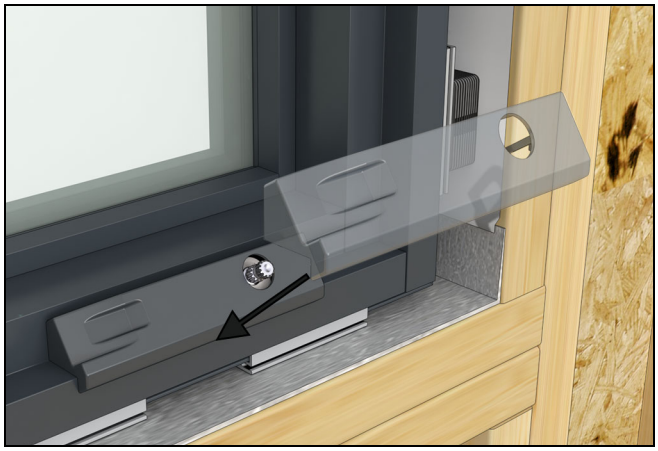

Figure 49

5. Insert the lock handle cover into the locking jamb cover recess.See Figure 50.

Figure 50

6. Insert the forked end of the lock handle to fit around the lever on the lock. Push the handle in until you feel it snap into place. See Figure 51.

Figure 51

IMPORTANT

Do not install drywall over the interior frame cover. This will hinder the ability to remove the cover later. When applying sealant between the cover and drywall, use a paintable caulk.

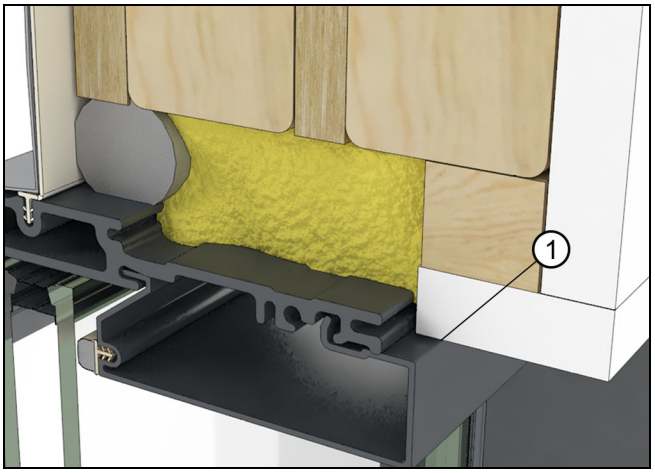

Figure 52

1	Do not block the cover with drywall

7. For crank out operators, if screens are included, test fit them to ensure fit-up of the frame and engagement of screen latches.

Refer to Installing the Crankout Screen on page 39.

Installing the Crank Handle

1. Seat the handle on the hardware spline. Turn the crank handle until the sash is completely closed. See Figure 53.

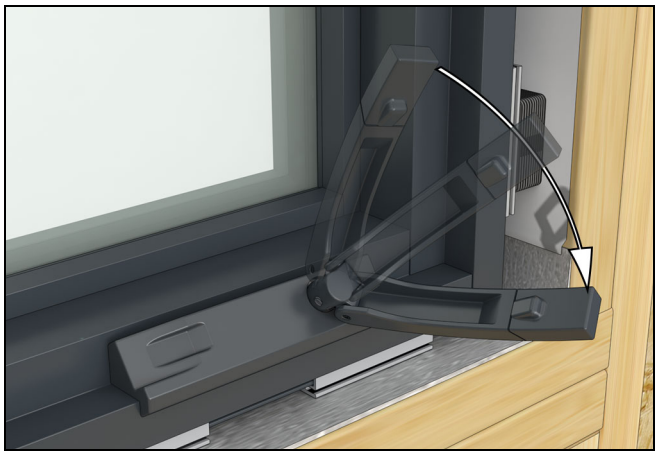

Figure 53

2. Remove the handle from the spline. Re-seat the handle aligned slightly lower than horizontal then tighten the set screw. See Figure 54.

Figure 54

3. Nest the handle in the recess. See Figure 55.

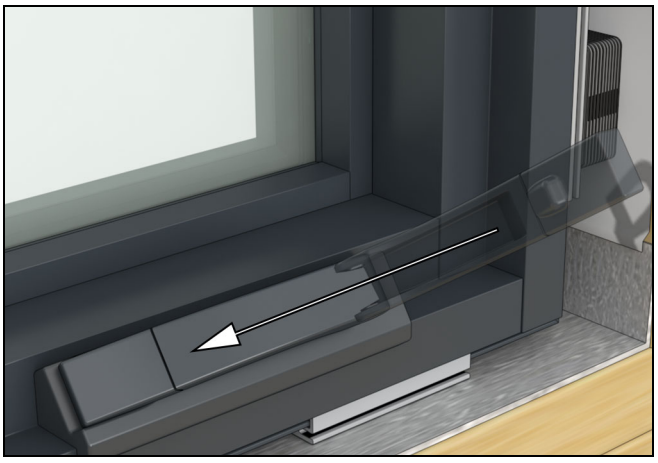

Figure 55

Exterior Sealing and Flashing Details

Nailing Fin Details-Optional

1. If installed, seal behind the nailing fin at the jambs and head jamb. See Figure 56 and Figure 57.

Figure 56

Figure 57

2. Optional: Complete fastening nailing fin around the perimeter.

Flashing Modern Window Installations

IMPORTANT

Nailing fin is not designed to be a weatherproof flashing.

IMPORTANT

Follow the flashing tape manufacturer's recommended instructions for attaching to the building material under the WRB. For example, priming wet or frozen wood, application temperature, etc.

Figure 58

1. If installed, seal behind the nailing fin at the jambs and head jamb. See Figure 56 and Figure 57.

Figure 59

2. On units that use nailing fin, apply a 2" x 4" strip of flashing material at 45 degrees to the corner, bridging the gap between the nailing fin. Do this at all 4 corners. See Figure 60.

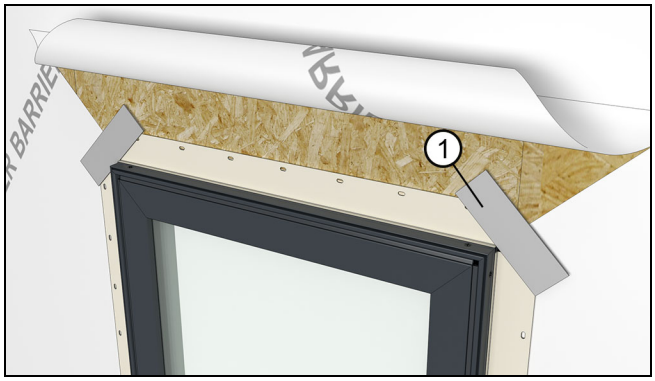

Figure 60

1	2" x 4" strip of flashing material

3. Apply a bead of sealant between the corner flashing and the window exterior. Tool the sealant out. See Figure 61.

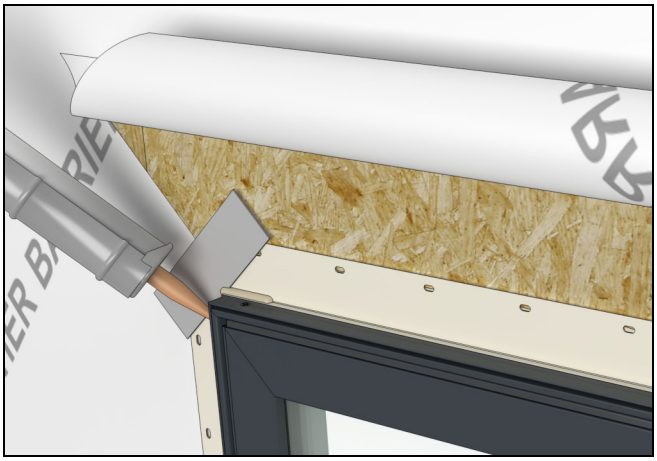

Figure 61

4. Install a rigid head flash. Apply sealant to all surfaces that will come in contact with the flashing. Flashing should extend past the window frame by at least 1/8" (3) on each side. See Figure 62.

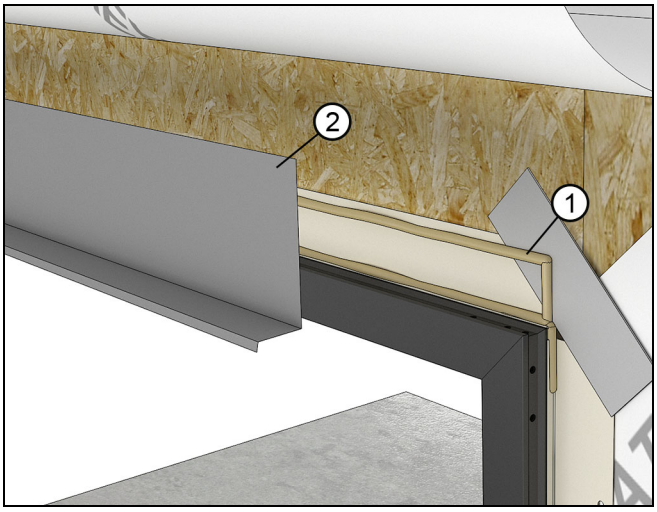

Figure 62

1	Sealant
2	Rigid head flash

5. OPTIONAL SKIRT: Install an optional "skirt" in applications with exposure to wind driven rain/climate. Use flashing material or a 12" (305) strip of WRB and attach to the sill of the window with seam seal tape or flashing tape. See Figure 63.

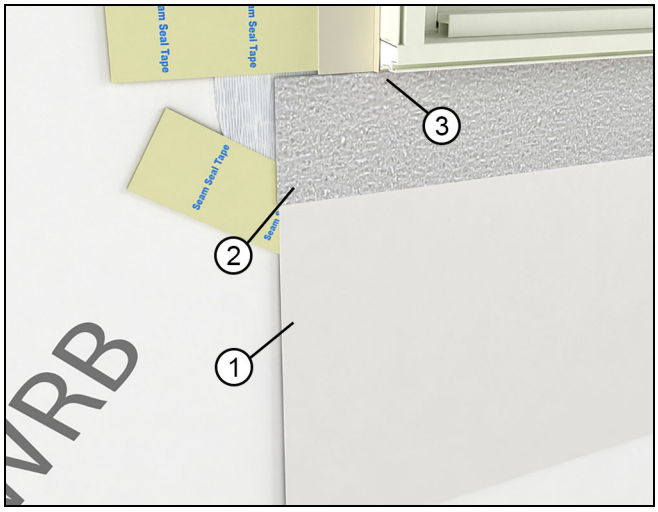

Figure 63

1	Skirt (WRB material or other)
2	Adhesive tape
3	Attached to sill of window

6. Lap vertical strips of adhesive flashing tape onto the window and out over the WRB. Make small diagonal cuts at the head jamb as in Figure 64 to allow the membrane to fold back onto the exterior and frame.

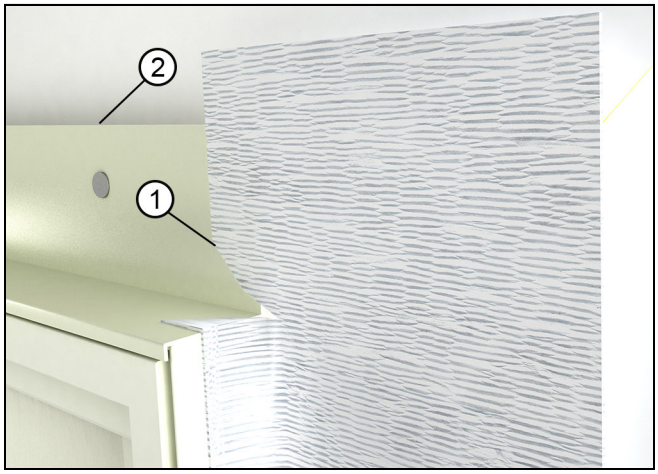

Figure 64

1	Diagonal cut in flashing
2	Rigid head flash

7. Install another layer of adhesive membrane lapping onto the rigid head flash of the window and over the sheathing. The membrane flashing at the head jamb should extend and cover the flashing previously installed at the jambs. Make relief cuts and fold down so the that it wraps around the jamb. See Figure 65 and Figure 66.

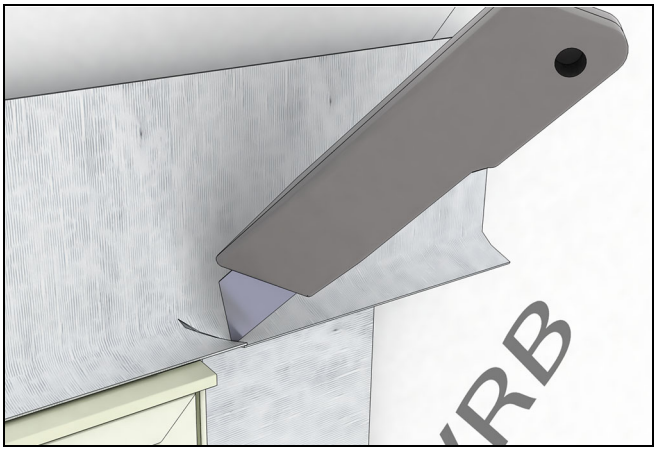

Figure 65

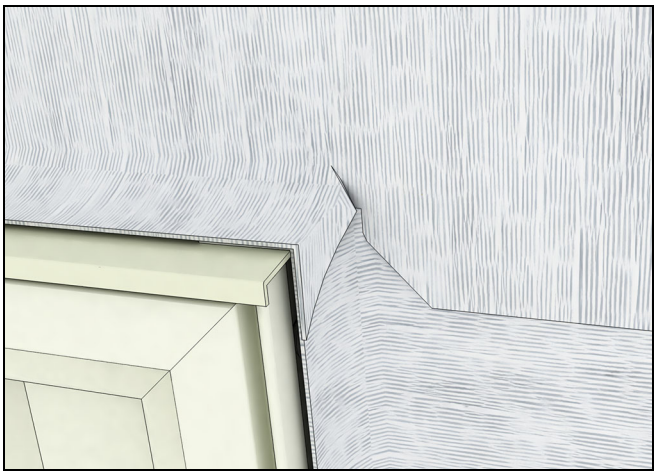

Figure 66

8. Tape the top edge of the head jamb flashing with seam seal tape. See Figure 67.

Figure 67

9. Seal the ends of the rigid head flash by injecting sealant at each end. See Figure 68.

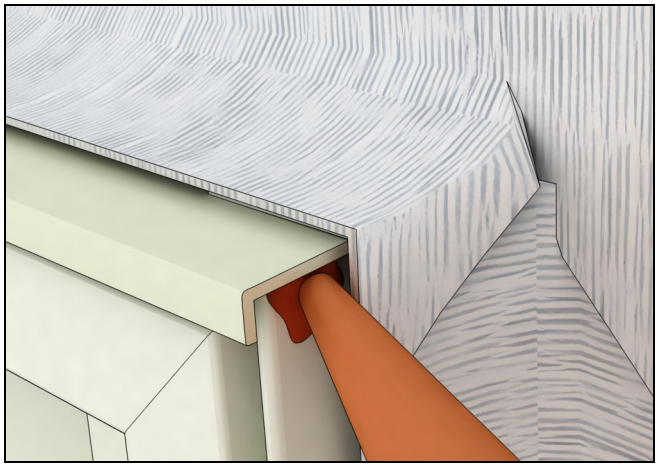

Figure 68

10. Fold the head jamb WRB down over the head jamb flashing. Apply seam seal tape over the diagonal cut in the WRB. Make sure the seam seal laps onto the window. Tape any seams and fasteners directly above the unit with seam seal tape. See Figure 69.

NOTE: This does not apply to self adhered WRB.

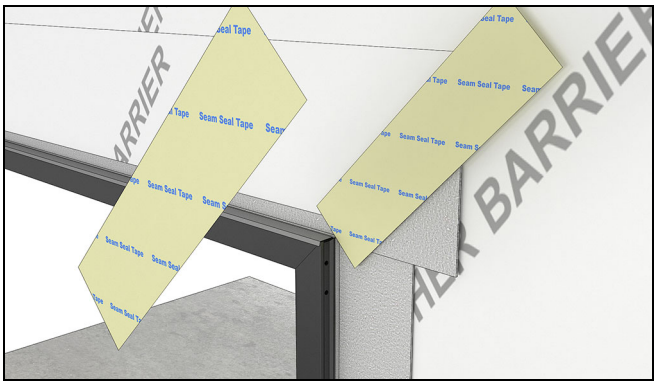

Figure 69

Insulating and Sealing the Installation

1. Apply insulation in the rough opening, against the backer rod installed earlier. See Figure 70.

2. Apply a continuous bead of sealant around the interior perimeter. **Seal all joints where drywall returns to the window frame.** See Figure 70.

IMPORTANT

Do not install drywall over the interior frame cover. This will hinder the ability to remove the cover later. When applying sealant between the cover and drywall, use a paintable caulk.

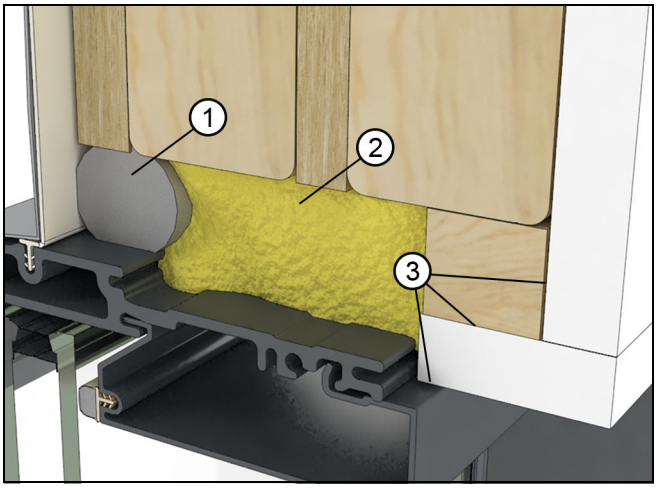

Figure 70

1	Exterior backer rod
2	Insulation
3	Sealant

3. At the exterior, once the exterior finish such as siding or brick veneer is installed, apply a bead of sealant between the finish and the frame exterior along the sides. Apply additional beads approximately 1"-2" (25-51) at the ends on top of the head jamb flashing. Use a backer rod when necessary. See Figure 71 and Figure 72.

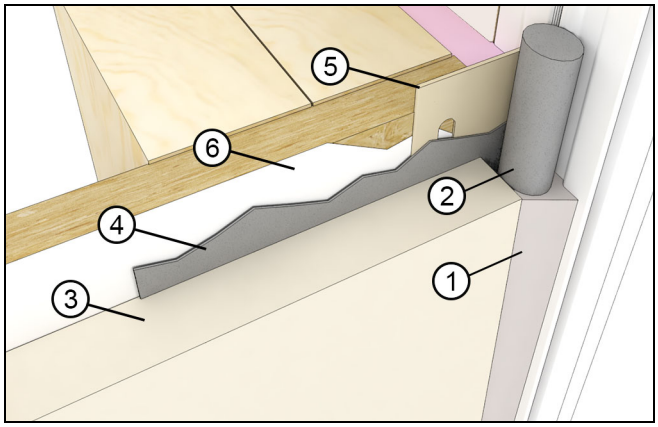

Figure 71

1	Sealant
2	Backer rod
3	Sheathing
4	Adhesive flashing
5	Nail fin
6	Weather resistive barrier

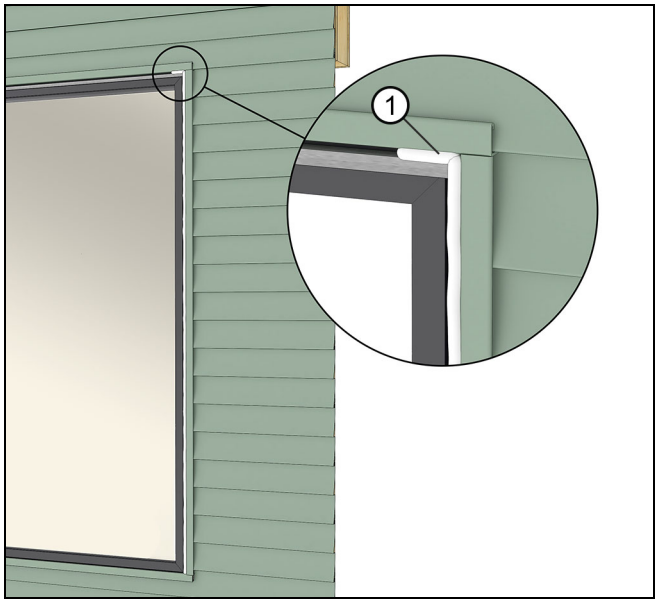

Figure 72

1	Sealant

⚠ CAUTION!

Perimeter sealant must be Grade NS Class 25 per ASTM C920 and compatible with the window product and the finished exterior(s) of the building. Using improper sealant could result in sealant failure causing air and water infiltration.

Casement and Direct Glaze Field Mulling

Field mulled units are prepped for mulling and include an attached mull pin to the right hand jamb of the left side unit (A1 as seen from the exterior). Subsequent units at the middle of the mull will have the mull pin fastened to the right hand jamb at the factory. Units prepped for mulling will also have the shim spacers attached at the fastener locations, and nailing fin where applicable. See Figure 73.

IMPORTANT

A level and flat sill is crucial when installing and mulling units in the opening. The sill should be within 1/16" flat and level to achieve a successful mull and installation.

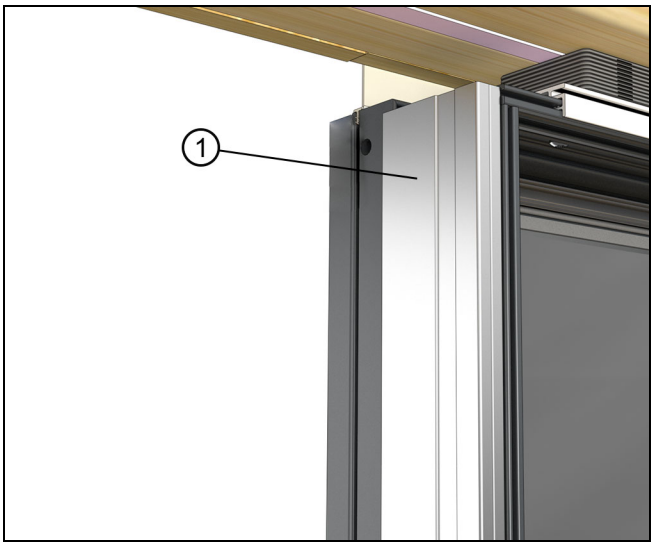

Figure 73 A1 units prepped for field mull (viewed from interior)

1	Mull pin (fastened from the inside of A1 unit)

Prep for Mulling

NOTE: If you are mulling an assembly in place set the first window (A1) in the opening and fasten the jamb, sill, and head jamb. See Figure 74 and Figure 75. The illustrations that follow in this section show a 3-wide unit with two vertical mulls, mulled in the opening. If you are mulling the assembly before installation follow step 1 on page 29 through step 6 on page 32.

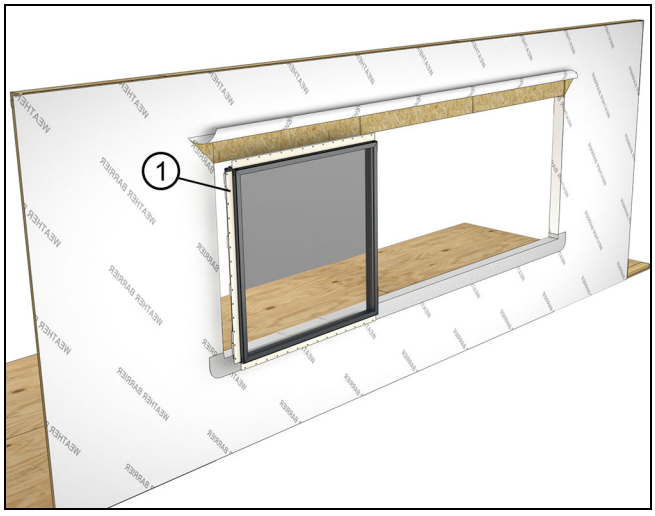

Figure 74 Install the first window (A1)

1	A1 (in mull configurations)

Figure 75

1. Apply a continuous 1/4" (6) bead of sealant along the length of the frame. See Figure 76.

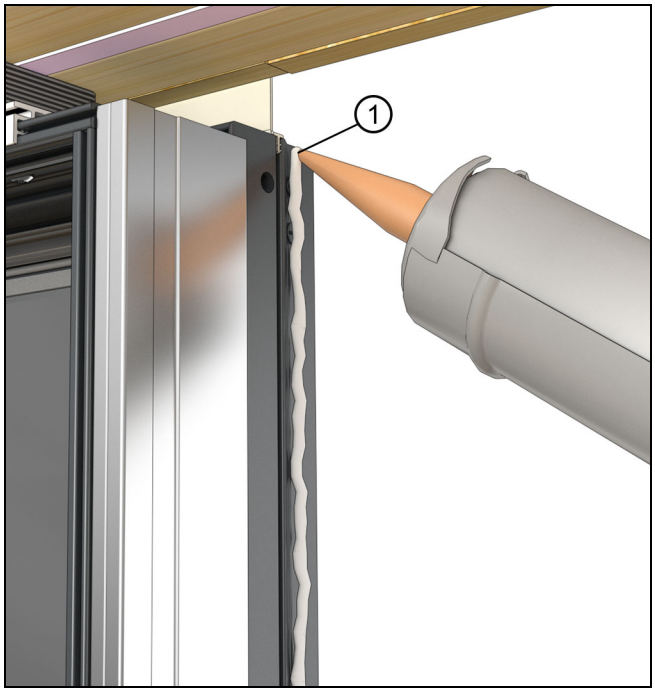

Figure 76

1	Apply sealant full length.

Join the Assembly

IMPORTANT

Make sure the sill is level and flat before installing and mulling assemblies. Mulled surfaces on both units must be completely free of debris to ensure proper contact.

1. Set the next unit close to the A1 unit. Clamp the two units together making sure the windows are flush to one another on all planes (interior/exterior and top and bottom). See Figure 77 and Figure 78.

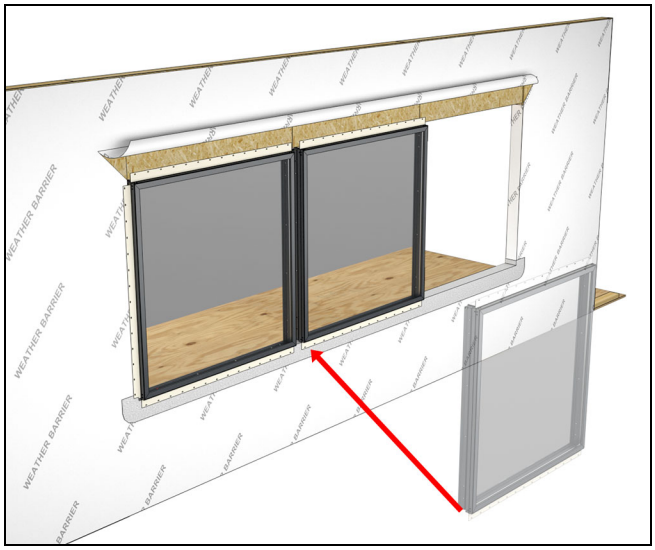

Figure 77

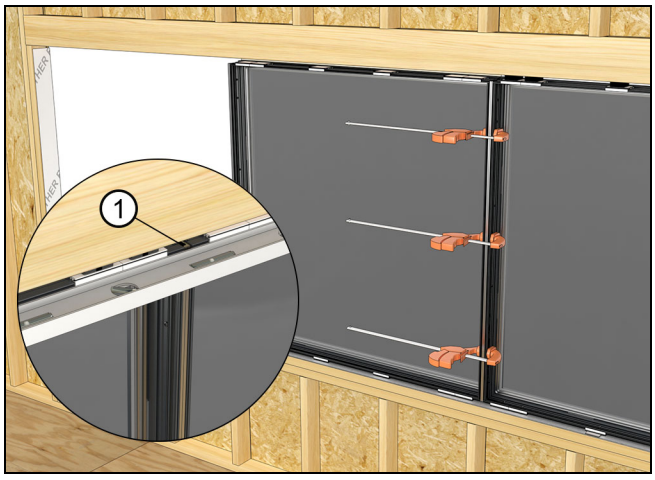

Figure 78

1	Flush the frames to one another.

2. Fasten at each pre-drilled hole location with the #8 x 7/16" Phillips head self drilling screws provided. See Figure 79.

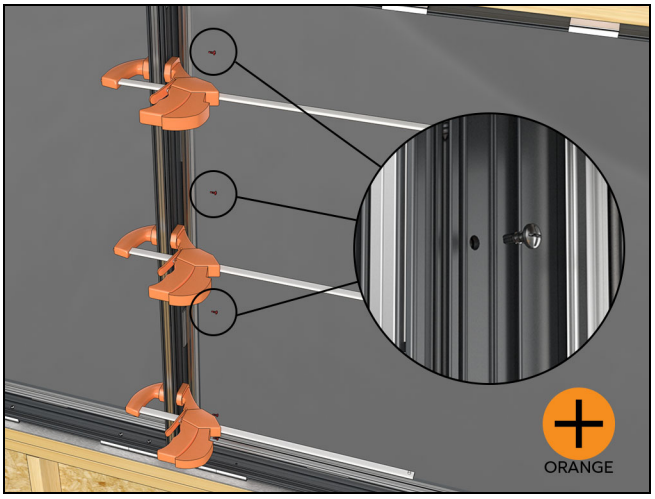

Figure 79

IMPORTANT

To ensure consistent alignment and reveal for the mull covers, it is critical that frames are flat and flush on both the interior and exterior. Gaps where the exterior covers install (See Figure 80) must be consistent along the entire length of each mull, and frames must be in tight contact with the mull pin where the interior covers install. See Figure 83.

3. Apply the exterior covers. These can be seated with a rubber mallet. Make sure the covers are flush to the exterior accessory kerf. See Figure 80.

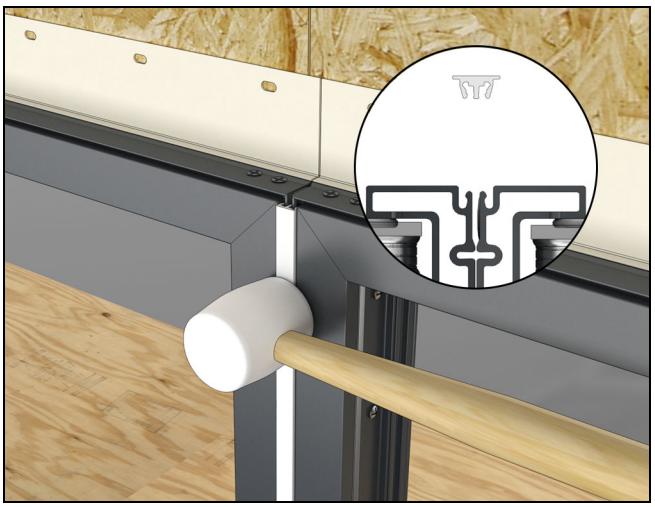

Figure 80

4. Fasten at the head jamb and sill with #10 x3" installation screws. Make sure the frame is plumb to the interior/exterior. See Figure 81 and Figure 82.

Figure 81

Figure 82

5. Apply the interior aluminum covers. These are barbed on and can be seated with a rubber mallet. Make sure the covers are flush to the interior accessory kerf. See Figure 83.

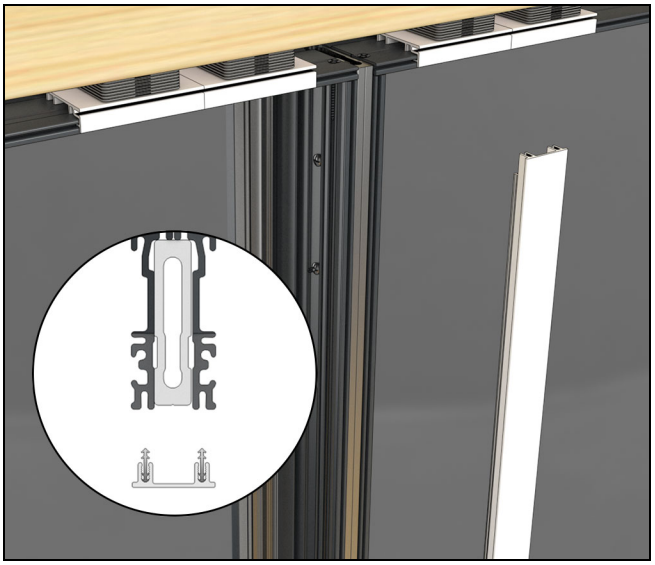

Figure 83

IMPORTANT

Apply the mull caps between each window in multiple assemblies before joining the next window.

6. Repeat the previous steps until the entire assembly is complete. See Figure 84.

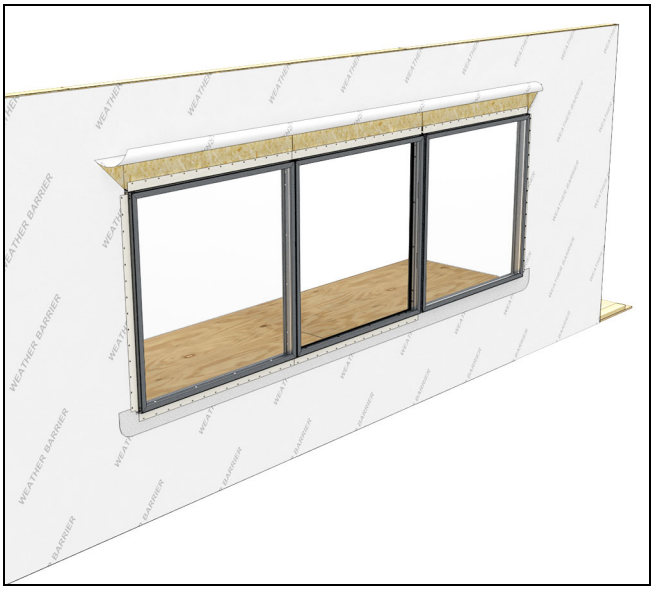

Figure 84

Horizontal Mulls

Use the techniques outlined in the previous sections to apply a horizontal mull. Install the lower units first. Then set the top unit (with mull pin attached) above, being careful not to disturb the sealant bead until you have the assembly aligned correctly. See Figure 85.

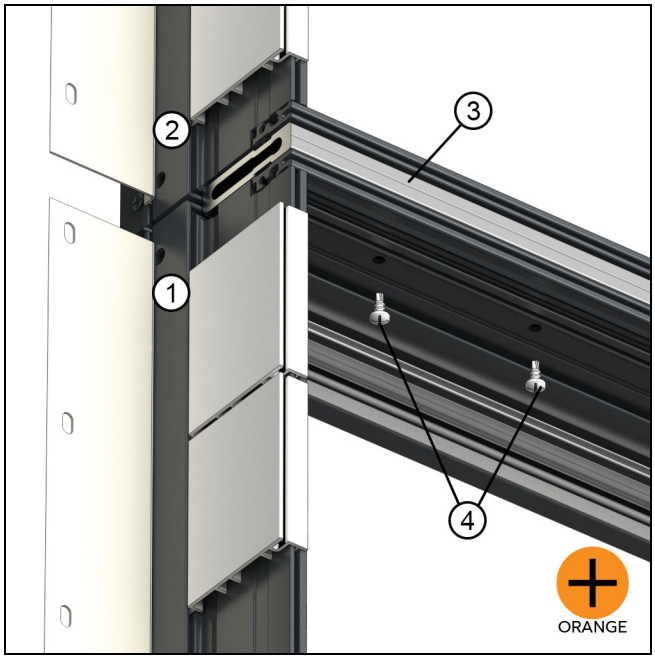

Figure 85 Horizontal mull (framing not shown for illustrative purpose)

1	B1 unit
2	A1 unit
3	Mull pin attached to top unit
4	#8 x 7/16" Phillips self drilling screws

Multiple High / Multiple Wide Assemblies

On multiple high/multiple wide assemblies a continuous mull pin must be applied to the mull direction with the shortest span. The non-continuous mull pins will be factory installed. Use the techniques outlined in the previous sections to mull the units with factory applied mull pins first. See Figure 86.

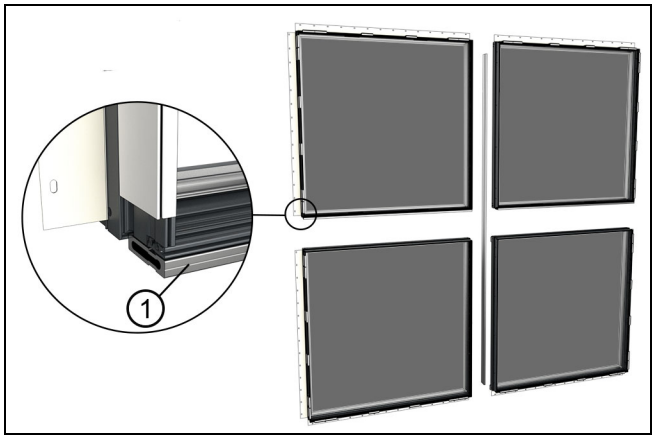

Figure 86 Multiple high and wide assemblies

1	Mull pin factory applied.

Additional Fastening for Some Horizontal Mulls

1. In some cases where the horizontal mull pin is not already fastened to the bottom of the window, you will need to attach the mull pin and then fasten through the hardware base with the 1 3/8" (35) screws found in the bag marked with the gray dot. Pre-drill with a 1/8" (3) drill bit. See Figure 87.

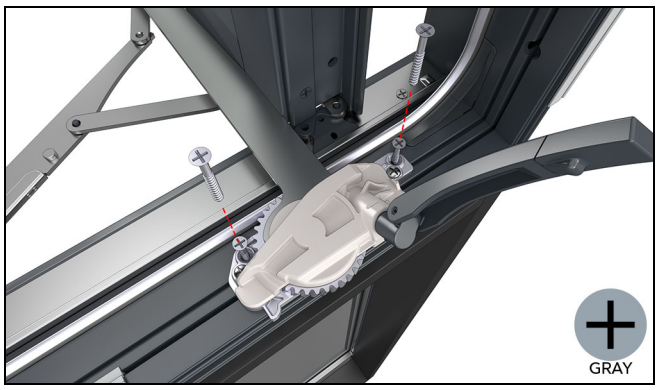

Figure 87

1.A. If the motorized frame bracket is next to a mull pin, and the mull pin is not attached to the window, you will need to attach the mull pin and then fasten through the frame bracket. Pre-drill with a #29 or 9/64" drill bit and fasten with the 1 1/4" trilobular screws found in the bag marked with the teal dot. Replace 2 screws on all frame brackets except Awnings less than 20" tall, which will have 1 screw replaced. See Figure 88 and Figure 89.

Figure 88

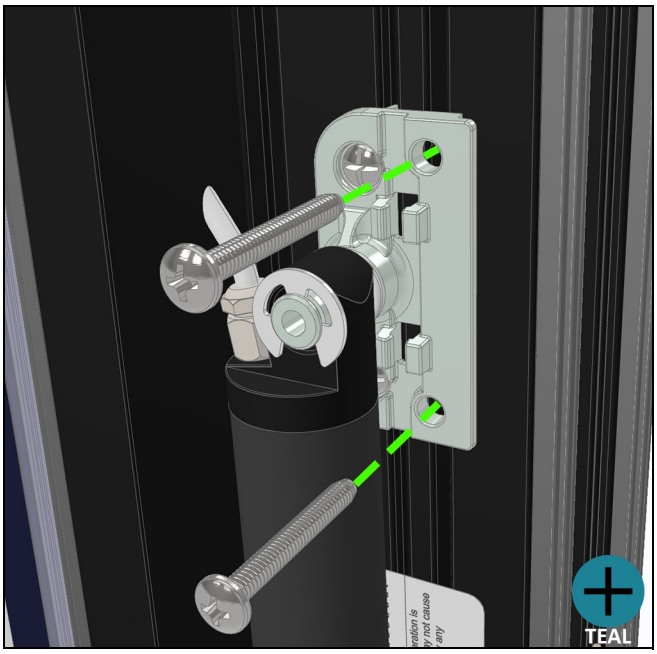

Figure 89

Removing Casement Sash

Using a smartphone or similar device, scan the QR code or click here to play a video of this procedure.

1. Open the sash approximately 4" (102). See Figure 90.

Figure 90

1.A. When removing an automated casement sash, partially open the window and remove the 1/4" Pan head screw and rotate the sash actuator back into the frame

Figure 91

2. With a firm grip on the sash, detach the operator arm from the track by pushing the arm down. See Figure 92 and Figure 93. Crank the arm back to the frame.

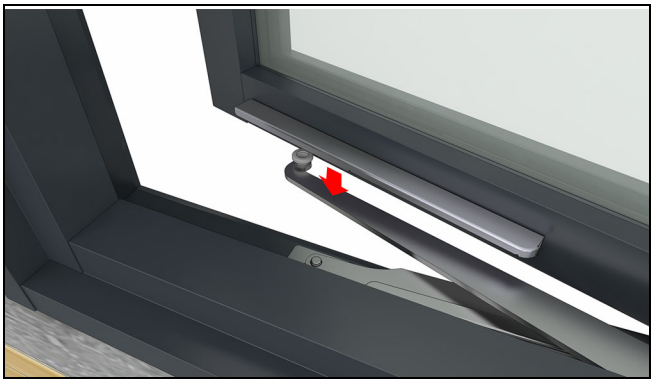

Figure 92

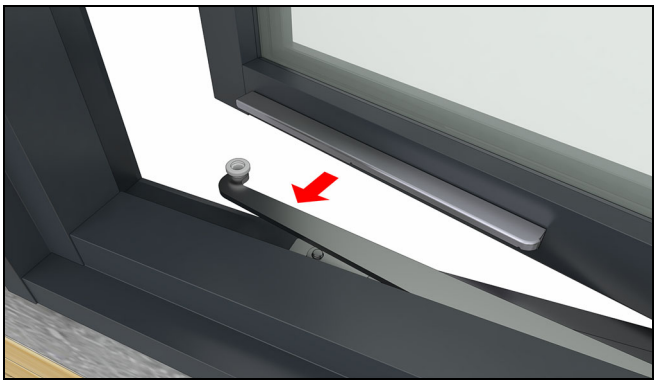

Figure 93

CAUTION!

To avoid damage to the sash and/or personal injury, the sash must be fully supported at all times. Do not rack the hinges during removal, the sash stile must remain parallel to the side jamb when removing or installing the sash. Do not tip or rest the sash on the corners.

3. While fully supporting the sash, detach both the top and bottom hinge linkages from the studs. See Figure 94 and Figure 95.

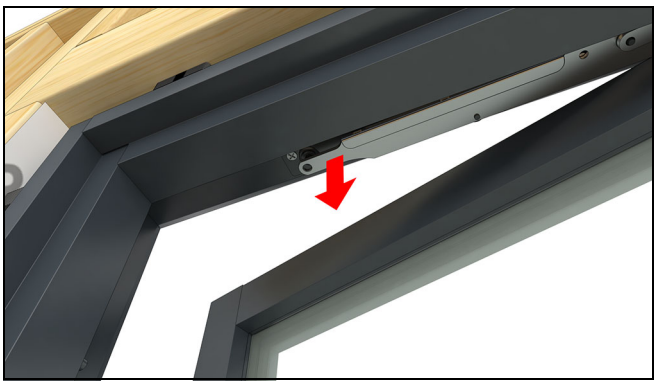

Figure 94

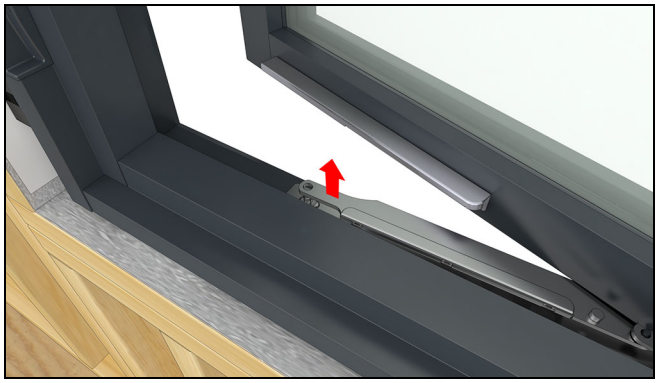

Figure 95

4. Remove the sash by sliding it across the groove in the hinge track. Both hinge shoes must be free of the groove in the hinge track before removal. See Figure 96

Figure 96

5. To reinstall the sash, reverse the removal procedures.

NOTE: Keep the sash shoes flat up against the track just in front of the groove. For ease of installation, keep the sash stile parallel to the side jamb and slide the top shoe into the groove in the track followed by the bottom. The sash should be fully supported until after both sash shoes are securely engaged with the groove in the hinge track, the hinges have been fully seated onto the hinge studs and the operator arm has been attached.

NOTE: On automated units, when the sash is reinstalled and if power is applied, the actuators need to be re-homed. Press the top On Unit Control button 3 times followed by pressing the bottom On Unit Control button 3 times (3 up / 3 down). If power is not applied, the motors will automatically re-home when power is applied.

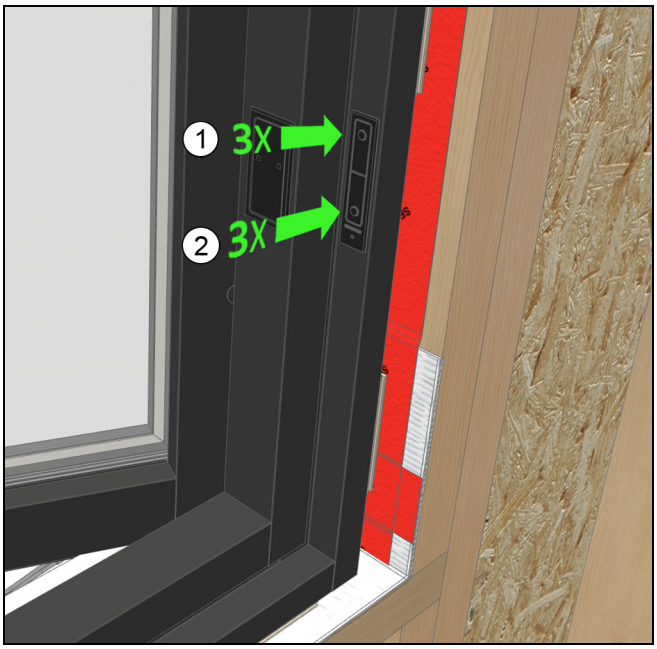

Figure 97

Removing Awning Sash

1. Open the sash approximately 4" (102). See Figure 98.

Figure 98

1.A. When removing an automated awning sash, partially open the window and remove the 1/4" Pan head screw and rotate the sash actuator back into the frame.

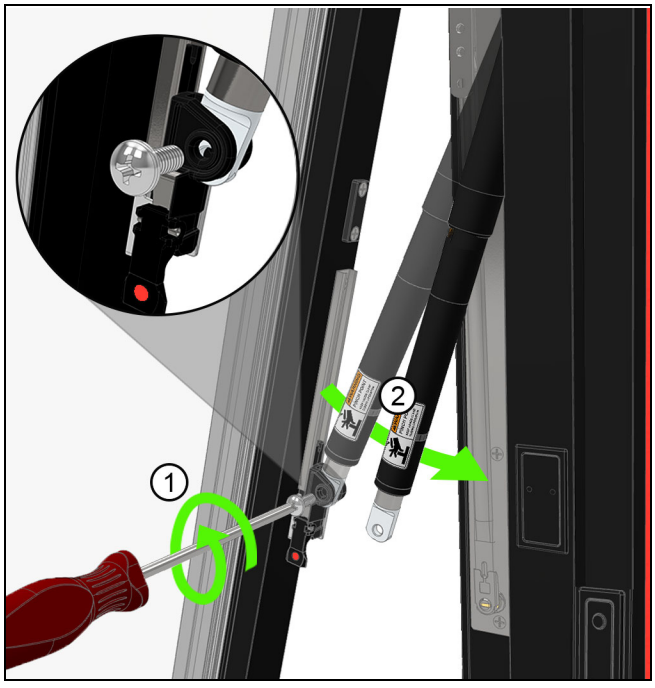

Figure 99

2. Detach the operator arm from the track by sliding back the clip and then pulling the operator arm down. See Figure 100. Crank the arm back into the frame.

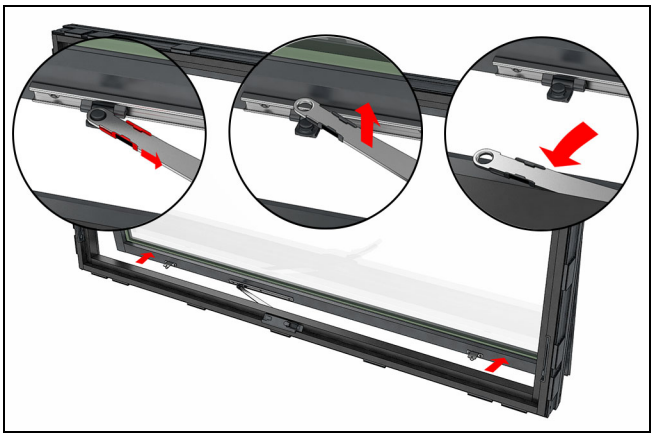

Figure 100

CAUTION!

To avoid damage to the sash and/or personal injury, the awning sash must be fully supported at all times.

3. While fully supporting the sash, detach the hinge linkages from both sides of the sash. Use a flat head screwdriver to disengage the clip. Pry the hinge arm inward to release the arm from the hinge stud. See Figure 101.

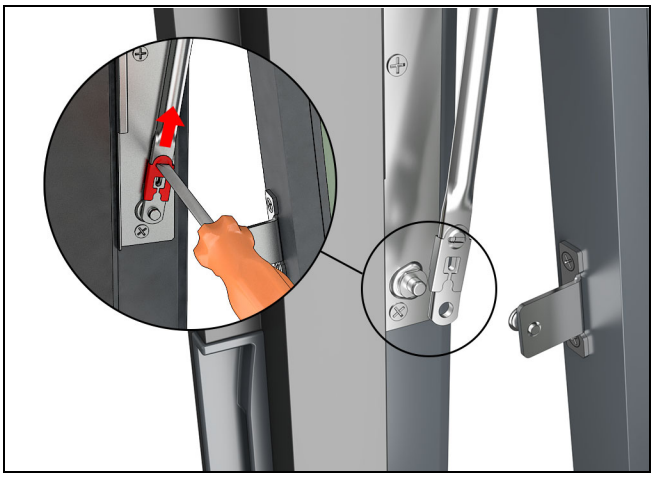

Figure 101

4. Gently lower the sash until the shoe on both sides of the sash are below the groove in the hinge track. Remove the sash from the frame by pulling it outward. See Figure 102.

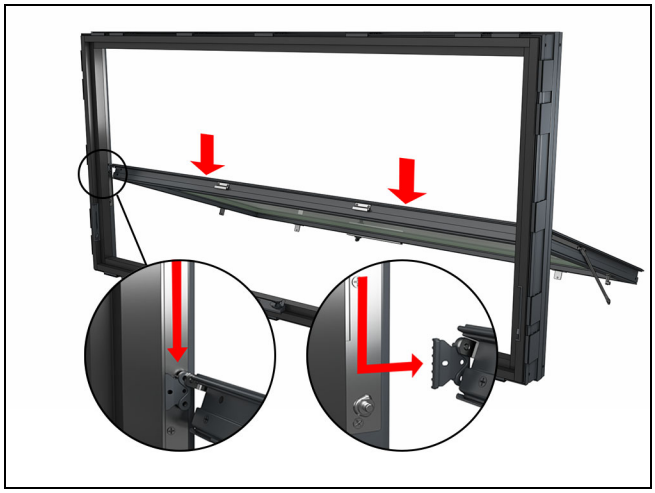

Figure 102

5. To reinstall the sash, reverse the sash removal procedures.

NOTE: Keep the sash shoes flat up against the track just in front of the groove. Keep the sash stile parallel to the sill. Slide the sash shoes into the groove in the track. Support the sash fully until both shoes are securely engaged with the hinge track; the hinge arms are placed onto the hinge stud; and clips seated. See Figure 103.

Figure 103

5.A. On automated units, when the sash is reinstalled and if power is applied, the actuators need to be re-homed. Press the top On Unit Control button 3 times followed by pressing the bottom On Unit Control button 3 times (3 up / 3 down). If power is not applied, the motors will automatically re-home when power is applied.

NOTE: Use the cadence of about 2 presses per second.

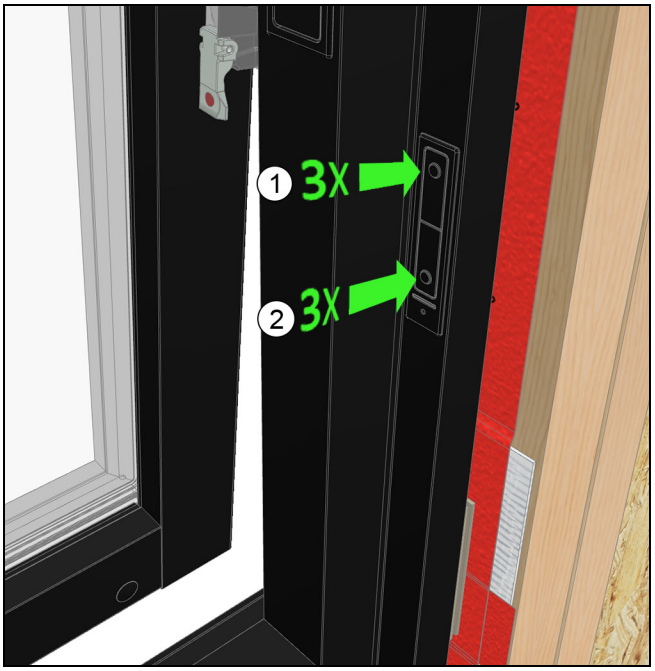

Figure 104

Installing the Crankout Screen

1. Align the notch in the screen frame to fit around the hardware cover then tip the screen into place. See Figure 105.

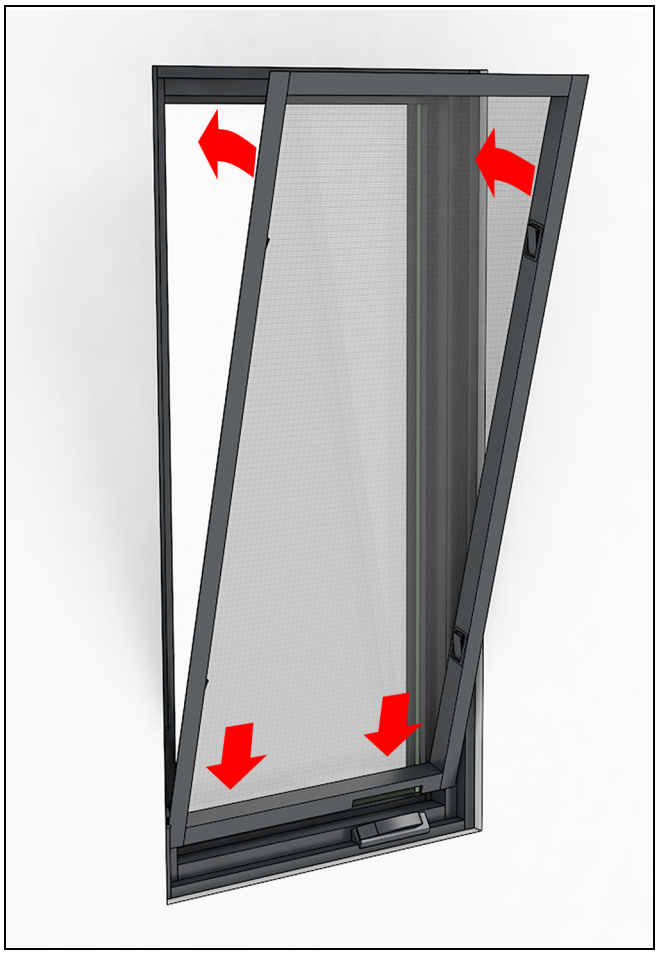

Figure 105

NOTE: The casement pushout screen is shown. Awning pushout version is rotated 90 degrees, with the hinge attached to the head jamb.

2. Engage the latches to secure the screen in place. See Figure 106.

Figure 106

Installing the Pushout Screen

1. Insert the hinge bar on the screen into the window frame, lining up the pre-drilled holes in the hinge with the pre-drilled holes in the frame. Fasten with the stainless steel screws provided. See Figure 107 and Figure 108.

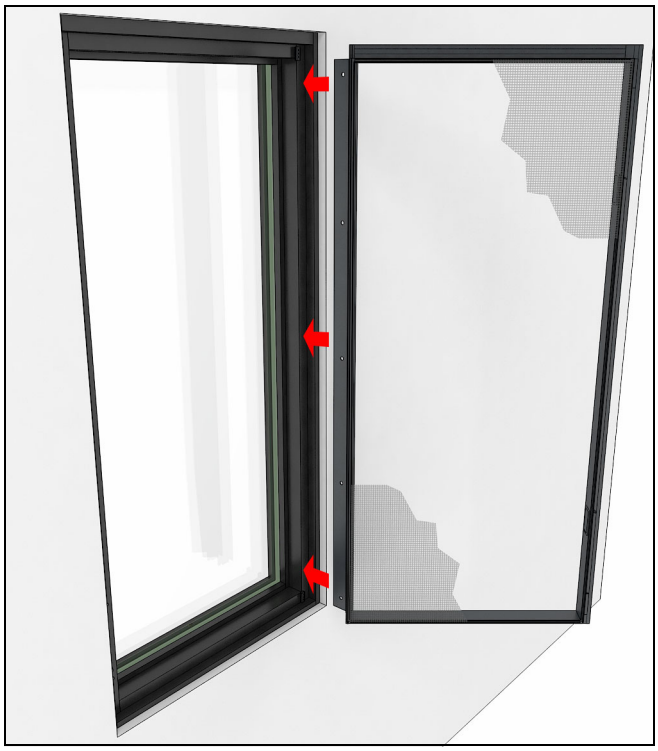

Figure 107

Figure 108