

TERRASTILE[®] DOOR
SERIES T3501, T4001, T4501
INSTALLATION INSTRUCTIONS



Part NO. YW42

February 2013

WHERE WINDOWS ARE JUST THE BEGINNING[®]



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Minimizing Condensation

Note: Please reference EFCO's "Understanding Condensation" brochure which can be obtained through your EFCO representative.

Condensation will form on any surface when unfavorable conditions (interior temperature and relative humidity and exterior temperature) are present. When the formation of excessive condensation is a concern, it is highly recommended that a design professional is utilized to perform an analysis of the shop drawings to recommend the best possible installation methods. Please contact your EFCO representative for information on EFCO's Thermal Analysis Services.

Many current installation practices lead to an increase in the possibility of the formation of condensation.

Though not all inclusive, the list of examples below illustrates conditions under which condensation is likely to occur:

1. Bridging system thermal break with non-thermally broken metal flashing or lintels that are exposed to the exterior
2. System exposure to cold air cavities
3. Interior relative humidity levels not maintained at recommended levels, see EFCO's "Understanding Condensation" brochure
4. Inadequate separation between system and surrounding condition at perimeter
5. Product combinations during the shop drawing stage that result in bridging thermal breaks of one or all products involved

These recommendations are for general erection procedures only. For actual job conditions, see the details on the shop drawings. For perimeter anchor type and spacing, refer to the approved shop drawings or consult the project design professional.

SECTION I: General Notes and Guidelines

TerraStile® doors are finished products and must be protected against damage. The following procedures and precautions are recommended:

A. General Notes

1. Protection and Storage

- a. Handle the material carefully.
- b. To avoid racking or damage to the doors and frames do not drop or drag from the truck.
- c. Stack the door with the directional arrows in the proper position to allow adequate separation so the door panels will not rub together.
- d. Store the doors and accessories off the ground (i.e., pallets, planks, etc.).
- e. Protect against the elements and other construction trades by using a well ventilated covering.
- f. Remove material from packaging, if it becomes wet. Then repack materials and move to a dry location.
- g. Doors are not to be used as ladders, scaffolds, or scaffold supports.

2. Check Materials

- a. Check all the material upon arrival for quantity and damage. Any visibly damaged material must be noted on the freight bill at the time of receipt. If a claim is required, the receiving party must process a claim with the freight carrier. If the delivery is by an EFCO truck, any damage or variance in the quantity of window units or boxes must be reported to the EFCO driver during the unloading process.

3. Cleaning Door Units

- a. Cement, plaster, terrazzo, alkaline, and acid based materials used to clean masonry are very harmful to finishes and should be removed with water and mild soap immediately; otherwise, permanent staining will occur. A spot test is recommended before any cleaning agent is used.
- b. For cleaning of anodized aluminum surfaces, refer to AAMA 609-93 Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
- c. For cleaning of painted aluminum surfaces, refer to AAMA 610.1-1979 Voluntary Guide Specification for Cleaning and Maintenance of Painted Aluminum Extrusions and Curtain Wall Panels.
Please note: The prolonged application of masking tape, duct tape, and similar products to painted aluminum surfaces will induce permanent bonding of the tape to the paint. This will cause adhesion failure between the paint and the aluminum surface when the tape is removed.
- d. If a protective coating is specified, remove it in areas that require field-applied sealant prior to installation.

B. Construction Notes

1. Reference Shop Drawings

- a. Check the shop drawings and installation instructions to become thoroughly familiar with the project. The shop drawings take precedence and include specific details for the project. The installation instructions are general in nature and cover most common conditions.

2. Check Openings

- a. Make certain that the construction, which will receive the material, is in accordance with the contract documents. If not, notify the general contractor and EFCO in writing to resolve differences before proceeding with your work.

3. Benchmark Layout

- a. All work should start from benchmarks and/or column center lines as established by the architectural drawings and the general contractor.

4. Plumb and Level

- a. All materials are to be installed plumb, level, and in proper alignment and relation to established lines and grades. Products are to be installed maintaining tolerances of 1/8" in 12'-0" of length.

5. Isolate Aluminum

- a. Isolate aluminum that directly contacts masonry, CA treated wood, or other incompatible materials with high impact plastic isolators, etc.

6. Poured and Debrided and Thermal Strut Sections

- a. Do not drill, punch, penetrate, or alter the thermal break in any manner.

7. Fastening

- a. Fastening means any method of securing one part to another or to adjacent materials. Due to varying opening conditions, window configurations, design pressures, and methods of anchorage (subframe, "F" anchors, etc.), perimeter fasteners are not specified in these instructions. For anchor fastening, refer to the shop drawings or consult the project design professional. See section "E".

8. Blocking

- a. All blocking and shims will be high strength plastic or non-corrosive materials, Not by EFCO. Blocking must be of sufficient size and shape to support the frame at all anchorage locations. The blocking must prevent the anchorage fasteners from bowing, racking, twisting, or distorting the window frames and accessories in any manner.

9. Sealant

- a. Sealants must be compatible with all materials they contact, including other sealant surfaces. Any sealant details shown herein, unless specifically called out to be by EFCO, are by others.

It is not EFCO Corporation's position to select or recommend sealant or caulking types and will not assume liability or responsibility thereof. Consult the sealant supplier for recommendations relative to compatibility, adhesion, priming, tooling, shelf life, and joint design. It is the sole responsibility of the customer to perform all sealant adhesion and compatibility testing that is required by the sealant manufacturer of choice.

C. Building Codes

1. Glass and glazing codes governing the design and use of products vary widely. EFCO does not control the selection of product configurations, operating hardware, or glazing materials; therefore, we assume no responsibility in these areas. It is the responsibility of the owner, architect, and the installer to make these selections in strict conformity to all applicable codes.

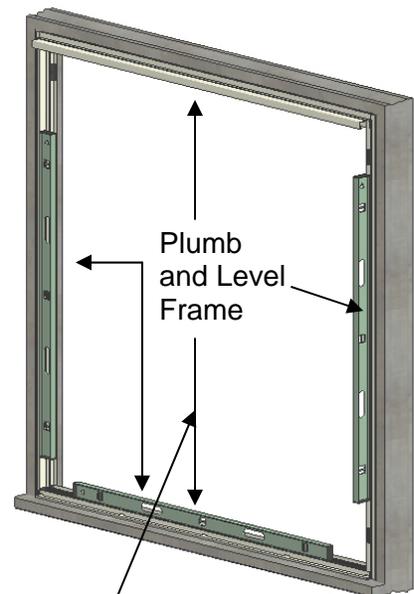
D. General Door Frame Installation

1. The rough opening should be checked for the correct size as determined by tolerances listed in the architectural specifications and the shop drawings. (Fig. A)
2. Establish the face of the door line at the head, sill, and jambs. This reference is to be arrived at by using the architectural plans, general contractor's reference lines, and shop drawings.



Note: For proper door operation and drainage it must be installed *PLUMB* and *LEVEL*.

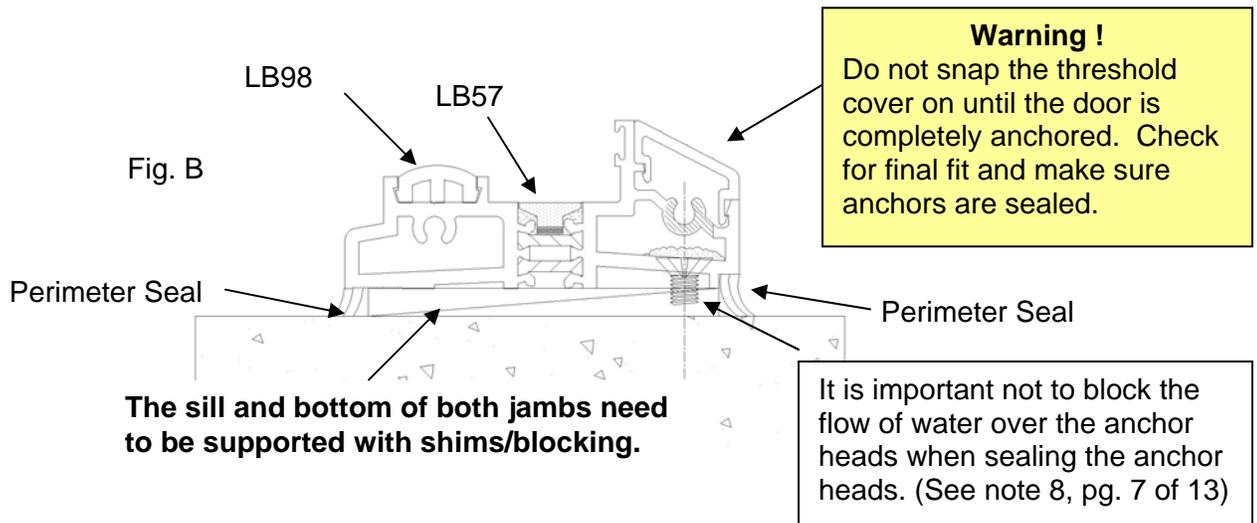
Fig. A



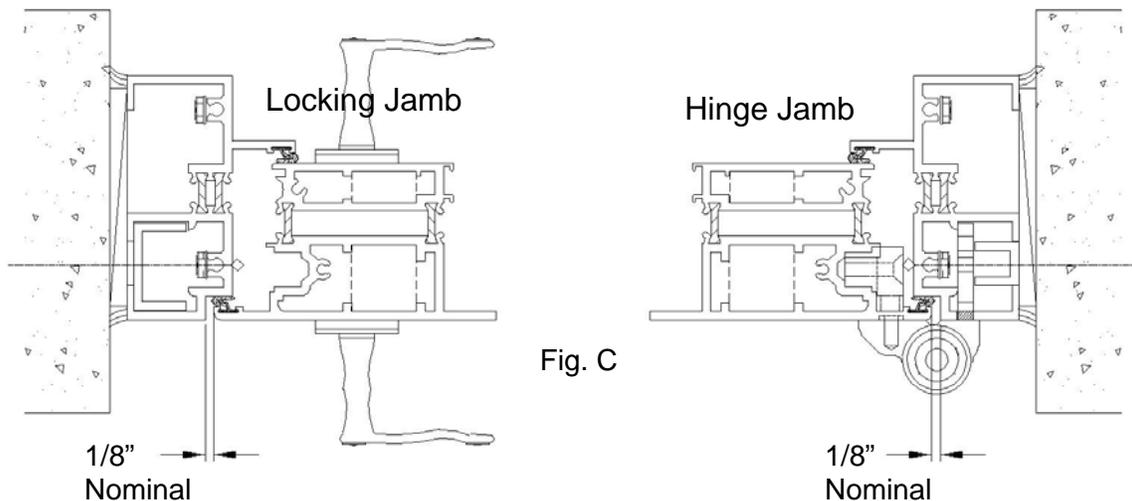
For proper operation of doubled doors it is important that the brass receivers, for the inactive panel, in the head and sill be in exact alignment.

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3. Determine the high point of the masonry sill using string line or transit and shim the balance of the opening to match. Shims/blocking at the sill need to provide support to the threshold and the bottom ends of the jambs, particularly on the hinge side. The door leaf's full weight is carried through the butt hinges into the jamb and the jamb into the sill. This is why it is very important to shim/block solid the bottom of the hinged jamb to the opening. (Do not anchor the sill at this time.)

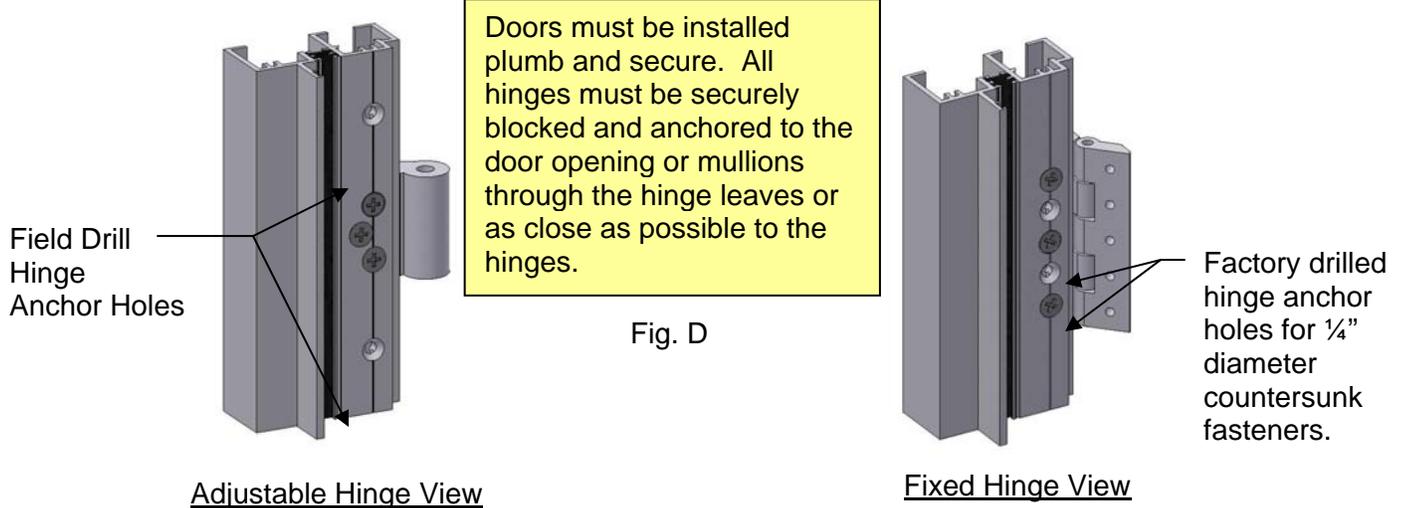


Due to varying opening conditions, construction substrates, door configurations, and design pressures, the door shim or blocking methods can vary greatly. A fully installed door must be plumb, level, and without rack or twist to operate properly. One point of reference to a proper fit is a nominal 1/8" or equal gap between the frame and operable door leaf (see Fig. C).



4. After completing step 3 which will level the sill and support the weight of the door, shim and anchor the hinged jamb. Shim behind all hinge points (and snubber) to plumb the hinged jamb and center in the opening. Some shimming at the top and bottom of the locking jamb may be necessary at this point to provide pressure to hold the hinge jamb shims in place. Support the weight of the door leaf to prevent twisting of the frame and open the door leaf to install the perimeter hinge anchors as shown in Fig D.

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Field drill anchorage holes and countersink for flat head fasteners by installer. Anchor holes should be approximately 2" above and below the adjustable hinges and midpoint snubber. Additional anchorage may be required per job specifications. (See subsection E, and refer to shop drawings for anchor type and locations). **NOTE: Should hex head or pan head fasteners be required, anchor holes should be 4" above and 2" below each adjustable hinge. (See NOTE #6)**

Anchor door at all hinge points using the factory drilled hole locations and flat head fasteners by installer. Additional anchorage may be required per job specifications. (See subsection E, and refer to shop drawings for anchor type and locations).

5. Shim and anchor the remaining door perimeter. A properly shimmed door will have an even gap, as shown in Figure C on page 6, around the entire door leaf and will open and close smoothly. If the door leaf has a tendency to bump or hit the sill when closing, shorten the shim pack under the sill, opposite the hinged side of the door. Because the hinged jamb is already anchored, the side opposite the hinged jamb will drop to the height of the readjusted shim pack. This will eliminate any bumping or hitting that may happen. If an adjustable hinge is provided, refer to page 9 for additional adjustment.
6. For perimeter anchor type, refer to the approved shop drawings, or consult the project design professional. Anchors must be of a flat head design, Not by EFCO. (See section E for additional explanation.)
7. Seal all exposed perimeter joints between structure and door frame perimeters with a skinning, non-hardening type of sealant. Refer to Fig's B and C (page 6), and the approved shop drawings for joint design.

Seal all frame to frame and frame to accessory (subframe, panning, mullions) joints with compatible silicone sealant. Refer to the approved shop drawings for joint design.

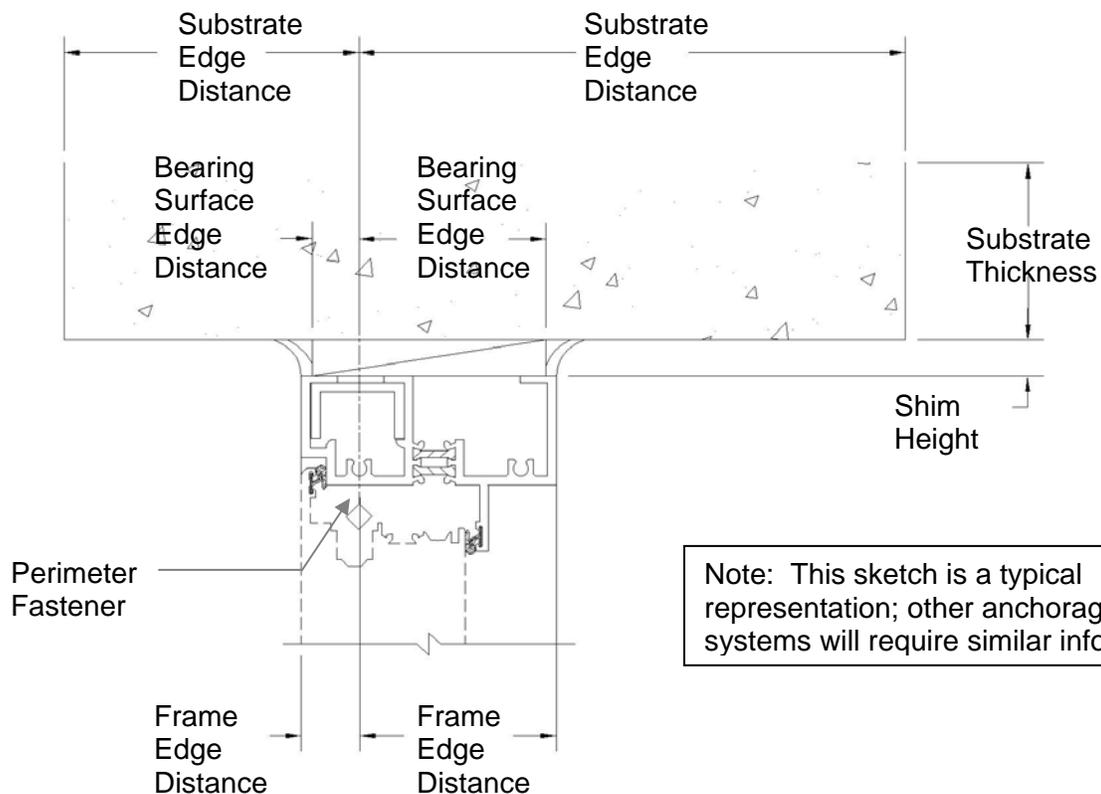
8. Seal all anchor heads along the sill before snapping on the threshold cover. It is important not to seal the anchor heads in such a way as to block the flow of water over the anchor heads to the weeps at each end of the sill. See Fig. B on page 6.

E. Perimeter Anchorage

1. From the approved shop drawings, determine the size, type, and quantity of perimeter fasteners required. EFCO will provide fasteners for EFCO material to EFCO material only. All perimeter fasteners are Not by EFCO and should be purchased prior to arriving at the job site.

Due to varying opening conditions, window configurations, design pressures, and methods of anchorage (subframe, "F" anchors, etc.), perimeter fasteners are not specified in these instructions. For perimeter anchor type and spacing, refer to the approved shop drawings or consult the project design professional. The design professional should analyze the anchorage system, and take into account the following information.

- a. Frame dimensions and configuration of the as installed door.
- b. Material properties of the door frame.
- c. Allowable tension, shear, and bending properties of the perimeter fastener.
- d. Design pressure.
- e. Details of the surrounding condition for the head, sill, and jambs.
- f. Relative building movements and expected thermal movement of the door system.

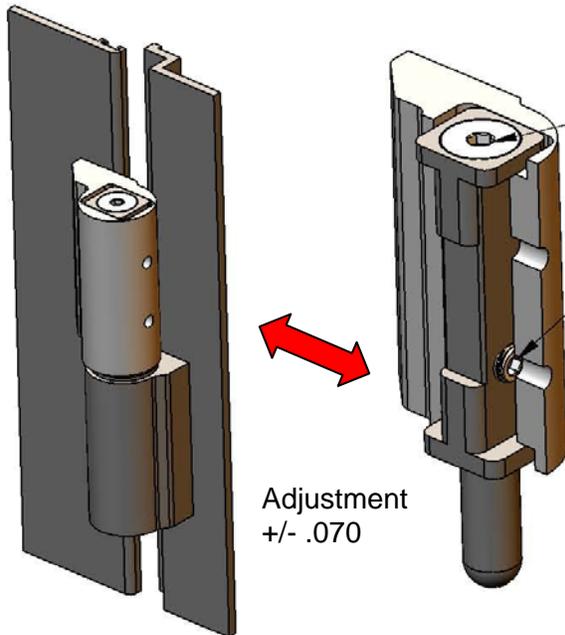


2. Perimeter anchors should never penetrate a tank or tubular shape at a sill. Any penetration of the frame must be visible for sealing purposes.
3. Blocking must be of sufficient size and shape to support the frame at all anchorage locations. The blocking must prevent the anchorage fasteners from bowing, racking, twisting, or distorting the frames and accessories in any manner. Excessive shim heights could increase the prying tension and/or bending forces on the perimeter fastener. Refer to the approved shop drawings and/or design professional for project specific applications.

SECTION II: Hinge Adjustment

Instructions for TerraStile® doors if equipped with adjustable hinges. Adjustments to the door leaf can be made in all directions (lateral, vertical, and compression).

LATERAL ADJUSTMENT

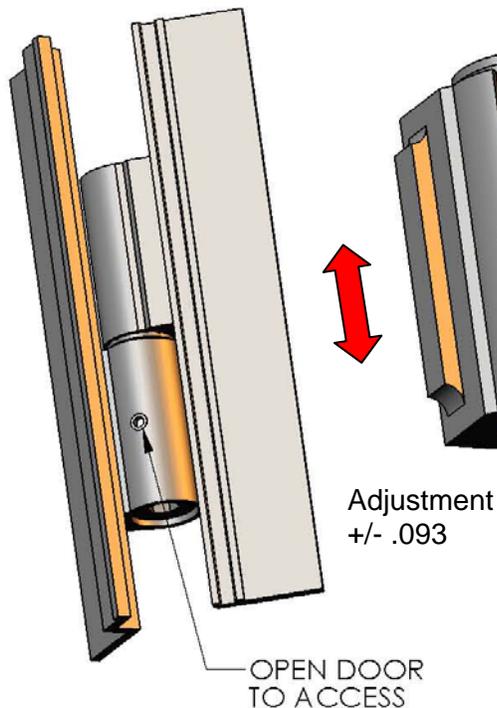


Lateral Adjustment: Side to Side
 Vertical Adjustment: Up and Down
 Compression Adjustment: The amount of compression on the weatherstrip.

- 1) Using a 5/32" hex wrench, break free this pin screw. Do not loosen the pin screw.
- 2) Using a 1/8" hex wrench, adjust the set screw to the desired lateral location (+/- .070 possible adjustment).
- 3) Retighten the pin screw that was broke free in Step 1.

Note: When making vertical and compression adjustments, you must loosen the collar locking screws on all hinges prior to adjusting, and make sure all collar screws are snug prior to tightening the collar lock screw. Lateral adjustments can be made individually.

VERTICAL AND COMPRESSION ADJUSTMENT



Vertical and Compression Adjustment:

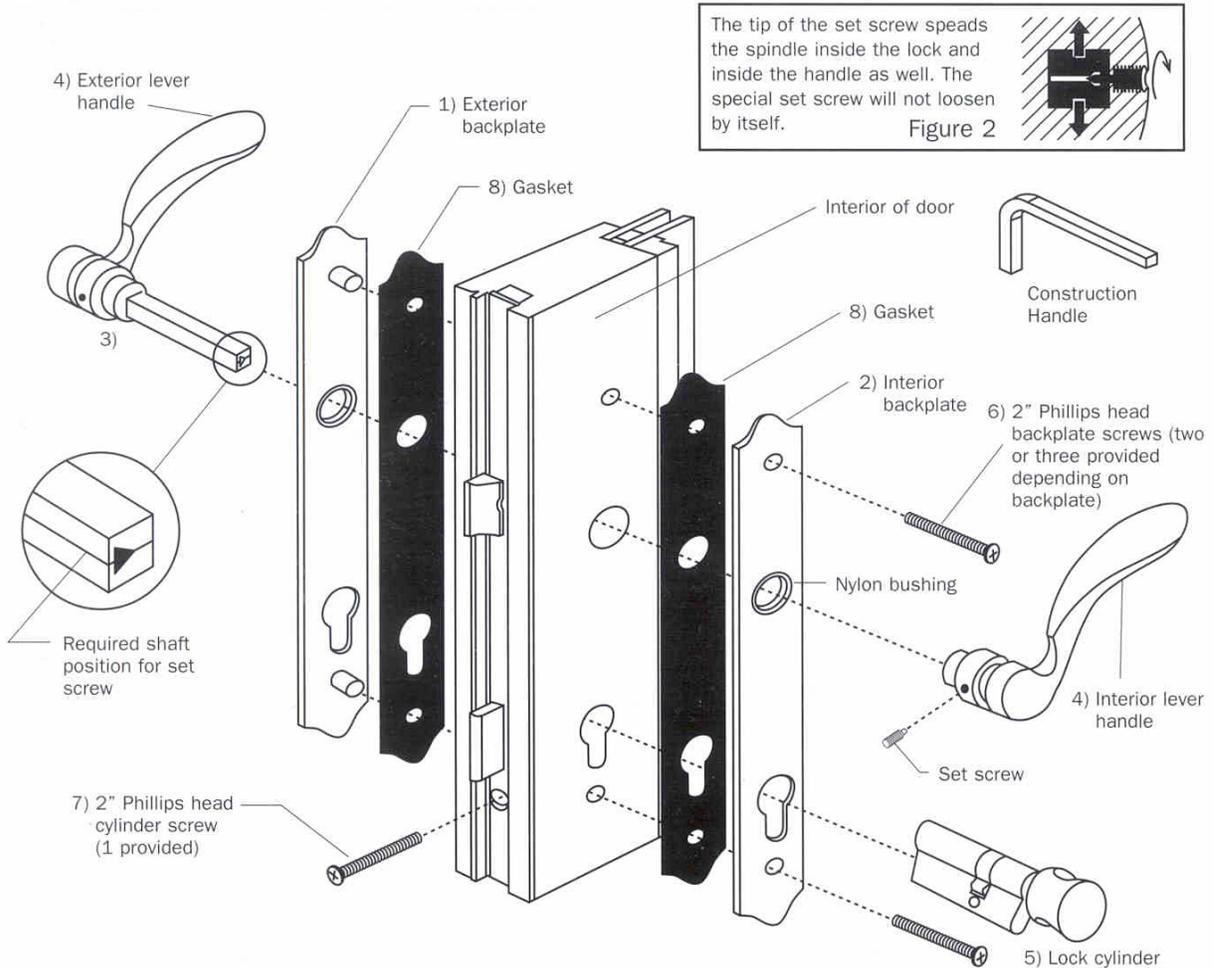
- 1) Open door to access and using 1/8" hex wrench, loosen collar lock screw. (1 turn max.)
- 2) Using 1/4" hex wrench up inside, adjust hinge collar assembly to desired compression by rotating off centered cam. (+/- .020 possible adjustment)
- 3) Using 3/8" hex wrench, adjust collar screw to desired vertical location. (+/- .093 possible adjustment)
- 4) Retighten collar lock screw.

SECTION III: Locking Hardware Installation and Adjustment

Handle Installation

Note: Handles and back plates vary in style.

For proper operation, the hardware must be installed in the following order.



Tools required:

A number 2 Phillips screwdriver

A hex-wrench for set screws is provided in the hardware package.

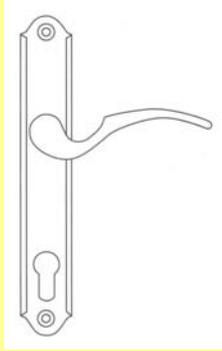
Notes:

To prevent damage to the handle set while in construction phase, use the construction handle to operate the door. Lift to engage multipoint after door is closed. Push down handle to open the door. (See next page for handle operation.)

Use water to clean. Do not use brass cleaner. It will remove the protective coating.

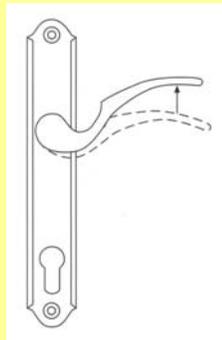
1. Apply the backplate gasket (8) to the inside of the exterior backplate (1). Push gasket firmly onto plate to ensure a tight seal. Apply the backplate gasket (8) to the inside of the interior backplate (2). Apply interior (2) and exterior (1) backplates and fasten loosely with the two screws (6) provided. Note: The screw heads must be on the interior side of the door.
2. Insert the two piece handle shaft (3) into the handle. Be sure to orient the shaft (3) as shown. Screw the set screw until flush with handle using the Allen wrench. See Figure 2. Note: This may seem to be tight fit. Insert the handle attached to the shaft into the latch hole.
3. Install the interior handle on the shaft through the latch hole, pressing tightly to the backplates. Tighten the interior handle set screw with Allen wrench. Screw until flush with handle.
4. Insert the thumb turn from the interior side of the door until the clear hole for screw (7) lines up with the threaded hole in the thumb turn housing. Install the cylinder screw (7) in the screw hole below the deadbolt in the edge of the door.
5. Tighten the backplate screws.

Handle Operation



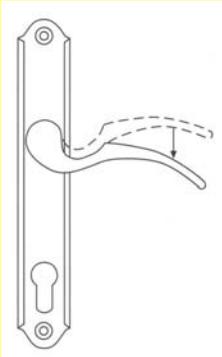
Handle at Rest

Use key or thumb turn to engage or disengage deadbolt lock.



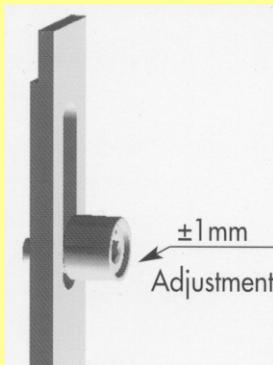
To Lock

To lock, close door and lift handle to engage multipoint locks. Allow handle to return to the rest position then use key or thumb turn to engage deadbolt.



To Unlock

To unlock, disengage deadbolt with key or thumb turn while the handle is in the rest position. Push handle down to disengage multipoint locks, then open the door.



Sealing Pressure Adjustment

Four rollers on the multipoint locking system offer some adjustment in closing pressure. The rollers have an off centered cam design and can be rotated to increase or decrease the sealing pressure of the door leaf.

SECTION IV: Deglazing / Reglazing

A. Deglazing

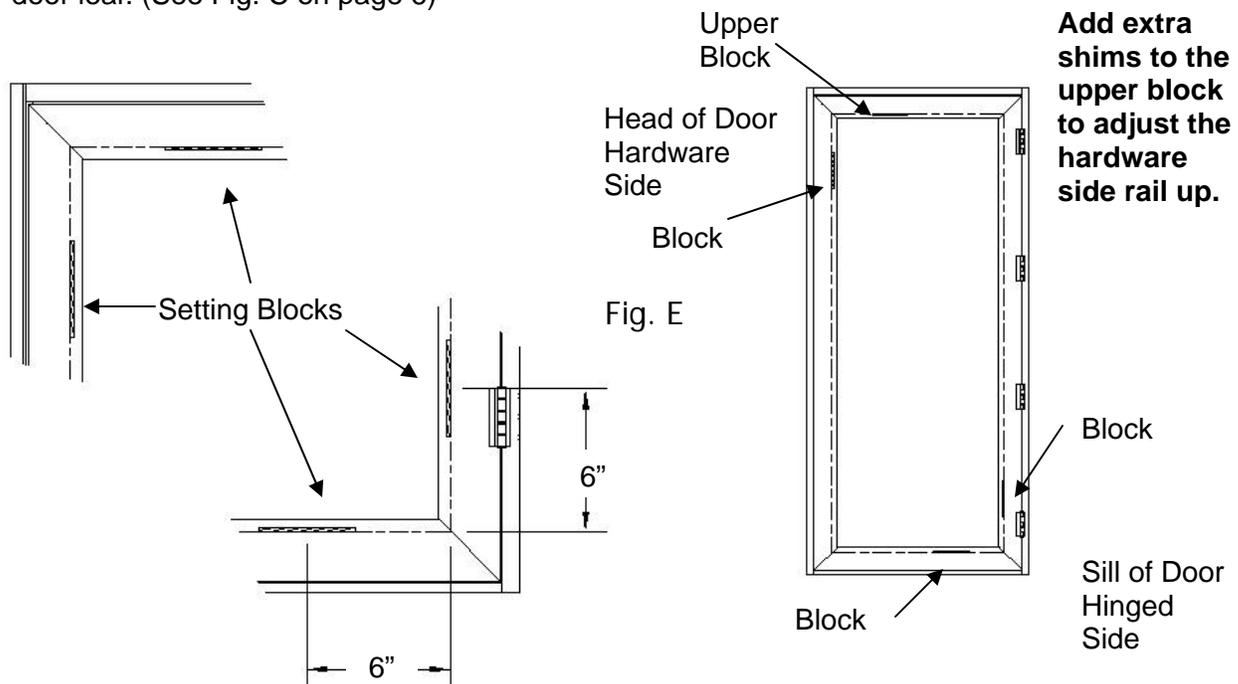
1. Cut the cap bead and glazing tape away from the door and the glass. Next, remove the glass stops with the glazing tool. If heel beaded, cut the heel bead out as much as possible, and remove all shims and setting blocks. Lift the old glass out of the door and discard.
2. Scrape glazing leg clean from any remaining tape or sealant.

B. Reglazing

1. Careful consideration must be used for determining the appropriate preshim back bed tape. The back bed thickness is based on the actual glass thickness.

Measure the metal to metal gap and subtract the actual glass thickness and nominal 1/4" for the compression gasket. This should be the appropriate gap for the tape in the compressed stage. The compressed state of the tape is typically to the diameter of the preshim rod or 10 to 25 percent of the total tape thickness. Install the tape in accordance to the tape manufacturer's recommendations.

2. Insert setting blocks on each side of the glass, 6" from the glass corners, as required, based on configurations shown in Fig. E below. Use silicone on the back of the setting blocks to keep them in the correct position until the glass is installed. The glass must be blocked tightly at the four locations shown in Fig. E for a smooth operating, nonsagging door leaf. Block so that the two diagonal dimensions of the door leaf are equal. Operate the door. Should the door leaf bump or hit the sill, which will usually be the case, adjust the upper block by adding extra shims. Add shim/blocks until the sill end of the door leaf operates smoothly over the door frame sill. A properly aligned door will have a nominal 1/8" or equal gap between the frame and operable door leaf. (See Fig. C on page 6)



3. To reinstall the glass stops, follow the slide and hook diagram shown in Figs. F and F1 on the following page.

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4. To install the wedge gasket, wet the glass with soapy water or window cleaner to prevent the gasket from rolling or tearing. Drive the wedge into the space between the glass and the stop, work from both ends then the middle to ensure proper gasket compression.

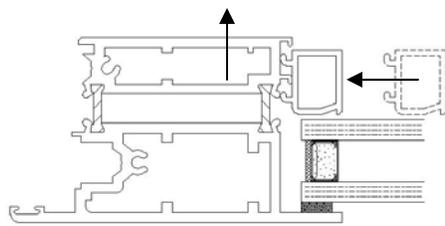


Fig. F

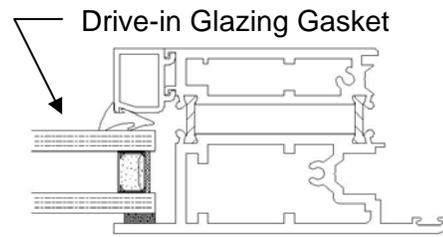


Fig. F1

Note: If the original glass was heel beaded with silicone, apply a new heel bead before installing the glazing bead. Cap sealing of the glass is done after the glazing bead and drive-in gasket are in place.

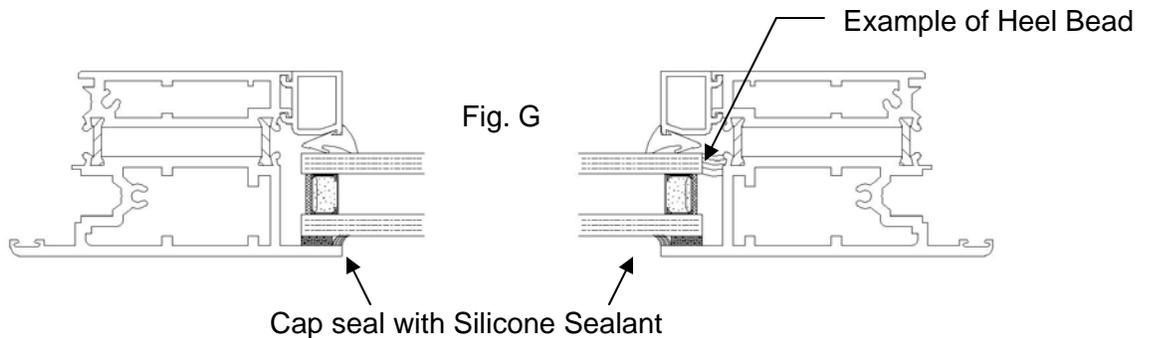


Fig. G

After all the glass stops and wedge gaskets are in place, cap seal and neatly tool silicone on the fixed glazing leg side. See Figs. G and H.

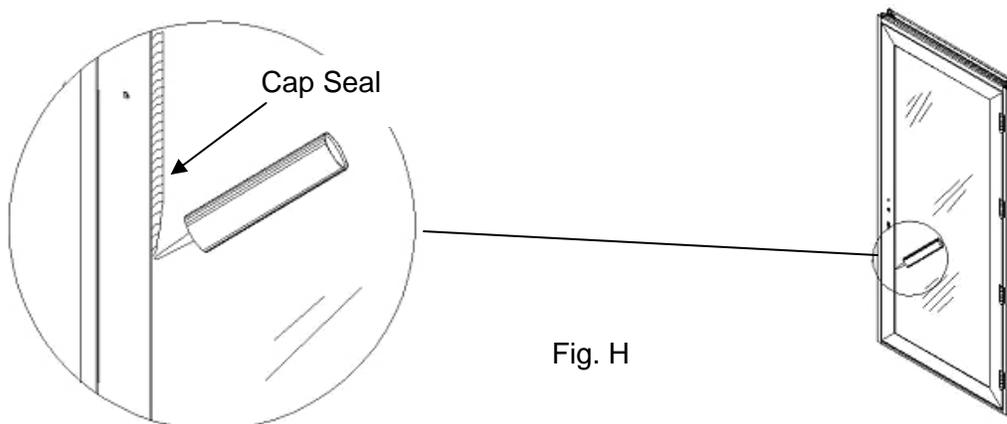


Fig. H