

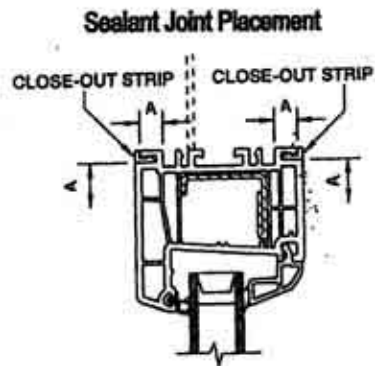
# SA-FE Installation Manual

If any information you need is not covered or is unclear in this Installation manual please contact SA-FE at [info@sa-fe.net](mailto:info@sa-fe.net) or by phone at 717-284-7039 before proceeding with the installation of your product.

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## Materials and Tools Required



### CAUTION

The close-out strip is not for air and water tightness.

To ensure an air and water seal, joint placement is as shown in one or more of the locations shown "A".

Sealant joint must be 7/8" (22 mm) below drain caps on the sill.

Check with your sealant supplier that materials are compatible with the extrusion.

### Tools

- Spirit level
- Framing hammer
- Screwdriver/screw gun
- Tape measure
- 11 mm wrench
- 4 mm allen key

### Materials

- Shims: use SA-FE approved 4" (100 mm) x 1 1/2" (30 mm), thicknesses from 1/8" to 1/2" (available from SA-FE). **DO NOT USE WOOD SHIMS.**
- 2" Galvanized Roofing Nails (10 1/2 ga.)
- 1 1/2" #10 Pan Head Tapping Screws (cadplated).

## Rough Openings

Make sure that the rough openings are square, and that they have a level sill and plumb (vertical) jambs. Make sure that the outside face of the wall is straight and plumb. If a rough opening is out-of-square, adjust the thickness of the shim blocks as necessary to make sure that you install the window or door frame in a square, level and plumb way.

If you see any rough openings that are not acceptable for frame installation, tell the general contractor or the party responsible for the construction. Get written authorization from the general contractor or from the responsible party before you install frames in unacceptable openings.

Make sure that the general contractor corrects the rough opening if you find the rough opening does not allow you to install the frame perfectly level, square, straight in every direction and plumb, and does not provide a minimum of 3/8" (10 mm) and no larger than 1/2" (12 mm) clearance between the top of the frame and the top of the rough opening.

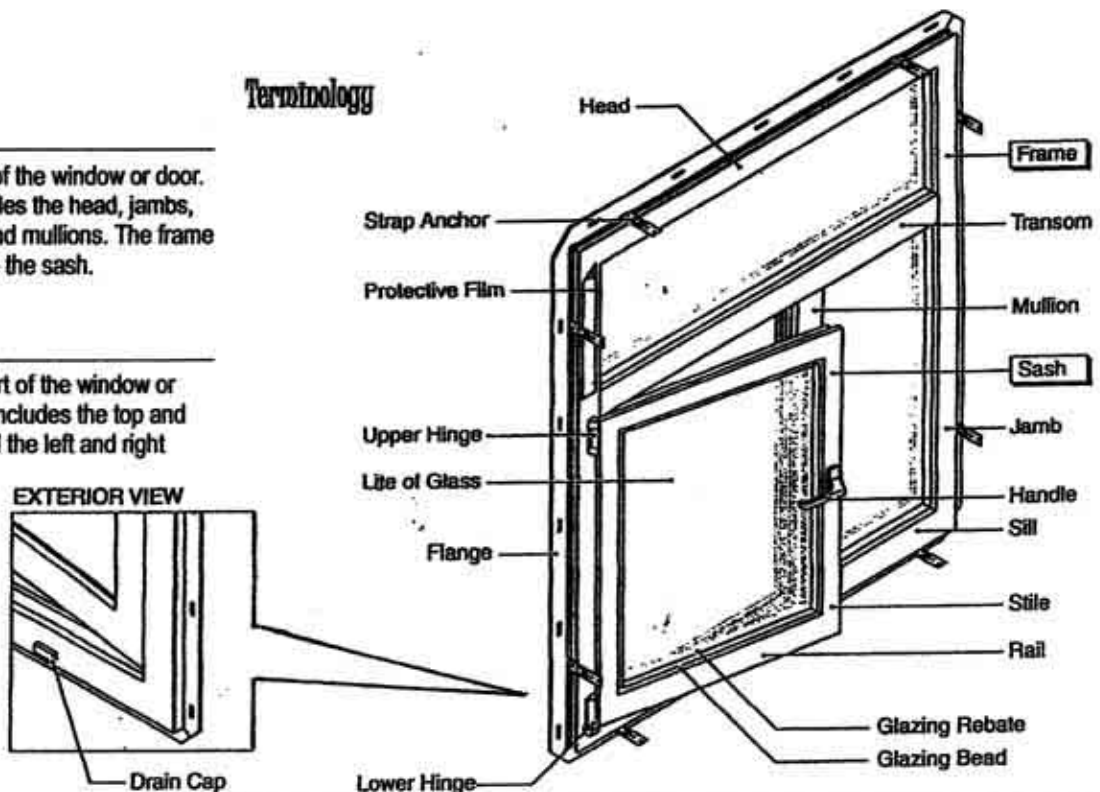
### Frame

The fixed parts of the window or door. The frame includes the head, jambs, sill, transoms, and mullions. The frame does not include the sash.

### Sash

The movable part of the window or door. The sash includes the top and bottom rails, and the left and right stiles.

## Terminology



# Section 1 Fixed Windows

## Rough Opening Clearances

To allow for small defects in the size, level or squareness of the rough opening, SA- FE recommends that you provide these clearances between the window frame (excluding flanges and accessory sills) and the rough opening.

Head (top of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Jamb (sides of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Sill (bottom of opening)	3/8" (10 mm) min	1/2" (12 mm) max

## How To Install Fixed Windows

### 1. Prepare The Frame

- 1.1 Remove the wooden shipping blocks that are attached to the flange (if supplied).
- 1.2 If strap anchors are included with the window, rotate them until they are at right angles to the frame. Bend the strap anchors inwards about 45°. See fig. 1-1.  
Note: Some windows do not have strap anchors.  
If shop drawings are required for the project, refer to these drawings for supplemental installation instructions.

### 2. Put The Frame In The Rough Opening

- 2.1 Having prepared the rough opening as per building codes and/or Architect/Building Envelope Specialist, ensure the window is installed in a weather manner.
- 2.2 If supplied, swing out strap anchors attached to the frame. Strap anchors should point to the interior of the building. Do not nail or screw strap anchors until step 2.8.
- 2.3 Center window into opening, ensure window is right side up.
- 2.4 Shim sill of window on the corners and on both sides of any mullions with 4" x 1 1/2" shims (See fig. 1-2). Adjust the height of the shims to obtain a level sill, ensuring you have 3/8" gap at the head (inter-storey deflection not to exceed  $\pm 3/8"$ ).
- 2.5 Fasten bottom corners of flange to the wall with 2" galvanized nails or 1 1/2" #10 tapping screws.

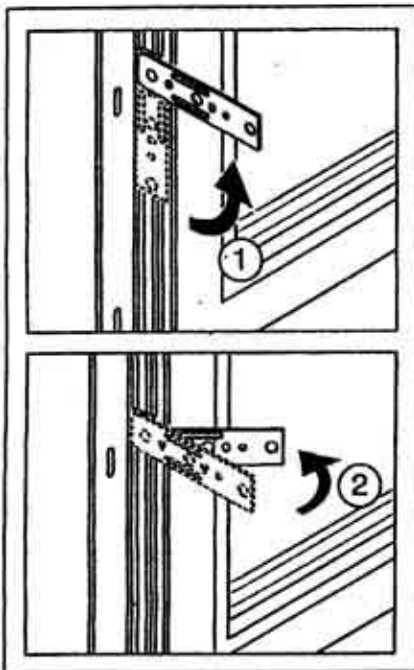


Figure 1-1. How to rotate and bend the strap anchors

### CAUTION

DO NOT put shims under the strap anchors!

Window Width W	Shim Spacing	
	a	b
<36"	7 1/2"	7 1/2"
36" - 70"	10"	10"
>70"	10**	10**

\* Plus add shim at centerline of window

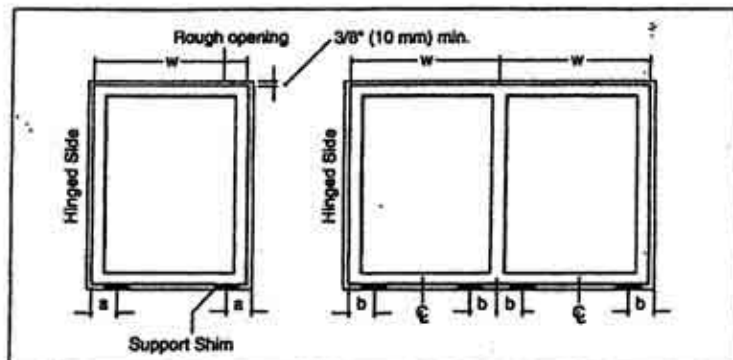


Figure 1-2. Where to put the support shims

- 2.6 Plumb the frame jambs with a level and fasten the two top corners of the flange to the wall.
- 2.7 Use a straight edge to ensure the frame is straight on all four sides. Fasten the flange every second slot. DO NOT nail or screw too tight.
- 2.8 Nail or screw all strap anchors to the wall.
- 2.9 Remove protective film from all profiles immediately after installation.
- 2.10 Install drain caps.

### **WARNING**

**DO NOT** nail the top flange to the wall!

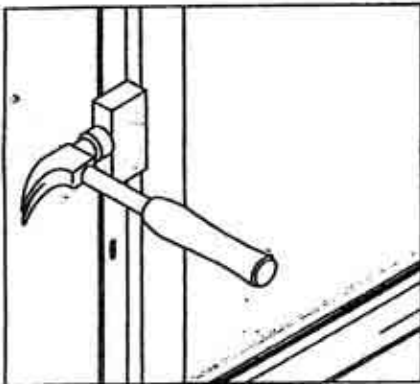


Figure 1-3. How to straighten a bowed frame

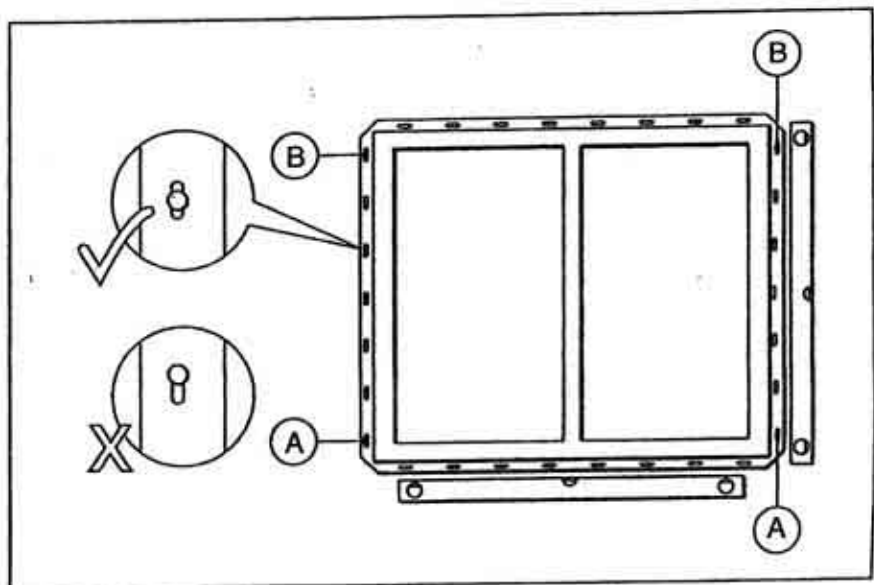


Figure 1-4. Where to fasten the flanges — exterior view

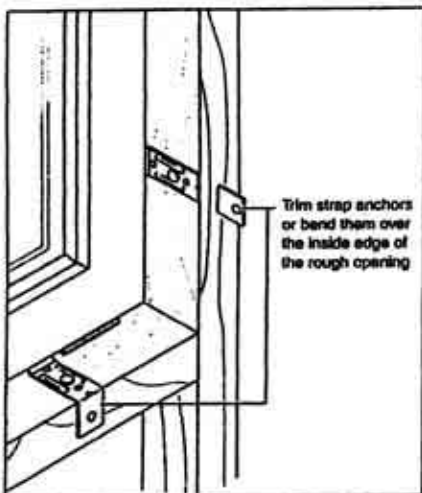


Figure 1-5. How to attach the strap anchors

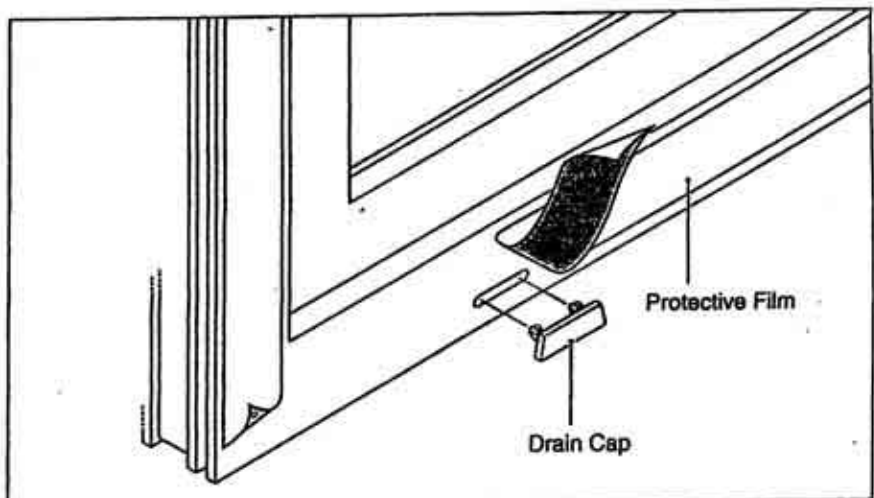


Figure 1-6. How to remove the protective film and install the drain caps — exterior view

## Section 2

# Tilt & Turn Windows & Doors

### Rough Opening Clearances

To allow for small defects in the size, level, or squareness of the rough opening, SA- FE recommends that you provide these clearances between the frame (excluding flanges and accessory sills) and the rough opening.

Head (top of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Jamb (sides of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Sill (bottom of opening)	3/8" (10 mm) min	1/2" (12 mm) max

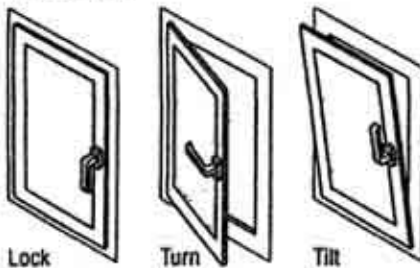
### Finish Material Clearances

SA- FE recommends that you provide a clearance of at least 3/8" (10 mm) between the finish materials and the edge of a hinge. To do this, make sure the finish materials cover no more than 1/2" (12 mm) of the window frame on any side. See Fig. 2-2.

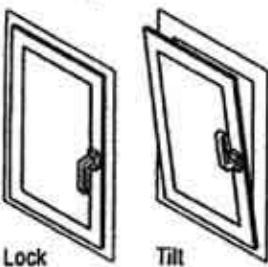
If the rough openings are within acceptable tolerances, then SA- FE 's standard installation clearances allow you to use finish materials up to 3/4" (19 mm) thick at the top and sides of the window, and up 1" (25 mm) thick at the bottom. If you use thicker finish materials, you may need to provide larger rough openings to maintain the specified clearance between the finish material and the hinges.

#### Handle Positions

##### Tilt & Turn



##### Tilt Only



##### Tilt Before Turn

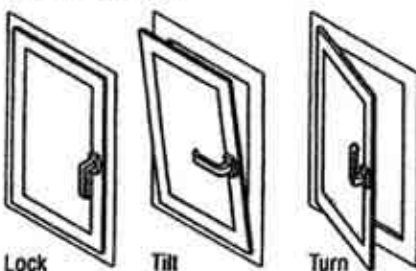


Figure 2-1. Handle Positions

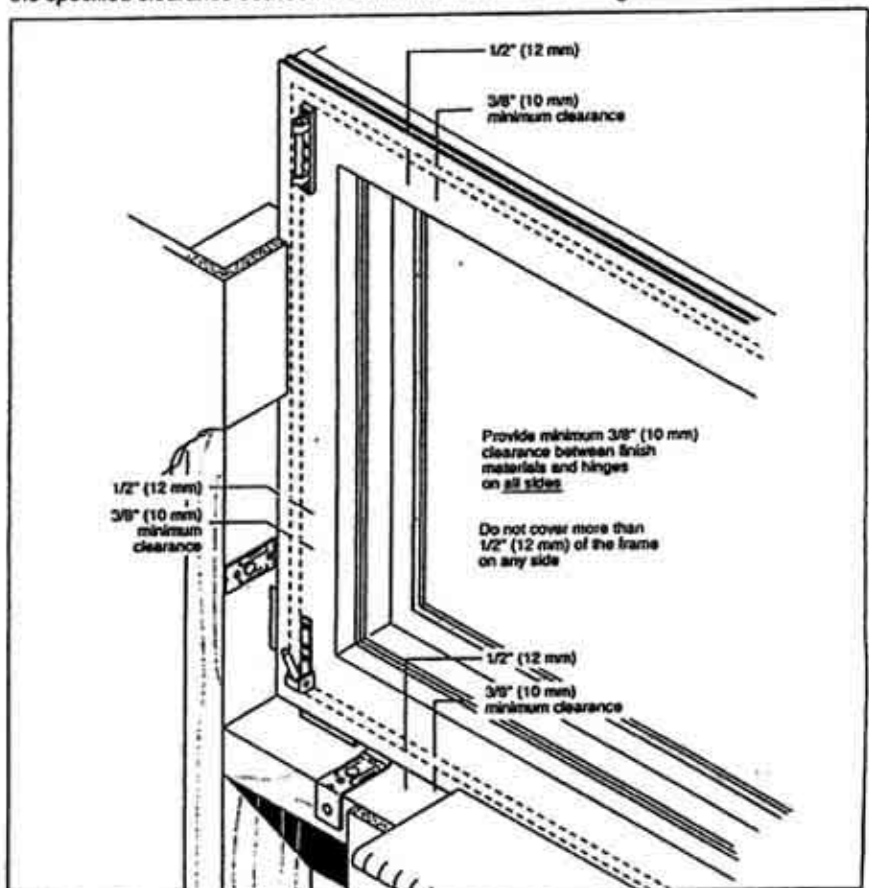


Figure 2-2. Finish materials clearances

# How To Install Tilt & Turn Windows & Doors

## 1. Prepare The Frame

- 1.1 Remove the wooden shipping blocks that are attached to the flange (if supplied).
- 1.2 If strap anchors are included, rotate them until they are at right angles to the frame. Bend the strap anchors inwards about 45°. See Fig. 16.  
Note: Some frames do not have strap anchors.  
If shop drawing are required for the project, refer to these drawings for supplemental installation instructions.

## 2. Install the SA- FE - Handle

Handles are usually shipped loose. Follow the steps below to install the SA-FE-Handles.

- 2.1 Pull the screw cover of the SA- FE-Handle base towards you and rotate it 90° to uncover the screw holes. See Fig. 2-3.
- 2.2 Determine if the sash hardware is in the Lock position or in the Turn (Open) position. If the sash is installed in the frame and cannot open, the sash hardware is in the Lock position. Go to Step 2.3. If the sash swing open on its hinges, the sash hardware is in the Turn (Open) position. Go to Step 2.5.
- 2.3 Lock position: install the SA- FE-Handle on the sash in the vertical Lock position, with the handle pointing down. Insert the shaft into the center hole. See Fig. 2-4.
- 2.4 Lock position: rotate the SA- FE-Handle to the horizontal position (Note: The handle should be pointing towards the hinge side of the sash). This gives you access to both of the screw holes. Insert the screws that came with the handle and tighten them. See Fig. 2-5. Go to Step 2.7.
- 2.5 Turn (Open) position: rotate the SA- FE-Handle to the horizontal position, with the handle pointing toward the hinge side of the sash. Install the SA- FE-Handle on the sash: insert the shaft into the center hole. See Fig. 2-6.  
Note: If you are installing a Tilt before Turn product install the SA- FE-Handle on the sash in the vertical Turn (Open) position, with the handle pointing up. Insert the shaft into the center hole and then turn the handle to the horizontal position.
- 2.6 Insert the screws that came with the handle and tighten them. See Fig. 2-5.
- 2.7 Rotate the screw cover on the SA- FE-Handle base to the vertical position. Rotate the SA- FE-Handle to the vertical Lock position with the handle pointing down.

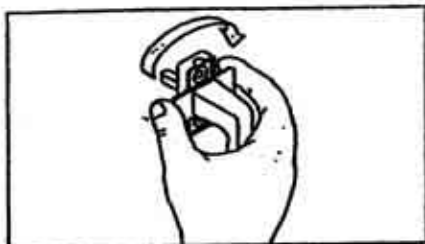


Figure 2-3. How to uncover the screw holes

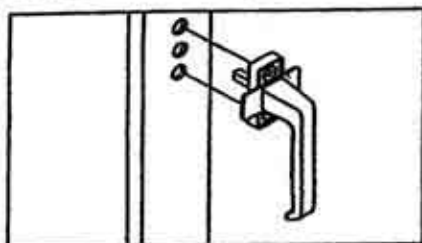


Figure 2-4. Euro-Handle in the Lock position

### CAUTION

DO NOT over-tighten the screws. If you over-tighten the screws, you can damage the hardware and make the SA- FE-Handle difficult to operate.

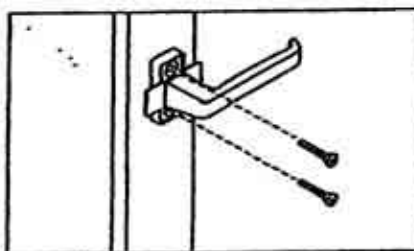


Figure 2-5. Where to install the mounting screws

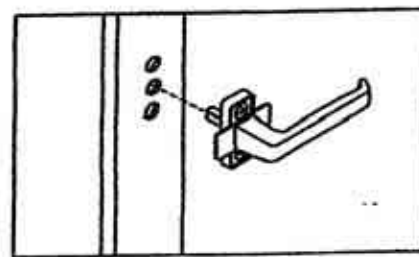


Figure 2-6. Handle in the horizontal position



### Note

If you must remove the sash prior to installation follow steps 3.1 through 3.6. Proceed to step 4 if not removing sash.

### 3. Remove The Sash From The Frame

- 3.1 Rotate the SA-FE-Handle to the Turn position. Partially open the sash. See Fig. 13.
- 3.2 Pull off the hinge cover. If you do not partially open the sash, you cannot remove the hinge cover. See Fig. 2-7.

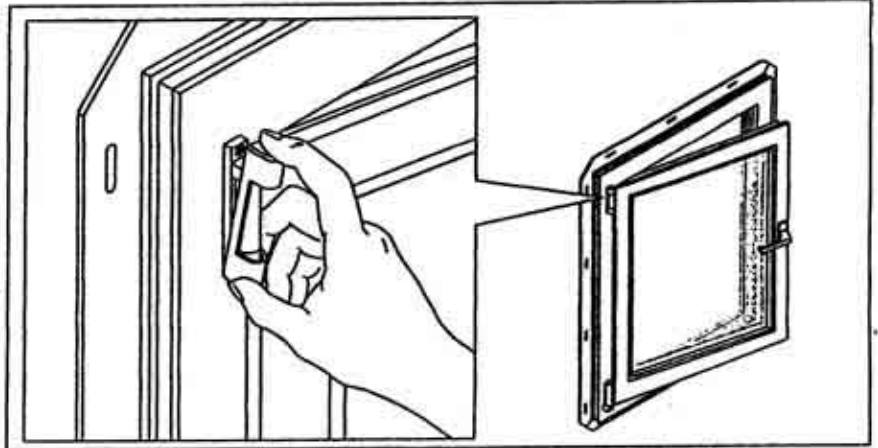


Figure 2-7. How to remove the hinge cap

### WARNING

The sash is heavy! DO NOT try to remove the sash alone. SA- FE recommends an installation crew of at least two people/

- 3.3 One installer supports the weight of the open sash. The other pulls the hinge pin down: use the point of a nail and push down the top of the hinge pin. Then, use the point of the nail and pull the bottom of the pin down until the head of the hinge pin "clicks" into place in the lowest flange of the hinge. Do not continue to pull the hinge pin lower, or it will fall out. See Fig. 2-9.
- 3.4 Slightly tilt the sash towards you. Lift the sash up off the lower hinge pin. See Fig. 2-8.
- 3.5 Put the sash in a safe place, on a clean and dry surface. Make sure that dirt and sand do not enter the lower hinge hole.
- 3.6 Push the upper hinge pin into its original position: push it up from below until it "clicks" into place. Put the hinge cap back on the hinge so it does not get lost.

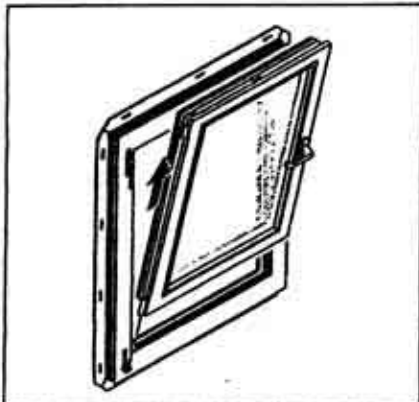


Figure 2-8. How to remove the sash from the frame

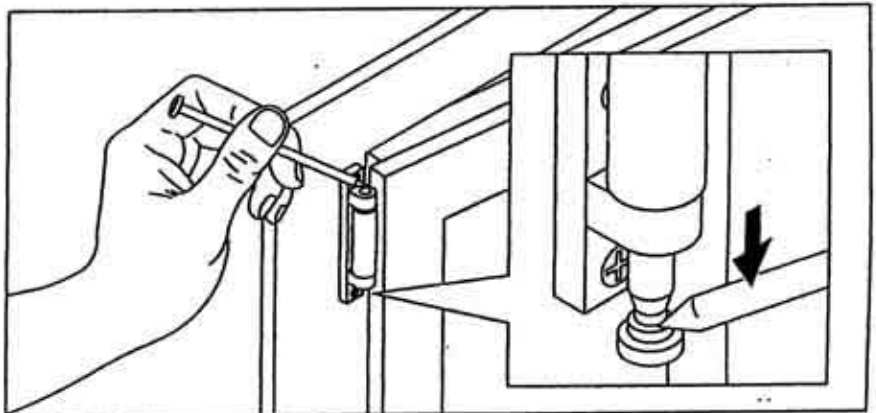


Figure 2-9. How to pull down the hinge pin



**CAUTION**

Keep the bottom hinge of the sash free of dirt and sand! When you install the sash again, dirt and sand in the hinge can cause operational problems. Dirt and sand will cause premature wear of the lower hinge.

**CAUTION**

DO NOT put shims under the strap anchors!

**4. Put The Frame In The Rough Opening**

- 4.1 Having prepared the rough opening as per building codes and/or Architect/ Building Envelope Specialist, ensure that the frame is installed in a weather tight manner.
- 4.2 If supplied, swing out strap anchors attached to the frame. Strap anchors should point to the interior of the building. DO NOT nail or screw strap anchors until step 4.8.
- 4.3 Center frame into opening, ensure frame is right side up.
- 4.4 Shim sill of frame with 4" x 1 1/2" shims (See Fig. 2-11). Adjust the height of the shims to obtain a level sill, ensuring you have 3/8" gap at the head (inter-storey deflection not to exceed 3/8").

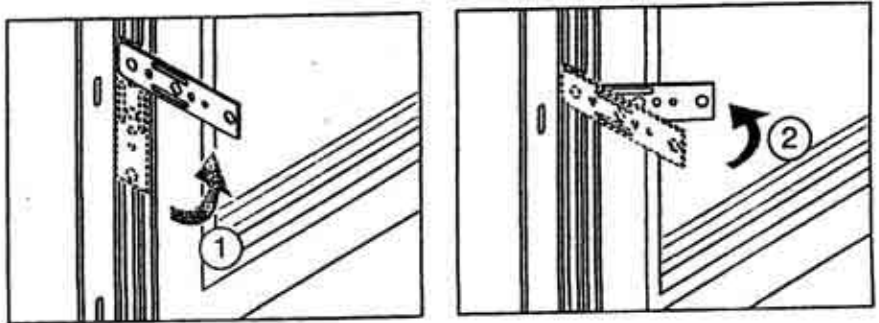


Figure 2-10. How to rotate and bend the strap anchors

**CAUTION**

Make sure the frame is LEVEL. If the sill is not level, the sash will not operate properly.

- 4.5 Fasten bottom corners of flange to the wall with 2" galvanized nails or #10 1 1/2" tapping screws.
- 4.6 Plumb the frame jambs with a level and fasten the two top corners of the flange to the wall.
- 4.7 Use a straight edge to ensure the frame is straight on all four sides. Fasten the flange every second slot. DO NOT nail or screw too tight.

**CAUTION**

DO NOT put shims under the strap anchors!

Window Width W	Shim Spacing	
	a	b
<36"	2 1/2"	7 1/2"
36" - 70"	2 1/2"	10"
>70"	2 1/2"	10"

\* Plus add shim at centerline of window

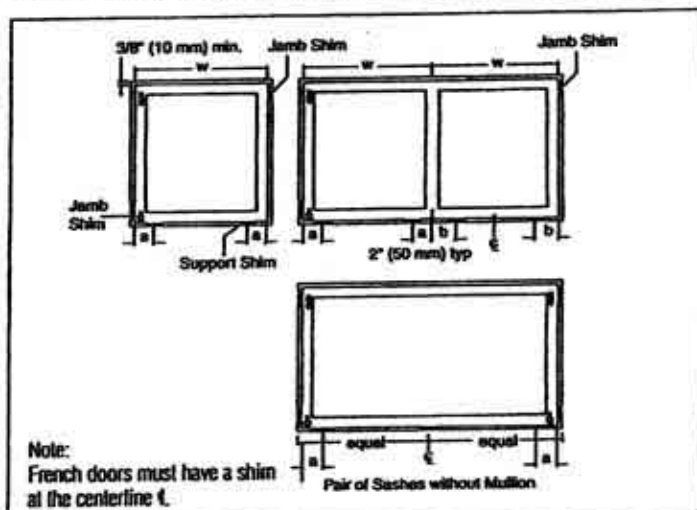


Figure 2-11. Where to put the support shims and jamb shims

### CAUTION

DO NOT set the nails to tight!  
Drive the nails into the center of the slots in the flange. This lets the nails move a little bit when the framing shrinks or the building settles.

### WARNING

DO NOT nail the top flange to the wall!

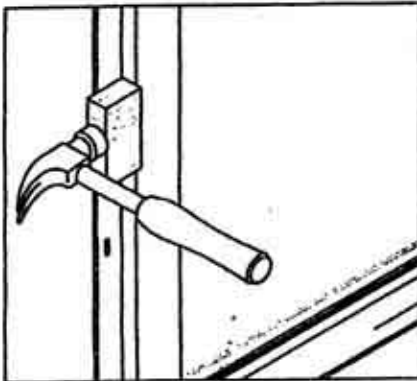


Figure 2-12. How to straighten a bowed frame

- 4.8 Nail or screw all strap anchors if provided to the wall.
- 4.9 Install shims at jambs on all operable windows and doors.
- 4.10 Install sash and check for operation.
- 4.11 Remove protective film from all profiles immediately after installation. See Fig. 2-16.
- 4.12 Install drain caps.

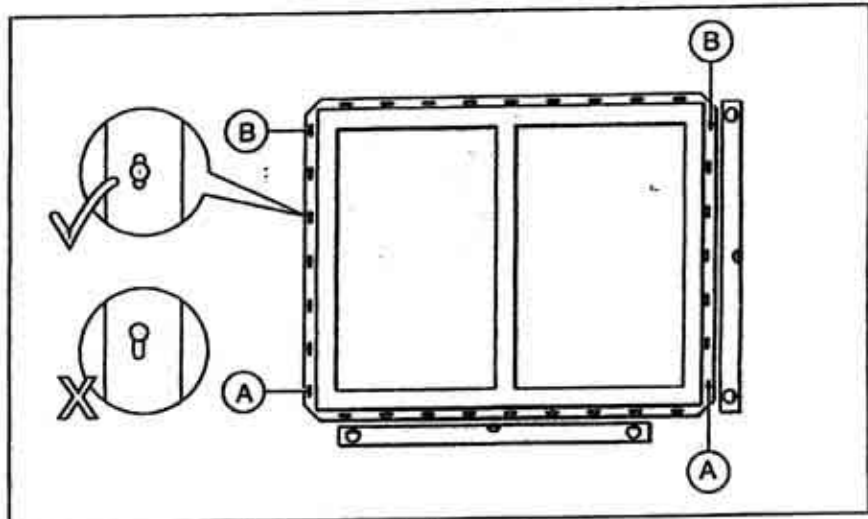


Figure 2-13. Where to fasten the flanges — exterior view

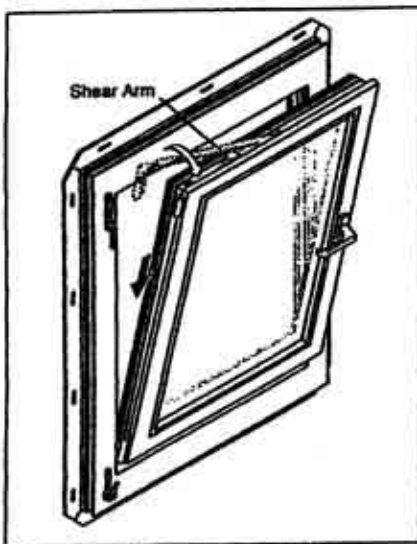


Figure 2-14. How to install the sash, and put the shear arm back into position

### 5. Install The Sash(es)

- 5.1 Pull the lower hinge cover. Use a nail to pull the hinge pin down as shown in Step 3.3.
- 5.2 Tilt the lower hinge pin forward approximately 30°.
- 5.3 Prepare the sash for installation: make sure that there is no dirt or sand in the lower hinge. Make sure that the SA- FE-Handle is horizontal in the Turn position.
- 5.4 With the help of an assistant, lift the sash. Lower the sash into position on the lower hinge pin. Tilt the sash up until you align the two parts of the upper hinge.
- 5.5 As you do this, the shear arm at the top of the sash may disengage. If this occurs, gently lift the arm upwards, align the arm parallel to the sash, and press the arm downward until it "clicks" into place. See Fig. 2-14.
- 5.6 Install the upper hinge pin: push the pin upwards until it clicks firmly into place. Make sure that the hinge pin is all the way up, with the cone-shaped tip fully visible at the top.
- 5.7 Replace the plastic hinge cover. Close the sash. Rotate the SA- FE-Handle downward to the Lock position. This secures the sash.

### CAUTION

Make sure that shear arm is in position before you install the sash. See Fig. 2-14.

### WARNING

The sash is heavy! DO NOT try to install the sash alone. SA- FE recommends an installation crew of at least two people.

## 6. Operate The Sash(es)

SA- FE squares the sashes and align them with the hardware at the factory. Operate problems occur when the frame is not installed level and square, or when the frame or sash members are not straight because of handling.

- 6.1 Open and close the sash several times, in both the Tilt and Turn positions. If the sash operates freely, go to Step 4.11. If the sash does not open and close freely, but binds or strikes the frame at one or more points, then you may not have a level or square frame. To correct the problem, do the steps that follow:
- 6.2 If the sash hardware binds at the top of the lock stile or at the bottom of the rail, the frame may not be level, or it may be out of square. See Fig. 2-15 Item A. Use a spirit level and make sure that the sill is level and that the mullions and jambs are square. If the frame is not level or square, adjust the thickness of the shims to make it level and square.
- 6.3 If the sash hardware binds at the midpoint either the sash or the mullion became bowed during handling or installation. See Fig. 2-15 Item B. Use a straight edge and make sure that the sash and the mullion are not bowed. If either the sash or the mullion are bowed, make them straight as shown in Fig. 2-12.
- 6.4 If you cannot correct the binding problems with these methods, adjust the operating hardware. See following.

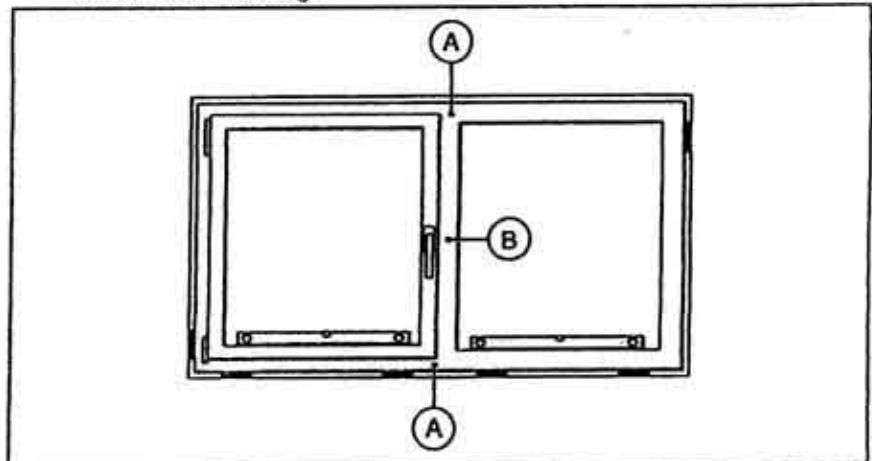


Figure 2-15. Where sashes sometimes bind

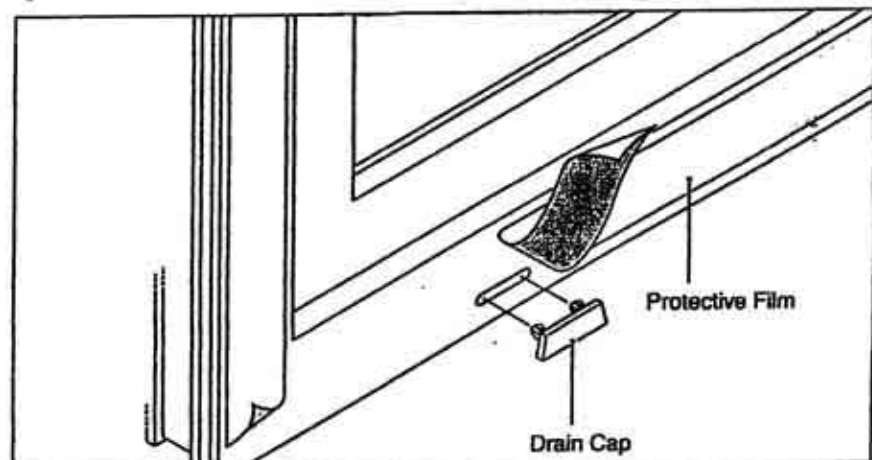


Figure 2-16. Remove the protective film and install the drain caps — exterior view

## How To Adjust Tilt & Turn Windows and Doors

### Tools Required:

11 mm wrench  
4 mm allen key

With SA - FE unique Tilt and Turn hardware system you can adjust window or door sashes to compensate for the effects of small settlements, heavy use, and for wear of the hardware components and the sealing gaskets. These adjustments allow you to maintain the performance of your windows and doors much longer than conventional hardware systems allow.

### Sash Binding Problems?

The sash may bind against the fixed frame at one or more points after the building settles, or because of heavy use. You can increase the clearance between the frame and the sash with one or more of these three adjustments:

Adjustment 1 : Upper Hinge Offset  
Adjustment 2 : Sash Height  
Adjustment 3 : Lower Hinge Offset

### Closing Tightness Problems?

The sash may close less tightly after many years of use. These adjustments make the sash close more tightly or less tightly. To reduce air leakage around the sash, make the sash close more tightly. To make the SA - FE - Handle easier to operate, make the sash close less tightly.

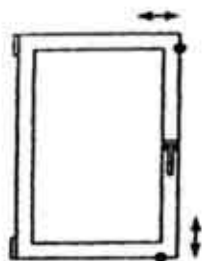
You can increase or decrease the closing tightness with one or more of these adjustments:

Adjustment 4 : Locking Cam Closing Tightness  
Adjustment 5 : Shear Closing Tightness  
Adjustment 6 : Corner Drive Closing Tightness

### How To Correct Sash Binding Problems?

Use a 4 mm allen key for Adjustments 1-3. For all of these adjustments, first turn the allen screw  $\frac{1}{4}$  turn, then operate the sash to see if you have corrected the problem. Repeat if necessary: turn the screw approximately  $\frac{1}{4}$  turn each time, until the sash stop binding.

When you correct the binding with one adjustment, you may cause the sash to bind in another place. You may have to make more then one adjustment to correct all of the binding problems.



If the sash binds at one of these locations, use this adjustment to "tilt" the sash towards the upper hinge.

### Adjustment 1 : Upper Hinge Offset

Maximum adjustment: Raises the bottom corner of the sash 3 mm. Lowers the bottom corner of the sash 1.5 mm.

This adjustment moves the top of the sash towards the upper hinge or away from it.

With the SA-FE -Handle in the Turn position, open the sash as far as it will open. Insert the 4 mm allen key into the head of the screw at the end of the shear arm. To tilt the sash towards the upper hinge, rotate this screw in a counter-clockwise direction. This raises the bottom corner of the sash on the handle side. To tilt the sash away from the upper hinge, rotate the screw in a clockwise direction. This lowers the bottom corner of the sash on the handle side.

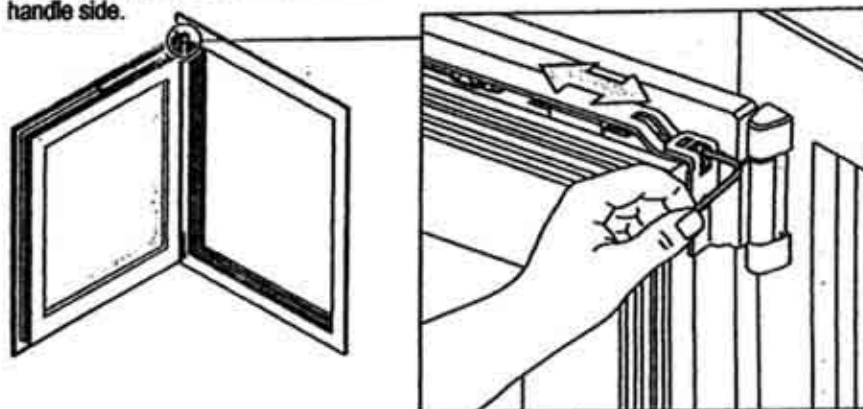


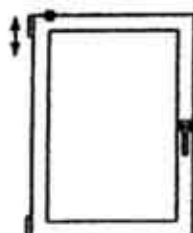
Figure 2-17.

### Adjustment 2 : Sash Height

Maximum adjustment: Raises the sash 3 mm. Lowers the sash 3 mm.

This adjustment raises or lowers the sash.

With the SA-FE-Handle in the Turn position, open the sash approximately 2" (50 mm). Remove the plastic cover from the top of the lower hinge body. Insert the 4 mm allen key into the top of the exposed screw head. To raise the sash, rotate the screw in a clockwise direction. To lower the sash, rotate the screw in a counter-clockwise direction. After adjusting, check that the tilt function operates correctly.



If the sash bind at the top when you open it in the Tilt position, use this adjustment to lower the sash.

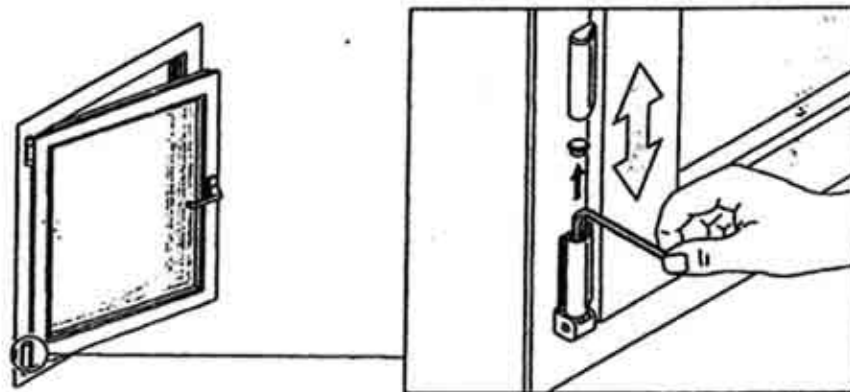
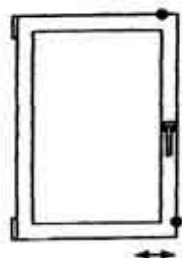


Figure 2-18.



If the sash binds at one of these locations, use this adjustment to "tilt" the sash towards the lower hinge.

### Adjustment 3: Lower Hinge Offset

**Maximum Adjustment:** Moves the sash 2 mm to the right. Moves the sash 2mm to the left.

This adjustment moves the bottom of the sash towards the lower hinge, or away from it.

With the SA-FE-Handle in the turn position, open the sash. Insert the 4 mm allen-key into the pivot screw below the lower hinge. To move the sash towards the hinge, rotate the screw in a clockwise direction. This lowers the top of the sash. To move the sash away from the hinge, rotate the screw in a counter-clockwise direction. This raises the top of the sash.

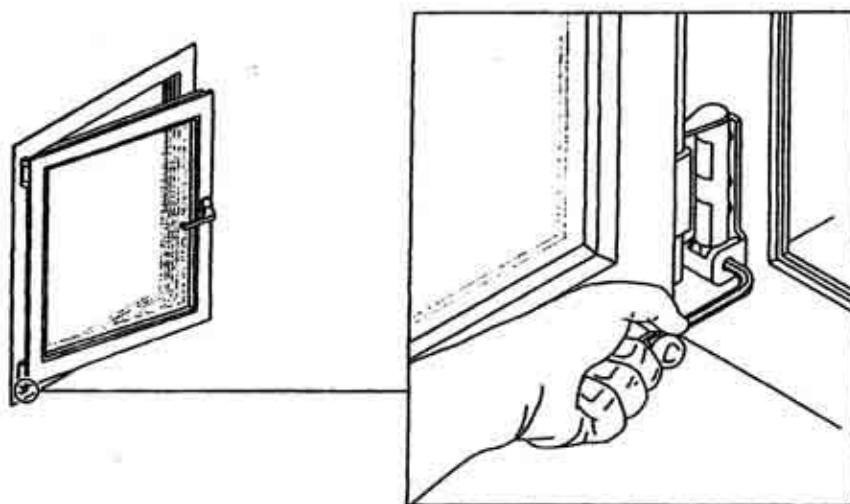


Figure 2-19.

### How To Correct Closing Tightness Problems

Use these adjustments to reduce air leakage around the sash, or to make the SA-FE-Handle easier to operate.

If you have an air leakage problem, you need to adjust the hardware that is closest to the location where the air leaks in. First, try to correct the problem by increasing the closing tightness of the nearest locking cam using Adjustment 4. If this does not correct the problem, you will need to do one of the adjustments that follow. If the air leaks at the upper hinge, increase the closing tightness using Adjustment 5. If the air leaks at the corner of the sash below the handle, increase the closing tightness using Adjustment 6. If you have air leakage at another location, increase the closing tightness of the nearest locking cam(s) using Adjustment 4. Do not increase the closing tightness any more than you need to in order to control the immediate problem, or the SA-FE-Handle will become difficult to operate.

If the SA-FE-Handle is difficult to operate, use these adjustments to decrease the closing tightness. Do the adjustments in the following order: first, use Adjustment 4 to decrease the closing tightness of the locking cams. If this does not correct the problem, use Adjustment 5 to decrease the shear closing tightness. If this does not make the handle operate more easily, undo the adjustment. Then use Adjustment 6 to decrease the corner drive closing tightness.



#### Adjustment 4 : Locking Cam Closing Tightness

**Maximum Adjustment:** Moves the sash 0.8 mm towards the frame. Moves the sash 0.8 mm away from the frame.

Open the sash, notice the cylindrical eccentric locking cams along the top and along both sides of the open sash. Close the sash. With the SA-FE-Handle in the Turn position, open the sash. You may also find one or more cams along the bottom of the sash.

Notice that each cam has an index groove stamped into its head. There are many different positions for each locking cam head. The index groove shows the current position. Refer to the position of the index groove before you adjust a cam.

With the sash in the most convenient Tilt or Turn position, adjust the closing tightness of a locking cam using the 4 mm allen key.

To increase the closing tightness, turn the fat side of the cam away from the gasket.

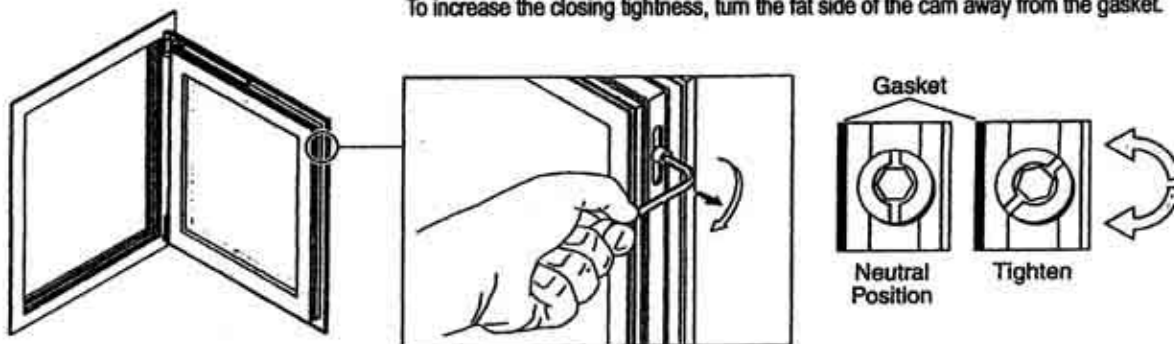


Figure 2-20.

#### Adjustment 5: Shear Closing Tightness

##### CAUTION

When you increase the closing tightness with Adjustments 5 and 6, the SA-FE-Handle will become more difficult to operate. Increase the closing tightness only if you have excessive air leakage.

**Maximum Adjustment:** Moves the sash 1.5 mm closer to the frame. Moves the sash 1.5 mm away from the frame.

Use a 4 mm allen key to make this adjustment. When you use the allen key, first turn the screw  $\frac{1}{4}$  turn, then operate the sash to see if you have corrected the problem. Repeat if necessary: turn the screw approximately  $\frac{1}{4}$  turn each time, until correct the problem.

With SA-FE-Handle in the bottom (Tilt) position, tilt the sash. Insert the 4 mm allen key into the screw head on the underside of the shear arm. To increase the closing tightness, rotate the screw in a clockwise direction. To decrease the closing tightness, rotate the screw in a counter-clockwise direction.

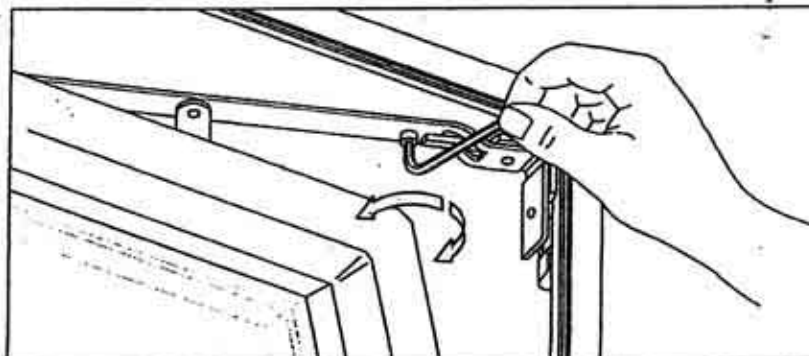


Figure 2-21.



### Adjustment 6: Corner Drive Closing Tightness

**Maximum Adjustment:** Moves the sash 1.5 mm closer to the frame. Moves the sash 1.5 mm away from the frame.

With SA-FE-Handle in the Turn position, open the sash. On the SA-FE-Handle side of the sash, at the bottom corner, find the screw head located on the sliding plate. Insert the 11 mm wrench as shown in figure 2-22.

When you use the wrench, first turn the screw  $\frac{1}{4}$  turn, then operate sash to see if you have corrected the problem. Repeat if necessary: turn the screw approximately  $\frac{1}{4}$  turn each time, until you correct the problem.

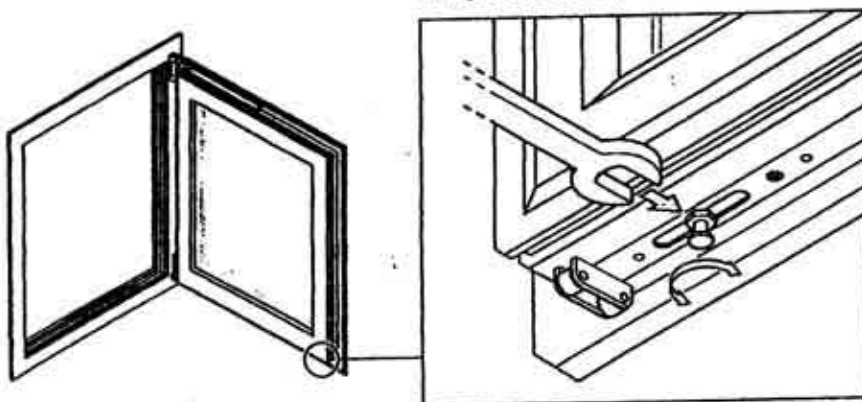


Figure 2-22.

### How To Reset A Hung Sash

- Step 1 Depress the fail safe switch and turn the handle to the tilt position. See fig. 2-23.
- Step 2 Gently push the upper hinge corner of the sash against the frame, while leaving the sash open.
- Step 3 While depressing the fail safe switch, rotate the handle to the turn position. Release the fail safe switch. The window is now reset in the turn position.

**Note:** The above figures are for a Tilt & Turn window. For a Tilt before Turn window, use the above instructions, using the handle positions shown in fig. 2-1.

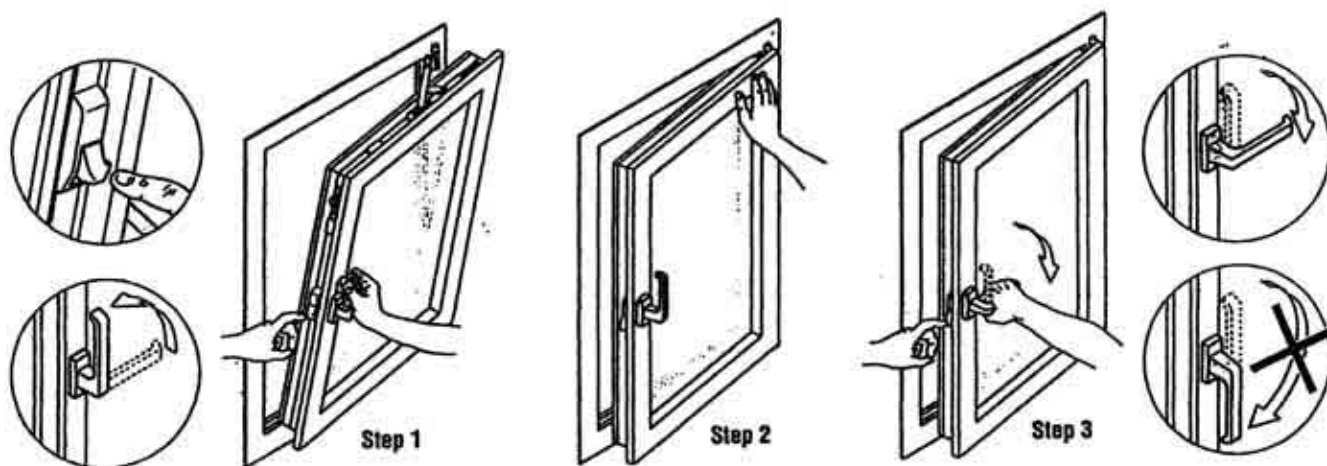


Figure 2-23.

# Section 3 Casement & Awning (Push-Out) Windows

## WARNING

Head flashing must be less than 1" below the frame or sash interference will result.

## Rough Opening Clearances

To allow for small defects in the size, level, or squareness of the rough opening, SA-FE recommends that you provide these clearances between the window frame (excluding flanges and accessory sills) and the rough opening.

Head (top of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Jambes (sides of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Sill (bottom of opening)	3/8" (10 mm) min	1/2" (12 mm) max

## How To Install Casement Windows

### 1. Prepare The Frame

- 1.1 Remove the wooden shipping blocks that are attached to the flange (if supplied).
- 1.2 If strap anchors are included with the window, rotate them until they are at right angles to the frame. Bend the strap anchors inwards about 45°. See fig. 3-1.  
Note: Some windows do not have strap anchors.  
If shop drawings are required for the project, refer to these drawings for supplemental installation instructions.

### 2. Put The Frame In The Rough Opening

- 2.1 Having prepared the rough opening as per building codes and/or Architect/Building Envelope Specialist, ensure the window is installed in a weather tight manner.
- 2.2 If supplied, swing out strap anchors attached to the frame. Strap anchors should point to the interior of the building. **Do not Nail or screw strap anchors until step 2.8.**
- 2.3 Center window into opening, ensure window is right side up.
- 2.4 Shim sill of window 2" from the corners and on both sides of any mullions with 4" x 1 1/2" shims (See fig. 3-2). **Adjust the height of the shims to obtain a level sill**, ensuring you have 3/8" gap at the head (inter-storey deflection not to exceed ±3/8").

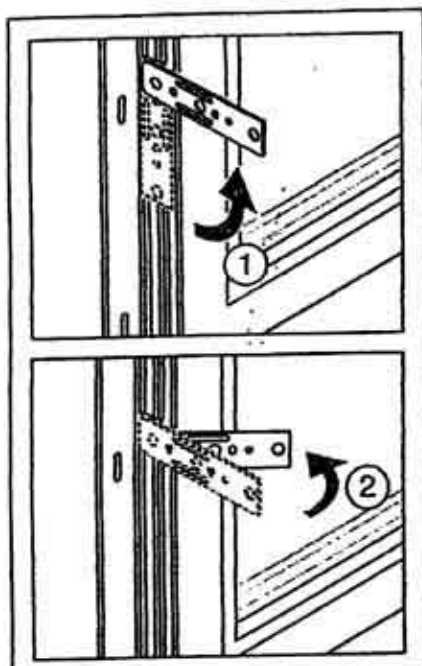


Figure 3-1. How to rotate and bend the strap anchors

## CAUTION

**DO NOT** put shims under the strap anchors!

Window Width W	Shim Spacing	
	a	b
<36"	2 1/2"	7 1/2"
36" - 70"	2 1/2"	10"
>70"	2 1/2"	10"

\* Plus add shim at centerline of window

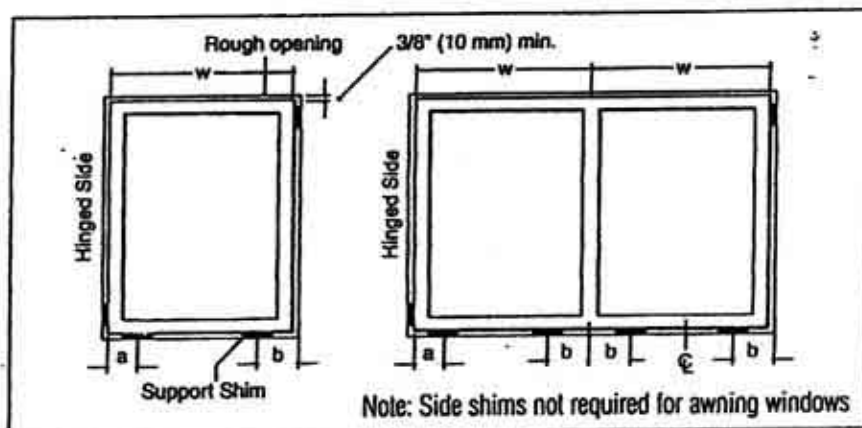


Figure 3-2. Where to put the support shims

- 2.5 Fasten bottom corners of flange to the wall with 2" galvanized nails or 1 1/2" # 10 tapping screws.
- 2.6 **Plumb the frame jams with a level** and fasten the two top corners of the flange to the wall.
- 2.7 Use a straight edge to ensure the frame is straight on all four sides. Fasten the flange every second slot. **DO NOT NAIL or screw too tight.**
- 2.8 Nail or screw all strap anchors to the wall.
- 2.9 Remove protective film from all profiles immediately after installation. See fig. 306.
- 2.10 Install drain caps.

**WARNING**

**DO NOT nail the top flange to the wall**

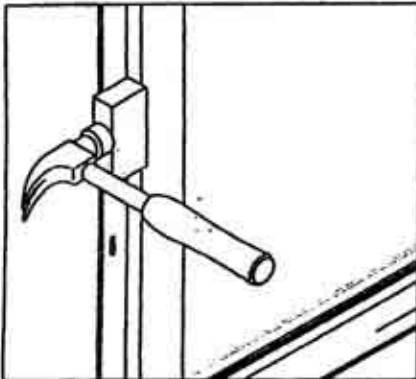


Figure 3-3. How to straighten a bowed frame

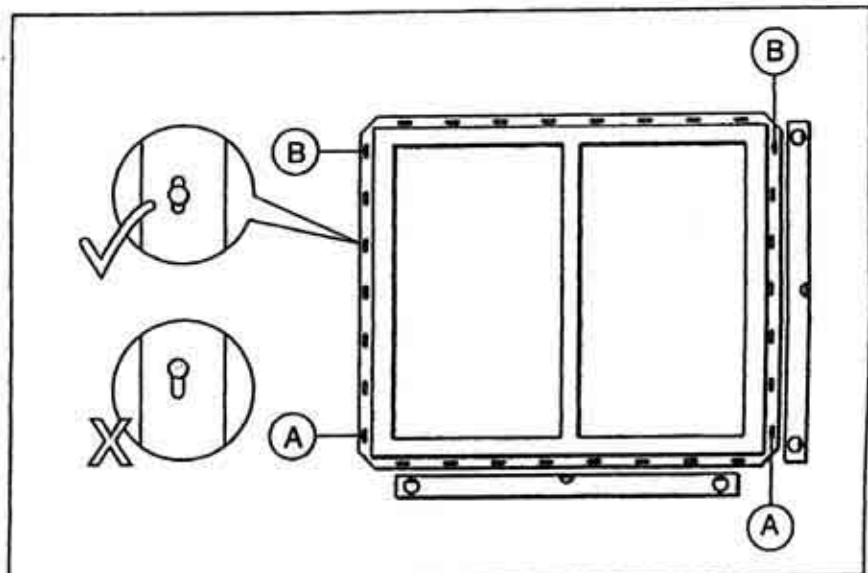


Figure 3-4. Where to fasten the flanges — exterior view

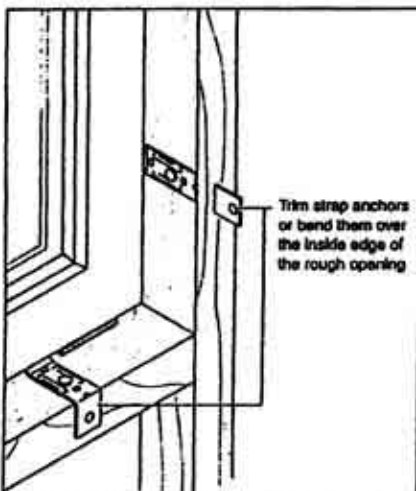


Figure 3-5. How to attach the strap anchors

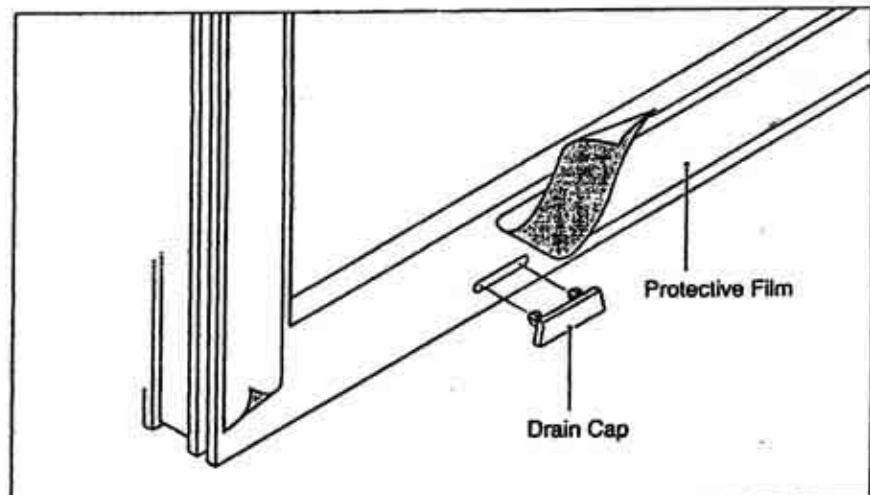


Figure 3-6. How to remove the protective film and install the drain caps — exterior view

# Section 4 Hinged Doors

## Rough Opening Clearances

To allow small defects in the size, level, or squareness of the rough opening, SA-FE recommends that you provide these clearances between the window frame (excluding flanges and accessory sills) and the rough opening.

Head (top of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Jambs (sides of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Sill (bottom of opening)	3/8" (10 mm) min	1/2" (12 mm) max

## Finish Material Clearances

There are two types of hinged doors: inswing doors that open into a building, and outswing doors that swing open to the exterior of the building. The finish material clearance requirements for each type of door are different.

### Inswing Doors

Inswing doors swing open into building, and have hinges mounted on the interior side of the door frame. SA-FE recommends that you provide a clearance of at least 1/8" (3 mm) between finish materials and the edge of each hinge of an inswing door. You will do this if you make sure that the finish materials cover not more than 1/4" (6 mm) of the door frame on the jambs. See fig. 4-1.

If the rough openings are within acceptable tolerances, than SA-FE's standard installation clearances allow you to use finishing materials up to 5/8" (16 mm) thick at the top and sides of the door, and up to 1" (25 mm) thick at the bottom. If you use thicker finishing materials, you may need to provide larger rough openings to maintain the recommended clearance between the finish material and the hinges.

### Outswing Doors

Outswing doors swing open to the exterior of a building, and have the hinges mounted on the exterior side of the door frame. You do not need to worry about interior finish material clearances for outswing doors.

**WARNING**

**DO NOT** reduce the rough opening clearance at the jambs (inswing doors). If you do, the finish materials will interfere with the hinge,

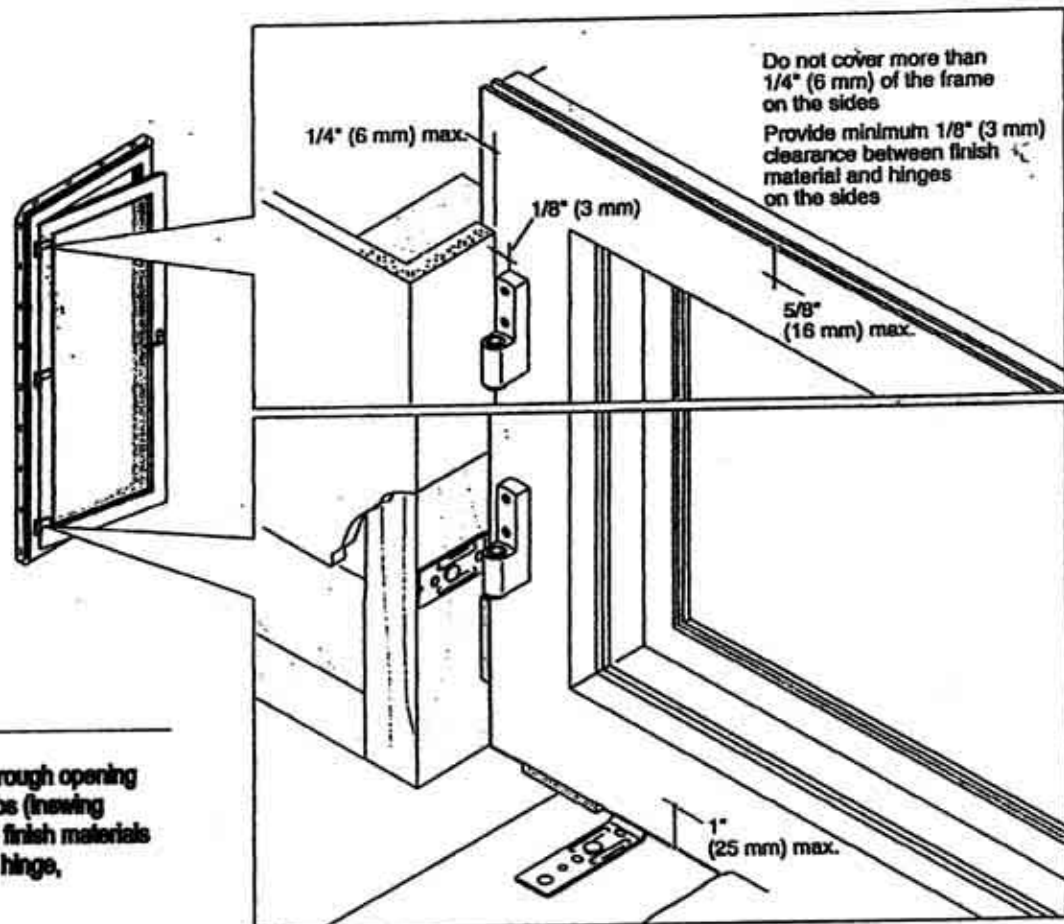


Figure 4-1. Finish material clearances

## How To Install Hinged Doors

### 1. Prepare the frame

- 1.1 Remove the wooden shipping blocks that are attached to the flange (if supplied).
- 1.2 If strap anchors are included, rotate them until they are at right angles to the frame. Bend the strap anchors inwards about 45°. See fig. 4-10.  
 Note: Some frames do not have strap anchors.  
 If shop drawings are required for the project, refer to these drawings for installation instructions only.

### 2. Install the SA-FE-Handle

Handles are usually shipped loose. Follow the steps below to install the SA-FE-Handles.

- 2.1 Pull the screw cover of the SA-FE-Handle base towards you and rotate it 90° to uncover the screw holes. See fig. 4-2.
- 2.2 Determine if the sash hardware is in the Lock position or in the Turn position. If the sash is installed in the frame and cannot open, the sash hardware is in the Lock position. Go to Step 2.3. If the sash swing open on its hinges, the sash hardware is in the Turn position. Go to Step 2.5.

## SA-FE Windows and Doors

- 2.3 Lock position: install the SA-FE-Handle on the sash in the vertical Lock position, with the handle pointing down. Insert the shaft into the center hole. See fig. 4-3.
- 2.4 Lock position: rotate the SA-FE-Handle to the horizontal Turn position. This gives you access to both of the screw holes see fig. 4-5. Insert the screws that came with the handle and tighten them. See fig. 4-5. Go to step 2.7.
- 2.5 Turn position: rotate the SA-FE-Handle to the horizontal Turn position, with the handle pointing toward the hinge side of the sash. Install the SA-FE-Handle on the sash: insert the shaft into the center hole. See fig. 4-4.
- 2.6 Turn position: insert the screws supplied and tighten them. See fig. 4-5.
- 2.7 Rotate the screw cover on the SA-FE-Handle base to the vertical position. Rotate the SA-FE-Handle to the vertical Lock position with the handle pointing down.

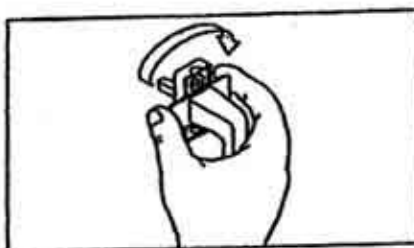


Figure 4-2. How to uncover the screw holes

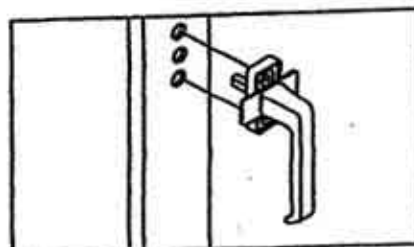


Figure 4-3. Handle in the Lock position

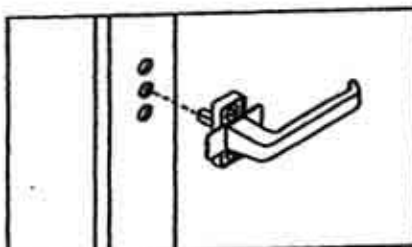


Figure 4-4. Handle in the Turn position

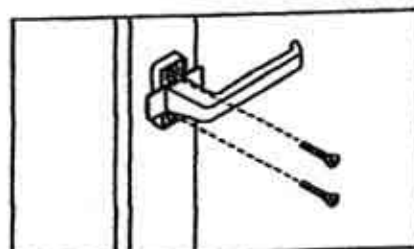


Figure 4-5. Where to install the mounting screws

### CAUTION

**DO NOT** over-tighten the screws. If you over-tighten the screws, you can damage the hardware and make the SA-FE Handle difficult to operate.

## SA-FE-Luxe Hardware

SA-FE-Luxe hardware includes a high quality latching mechanism and a dead bolt lock, in addition to SA-FE's standard concealed multipoint locking mechanism. It also includes an exterior key cylinder and an interior thumb turn.

There are several different styles available. The handle positions are shown below.

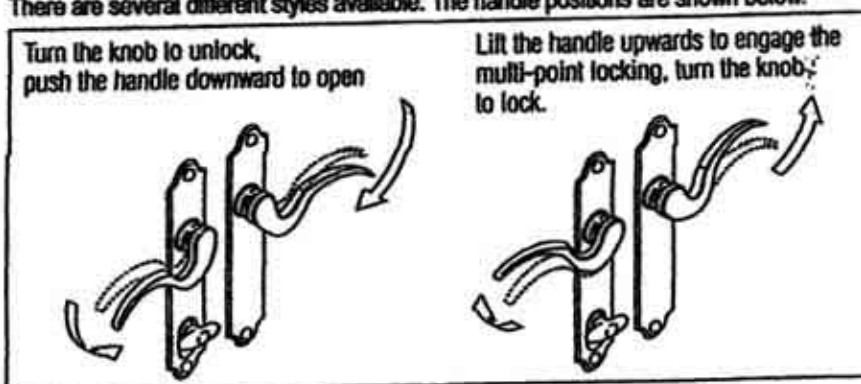


Figure 4-6. Luxe Handle positions



**WARNING !**

The sash is heavy! DO NOT attempt to remove the sash alone. SA-FE recommends an installation crew of at least two people.

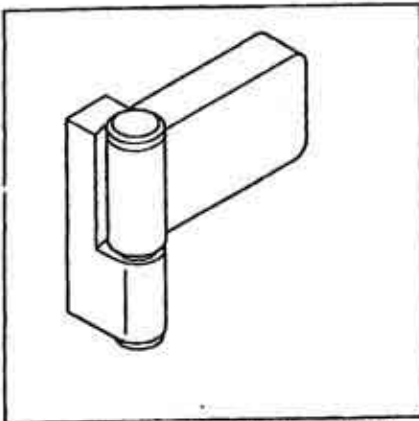


Figure 4-7. A typical offset pivot hinge—style of hinge may vary

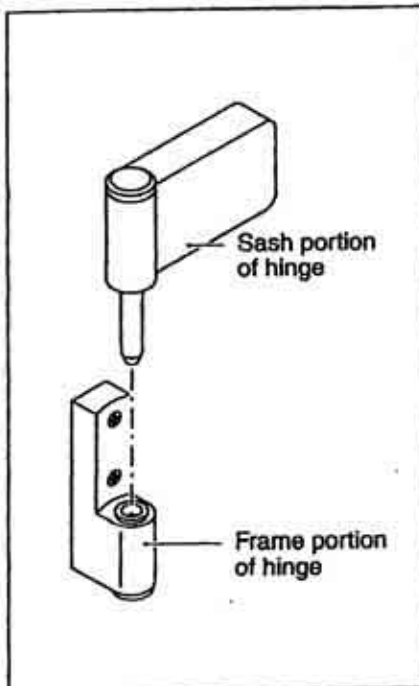


Figure 4-8. The parts of an offset pivot hinge

**3. Remove The Sash From The Frame**

- 3.1 Unlock the sash. If the sash has a SA-FE-Handle, unlock the dead bolt, and rotate the handle sideways to the Turn position to open the sash.
- 3.2 If the sash has a SA-FE-Luxe handle, unlock the dead bolt, and gently depress the SA-FE-luxe handle to open the sash. See fig. 4-6.
- 3.3 Open the sash approximately 90°.
- 3.4 With the help of an assistant, gently lift the sash up and free of the hinges. Move the sash away from the frame. See fig. 4-9.

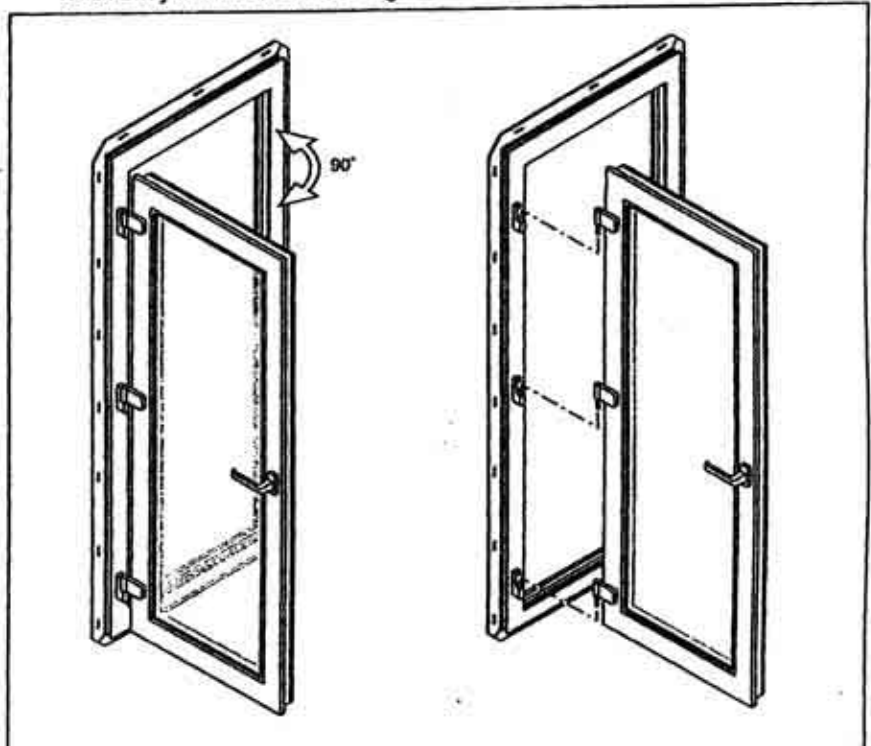


Figure 4-9. How to remove the sash from the hinges

- 3.5 When you lift the sash free of the hinge pins, some of the pins may come out of the sash. Take any pins that come out and put them in the sash portion of each hinge. Make sure that each hinge pin is in place in the sash portion of each hinge.

Note: The door sashes are mounted to the frame with three offset pivot type hinges.

- 3.6 Put the sash in the safe place, on a clean and dry surface. Make sure that dirt and sand do not enter the hole in the frame portion of each hinge.



**CAUTION**

Keep the bottom hinge of the sash free of dirt and sand! When you install the sash again, dirt and sand in the hinge can cause operation problems. Dirt and sand will cause premature wear of the lower hinge.

**CAUTION**

**DO NOT** put shims under the strap anchors!

**4. Put The Frame In The Rough Opening**

- 4.1 Having prepared the rough opening as per building codes and/or Architect/Building Envelope Specialist, ensure that the door is installed in a weather tight manner.
- 4.2 If supplied, swing out strap anchors attached to the frame. Strap anchors. Should point to the interior of the building. **DO NOT nail or screw strap anchors until step 4.8.**
- 4.3 Center frame into opening, ensure frame is right side up.
- 4.4 Shim sill of frame approximately 2" from the corners and on both sides of any mullions with 4" x 1 1/2" shims. See fig. 4-11. **Adjust the height of the shims to obtain a level sill**, ensuring you have a 3/8" gap at the head (inter-storey deflection not to exceed + 3/8").

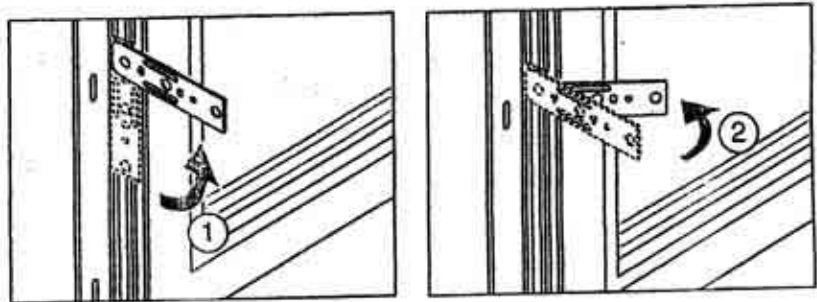


Figure 4-10. How to rotate and bend the strap anchors

**CAUTION**

Make sure the door is **LEVEL**. If the sill is not level, the sash will not operate properly.

- 4.5 Fasten bottom corners of flange to the wall with 2" galvanized nails or 1 1/2" # 10 tapping screw.
- 4.6 **Plumb the frame jambs with a level** and fasten the two top corners of the flange to the wall.

Window Width W	Shim Spacing	
	a	b
<36"	2 1/2"	7 1/2"
36" – 70"	2 1/2"	10"
>70"	2 1/2"	10"

\* Plus add shim at centerline of window

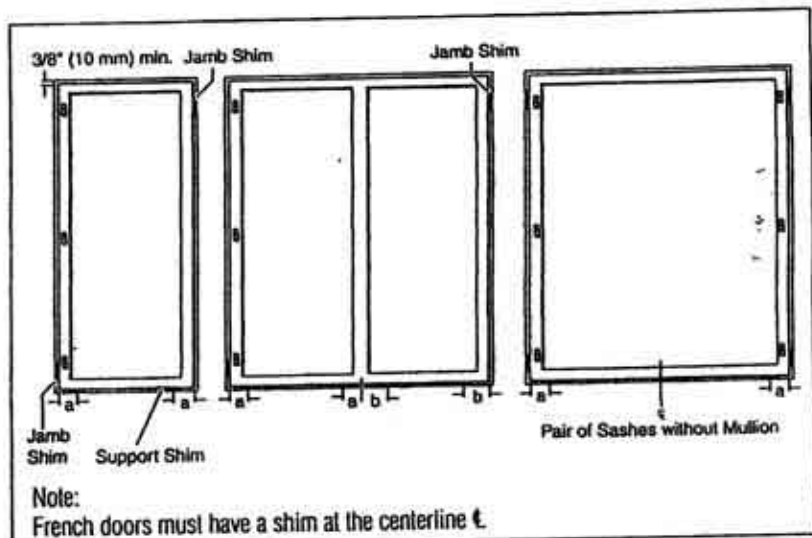


Figure 4-11. Where to put the support shims and jamb shims

**CAUTION**

**DO NOT** set the nails too tight!

Drive the nails into the center of the slots in the nailing flange. This lets the nails move a little bit when the framing shrinks or the building settles.

**WARNING**

**DO NOT** Nail the top flange to the wall!

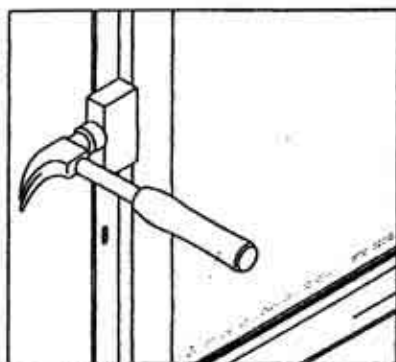


Figure 4-12. How to straighten a bowed frame

**WARNING**

The sash is heavy! **DO NOT** try to remove the sash alone. SA-FE recommends an installation crew of at least two people.

**SA-FE Windows and Doors**

- 4.7 Use a straight edge to ensure the frame is straight on all four sides. Fasten the flange every second slot. **DO NOT** nail or screw too tight.
- 4.8 Nail or screw all strap anchors if provided to the wall.
- 4.9 Install shims at jambs on all operable windows and doors.
- 4.10 Install sash and check for operation.
- 4.11 Remove protective film from all profiles immediately after installation. See fig. 4-15.
- 4.12 Install drain caps.

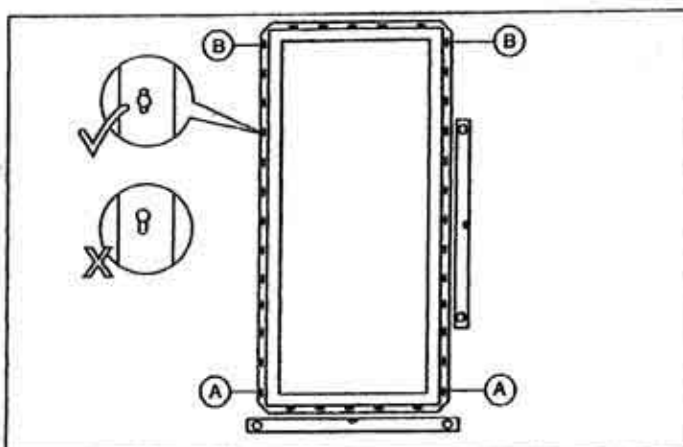


Figure 4-13. Where to fasten the flanges — exterior view

**5. Install The Sash(es)**

- 5.1 Make sure that hinge pins are clean and free of sand or other construction debris.
- 5.2 With help of an assistant, lift the sash. Put the sash in position: make sure that the hinge pins correctly engage in the frame portion of the hinge. See fig. 4-9.
- 5.3 Close the sash. If the sash has a SA-FE-Handle, rotate the SA-FE-Handle downwards to the Lock position. This secures the sash. If the sash has a SA-FE-Luxe handle, the handle automatically springs back to the normal position.

**6. Operate The Sash(es)**

SA-FE squares the sashes and aligns them with the hardware at the factory. Operating problems occur when the frame is not installed level and square, or when the frame or sash members are not straight because of handling.

- 6.1 Open and close the sash several times. If the sash operates freely, go to Step 4.11. If the sash does not open and close freely, but binds or strikes the frame at one or more points, then you may not have a level or square frame. To correct the problem, do the steps that follow:
- 6.2 If the sash hardware binds at the top of the lock stile or at the bottom of the earail, the frame may not be level, or it may be out of square. See fig. 4-14 Item A. Use a spirit level and make sure that the sill is level and that the mullions and jambs are square. If the frame is not level or square, adjust the thickness of the shims to make it level and square.

- 6.3 If the sash hardware binds at the midpoint either the sash or the mullion became bowed during handling or installation. See fig.4-14 Item B. Use a straight edge and make sure that the sash and the mullion are not bowed. If either the sash or the mullion are bowed, make them straight as shown in fig. 4-12.
- 6.4 If you cannot correct the binding problems with these methods, adjust the operating hardware. See next section.

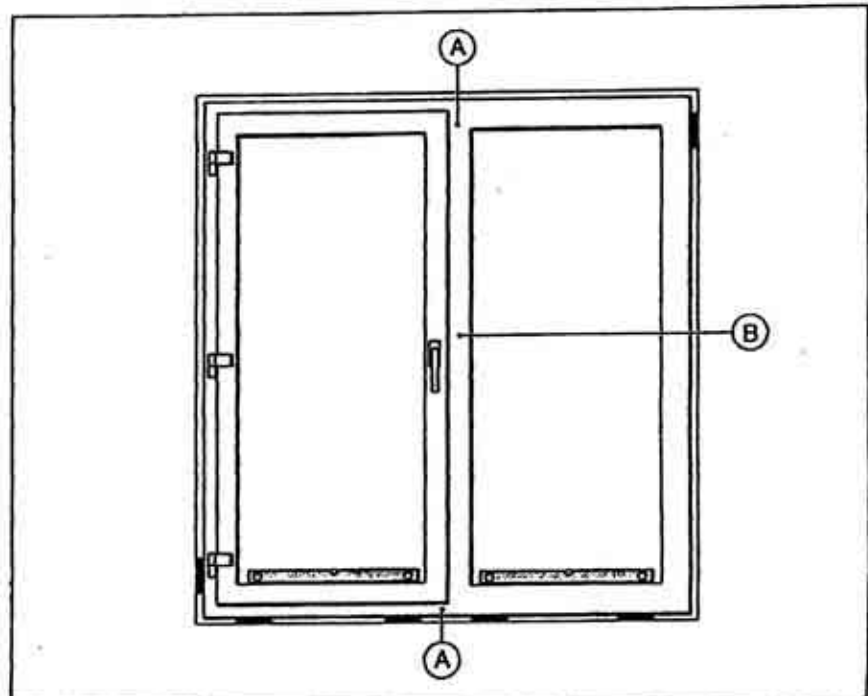


Figure 4-14. Where sashes sometimes bind

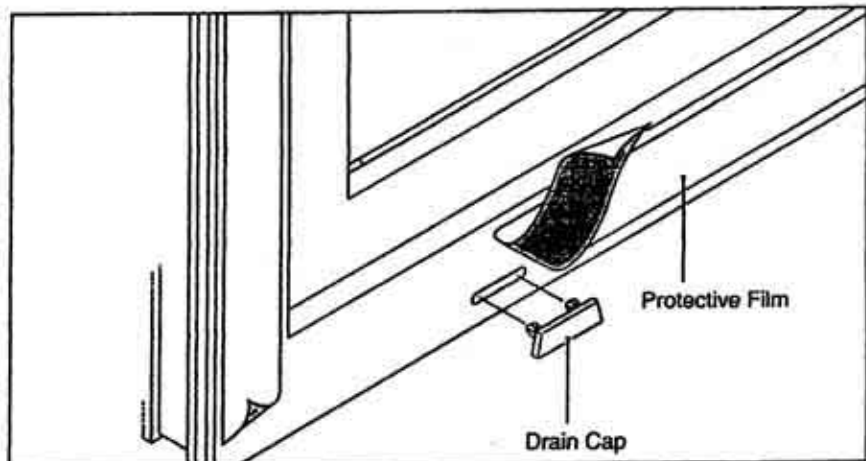
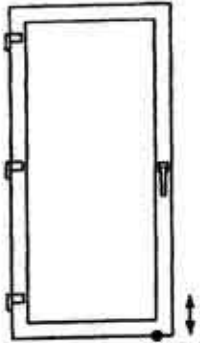


Figure 4-15. Remove the protective film and install the drain caps — exterior view

## How To Adjust Hinged Doors

### Adjustment 1: Vertical Clearance



If the sash binds at the bottom, use this adjustment to raise the sash.

**Maximum Adjustment:** Raises the sash 4 mm from the factory setting.

This adjustment moves the sash up or down.

Open the sash approximately 2° (50 mm). Insert the 4 mm allen key into the recessed screw head in the bottom of the hinge. To raise the sash height, rotate the screw in a clockwise direction. To lower the sash height, rotate the screw in a counter-clockwise direction.

**Make sure that you raise or lower all three hinges by the same amount.**

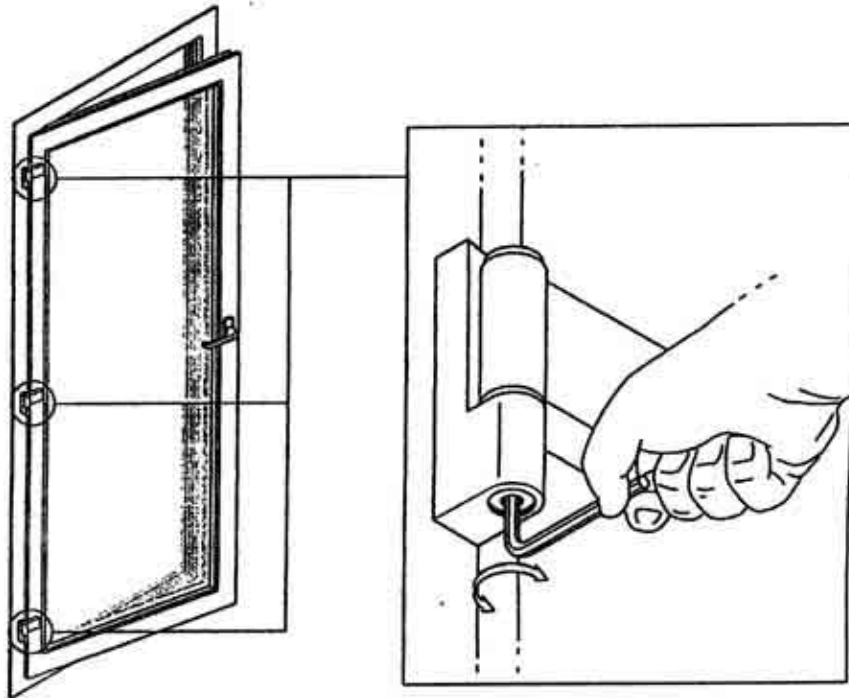
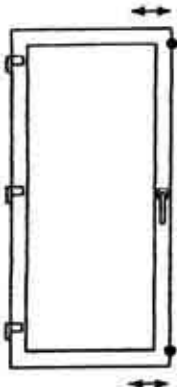


Figure 4-16.

### Adjustment 2: Horizontal Clearance



If the sash binds at the handle side, use this adjustment to move the sash toward the hinges.

**Maximum Adjustment:** Moves the sash 5 mm to the left. Moves the sash 5 mm to the right.

This adjustment moves the sash from side to side.

### How To Remove The Security Cover

Most SA-FE pivot hinges have a tamperproof security cover. One screw holds the cover in place. To find the concealed screw, open the sash 90°. The screw is on the back side of the hinge body. Use a 4 mm allen key to loosen the screw.

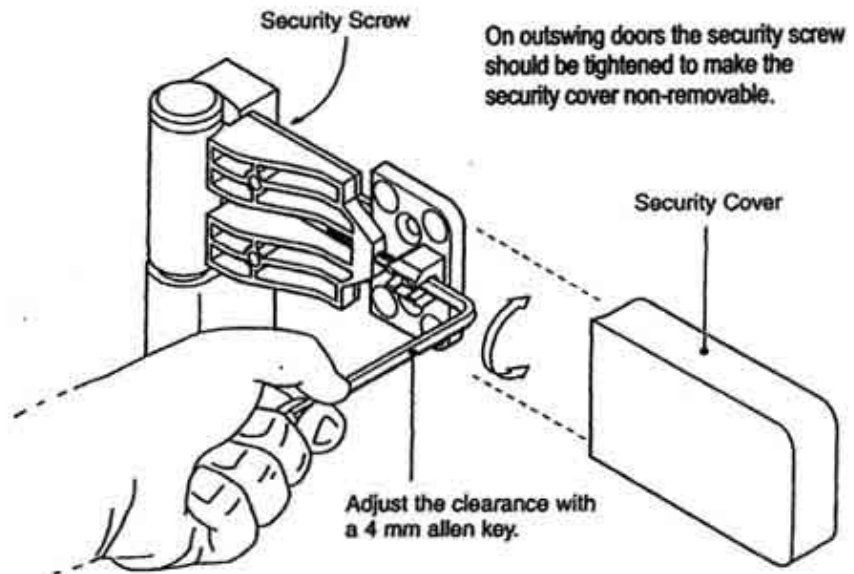
### CAUTION

Do not adjust the sash more than 2 mm to the left or 2 mm to the right. If you adjust the sash more than 2 mm, you will reduce the coverage of the sealing gaskets.

### How To Make The Horizontal Clearance Adjustment

Open the sash approximately 2" (50 mm). Insert the 4 mm allen key into the recessed screw head on the edge of the hinge body. To move the sash away from the hinge, rotate the screw in a clockwise direction. To move the sash towards the hinge, rotate the screw in a counter-clockwise direction.

Make sure that you **adjust all three hinges by the same amount**.



There are different hinge styles. The hinge may not look exactly as shown.

### How To Correct Closing Tightness Problems

Use these adjustments to reduce air leakage around the sash, or to make the SA-FE-Handle easier to operate.

If you have an air leakage problem, try to correct it by increasing the closing tightness of the nearest locking cam(s) using Adjustment 3. If this does not correct the problem because the air leakage occurs at a hinge, increase the closing tightness of that hinge using Adjustment 4. Do not increase the closing tightness any more than you need to in order to control the immediate problem, or the SA-FE-Handle will become difficult to operate.

If the SA-FE-Handle is difficult to operate, use Adjustment 3 to decrease the closing tightness of the locking cams.

### Adjustment 3: Locking Cam Closing Tightness

**Maximum Adjustment:** Moves the sash 0.8 mm towards the frame. Moves the sash 0.8 mm away from the frame.

Open the sash. Notice the cylindrical locking cams along the vertical edge of the open sash. You may find one or more cams along the top or along the bottom of the sash as well. Notice that each cam has an index groove stamped into its head. The index groove shows the current position. Refer to the position of the index groove before you adjust a cam.

With the sash in the most convenient Tilt or Turn position, adjust the closing tightness of a locking cam using the 4 mm allen key.

To increase the closing tightness, turn the fat side of the cam towards the gasket. To decrease the closing tightness, turn the fat side of the cam away from the gasket.

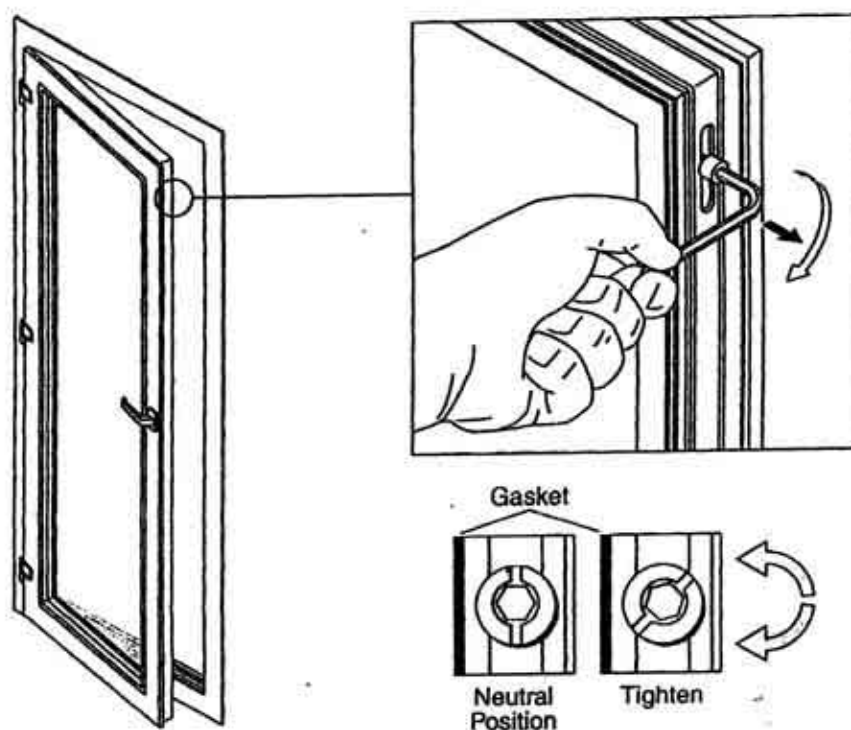


Figure 4-18.

### Adjustment 4: Corner Drive Closing Tightness

**Maximum Adjustment:** Moves the sash 1.5 mm closer to the frame. Moves the sash 1.5 mm away from the frame.

With the SA-FE-Handle in the Turn position, open the sash. On the SA-FE-Handle side of the sash, at the bottom corner, find the screw head located on the sliding plate. Insert the 11 mm wrench as shown in fig. 4-19 on the following page.

When you use the wrench, first turn the screw  $\frac{1}{4}$  turn, then operate the sash to see if you have corrected the problem. Repeat if necessary: turn the screw approximately  $\frac{1}{4}$  turn each time, until you correct the problem.

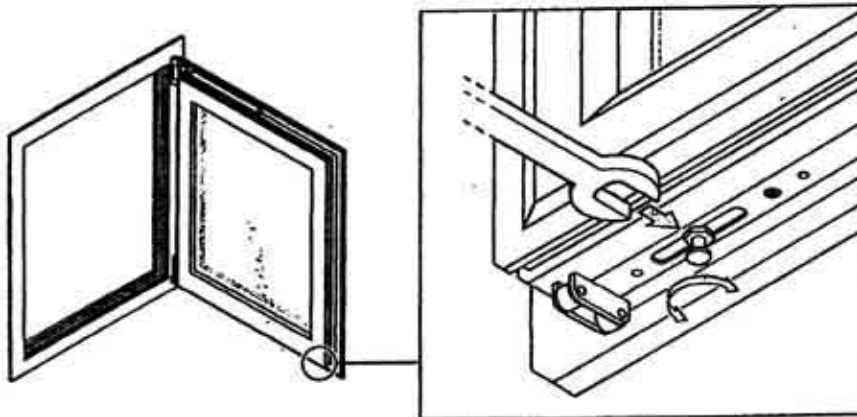


Figure 4-19. Corner Drive Closing Tightness

#### Adjustment 5: Hinge Closing Tightness

**Maximum Adjustment:** Moves the sash 0.8 mm closer to the frame. Moves the sash 0.8 mm away from the frame.

Use a small knife blade or a flat head screw driver to remove the plastic cap from the top of each hinge.

Open the sash approximately 2" (50 mm). Insert the 4 mm allen key into the recessed screw head on the top of the hinge pin. To move the sash closer to the frame or to move it farther away, rotate the screw. This adjustment also moves the sash slightly to one side or to the other. You can rotate the screw in either direction.

You can measure the distance between the moving part of the hinge and the fixed part of the hinge that is attached to the frame. Adjust all three hinges to the same distance. Replace the plastic cap to the top of each hinge.

#### Note:

The hinge pin is mounted inside an eccentric sleeve. When you turn the screw head in the top of the hinge pin the sleeve rotates.

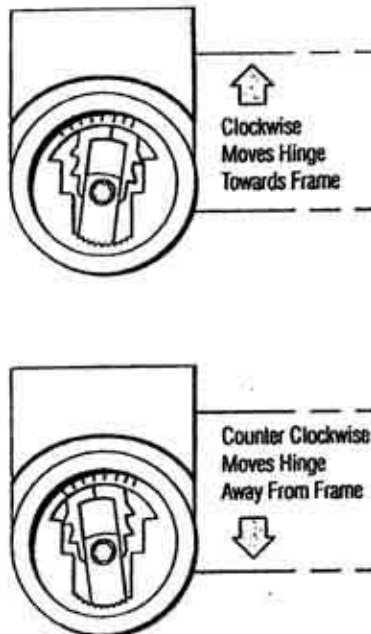
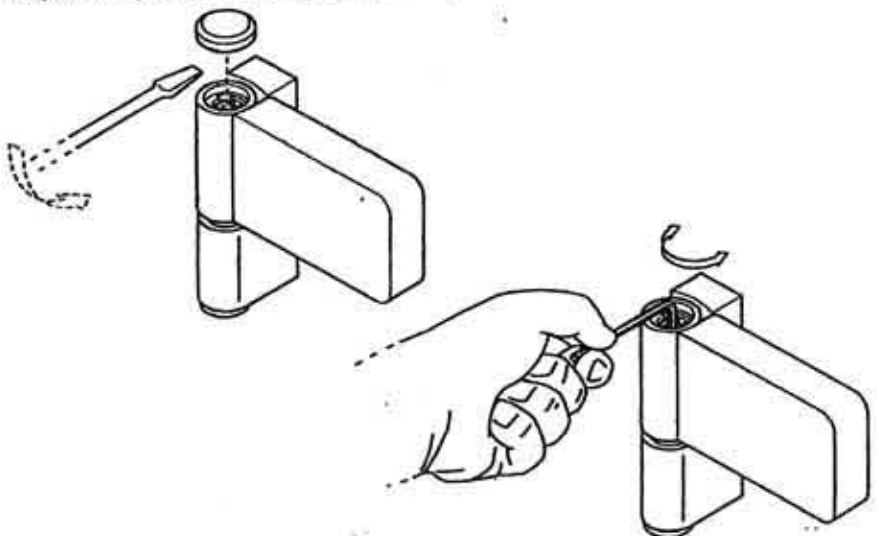


Figure 4-20.



There are different hinge styles. The hinge may not look exactly as shown.

Figure 4-21.



# Section 5 Tilt & Glide Doors

## Rough Opening Clearances

To allow for small defects in the size, level, or squareness of the rough opening, SA-FE recommends that you provide these clearances between the frame (excluding flanges and accessory sills) and the rough opening.

Head (top of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Jamb (sides of opening)	3/8" (10 mm) min	1/2" (12 mm) max
Sill (bottom of opening)	3/4" (19 mm) min	1" (25 mm) max

### CAUTION

**DO NOT** reduce the rough opening clearances at the head or the sill. If you do, the finish materials will interfere with the operation of the doors.

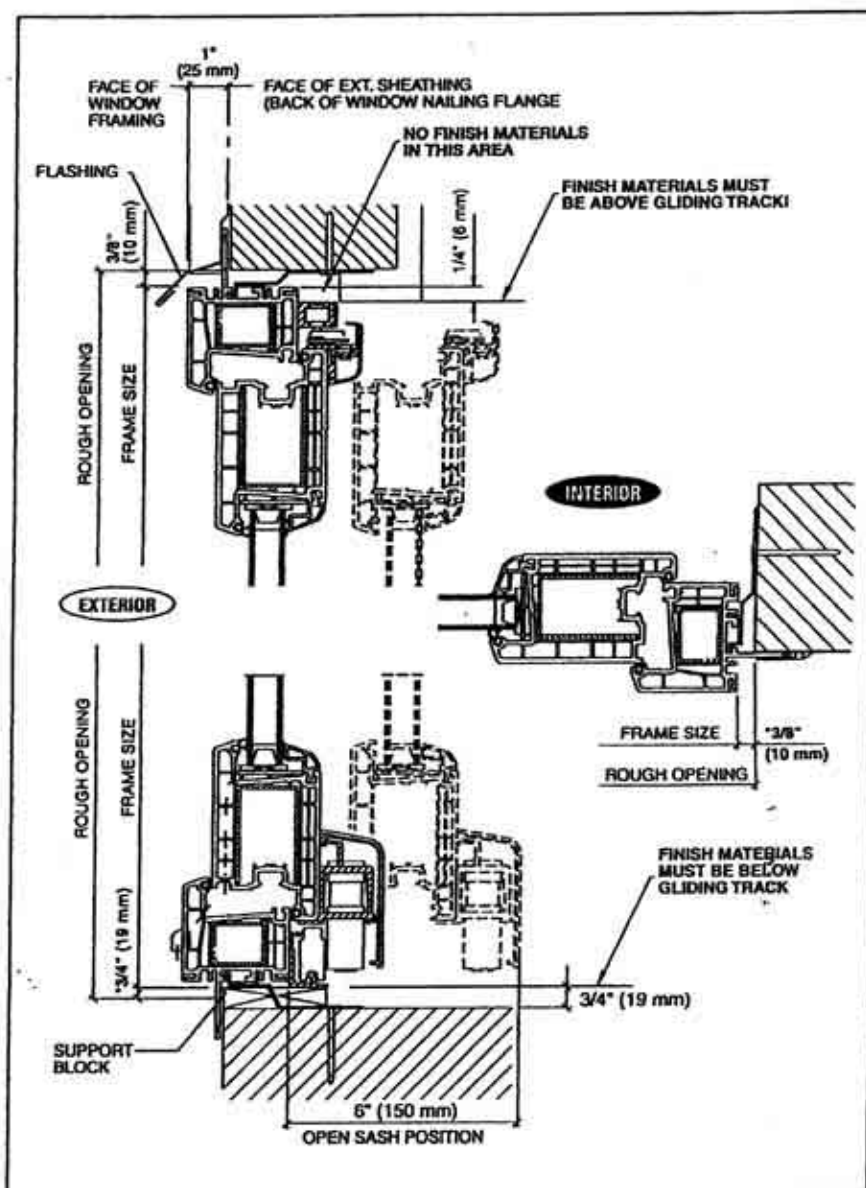


Figure 5-1. Tilt & Glide door: typical cross-sections through the head, sill, and right-hand jamb

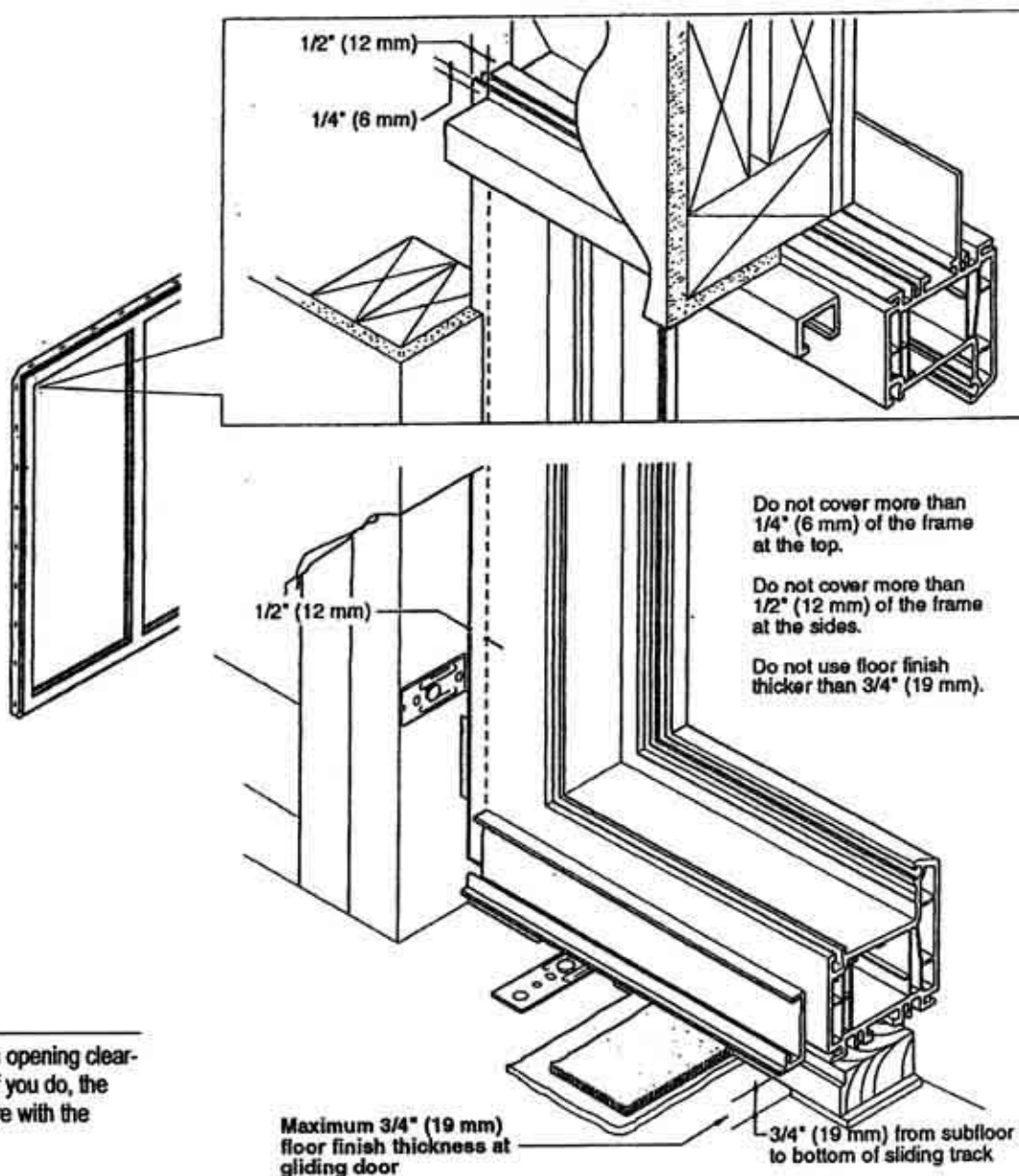
### Note

The design of the building envelope is the responsibility of the owner/contractor/builder/architect/building envelope consultant. The attachment of the window/door assembly to the building envelope, to assure continuity of the water/air vapour barriers, is the contractual obligation of others.

## Finish Material Clearances

SA-FE recommends that finish materials cover no more than 1/2" (12 mm) of the frame at the sides, and 1/4" (6 mm) of the frame at the top, so that finish materials clear the gliding tracks. See fig. 5-1.

If the rough openings are within acceptable tolerances, then SA-FE's standard installation clearances allow you to use finish materials up to 1/2" (12 mm) thick at the top, and up to 7/8" (22 mm) thick at the sides and at the bottom of the Tilt & Glide door. If you use thicker finishing materials, you will need to provide larger rough opening to maintain the specified clearance between the finish material and the gliding tracks.



### CAUTION

**DO NOT** reduce the rough opening clearances at the head or sill. If you do, the finish materials will interfere with the operation of the doors.

Figure 5-2. Finish material clearances

## How To Install Tilt & Glide Doors

### Tools Required:

8 mm allen key  
4 mm allen key  
Special key (supplied)

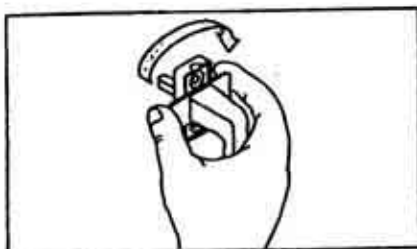
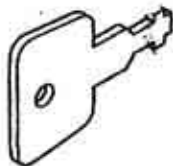


Figure 5-3. How to uncover the screw holes

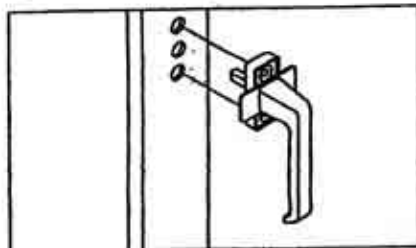


Figure 5-4. Handle in the Lock position

### CAUTION

**DO NOT** over-tighten the screws. If you over-tighten the screws, you can damage the hardware and make the SA-FE-Handle difficult to operate.

### 1. Prepare The Frame

- 1.1 Remove the wooden shipping blocks that are attached to the flange ( if supplied).
- 1.2 If strap anchors are included, rotate them until they are at right angles to the frame. Bend the strap anchors inward about 45°. See fig. 5-11.  
Note: Some frames do not have strap anchors.  
If shop drawings are required for the project, refer to these drawings for installation instructions only.

### 2. Install The SA-FE-Handle

Handles are usually shipped loose. Follow the steps below to install the SA-FE-Handles.

- 2.1 Pull the screw cover of the SA-FE-Handle base towards you and rotate it 90° to uncover the screw holes. See fig. 5-3.
- 2.2 Determine if the sash hardware is in the Lock position or in the Glide position. If the sash is installed in the frame and cannot open, the sash hardware is in the Lock position. Go to Step 2.3. If the sash glides open on its hinges, the sash hardware is in the Glide position. Go to Step 2.5.
- 2.3 Lock position: install the SA-FE-Handle on the sash in the vertical Lock position, with the handle pointing down. Insert the shaft into the center hole. See fig. 5-4.
- 2.4 Lock position: rotate the SA-FE-Handle to the horizontal Glide position. This gives you access to both of the screw holes. Insert the screws that came with handle and tighten them. See fig. 5-5. Go to Step 2.7.
- 2.5 Glide position: rotate the SA-FE-Handle to the horizontal Glide position, with the handle pointing toward the hinge side of the sash. Install the SA-FE-Handle on the sash: insert the shaft into the center hole. See fig. 5-6.
- 2.6 Glide position: insert the screws that came with the handle and tighten them. See fig. 5-5.
- 2.7 Rotate the screw cover on the SA-FE-Handle base to the vertical position. Rotate the SA-FE-Handle to the vertical Lock position with the handle pointing down.

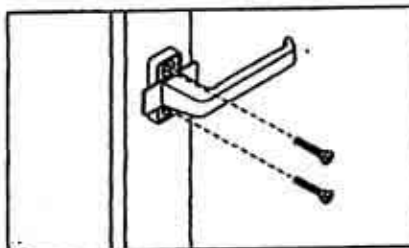


Figure 5-5. Where to install the mounting screws

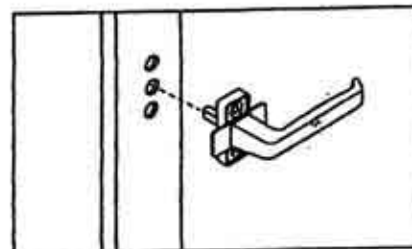


Figure 5-6. Handle in the Turn position

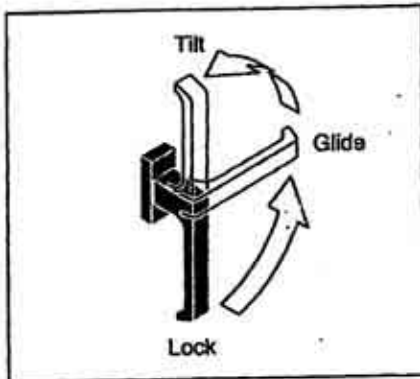


Figure 5-7. How to operate the Handle

### 3. Remove The Sash From The Frame

If the frame has a sash installed, remove the sash as follows:

- 3.1 Rotate the SA-FE-Handle 90° to the Glide position. Gently pull the SA-FE-Handle towards you. The sash swings out on its stay arms. Gently pull the SA-FE-Handle to the side and open the sash completely. See fig. 5-7.
- 3.2 With the sash in the open position (but still in the opening) insert the special key into the glide block which retains the stay arm. See fig. 5-8.
- 3.3 Turn the key 90° and pull down on the stay arm to disengage it from the glide block.
- 3.4 Repeat the procedure for the other stay arm.

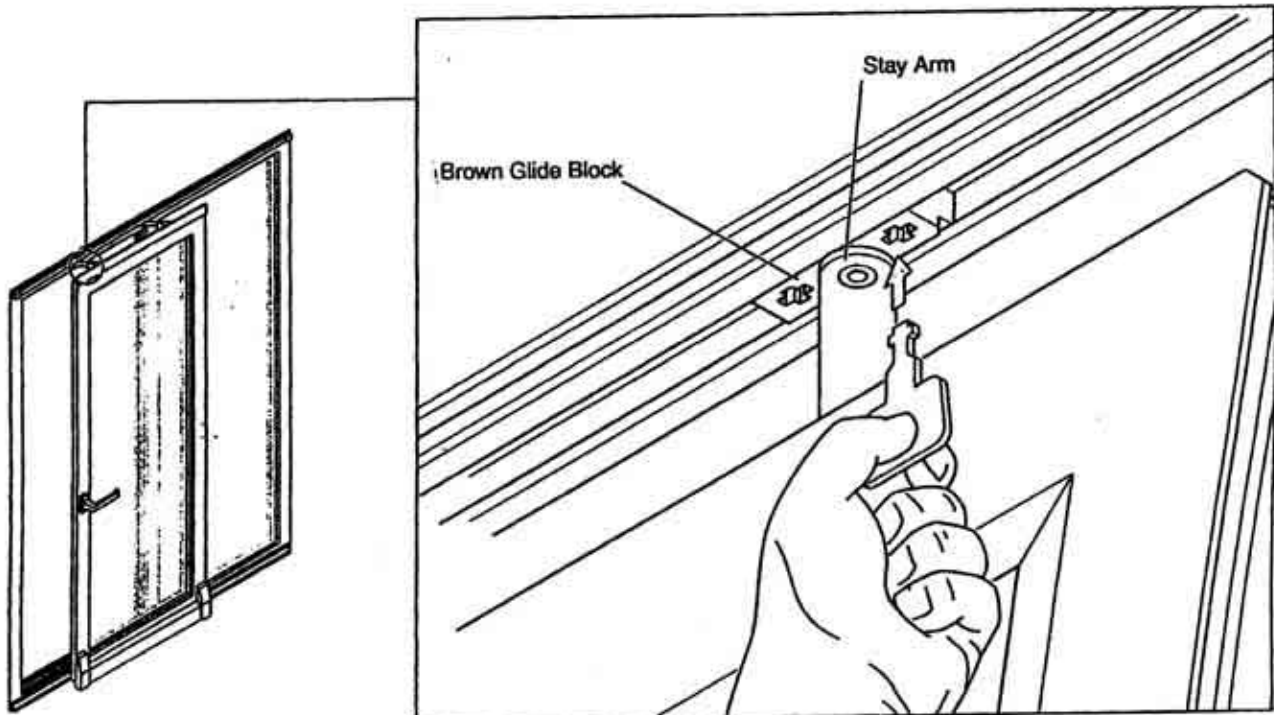


Figure 5-8. How to remove the stay arm assembly

**WARNING**

The sash is heavy! **DO NOT** try to remove the sash alone. SA-FE recommends an installation crew of at least two people.

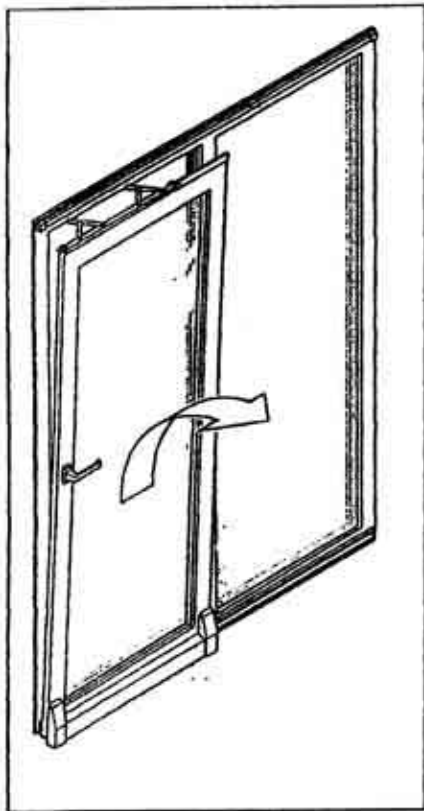


Figure 5-9. How to remove the sash from the frame

**CAUTION**

**DO NOT** Tilt the sash too far out of the bottom track. If you tilt the sash too far, you will damage the glide runner hardware cover.

**CAUTION**

Keep the bottom of the sash free of dirt and sand! When you install the sash, dirt and sand in the bottom track can cause operational problems. Dirt and sand will cause premature wear of the gliding hardware.

- 3.5 Tilt the top of the sash towards you: tilt it far enough to release the wheels out of the bottom track, but not too far that you can cause damage to the glide-runner hardware cover. See fig. 5-9 and 5-10.
- 3.6 With the help of an assistant, gently lift the sash out of the bottom track and move it away from the frame.
- 3.7 Put the sash in the safe place, on a clean and dry surface. Make sure that dirt and sand do not enter the wheels on the glide runners. Keep dirt and sand away from all of the moving parts of the glide runner assembly.

Note: You can collapse the sash arm assembly against the frame.

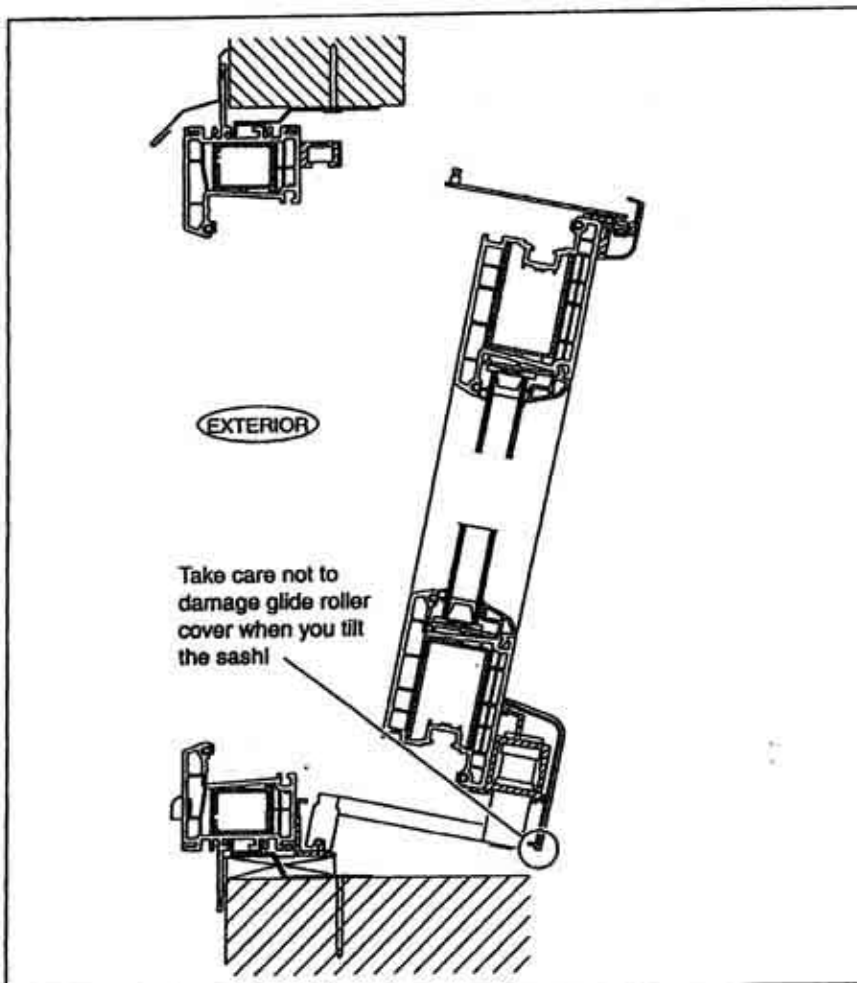


Figure 5-10. How far you can tilt the sash

**Note**

Interface detail is the responsibility of the contractor/builder/architect.

**CAUTION**

Keep the bottom hinge of the sash free of dirt and sand! When you install the sash again, dirt and sand in the hinge can cause operational problems. Dirt and sand will cause premature wear of the lower hinge.

**CAUTION**

**DO NOT** put shims under the strap anchors!

**4. Put The Frame In The Rough Opening**

- 4.1 Having prepared the rough opening as per building codes and/or Architect/ Building Envelope Specialist, ensure that the frame is installed in a weather tight manner.
- 4.2 If supplied, swing out strap anchors attached to the frame. Strap anchors should point to the interior of the building. **Do not nail or screw strap anchors until step 4.9.**
- 4.3 Center frame into opening, ensure frame is right side up.
- 4.4 Shim sill with 4" x 1 1/2" shims (See fig. 5-12). **Adjust the height of the shims to obtain a level sill**, ensuring you have a 3/8" gap at the head (inter-storey deflection not to exceed + 3/8").

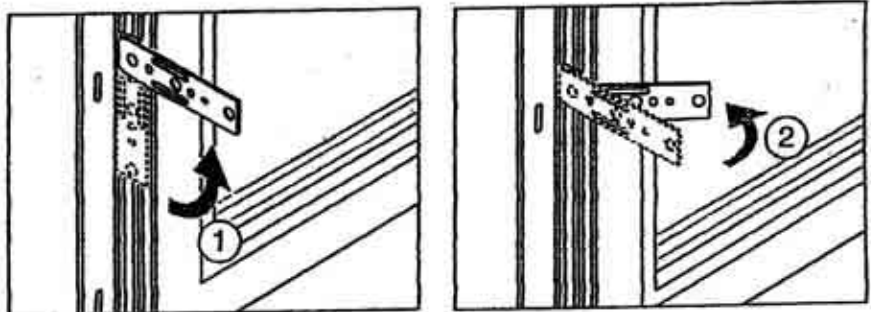


Figure 5-11. How to rotate and bend the strap anchors

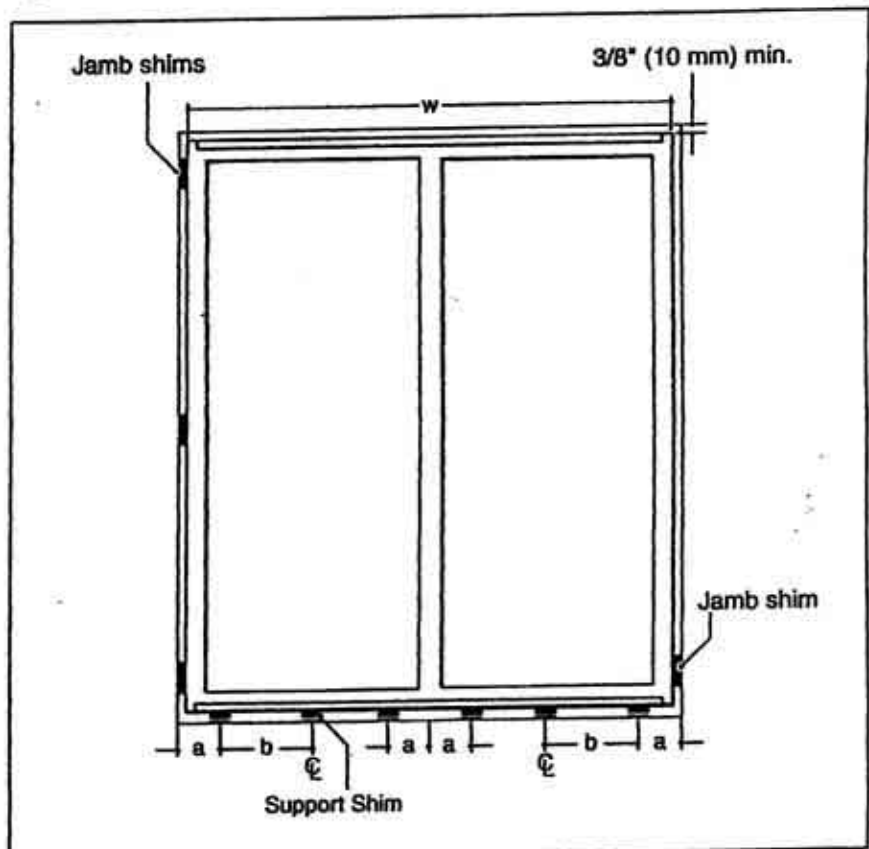


Figure 5-12. Where to put the support shims and the jamb shims

**Shim Spacing at Sill**

a 7 1/2"

b Shim spacing must be no more than 18" on centre

Note: Minimum of 3 shims per light

### CAUTION

Make sure the frame is **LEVEL**. If the sill is not level, the sash will not operate properly.

### CAUTION

**DO NOT set the nails too tight!**  
Drive the nails into the center of the slots in the flange. This lets the nails move a little bit when the framing shrinks or the building settles.

### WARNING

**DO NOT nail the top flange to the wall!**

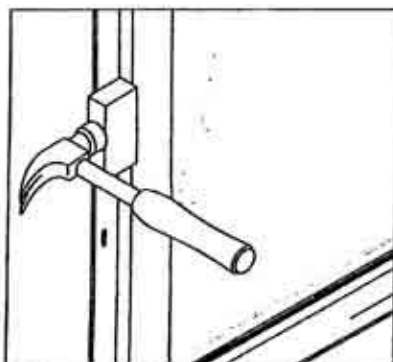


Figure 5-13. How to straighten a bowed frame

### WARNING

**The sash is heavy! DO NOT try to install the sash alone. SA-FE recommends an installation crew of at least two people.**

## SA-FE Windows and Doors

- 4.5 Fasten bottom corners of flange to the wall with 2" galvanized nails or 1 1/2" #10 tapping screws.
- 4.6 **Plumb the frame jambs with a level** and fasten the two top corners of the flange to the wall.
- 4.7 Use a straight edge to ensure the frame is straight on all four sides. Fasten the flange every second slot. **DO NOT nail or screw too tight.**
- 4.8 Nail or screw all strap anchors if provided to the wall.
- 4.9 Install shims at jambs on all operable doors.
- 4.10 Install sash and check for operation.
- 4.11 Remove protective film from all profiles immediately after installation. See fig.5-17.
- 4.12 Install drain caps.

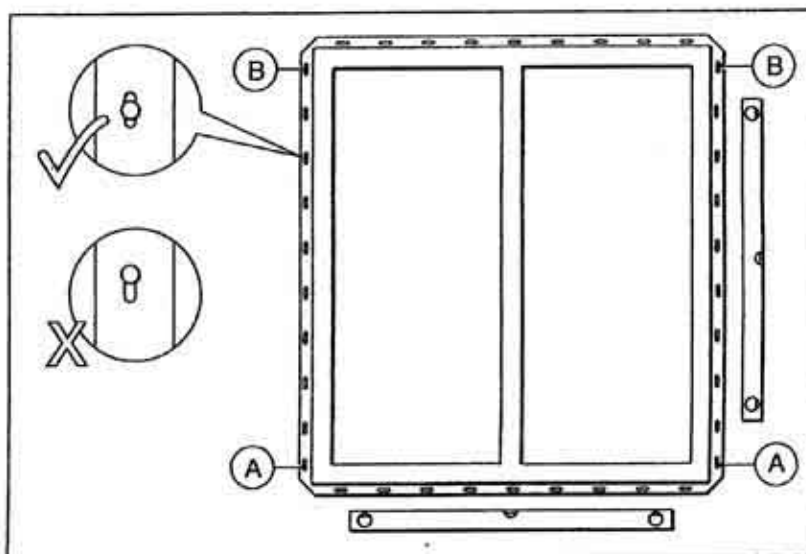


Figure 5-14. Where to fasten the flanges — exterior view

## 5. Install the sash(es)

- 5.1 On the sash, move both stay arms to the open position. Make sure that you fully extend each stay arm.
- 5.2 On the frame, make sure that there is no dirt or sand in the bottom track.
- 5.3 On the sash, make sure that there is no dirt or sand in any moving parts of the glide runner assembly. Make sure that the SA-FE-Handle is horizontal in the Glide position.
- 5.4 With the help of an assistant, lift the sash. Tilt the top of the sash towards you just enough to put the wheels in position on the track, but not so much that you cause damage to the aluminum glide-runner hardware cover.
- 5.5 Tilt the sash to the vertical position. Move it slightly to the left and to the right to make sure that the wheels roll smoothly in the bottom track.



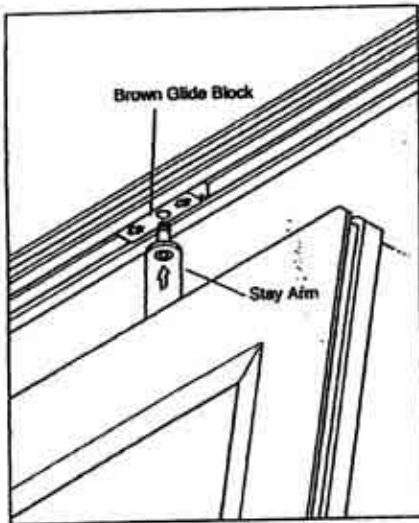


Figure 5-15. Installing the Stay Arm

- 5.6 Move the sash in front of the door opening.
- 5.7 Locate the 2 glide blocks so that they are opposite each stay arm.
- 5.8 Locate the pin on each stay inline with the opening on each glide block. Press upwards with your thumb on the underside of the stay arm and snap the pin into the glide block. See fig. 5-15.
- 5.9 Repeat with the other stay arm.
- 5.10 Close the sash. Rotate the SA-FE-Handle downward to the lock position. This secures the sash.

## 6. Operate The Sash(es)

SA-FE squares the sashes and aligns them with the hardware at the factory. Operating problems occur when the frame is not installed level and square, or when the frame or sash members are not straight because of handling.

- 6.1 Open and close the sash several times, in both the Tilt and Glide positions. If the sash does not open and close freely, but binds or strikes the frame at one or more points, then you may not have a level or square frame. To correct the problem, do the steps that follow:
- 6.2 If the sash hardware binds at one of the top corners (See fig. 5-16 Item A), then the frame may not be plumb, or it may be out of square. Use a spirit level and make sure that the mullions and jambs are plumb and square. If the frame is not plumb or square, adjust the thickness of the jamb shims to make it plumb and square.
- 6.3 If the sash hardware binds at the midpoint on either side (See fig. 5-16 Item B), either the sash or the mullion became bowed during handling or installation, or the frame is not straight. Use a straight edge and make sure that the sash and the mullion are not bowed and that the frame is straight. If either the sash or the mullion are bowed, or the frame is not straight, straighten them as shown in fig. 5-13.
- 6.4 If you cannot correct the binding problems with these methods, adjust the operating hardware. See following pages.

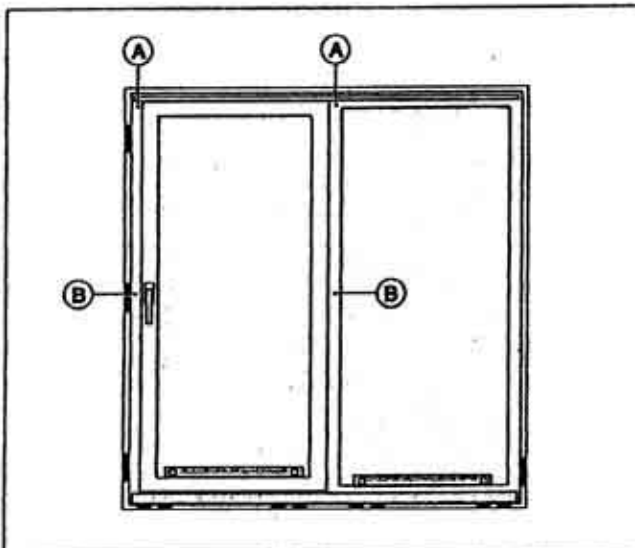


Figure 5-16. Where sashes sometimes bind

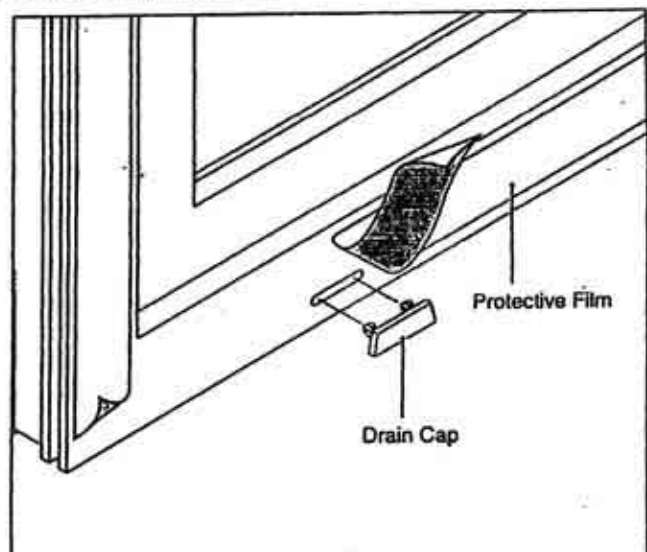


Figure 5-17. How to remove the protective film and install the drain caps — exterior view

## How To Adjust Tilt And Glide Doors

With SA-FE's unique Tilt & Glide hardware system you can adjust window or door sashes to compensate for the effects of settling, heavy use, and for wear of the hardware components and the sealing gaskets. These adjustments allow you to maintain the performance of your windows and doors much longer than conventional hardware systems allow.

### Sash Binding Problems?

The sash may bind against the fixed frame at one or more points after the building settles, or because of heavy use. You can increase the clearance between the frame and the sash with Adjustment 1: Gliding Shoe Height.

### Closing Tightness Problems?

The sash may close less tightly after many years of use. These adjustments make the sash close more tightly or less tightly. To reduce air leakage around the sash, make the sash close more tightly. To make the SA-FE -Handle easier to operate, make the sash close less tightly.

You can increase or decrease the closing tightness with Adjustment 2: Locking Cam Closing Tightness.

### How To Correct Sash Binding Problems

There are two gliding shoes on a sliding sash. This adjustment raises or lowers the side of the sash nearest to the gliding shoe. When you raise or lower the sash on only one side, you make the sash tilt. When you raise or lower the sash differently on each side, you also make the sash tilt.

If the bottom of the sash binds against the frame (see Figure, Item C), use this adjustment on both shoes to lift the bottom of the sash. If the top of the sash binds against the frame (see Figure, Item A), use this adjustment on both shoes to lower the sash. To move the sash straight up or straight down, adjust both shoes by the same amount.

### Adjustment 1: Gliding Shoe Height

Maximum Adjustment: Raises the sash 3 mm. Lowers the sash 3 mm.

This procedure shows you how to adjust the sash height on one gliding shoe. If you want to move the sash straight up or straight down, adjust the sash height on both gliding shoes by the same amount. If you want to tilt the sash to correct binding problems on the sides of the sash, you may only need to raise or lower the sash on one gliding shoe. You may also need to raise the sash height on one gliding shoe, and lower it on the other.

Remove both end caps from the hardware cover (see fig. 5-18).

Remove the hardware cover. Press down on the top of the cover with one hand, and gently pull the bottom of the cover away from the sash, until it "clicks". Do not use force, or you will damage the cover (see fig. 5-19). Now lift the cover straight up (see fig. 5-20).

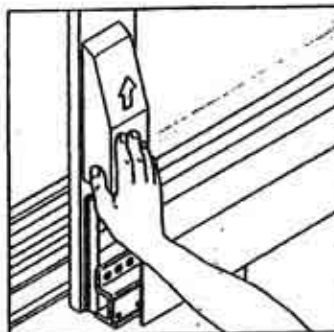


Figure 5-18. End Cap Removal

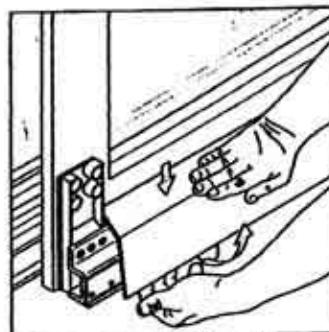


Figure 5-19. Hardware Cover Removal

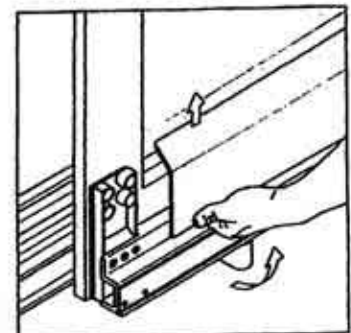


Figure 5-20. Hardware Cover Removal

Insert the 8 mm allen key into the top of the adjusting screw. Turn the screw in a clockwise direction to raise the sash. Turn the screw in a counter-clockwise direction to lower the sash (see fig. 5-22).

Turn the allen screw  $\frac{1}{4}$  turn at first, then operate the sash to see if you have corrected the problem. Repeat if necessary: turn the screw approximately  $\frac{1}{4}$  turn each time, until the sash stops binding.

Use the 4 mm wrench to tighten the lock nut on the side of the gliding shoe (see fig. 5-21).

Replace the hardware cover. First, hang the top of the cover on the gliding shoes. Then press downwards on the face of the cover until it clicks in place (see fig. 5-23).

Replace the end caps (see fig. 5-23).

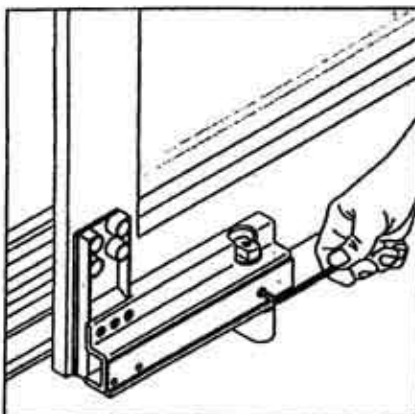


Figure 5-21. Use 4 mm Allen Key

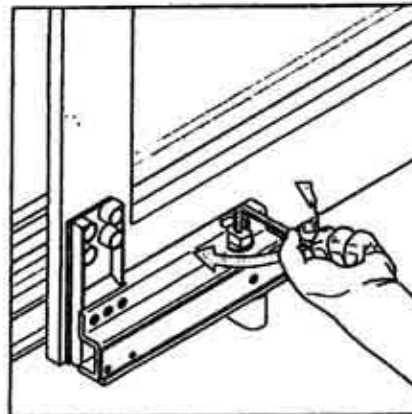


Figure 5-22. Use 8 mm Allen Key

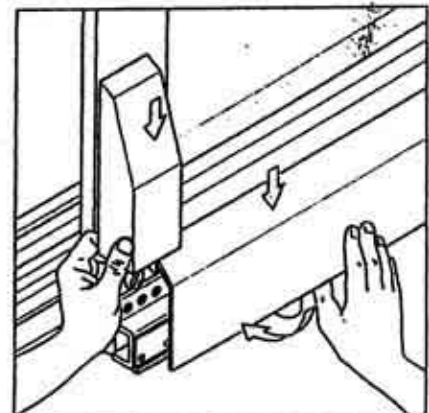


Figure 5-23. Replace Covers

### How To Correct Closing Tightness Problems

Use this adjustment to reduce air leakage around the sash, or to make the SA-FE-Handle easier to operate.

If you have air leakage at any point around the sash, increase the closing tightness of the nearest locking cam(s) using Adjustment 2. Do not increase the closing tightness any more than you need in order to control the immediate problem, or the SA-FE-Handle will become difficult to operate.

If the SA-FE-Handle is difficult to operate, use Adjustment 2 to decrease the closing tightness of the locking cams.

#### Adjustment 2: Locking Cam Closing Tightness

**Maximum Adjustment:** Moves the sash 0.8 mm towards the frame. Moves the sash 0.8 mm away from the frame.

With the SA-FE-Handle in the Glide position, open the sash. Notice the cylindrical locking cams along the top and along both sides of the open sash.

Notice that each cam has an index groove stamped into its head. The index groove shows the current position. Refer to the position of the index groove before you adjust a cam.

With the sash open in the glide position, adjust the closing tightness of a locking cam as follows:

Insert the 4 mm allen key into the cam.

To increase the closing tightness, turn the fat side of the cam towards the gasket. To decrease the closing tightness, turn the fat side of the cam away from the gasket.

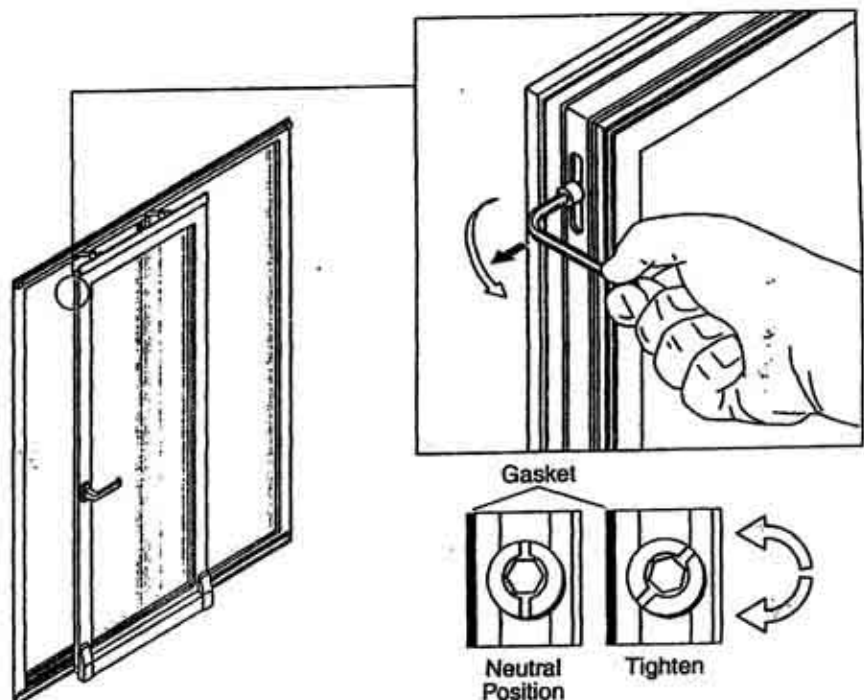


Figure 5-24.