

HOW TO...

Window Hardware

Uses:

There is a wide variety of window styles on the market and all require some type of hardware to function. Most of these hardware components wear out over time and require repair and replacement. It is important that all windows function properly in case an emergency escape event occurs such as a fire or natural disaster.

Materials:

Given the variety of components nearly every common material can be found in these devices. Steel, diecast zinc, plastic, and vinyl are all common elements.

Selection:

Determine the type of window you have and estimate the age of the unit. Hung windows (those that go up and down) have been around since the 1800's. Older systems use lead or iron weights in hollow pockets behind the jamb. Newer styles made in the 1960's use a channel or spiral balance installed in the jamb. Channel and spiral balances are complicated devices that can require a window repair specialist or glass professional. These windows also have sash locks and tilt latches that can be repaired by the homeowner. Look at latch style, hole spacing, and hole baskets.

Casement windows are also popular in many areas of the country. Older systems use a steel frame. Operators and locks can be replaced easily on these. Arm length and hole spacing are needed to select the right operator. Newer style casements made of wood, fiberglass or vinyl use a newer system. These operators and locks can also be replaced easily but may require removal of some interior molding strips or operator covers. Crank handles can be replaced with original style, folding style or T-style cranks. Spline diameter is the critical issue here. 9/32" (Peachtree), 5/16" (steel frame), 11/32" (Truth), 3/8" (steel frame and Andersen) and 7/16" (Marvin) are all used today.

Horizontal sliding windows are common in many areas of the country. These have rollers, guides and locks that can be replaced. Rollers are important because if the old units are broken the window can drop onto the track causing damage and air loss. Compare the dimensions of your old units to the cataloged items; wheel diameter and housing height and width are critical. Latches also need to match in whole pattern and latch tongue length.

Jalousie and Awning windows are common in coastal areas, islands and in many large cities. These use an operator mounted in one corner. Compare the mounting whole spacing and link design to be sure you have selected the right unit.

Expected Lifetime:

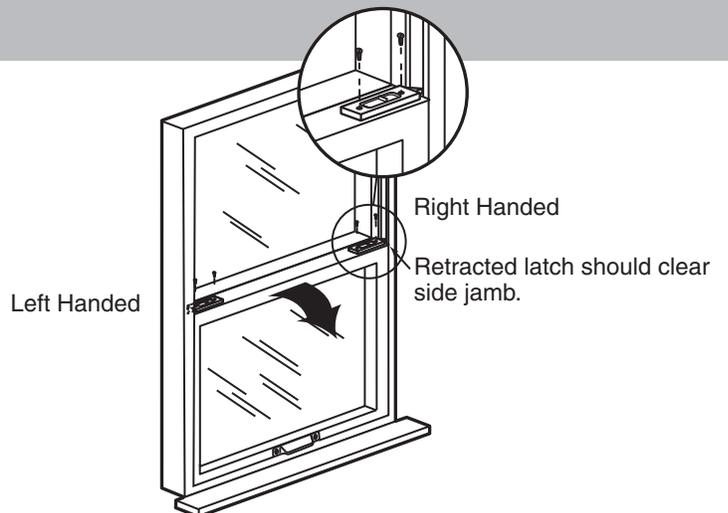
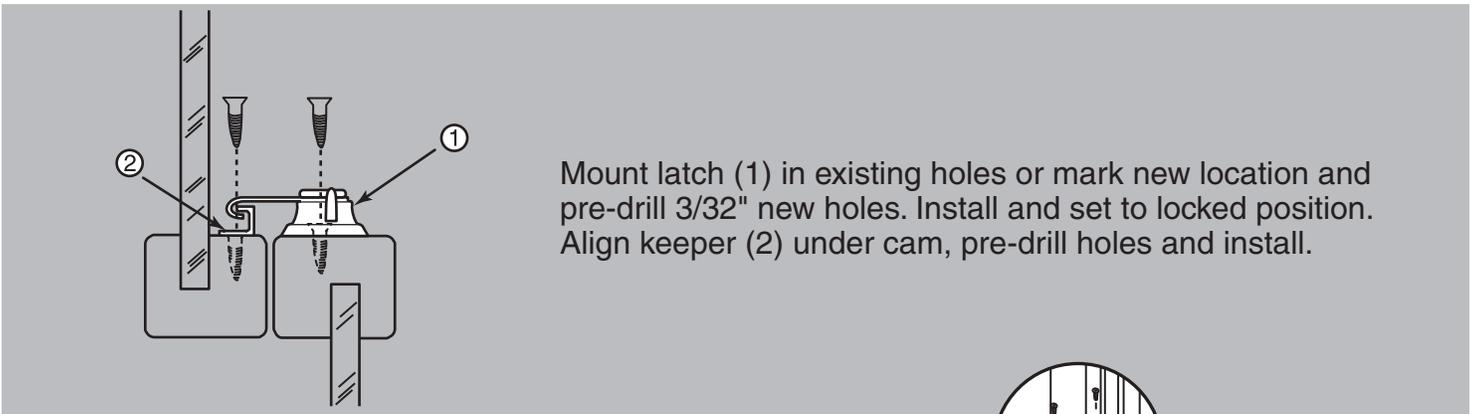
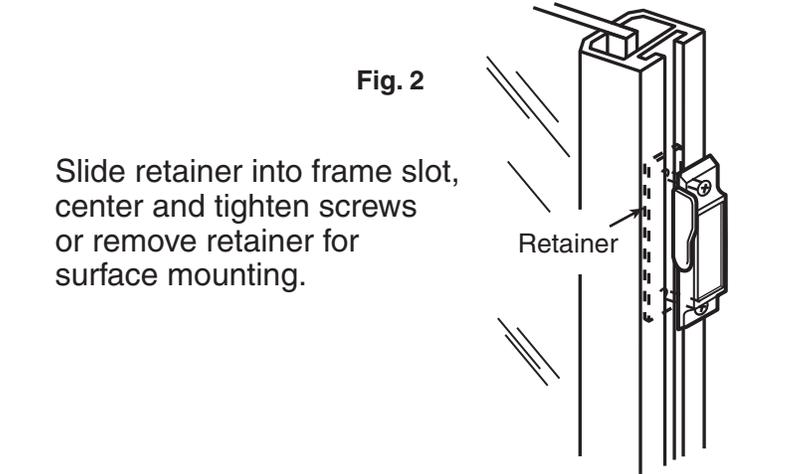
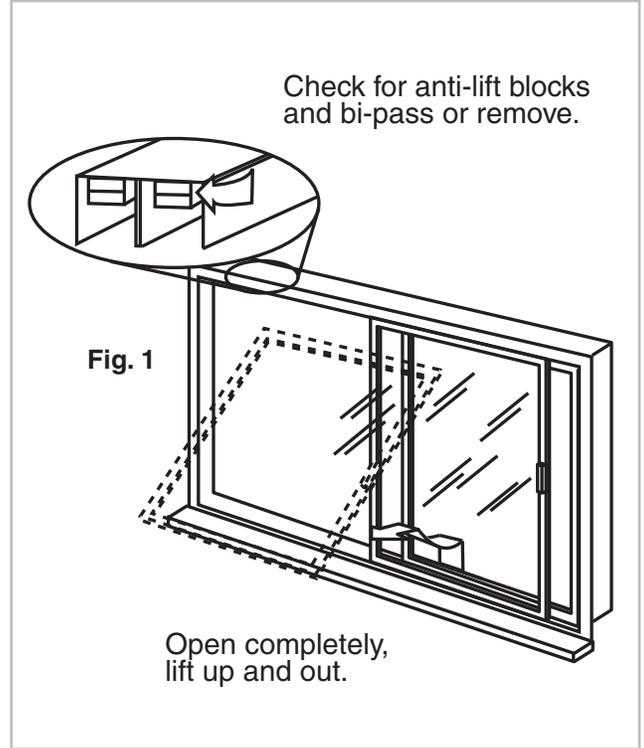
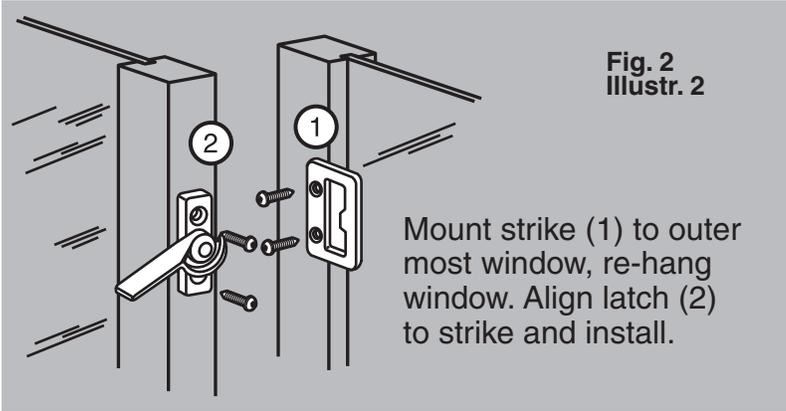
Window hardware life can vary widely. Generally if the item is properly installed, lubricated annually and cleaned, it will last for many years.

Care and Maintenance:

Latches should be lubricated every season. Avoid using a degreaser or solvent-based lubricant as it can damage the plastic components. Use a good quality dry film lubricant. Operators should be lubricated with a spray grease or white grease on the gears. Do not use solvent-based lubricants. Balances can be lubricated as well as the tracks they ride in with a dry film lubricant.

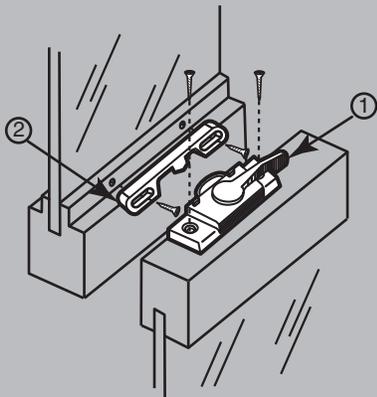
HOW TO...

Sliding Window Hardware

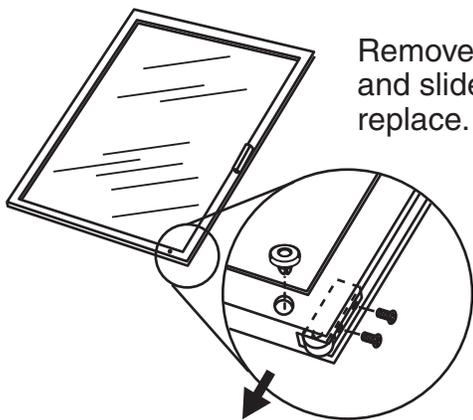


HOW TO...

Sliding Window Hardware



Mount latch (1) in existing holes or mark new location and pre-drill 3/32" new holes. Install and set to locked position. Align keeper (2) under cam, pre-drill holes and install.



Remove screws and slide out to replace.

Fig. 2

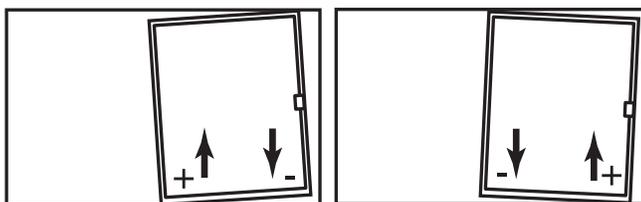
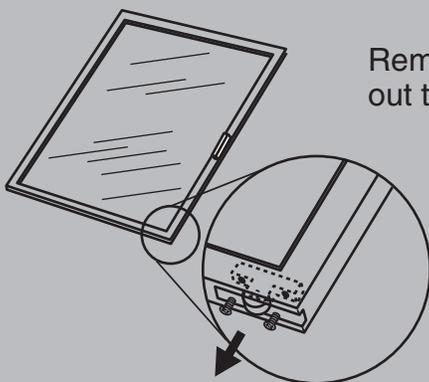
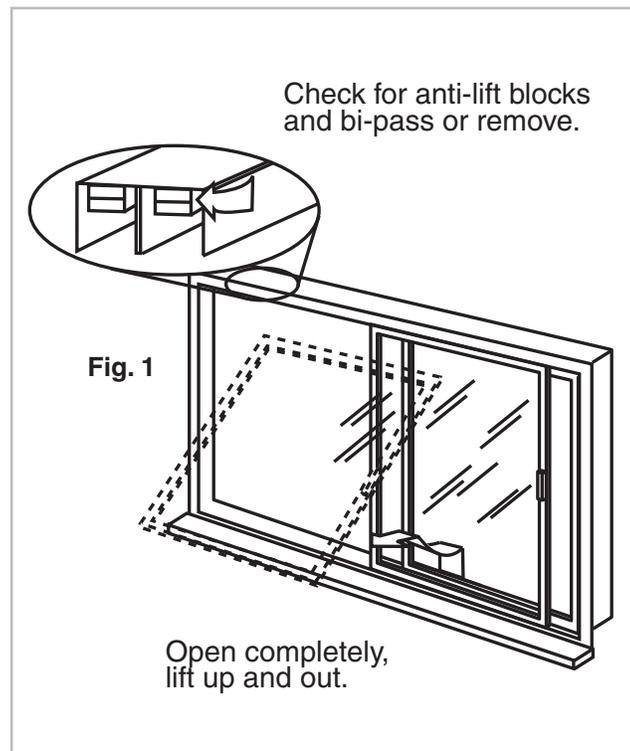


Fig. 3



Remove screws and slide out to replace.

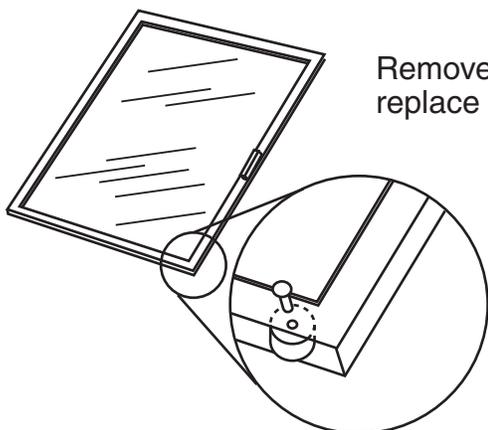
Fig. 2



Check for anti-lift blocks and bi-pass or remove.

Fig. 1

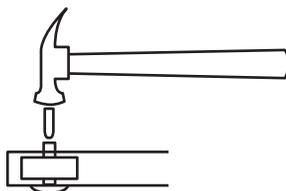
Open completely, lift up and out.



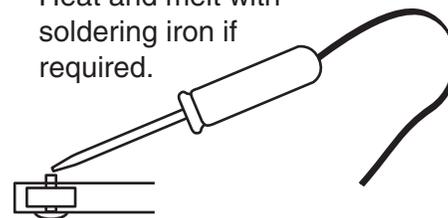
Remove axle and replace wheel.

Fig. 2

IF METAL
Set rivet carefully.



IF NYLON
Heat and melt with soldering iron if required.



HOW TO...

Casement Window Hardware

Selecting the correct operator:

Determine length of arm by measuring from center of guide button at end of arm to center of pivot point rivet. Left or right hand operation is determined by viewing the window from inside.

Installation Instructions:

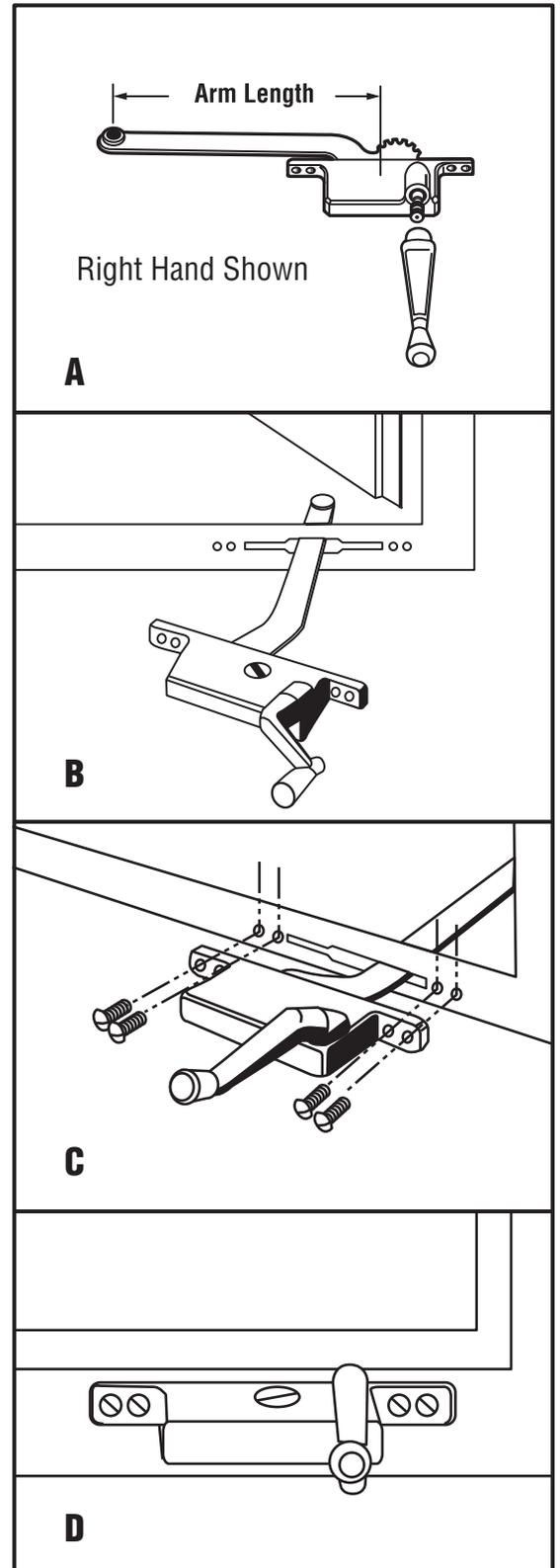
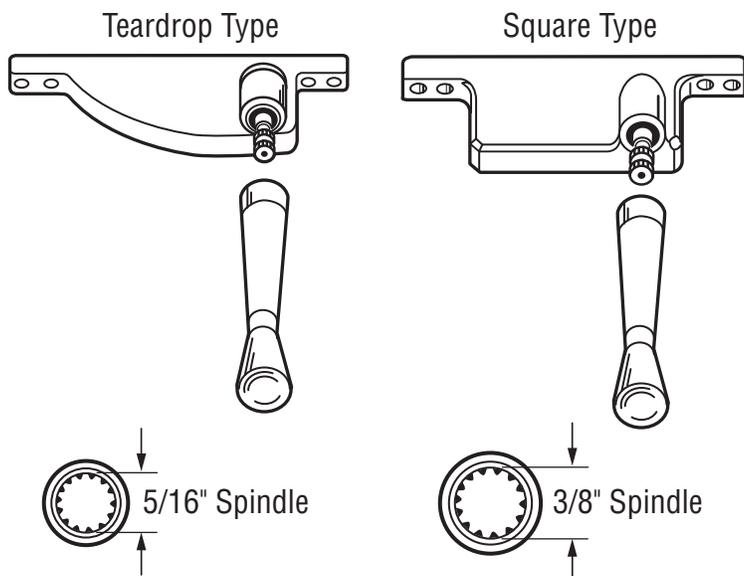
Step 1 - Open window to full open position. Remove old operator.

Step 2 - Attach crank handle to new operator (do not tighten set screw) and rotate handle until operating arm is in position shown. (Fig. B)

Step 3 - Slide arm through slot in window frame and insert guide button, at end of arm, in track channel at bottom of window. (Fig. B)

Step 4 - Attach screws in holes indicated in the illustration. (Fig. C)

Step 5 - Rotate handle until window is closed. Remove crank handle and replace it in position shown in illustration. Tighten set screw. (Fig. D)



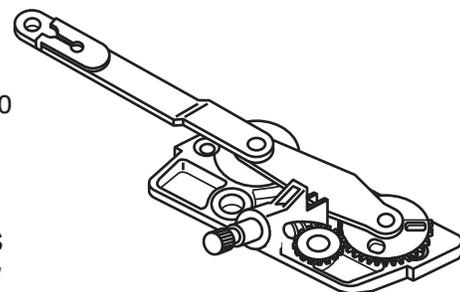
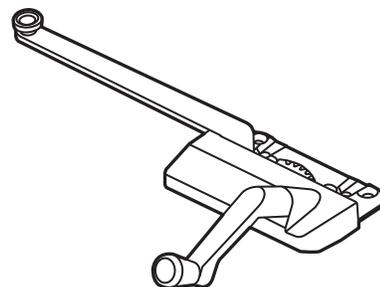
HOW TO...

Truth Casement Window Hardware

Surface Mount

TO REPLACE OPERATOR:

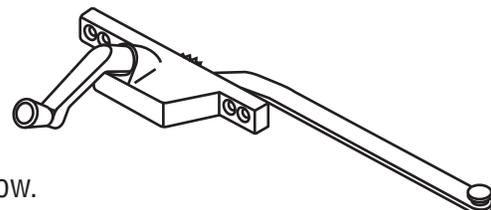
1. Open window fully and examine operator track. Locate cutout or exit notch in track and position window so that round guide roller on operator arm can be removed through this opening. (For dual arm or dyad operators, slide the retainer clip back on the short drag link and disengage arm from stud).
2. Loosen set screw on crank handle and carefully pull handle from operator spindle. (If your operator has a removable cover, this will slide off easily after the crank handle has been removed).
3. Most wood windows have a wood sill cap which covers the operator mechanism and mounting screws. This will have to be removed. Tip: If sill cover and sill have several coats of paint, it may be helpful to cut a score line (using a razor knife) in the joint line between the cover and sill to prevent uneven cracking and chipping of paint. Using a wide thin pry bar, carefully insert underneath cover, place a thin piece of wood on sill under pry bar to prevent damaging sill. Slowly pry cover off sill in 3 or 4 locations, to prevent splitting cover. Prying from the back (outer) side of cover further reduces the chance of visible damage.
4. Remove screws from old operator and install new operator.
5. Prior to installing sill cover, you may wish to attach operator and guide arms to track and check window for smooth operation. Remember: Your new operator will work only as well as your hinges will allow. The best time to check the hinges for operation is with the operator disconnected from the sash. Moving the sash by hand will help with determining the problem area. If window binds or the hinges do not pivot easily, they should be replaced. Also, check window and jamb for excess paint build-up.
6. Re-attach operator trim cover and crank handle.



TO REPLACE OPERATOR:

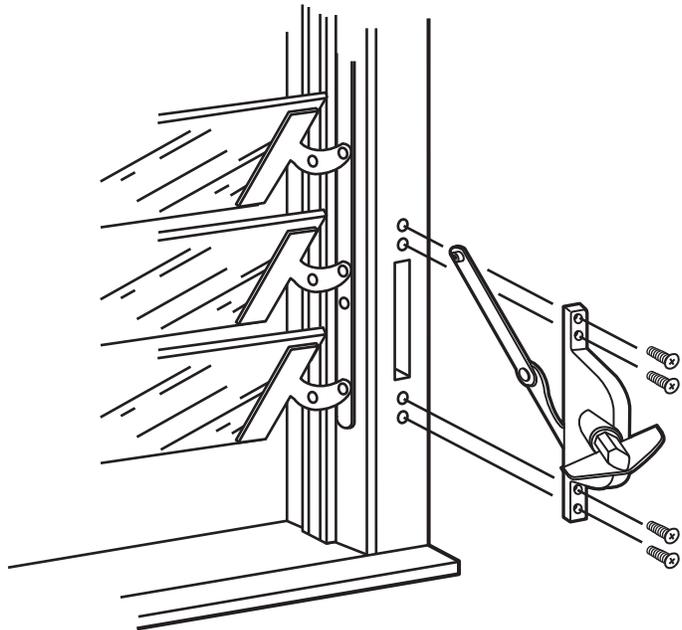
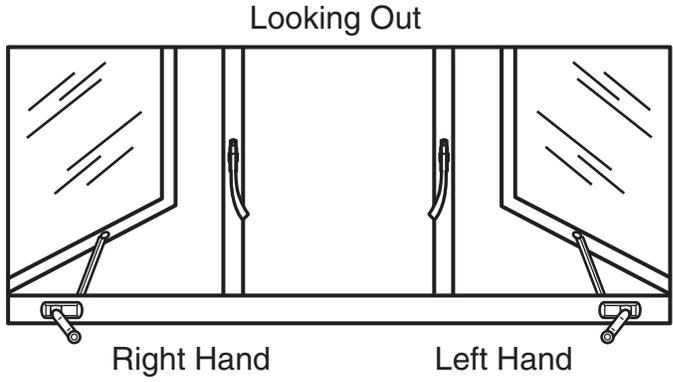
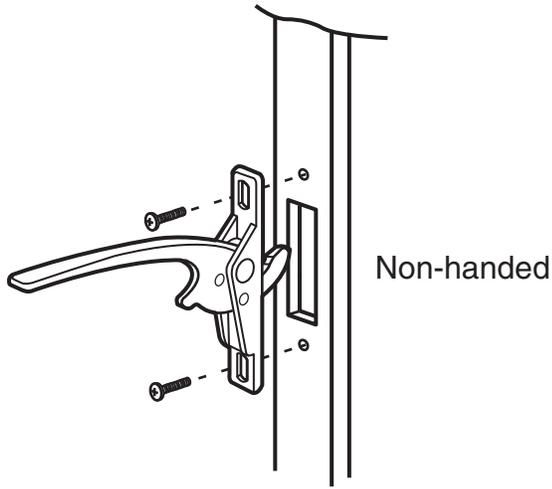
1. Open window fully and examine operator track. Remove mounting screws from each end of track. Then slip track off of guide button on end of operator arm.
2. Loosen set screw on crank handle and carefully pull handle from operator spindle.
3. Remove screws from old operator and install new operator.
4. Prior to installing operator track, check window for smooth operation. Remember: Your new operator will work only as well as your hinges will allow. The best time to check the hinges for operation is with the operator disconnected from the sash. Moving the sash by hand will help with determining the problem area. If window binds or the hinges do not pivot easily, they should be replaced. Also, check window and jamb for excess paint build-up.
5. Re-attach operator crank handle.
6. Re-install operator track onto guide button on operator arm, and re-attach the track to the sash with original pan head screws. Be careful to use the correct screw length, since glass damage can occur if screws are too long.

Face Mount



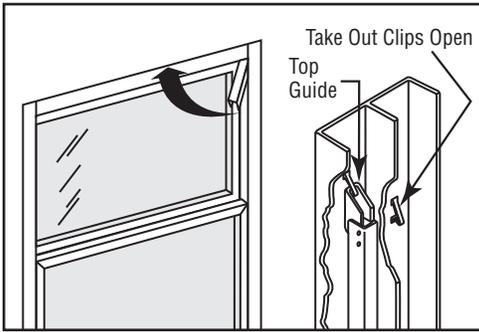
HOW TO...

Casement Window Hardware

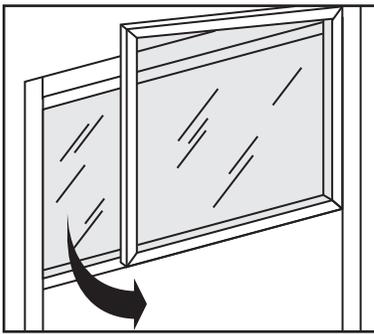


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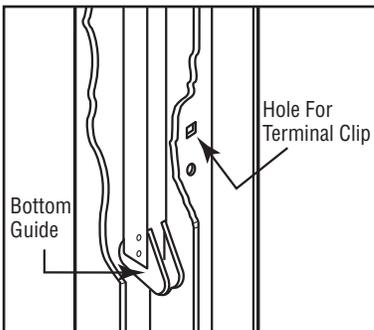
Channel Window Balances



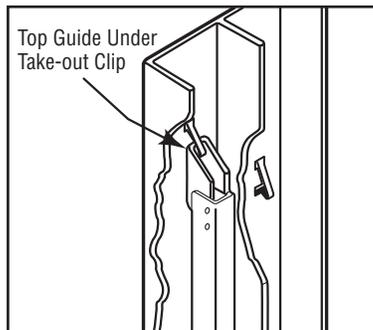
Remove the sash stops. Close sash to expose take-out clips. Open both clips for sash removal. Raise sash until top guide engages take-out clip. Continue to raise sash, 2 to 3 inches more.



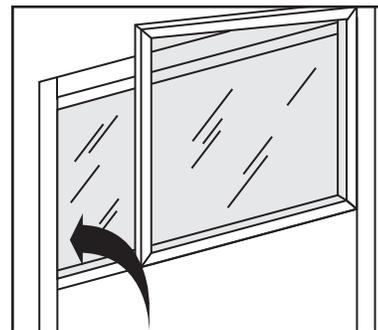
Move sash right or left as far as possible. Removal is then accomplished by swinging the opposite side of sash inward.



Make sure that the "take-out clip" is rotated away from the jamb. Hook the terminal clip into the square hole in the jamb.

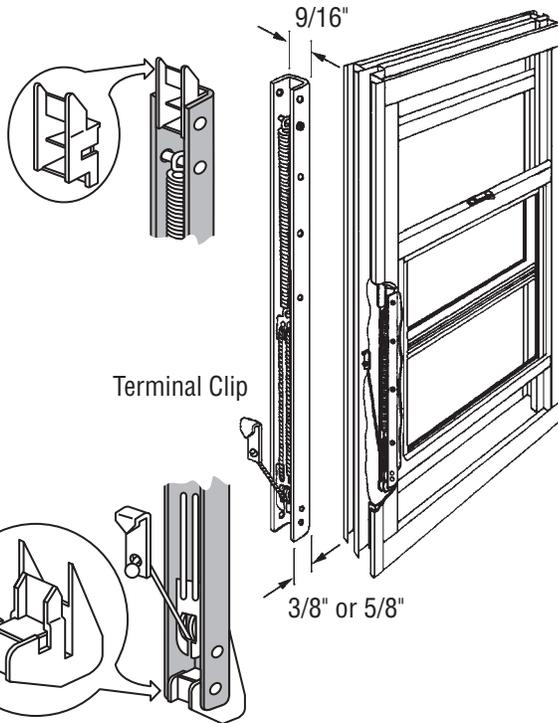


Insert balance into channel, allowing it to connect under the take-out clip.

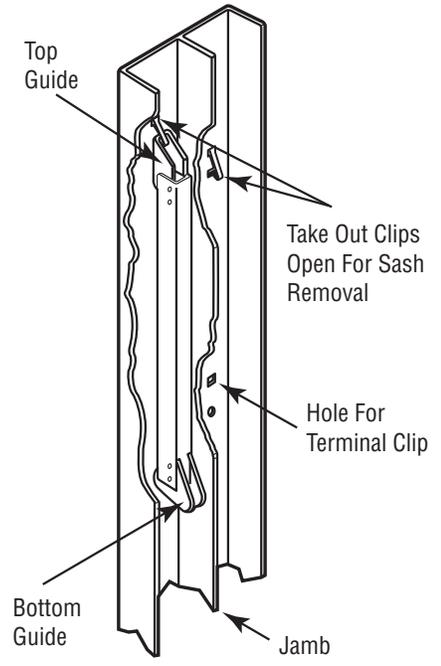


Position right or left side of sash into jamb, 2 to 3 inches above take-out clip and swing opposite side into alignment with frame. Lower sash to engage balances and on down to clear take-out clips. This will automatically center the sash. Snap take-out clips into jamb to facilitate normal operation.

Used On Single Or Double Hung Sash



Balance Shown Installed In Jamb With Sash Removed



Channel Balances:

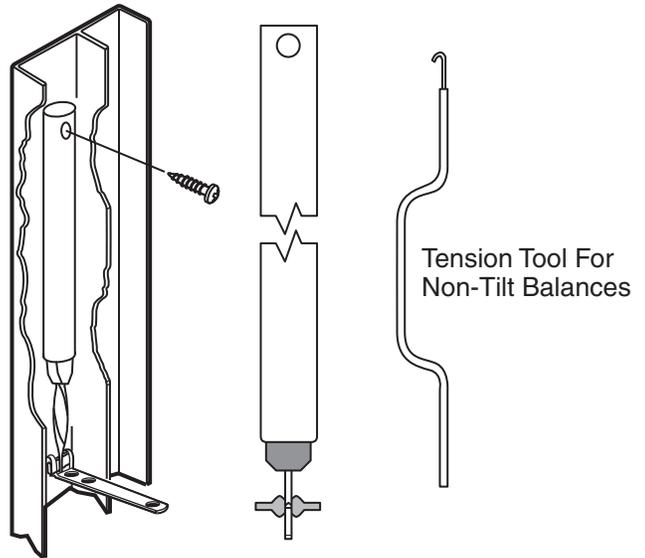
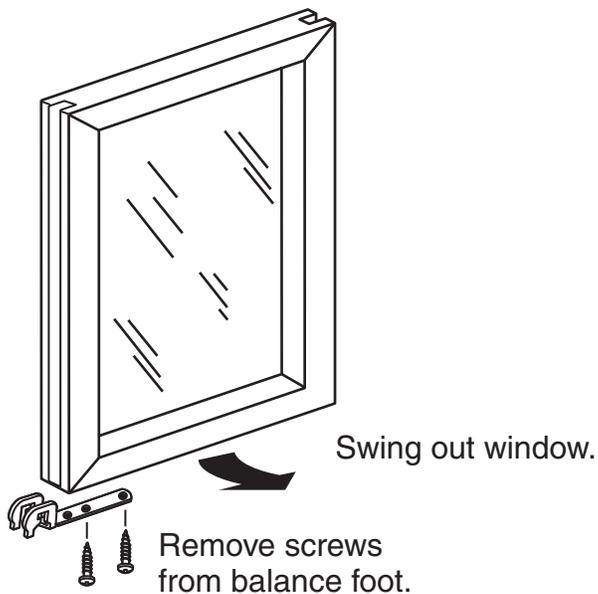
Channel balances, sometimes referred to as "block and tackle" balances because they contain cord and pulleys, are square in shape. In addition to the cord and pulleys, they have a long spring, which can be seen from the open side of the "U" frame. The depth of the balance may be either 3/8" or 5/8" (considered 1/2" in the trade). Riveted through the "U" frame, on both ends are nylon end pieces, which serve as guides.

To remove the balance, the first step is to remove the sash stop. The sash stop is located at the top of both jambs. It is the part that the sash contacts so that the sash cannot be raised any higher. The sash stops are usually pressed into the jambs and they can be pried out. Unlatch the sash and raise it to the uppermost position. The balance will disengage from the sash. Push one side into the jamb and rotate the other side towards you. The sash can now be carefully set aside.

Near the top of the jamb there is a retainer, which is called a "take-out clip". Take hold of the top of the balance carefully and pull it down to clear the bottom of the clip. Then tilt the balance towards the center of the window and allow the spring to relax. Now the cord terminal can be disconnected.

Look for a four (4) digit number stamped into the balance housing. The number may be something like 2820, 2830 or 2840. The first two digits represent the length of the metal portion of the housing minus 1". The last two digits represent the weight of the window for which the balance was designed and therefore takes into consideration the tension in the spring when the balance was manufactured.

The new balance can now be installed. Make sure that the "take-out clip" is rotated away from the jamb. Hook the terminal clip into the square hole in the jamb. Pull down on the balance while inserting it into the channel and allowing it to connect under the take-out clip. Do the same for the opposite side.

HOW TO...**Spiral Balances (Non-Tilt)****Non-Tilt Spiral Balances:**

Most spiral balances have a colored nylon bushing (the color designates the weight of the sash for which the balance was designed) with a slot through which a spiral rod extends. Near the end of the spiral rod there may be a cross pin or a clip, depending on the system design. At the end of the spiral rod there is a small hole for attaching the winding or tensioning tool. The diameter of the balance may be either 3/8" or 9/16" (considered 5/8" in the trade).

Never remove the screw at the top of the balance. Always remove the tension on a balance from the bottom with a tensioning tool and don't release the tensioning tool from the rod until you are positive that all the tension is gone.

The internal portion of the balance is factory lubricated when new. To lengthen the life of the balances lubricate the spiral rod once a year.

When a sash does not hold its position and drifts down a few inches from where you originally set it, the balances need to be retensioned. This can happen due to variations in temperature. When a balance does need to be replaced, the important specifications are the diameter and length of the tube, the length of the rod, the color of the bearing and whether a cross pin or clip is required. If the tension and adjustment applied when installing a balance is performed properly, the color of the bearing is not really critical. If your window system needs a balance, you should replace both of them at the same time.

Single Cross-Pin Balance

To remove the sash, the sash should be held or propped up in the uppermost position. Using a stick, cut to the proper length, can be used to support the sash. On many window systems with bottom mounted sash brackets, one of the brackets must be removed after the cross-pin has been disconnected from the bracket before the sash can be rotated out of the jamb. Some sashes cannot be rotated out of the jamb until after one of the balances has been removed.

On some windows needing repair, the spiral rod may already be hanging inside the jamb. Hook the point of the tensioning tool into the small hole at the end of the spiral rod. Pull the rod down with the tool about one inch. Slowly allow the spiral rod to unwind. This will release the tension and allow the rod to drop to the sill when the tool is disconnected. Repeat the procedure on the opposite side.

Remove the stick while holding the sash and lower it to the closed position. Remove the screw that fastens the balance to the jamb. Lift the balance out. If the balance accidentally drops below the top of the sash, use the hook on the end of the tensioning tool to retrieve the balance and lift it up. You should now be able to lift the sash a few inches and rotate it towards you. If you are having a problem, push the sash into the area vacated by the balance and rotate the other side of the sash. Remove the screw that holds the other balance to the jamb.

When installing new balances, make sure that the sash brackets are in good condition and replace them if necessary. If the sash has side mounted sash brackets, both of them can be installed prior to holding the sash in place. If the sash has bottom mounted sash brackets, the second bracket can only be installed if someone is holding the sash in place for you or if you have the sash propped up with a stick. Then hold the sash, remove the stick, and lower the sash to the sill.

The next step is to pull the complete length of the spiral rod out from the tube. Feed the spiral rod down the side of the sash. Next, screw the top of the balance along with any sash stops or dust covers to the jamb.

It might be easier to prop the sash up as far as it will go and mount both bottom sash brackets now. With both brackets mounted, the spiral rod can easily be positioned between the prongs of the bracket.

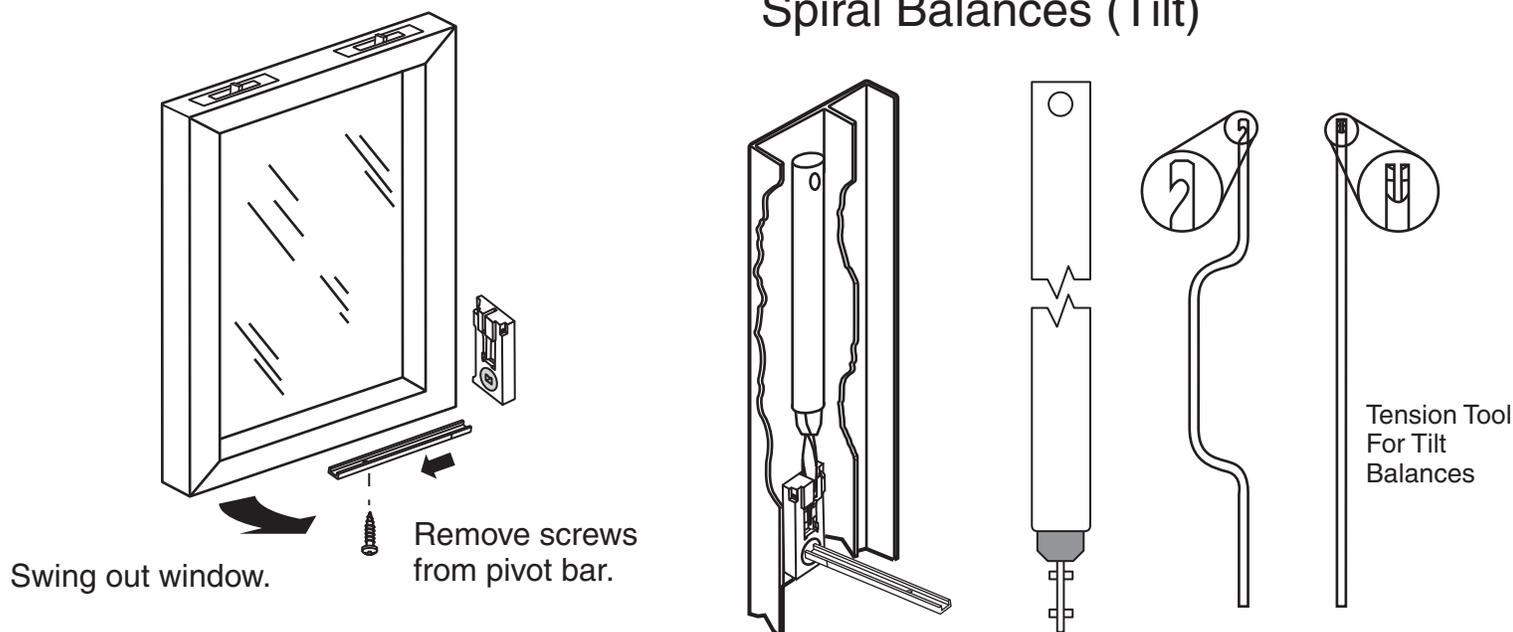
With the sash propped up and with both brackets mounted, hook the tensioning tool into the hole at the bottom of the rod. Then rotate the tool six complete turns. Allow the rod to retract so that the cross-pin seats into the prongs of the bracket securely. Repeat the procedure for the other side of the sash.

Now remove the stick and check the operation. If the sash does not stay in the raised position, mount the face guides and check the operation of the sash again. If the sash still does not stay in the raised position, replace the stick, unhook the rod and add a couple of more turns. Do this to both sides. When the sash does not stay in the down position or in a partial ventilating position, prop the sash up, unhook the rod and decrease the tension on both sides.

In summary, wear eye protection when tensioning balances. Always tension balances with the sash in the uppermost position. Make sure the window sash is secure when tensioning balances. Be sure that you have seated the cross-pin properly in the prongs of the carrier before unhooking the tension tool.

Broken cross-pins can not be replaced as they are no longer available as an individual item.

There is another window system in use that has side mounted sash brackets and uses the cross-pin balances. This system is tight fitting and there is nothing that can be removed which would allow some play so that the sash could be pivoted out. In order to replace a sash bracket or balance on this system, it is necessary to bend the jamb metal with pliers and pry the sash out. After the parts have been replaced, the sash positioned and the balance retensioned, one can attempt to bend the metal back to its original position using a block of wood and a mallet.

HOW TO...**Spiral Balances (Tilt)****Tilt Spiral Balances:**

The tilt tube balance is similar to the cross-pin balance or clip balance except that there are two (2) small barrel pins near the end of the spiral rod instead of the cross-pin or the clip. A twin hook style tensioning tool is used for the tilt balance. The upper barrel pin is pulled up and locked to the top of the pivot lock shoe by means of a slot and the tension in the balance. The pivot lock shoe slides in a jamb channel and has a cam which will lock the shoe in the channel when the sash is tilted. A pivot bar is attached to the sash bottom. This bar fits into the rotating bushing of the pivot lock shoe.

Unlatch the sash and raise the window twelve to eighteen inches. Release the top latches and tilt the sash towards the inside to a horizontal position. The cams in the pivot lock shoes will be locked in the channel. Slowly raise one side of the sash two or three inches. Since the cam is locked, some force will be required to raise the side of the sash. When the sash is raised the pivot bar will disengage and the sash can be removed. Set the sash aside.

An alternative method is to have someone hold the sash or to prop it up with a stick of suitable length. Then loosen each of the screws that hold the pivot bars and slide the pivot bars towards the center of the sash. This will disengage the pivot bars from the pivot lock shoe bushing. Release the top latches, lift the sash and set it aside.

On the pivot lock shoes used with 5/8" diameter tubes, check if there is either a square or rectangular plug (also called a "T" lock). This item acts as a retainer to keep the spiral rod from rotating out of the slot due to the torque or tension in the balance. Remove the plugs. The 3/8" diameter tube does not use the plugs or screws. Now hook the tensioning tool to the lower barrel pin. Pull the spiral rod out of the slot and down so that it is free from the pivot lock shoe. Allow the rod to slowly unwind. Disconnect the tool from the spiral rod.

Remove the screw(s) and stop at the top of the balance. Next, rotate the bushing on the pivot lock shoe with a screwdriver to unlock the cam so that the pivot lock shoe can be raised to the top of the channel. Look for broken pieces of nylon at the bottom of the channel and remove them. Broken or worn shoes should be replaced.

Install the new balance. Slide the pivot lock shoe down the channel and lock it in a convenient position with a screwdriver. Set the cam keyway perpendicular to the window. Next, attach the top of the balance along with any stops or dust covers to the top of the jamb. Do the same to the opposite side except that one shoe should be 3" higher or lower than the other shoe.

The next step is to wind the spiral rod about six turns with the tensioning tool and hook it onto the pivot lock shoe. On 5/8" diameter tubes, the pivot lock shoes have two angled slots and it is important to choose the correct slot. On the right side jamb use the slot that is nearest to the inside. On the left side jamb, use the slot that is towards the outside. If disconnecting the tension tool is a problem because of a screen, remove the screen and then tension the balance. After the tool is disconnected, replace the "T" lock so that the rod does not pop out of the slot.

Now the sash can be replaced. Replace the sash using the same method that was used to remove it except that a helper is recommended even though it might have been removed by one person. If the sash is held at an angle, it will be very difficult to align the sash (pivot bar). Hold the window in a horizontal position. Raise or lower the side of the sash to match the positions of the pivot lock shoes. Insert one of the pivot bars into the bushing. Now move that side as required to make the other pivot bar fit into the other bushing. If the sash is level it can be tilted into its normal position and locked. If the alternative method was used, slide the pivot bars into the bushings and lock them in place with the fastening screw. Test the sash for proper operation.