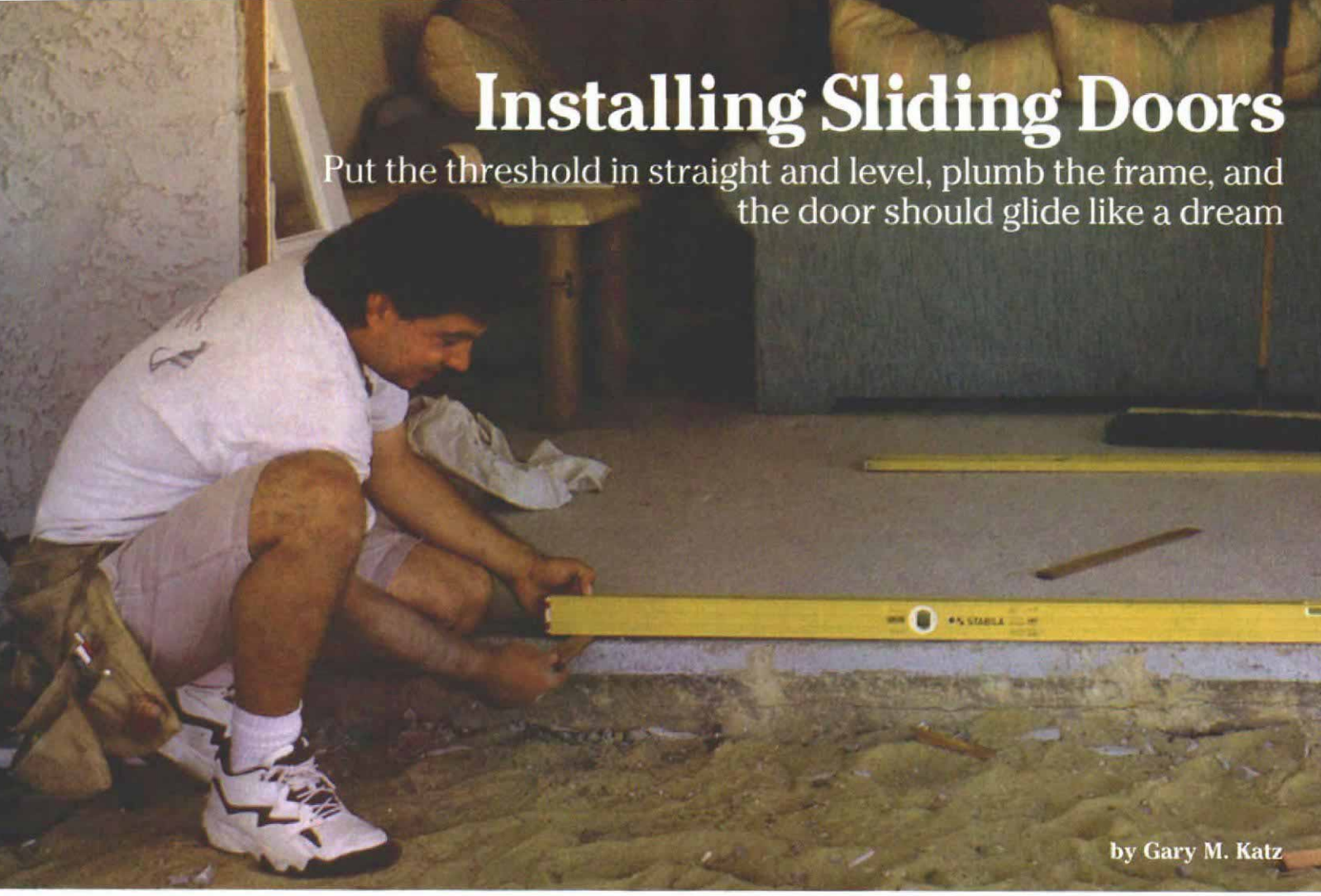


Installing Sliding Doors

Put the threshold in straight and level, plumb the frame, and the door should glide like a dream

by Gary M. Katz

I recently got a call from a homeowner who wanted me to come out and adjust a sliding door that wasn't working right. It sounded like a small job, so I figured that my toolbox and cordless drill were all the tools I'd need. I was wrong.

Right away, I had trouble unlocking the sliding door. The homeowner explained that the only way she could get the door to latch was by slamming it as hard as she could against the jamb. With the unlocked door close to the jamb, I could see part of the problem. The door was touching the jamb at the top but was more than ¼ in. away from the jamb at the bottom. I said to myself, Hey, this'll be a snap. I'll just raise the front wheel on the door, and the lady will think I'm a genius.

But when I slid the door back to get at the wheel-adjustment screw, the back of the door was rubbing so badly on the head jamb that the slider would open only halfway. I said to myself, Hey, this'll be a snap. I'll just lower the back wheel, and the lady will think I'm a genius. But the rear wheels were already set as low as they could go. That's when I noticed that the head jamb was pushed way up in the center.

Then I got down on my hands and knees, sighted down the sill and saw the real problem. The oak sill looked like a foothill in the San Gabriel Mountains. An improperly set sill is a classic, common mistake made while installing prefit sliding-door units. By following just a few a simple steps, you'll be able to avoid that mistake, and a few others, too.

Make sure the door is going to fit—I admit it: I've been embarrassed by removing an old door before realizing that the new unit wasn't going to fit. So now I always measure the opening, or on a remodel, I measure what will become the opening before the door is ordered.

I like to have the rough opening about ½ in. larger in width and height, though some slider manufacturers call for rough openings a little bigger, in some cases 1 in. wider and taller than the unit dimensions. Sometimes the extra space is more than necessary, and sometimes it's not nearly enough if the floor of the opening is out of level or has a big hump in it.

If I'm working on a concrete slab that is grossly out of level or if the threshold has a terrible high spot, then I know I'm going to need more head clearance. I look for these problems before assembling the frame by checking the threshold with a long level. If there is an old door in the opening, I check the floor just inside the threshold for obvious humps or for an out-of-level floor. It's also a good idea to give the jambs a quick check. If they're out of plumb, I may need to make the rough opening a little wider as well.

Although the wood sills on most sliders are back-primed by the manufacturer, some still need to be back-primed or sealed by the installer. If the sill isn't sealed properly, it will warp and twist. If the sill hasn't been thoroughly primed, I start back-priming as soon as I'm sure that the slider is the right size and that it won't be going back to the store. If possible, I start back-priming before removing the old unit so that I can get at least two good coats of exterior primer on the sill before it's time to assemble the frame. If the whole frame is wood, I also make sure that the bottoms of the side jambs are back-primed to keep the end grain from soaking up moisture.

Level the sill in the rough opening—I begin prepping the opening by cleaning the threshold. Then I lay down the longest level I have that will fit between the jambs (photo above). A short level placed on top of a straight board also works

Start at the bottom. The first step in installing a slider is leveling the threshold. Lay a long level on the rough opening, and shim the threshold up to the proper level.

A paper drain pan. Special waterproof-paper flashing is layered in beds of silicone to form a drain pan under the slider.

well. I shim up the low end until it's perfectly level; then I fill in the gaps between the level and the floor with additional shims placed about every 12 in. On concrete slabs I hold each shim in place with a blob of silicone adhesive. On wood floors I nail the shims down so that they won't move when I slide the frame in and out during the dry fit. I always double-check the header height from the top of the shims. If there's not enough room, I'll have to get a shorter slider. Next, I make sure the trimmer studs that flank the opening are plumb. I measure the width of the opening, and I add furring to the trimmers if the opening is too wide.

The next step is flashing the threshold to keep water from coming in under the door. If I've had an aluminum drain pan made for me, I press it into a bed of silicone right over the shims, making sure that corners and seams are well sealed.

If no aluminum drain pan is available (which is the case on virtually every remodeling job where I install a slider), I make the pan out of layers of Moistop (Fortifiber Corp., 1001 Tahoe Blvd., Incline Village, Nev. 89451; 800-773-4777), a fiber-reinforced waterproof-paper flashing with a polyethylene coating on both sides. Moistop comes in

Drill anchor holes during the dry fit. After the frame has been tested in the opening, anchor holes are drilled through holes in the sill with a masonry bit.

Slider frame is bedded in caulk. Caulking is applied around the framed opening, and the nailing flanges on the side jambs are pressed into the caulk and fastened temporarily until the jambs are plumbed.

6-in. wide rolls. I cut the first layer of paper flashing about 12 in. longer than the opening so that ends extend up the jambs, and I install that layer in a bed of silicone over the shims (photo top right, p. 75). I let a few inches of the paper flashing lap over the outside edge of the sill. Staples keep the flashing in place while the silicone adhesive is curing.

I cut a second layer the same length and bed it in silicone over the first layer, only this time I let the excess paper flashing extend into the room. If there is hardwood flooring or a subfloor that the sliding door will fit against, I wrap the excess flashing up the edge of the flooring to create a dam. If there is no flooring or subfloor, I leave the excess flap until after the door is installed, and then I staple it to the inside edge of the slider threshold to form the dam. Finally, I caulk a short piece of paper flashing into each corner, making sure that the stacked-up layers provide complete coverage.

A dry fit locates the anchor positions—The frames for most sliders, no matter whether they're wood, metal or vinyl, have to be assembled on site. I lay all the pieces on a flat, open area with the outside facing up, and I screw the corners together after sealing them with silicone.

Before bedding the frame on top of the drain pan, I test the assembled frame in the opening to be absolutely sure that the door is going to fit right. If screws and concrete anchors are being used to secure the sill, a dry run is the best way to locate the anchors.

After centering the frame in the opening, I make sure that there's ample room to plumb the side jambs. If I'm installing the door over concrete, I mark both ends of the sill so that I can put it in the exact same position when I install it for good. For aluminum or vinyl sills, I run a masonry bit through the factory-drilled holes, drilling into the concrete for the plastic anchors (bottom photo, p. 75). I locate concrete anchors the same way for sills on wood sliders, only first I counterbore the holes for wood plugs, which I install later to cover the screw heads.

After all the anchors are located, I remove the frame from the opening, sweep out the dust and dirt, and then insert the plastic concrete anchors. Before slipping the frame back into the opening, I lay down another bed of silicone caulking on top of the paper flashing. For sliders with a nailing flange or an extruded exterior trim that sits on top of the finished wall, I run a heavy bead of silicone caulking behind the flange or trim before installing the frame (photo above). I try to keep that bead of caulking back from the exposed edge of the trim so that the silicone doesn't squeeze out when I press the door into place.

A transit and fishing line make straight sills—Once the unit is in the opening and is sitting at the pencil marks I made during the dry fit, I tack each side jamb in place with a screw or with

a half-driven nail through the face of the jamb or the nail flange. The slider sills that are 8 ft. long or less stay pretty straight, and I can usually secure the sill in place without adding shims.

For sills longer than 8 ft., I stretch a string between the jambs to make sure the sill is perfectly straight. The fluorescent nylon string that is common on construction sites is really too heavy for this task, sort of like using a framer's pencil for finish carpentry. My favorite string for straightening sills is 20-lb. braided Dacron fishing line, the strong, thin backing that I use on my fly reels (available at any fishing store). I stretch the line tight between the side jambs and insert shims from the outside between the sill and the drain pan until the sill is even with the line.

Fortunately, almost all sliding doors have adjustable wheels. But for those that don't, the sills have to be set absolutely level and straight. The same is true for multiple adjoining units that have to be set accurately to ensure that the mullions and casings line up horizontally. For these situations I level both ends of each sill with a transit to put all the adjoining units at precisely the same level. Once the ends of the adjoining sills are shimmed to the same level, I stretch my string and insert any shims needed to make each sill perfectly straight.

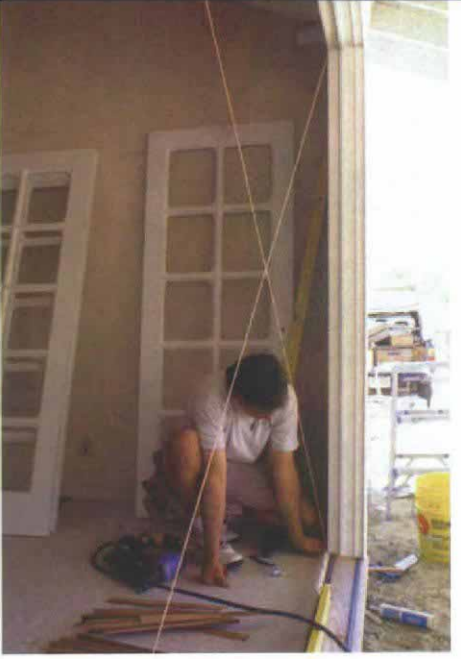
After the sill is set, I work on the side jambs, shimming out each one until it touches the level evenly top to bottom (photo top left). I secure the side jambs with more screws or half-driven nails and wait until the door panels are installed before I fasten the side jambs permanently. After the side jambs have been shimmed, I measure the diagonal distance of the frame corner to corner as a final test to make sure the frame is square.

On sliders wider than 8 ft., I also test for cross-legged jambs, which happens when the jambs are not in precisely the same plane. With cross-legged jambs, the sill and the head jamb aren't parallel, and the doors panels might bind in their channels and won't slide smoothly no matter how much wax or silicone I use. I test for this condition by stretching strings diagonally between the corners (photo top right). I move the top of one jamb and the bottom of the opposite jamb in or out until the strings just touch in the middle.

Most door panels go in top first—If the slider didn't come preassembled, the next step is putting in the door panels. The stationary panel is almost always installed before the active or sliding panel, and all stationary-door panels go into the frame top first.

In most cases the head jamb has a channel that the panel fits into. After the door panel is lifted into the channel, the bottom is placed over the track on the sill. The panel is then slid into position against the jamb. Most sliding-door units have an additional threshold strip that snaps into

Shims bring the jamb out to the level. After the sill is leveled and the jambs are plumbed top to bottom, shims are inserted behind the jamb until the jamb touches the level.



Checking for cross-legged jambs. Strings stretched from corner to corner will touch in the middle if jambs are in precisely the same plane, which ensures the door slides smoothly.

Most panels go in top first. The door panels are installed after the frame is secure in its opening. Most door panels slip into a channel in the head jamb first; then the bottom edge is set down over the track on the sill.

Tuning the sliding panel. A screw is turned to raise or lower the wheel, which brings the edge of the sliding panel parallel to the jamb.

A putty knife puts screen wheels on track. If the screen panel rides on spring-loaded wheels, a stiff putty knife can be used to depress the wheel and guide it onto its track.

Screws adjust the screen wheels. Screws in the edges of the screen adjust the height of the spring-loaded wheel as well as the tension on the springs to keep the screen from binding.

the sill between the stationary panel and the strike jamb to lock the panel in place. The active panel then is installed top first in its own channel (bottom photo, p. 77), and the wheels are adjusted down to lift the door off the track.

Adjust the wheels to make the slider parallel to the jamb—The next step is adjusting the wheels on the active door. Some wheels have adjustment screws that are accessed through the leading and trailing edges of the door, and other types have adjustment screws accessible through the exterior face of the door just above each wheel. Turning the adjustment screws raises or lowers the wheels, which in turn affects the alignment of the door panel in the frame (photo left).

I adjust the wheels until the active-door panel is parallel to the jamb. At the same time I make sure the door still slides smoothly. Before trying to turn the adjustment screws, I pick up the door a little to relieve some of the weight on the wheel, which is especially helpful with some of the larger, heavier door panels. While adjusting the wheels, I also keep an eye on the alignment at the center, making sure the stile of the sliding-door panel is even and parallel with the fixed panel and that the muntin bars, if there are any, stay lined up.

When I'm satisfied with the way the panels are set, I drive home the screws in the side jambs, placing additional shims behind the strike location. To get the head jamb perfectly straight, I stretch my string and shim the head down to the string. I then secure it with screws or nails.

A moisture barrier seals the outside of the slider—In many parts of the country, door installers run strips of felt paper under the nailing flanges on the side jambs to weatherproof sliding doors. Here in California, where stucco is the most-common siding material, the seal around the slider definitely has to be waterproof. So we use a system that is recommended by many manufacturers as well as by the National Fenestration Rating Council.

After the nailing flanges have been bedded in caulking against the sheathing, we run another bead of caulking on top of the nailing flanges, and a layer of Moistop is pressed into the caulk. The side jambs are flashed first with the Moistop extending at least 8 in. above the head jamb. I then apply a length of paper flashing across the head jamb, again pressing it into a bead of caulk on top of the nailing flange. The flashing on the head jamb should be long enough to overlap the flashing on the side jambs.

In areas exposed to extreme weather, such as places near the ocean, we follow the same steps to waterproof doors and windows except that we use self-healing, adhesive-backed waterproof membrane instead of paper flashing.

Screens should slide as smoothly as main panels—Putting in the screens is probably the most frustrating part of sliding-door installation. If manufacturers were graded by the quality of their screen doors, a lot of them would fail miserably.

Photos this and facing page: Roe A. Osborn

The worst screen doors have little plastic wheels without bearings. Often, these wheels cannot be adjusted and instead rely on a spring to counterbalance the door. When you try to slide the door, it acts like a rocking horse, dragging first on the sill, then on the head.

I always install screens top first into the screen channel in the head. While lifting the door against the head jamb, I raise the screen over the sill and set the bottom wheels down on top of the track. If the bottom wheels don't clear the track, I engage the top of the screen, then gently set the screen down next to the lower track. I then lift the screen from the bottom and push each wheel up with a stiff putty knife guiding it onto the track (photo top right, facing page). The difficulty of screen installation seems to increase in direct proportion to the amount of wind. So pick a calm day or get an extra pair of hands to help on windy days.

Most screens have wheels that adjust up or down by turning a screw in the leading or trailing edge of the door (photo bottom right, facing page). If the sill has been installed level and straight, it usually takes just a slight adjustment to get the leading edge of the screen parallel to the jamb. If there are wheels on top as well, I reduce their tension until the door slides smoothly.

The best sliding screens I've seen are on Marvin doors (Marvin Window and Door, P. O. Box 100, Warroad, Minn. 56763; 800-346-5128). Marvin screens are suspended from an upper track, and the spring-loaded wheels on the bottom just keep the bottom of the screen in line. I place the Marvin screen door first on the lower track, and I make sure the door slides easily on its lower wheels. Then I climb a ladder and slip the upper wheels into the upper track. All the adjustments are made on the upper wheels by turning a single cam-action screw.

By their nature, slider screens tend to be flimsy, so it's not uncommon to see them come from the factory slightly out of square. An out-of-square screen usually doesn't glide smoothly and is difficult to line up with the jamb. But in most cases these parallelogram screens can be squared by applying diagonal pressure on the screen frame. If the wheels on the screen are not adjustable, racking the screen is often the only way to make it line up with the jamb.

Screen doors on wood sliders have bumpers to keep them from damaging the jambs. But if the screen has just a single bottom bumper, the wheels have a tendency to bounce off the track when the bumper hits the jamb. I make sure that there are bumpers at both the bottom and the top of the screen door so that the back of the screen hits the jamb evenly. And with all sliding screens, a little silicone spray on the track helps to keep those wheels gliding smoothly.

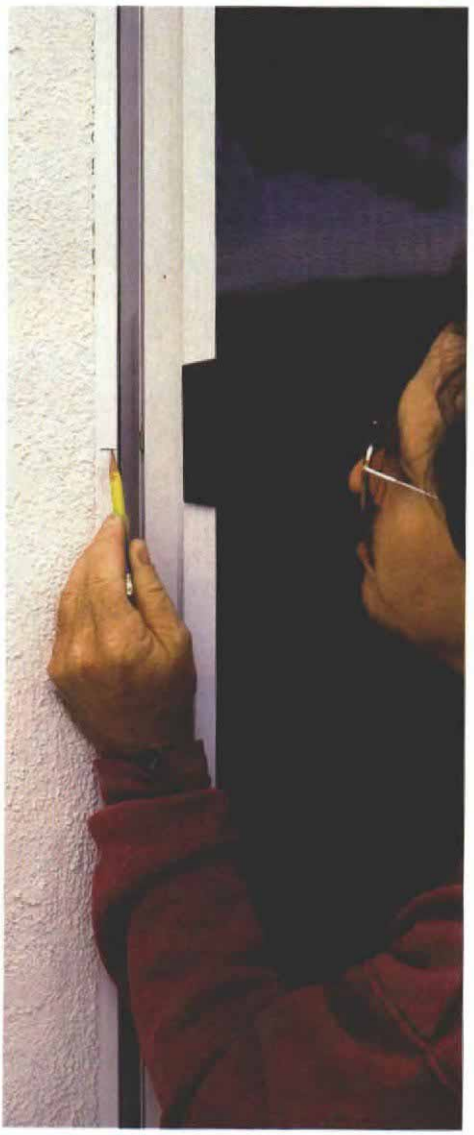
Installing the locks and hardware—Most sliders come from the factory prebored for their latch hardware, although a few come with the strikes installed. Installing strikes is one area in which reading the instructions and mocking up the hardware really helps. The strikes have to be located after the doors and latches are installed.

Some latches, especially those on screen doors, have a jaw or hook that engages the strike when the latch is closed. To locate the strike for this type of latch, I extend the latch mechanism and slide the door up to the jamb. I make a mark on the jamb in line with the bottom of the latch jaw (photo left), which is the location of the proper position for the opposing jaw on the strike.

Other slider locks are internal, and the strike seats inside the latch. To line these up, I engage the strike in the latch and slide the door up against the jamb. A sharp point on the backside of the strike marks the jamb to locate the proper position for the strike (photo right). Some strikes have to be mortised into the jamb for the door to close properly. But I always install the strike on the surface of the jamb first to figure out how deep I need to make the mortise. I try not to mortise the strike too deep or to close the gap between the slider and the jamb entirely. Adequate room has to be allowed for the weatherstripping, and too much pressure can jam the lock.

Speaking of pressure, you're probably wondering what happened at that lady's house. I discovered that the sill was sitting on a foundation anchor bolt that I was able to trim off with my reciprocating-saw blade slid under the sill. I needed to draw the oak sill down, so I drilled through it in three spots, first counterboring for wood plugs. I used concrete screws to pull down the sill, an easy way to go if you can't remove the sill to install anchors. Three screws sucked that sill right down, and adjusting the doors was easy after that. The lady thought I was a genius. □

Gary M. Katz is a writer and a carpenter in Tarzana, California. Photos by the author, except where noted



A point locates this strike. If the jaw is located on the strike instead of the latch, the strike is engaged in the latch, and the panel is slid to the jamb. A point on the back of the strike marks its location.

Locating the screen strike. For most screens and many sliding doors, the strike is located by sliding the panel over and making a mark in line with the latch jaw.