

Installing an Exterior Door

Exterior doors are the most challenging of all of the penetrations in a home's envelope. They are opened and closed about a hundred times as often as the average window, and everything in the house goes through them, from teenagers to baby grand pianos. Proper installation is the first step toward meeting that challenge.

Check the door. When I get the door, I check both the door slab and the preassembled jamb carefully, looking for quality issues from the manufacturer. Prehung exterior doors sometimes come with the trim attached, but I never order precast doors from the factory, preferring to trim my own doors. Preattached molding interferes with adjusting the jambs in and out, and it makes air-sealing the jambs difficult as well.

Check the opening. Make sure the rough opening is the right size, ideally about an inch bigger than the outside dimensions of the door jamb in height and width. If the opening is not plumb from side to side, make sure it's big enough that the door can stand plumb within it.

If the wall plane is a little bit out of plumb (no more than 1/4 inch over the total height of the door), you can hang the door plumb and fudge the casings. If the discrepancy is more than that, you will need to fix the wall before hanging the door. Also, make sure that the sides of the opening are in plane with the wall by setting small nails near the corners of the opening and stretching a chalk line between the nails to form an "X." If the sides of the opening are

parallel, the lines should just kiss in the middle where they cross.

Checking the rough sill is always top priority. Unlike an interior door, for which you can cut the jambs to different lengths if the floor isn't level, an exterior door has an integral sill that needs to sit level. The sill should be evenly supported across its entire width, so that loading from the inevitable traffic doesn't flex it constantly. You can shim the sill, but a shim is a potential path for water intrusion. Whenever possible, I level the rough sill before installing the pan.

Flash the sill. A traditional approach for flashing a rough sill is to install a metal pan with upturned sides and an interior curb that fits against the finished flooring. But custom pans are expensive and also form a thermal bridge. Adjustable plastic versions are available, but they often don't work with different sill configurations, and they can crack over time. Instead, I prefer to use flexible self-adhering flashing tape to make durable and effective pans (see "Flashing an Entry Door," Jan/06).

Have everything ready. With the sill pan in place, I lay the door face down on a protected surface in front of the opening so that it can be lifted into place without turning it. I remove all of the packing materials, paying special attention to the staples in the bottom of the sill. Some heavy doors come with lifting handles that I usually remove before setting the door in the opening. At this point, I make sure that everything I'll need to fasten the door to the framing is within easy reach. That includes a pile of shim



Inspect the door and remove any protective packaging (1). After flashing the sill with flashing tape (2), apply a heavy bead of caulk to the sill pan (3). Carefully slip the door into the opening, keeping movement of the door to a minimum (4).



When the door is in position, shim behind the jamb at the bottom hinge (5) and on the opposite side as well (6). Check the sill for level (7), and shim if needed (8). Hold the door in plane with the wall (9), and shim both sides at the top (10).

shingles in addition to the necessary tools and fasteners.

Caulk the sill pan. Some manufactured sills have hollow or recessed areas, so before caulking the sill pan, I check the bottom of the door sill to make sure that I apply the caulk where it will make good contact. I clean and dry the sill pan, and then apply a very heavy bead of silicone caulk across the entire width. I use silicone because it is flexible but cures hard enough to provide some support to the sill, and it can be peeled off years later if the door needs to be replaced. I put additional caulk at the two ends, which are areas prone to leaking. After installing the door, I reach in with a narrow shingle and tool any excess caulk into a sloped dam toward the outside of the pan.

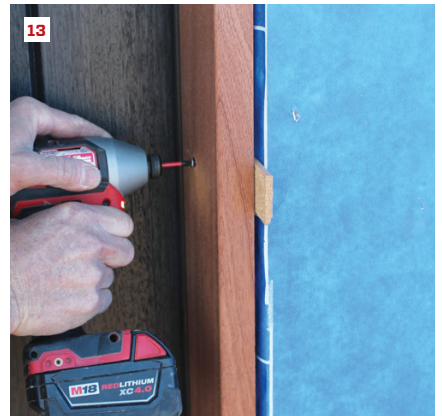
Secure the hinge side first. Some doors come with screws and predrilled holes for securing the jambs, others can be drilled and countersunk for screws and plugs, and some I simply fasten with finish nails that will be puttied and painted. Regardless of the fastening strategy, I lift the door into place and try to set the sill down into the caulk just once, with minimal sliding around.

With one person (or a couple of blocks tacked to the wall) holding the door vertical, I center the sill in the opening, making sure that

it is fully seated. Next, I check the sill for level, adding small shims as needed until it's perfect. Any shims need to be fully bedded in and surrounded by the caulk to eliminate any entry points for water. I also check the top of the jamb for level at this point, but if the head and sill don't match, the problem is with the manufacturer.

Before securing the bottoms of the jambs, I make sure that there is enough room in the rough opening to plumb the door from side to side. Sometimes it's necessary to start with the sill closer to one side. Once I'm sure of the placement, I shim and fasten the hinge jamb right behind the bottom hinge.

Using the door itself as a guide, I shim the tops of both side jambs until the margin between the door and jamb across the top is perfectly even. If the sill is level, this occurs when the jambs are plumb. I use a level only for double-checking and as a straightedge. As I shim and fasten the door jambs into place, I keep them in plane with the wall so that the exterior casing lies flat. Out-of-plumb walls may need tapered extension jambs for the trim to lie flat. I drive two screws—one in the thick part of the jamb and one in the door rabbet—at each set of shims.



Drill and drive a stainless steel screw to hold the jamb at the top hinge (11). Make sure the jamb is straight (12), then fasten the rest of the hinge jamb (13). Fasten the top of the strike jamb (14), then straighten (15) and fasten the rest of that jamb (16).

I add shims directly behind each of the hinges and drive long screws (typically provided by the manufacturer) through the hinges and into the framing as soon as I confirm that the jamb is plumb. Without the screws into the framing, the weight of the door tends to flex the jamb and makes it difficult to control the margin on the strike side.

Attach the strike side. When shimming the strike side, I use the margin between the jamb and the door as a reference. Installing shims very close to the top and bottom lets me straighten both ends of the hinge jamb at the same time by pushing the head jamb and sill over as needed. I shim behind the lockset strike for security and then add more sets of shims as needed to hold the jamb straight. I avoid putting shims and nails where I might need to drill and mortise later for a deadbolt.

Because of the inevitable movement and settling of the framed

opening, I never shim between the head jamb and header, so that the jamb stays straight and the door operates properly over time. If I need to hold the head jamb straight, I shim it temporarily, fasten the exterior casing, and then remove the shims with the casing left to hold the jamb straight. Another strategy is driving a couple of 10d galvanized finish nails up through the jamb and using the friction of the nails to hold the jamb straight until I install the trim.

When the door is secure in the opening and operates smoothly, I cut off the excess shim material with a razor knife or multi-tool. While the caulk is still wet, I make sure that the sill is supported anywhere that it might flex when stepped on. The final step is installing the lockset, and then I'm ready to air-seal and trim the door.

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For a more detailed discussion of installing an exterior door, go to jlconline.com/training-the-trades/installing-an-exterior-door.