

Installing Prehung Doors

An accurate level and a bucketful of shims will correct just about any out-of-plumb condition

by Jim Britton

CHECK THE ROUGH OPENING FIRST



Of all the tasks a trim carpenter faces, few offer the opportunity to transform the look of a house quickly from ragged edges to finished surfaces like installing prehung doors. It's the trim carpenter's version of instant gratification because once in the groove, a good trim carpenter can install a door, its jamb and all the casings in about 15 minutes. That's money in the bank for a pro, and a satisfying slice of sweat equity for the owner/builder.

But doors that squeak, bind, stay open or swing open by themselves are constant reminders of the fallibility of the trim carpenter. In this article I'll describe the methods I've settled on after 20 years in the trades for efficiently installing a typical prehung door and avoiding common glitches that bedevil a door installation. Like most homebuilding jobs, installing a door begins with checking work done before you got there.

Check the rough opening first—In a perfect world of accurate levels, conscientious framing crews and straight lumber, all rough openings are square, plumb and correctly sized. Because

these three conditions rarely coincide, it falls to the trim carpenter to compensate for less-than-perfect rough openings.

Although there are exceptions, the rough opening should be 2 in. wider and 2½ in. taller than the door. Thus, the correct rough opening for a 2-ft. 6in. door would be 32 in. by 82½ in. The extra space allows room for the door jambs and a little wiggle room to accommodate rough openings that are out of plumb. In my experience, rough openings are the same for both interior and exterior doors that are made by door manufacturers. Doors made by window manufacturers, on the other hand, sometimes require a different rough opening. If in doubt, check with the manufacturer before the framers start work.

Before installing a door, I inspect the rough opening to familiarize myself with its condition. First I check the dimensions to see if they are workable. Then I use a 6-ft. level to check that the two trimmers (the studs that frame the rough opening) are plumb (photos 1 and 2) in both directions. Sometimes the trimmers will actually be plumb in both directions, in which case the

door jambs will be flush to the wall, and the casings will be easy to install.

But in some situations, the wall will be out of plumb in section, with the trimmers plumb in elevation. In this case, the door jambs will have to protrude slightly beyond the plane of the wall at the top and bottom on opposite sides.

Another common condition is the parallelogram-shaped rough opening. The wall may be plumb in section, but the elevation view of the rough opening is out of plumb. The net door width is usually ½ in. narrower than the rough opening. Therefore, I can install a plumb door in a rough opening that is up to ½ in. out of plumb. The jambs will fit snugly to the diagonally opposite corners of the rough opening. If the rough opening is more than ½ in. out of plumb, I use a sledgehammer to pound the trimmers into line. I can usually move a trimmer up to ½ in. without adversely affecting the drywall. This operation requires cutting back the sole plate once the trimmer has been adjusted.

The scissor condition, in which the trimmers are out of plumb in opposite directions in sec-



1 and 2. Read the rough opening. Before installing the door and its jamb, the author checks the trimmers on both sides of the rough opening with a 6-ft. level to see if the trimmers are plumb (photo facing page). If the jamb needs to project beyond the plane of the wall in order for the door to hang plumb, he notes the direction of the adjustment on the trimmer. To avoid mistakes, he marks on the floor the direction the door will swing.

3. Check the trimmers for twist. If the trimmer isn't square to the header, the door jamb will also be askew. Use a square to gauge the accuracy of the door frame.



tion, requires a more involved solution. Let's say one trimmer is $\frac{1}{2}$ in. out top to bottom in one direction, and the other trimmer is out $\frac{1}{2}$ in. in the other direction. This situation amounts to 1 in. of scissor. This condition is remedied by holding the jamb out $\frac{1}{4}$ in. at the top and in $\frac{1}{4}$ in. at the bottom on opposite sides of the wall. Do the opposite for the other trimmer.

The other condition I look for is twist (photo 3). If the trimmers aren't square to the header, the jamb will likewise be twisted. This condition results in hinge binding or a poor visual relationship between the door and its jamb after the installation. I take the twist out when I affix shims to the trimmer.

Next, put up the hinge shims—To begin an installation, I measure the height of the top and bottom hinges of the door from the bottom of the hinge jamb. My 6-ft. level makes a convenient stick to note the middle of the hinge positions (photo 4). These locations mark where I fasten my shims to the framing before the door goes in.

I shim the bottom location first with an appropriate combination of shims to bring the level plumb and to compensate for any twist in the trimmer. Then I move to the top hinge position, holding the shims in place with my level as I affix the shims to the trimmer (photo 5). Pre-nailed shimming makes handling the door easy and ensures that the door will automatically be plumb

in the elevation view. I use a 15-ga. or 16-ga. pneumatic nailer loaded with $1\frac{3}{4}$ -in. to 2-in. nails for installing prehung doors. If you don't have one of these wonderful timesaving tools, use 8d finish nails instead.

Now it's time to squeeze the door and jamb into the opening. Remove any nails or straps used as bracing, and place the hinge jamb atop the thick end of a shim resting on the floor next to the trimmer (photo 6). Raising the jamb has three benefits: It eliminates squeaks by separating floor and jamb; it eliminates the problem of an out-of-level floor preventing the strike jamb from not coming down far enough to engage the lockset latch; and it eliminates (or minimizes)

NEXT, PUT UP THE HINGE SHIMS



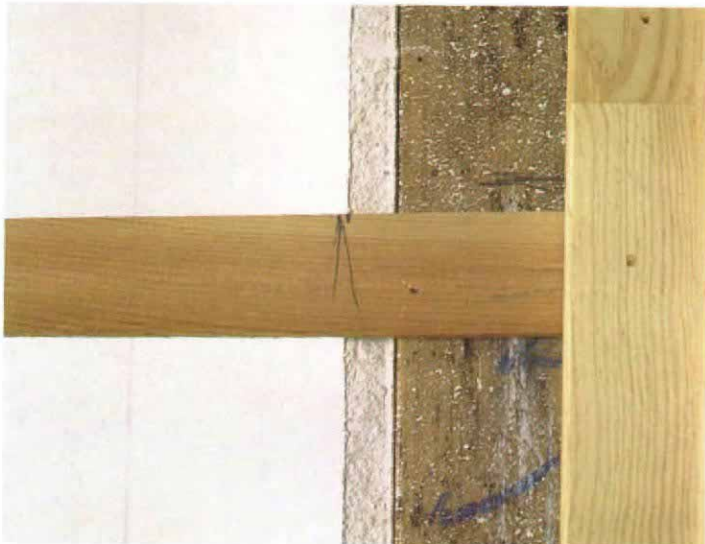
4. Note the hinge positions. Using a 6-ft. level as a story pole, the author marks the centers of the top and bottom hinges.

7. Mark the jamb alignment on the shims. If you need to adjust the edge of the jamb in or out of the plane of the wall to get the door to hang plumb, make a note of the correct position of the jamb's edge on the top and bottom shims.



5. Affix the shims. Shims behind the top and bottom hinges make backing for the jamb. A single shim at the top compensates for twist.

8. Nail the jamb. Secure the jamb to the trimmer with a couple of nails right next to the hinges. The nails *must* pass through the shims.



the need to remove some of the door's bottom to accommodate finish flooring.

Once the jamb is in the rough opening, I swing open the door. If it's a troublesome installation, I'll block the door with a couple of shims. But typically I leave the open door unsupported. If the wall is plumb at the rough opening, I bring the edge of the hinge jamb flush with the drywall and nail it to the trimmer through the shims. If the wall isn't plumb, I compensate for the error by moving the jamb out equal amounts at the bottom and then the opposite direction at the top. I make pencil marks on the shims to note the correct alignment for the edge of the jamb (photo 7).

I affix the jamb in the correct position relative to the wall with a couple of nails through the top and bottom shims. Then, while the door is still open, I drive a couple of nails through the jamb right next to the hinges (photo 8). The hinge jamb and door now should be hanging plumb because they are held fast against the shims. If there is a middle hinge, shim it at this time, taking care not to make any changes to the already perfect alignment.

Nails are enough to keep the jamb of a hollow-core door from pulling away from the trimmer. But if I'm hanging a solid-core door, I run a 2½-in. screw through the jamb and into the trimmer next to each hinge. Because this step leaves a

hole that no painter will be pleased to discover, I put the screws under the doorstops. Working from the bottom, I carefully pry away the stops (photo 9) and set them aside.

Sometimes run a 2½-in. screw through a hinge and into the trimmer. But I don't do this to keep the door from sagging: A properly hung door doesn't sag. Instead, I use the longer screw to straighten a warped jamb or to compensate for a hinge mortise that might be shallow. The longer screw will give me about ¼ in. of adjustment.

Secure the head jamb and strike jamb—Now that the hinge jamb is firmly secured to its trimmer, I close the door. Next I set the head jamb



6. Don't forget the shim on the floor. Elevate the hinge jamb by placing it atop the butt end of a shim shingle as the door is lifted into position.

9. Remove the stops. Pry the doorstops from the bottom up. Then locate the screws that secure the jamb to the trimmer under the stop.



SECURE THE JAMBS



10. Equalize the strike-jamb reveal. Use shims placed next to the door latch to adjust the strike jamb in or out until the gap is consistent from top to bottom.

11. Reinforce the strike plate. After pulling the doorstop, run a screw through the strike jamb next to the door latch.



parallel to the top of the door by raising or lowering the strike jamb. At this stage of the game, a single, unshimmed nail through the strike jamb into its trimmer or through the head jamb into the header can help hold the parts in alignment while I assemble the correct combination of shims. A jamb held by a single nail still can be pried in or out as needed. A shim under the strike jamb also can be helpful.

When I've got the head jamb parallel with the top of the door, I check the reveal along the edge of the door and the strike jamb. I put a couple of shims between the jamb and the trimmer 6 in. down from the head jamb and adjust the shims until the gap, or reveal, between the door and the jamb is the same at the top corner. Then I

shim the bottom of the jamb, 6 in. from the floor, and the center of the jamb opposite the strike plate (photo 10). Some door jambs are straighter than others. If I've got one with some dips and wows in it, I add shims as necessary to keep the reveal consistent. I add extra support to the jamb where the strike engages it. To do so, I pry away the doorstop and drive a 2½-in. screw into the trimmer (photo 11).

Replace the doorstop—The door is now where I want it and fully supported. With the door closed flush with the head jamb, I position the head stop on the hinge-jamb side with the help of a dime (photo 12). This ¼-in. gap between the door and the stop helps to keep the door from

binding on the stop and allows for paint buildup. I continue this space down the hinge jamb with the hinge stop, attaching the stop with my 16-ga. nails, 16 in. o. c.

I install the strike stop so that it just touches the entire height of the door with the door's face and the jamb flush over the full height. This system works well for a strike that has an adjusting tang. However, if the strike will be the T-mortise type, it will have to be installed first and the stop set to it.

Apply the casings last—I start casing a door at the top (photo 13) with the head casing set back ⅜ in. from the edge of the jamb. The casing has 45° miters on each end, and the short side of the casing is ⅜ in. longer than the jamb opening.

REPLACE THE DOORSTOP



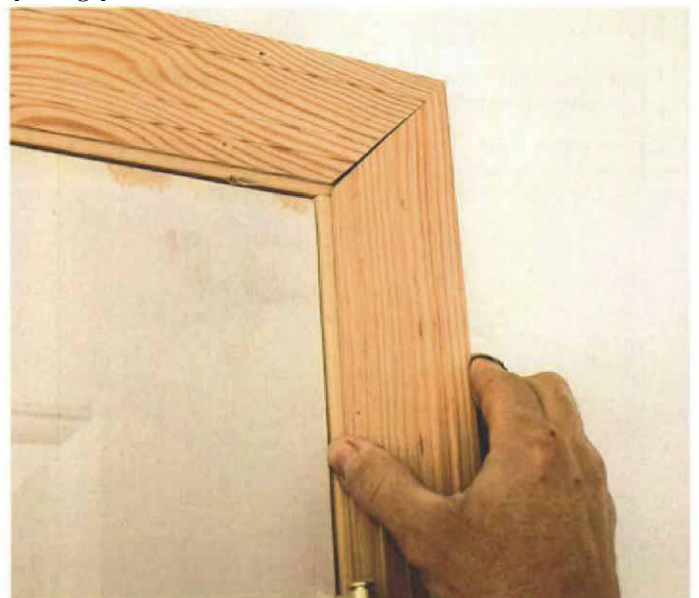
12. Don't forget the stop gap. Use a dime between the closed door and the doorstop to gauge a consistent gap between the door and the stop. The gap allows for paint buildup.

APPLY THE CASINGS LAST



13. Casing starts at the top. Britton begins trimming a door by installing the head casing first. He affixes the casing with pairs of nails on 16-in. centers. One nail goes into the jamb, and another into the header.

14. This gap won't make the cut. When the door jamb and the wall are in slightly different planes, the casings don't lie completely flat. The tapered gap at the inside corner is the result.



That gives me the $\frac{3}{16}$ -in. reveal along both of the side jambs.

The tricky part of casing a door is dealing with the differential between the plane of the wall and the plane of the jambs when you've made allowances for an out-of-plumb rough opening. For example, this door had a head casing whose edge was recessed a bit from the plane of the wall. When I test fit the side casing, I came up with a gap at the inside corner (photo 14). To fix it, I undercut the miter with a disc sander (photo 15). This cut isn't a back bevel, however. In this case I removed material from the casing's face. Once I'd shaved the miter, I had an acceptable joint for paint-grade trim work (photo 16). To keep the adjoining casings in the same plane at

the outside corner, I put a thin shim under them (photos 17 and 18).

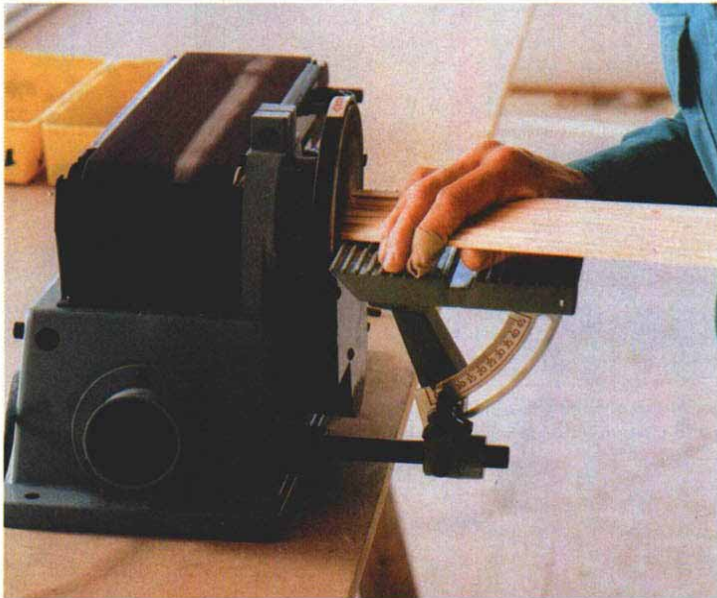
I attach the side casings with pairs of nails, one into the jamb and one into the trimmer a couple of inches away. This nailing pattern helps ensure that the casing will lie flat. I nail the casings next to the hinges and the door strike because these spots are well-backed by shims. Nailing the casing at these points also reinforces the jamb.

As you can imagine, drywall edges can be a pain in the neck when the door jamb is below the plane of the wall. The hollow milled into the back of the casing is there to compensate for this situation. If the hollow isn't enough to accommodate the drywall, I use my hammer to "tenderize" protruding drywall edges.

If the floor is to be covered with carpet, I hold the side casings $\frac{3}{8}$ in. above the floor. That gap gives the carpet guy some room to tuck the edges of the rug. It's a good idea to put a shim between the jamb and the trimmer at the bottom of the jamb if the room is to be carpeted. The shim keeps the jamb from being deflected by the carpet-layer's bump hammer as he tightens the carpet against the tack strips.

If the floor is going to be finished with $\frac{3}{4}$ -in. hardwood strips, I set the side casings on $\frac{3}{4}$ -in. blocks. When the floor is installed, the blocks come out, and the flooring slips into the gap. □

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15. Undercut the side casing. With the side casing faceside up and slightly tilted, Britton removes material from the miter cut with a bench-mounted disc sander.

16. Now it fits better. By undercutting the side casing with the disc sander, Britton achieves an acceptable miter. A dose of caulk will touch up the remaining crevices.



17. Shim problem casings at the corners. If the casings are out of plane, slip a shim under the corner so that both pieces bear on it. Then trim the shim flush with the casing with a utility knife.

18. Nail 'em. Once the shim has been trimmed, secure the casing corners to the wall with nails driven into the header, trimmer and door jamb. Fill any gaps between the wall and the casing with caulk.

