

EXTERIOR DOORS



Pre-Hanging Exterior Doors

Improve accuracy and save headaches by bringing it in-house

BY GREG BURNET

It wasn't long ago that the same carpenters who formed the foundation for a house were also responsible for framing, building the stairs, trimming the interior, and hanging the doors. In our rush to keep up with the post-WWII building boom, some elements that carpenters would normally have handled on site were sourced to factories and assembly lines. Ready-to-install stairs, windows, doors, and even whole houses began arriving on building sites where less-skilled labor was needed to install them.

While I have no problem with progress or the concept of “working smarter, not harder,” I do have issues with having to correct a defective product that I've paid someone else to supply. Such is the

case with many of the pre-hung doors my company has received from suppliers over the years. We've seen doors not hung square in their frames, misaligned hinges, incorrect lock bores, improperly set stops—you name the problem and we've probably seen (and fixed) it. Faced with the reality that ordering pre-hung doors has become a bit of a gamble, we've brought some of our door hanging back in-house.

WHY SHOULD I DO THE PRE-HANGING?

Aside from assuring a proper fit, pre-hanging my own doors has many other advantages. First, I'm able to choose the jamb

Photos: Sue Burnet



material—including the species, width, and type—which is important when we work in older buildings that don't have conventional walls. For example, standard-width 4 $\frac{1}{8}$ -inch-wide jambs don't work when the walls are framed with full-dimension 2x4s with $\frac{1}{8}$ -inch plaster on both sides.

Another advantage is being able to use any kind of hinges and hardware. We do everything we can to ensure the longevity of our installations, and we don't skimp on hinges. Many pre-hung doors come with cheap stamped-steel hinges that don't hold up over time, whereas we hang most of our doors on heavy-duty, solid-brass hinges that we select to match the hardware in the rest of the house. (Try telling a supplier to order a pre-hung door with 4x4 solid brass butt hinges in an oil-rubbed bronze finish with non-removable pins, and see what kind of response you get.) And when we do our own pre-hanging, we're not limited to the prep-work done for a "standard" lockset and deadbolt.

Pre-hanging our own doors also lets us handle doors with a unique configuration such as an integral transom. While our company does install standard doors in conventional projects, we focus on these "Specials," which are sometimes challenging, but always

satisfying. And we're often able to incorporate a reclaimed door or glazing into the project. Many of our clients enjoy having a unique vintage door in their house and saving a piece of history from going to the landfill in the process.

In a nutshell, pre-hanging our own doors gives us far better quality control, which translates to fewer problems with the installation and fewer problems with the door's function and operation down the line. But perhaps the most compelling reason for hanging our own doors is simply that it minimizes the headaches associated with fixing other people's mistakes, saving us time, aggravation, and money.

ASSESSING THE PROJECT

I approach each door that I pre-hang by making a list of requirements. First on the list is the size of the door I need to install and whether the door opens right-handed or left-handed. Next, I note the width and species of the jamb. The width is based on the wall that the door will be going into; the species matches, when possible, what has been used for other doors in the building. We also note the type and quantity of hinges for the door, again trying to



match the existing doors in the building. Finally, I note the lockset and deadbolt requirements.

Once I've gathered this information, I order the necessary components. For an interior door, these typically include the unprepped door slab—with no machining—jamb and stop material, hinges, and hardware.

For an exterior door, the list is a bit different. If we're not using a reclaimed door, I order the slab—again unprepped, which means the door has not been bored, mortised, or otherwise machined for hardware. For most projects, I order rabbeted jamb stock (we used Dura-Frame jambs for the projects shown in this article), along with any weatherstripping that is necessary. I also order an adjustable aluminum sill with integral thermal break. The final items are the hinges, lockset, and deadbolt, along with any special hardware items, such as a closer, viewer, or kick plate.

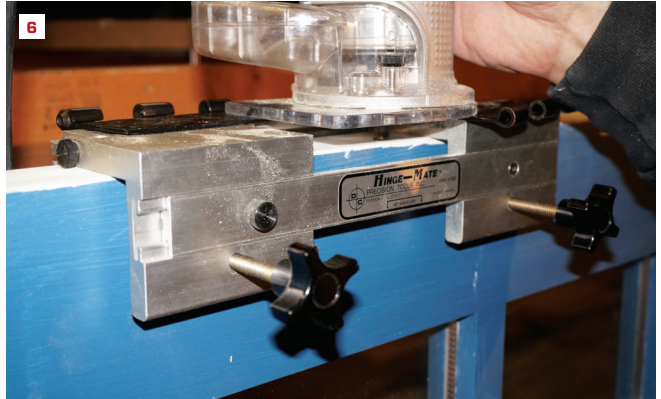
In one of the projects pictured here, the client had selected a fiberglass entry door, which we ordered as “no prep” from our lumberyard when we ordered the rest of the items on our list. For the other project shown in this article, we hung a pair of wood doors in a custom jamb with a transom.

PREPPING THE SLAB

After all the components have been delivered, the first thing we do is check the slab for square. It's surprising how often we see wood slabs that aren't square. If not recognized and corrected, an out-of-square slab will cause a lot of frustration during the pre-hanging and installation process. Wood slabs can be trimmed or planed slightly to correct for problems, but fiberglass slabs have little room for trimming, so they need to be square and flat when they arrive from the supplier.

If a door is to operate properly, either the width must be undersized slightly in relation to the jamb or the door needs to be beveled on the strike side. Both methods provide the necessary clearance for the door as it swings past the leading edge of the jamb. Most wood doors are beveled, while most steel doors are undersized. Fiberglass doors typically have wood cores behind the stiles and use a different method to provide clearance: The wood cores have slightly eased edges that allow the slab to be hung either left-handed or right-handed and make it unnecessary to plane a bevel for clearance on the latch edge.

Most fiberglass door slabs without glazing are reversible. But



those with integral glazing have a defined interior and exterior side (the side of the glazing retainer molding with the exposed screws faces toward the interior). To keep myself oriented when mortising for the hinges, I mark the upper interior corner of the slab with a piece of painters tape **(1)**. I then set the slab aside and turn my attention to preparing the jambs.

FABRICATING JAMBS

For the fiberglass door shown here, our supplier provided us with jambs pre-cut to the lengths that we needed. This particular jamb stock also came with weatherstripping inserted into a kerf that ran along the inside corner of the rabbeted section. After removing the weatherstripping **(2)** and setting it aside temporarily, I ripped the jamb stock to the correct width.

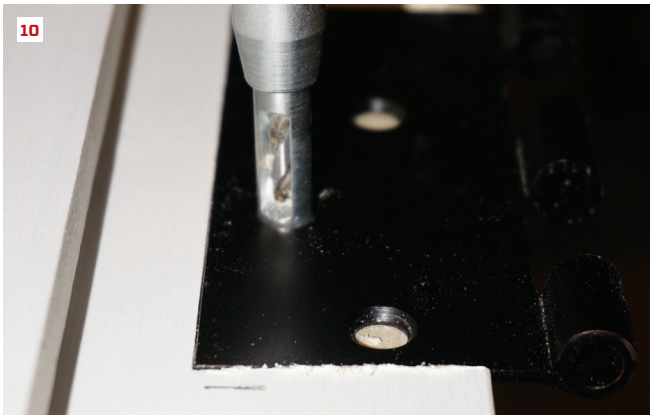
Because the wooden door was an odd size and a custom fit, we fabricated the jamb by cutting the legs and head to length, then rabbeted the side jambs to accept the head and sill. To make those rabbets, we set the depth of the miter saw to cut about halfway through the jamb stock, and then made successive passes across the stock. We removed the waste material from the rabbet with a sharp chisel.

STORY POLES FOR HINGE LOCATIONS

In almost every phase of the work I do, I rely on story poles for transferring measurements whenever possible, especially when there are multiple components that need to fit and operate together. Story poles minimize errors, which in turn increases efficiency. Generally, I just use simple strips of wood with the hinge locations marked on them. My standard layout for doors is to mark the top of the top hinge 7 inches down from the top of the story pole, and mark the bottom of the bottom hinge 11 inches up from the sill end of the pole. Then I center the middle hinge between the top and bottom hinges. With the hinge locations laid out on the story pole, I'm ready to mortise for the hinges.

JIG SIMPLIFIES HINGE MORTISING

To lay out the hinge mortises (or gains, as they're sometimes called), I set the hinge-side jamb leg flat on a bench and insert the head jamb into its rabbet. Working from the head jamb, I butt the story pole against a spacer such as a nickel **(3)** or a small, square brass rod about 1/8 inch wide **(4)**, which provides clearance at the top of the door. (A 1/8-inch drill bit also works well as a spacer.) I



then transfer the marks from the story pole to the rabbeted portion of the jamb (5).

While hinge mortises can be cut with a hammer and chisel, we rely on using a router and a simple hinge jig, which is faster and more accurate. The Hinge Mate jig we use is compact and clamps to the piece being mortised, so unlike hinge jigs that attach with nails, it doesn't leave holes. We adjust the jig for the size of the hinges (4 inches in the photos here) we're installing. To set the depth of the bearing-guided bit, we place the base on two hinge leaves, and then lower the bit until it just contacts the jamb (6). We clamp the jig and cut each mortise in less than a minute (7).

The ½-inch-diameter router bit supplied with the jig leaves mortises with ¼-inch radius corners. For the fiberglass door, we ordered hinges with a corresponding radius. But for the wood door, we used square-cornered hinges to match the other doors in the house, so the corner of each mortise had to be squared up to receive the hinges. A spring-loaded corner chisel makes quick work of cutting a perfectly square corner (8). The remaining fragment of wood is easily removed with a chisel or knife (9).

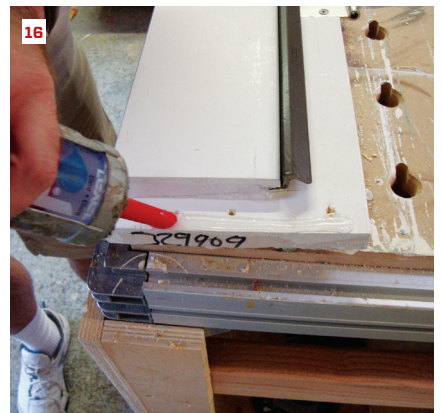
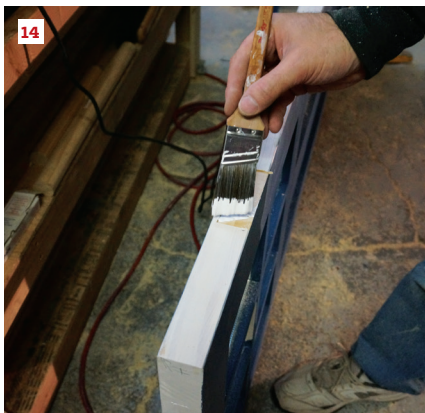
While the router is still set up, we cut the hinge mortises on the

DOOR HANGER'S TOOL KIT: THE SHORT LIST

Here are a few of the tools that I keep in my tool belt or in the truck when pre-hanging or installing doors. Many are specialty tools, but they pay for themselves the first time you use them. —G.B.

- **Hinge jig & router:** for fast and accurate hinge installation
- **Door bore kit & heavy-duty drill:** simplifies lockset installation
- **Vix bits:** self-centering for pre-drilling hardware screws
- **Butt mortise plane:** quieter, cleaner option than a router and jig
- **Jigs & templates:** homemade for specialty hardware
- **Power plane:** for fitting wooden doors and beveling door edges
- **Door stands:** holds door slab on edge while working (A)
- **Corner chisel:** makes square corners for mortised hardware
- **Magnetic levels:** will stick to metal hinges or to metal frame
- **Plumb bob:** always accurate for plumbing jambs
- **Door lifter:** Door Jack lets you safely lift doors with your foot (B)
- **Hinge tool:** Knuckle Bender from FastCap for adjusting hinges
- **Winbag:** inflatable bag moves heavy doors in the frame (C)
- **Spare hardware/hinge shims:** extras for when you need them (D)
- **Door dolly:** homemade for wheeling around heavy doors on site





door if need be. We begin by setting the door slab in our spring-loaded door bucks to lay out the hinge positions on the edge of the door. Without a spacer this time, we place the story pole flush with the top of the door and mark the hinge positions. We then align the jig, clamp it in position, and rout the hinge mortises on the door.

With a hinge leaf placed in each mortise, I drill a hole for every hinge screw (in the jambs and in the door) using a self-centering Vix bit (10). These spring-loaded bits ensure accurate placement of hardware screws—something that many pre-hanging facilities seem to have a hard time getting right these days. After drilling the holes, I drive the screws to secure the hinges (11).

BORING FOR THE LOCKSET AND DEADBOLT

To drill the holes in the slabs for the lockset and deadbolt, we use a boring kit made by Classic Engineering. This kit contains a jig as well as various bits and parts necessary to bore all the holes for most entry hardware quickly and efficiently. The heart of the system is a heavy, cast-aluminum jig that clamps firmly to the door and accurately guides the boring bits to make the necessary holes.

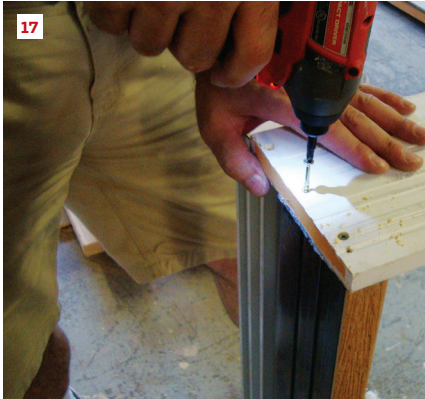
We start by adjusting the jig to the backset distance (the distance

from the door's edge to the center of the lockset holes). Then, we place the jig on the door and align it with one of the registration marks (typically 36 inches from the bottom of the door to the center of the lockset and 41 inches to the center of the deadbolt). Next, we tighten the clamps to secure the jig to the door, and we drill the holes. For the lockset and deadbolt holes, we use a 2 1/8-inch self-feeding spur bit (12), and for the edge bores, we use a 1-inch spade-type bit (13).

We always use a heavy-duty, 1/2-inch electric drill to power the large bits through the door slab. A quick-release bit holder that's included with the boring kit makes bit changes quick and easy, so we don't have to reach for a chuck key when switching between bits for the different size holes.

PUTTING THE UNIT TOGETHER

Cutting, mortising, and drilling the door and frame expose raw wood, so we always seal these areas with a fast-drying primer to minimize the chance for moisture to enter and cause decay (14). To assemble the jamb, we first drill holes through the jamb for the screws that will fasten the side jambs to the head and sill (15). These holes are countersunk on the back of the frame to help



minimize any chance for splitting. Before driving the screws, we apply a generous bead of sealant to the rabbeted areas of the side jambs (16). We then place the side jamb on the head and sill and drive 2-inch coated screws to secure the joints (17).

As with most fiberglass door slabs, the bottom edge of this slab had been machined with grooves during the manufacturing process to accept the door-sweep weatherstripping. We tapped the door sweep into the grooves, snugging it up against the bottom of the slab (18). We also reinserted the weatherstripping that we had removed earlier into its kerf in the side jamb. Finally, we brought the door slab to the assembled frame, inserted the hinge pins, and our pre-hung unit was ready for installation.

We always prefer to install the lockset and deadbolt during the pre-hanging process in our shop, but in this instance the homeowner supplied those items, so we installed them on site after installing the door.

To install the lockset and deadbolt, we first slide the cylinders into their respective holes and score the outlines of the latch faces onto the edge of the door using a utility knife, which leaves a finer line than a pencil does. I chisel around the perimeter of the plates

as well as in the field of the mortise, removing most, but not all, of the waste (19). Then I use a butt mortise plane to take the mortises down to their final depth (20). A router and template can also be used for this operation, but I find my method less dusty and just as fast, especially when working with just one or two doors.

With the hardware installed, the final step is adjusting the height of the threshold via its built-in adjustment screws. The door sweep should make firm contact with the threshold surface. I make a final check of the hardware operation and trim around the door.

It took just about 2 hours to pre-hang the fiberglass door in our shop. Because of the custom nature of the other project, pre-hanging the wood door took a bit longer. We've found that hanging multiple units at one time and using an assembly-line approach can make the procedure go considerably faster. I figure that the cost of pre-hanging our own doors compared with buying factory-hung units to be a wash. The biggest savings are in time and aggravation, because we're installing a better product.

Greg Burnet owns Chicago Window and Door Solutions and is a presenter at JLC Live.