Hanging a New Door in an *Old Jamb*

Careful scribing makes for a perfect fit on the first try

by Gary Katz

There are many ways to hang doors, but few guarantee a perfect fit on the first try. Through trial and error over the years, however, I've developed a technique that's foolproof and fast, especially when hanging a new door in an old jamb.

Scribing the Door

Since an existing jamb is almost always slightly out of square, the first step is to scribe the door to fit the opening. Before scribing a raised panel door, cut any excess height off the bottom so that the door can be held against the opening without projecting above the jamb. This ensures that only a small amount of wood will have to be removed from the top of a door, keeping the width of the stiles and rails about the same.

Next, stand on the stop-side of the opening, and pull the door against the jamb, then secure it with a door hook (see "A Homemade Door Hook," next page). Now adjust the door until it's perfectly centered in the opening (see Figure 1, next page). Start at the head of the door by measuring the width of the top rail at both sides of the door, then measure the width of both stiles at the top and bottom of the door. Unless the jamb is terribly out of square, you should be able to adjust the door in the opening until the stiles are the same width and parallel to the jamb. I use a small prybar to move the door left or right

Figure 1. After marking the door with an X for reference, use a door hook and shims to hold the door against the jamb, then make adjustments until the stiles are of equal width and parallel to the jambs (see photo, previous page). Use a set of scribes to mark cut lines on the door, making sure to allow for the thickness of the carpeting or saddle at the bottom (right).

in small increments, and long tapered shims beneath the door to adjust the height.

If the jambs are grossly undersized and a lot of wood has to be planed off the stiles, then make sure that the lock stile will be at least 3 7/8 inches wide. This is the minimum width necessary for some locksets, like Schlage deadbolts, which are 3 5/8 inches deep.

Scribe All Four Sides

Before scribing the door, I always mark a large "X" — in pencil or with two pieces of tape — on the hinge stile near the top of the door. This prevents dumb mistakes, like hinging the door

A Homemade Door Hook

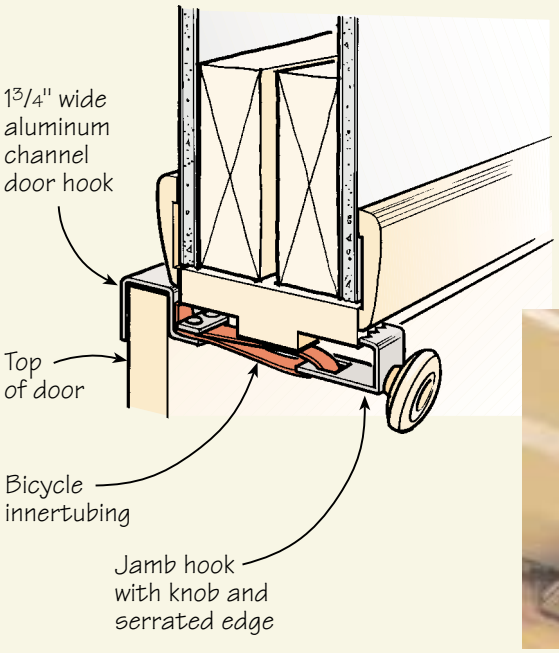
To scribe a door, the door has to be held tightly against the jamb so it can't move at all, not even a little. It's virtually impossible to do this alone, so I use a homemade door hook made from aluminum channels connected by a length of rubber innertube. One aluminum channel slips over the top of the door, the other catches on the head jamb, and the rubber stretches across the head to hold them together. One door hook at the top of the door and two shims at the bottom will hold any door snugly against the jambs.

The aluminum hook that goes over the door should be 1 3/4 inches wide so that it will fit both standard door thicknesses. (For thicker doors, I use a door hook who's paid by the hour and helps me carry the door, too.) To help the jamb hook grab securely, I use a grinder to serrate the edge, then file and sand the cuts to prevent scratches in the jamb. The piece of bicycle innertube should be about 8 inches long.

With the rubber attached, the distance between the two hooks shouldn't be more than 3 1/2 inches for standard interior jambs less than 5 inches wide. The rubber is threaded through a slot in the jamb hook, but at the door hook, I use 3/16 x 1/2-inch hex-head bolts and a strip of aluminum to clamp the rubber. The excess innertubing sticks out the top of the door hook. When I work in a house with 6-inch jambs, I loosen the hex-head bolts and slip the excess rubber out a little, which allows for wider jambs.

Finally, I mount a knob to the jamb hook. The knob makes it easier to stretch the innertubing across the jamb.

—G.K.



To hold the door securely in place for scribing, the author uses a door hook that catches the top of the door and clamps snugly around the head jamb. The hook, which is fabricated out of aluminum channel and a length of bicycle innertube, can be adjusted for jambs of varying widths.

backwards or upside down, or drilling for the lockset 36 inches from the top of the door instead the bottom.

For scribing, I prefer to use a set of $2 scribes made by General Tool Co. Although any pencil fits them, I like to use a mechanical lead pencil, because a broken lead is easy to fix. Adjustable scribes are also handy at the bottom of the door, where they can be spread to accommodate the thickness of the floor covering, which varies from 1/4 inch for vinyl to 1 3/8 inches for carpet. For exterior doors, you'll also need to know what type of door shoe and threshold will be used.

I like to leave a gap around the door slightly smaller than 1/8 inch. To scribe the stiles, I spread my scribes 3/16 inch apart because I bevel both stiles so that they'll never rub or bind on the jamb (called *jamb bound*), and the leaves of the hinges will never touch (called *hinge bound)*. The 3/16-inch spread of my scribes works well for a typical 3-degree bevel, which grows almost 1/8 inch longer on the hinge side (long point of the bevel) than on the stop side (short point of bevel), where the scribe marks are made. Be careful to hold the scribes perpendicular to the jamb, and press just hard enough to leave a clean sharp line — pressing too hard might accidentally close the scribes. If the grain in one area interferes with the lead, scribe in the opposite direction.

At the head jamb, squeeze the scribes completely closed, because the top of the door doesn't get a bevel. If the top of the door doesn't reach the head of the jamb, spread the scribes so that they just reach the top of the door where it's farthest from the jamb. This ensures that you will remove a minimal amount of material from the top rail.

Locating Hinges and Locksets

To avoid confusion and save time, mark the hinge and lockset layout while the door is standing near the opening. To locate the hinges, pull a tape measure down the hinge side of the jamb (Figure 2). Touch the top of the tape measure against the top of the jamb, then slide it down almost 1/8 inch — the standard gap between the top of the door and the top of the jamb. (I prefer to slide the tape down instead of subtracting from the measurement at each hinge because it reduces mistakes — and it usually takes longer to correct mistakes than to hang the door.) Holding the tape tightly with one finger, measure to the top of each existing hinge mortise — this is

Figure 2. Measure to locate the top of the existing hinges and write the dimensions lightly on the door. To reduce math errors, the author prefers to leave a gap between the tape and the head jamb rather than holding the tape tight to the jamb and subtracting 1/8 inch.

Figure 3. To ensure an even reveal at the top of the door, cut close to the scribe line with a circular saw, but finish the job with a power plane. To avoid tearout at the edges, hold the plane upside down and work the first 6 inches of the rail from one side (left), then flip the plane over and finish planing from the other side (right).

exactly where the hinges should be placed on the new door. Write the measurements lightly on the face of the door near each hinge location, or on a scrap of paper.

To locate the lockset, measure down the strike side of the jamb to the center of the strike and subtract 1/8 inch for the head gap. Again, note the dimension on the door, near the location of the lockset. On raised panel doors, I like to center the lockset in the lock rail. If the old strike mortise in the jamb doesn't align with the lock rail of the new door, I'd rather move the existing strike mortise on the jamb than have the lockset look out of center in the door. On a painted jamb, I'll fill the strike mortise, but on a stain-grade jamb either the door must be drilled to match the strike mortise in the jamb, or the jamb must be replaced.

Cutting Down the Door

I do all cutting, drilling, and planing of the door on a work bench especially made for the purpose (see "Portable Door Bench"). The bench holds the door either flat or on edge, and it also provides a storage area for my door-hanging tools.

Top and bottom cuts. Because circular saws cause tearout and chip end grain, use a square and a utility knife to score a line across the face of the lock and hinge stiles. (For flush doors with veneered skins, score a line completely across the door.) I also score the far edge of the door, where the saw blade will exit, to eliminate tearout on the back of the stile.

While the bottom of the door can be cut quickly with a circular saw, the top has to be cut very straight — if the saw tips even slightly, the gap between the top of the door and the jamb will be uneven. One trick is to cut just outside the pencil line, then use an electric door plane to finish the cut right to the line (Figure 3, previous page). To eliminate tearout, start by holding the plane upside down and come in from the far side of the door. It's essential to keep pressure on the fence beneath the door to make sure the plane stays square with

Portable Door Bench

Many manufacturers make a simple clamping device to hold a door securely while you work on it. But I hang a lot of doors and I'm too old to bend over all day picking up tools, so I use a door bench that not only holds a door either flat or on edge, but carries all my tools as well. My 22x68-inch bench is narrow enough to fit through a 28-inch-wide doorway, but long enough to support an 8-foot door. It's designed so that I can step inside it to carry it around.

This custom-made door bench can hold up to an 8-foot-tall door either flat or on edge. The bench is small enough to be carried from room to room by standing inside it. An adjustable steel hook mortised into the end holds doors snugly on edge.

I'm 5 feet 7 inches tall, so my bench is 32 inches high, a comfortable working height that is still short enough so when I step inside the box to carry it the legs clear the ground easily. Also, at this height I can climb stairs while walking inside the bench without having to lift it up over my head.

The bench has adjustable rungs to hold doors of varying widths on edge. The best layout I've found is to have four rungs spaced 5 inches apart. The 2x4 legs can be drilled to accept 1 1/4- inch closet pole, but doors slip off round rungs too easily. To avoid having to put stops on the ends of round rungs, I made rectangular rungs that fit into slots in the laminated hardwood legs of my bench. Since I store my bench in the back of my van, I attached the legs with butt hinges that fold flat. When I carry the bench up to my van, I set the front end in the back of the van, then step out of the box. When I push the bench into the van, the front legs fold up almost automatically, and I fold the back ones up as the bench slides into the van. I carry a 1x2 spreader to secure the legs open while I'm working at the bench.

The center of my bench has a 20-inch clear opening that I can step into to carry the bench around, and the remaining space is filled by two 22-inch tool shelves with dividers to hold the tools securely. The sides of the bench are deep enough to hold the tallest tool while still allowing a door to lie flat across the top of the box and not rock on a tool handle.

The door bench also has an adjustable steel hook, which clamps doors in place on edge. The hook is mortised flush with the face of the box, which acts like a track, and is adjustable by means of a single wing nut.

—G.K.

the top of the door. But because this is awkward, I plane only about 6 inches into the door right to the pencil line, then turn the plane around and come in from the opposite end of the door to finish the cut.

Planing the hinge stile. To avoid costly mistakes, the "X" and all the scribe lines must *always* point toward the inside of the door bench. To keep this straight, imagine that the bench is just like the doorstop on the jamb. The hinges will then be installed with the barrels pointing away from the door bench. Also, the door plane should always bevel in the same direction — down toward the inside of the bench.

Again, it's important to hold the fence tightly against the face of the door so the plane doesn't rock (Figure 4). Otherwise, the bevel might vary and cause an ugly wave in the margin between the door and the jamb.

Watch the scribe line carefully. If it isn't parallel to the edge of the door, slowly plane until the line and the edge of the door are parallel, then plane closer toward the line with successive passes. Never bury the cutter or try to cut too much on one pass. There's no hurry, so just make smooth passes that slowly approach the scribe line. I like to just leave the line, then finish by tipping the plane at an angle and easing the edge of the stile.

Lock stile prep. To avoid having to move the door too many times, I mortise the hinges before planing the lock stile. But the lock stile planing process is the same. The biggest hurdle is cutting a consistent bevel. Otherwise, the gaps will be too big, or the door will rub against the jamb or may not even shut. Check the angle frequently by placing a square across the bevel at various points along the stile. On a $1\frac{3}{4}$-inch door with a bevel of about 3 degrees, the bevel should fall away from the square a little more than $\frac{1}{16}$ inch.

Figure 4. To avoid confusion when beveling the stiles, always work with the X facing toward the work bench. Make several passes with the plane, taking a small amount of material each time and holding the guide firmly against the face of the door to avoid a wavy reveal (top). The last step is to tip the plane to ease the edges (above).

Mortising Hinges

When laying out the hinges, look for the "X" first to avoid hinging the door upside down. Pull a tape measure down the edge of the door from the top to the

Figure 5. To mount hinges quickly and accurately, the author attaches a template over the hinge marks (top), then uses a router to cut the mortise (above left). Predrilled holes and a Vix bit speed the driving of the hinge screws (above right).

Figure 6. To hang the door, split the top hinge and attach one leaf to the door and the other to the jamb, then lift the door onto the hinge and drive the pin. To ensure proper alignment, first attach the middle and lower hinges to the door, then screw them to the jamb.

bottom, then transfer the measurements taken earlier onto the door. Use a sharp pencil and a square to extend the marks straight across the edge of the door. I also draw a light "X" beneath each measurement, so I won't get confused and set my template on the wrong side of the mark.

I hang a lot of doors, so I use a router and templates to cut the mortises (Figure 5). The templates are made by Templaco Tool Co. (295 Trade St., San Marcos, CA 92069; 800/578-9677), and include almost every hinge size and other common types of hardware, including flush bolts and mortise locks.

First, set the router to the right depth by holding the hinge flat against the bottom of the template and extending the bit until it's flush with the face of the hinge. Then attach the template to the door, positioned above the first layout line by 1/16 inch, which is the clearance of the router bit guide. Rout just a small nick of the first hinge mortise, then check the depth setting before going further.

To avoid tearing out the face of the door, first run the router into the door along each shoulder of the template, then make a pass along the face of the mortise, and finish by cleaning out the center. For a smoother cut, always move the router against the rotation of the bit. For square-cornered hinges, I use a corner chisel to square up each mortise.

I always drill pilot holes for hinge screws. Four good-sized screws driven into a 1x3-inch space act like a wedge and, without pilot holes, will split the door and ruin the job. I use a self-centering Vix bit, which is available at most catalogue suppliers, including Woodworkers Supply (800/645-9292) and Tool Crib (800/635-5140), to speed up the drilling.

Adjusting the Hinges

To hang the door, first split the top hinge. If the existing hinge-screw holes don't line up with the new hinges, use the top hinge leaf to drill pilot holes for all three hinges, then attach the leaf to the top mortise on the jamb. Lift the door onto the top leaf and drive in the

Adjusting a Door to Fit the Jamb

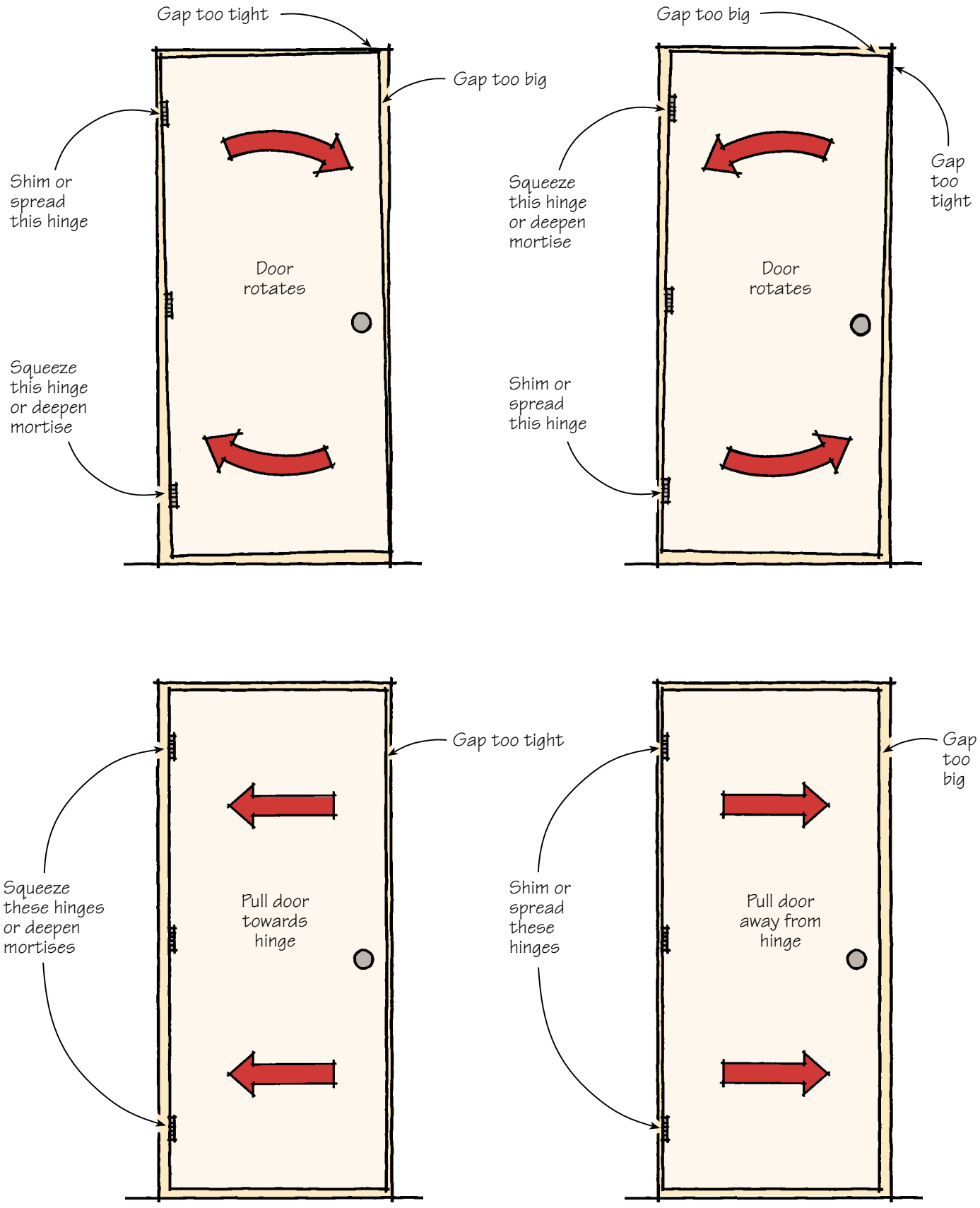


Figure 7. If careful scribing doesn't result in a perfect fit, the door can be "rotated" in the opening by spreading or squeezing the hinges (top left and right). If the gap against the lock jamb is too tight or too big, squeeze or spread the top and bottom hinges to move the door toward or away from the hinge jamb (bottom left and right).

hinge pin, then swing the door open and hold it still with one foot while driving a hinge screw into the middle and bottom hinges (Figure 6, page 6). Attaching the lower hinges to the jamb while they're on the door ensures that they'll be aligned perfectly.

If a door is scribed carefully and beveled correctly, it will usually fit the first time up. If it doesn't fit just right, small hinge adjustments will probably correct the problem. But I always adjust the hinges before installing the lock strike, because the position of the strike might change.

The secret to adjusting hinges is to imagine the door and the jamb as a rectangle within a rectangle (Figure 7, previous page). If the rectangles aren't parallel, one of them — the door — has to be rotated.

Spreading hinges. When the head gap is too tight or the top of the door rubs the head jamb, the gap at the top of the lock stile is usually too big. The quickest remedy is to bend and spread the top hinge, which rotates the door down.

To bend and spread the top hinge, open the door enough to slip the head of a nail set between the leaves of the hinge, then pull the door closed and gently squeeze the hinge (Figure 8). Don't pull too hard or the hinge screws might rip out. Bend the hinge a little at a time and check the fit each time.

If the head gap is too big at the lock side, bend and spread the *bottom* hinge to rotate the door upward.

Squeezing hinges. In the reverse situation, the lock stile rubs on the jamb. This means the hinge gap is too big, so one or more hinges may have to be squeezed shut a little, which will pull the door back towards the hinge jamb.

Use a crescent wrench to bend and squeeze the top hinge. Drive the hinge pin up until only the top knuckle is engaged, then tighten the wrench on the top knuckle of the door leaf — not the leaf attached to the jamb. Bend the top knuckle on the door away from the jamb—toward the lock stile of the door, then carefully bend the other knuckles on the door leaf the same amount. This adjustment will pull the door tighter to the jamb, increasing the gap on the lock side. Bright brass hinges dent and mar easily. To adjust one, remove it from the jamb and either shim behind the hinge slightly or chisel the mortise a little deeper.

Figure 8. To rotate the door away from the hinge jamb, spread the top or bottom hinge by gently closing the door while holding a nail set between the leaves of the hinge (left). To pull the door toward the hinge jamb, bend the knuckles of the hinge one at a time toward the jamb using a crescent wrench (below).

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