

Flawless Hinges in Fine Furniture

Install precise butt hinges in projects of all kinds

BY STEVE LATTA

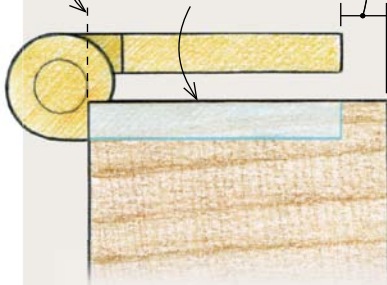
DON'T SKIMP ON QUALITY

High-quality, extruded, all-brass hinges (like those shown, from Horton-Brasses.com) have the perfect gap built in. Here's how to size and locate them on the door.

Place edge of pin flush with outside of door.

Size hinges and door to leave about $\frac{1}{8}$ in. of wood at back of mortise.

Mortise hinge leaves flush for the perfect gap between door and case.



The butt hinge is the most common type of door hardware, and for good reason. It provides a lifetime of smooth service in everything from large cabinets to small boxes, with a low-profile look that exudes class. Although the butt hinge is a simple device—just two pieces of flat metal connected by a knuckle joint—it can be fussy to install, especially for beginning woodworkers. You have to mortise the hinges carefully into the door and cabinet, with a nice, even gap between the two and, at the same time, no unsightly gaps around the hinges themselves.

The job doesn't have to be scary. I'll show you my time-tested method for installing top-quality, brass butt hinges, from

laying out each mortise to cutting them precisely for a door that looks as good as it swings. You'll need a combination square (preferably a small one), a small router, a marking knife, and a basic set of chisels.

Before you start, you need to have the door fitted to its opening on three edges (see Fundamentals, "Fitting an inset door," on p. 20). You'll fine-tune the last edge, called the striker stile (opposite the hinge stile), once the door is attached.

Good hinges are a great value

My most important advice is to buy the highest-quality hinges. A \$5 pair of plated, rolled hinges purchased at the local big-box store will waste your time and insult

How to nail the layout



Measure the backset. Set the blade of a square to reach from the back edge of the leaf to the inside edge of the hinge pin.

the piece you are building. Get extruded, all-brass hinges from a reputable hardware supplier. The “precision butt hinges” from Horton-Brasses.com are a great example. They have flat leaves, not tapered, making them easier to install; they have the perfect $\frac{1}{32}$ -in. gap between them when closed, meaning you can mortise them flush; and they come with both steel and brass screws. You’ll see why that’s important later.

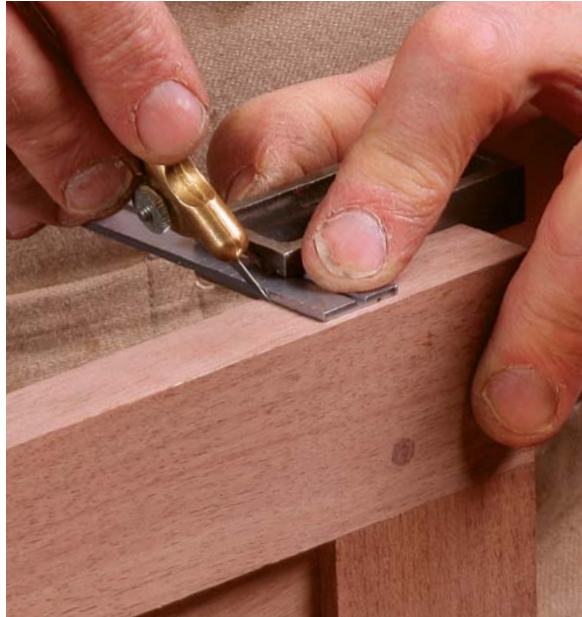
It’s important to pick the right size of hinge, too. The size of a butt hinge is described by its height and open width. You want $\frac{3}{32}$ in. to $\frac{1}{8}$ in. of wood left at the back of the hinge mortise. So I typically use 2-in. by $1\frac{1}{2}$ -in. hinges, which have $\frac{5}{8}$ -in.-wide leaves. These work well on doors $\frac{3}{4}$ in. or thicker. For aesthetic reasons, I don’t like to use hinges much larger than this for furniture. For the largest doors, such as those on a secretary or bookcase, I’ll typically add a center hinge instead of beefing up the hardware size.

If you end up with hinges that are a little too wide for your project, you can scribe lines on the leaves and trim the hinge to those lines on a belt or disk sander.

No matter how well-made a pair of hinges are, or how identical they look, they need to be fitted individually because they sometimes have slight differences. Mark them by writing on the back side of a leaf so that you can remember where each hinge goes.

Precise layout paves the way

I find it easier to mortise the door for the hinges first and transfer those mortise locations to the case opening. Hinges have



Scribe one edge. After lightly penciling the hinge location, use a marking knife to scribe one edge of the hinge, starting at the end of the square’s blade.



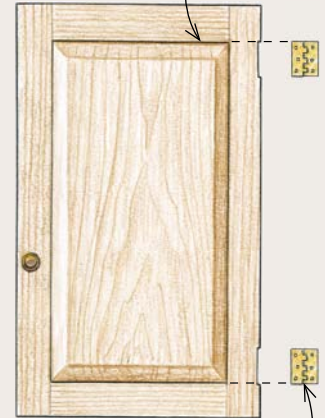
A trick for the other edge. Without moving your square, set the hinge against it, and place the knife tight against the far end (left). Now, without moving the knife, remove the hinge, slide the square against the knife, and mark the line (right) for the other edge of the mortise.



Now the back. Without changing the setting on the square, scribe the line along the back of the hinge.

WHERE THEY GO

Hinges look best when aligned with the inside edge of the rails.



Latta usually places hinges on the right side of the door, so the swing action works well for righties.

Mortise the door

ROUT A FLAT BOTTOM



Notch the edges. First roll your knife over the front corners (left), severing the fibers there. Then define all three edges of the mortise by paring a shallow notch along them (right).

an odd number of knuckles on one leaf—three or five—and an even number on the other. I always set the leaf with the even number of knuckles into the door, as I was taught. Also, like many furniture makers, I align the ends of the hinges with the inside edges of the rails. They are less distracting to the eye that way. See the photos on the previous page for a great way to lay out the perfect mortise. You'll need a pencil, a good combination square, and a sharp marking knife.

For good swinging action, the hinge axis must be just a hair outside the case. If you



Set the router depth. Latta uses a $\frac{3}{16}$ -in. straight bit in his trim router. These hinges have leaves of uniform thickness, so you can set the depth exactly to the thickness of a leaf.



Route in stages. Clamp a support block flush with the edge of the door, at the back of the mortise. Start routing with a light climb cut along the front edge (above), to avoid chipout there. Then route in front-to-back passes, staying a healthy distance from the back edge. Finish by taking a pass down the back edge (right), with your eyes lined up for a clear view. Stay about $\frac{1}{16}$ in. away from all of the edges.



position the edge of the pin even with the outside of the door (see drawing, p. 38), that will place its center about $\frac{1}{32}$ in. outside the front of the door, which is perfect.

There is another type of butt hinge, which has a ball-shaped tip at each end of the pin. These hinges need to be set a bit farther outside the cabinet, or you would have to cut a notch in the door and case to accommodate the ball. If you have that type, set the blade of your combo square just short of the ball, and it will end up just outside the front of the case and door.

The most important part of the mortise is its bottom, which needs to be excavated to a uniform depth (assuming the leaves are a constant thickness, as is the case with these from Horton Brasses). That's why I use a small router to excavate the waste, finishing with handwork in the corners. Using the router, you don't have to scribe the depth on the workpiece. But if you are going to do the entire mortise with hand tools, mark the depth along the front of the door.

Define the edges with a bit of handwork—Before routing, I use a 1-in. chisel to notch out the first $\frac{1}{8}$ in. (or so) along the inside edges of the scribe lines. This defines these edges clearly for the routing and chisel work that follows. Use hand pressure only and be careful you don't blow out the delicate area at the back.

Trim router adds speed and precision

To excavate the mortises, I use a trim router and a $\frac{3}{16}$ -in.-dia. straight bit. The router is more efficient than chisels for this task, clearing the waste quickly and, more importantly, ensuring a flat-bottomed mortise. If a hinge doesn't sit flat, it will bind. Also, the key to maintaining those nice even gaps around the door is having all of the mortises cut to the exact same depth. The router guarantees that, too.

The Horton hinges have the perfect gap built in—a heavy $\frac{1}{32}$ in.—and the leaves are not tapered in thickness, so you can set the router bit to exactly the thickness of a leaf. That will set the hinges flush with the edge of the door and door opening, which looks great.

But if you have different hinges, or you just want to practice your technique

FINISH WITH CHISEL WORK



Chop and pare. Without removing the router-support block, begin chopping at the ends of the mortise. Don't chop at the edge of the mortise right away, or the chisel will deflect backward, making the mortise too big. Instead nibble backward until you reach the scribe mark (above). Then pare along the bottom of the mortise to remove the waste. Last, chop downward to remove the long piece of waste at the back edge (right).

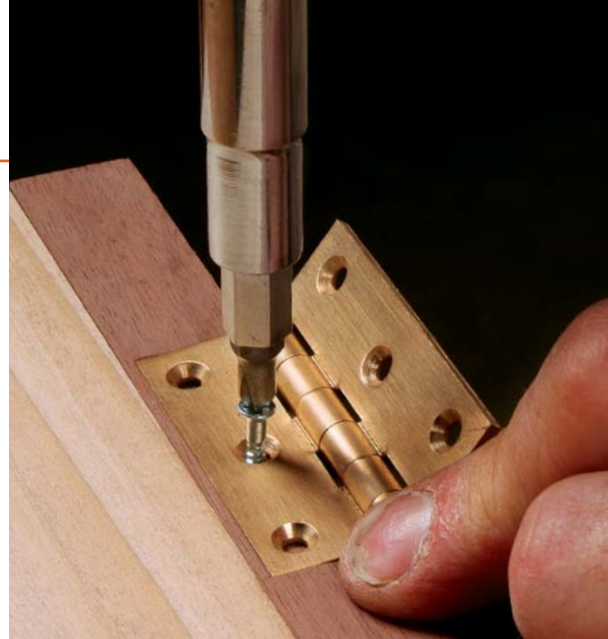
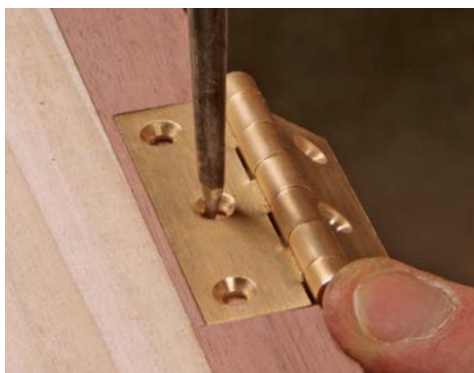


Finish the job. Pare into the corners to make sure no waste is lurking there.



Check your work. The hinge leaf should fit perfectly. If it doesn't, check for any last bits of waste, or scribe a new line and expand the mortise very slightly.

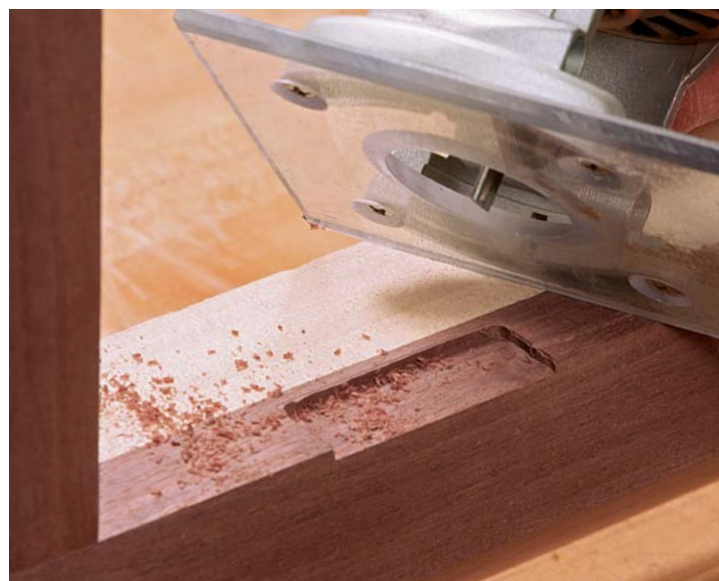
Hang the door



Install the hinges in the door. To transfer the mortise location, place just one screw in each hinge, in the center hole. Use an awl to offset the hole slightly toward the back of the hinge (left). Then drill a pilot hole (center), and install a steel screw (right).



Transfer the hinge location. Set the door in its opening, with shims below to create even gaps top and bottom. Swing out the loose hinge leaves, and make a small knife mark at the top and bottom of each one, where the leaf touches the cabinet.



Rout as usual. Lay out, rout, and chisel these mortises the same way you did the ones in the door. Install a single steel screw as before to attach each hinge to the cabinet.

before tackling the real thing, it is a great idea to cut hinge mortises in a pair of scrap pieces. That will let you dial in the exact router depth to obtain the gap you want.

I usually clamp the door in my vise, making sure the jaws are clean so they won't mar the frame. Then I clamp a piece of wood along the rear edge to help support the thin area at the back of the mortise and give the router a larger surface to ride on.

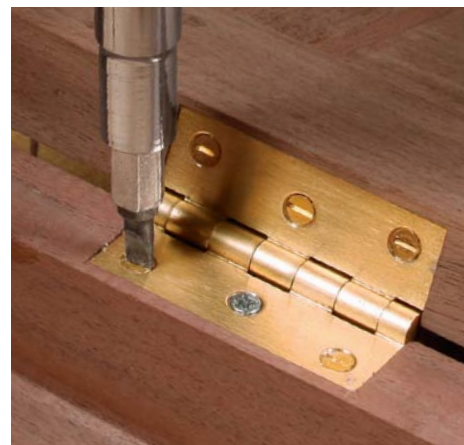
After routing, it only takes a bit of chisel work to finish the job. Stay a little bit away from the line at first, nibbling backward until the chisel is against the mortise wall established earlier. Don't try to chop all the

waste at once, or the chisel could deflect backward beyond the line.

Install and transfer

Once the hinges fit nicely, attach them to the door. I put a screw only in the center hole of each leaf at this point to allow for adjustments later. I use an appropriately sized steel screw for this stage, not the brass ones, which are softer with slotted heads that are easy to mar during the trial fitting. Save those for the very end.

For drilling pilot holes, some folks use a Vix bit, which centers the pilot holes in the countersunk holes in the hinges. That is a bad move. All of the holes for the screws should be slightly off-center, about



Brass last. After you have fine-tuned the door frame for even gaps all around, install the brass screws, starting with the outside ones. To avoid marring them, be sure your screwdriver fits the slots, and put some wax on the threads.

$\frac{1}{64}$ in. toward the back edge of the mortise. This will push the hinge tight against the mortise wall, eliminating any gaps. I use a standard twist drill for the job, $\frac{3}{32}$ in. dia. in this case. Some drill a tapered or stepped hole for these traditional wood screws, but I don't find that necessary.

With the hinges mounted in the door, it's easy to locate them precisely in the cabinet. Put the door in the opening, resting on shims to establish the proper gap at the bottom and top. Then simply pivot the loose leaves onto the face of the cabinet to transfer their locations.

Remove the door and use your square to mark both end lines and the backset, and then rout and chisel these mortises like the others. Now you can screw the other half of each hinge into the cabinet, once again using only one steel screw in the center hole.

If necessary, some troubleshooting

At this point, the door should have an even gap along the hinge side and the top and bottom of the door, with the striker stile still just a bit too fat. If the door looks good, go ahead and install the brass screws. If not, you can make any number of adjustments.

If the door is not flush with the front of the opening along the hinge side, set one or two of the hinge leaves farther back, either in the cabinet or the door. If the door is proud (sticking out a bit), the backset will need to be increased in the case on one or both hinges. If the door sits too deep, then its hinge leaves will need to be set back a bit farther. (You could also set the hinges farther forward in either case, reducing the backset, but that would leave a gap in the hinge mortise.) Remove the door and make the necessary adjustments.

Since you've only used one steel screw in each hinge, you can bore one of the remaining holes to snug the hinge to the new back edge. During final hanging, be sure to put these screws in first.

Once you're happy with the mounting, install the brass screws, making sure the slots in their heads are all in alignment for a truly professional look. Then finish off the striker stile with the door installed. See Fundamentals on p. 20 for that. □

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Router won't fit? Mortise by hand

If your door rails are narrow, your hinge locations might end up too close to the top and bottom of the door opening for your router to fit there. Don't worry, it's not hard to cut clean hinge mortises completely by hand.



Scribe the depth. Set a marking gauge (or a router plane) to the thickness of the hinge leaf, and then scribe a line along the front edge of the cabinet.



Break the fibers. Use a series of crisscross chopping cuts to break up the waste.



Pare away the waste. Gentle paring cuts will remove most of the waste.

Plane or chisel to final depth. If you have a router plane, use it to ensure an even bottom with uniform depth. If not, you can do the job with a wide chisel.

