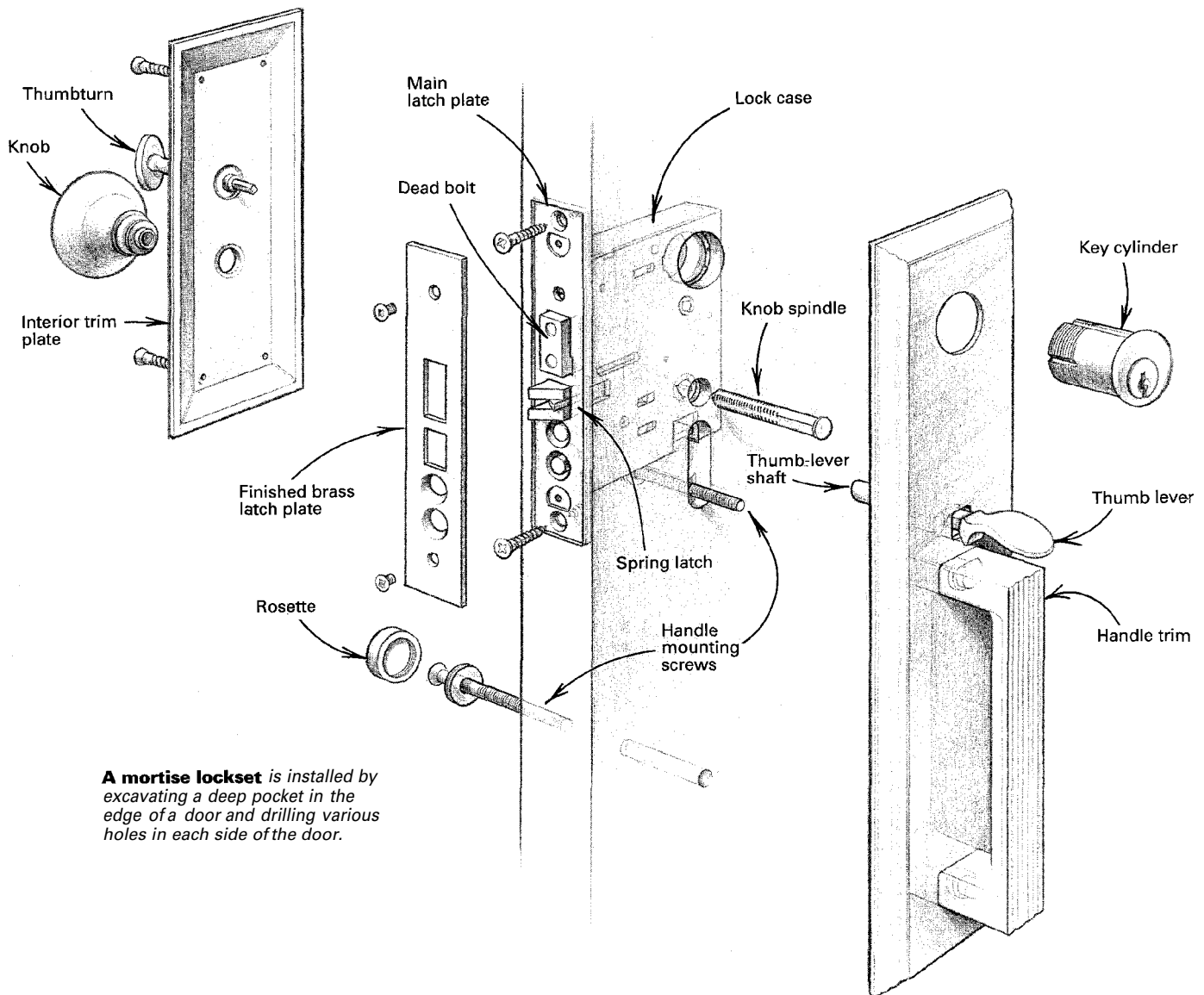


Installing Mortise Locksets

Whether you drill and chisel or rout with an expensive lock mortiser, cutting a big hole for the case is only part of the job



A mortise lockset is installed by excavating a deep pocket in the edge of a door and drilling various holes in each side of the door.

by Gary M. Katz

Mortise locksets (drawing above) are generally considered to be the Cadillacs of door hardware. That's because their larger cases are stronger and wear longer than bored locksets and dead bolts. And because the spring-latch and the dead bolt are housed together, they can be interconnected. For example, some mortise locksets require only one key to retract both latch and dead bolt at once. But mortise locksets are also expensive and difficult to install.

Installing a mortise lockset involves lots of precise drilling. There's the deep pocket, or mortise, in the edge of the door and another mortise in the jamb. There are holes of various sizes on both sides of the door for the knobs, the handles, the levers and the dead bolt, and these holes have to line up precisely. It's possible to do all this drilling freehand, but this article will focus mostly on the tools that speed mortise-lockset installations.

Premortise—The first thing I do when I install any mortise lockset is to figure out the handing of the lock. Holding the lock case with the dead bolt up

and looking at the taper of the spring-latch indicates whether the lock was meant for a right-handed door or a left-handed door. Don't unscrew the lock case and try to switch the handing of the lock unless you want to end up with a pile of parts.

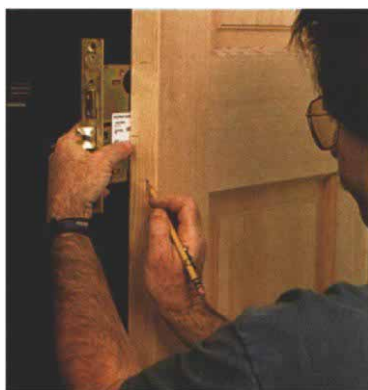
Next I measure the backset of the lock case and the width of the door's lock stile. Backset is the distance from the latch plate to the center of the knob-spindle hole. A mortise lockset with a $2\frac{3}{4}$ -in. backset is too wide for the 4-in. lock stile of a standard French door. If the lockset has a $2\frac{1}{2}$ -in. backset, I measure the lock stile anyway. Some carpenters install doors by hinging them, then planing the lock stile to fit it. The more a lock stile has been shaved, the easier it is to mortise completely through the wood.

Various handles, knobs and levers are available for mortise locksets. Handle trim sets with thumb levers are common on entry doors, but I always check the trim set that comes with each lockset. You don't want to drill for a handle trim set, then reach into the carton and unwrap a knob. Knob and lever trim sets will not cover the holes drilled for a handle trim set.

Positioning the hardware—

I hold the lock case and the handle set against the door to help visualize where the trim will be positioned. If necessary, I adjust the lock height so that the trim is centered on the lock rail. But keep in mind that the most comfortable position for a thumb lever is between 34 in. and 38 in. high. I pencil a mark on the edge of the door at the top and bottom of the case (1).

For a Baldwin mortise lockset, which is the most common brand, I like to make the mortise 6¼ in. high by 1½ in. wide—slightly larger than the lock case—so that the lock case slips easily into the finished hole. There are several different methods you can use to excavate this mortise.



1. Locating the mortise lock case.

Freehand mortising—In the distant past I cut mortises freehand with a drill and a chisel. Freehand mortising must be done very slowly and carefully. Lock cases are usually 7⁄8 in. wide, so I bore a series of 1½ in. holes using a ½-in. drill fitted with a spade bit. Holding the drill firmly with two hands, square to the door (2), I drill the top and the bottom holes first and then make overlapping holes as close together as I can to minimize chiseling later. Some people



2. Drilling a series of overlapping holes.

clamp blocks on both sides of the door to support the thin stock. I always use a piece of tape on the spade bit for a stop guide so that I don't drill too deep. A sharp, wide chisel can be used to shave the sidewall of the mortise (3).

You can also use a lock-boring jig (see *FHB* #79, p. 42) to make the holes for a mortise. It works like a drill press that you clamp to the door. Using a jig guarantees that you'll drill straight, but it too is a little slow.



3. Shaving the mortise clean.

Using a lock mortiser—Several years ago I landed a job that included 12 mortise-lock installations. Because the standard installation fee is between \$80 and \$100, that job justified the purchase of a Rockwell lock mortiser (now Porter-Cable model 513, Porter-Cable Corp., Youngs Crossing at Hwy. 45, P. O. Box 2468, Jackson, Tenn. 38302-2468; 901-668-8600). A similar tool is available from Bosch (Robert Bosch Power Tool Corp., 100 Bosch Blvd., New Bern, N. C. 285624097; 919-636-4200). My mortiser lists for \$1,025, but it makes short work of the 40 or so mortise locksets that I install each year.

The tool consists of a router and an adjustable jig that clamps on the edge of a door. A handle cranks the router up and



4. Engaging the bit drive.

down on the jig, with each pass driving a long carbide-tipped bit deeper into the door. The adjustable depth stop keeps the bit from going through the lock stile, and a dial adjusts the height of the mortise.

Before I start the mortiser, I press a button to engage the gears that drive the bit (4). Then I switch the tool on and crank it up and down the bars on which it is mounted (5). Each vertical pass gradually drives the bit deeper. When the bit reaches the proper depth (about ½ in. deeper than the lock being installed), the depth stop automatically disengages the gears that drive the bit, stopping the bit from mortising any deeper. The entire operation, from setup to breakdown, takes about five minutes.



5. Using the lock mortiser.

Installing the lock case—Sliding the lock case into the mortise, I trace the outline of the latch plate onto the edge of the door, which helps to position my router template (for more on making router templates, see *FHB* #79, p. 45). I rout a ¼-in. deep mortise for the latch plate (6) and square the corners with a corner chisel.

The lock case won't seat completely in the mortise unless you chisel out a 1-in. high by ¼-in. deep notch on each side of the mortise (7). These notches make room for the latch hinges, which project behind the latch plate.



6. Routing for the latch plate.



7. Notching for the latch hinges.

Trim preparation—The next step is to lay out the locations for the handles, the dead bolt and the decorative plates, collectively called the trim. This means marking each side of the door and then drilling a series of holes through the door and into the mortise.

For accuracy and speed, I made a layout template from a piece of ¼-in. oak (drawing below). I transferred the layout from a manufacturer's paper template, along with the actual lock-spread measurements, and by trial and error (the paper templates aren't all that accurate) I finally made a template that works fine for mortise locksets with 2½-in. backsets, the most popular size that I install.

Securing this template on the face of the door with a spring clamp, I mark with a sharp awl the locations for four of the five holes. I intentionally have not included the fifth hole, for the bottom handle-mounting screw, in my layout template. All exterior trim must be measured. Baldwin manufactures many different handle sets, most of which have

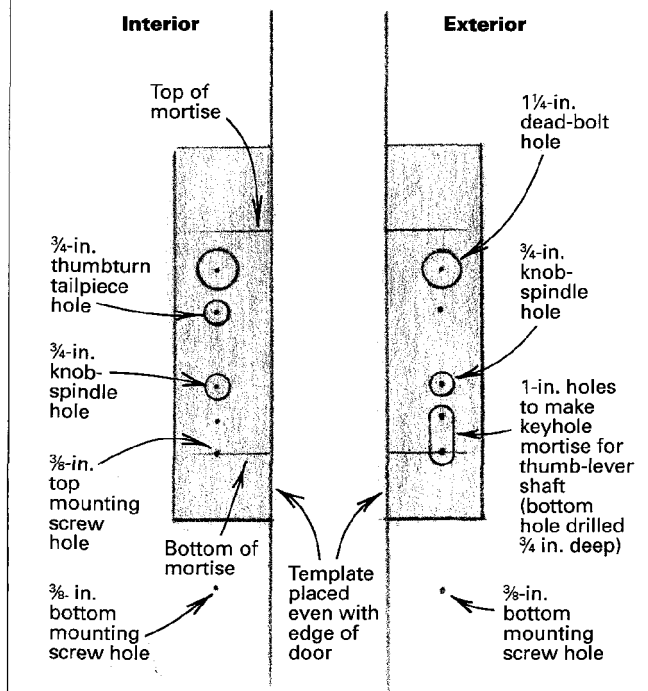
different bottom mounting-screw locations. With the trim in hand, I measure from the center of the dead-bolt hole to the center of the bottom mounting screw (8), then transfer this measurement to the door.

I use the same template to mark the interior layout (9). The interior requires only four holes, three marked using the template and one below the template for the bottom mounting screw. Again, I measure for the location of this hole.

When it comes time to drill (10), I start all the through-holes on one side and finish them from the other side. Other holes, like the thumbturn hole, are drilled only in one side of the door. The template aligns the holes, and drilling from both sides prevents the bits from chipping the back of the door.

On the exterior of the door, I connect the third and fourth holes by carefully chiseling out the wood between them, forming a keyhole mortise (11).

A layout template, made of ¼-in. thick oak, quickly and accurately identifies the locations and the sizes of the holes that accommodate a mortise lockset's trim.



8. Measuring the trim.



9. Marking the layout.



10. Drilling the interior layout.



11. Chiseling keyhole mortise.

Installing the lock—Because the edge of a door is beveled, the lockset's main latch plate (there's also a finished brass plate that fits over the main plate and is installed later) must be adjusted to match the bevel of the door. Otherwise, the case won't sit squarely in the mortise, and the dead-bolt key cylinder won't seat properly against the exterior trim. Screws on the top and the bottom of the lock case allow you to adjust the latch-plate bevel.

Once the lock case fits, you can insert the threaded spindle that will hold the interior knob (12). This spindle threads in from the door's exterior and cannot be installed once the exterior trim is in place.

On Baldwin locksets you have to cut the thumb-lever shaft to match the thickness of the trim and the door you're working on. Hold the exterior trim with the thumb-lever shaft against the linkage plate (13). The shaft is so long that the trim can be more than an inch from the face of the door. Measure that distance, then cut that amount off the shaft with a hacksaw.

With the thumb-lever shaft trimmed and the handle set in place, carefully thread the dead-bolt key cylinder into the lock case (14). Use a key to turn the cylinder all the way in. Both Baldwin and Schlage happen to use the same keyways, so I use a Schlage key to tighten cylinders. I've found that Schlage keys are stronger than Baldwin keys, which I've

had snap off inside the lock. On the face of the main latch plate there's a set screw that secures the dead-bolt key cylinder.

Two wood screws mount the lock case in the door; I drill for these screws first. While tightening the screws, I check every function of the lock; one overly tight screw can really foul things up. Now the finished brass plate can be installed over the main latch plate.

Next come the two handle-mounting screws. These screw into the back of the handle from the interior side of the door. The upper screw is hidden behind the interior trim, and the lower screw (15) has a threaded base and a finishing washer that accepts a rosette, which covers the screw. Again, while tightening these and all other screws, I check all the functions of the lock, making sure the dead bolt throws and retracts with the key, that the thumb lever retracts the latch, and that the latch springs back.

To install the interior trim, I start by engaging the tailpiece of the dead-bolt thumbturn into the lock case. Next, I thread the handle-set knob or lever against the trim plate (16) tight enough to hold the trim plate in the right position. After drilling pilot holes and installing the brass screws to secure the trim, I check again to see that the lock functions smoothly. Then I tighten the interior handle until it causes the latch to hang up in the case. I back off one turn and tighten both set screws.



12. Threading in the knob spindle from exterior.



13. Measuring the thumb-lever shaft.



14. Use a key to tighten the dead-bolt cylinder.



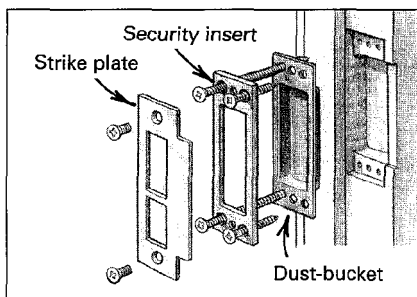
15. A mounting screw secures bottom of handle.



16. Threading the knob onto the spindle.

Installing the strike plate—On a Baldwin mortise lockset, the strike plate is mortised into the jamb 1½ in. below the top of the lock's latch plate, with the large hole for the dead bolt up (drawing right). I use a router template to make the strike-plate mortise (17), setting the router's depth for the thickness of the strike plate, the dust bucket and the security insert—a steel plate installed behind the strike plate that strengthens the strike plate.

To check the location of the strike plate, I measure the edge of the door from the exterior face to the interior side of the latch. This is the distance that the interior side of the strike plate's latch opening should be from the doorstop. If the strike plate is too close to the doorstop, the latch will not enter the latch hole; if the strike plate is installed too far from the stop, the lock will latch, but the door will rattle in the jamb.



17. Making a shallow strike-plate mortise.

After routing the shallow mortise for the strike plate, I drill pilot holes for the mounting screws. Then I can position my 1-in. wide by 3½-in. long mortise for the dust bucket. I use a 1-in. Forstner bit to drill overlapping holes for this mortise, which I make freehand. It's easier to overlap holes with a Forstner bit than with a spade bit. Then I clean up the sides of the deeper mortise with a chisel.

With the dust bucket, the security insert and the strike plate screwed into place, I pull my cords out of the opening, sweep aside the sawdust and slowly swing the door shut. I hold my breath as the door hits the stop. I wait for the latch to fall into the strike. Clunk-klunk. The dead bolt next. Click-klunk. Then my lungs relax, my blood flows, and I'm ready for another door. □

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