



800.527.11

Entry & Interior Door Router Bit Set

Instruction Manual



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USER INSTRUCTIONS

Congratulations on your purchase of the **CMT Entry Door Set**. This set will help open new doors in your woodworking experience by allowing you to make your own entry doors. In addition to doors, the tenon cutter included with this set can be used for other woodworking projects that require tenons, such as tables and chairs.

Following are complete step-by-step instructions for using the **Entry Door Set**.

Be certain to unplug the router whenever you are making adjustments or doing bit changes.

All of these cutters are to be used in a router table only, never in a hand-held router. While a 2-1/4-hp router will work, CMT recommends using a 3-hp (15 amp) router. The router must be equipped with variable speed to provide the low rpm needed for the tenon cutter.

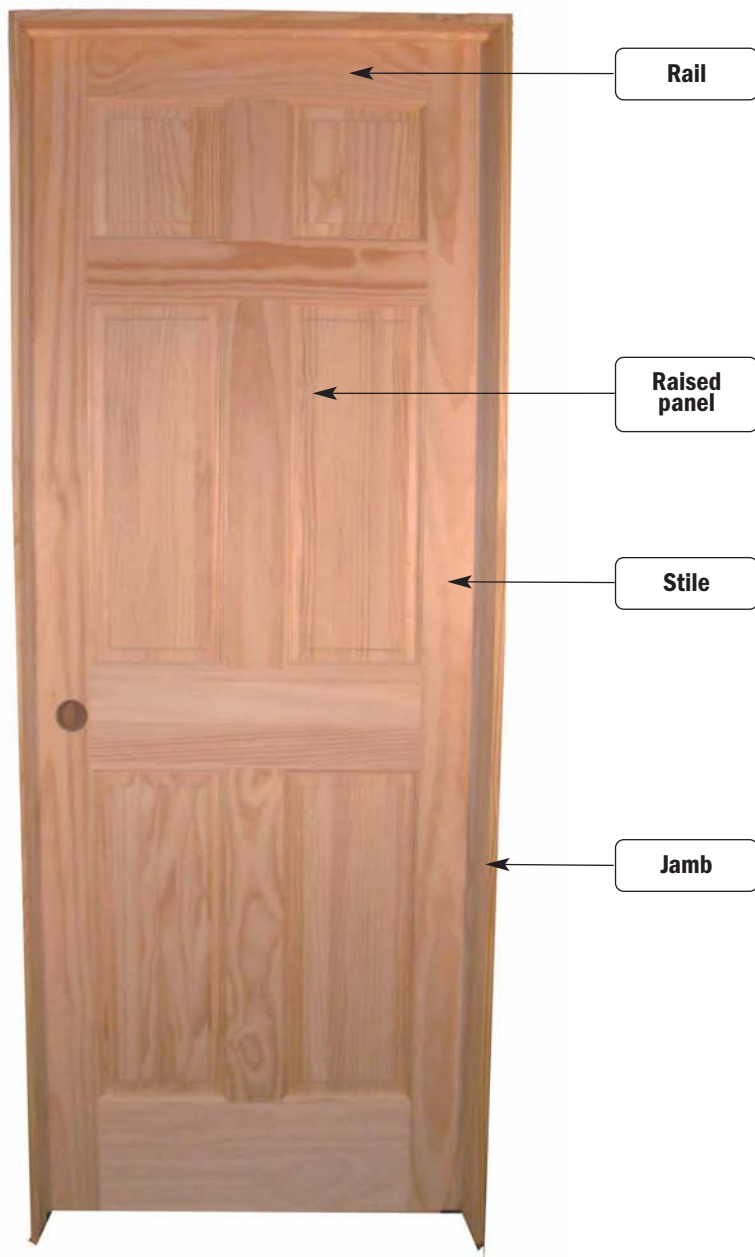
When milling your door stock make extra pieces that can be used for test cuts. It's critical that pieces used for test cuts are exactly the same thickness as your door parts.

You'll also need to make a Gauge Stick, which will be used for setting the fence. Make the Gauge Stick 1/2-in. x 1/2-in. x 12-in.

Read through the instructions completely so you know and understand the entire process before setting up your first cuts.

CMT recommends that you make and master a set of practice joints before attempting your first door.

ANATOMY OF A DOOR



MAKE THE TENONS FIRST

Set the height of the tenon cutter

Mount the tenon cutter in your router. Set the height of the cutter so it is centered on the thickness of your door material.



Position the Gauge Stick on the miter gauge

Don't try to cut the entire tenon in a single pass. Depending on your router, you may do it in two or three passes. The full depth of cut of the tenon cutter is 1-1/16-in. Make a mark on the Gauge Stick indicating the depth of the first pass. If you'll be making the cut in two passes, the mark should be 1/2-in. from the end. Align the mark with the tip of the cutter and clamp the Gauge Stick to the miter gauge.



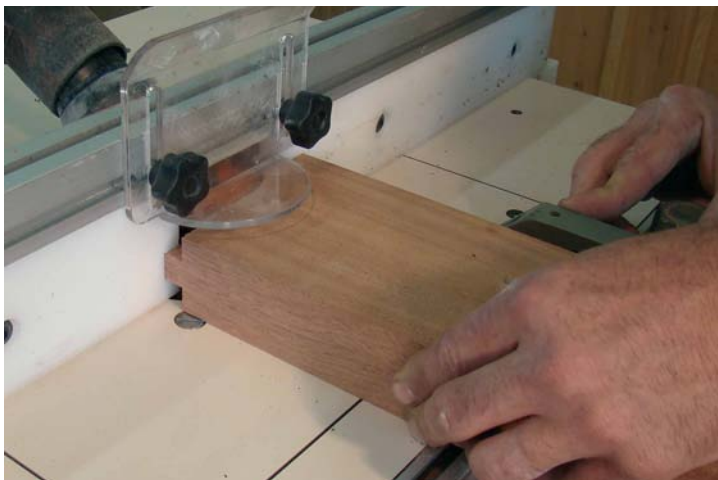
Locate the fence

Since you'll be using a miter gauge to make the tenon cuts it's critical that the fence is parallel to **and** the correct distance from the miter gauge slot. With the Gauge Stick clamped in place position the miter gauge at both ends of the table and gently slide the fence against the end of the stick. Lock the fence and check your work.



Check the cutter height

Make a test cut in material that is exactly the same thickness as your door parts. Check that the resulting tenon is centered. Make bit height adjustments as needed before cutting the door rails.



MACHINE THE RAIL ENDS

With the bit height correctly set make the first pass on the ends of all the rails.

Use a piece of scrap to support the trailing edge of the material and eliminate chipping. Because of the large pieces required for entry doors, it's easiest to clamp the work to your miter gauge, rather than hand-hold it.



After the preliminary cuts are made you're ready for the full depth pass. Touch the Gauge Stick against the core of the tenon cutter while clamping the stick to the miter gauge.



As before, use the Gauge Stick to set the fence parallel to the miter gauge slot.



Finish the tenon cuts on all the rails.

MAKE THE LONG GRAIN CUTS. SET UP THE CUTTER AND FENCE

Insert the long grain cutter in the router table. Set the height of the cutter so the top of the cutter is even with the top of the tenon you made previously.

Set the fence by bridging the opening in the fence with a straight edge. The straight edge should touch both faces of the fence and the ball bearing on the router bit. You won't be using the miter gauge, so it's not important to make the fence parallel to the miter gauge slot for these cuts.



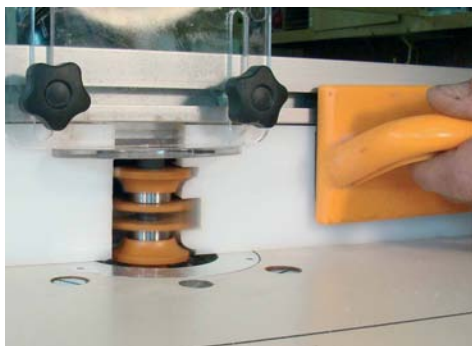
Make a test cut in a piece of scrap that is the same thickness as your door material. Featherboards on the fence will help hold the material down to the router table top.



Check the set up by slipping a tenon into the groove and checking alignment across the tops of the pieces. The tops of both pieces should be even. Adjust the height of the bit as needed.

MAKE A ZERO CLEARANCE FENCE

When the bit height is correct make a zero clearance fence by pushing the infeed half of the fence into the spinning bit. This will significantly reduce chipping on your door parts.



MAKE THE CUTS

Make the long grain cut on all your door parts. If you're making a door with a center rail, make long grain cuts on both edges of the rail.



COPE THE ENDS. SET UP THE CUTTER AND FENCE

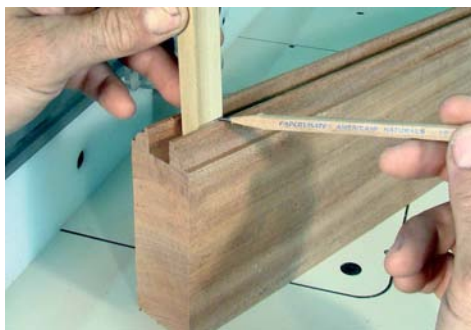


Insert the coping cutter in your router.



Set the height so it's even with the groove produced in the previous step.

Insert the Gauge Stick into the groove and make a mark even with the top of the groove.



Align the mark on the Gauge Stick with the tip of the coping cutter and clamp the Gauge Stick to the miter gauge.



As before, use the Gauge Stick to make the fence parallel to and the correct distance from the miter gauge slot.



Make a test cut and check the set up.
Machine a test piece

Insert the test piece into the long grain cut to check the fit. The stub tenon should be snug in the groove and the joint should close. If the tenon is too loose you should lower the cutter. If the tenon is too tight you must raise the cutter.



If the fence is too far forward the tenon will be too short, as shown here. Adjust the fence by moving *both* ends.



If the fence is too far back the tenon will be too long, as shown here. In this case move *both* ends of the fence forward.



Machine a support block when the fence position and cutter height are correct. The support block must be the same thickness as your door material, 2-1/2-in. wide and 16-in. long.



The positive profile formed on the edge of the support block will fit into the negative profile of the long grain cut.

Use the support block on the trailing edge of the cut to eliminate chipping when coping the end grain of the rails.



Clamp the square edge of the support block against the material when the trailing edge is square. Machine both ends of all the rails.



Cut the extra-long tenons by moving the fence back from the cutter and undercutting the tenon produced in the previous steps.

MORTISING THE STILES AND HAUNCHING THE RAILS

In order to assemble your door you'll need to cut mortises in the stiles to receive the long tenons you cut on the ends of the rails. There are a variety of methods for doing this; hand-held plunge router, mortise machine, drill press, or even hand chopping with a chisel. The method you choose for your door will depend on the tools you have in your shop.

After you've mortised the stiles you'll need to haunch (cut a square shoulder) into the long tenon on the rails.

DOWN SIZING THE LONG GRAIN CUTTER FOR 1-3/8-IN. THICK DOORS

Passage, or interior, doors are typically 1-3/8-in. thick. You'll need to downsize the long grain and tenon cutters in order to make passage doors.

Begin by disassembling the long grain bit. Use a 13-mm wrench on the nut on the end of the bit, and a 17-mm wrench on the shank of the bit.



Slide the top cutter, bearing, and upper slot cutter off the bit arbor. Remove the two spacers from between the upper and lower slot cutters.



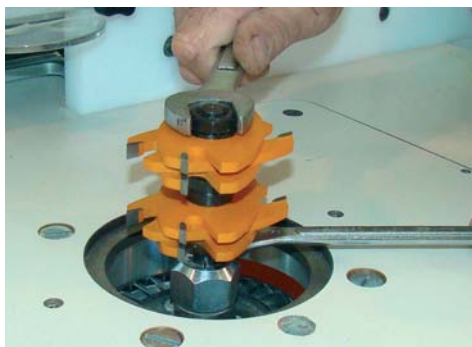


Slide the upper slot cutter back on to the arbor, making sure the carbide tips are clear of each other. Replace the bearing and upper cutter. Store the two spacers you removed in the previous step between the upper cutter and nut. Tighten the bit stack.

ADJUSTING THE TENON CUTTER

The tenon cutter included with your CMT Entry and Passage Door Set can be used for a variety of woodworking operations. In order to make smaller tenons required for passage doors and furniture projects, you'll need to downsize the bit.

Disassemble the bit using a 19-mm wrench on the nut on top of the bit and a 17-mm wrench on the bit shank.



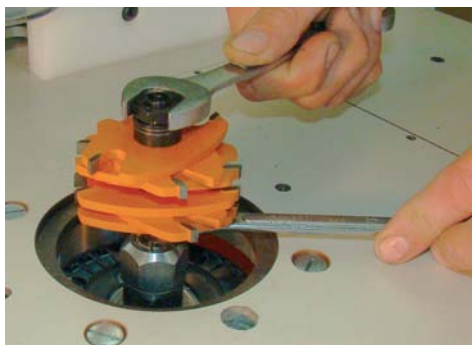
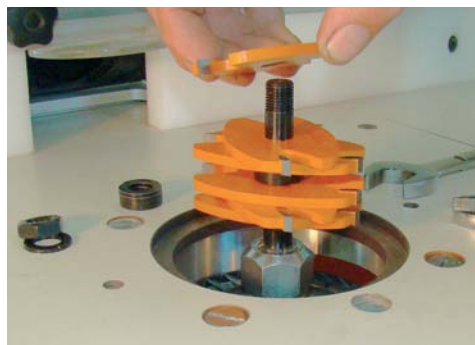
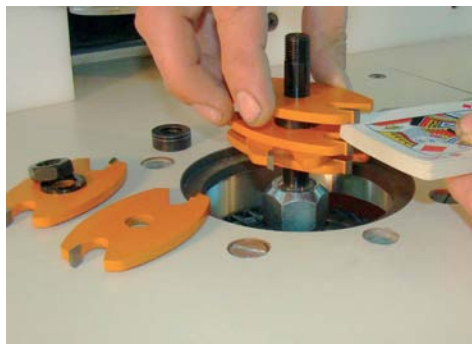
Set aside the three upper slot cutters and remove the spacers from between two cutter sets.



Find the size of the tenon you need to produce. An easy way to do this is by slipping a stack of playing cards in to the mortise (or groove if you're making a passage door) to gauge the size..

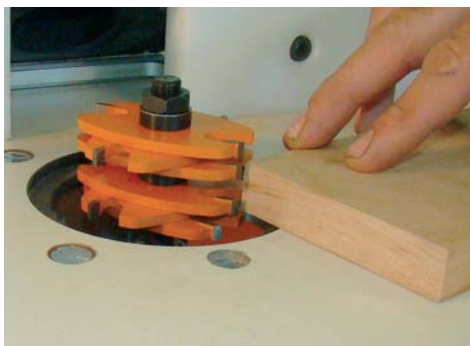


Use the same stack of cards to determine which spacers should be placed between the cutter sets.



Replace the upper set of cutters and tighten the bit stack.

Set the height of the tenon cutter.



Make a test cut. Use a piece of scrap behind the rail to prevent blowout when the bit exits. Narrow pieces must be clamped into a miter gauge.

Check the fit of the tenon. If it's too loose add spacers between the upper and lower cutter sets. If the tenon is too tight remove spacers. Make test cuts until you've achieved a perfect fit.



After accurately machining the tenon, cut the shoulders on the top and bottom by standing the board on edge.

Use a piece behind the rail to prevent blowout when the bit exits, and to help keep the board vertical.



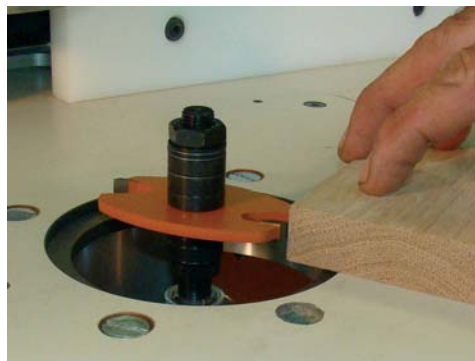
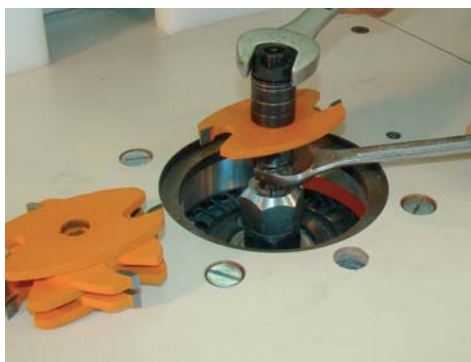
USING THE TENON CUTTER AS A SLOT CUTTING BIT

Start by loosening the bit stack, as shown above.

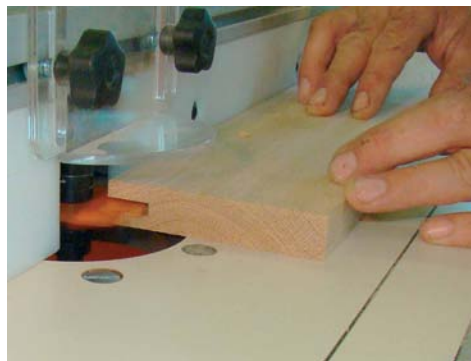
Remove all the cutters and place enough spacers on the bottom of the bit arbor to position a single cutter in the center of the arbor.



Tighten the bit stack.

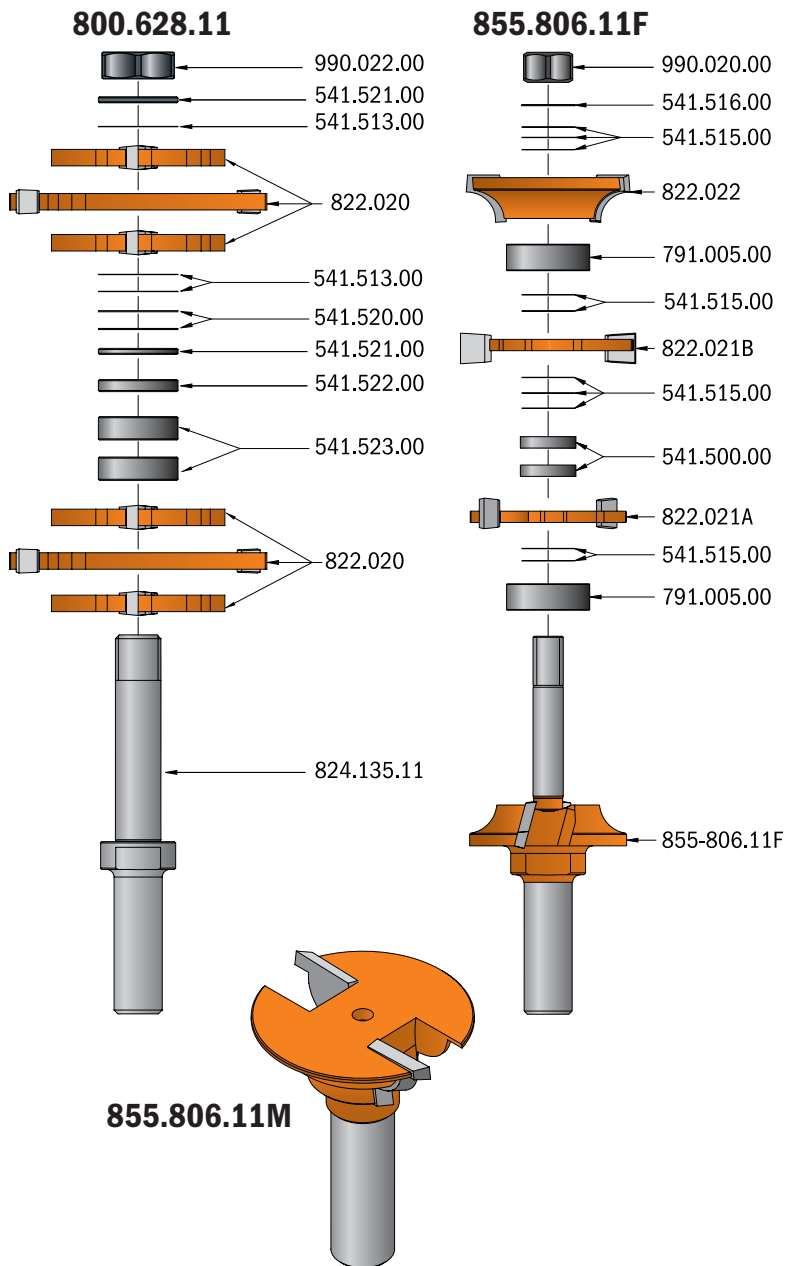


Set the height of the bit.



Position the fence to control the depth of the slot. Make the slotting cut.

ASSEMBLY





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