D1600 CHAPTER 9

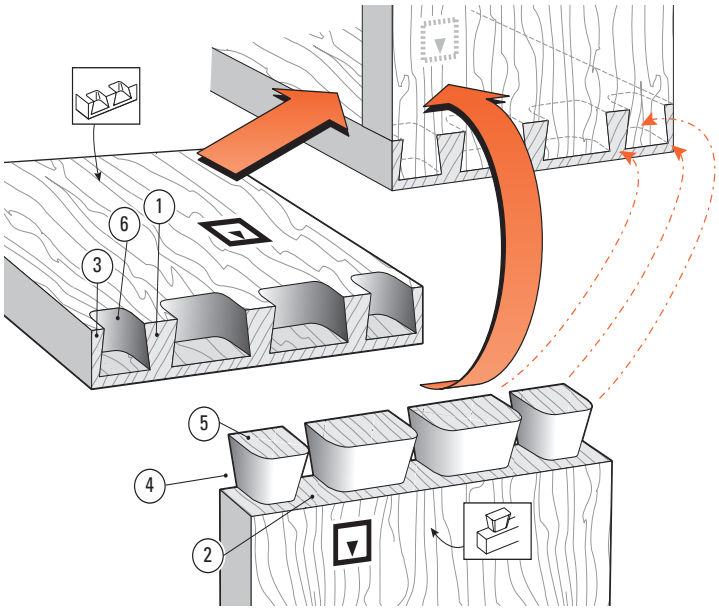
Half-Blind Dovetail Procedures

Chapter Foreword.

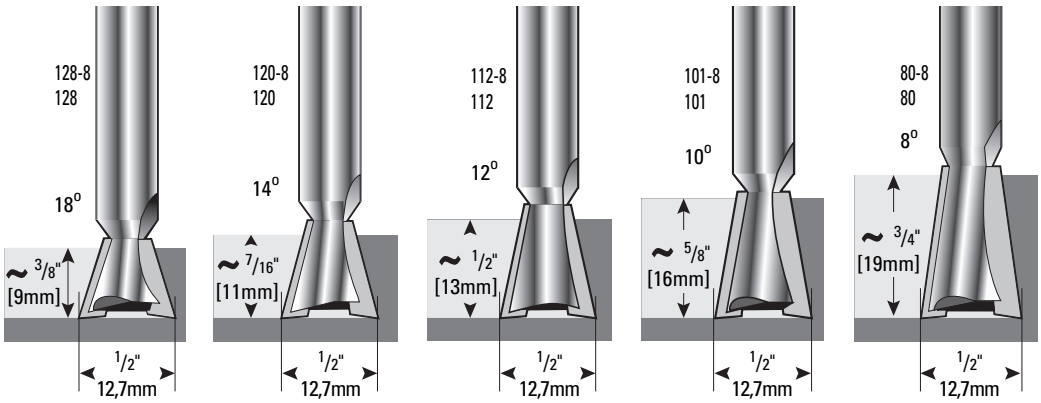
IMPORTANT!

The most commonly misunderstood aspect of routing half-blind dovetails is how the dovetail cutter's depth of cut is used to adjust the joint fit, and how the angle of the cutter affects that depth of cut. Reviewing the instructions and illustrations in this chapter will make this concept clear.

Note: Only a 7/16" OD guidebush and the five cutters listed on the next page may be used for half-blind dovetails. See "Half Blind Cutter Selection" in Appendix II for a full description on how to select the appropriate cutter.

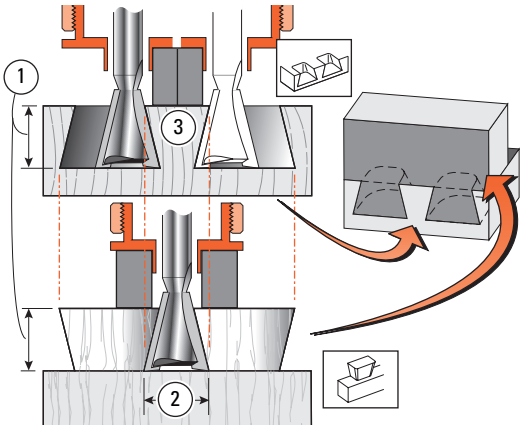


9-1
Half-blind Dovetails:
① Pins
② Pin sockets
③ Half-pins
④ Half-pin sockets
⑤ Tails
⑥ Tail Sockets
The pins fit in the pin sockets. Joints should almost always end each side with half-pins.

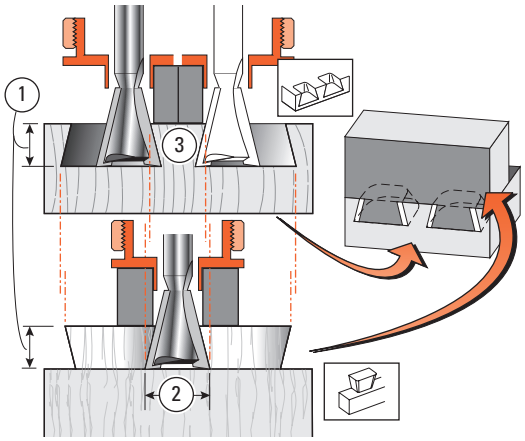


9-2 ⚠ Important! Read This About Depth of Cut

- Depth of cut must be as specified for each of the five cutters illustrated above.
- Raising the cutter above its specified cutting depth will result in loose joints and may damage the jig, cutter and/or guidebush. A lower setting will result in tighter joints that may not fit together.
- Small Depth of Cut adjustments will change joint fit tightness. See 9-3 to 9-5 for why.
- Half-blind PINS and TAILS are routed with the same dovetail cutter and must be at the same Depth of Cut.
- Choose one of the five ½" [12,7 mm] diameter dovetail cutters shown above, and check cutter selection in Appendix II.
- Use only 7⁄16" [11,1 mm] outside diameter guidebushes.

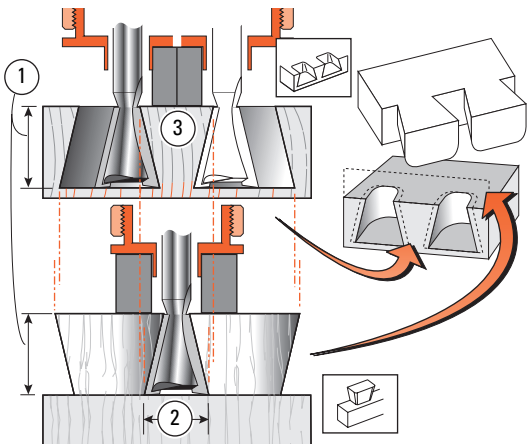


9-3 Joint Fit and Depth of Cut
Here's why the depth of cut ① changes the fit in half-blind dovetails. Increasing or decreasing the depth of cut does not affect the pin socket width ②, but does affect the width of the pin ③ that goes into the socket ②.



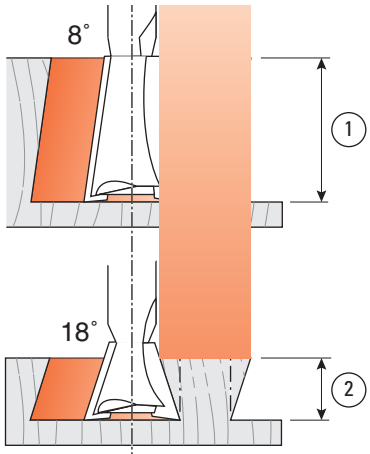
9-4
Note that decreasing the cutter depth ① makes the pin ③ narrower while the pin socket ② stays the same width, producing a loose fit.

Decreasing the cutter depth (i.e. raise the cutter into the router) produces a looser fit.



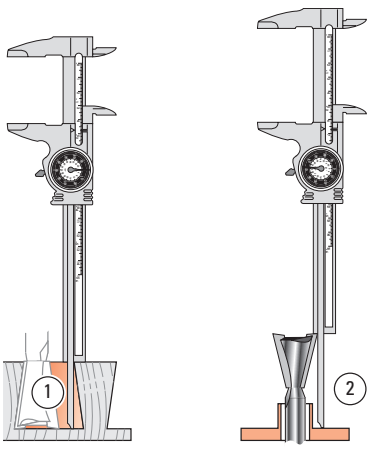
9-5
Increasing the cutter depth ① makes the pin ③ larger while the pin socket ② stays the same width, producing too tight a fit.

Increasing the cutter depth (i.e. lower the cutter) produces a tighter fit.

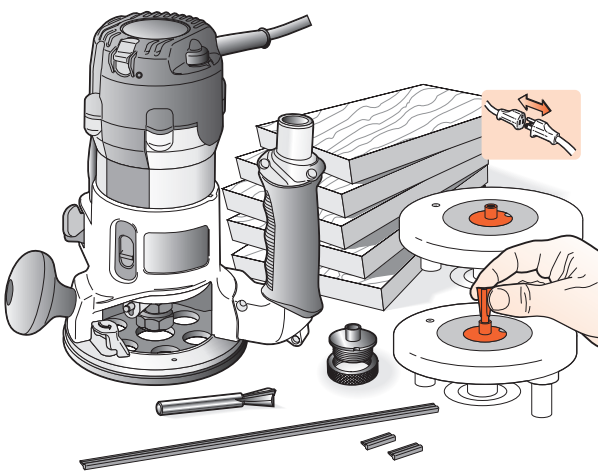


9-6 Cutter Angle and Depth of Cut.
Both the pins and tails of a half-blind joint are routed using the **same** dovetail cutter, with the **same** guidebush and at the **same** depth of cut.

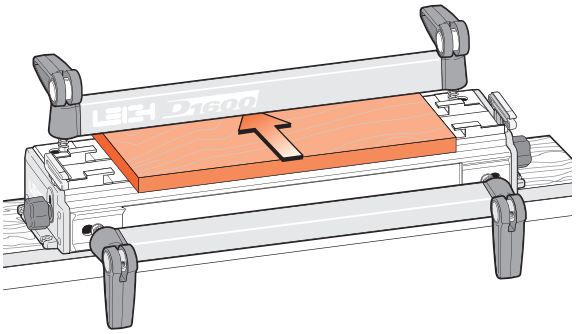
The only way to select a different depth of cut is to use a different angled cutter. Leigh provides five different angled dovetail cutters for a range of cut depths. The lesser the angle, say 8°, the deeper the cut ①; the greater the angle, say 18°, the shallower the cut ②.



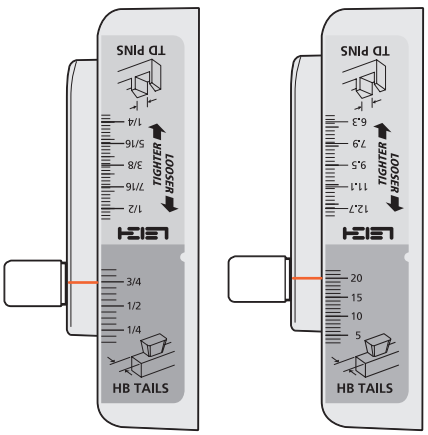
9-7
Just as with through dovetails, the cumulative plus and minus tolerances in the manufacturing processes of routers, cutters and guidebushes, makes it impossible to provide the exact cutter depth setting to provide a first-time precision fit. It is only by trial and error test cuts that a fine fitting joint can be attained. This trial-and-error testing is common to all dovetail jigs. The good news; we provide you with the starting depth for each cutter and the 'best fit depth' is measurable and recordable for all future first-time fits, by measuring either the successful depth of cut ① or the cutter projection ②.



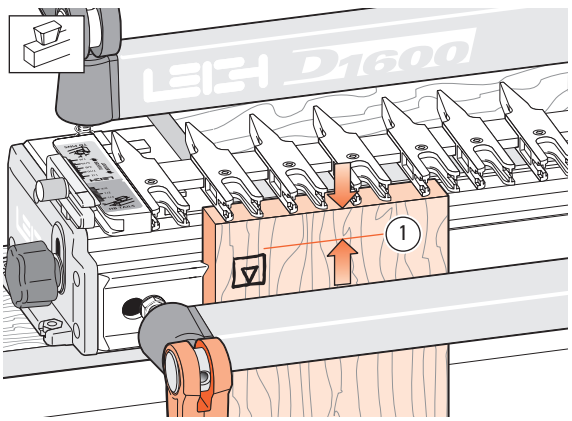
9-8 CUTTING A TEST JOINT
You will need one router, a 7/16"[11,1mm] guidebush, either the provided No.120 - 8 ½"[12,7mm] 14° dovetail cutter or equivalent. The 80 series cutters cut too deep for ¾"[20mm] boards (see the HB cutter selection charts in Appendix II). You will also need several pieces of ¾"x 5 ½"[20x140mm] x 8"[200mm] or so long, and the plastic bridge piece extrusion. *Note: Half-blind pin boards must be a minimum ½"(13mm) thickness for clamping. Thinner boards must be packed up from the jig body; see 9-22.*



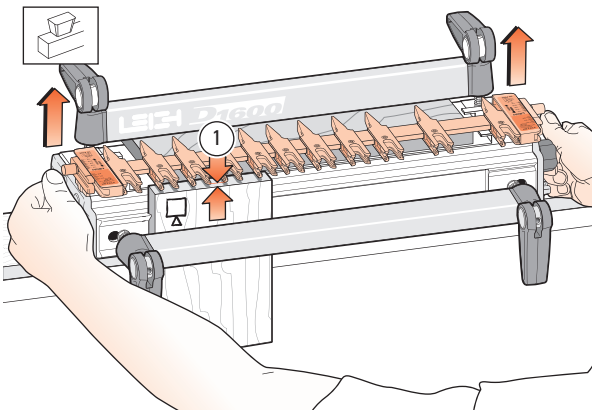
9-9
Clamp the spacer board in the rear clamp.



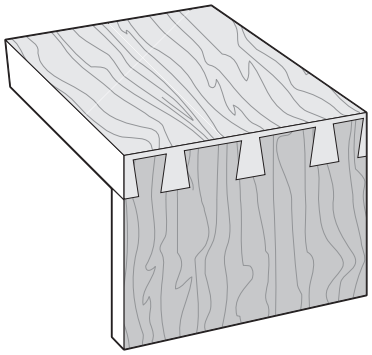
9-10
Mount the finger assembly on the support brackets in the HB TAILS mode, **flat on the spacer board**, *scales set on the thickness of the tail board* (¾"[20mm] in this instance). **The** HB TAILS **scale is always set at the tail board thickness.**



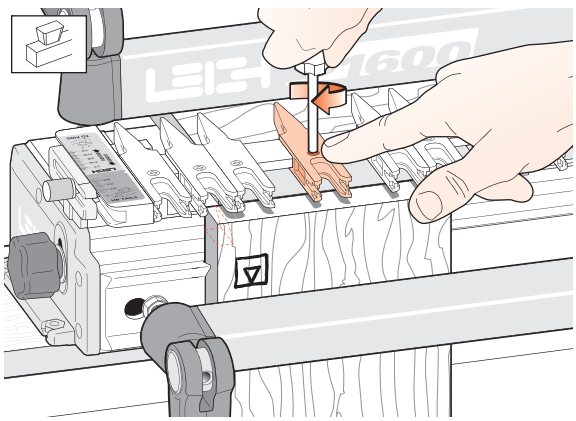
9-11
Measure and mark a line on the inside face of the tail board ① to the working depth of the cutter to be used as in 9-2. Clamp this test tail board in the left front clamp, against the side stop with the top edge flush under the guidefingers, and the inside face ⊡ of the drawer side away from the jig.



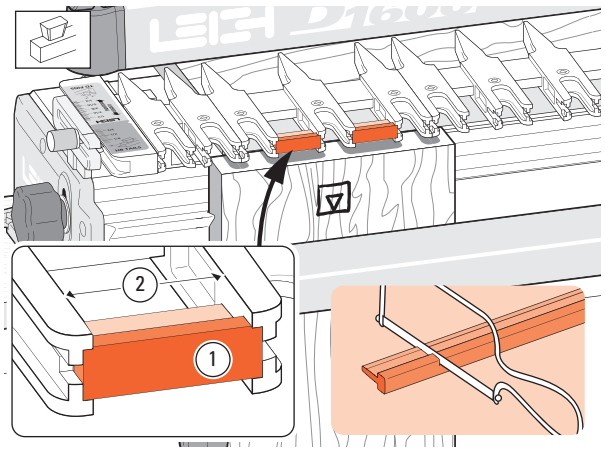
9-12
Unlock and raise the finger assembly support brackets slightly so that the finger assembly is about 1/16"[2mm] ① above the boards. This will allow easy movement of the guidefingers.



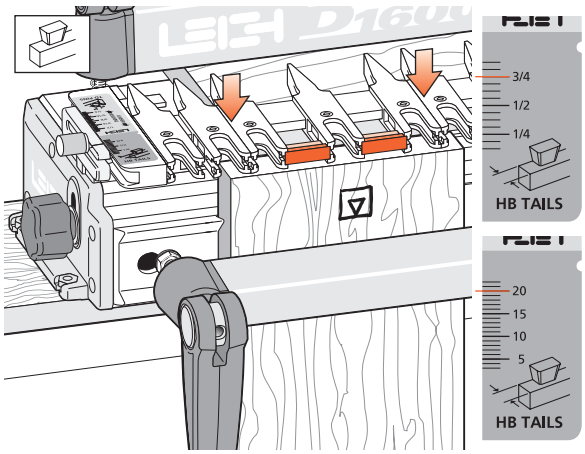
9-13
The following joint design is only a suggestion for this trial. It has a typical and traditional even layout of pins, with half-pins at each edge. The Leigh jig, however, allows for an infinite variety of joint designs, and boards of different thicknesses can be joined to each other as shown in this illustration. Before attempting joints of asymmetrical design, please see chapter 14.



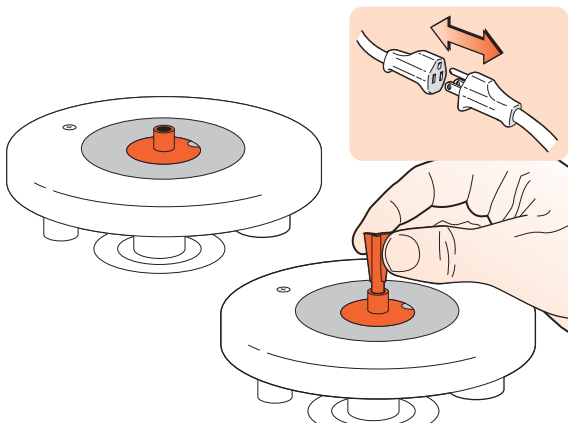
9-14
Ignoring the extreme outer guidefinger next to the scale (which just supports the router), loosen enough of the adjacent guides to give the required pin socket layout. The half-pin guidefinger position illustrated will give a half-pin socket profile like that shown (dotted lines).



9-15
If the gaps between the guidefinger tails are wider than about ⅛"[3mm], mark off and cut some pieces of bridge extrusion ① to fit into the slots in the ends of the guidefinger tails. Cut the pieces a "bare" ⅛"[3mm] more than the distance between the fingers ②. They are a firm friction fit.
After completing a project, save the bridge pieces for future use.



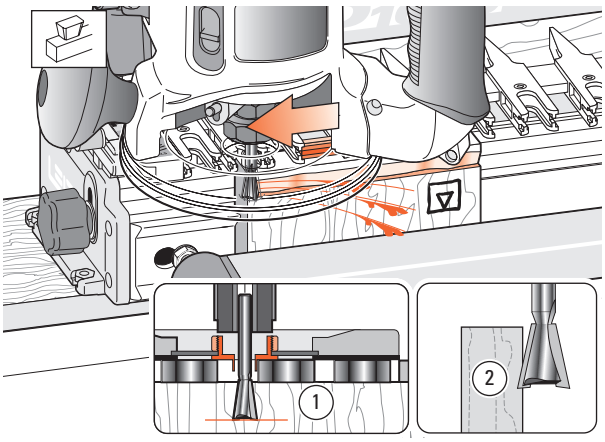
9-16
Remember to tighten any loose guidefingers. **Lower the finger assembly back onto the spacer board and workpiece. It must touch the workpiece or the depth of cut will vary and the joint won't fit.** The scale should be set on the tailboard thickness, in this case ¾"[20mm].



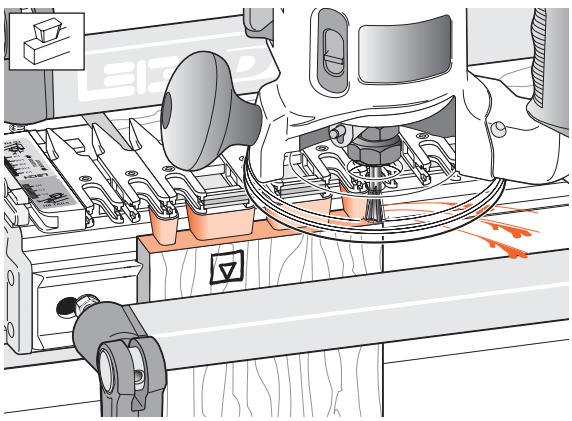
9-17
Attach the provided 7⁄16"[11,1mm]guidebush (or equivalent) to the router securely.

Mount the selected dovetail cutter to the router.

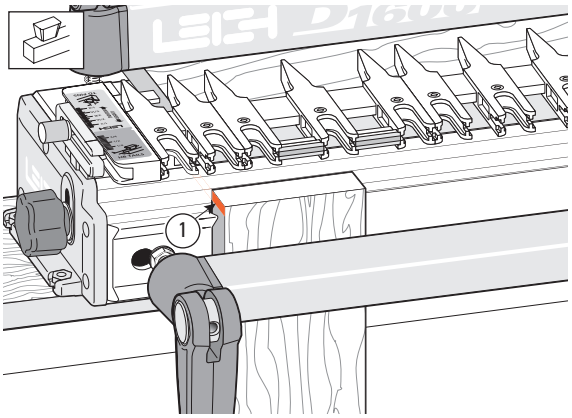
9-18
Remember to follow all safety precautions when routing.



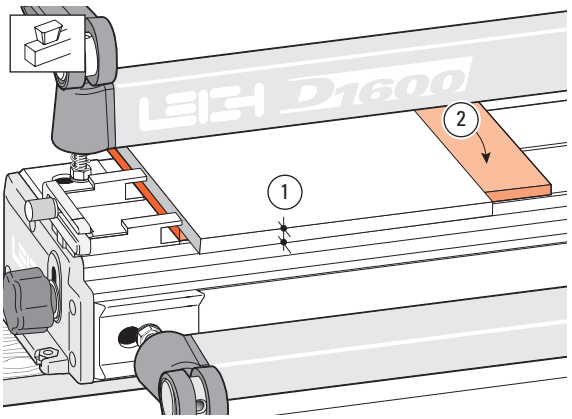
9-19 ⚠
Adjust the cutter height until the cutter tip is level with the marked line ①. For the first light cut move the router from right to left. **Make sure you control it firmly, because it is driven in this direction by the cutter. Only the tip of the cutter should be cutting on the first cut** ②. This *back* or *climb* routing leaves a very clean shoulder in side grain.



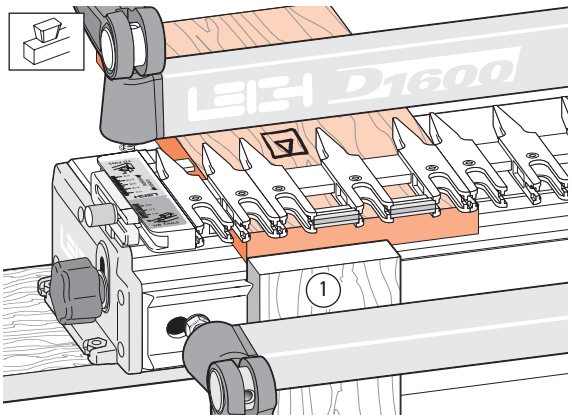
9-20
Now rout in and out from left to right following the guides and bridge pieces to rout out the pin sockets, leaving the tails.
See Hints and Tips 14-11.



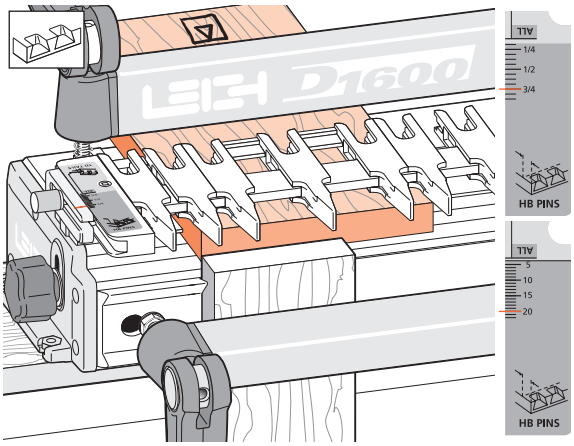
9-21
Remove the test tail board, then clamp a scrap board in the front of the jig so that the top edge projects above the top face of the jig by about ⅛"[3mm]①. This will keep the scrap piece below the path of the cutter when routing the pin board.
Remove the spacer board from the rear clamp.



9-22 If you're mounting Thin Pin Boards:
The minimum recommended pin board thickness is ½"[13mm]. Remember, the No 128 cutters rout at ⅜"[9,5mm] deep. If you wish to rout a pin board less than the minimum thickness ①, it will be necessary to pack the board up from the jig body. We suggest using a piece of ¼" to ⅜"[6 to 9mm] plywood for this purpose ②.



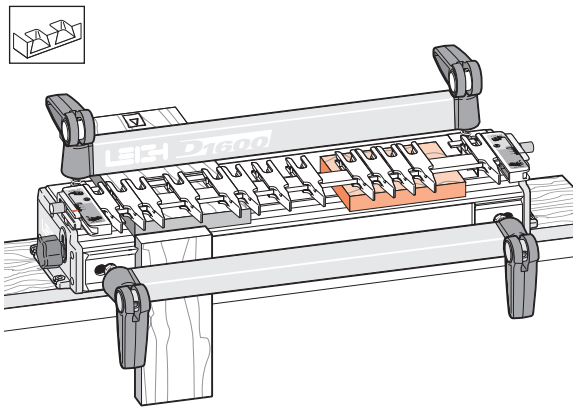
9-23 Flush Drawers
Place a test pin board in the left rear clamp against the side stop, fitting its front end edge flush against the vertical scrap piece, with the inside face ⊡ of the drawer front away from the jig body. The pin board is now positioned with the edge to be routed flush with the jig's front face, correctly registered for the scale readings. **For drawers with rabbeted fronts, see Chapter 10.**



9-24

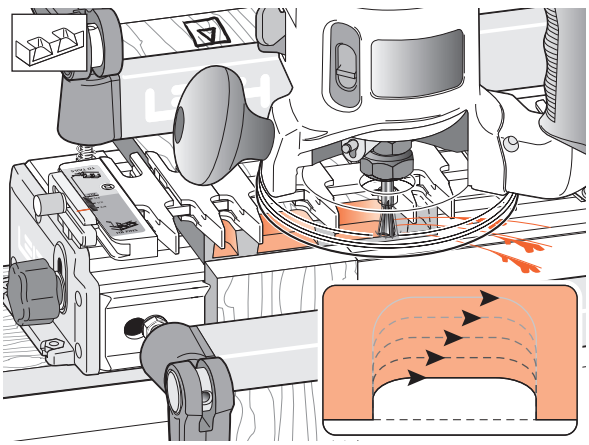
Rotate the finger assembly to the HB PINS mode and set the HB PINS scale *equal to the tail board thickness* (i.e., the same setting as for the tails: in this example, ¾"[20mm]). **Both HB pins and HB tail scales are always set to the tail board thickness.**

Make sure the finger assembly is flush and level on top of the pin board. The guidefingers must be touching the pin board or the depth of cut will vary and cause poor joint fit.



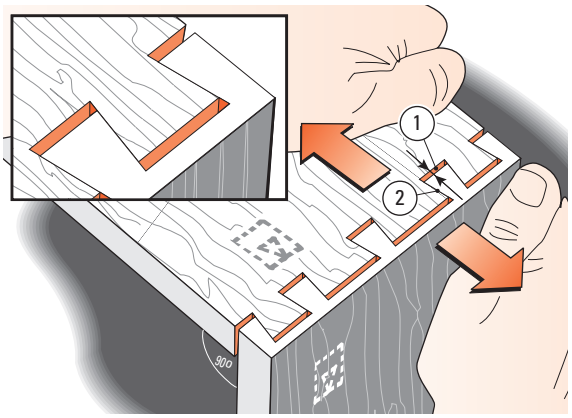
9-25

If you have difficulty leveling the finger assembly on a narrow workpiece, place a board the same thickness as the pin board under the other end of the finger assembly, *but not in the rear clamp.*

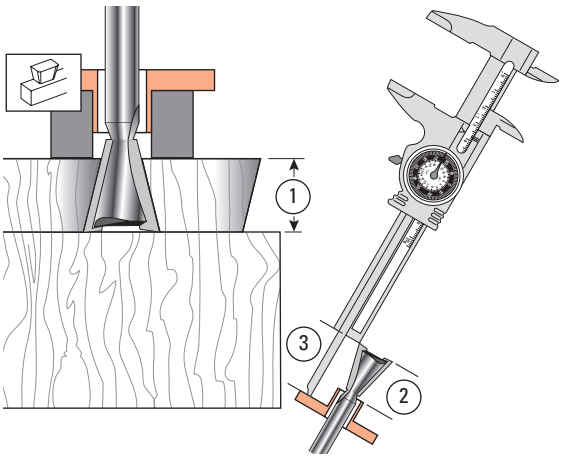


9-26

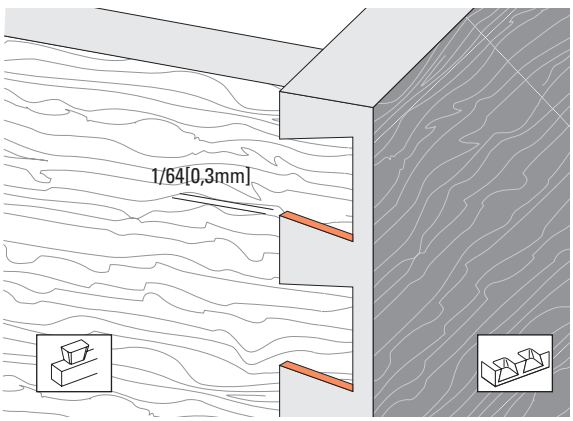
Rout out the waste between the pins. Rout each space from **left to right. Do not back rout on end grain. If the cutter enters on the right side of the opening there will be a very strong pull to the left, so…** rout each opening in at least three or four passes, **left to right.**



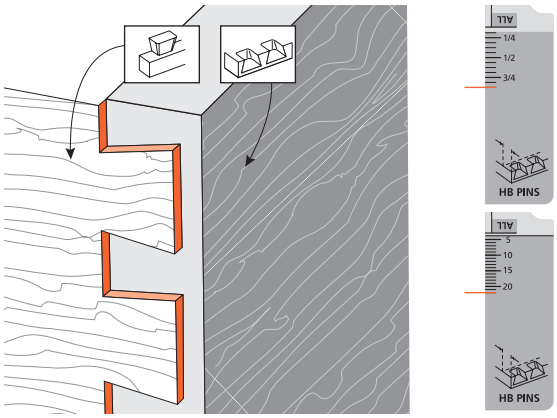
9-27
Remove the pin board and test the joint for fit. If the joint is loose, as shown here, you need to **lower** the cutter by the same amount as the gap at the bottom of the pins ① (when the pins are pulled against the socket sides ②). If the joint is too tight, **raise** the cutter slightly. Test again. You cannot rout the same board twice with a dovetail cutter, so use two fresh board ends for each test.



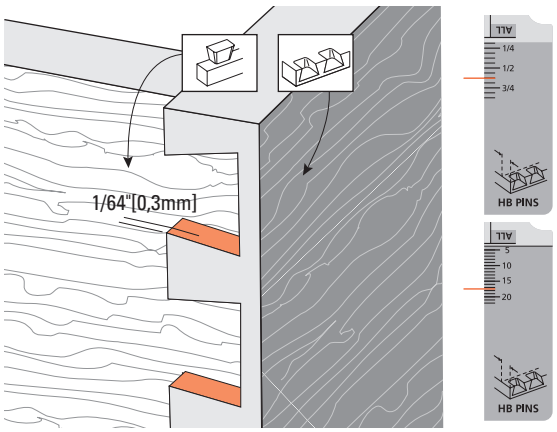
9-28
Keep the test tail board that fits well, and mark it with the number of the cutter you used to rout it. For quick set-up next time, clamp this tail board in the jig as a *depth-of-cut gauge* ① to show how far to lower the cutter. Better yet, measure the cutter projection from the end of the guidebush ② or guidebush flange ③ and record this for fast set-ups in future.



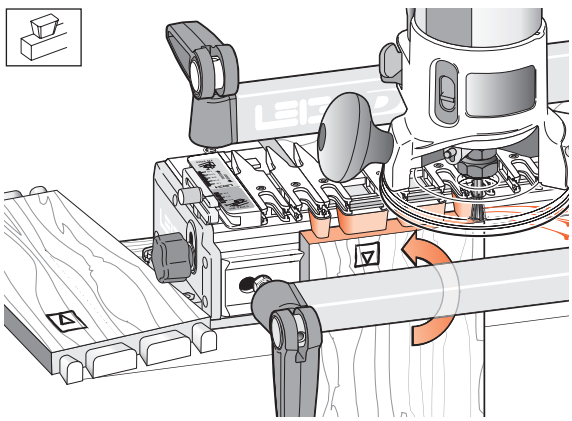
9-29
When you have the proper tightness of fit, check the flushness. The tails should be under flush to the pins by *no more than 1/64"[0,3mm] to allow for cleanup (exaggerated here)*. Any concentricity errors in the collet and guidebush on different routers will affect this tolerance.



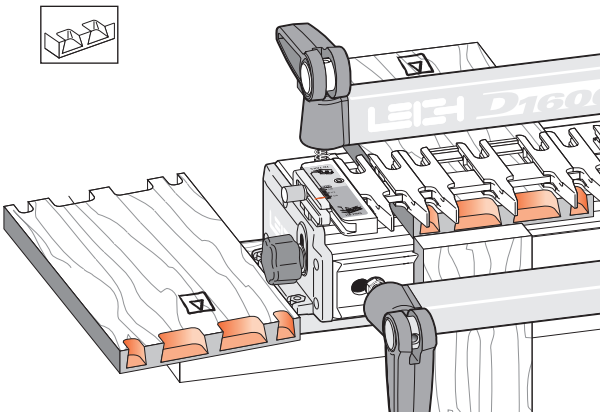
9-30
If the tails stand out from the pins, set the HB PINS scale **away from the operator** by the amount required.



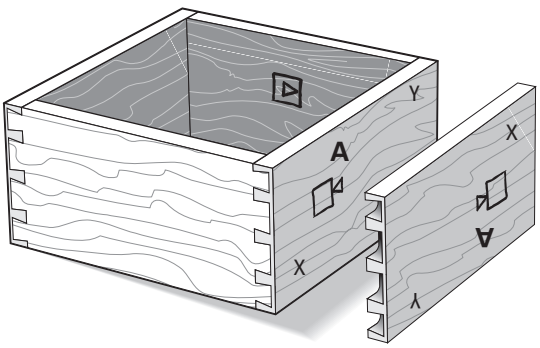
9-31
If the tails fit in too far past the pins ends, set the HB PINS scale **toward the operator** by the amount required. These adjustments for "flushness" are made only in the HB PINS mode.



9-32
To make a box, rout all four ends of the tail boards, keeping the inside face ⊡ of the tail boards away from the jig.



9-33
Rout all four ends of the pin boards keeping the inside face ⊡ of the boards away from the jig.
Note: When making drawers you may prefer to use through dovetails on the rear corners.



9-34
Assemble the box. As with through dovetails, it doesn't matter which edge of any of the boards are at the top or bottom, the box will still fit together e.g. pin board 'A' can be up either way. ■