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## D4R Pro - CHAPTER 11

# Single Pass Half-Blind Dovetails

Why rout "single pass" dovetails on a variable spaced Leigh jig? Well, you just may need to reproduce or restore a late 19th or early 20th century drawer which has similar, machine made joints. Or, if you are making a lot of drawer boxes and are not so concerned with the traditional "hand cut look", then routing both drawer fronts and sides together does go a little faster.

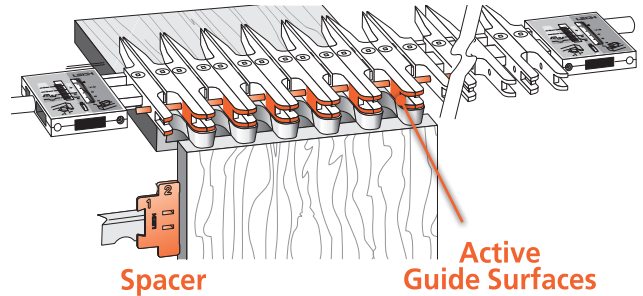
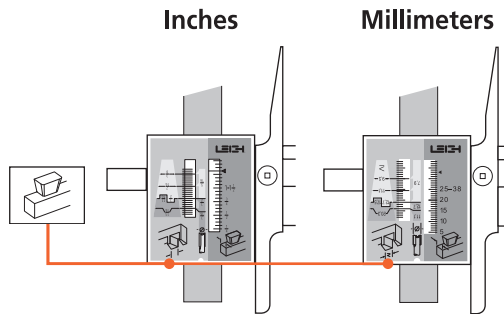
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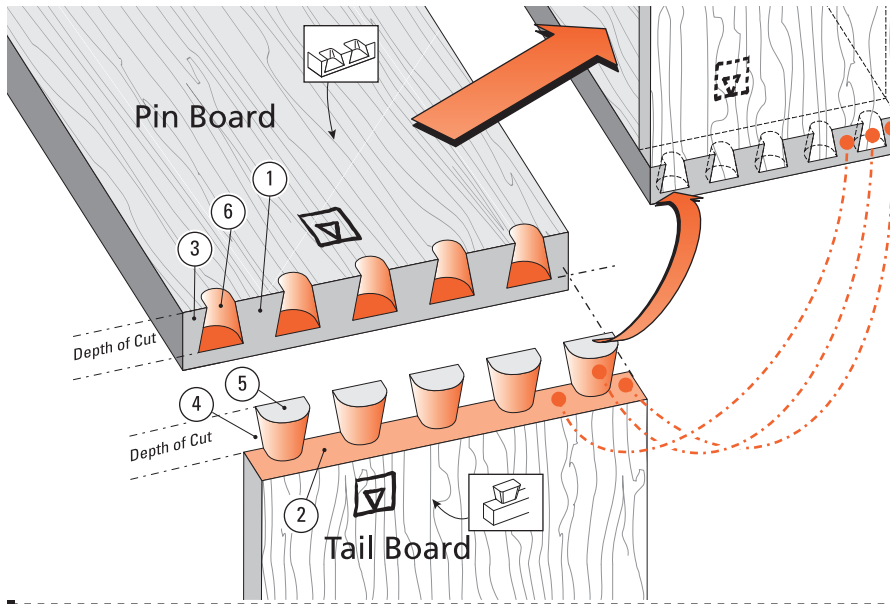
Only one mode is required:

### Half-Blind Dovetail Tails (HB TAILS) mode

#### MODE ICONS

Illustrations in this user guide include the correct *mode* icon for the current instruction. The icons are also used in the instruction text.



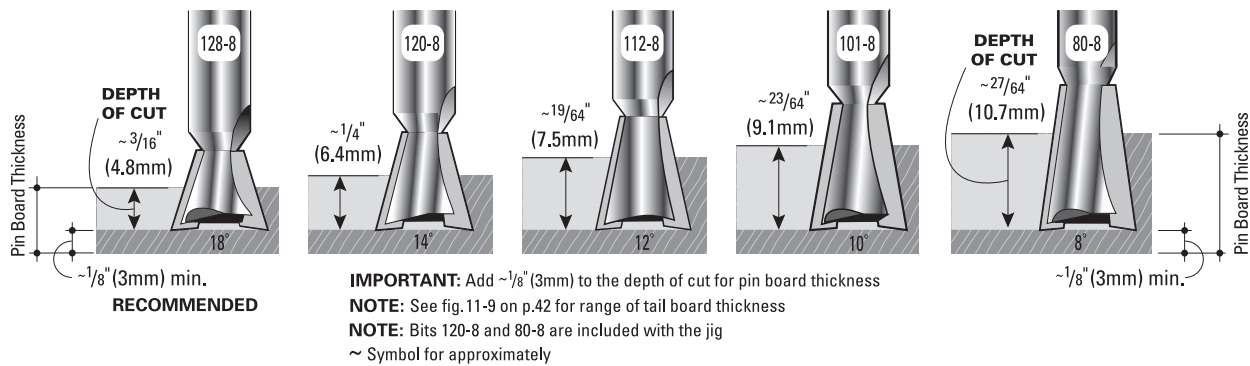


**11-1 Single Pass Half-Blind Dovetails:**

- ① Pins
- ② Pin sockets
- ③ Half-pins
- ④ Half-pin sockets
- ⑤ Tails
- ⑥ Tail Sockets

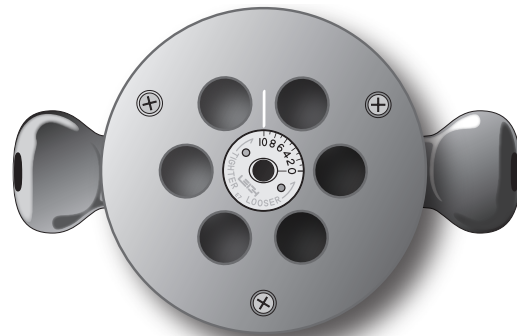
The pins fit in the pin sockets. Joints should almost always end each side with half-pins.

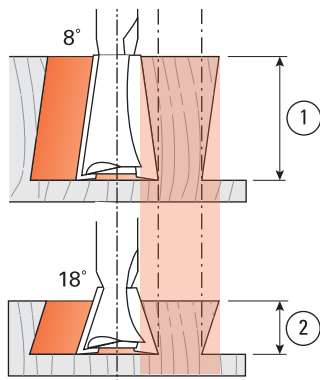
**11-2 Cutting Depth for Single Pass Half-Blind Dovetails**



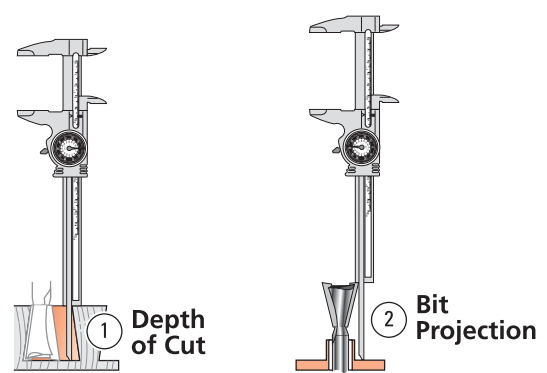
**⚠ IMPORTANT! Bit depths of cut for "single pass" dovetails are not the same as for variably spaced joints.**

- Depth of cut must be as specified for each of the five bits shown above. *Exception:* See fig. 11-26. *Note:* Leigh bits 101-8, 112-8 and 128-8 are optional.
- Raising the bit above its specified cutting depth will result in loose joints and may damage the jig, bit and/or guidebush. A lower setting will result in tighter joints that may not fit together.
- Small Depth of Cut adjustments will allow for joint fit tightness. **See 10-3 to 10-5 for why.**
- Choose one of the five,  $1/2"$  [12,7 mm] diameter dovetail bits shown above.
- Fit the provided Leigh e7-Bush to the router as shown below and set at No. 10, or use a standard  $7/16"$  [11,1mm] guidebush (min. barrel depth  $1/4"$  [6,35mm] see p.69).

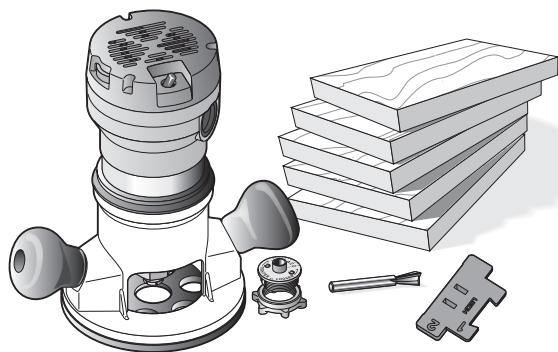




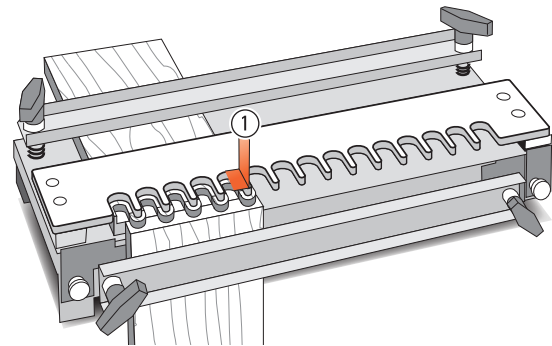
**11-3 Bit Angle and Depth of Cut** Half-blind pins and tails are routed with the **same** dovetail bit, the **same** guidebush, and the **same** depth of cut. A different depth of cut requires a different angled bit. Leigh offers five different angled dovetail bits for a range of cut depths. A lesser angle, say 8°, for a deeper cut ①; a greater angle, say 18°, for a shallower cut ②.



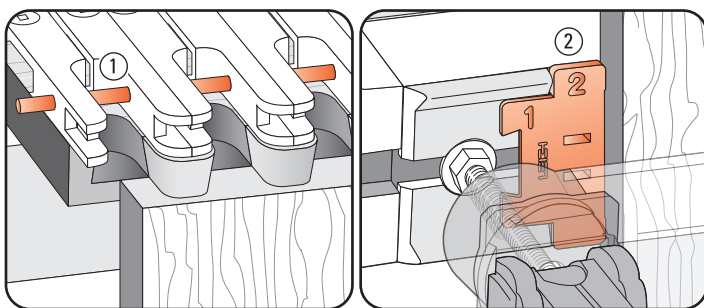
**11-4** Cumulative plus/minus tolerances in routers, bits and guidebushes, make it impossible to state exact bit depth for first-time precision fit. All dovetail jigs require trial and error tests to attain a fine fitting joint. The good news; we give a starting depth for each bit. Test and measure the successful ‘Best fit’ depth of cut ① or bit projection ② and record for future first-time fits.



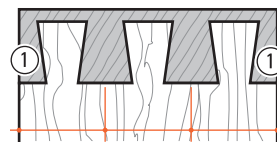
**11-5 Routing a Test Joint** You need a router, the e7-Bush set at No.10 (see chapter 3 for e-Bush instructions) and the 80-8 1/2" [12,7mm] 8° dovetail bit. *Note:* The No.80-8 bit routs at a shallower ~ 1/2" [13mm] depth on single pass dovetails than on regular variably spaced joints. For this test, start with the No.80-8 bit projecting 1 5/16" [24mm] from the router base.



**11-6** This is a typical fixed template comb type jig. The comb depth ① is usually dimensioned to suit the most popular drawer side thickness of 1/2" [12,7mm].

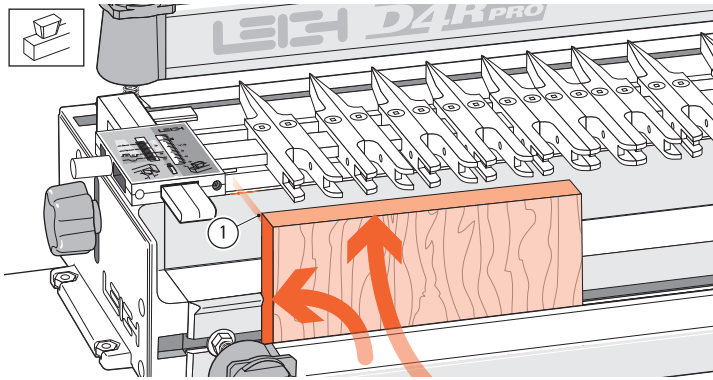



**11-7 Stop Rod and Dovetail Spacer** The stop rod is inserted in the fingers ① to convert them from deep tail sockets to a shallow fixed comb. The flexible stop rod is fed through the holes in the fingers from the “far” end of the jig. The **Dovetail Spacer** (note the dovetail shaped notch) snaps into the channel against the left-hand front side stop ② to correctly offset the drawer sides from the drawer fronts. After setup, the Spacer stays in place for the complete procedure.



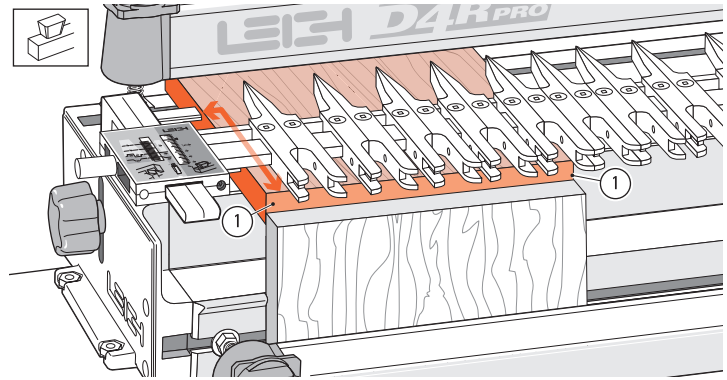
Single Pass Board Width Chart	
Add up to 1/4" [6mm] or subtract up to 1/8" [3mm]	
2 3/16 [55]	8 11/16 [221]
3 1/4 [83]	9 3/4 [248]
4 3/8 [110]	10 7/8 [276]
5 7/16 [138]	12 [305]
6 1/2 [166]	13 1/16 [331]
7 5/8 [193]	-

**11-8 Board Widths** To achieve equally sized half pins ① at each side on a fixed space joint, use the board width from the chart above. Alternatively, you can add up to 1/4" [6mm] to the listed board width, or reduce it by 1/8" [3mm]. This chart covers boards up to a maximum width of 13 1/16" [331mm]. Example: the 12" [305mm] can be up to 12 1/4" [311mm] or as small as 11 7/8" [302mm].

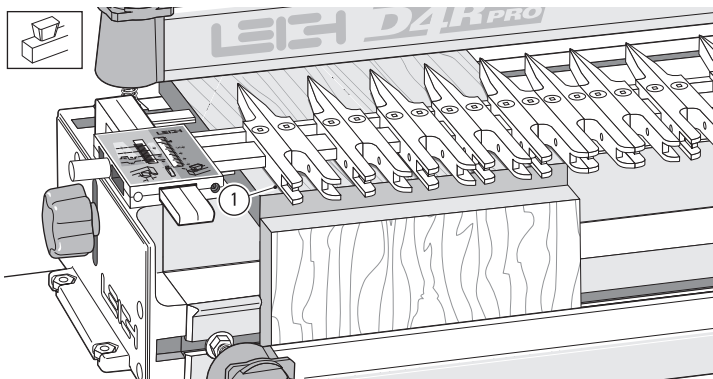


**11-9** With the finger assembly raised in the  HB Tails mode, clamp a drawer side in the front left side, against the side stop and the top end edge slightly above the jig body top ①.

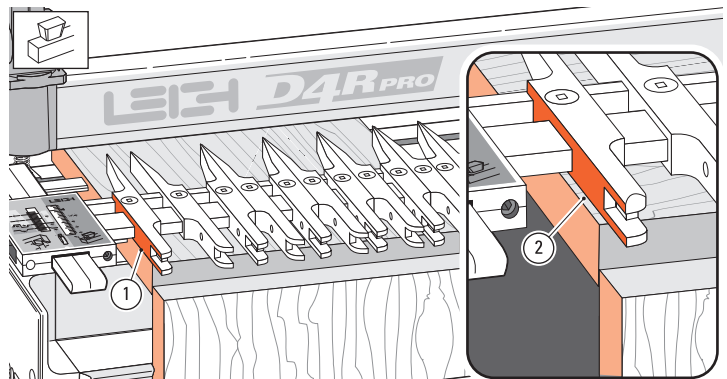
**Note: Drawer side (tail board) thickness can be from  $\frac{7}{16}$ " to  $\frac{9}{16}$ " [11mm to 14mm].** See 11-25 re drawer side thickness greater than  $\frac{9}{16}$ ".



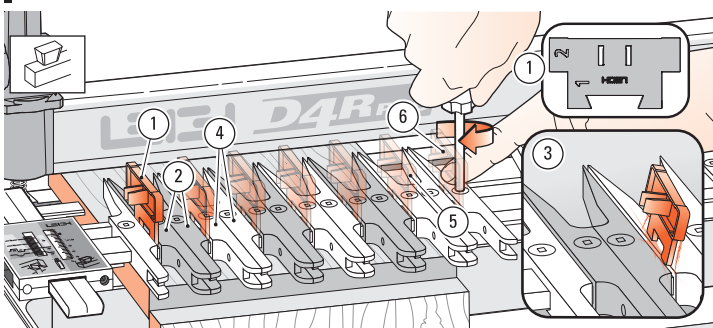
**11-10** Place a sample drawer front from  $\frac{5}{8}$ " to  $1\frac{1}{2}$ " thickness [16 to 38mm] in the rear clamp. Clamp with the side edge against the left rear side stop, front end edge touching flush across the rear of the front board ①. **Note: the  $\frac{5}{8}$ " [16mm] minimum thickness can be reduced if using other shallower bit depths. ! Board edges must be square.**



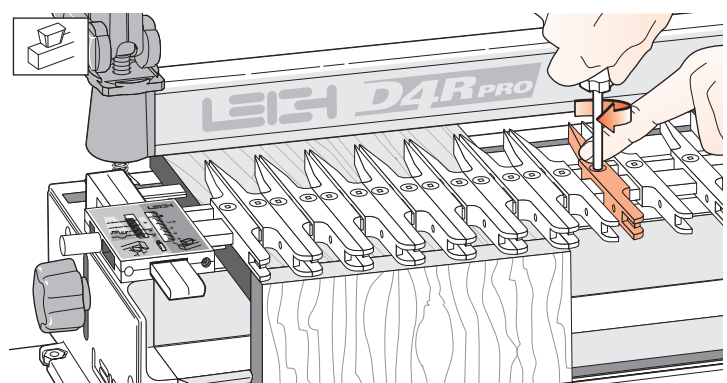
**11-11** With the scale set on  $\frac{1}{2}$ " [12,7mm], lower the finger assembly to about  $\frac{1}{8}$ " [3mm] above the drawer front to ease adjusting the guide fingers ①. **The scale is always set on the  $\frac{1}{2}$ " [12,7mm] mark for single pass dovetails.**



**11-12** With boards the same width as a board width chart size (Fig. 11-8), set the first guide finger flush against the board edge ① and tighten. If board width is greater than a chart size, set the first finger in from the edge by half the additional board width ②. If board width is narrower than a chart size, overhang the first finger by half the difference and tighten.

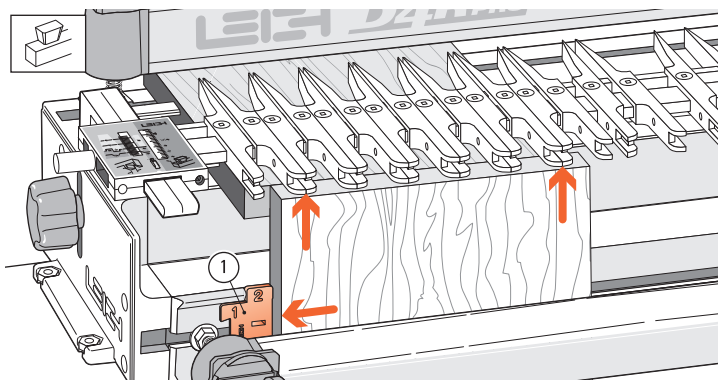


**11-13** Set the dovetail spacer ① with numeral 2 facing right, against the **single** left guide finger. Move the next **finger pair** ② against the spacer and tighten. **There will be a gap between the pointed ends (pin end) of the fingers, not the tail end.** Remove and locate the spacer to the right of the tightened fingers. You should feel friction when removing the spacer ③. Slide next **finger pair** ④ against spacer and tighten. Repeat across the board width to position ⑤ plus one more finger pair. Place the spacer against the last finger pair ⑥ and add one more half finger to the right.



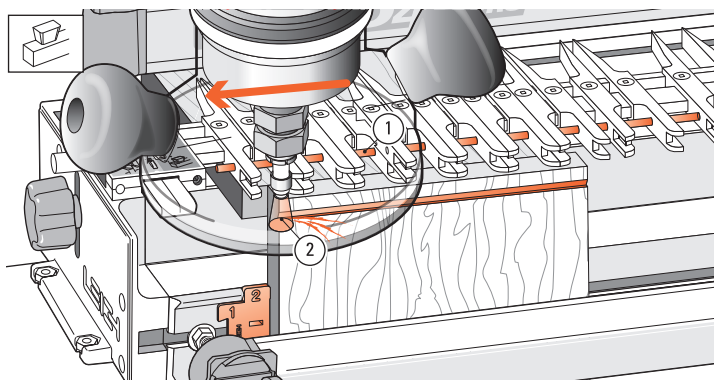
**11-14** Move any spare fingers so that they will support the router and tighten all loose fingers. Lower the assembly **flat onto the drawer front.**

 **REMEMBER SAFETY!**

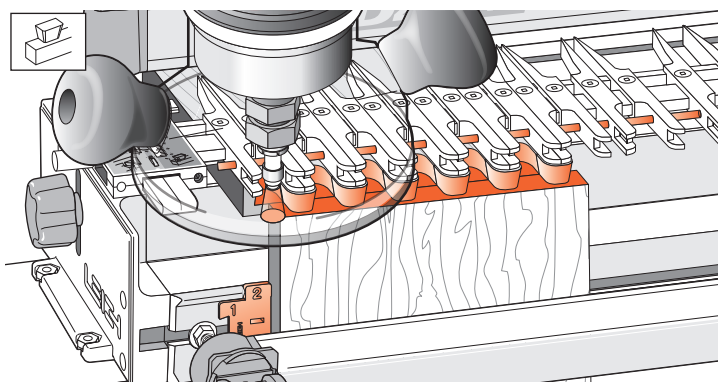


**11-15** Unclamp the tail board from the front clamp and insert the dovetail spacer as shown against the side stop ①. Re-set the drawer side in the front clamp so that its top edge touches the guide fingers and is perfectly flush with the top face of the drawer front and the left edge is against the Spacer.

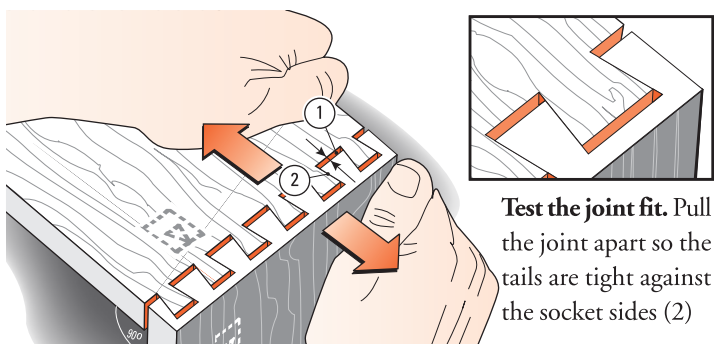
! Board edges must be square.



**11-16** Insert the Stop Rod through the holes in the fingers 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 bit. Only the tip of the bit should be cutting on the first cut ②. This back, or climb routing, leaves a very clean shoulder when routing side grain.

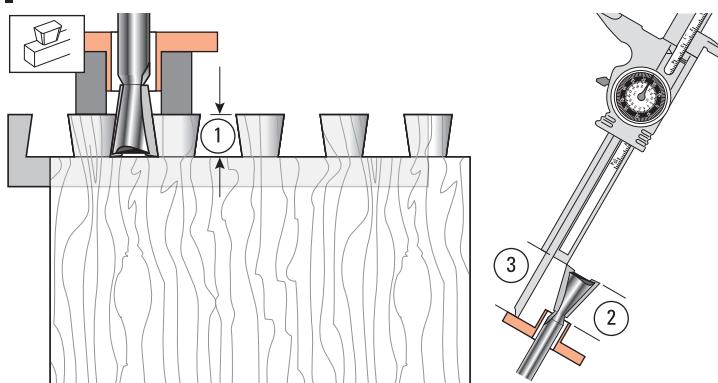


**11-17** Now rout in and out from left to right. Follow the guides in on the left of each finger opening to touch the stop rod and come out on the right. The pins, tails and sockets are formed simultaneously.

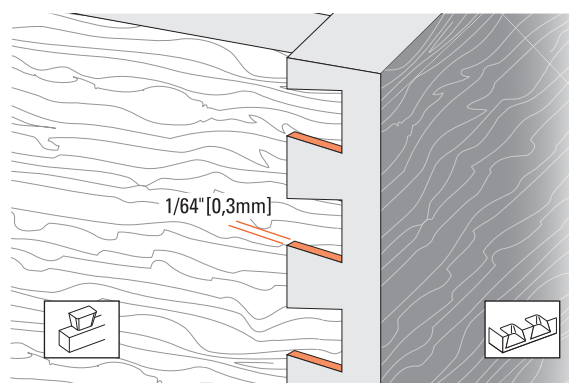


**Test the joint fit.** Pull the joint apart so the tails are tight against the socket sides (2)

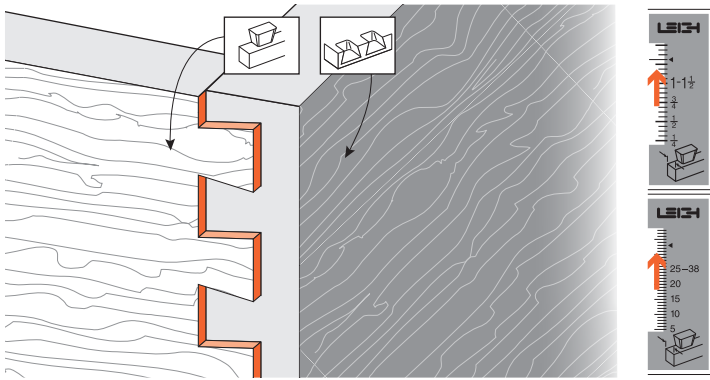
**11-18** If the joint is loose, lower the bit to increase the depth of cut by the amount of the gap at the bottom of the pins ①. If the joint is tight, raise the bit slightly to decrease the depth of cut. Test again. If there is a gap at only one end of the joint, the boards have been routed at different depths. Check the finger assembly is flat on the pin board and the tail board touches the bottom of the fingers.



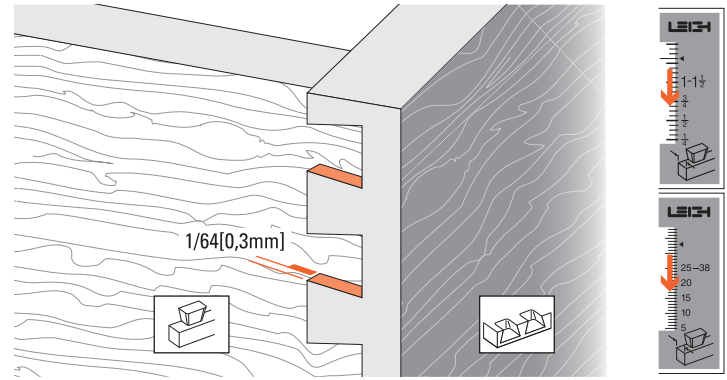
**11-19** Keep the test tail board that fits well, and mark it with the number of the bit you used to rout it. For quick set-up next time, clamp this tail board in the jig as a *depth-of-cut gauge* ① to show how far to lower the bit. Better yet, measure the bit projection from the end of the guidebush ② or guidebush flange ③ and record this for fast set-ups in future.



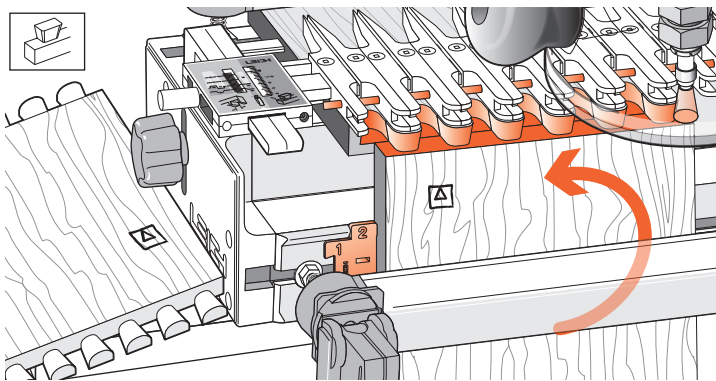
**11-20** When you have the proper tightness of fit, check the flushness. The tails should be under flush to the pins by *no more than 1/64" [0,3mm] to allow for cleanup (exaggerated here)*. Any concentricity errors in the collet and guidebush on different routers will affect this tolerance.



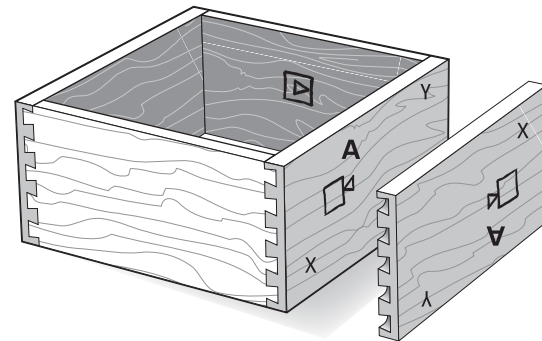
**11-21** Moving the finger assembly affects the pins and tails. So, if the tails stand out from the pins, set the HB TAILS scale away from the operator by half the amount required.



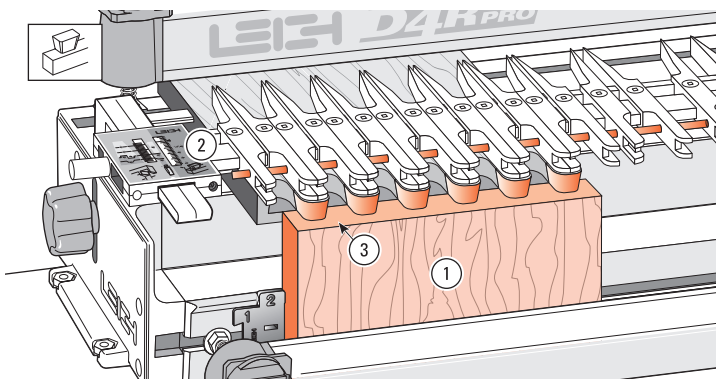
**11-22** If the tails fit in too far past the pins ends, set the HB TAILS scale toward the operator by half the amount required.



**11-23** To make a box, repeat the procedure four times, ensuring the drawer fronts, rears and sides are all rotated correctly in the jig, keeping the inside face of the boards away from the jig.



**11-24** Assemble the drawer. As with through dovetails, it doesn't matter which edge of any of the boards are at the top or bottom, the drawer will still fit together e.g. pin board "A" can be up either way.



**11-25** For tail (drawer side) boards thicker than 9/16" [14,29mm] ①, set the scale to 1/2" [12,7mm] ② and leave the stop rod in place. Do not set the scale to the actual tail board thickness. With thicker boards, more of the inside portion of the tail board ③ will be routed away. Slight scale adjustments may be required for a flush fit. See figures 11-20 through 11-22.

Bit	Cutting Depth Increase per e-Bush Increment
80-8	0.014"
101-8	0.011"
112-8	0.009"
120-8	0.008"
128-8	0.006"

**11-26 Hint: Increasing the Depth of Cut** (see page 40) This is based on setting the eBush on 10. The depth of cut for each bit can be increased slightly by turning the eBush to a lower number. For example, if you turn the eBush from 10 to 9 you will have to increase the depth of cut by 0.014" [0,36mm] for the 80-8 bit. If you turn the eBush two increments to number 8 you will have to increase the depth of cut by 0.028" [0,71mm] and so on. ■