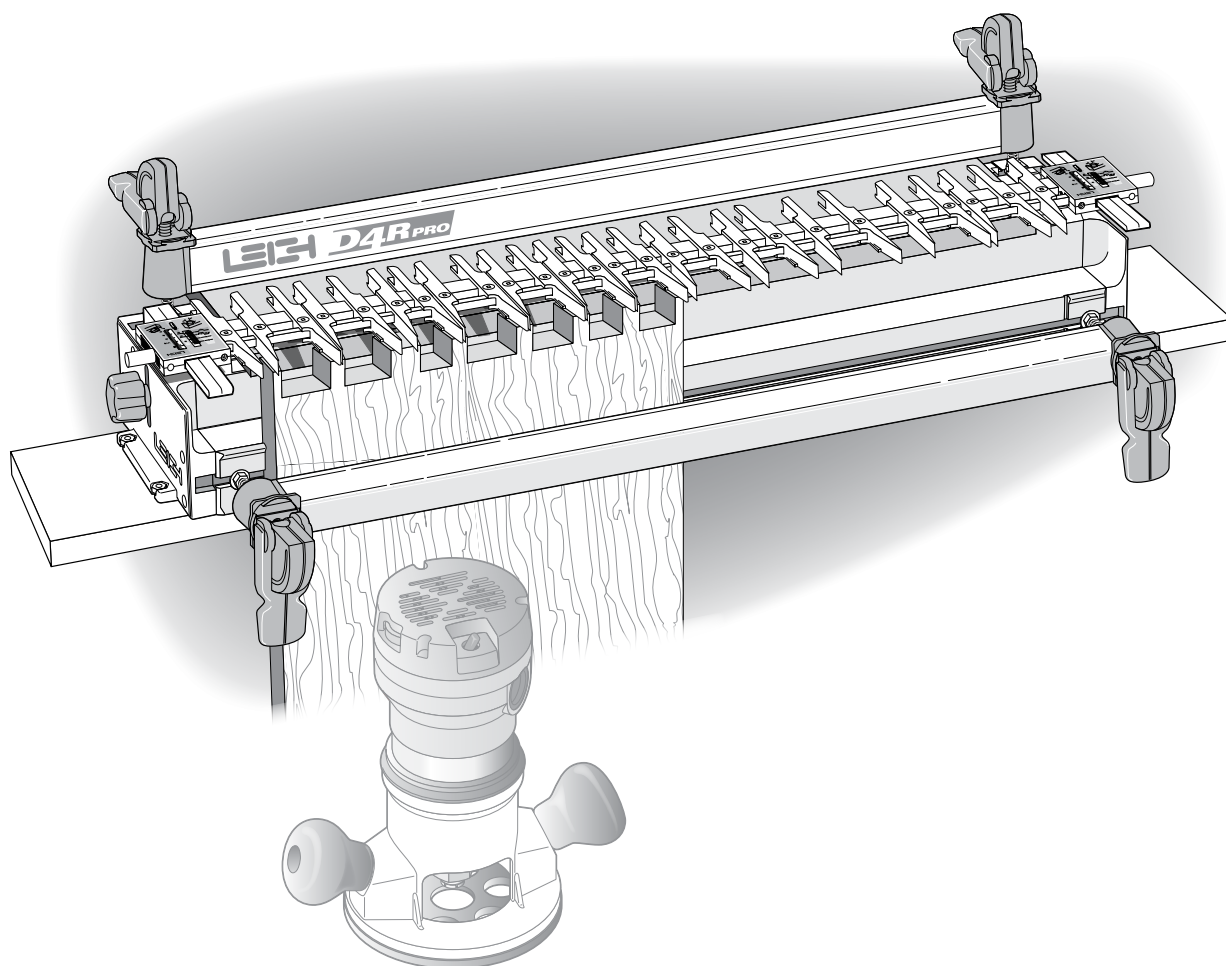


Leigh D4R Pro Dovetail Jig

Model D4R Pro, D4R Pro-M

User Guide

24" (610mm)



See page 83 for customer support

1-800-267-8761

LEIGH Leightools.com

Watch the Online Instructional Videos
in the Support Section at Leightools.com



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go to Leightools.com support section.
Stream while you work to your smart phone or tablet.



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TECHNICAL BULLETINS

Downloadable pdfs are available at leightools.com on the Support page for these How To's and more for your Leigh D4R Pro jig:

- Angled Through Dovetails
- Jumbo Half-Blind Dovetails
- Inlaid Through and Half-Blind Dovetails
- Needle Pins
- Through Dovetail Pins At Less Than 1" Centers
- Shelf Holes and Notches
- Clamp Short Boards on your Leigh Dovetail Jig – Quick Method
- Clamp Short Boards on your Leigh Dovetail Jig – Adjustable Width

Your New Leigh D4R Pro Dovetail Jig

Congratulations! You now own the world's most useful and versatile dovetailing tool (and more!). The Leigh D4R Pro Dovetail Jig will help you rout an infinite variety of joints, and all of its major functions are described in detail in this guide. A very helpful DVD is also included, but the guide is essential reading.

We recommend that you first assemble and mount the jig, carefully following the instructions in the first section of the guide. Then read the rest of the guide, following along with the basic functions and principles of operation, before you try to do any actual joinery routing. By all means, rout a few practice joints in scrap boards before you use the jig to rout a precious hardwood workpiece!

If you have any questions that are not answered in this guide, please contact Leigh customer support:

Tel: 1-1-800-267-8761

Tech Support: customerservice@leeevalley.com.

For more contact info, see Appendix IV – Customer Support

But remember:

“If at first you don’t succeed, read the instructions!”

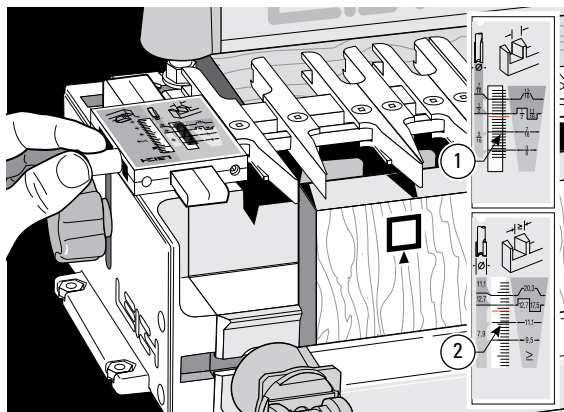
Important! Inches and Millimeters

The D4R Pro jig can be ordered in inch or metric versions. They're identical except for the calibration scales. This Leigh English-language user guide shows measurements in both inches and millimeters, with “inches” first, followed by “millimeters” in square brackets.

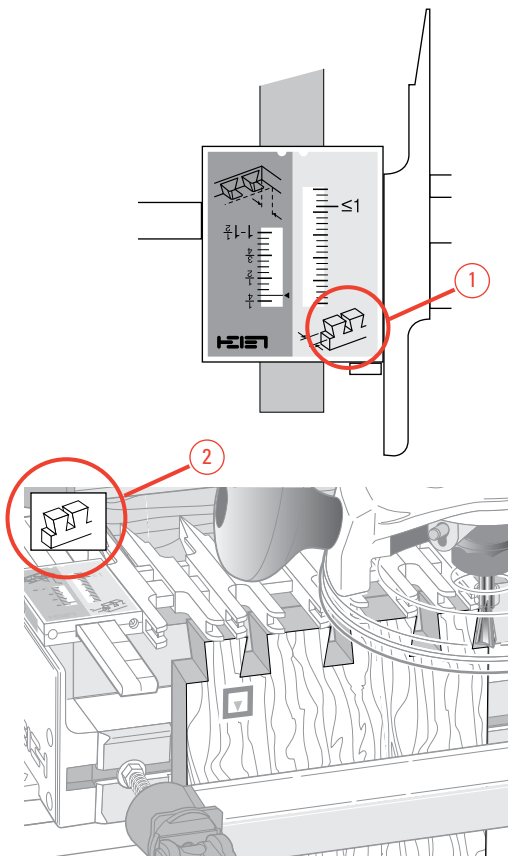
Example: $\frac{3}{4}$ " x $5\frac{1}{2}$ " x 8" [20 x 140 x 200mm]

Do not be concerned if the inch/millimeter equivalents are not exact. Just use the dimensions which apply to your jig.

To simplify the instructions, most jig illustrations show a jig considerably shorter than the standard 24" [610mm].



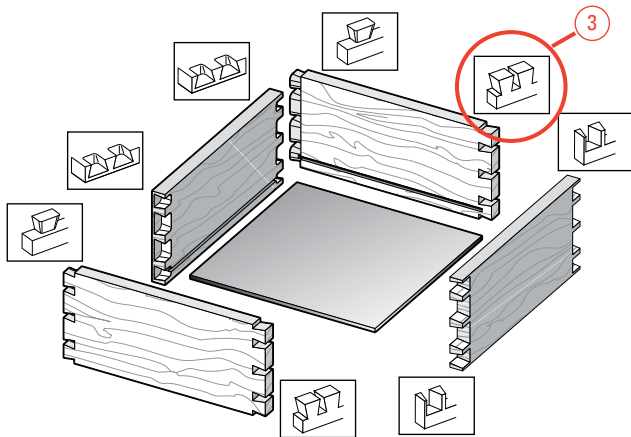
Where finger assembly scales overlay an illustration, the “inches” scale ① will be at the top, and “millimeters” scale ② at the bottom. Only the right hand “active” half of the scales are illustrated. For clarity, setting positions are indicated with a red line in the guide only. **On the jig, the lines are black.**



Glossary of Symbols

To help you understand the instructions and illustrations in this manual, we have used a number of international symbols, plus a few special ones of our own. They are all explained below. **You needn't worry about memorizing these symbols now**, because they are repeated quite frequently in this user guide, and you will soon get used to them.

The Leigh jig's guidefinger assembly can be in any one of four joint modes, depending on what type of joint and which part of the joint you are routing. Each finger assembly scale has its own mode icon ①, identifying the joint part being routed. You will also find the joint mode icon in the top left corner of most illustrations ②, indicating which finger assembly mode to use.



Sometimes a joint mode icon will be used to identify a board ③.

These are the four joint mode icons:



TD Tails
(tails for through dovetail joints)



TD Pins
(pins for through dovetail joints)



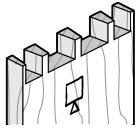
HB Tails
(tails for half-blind dovetail joints)



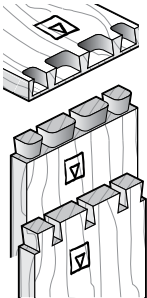
HB Pins
(pins for half-blind dovetail joints)

Board Faces

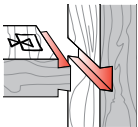
As virtually all dovetail joinery is used to make boxes, drawers and chests etc., we devised these simple (and hopefully intuitive) icons to indicate which side of a board faces inwards or outwards on the finished “box”, and which side of the board faces outward (toward you, the operator), when it is clamped in the jig.



□ This icon □ indicates the “outside” of a board. All through dovetail pin boards are mounted in the jig with this “outside” face away from the jig (toward you, the operator).

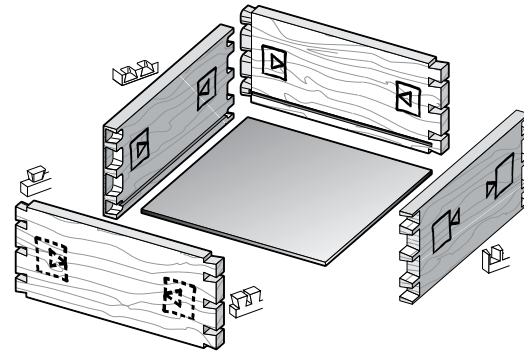
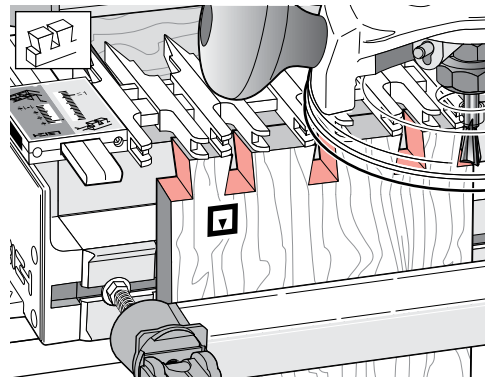


▣ This icon ▣ indicates the “inside” of a board. All half-blind pin and half-blind tail boards, and through dovetail tail boards, are mounted in the jig with the “inside” face away from the jig toward you, the operator.



▣ This icon ▣ indicates boards that are mounted both ways e.g. sliding dovetails and end-on-end dovetails.

▣ Dotted line icons ▣ indicate the “other” side of the board in the illustrations.



The following symbols indicate:



This edge against sidestop



This edge against sidestop



Sawcut allowance



Caution: use special care for this operation

①②③ Numbered References in text



Centerline of board or layout



Equals



Does not equal



Approximately

Add Leigh Accessories to make your jig even more versatile.



Finally, Dust-Free Routing and Superb Router Support!

A must-have! The VRS Vacuum & Router Support* is the ultimate dust and chip collector. As an added bonus, the VRS adds full width router support to your D4R Pro. It's simple to attach and the collector adapts to most popular vacuum hose sizes.

Item VRSD24

* US patent: 7,507,060 B2
UK patent: GB2446909
CA patent: 2,611,233



Leigh Brand Bit Sets Offer Great Savings...and the Box Is Free!

Save over individual bit prices. Each top quality bit set includes a box with foam insert that accepts all shank sizes, and a handy bit chart in the lid to list out all the bit specs.

Item 1607-8 7-piece Bit Set

Item 2411-8 12-piece Bit Set

Item 5116-8 15-piece Bit Set



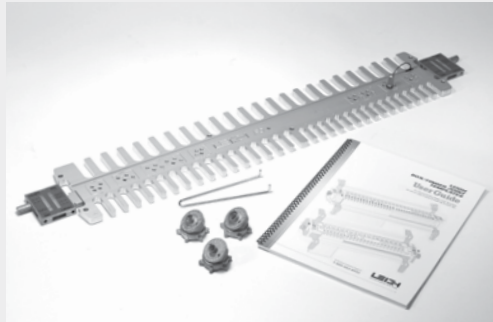
Combine the VRS with a Bit Set for Exceptional Savings!

The D4R Pro Accessory Kit is the best deal going. Enjoy great savings on the 12-piece Bit Set and even greater savings when you combine it with the VRSD24 Vacuum & Router Support.

Item ACD24

Visit www.leightools.com for more details

Optional Leigh Templates and Attachments

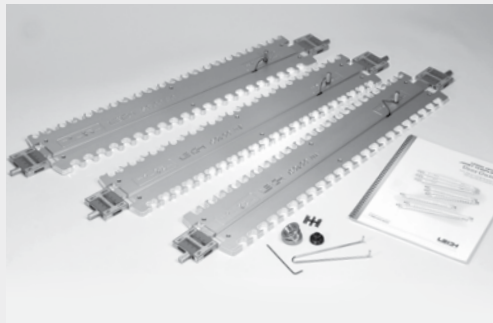
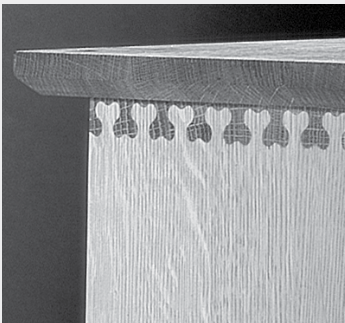


11 Sizes of Box/Finger Joints

Add an F3 Finger Joint Template* to your D4R Pro Jig to make even more sizes of strong, pleasing and easy box/finger joints. Rout perfect joints in minutes, in sizes ranging from $\frac{3}{32}$ " to 1" [2 to 24mm].

Item F3 / F3M

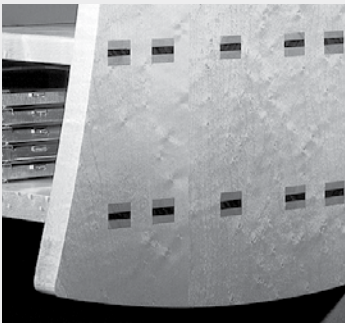
* US Patent No. 5,711,356
Canadian Patent No. 2,146,834
European Patent No. 0698458



Six Unique Isoloc Joints, Only from Leigh

The patented Isoloc joint gives any corner joint a very unique look. These one-of-a-kind patterns will really set your woodworking pieces apart from the rest. Great savings when you buy all three templates.

Items I1A, I1B, I1C and I13 (3 pack)



Classic Multiple Mortise & Tenon Joints that Last

The Leigh M2 Attachment is the only one of its kind. The multiple mortise & tenon joint is ideal for "shelf to upright" construction and produces extremely strong joints that stand the test of time.

Item M2-24 / M2M-24

Need a Helping Hand? Use Leigh Hold-Down Clamps

Leigh Hold-Down Clamps are tough, versatile and immensely strong! They employ proven cam-action technology developed for the award-winning Leigh D4R Pro and FMT/Pro. Bench clamps can be used in any size hole and surface clamps can be mounted on any flat surface, both on any angle. You can never have too many clamps!

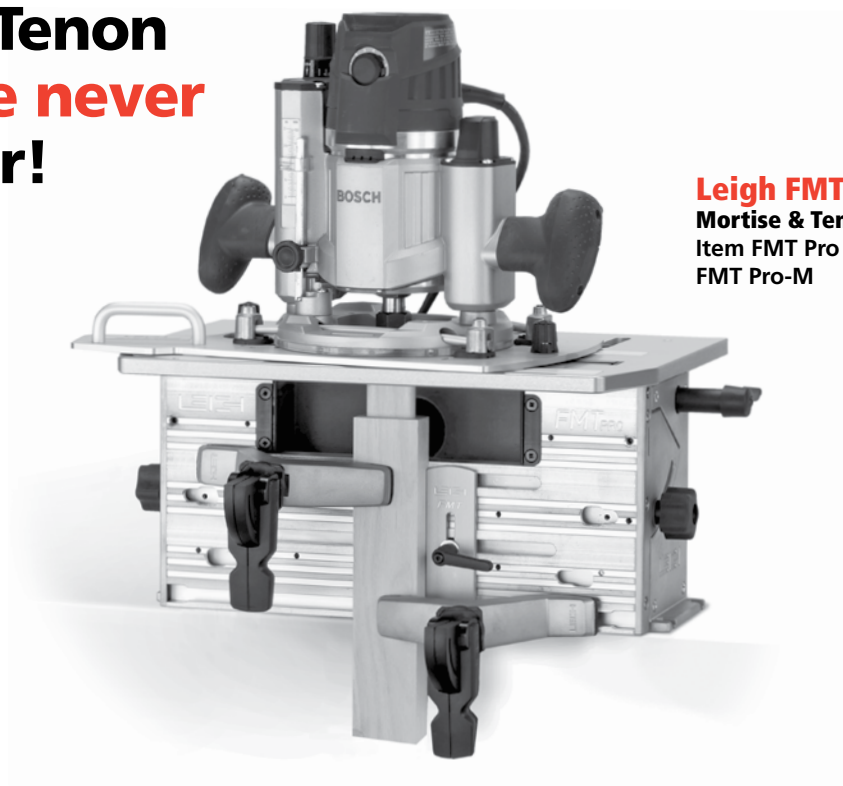
Item BHDC1 Bench Mount

Item SHDC1 Surface mount



Visit www.leightools.com for more details

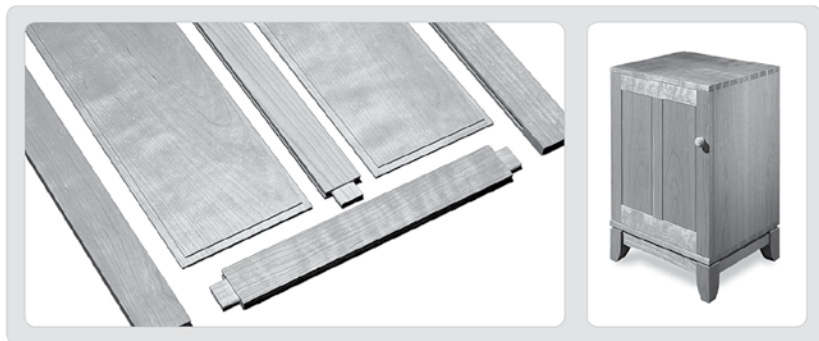
Mortise & Tenon Joints **have never** been easier!



Leigh FMT Pro
Mortise & Tenon Jig
Item FMT Pro /
FMT Pro-M

Rout mortises and tenons in 60 seconds!

The Leigh FMT Pro makes it easy: One guide, one bit, one setup for perfect joints every time. Make tables, chairs, beds, chests, cabinets and so much more!



JIG FEATURES

- 68 joint sizes from 1/16" x 1/8" up to 1/2" x 5" [79 metric joint sizes from 2x4mm up to 12x130mm] using 21 standard guides (24 metric)
- Custom joint sizes up to 1/2" x 5" [12x130mm] can also be achieved
- 6 optional specialty guides make square tenons, louver doors, Y-axis 90° mortise
- Single, double (in line and side-by-side), triple, quadruple joints
- Recordable, repeatable fit adjustment
- Angled and compound angled joints
- CNC machined alumin. frame
- Multi-position clamping
- Clamp boards up to 3" x 5-1/2" [76 x 140mm]
- Easy and precise joint sighting

STANDARD EQUIPMENT

- Universal sub-base that attaches to virtually any plunge router
- Cam-action speed clamps
- Joint guide stand
- 5/16" HSS spiral upcut bit, 1/2" shank
- Two outrigger bars
- Adjustable side stop fence for tenoning
- Screwdrivers and mounting hardware
- Illustrated user guide



Watch the Online Instructional Video

Scan the QR Code for instant video

To view the instructional video online go to Leightools.com support section. Stream while you work to your smart phone or tablet.



Scan QR Code

D4R Pro - CHAPTER 1

Jig Assembly, Mounting and Using the Clamps

Make Sure You Have All the Parts

Before you start to assemble your D4R Pro, check to make sure you have received all the required parts.

The small carton you removed from the end of the main carton contains:

- 1 1 Leigh e7 eBush (elliptical guide bushing) and pin wrench, 2 spacers
- 2 2 Dovetail bits, 1 straight bit, 1 collet reducer
- 3 2 Scale assemblies
- 4 2 Support brackets
- 5 2 Support bracket knobs
- 6 1 Square-head guide finger screwdriver
- 7 4 Clamp springs
4 Clamp T-bolts
4 Flat washers
4 T-bolt nuts
2 Square nuts
1 5/64" hex key
1 1/4"-20 x 3/4" machine screw (accessory attachment)
1 Leigh wrench/gauge
4 Jig hold-down nuts & machine screws 1/4"-20
- 8 4 Cam-action speed clamps
4 Cam clamp speed washers

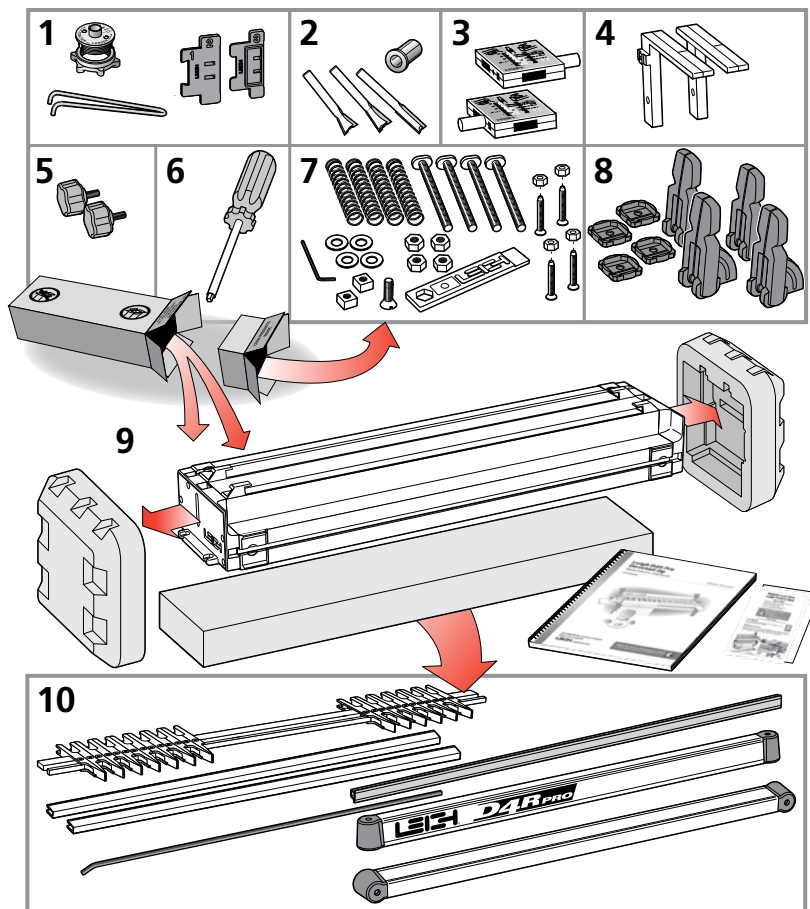
...and any other small optional items you may have ordered with your new jig. Check the packing slip for this information.

The main carton contains:

- 9 1 Main jig body
1 Leigh jig user guide
1 Warranty/registration card

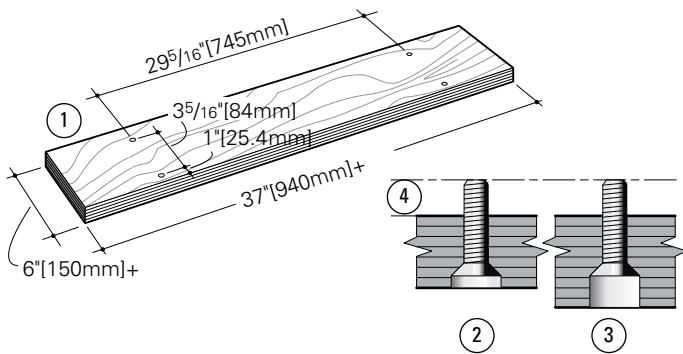
The large inner box contains:

- 10 1 Finger assembly on 2 bars
D4R Pro has 26 guide fingers (13 pairs)
- 2 Lengths bridge extrusion (used in chapter 10)
- 1 Sliding dovetail fence (cross cut fence) (used in chapter 16)
- 1 Nylon stop rod (used in chapter 11)
- 2 Clamp bars

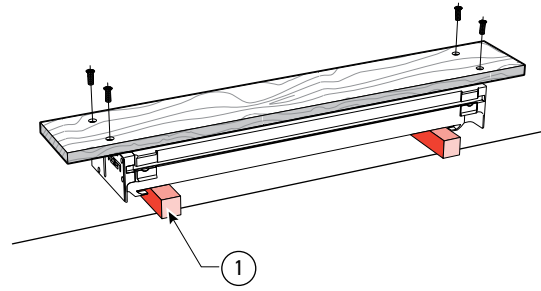


IMPORTANT Mount your jig securely and assemble it completely before you try to use it. Make sure you have read and understood all the material in the Safety Section of this user guide before using the jig.

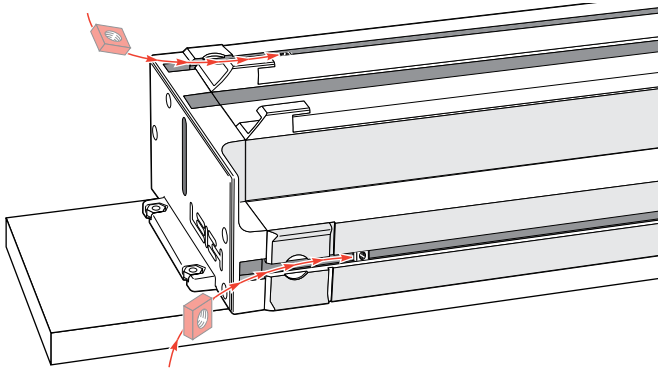
If any items are missing from your jig, contact your supplier or Leigh Industries immediately. See page 83 for customer support.



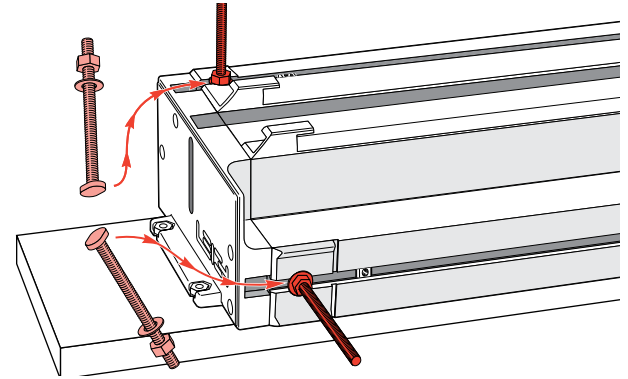
1-1 Prepare a flat mounting board (MDF or Plywood), $\frac{3}{4}$ " [20mm] thick and min. 37"x 6" [940x150mm]. Drill (4) $\frac{9}{32}$ " [7mm] holes on 29 $\frac{5}{16}$ " x 3 $\frac{5}{16}$ " [745x84,2mm] centers, 1" [25,4mm] in from front edge of board ①. Countersink ② or counterbore underside ③ if board is thicker, so (4) $\frac{1}{4}$ -20x1" long machine screws project above the top surface by $\frac{3}{8}$ " [9,5mm] ④.



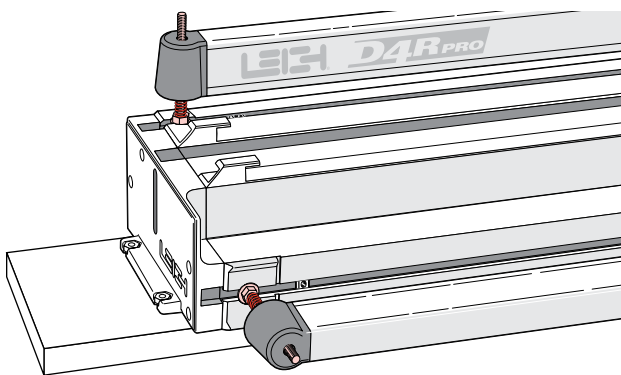
1-2 Turn the jig body upside-down on two blocks ① (to protect the side stops). Using the four nuts and four countersunk machine screws, bolt the base board to the jig using the two nut recesses in each end housing. Holes drilled 1" [24mm] from the front edge of the board go to the front of the jig. Now you can clamp your D4R to any bench.



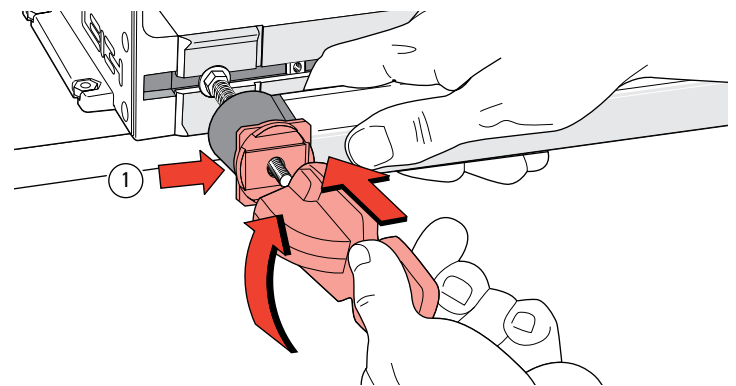
1-3 With the jig right side up, insert one square nut (part #284) into each of the channels in the main extrusion. These nuts are for possible future attachment of accessories. See Chapter 9.



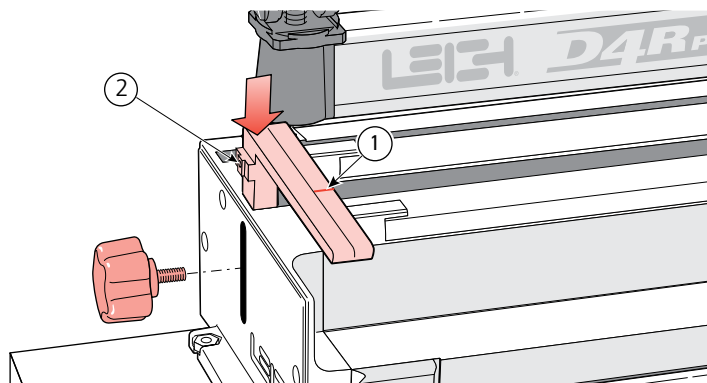
1-4 Insert the four clamp T-bolts into the T-slots (two at each end of the jig). Position so that the washers seat into the round milled recesses. Tighten the four clamp bolt nuts with the Leigh wrench.



1-5 Place four springs and two clamp bars on the T-bolts. Make sure the clamp bars move freely on the T-bolts.

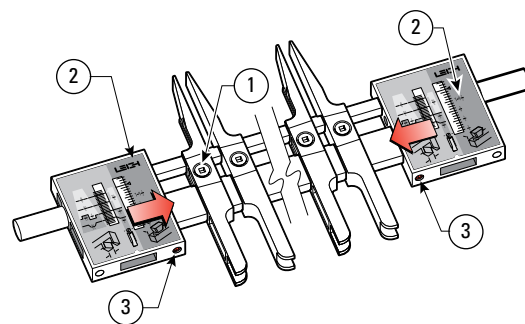


1-6 Place one black step washer ① on each T-bolt with the flat side against the clamp bar. Screw a clamp lever assembly onto each T-bolt, making sure the cam lobes are between the step washer sidewalls.

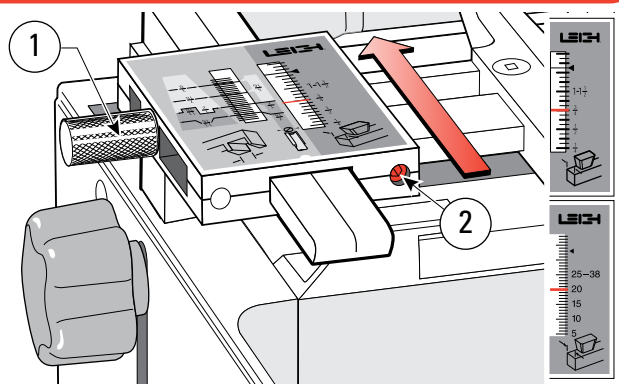


1-7 Insert the finger assembly support brackets. **Note: The right and left support brackets are NOT interchangeable.** Ensure the raised lug ② faces outwards when the bracket is installed. For clarity, the set line ① is drawn in red. The actual lines are black.

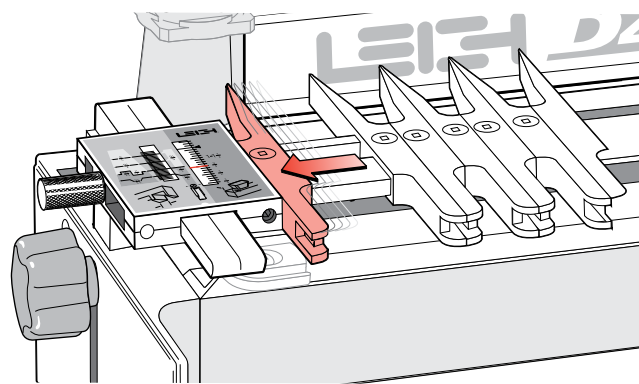
IMPORTANT



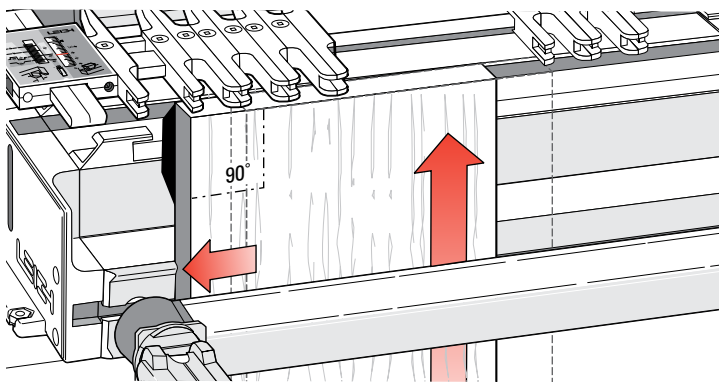
1-8 Place the finger assembly on your bench with the guidefinger screws ① on top and the pointed ends of the guidefingers away from you. Fit the scales onto the finger assembly, placing the HB TAILS scale ② to the right at both ends. **Do not tighten the scale set screws ③ yet.** **Note:** The 1/4" square half-blind pin bar is supposed to be shorter than the finger bar. It is not intended to fit in the scales at both ends.



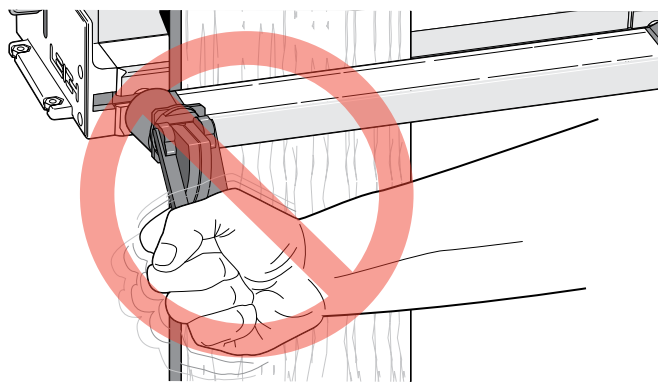
1-9 Slide the complete finger assembly with loose scales onto the support brackets. Set the bracket index line at 3/4" [20mm] on the HB TAILS scale and tighten the thumbscrews ①. Tighten the scale screws ② firmly with the hex key provided. **If the scales are removed from the finger bar for any reason, follow this procedure to re-attach them.**



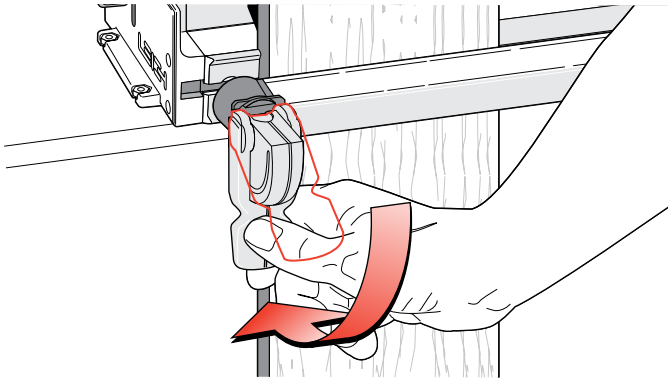
1-10 Loosen the thumbscrews and make sure the finger assembly slides on and off the support brackets smoothly, in both the tail and pin modes. Move the outermost guidefinger at each end of the finger assembly outward to touch the scales, and tighten. **If fingers do not slide easily, see note on page 7.** This finger acts as an end support for the router and is not generally used as a guide.



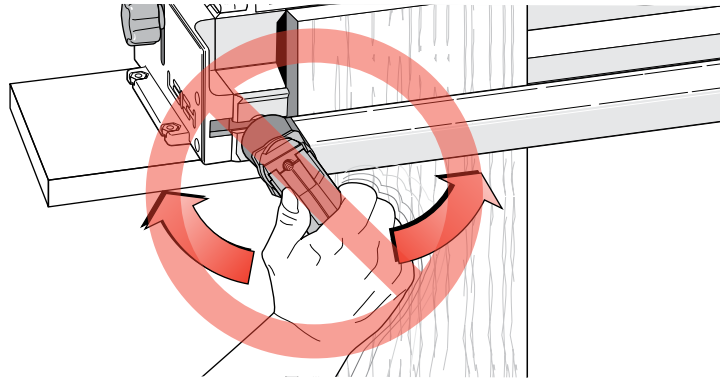
1-11 You will operate the cam-action speed-clamps every time you use the jig, so get used to the feel of the clamps first. Use some square ended boards for practice. Make sure the end of the board is touching the underside of the guidefingers. Then slide the board over against the side stop.



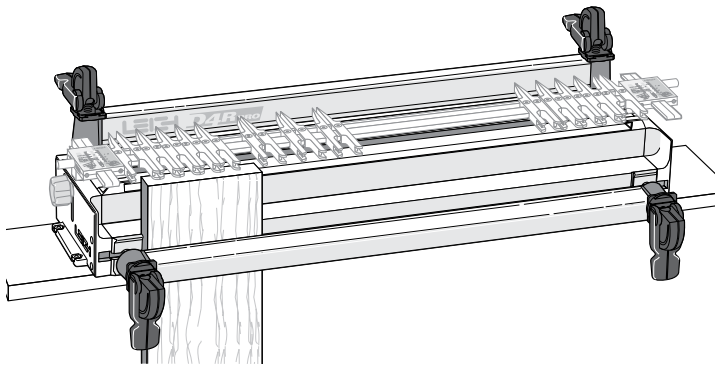
1-12 **Do Not force the cam-action speed-clamp.** It has great leverage, and excessive force may damage the workpiece or the jig.



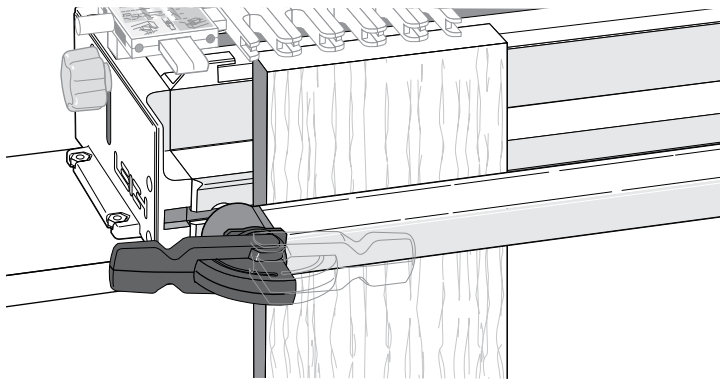
1-13 A smooth, firm action is enough to engage the clamp.
Rule of thumb: If you can't throw the lever comfortably by pressing the end of it with your thumb, reduce the tension. A few minutes of trial and error will help you feel the right clamp tension. **Firm thumb pressure is about right.**



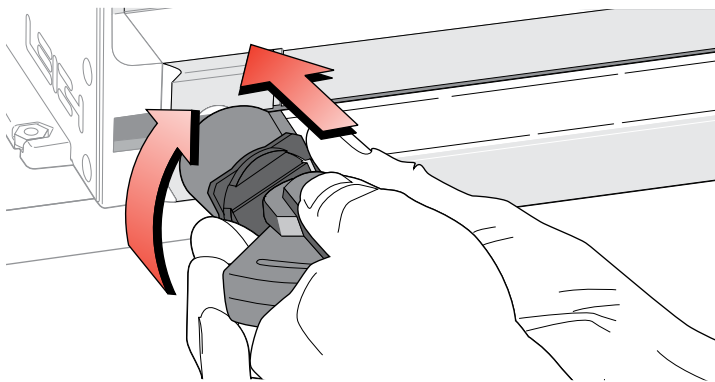
1-14 Do Not use the lever as a torque arm. Adjust the clamp tension only with the clamp disengaged.



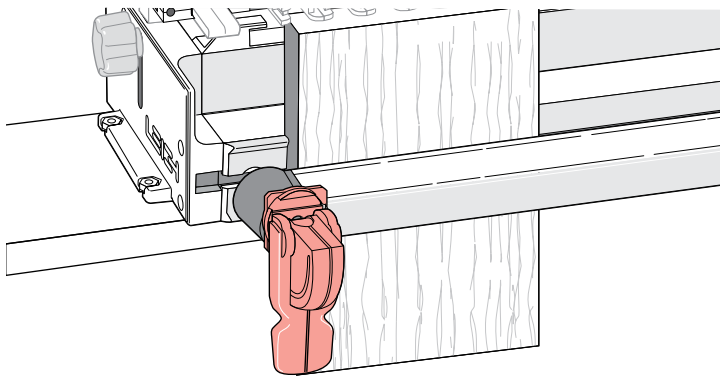
1-15 When engaged, the front clamp levers should point down and the rear clamp levers should point away from the operator.



1-16 If the lever is badly positioned at the correct clamping pressure...



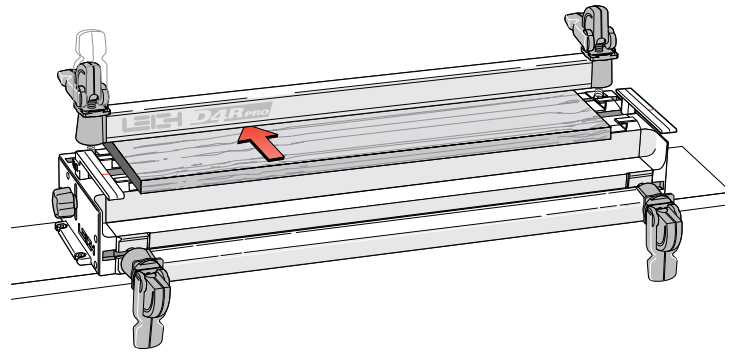
1-17 Release the clamp, remove the board and turn the step washer a quarter turn (the step height inside the step washer is one quarter of the thread pitch).



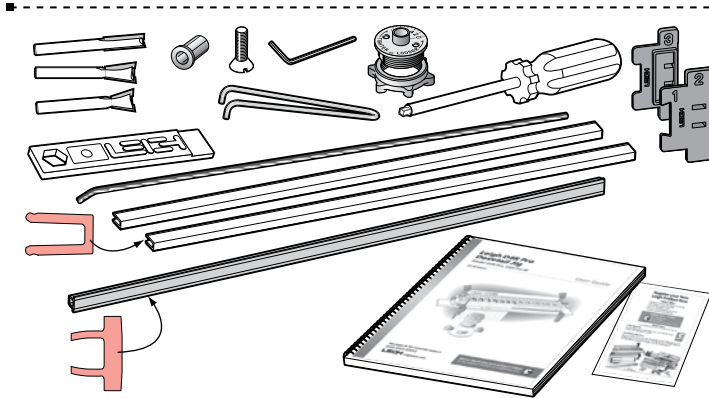
1-18 Then adjust the clamp until the clamp lever is in the right position at the right pressure.



1-19 For all but the wider workpieces, you need only operate the clamp on the workpiece end ① of the jig to release the board. For narrower boards, the clamp at the free end ② should be just tight enough to bow the clamp bar about $\frac{1}{8}$ " [3mm] ③ *greatly exaggerated in this view.*



1-20 Make up a spacer board. This board will be used to support the finger assembly in **all front-clamping vertical board modes**. The spacer board should be flat, straight and of even thickness. We suggest $\frac{3}{4}$ " x 6" [20x150mm] by approximately 23" [580mm] long. **Note:** the thickness of the spacer board has no relationship to the thickness of the vertical board being routed.

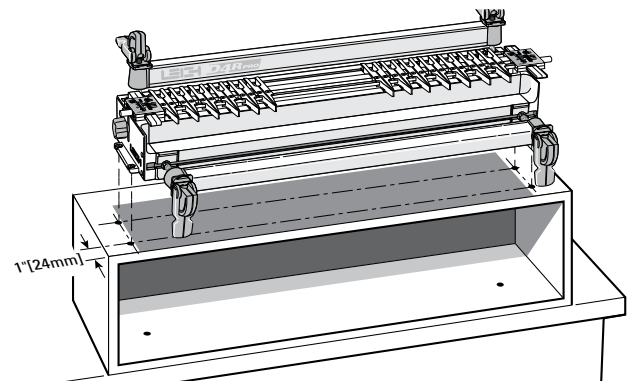


1-21 After you have assembled and mounted the jig, you will have some items left over:

- 1 Straight router bit Leigh No.140-8
- 1 Dovetail router bit Leigh No.80-8
- 1 Dovetail router bit Leigh No.120-8
- 1 Collet reducer
- 1 Leigh wrench/gauge (*gauge: Ch.9*)
- 1 Accessory attachment screw (*Ch.9*)
- 1 Hex key, allen wrench
- 1 Leigh e7 eBush (elliptical guide bushing)
- 1 Pin wrench (eBush adjustment wrench)
- 1 Leigh guide finger adjustment screwdriver
- 2 Spacers, one for single pass half-blind dovetails (*Ch.11*), and one for box joints (*Ch.15*)
- 2 Lengths of bridge piece extrusion (*Ch.10*)
- 1 Sliding dovetail fence (cross cut fence) (*Ch.16*)
- 1 Nylon stop rod (*Ch.11*)
- 1 Fully illustrated user guide (this user guide)

Please keep all these items ready for use.

1 Warranty card. **Register your new Leigh product today. Receive special pricing offers. Learn new ways to use your jig and get updates on the latest innovations from Leigh Tools.**



1-22 To gain height for a more comfortable working position or for routing longer boards, mount the jig to a box that can be bolted securely to a bench. *See also fig. 17-15.* ■

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Watch the Online Instructional Video

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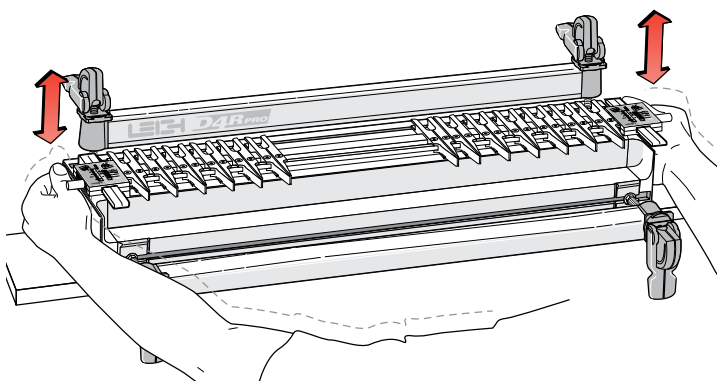
D4R Pro - CHAPTER 2

Adjusting the Finger Assembly

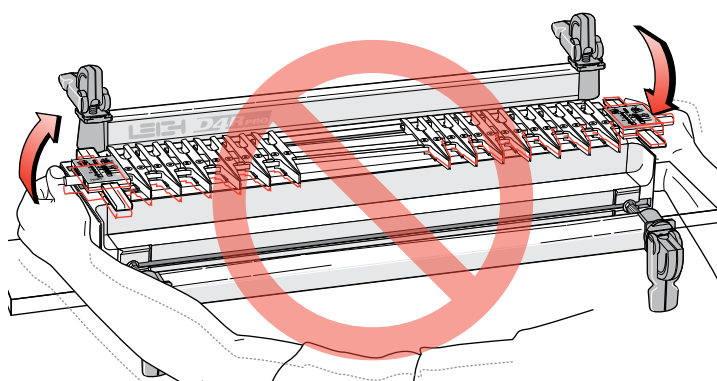
The Finger Assembly is The Heart of The Leigh Jig

Spend a few minutes now to familiarize yourself with these simple adjustments.

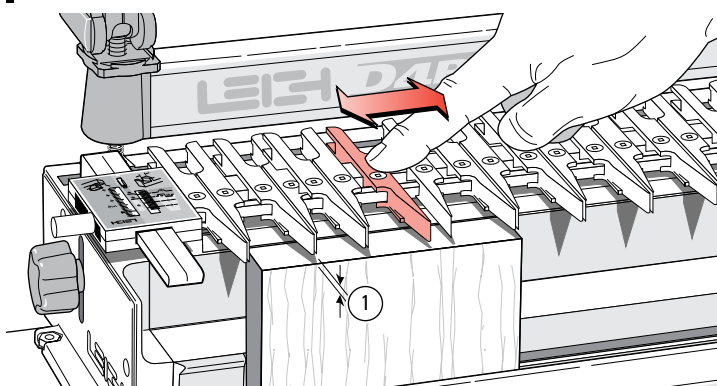
Note: The first few times you use your jig, some fingers may "stick". This is normal. To "unstick", loosen the finger screw approximately 3/4 of a turn. With the screwdriver still in the screw, press down firmly (on the screwdriver). This will loosen the finger locking wedge (you may feel a click). The finger will now move freely.



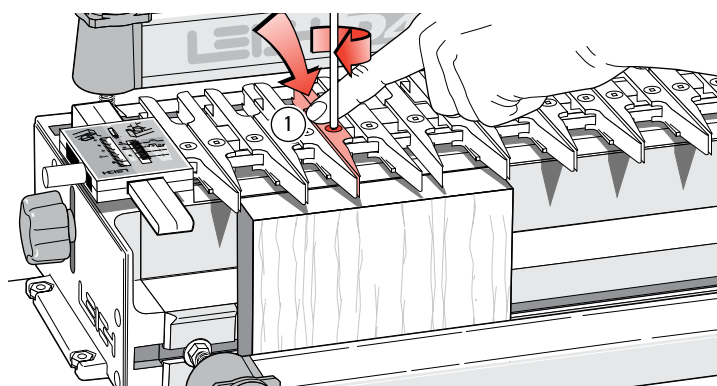
2-1 Practice adjusting the finger assembly height. Loosen the support bracket knobs and hold them firmly. Raise and lower the assembly evenly, keeping it level, and tighten the knobs to lock it at various heights.



2-2 Do Not raise or lower one end of the finger assembly at a time.

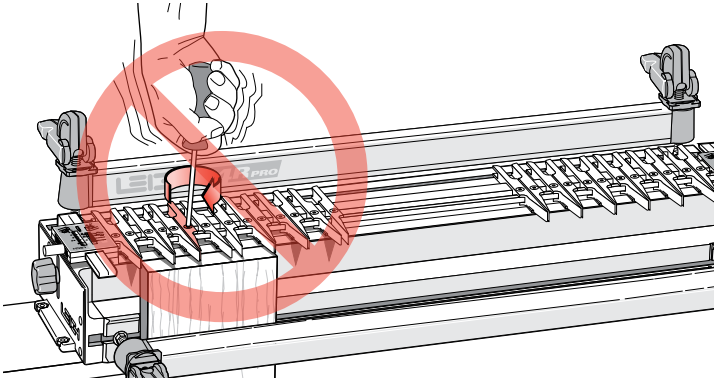


2-3 To practice adjusting the guide fingers, put a board in the front clamp. Always raise the finger assembly slightly, 1/8" [2mm] above the spacer board and or workpiece ①. This is essential to allow the fingers to move freely on the guide finger bar and ensures the fingers will be level and flush when locked up. To move guide fingers push on the middle to slide them along the guide finger bar.

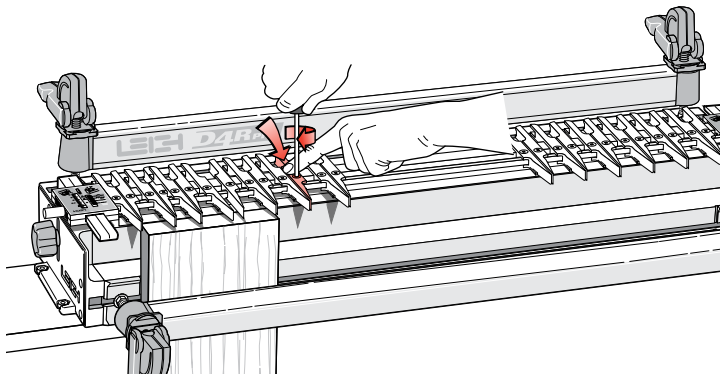


2-4 Loosen about half the guide fingers and practice unlocking, moving, positioning and re-locking them. Always press down lightly on the center of each guide finger ① when tightening the screws.

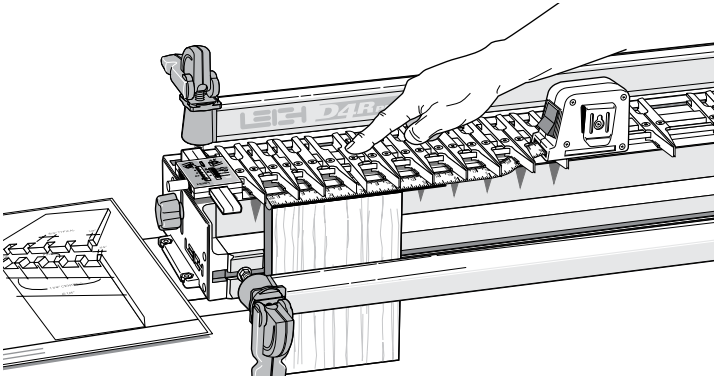
If after loosening a finger it "sticks" and doesn't slide, see header note above.



2-5 Do not over-tighten the guide finger locking screws. The Leigh screwdriver provided will give ample torque for easy lock-up without strain.



2-6 *Always tighten unused guide fingers before routing, as router vibration will cause loose screws and wedge nuts to fall out and be lost.*



2-7 You can adjust the guide fingers by eye, or by measurement to suit a set of plans.

Note: Always lower the finger assembly down onto the workpiece before routing. ■



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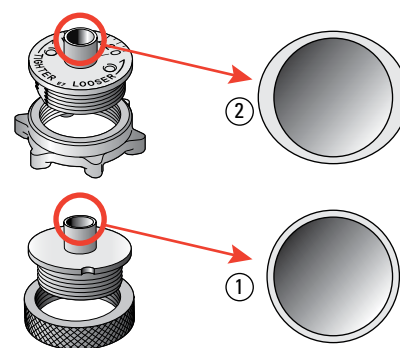
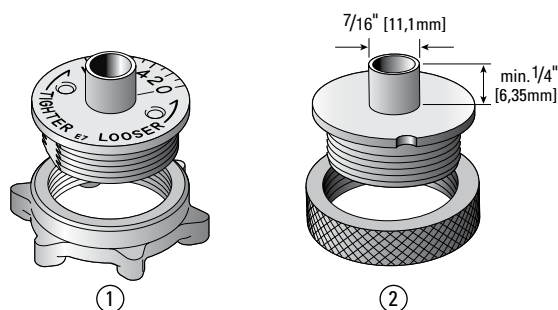
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D4R Pro - CHAPTER 3

The Leigh eBush & Optional Guidebushes

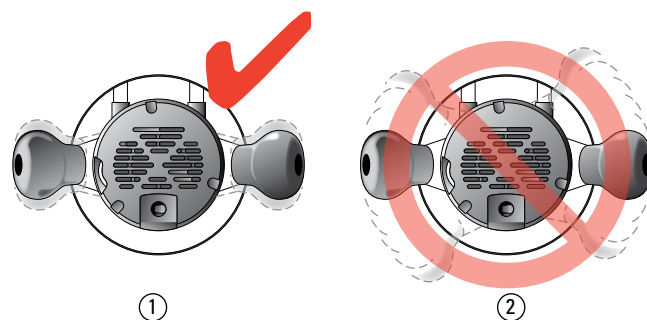
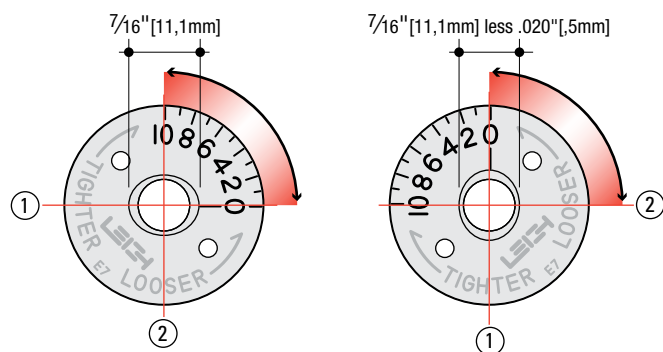
The guidebush is the vital link between router and jig. All joints created on the D4R Pro are routed with the unique e7 elliptical guidebush. This Leigh innovation provides precise joint fit adjustment for box joints and sliding dovetails. *Supplied with the D4R Pro. U.S. Patent No. 8,256,475. UK Patent No. GB2443974. Canada Patent No. 2,611,232*

Note: If your router doesn't accept the e7-Bush, you can use an alternative guidebush with some limitations.



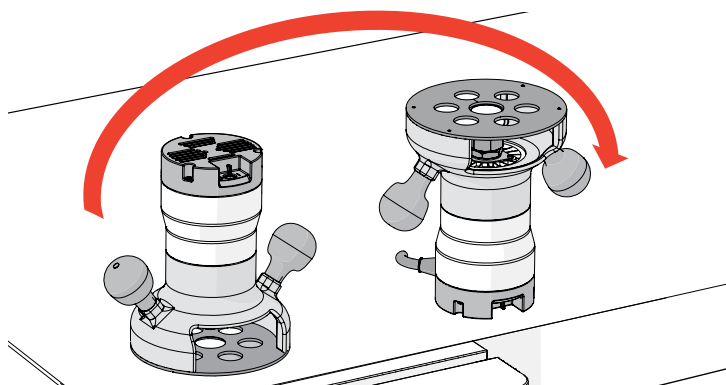
3-1 The Leigh e7-Bush ① is used to rout through, half-blind, single pass half-blind and sliding dovetails, and also box joints on the D4R Pro. The elliptical design provides precise joint fit adjustment for box joints and sliding dovetails. A round $\frac{7}{16}$ " [11,1mm] guidebush (min. barrel length $\frac{1}{4}$ " [6,35mm]) ② can be used to rout through, half-blind, and sliding dovetails on the D4R Pro.

3-2 The Leigh e7-Bush that comes with your D4R Pro is a unique template guidebush that is adjustable in size. Unlike regular circular template guidebushes ①, the e7-Bush is slightly elliptical in cross section ②. This simple innovation effectively changes the guidebush "active diameter size" when it's rotated, and provides benefits not possible with a standard round guidebush.

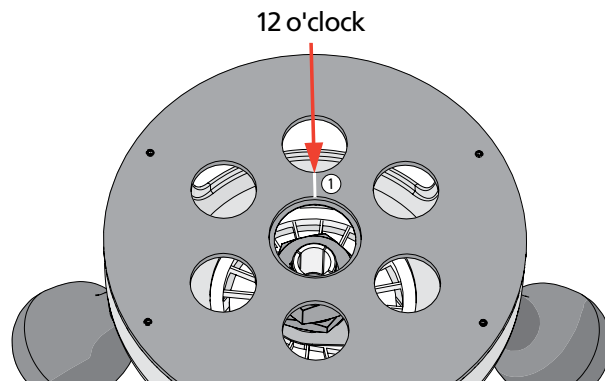


3-3 The e7-Bush ($\frac{7}{16}$ ") fits the router base or a guide bush adaptor in the base (see Appendix I). The ellipse/oval shape has a major axis ① $\frac{7}{16}$ " [11,1mm], and minor axis ② $\frac{7}{16}$ " [11,1mm] less .020" [5mm]. Turning the eBush 90° in the router base changes the active diameter by .020" [5mm] providing minute adjustment and recordable settings for perfectly fitting box joints.

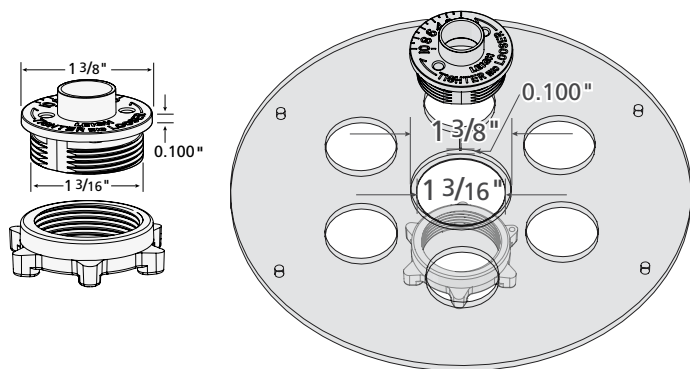
3-4 Here's how it works. In normal use on a dovetail jig, the operator does not rotate the router more than a few degrees either way ①. In fact because of potential bit-to-bush eccentricity problems it is advisable to minimize router rotation on jigs ②.



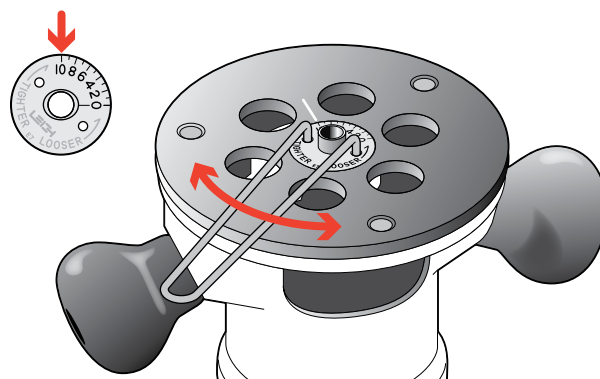
3-5 To install the e7-Bush, follow these simple steps. Hold the router the way you normally hold and operate it on the jig. Now, upend the router in the same orientation.



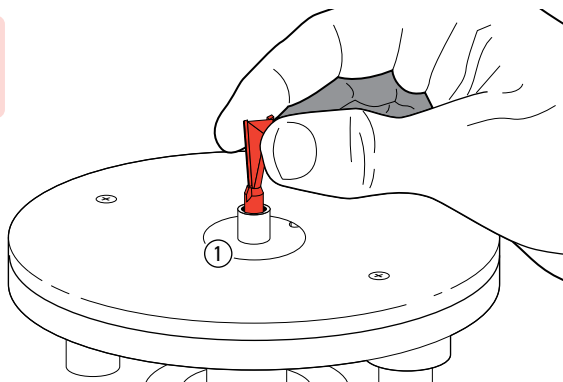
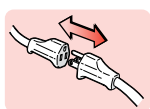
3-6 eBush Alignment Mark Think of the router base as a clock face. Make a small scratch line or permanent ink mark on the router base or e-Bush adaptor at the 12 o'clock position ①. This will be your reference mark for all e7-Bush settings.



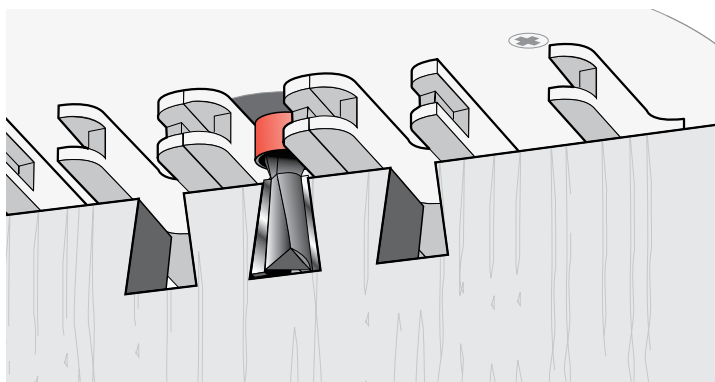
3-7 To fit the Leigh eBush directly to your router, the router base must have a 1-3/8" diameter counter bore. If your router base does not have the correct counter bore, you will need a guide bush adaptor or aftermarket router base plate. Leigh offers several guide bush adaptors to fit many common routers. See the Guide Bush Adaptor System in Appendix 1, page 69.



3-8 Fit the e7-Bush to the router and align No.10 to the scratch mark. This setting is used for all through and variably spaced half-blind dovetails on the D4R Pro. Settings for single pass half-blinds, box joints and sliding dovetails are described in applicable chapters. **Be sure to retighten the eBush nut after each adjustment is made with the included pin wrench.**



3-9 The bit goes through the e7-Bush ① and fits in the router collet or chuck.



3-10 The projecting part of the guidebush runs along the side edge of the guide finger. The rotating bit cuts the wood only, and touches neither the guidebush nor the guide surface. ■



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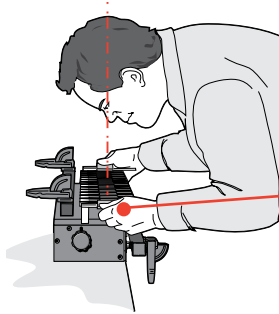


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D4R Pro CHAPTER 4

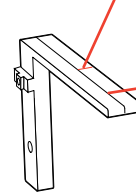
Basic Jig Functions and Scale Modes

Here are the very basics for understanding the different D4R Pro dovetail modes and settings.



Always read scales from directly overhead to avoid parallax problems.

This index line is used when setting the finger assembly scales. The line is illustrated in red for clarity, but is black on the jig.



All D4R Pro jigs are shipped with "short" support brackets.

THE FOUR SCALE MODES

The Finger Assembly attaches to the support brackets in four different modes to match the type of joint you are cutting.

Note: Inch scales are shown here. Millimeter scales have identical layout.

The **active** scale is always on the right of each scale assembly.

The **inactive** scale is always on the left of each scale assembly and is upside down.

Each scale has its own mode icon (a drawing of the joint part made in that mode).

Scales are color coded. Silver background for Through Dovetails. Green background for Half-Blind Dovetails.

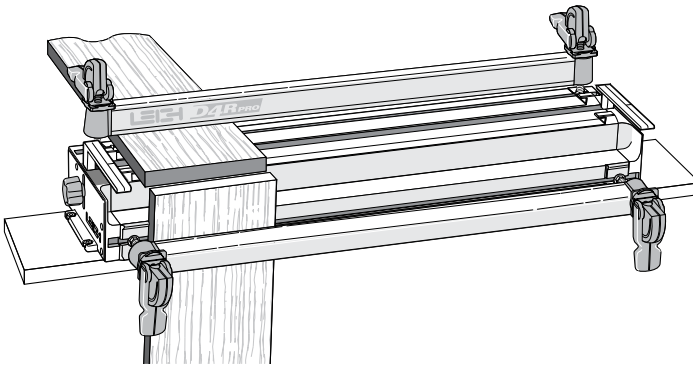
The specific settings for each scale are fully described in the appropriate chapters.

1. TD TAILS

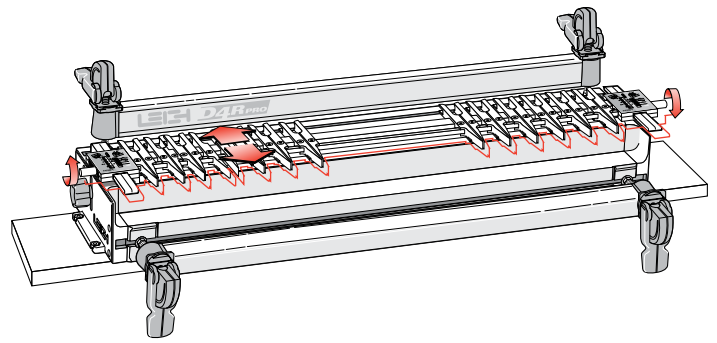
3. HB TAILS

2. TD PINS

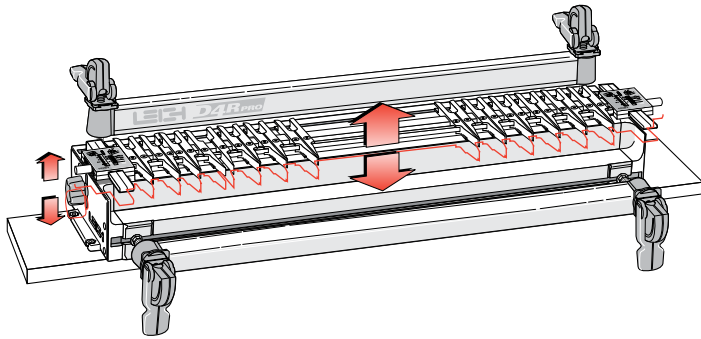
4. HB PINS



4-1 The two clamp bars hold workpieces horizontally or vertically. The side stops align the boards in the correct position each time.



4-2 The guidefinger assembly slides on to the support brackets above the workpiece. The finger assembly is adjusted in or out using calibrated scales on each end to suit different thicknesses of vertical boards.



4-3 The finger assembly is raised or lowered using the support brackets to suit different thicknesses of horizontal boards. ■



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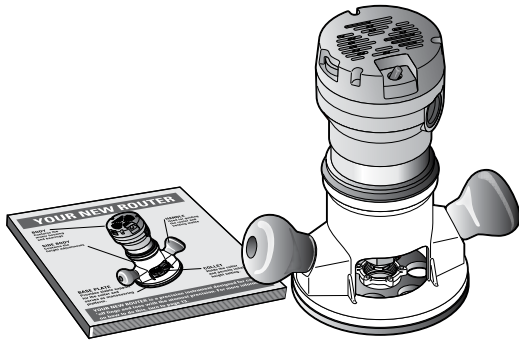
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D4R Pro - CHAPTER 5

Using Your Jig Safely

Safety is Not Optional

Read and follow the recommendations in this chapter.



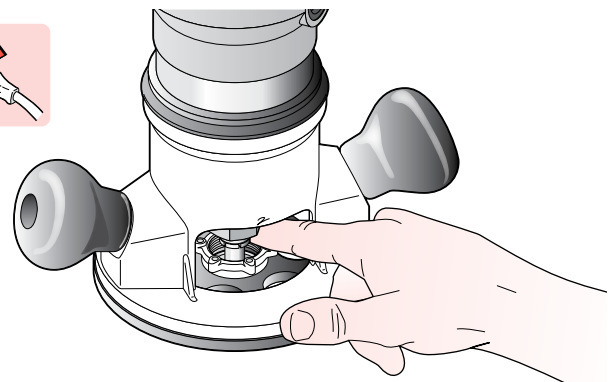
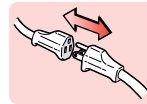
5-1 Read the owner's manual that came with your router. It is essential to understand the router manufacturer's instructions completely. Always operate variable speed routers at the fastest possible speed.



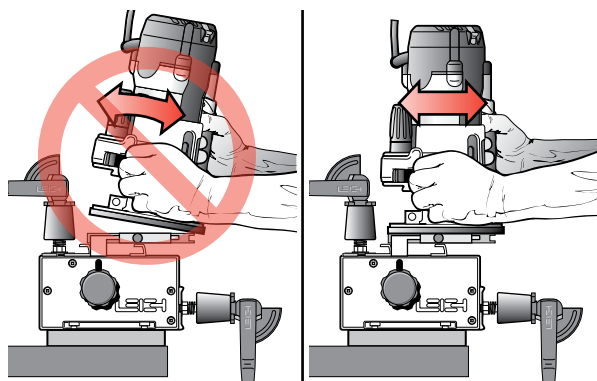
5-2 Always wear approved safety glasses. Always wear hearing protection. Protect yourself from harmful dust with a face mask. For complete dust and waste collection, add a Leigh VRS (Vacuum & Router Support) to your jig. See page vi.



5-3  Never drink alcohol or take medications that may cause drowsiness when you will be operating a router.

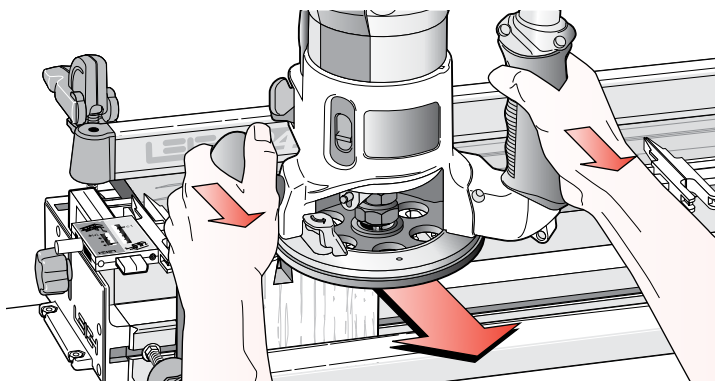


5-4 Always disconnect the power source from the router when fitting bits or guidebushes, or making adjustments. Before connecting the router to the power source, make sure the bit and collet revolve freely in all the areas you plan to rout, and the bit does not touch the guidebush or jig.

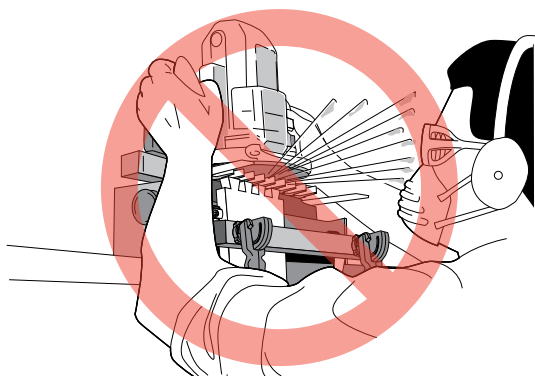


5-5 Do not tilt the router on the jig. Keep the router flat on the jig assembly.

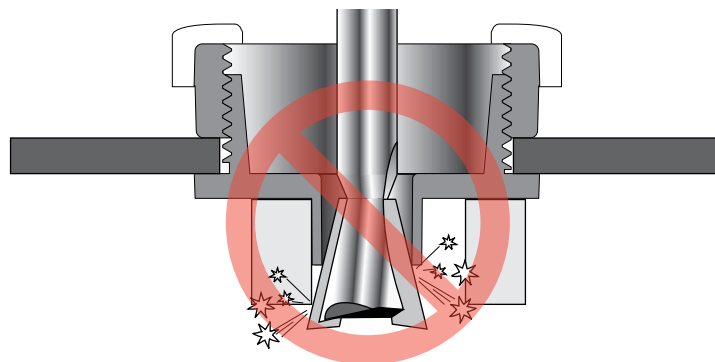
Note: The optional Leigh VRS attachment prevents router tilting. See page vi.



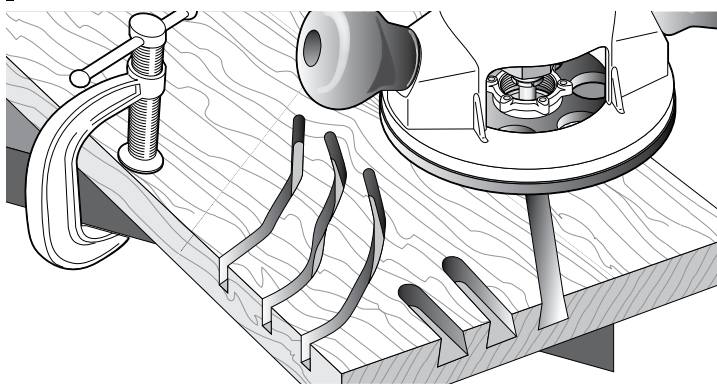
5-6 If you insist on removing the router from the jig while it is still revolving, always pull it straight off the jig horizontally, and do not raise or lower the router until it is completely clear of the jig. With the Leigh VRS fitted to your jig you can simply park your router to one side.



5-7 Do not rout at face level.



5-8 Never release the router plunge mechanism when using dovetail bits. Check if your plunge router has a stop nut to prevent this from happening accidentally.



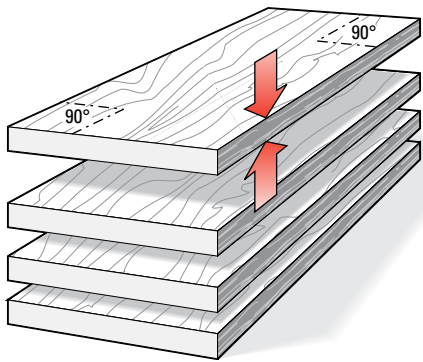
5-9 If you have never used your router before, be sure to follow the router manufacturer's instructions for its use. Make plenty of simple open-face practice cuts *without a guidebush* before you try to use the router on the Leigh jig. You must, of course, always use a guidebush when routing on the Leigh Jig. ■

D4R Pro - CHAPTER 6

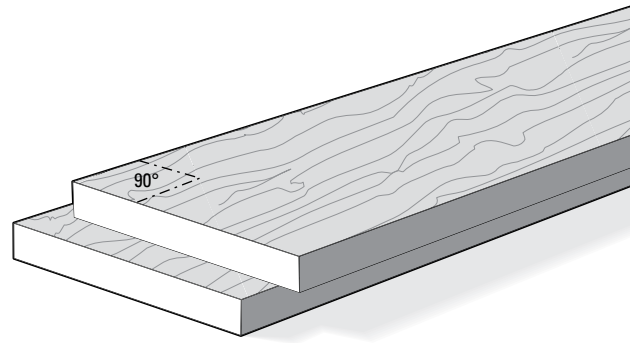
Wood Preparation

"Garbage In - Garbage Out"...

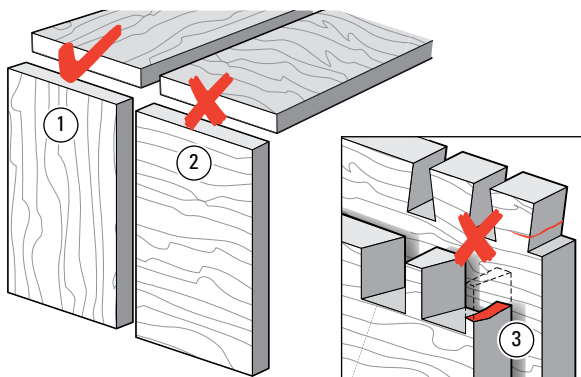
This adage of the computer age stands equally true for dovetail jigs.



6-1 It is vital for accurately aligned joints that stock used on the Leigh jig must be prepared straight, flat, of even thickness and equal widths, with square ends and edges. *Note that plywood is generally unsuitable for routing because of tearout problems.*



6-2 You will want to test the jig, so prepare some $\frac{3}{4}$ " x $5\frac{1}{2}$ " [20x140mm] boards. Cut them to length as you need them for the jig tests you want to perform. Use them for practice with the jig's various joint modes so you can see how the different modes work. Remember, though, that two boards of different thicknesses can be joined just as easily.



6-3  Dovetail joints are intended for joining end-grain ①. Attempting to cut dovetails in side-grain ② does not work because:

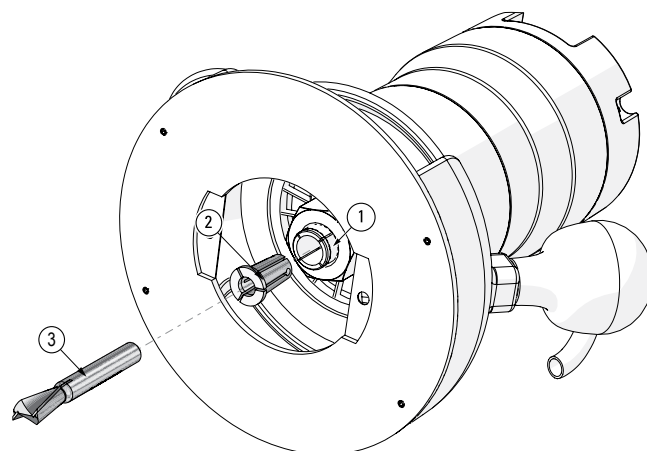
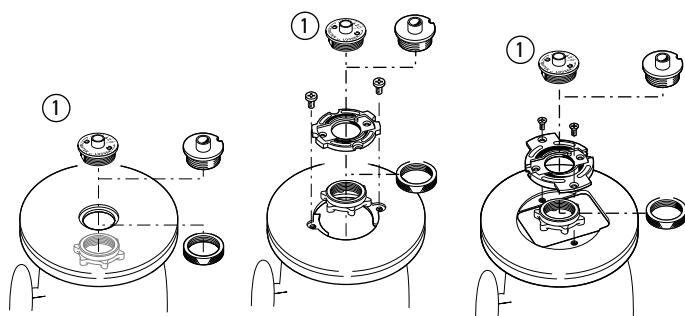
- A. The wood will tear out badly when routing.
- B. Even if you could rout them, the pins and tails would easily break off across the short grain ③, either during or soon after the assembly when the boards start expanding or contracting at different rates. ■

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D4R Pro - CHAPTER 7

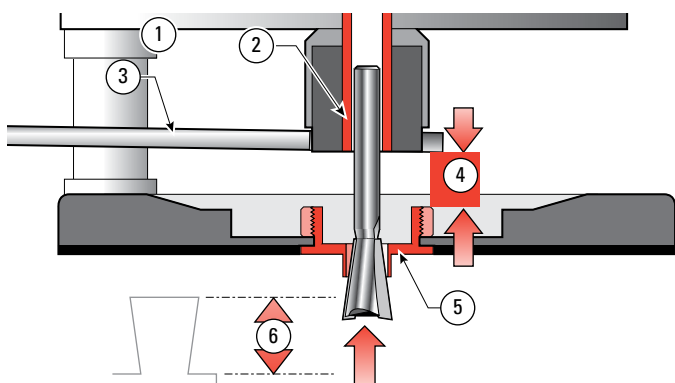
Router Preparation

Prepare your router for optimal use with the D4R Pro.

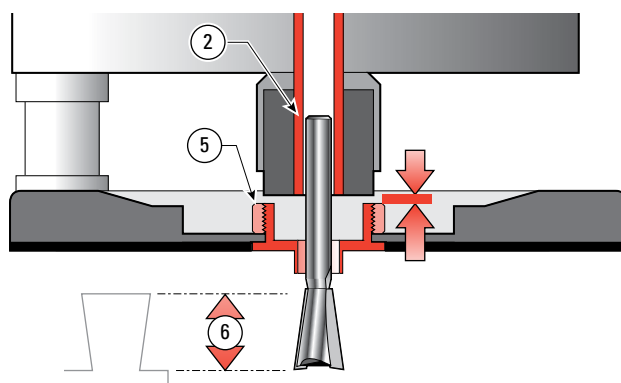


7-1 Fit the included e7-Bush ①. Some routers may require adaptation for the e7 to fit, *see page 69*. If the eBush is incompatible with your router, any $\frac{7}{16}$ " [11,1mm] guidebush (min. depth $\frac{1}{4}$ ", *see page 70*) will work for all Through and Half-Blind joints. The e7 is required for box joints on the D4R Pro.

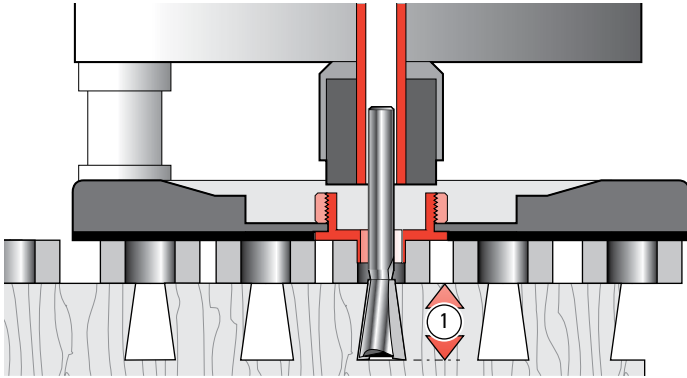
7-2 The D4R Pro and accessory templates utilize both 8mm and $\frac{1}{2}$ " shank bits. Your router requires a $\frac{1}{2}$ " collet for optimum versatility ①. Included 8mm shank bits fit an 8mm collet directly. Routers with $\frac{1}{2}$ " collets must use $\frac{1}{2}$ " to 8mm collet reducer ② supplied with the jig. Collet reducer ② is inserted in router collet ① (chuck) and 8mm shank bit ③ is inserted in collet reducer.



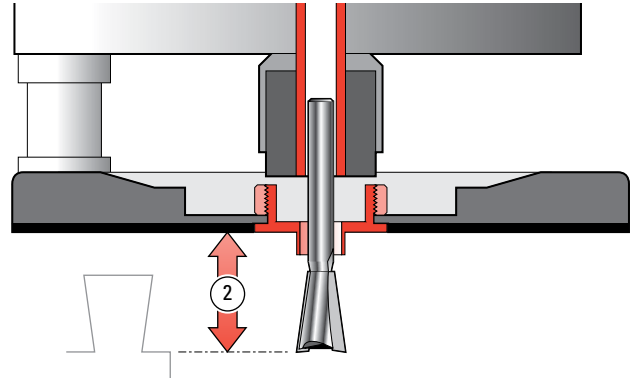
7-3 When fitting a bit to the router ①, fit the shank as far into the collet ② as possible. Always rout with the collet as close to the guidebush as possible. Usually you can't securely grip the collet nut with a wrench ③ if the collet is at its optimum low position. Fit the bit so that the remaining travel ④ between collet and guidebush ⑤ will let the bit reach the required depth of cut ⑥.



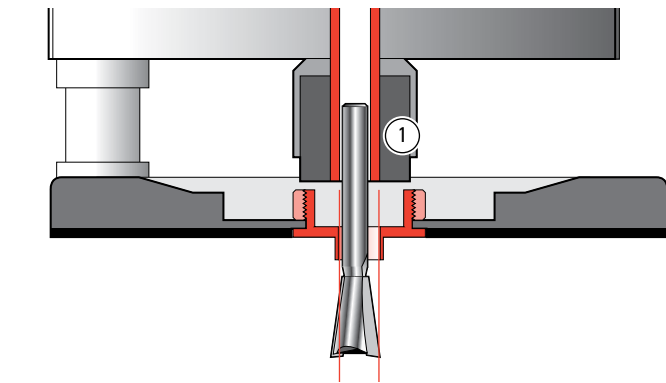
7-4 Tighten the collet ② securely and lower the collet to adjust the depth of cut ⑥, but make sure the collet does not contact the guidebush ⑤. Some smaller collets can go down into the inside of the guide bush. Take advantage of this.



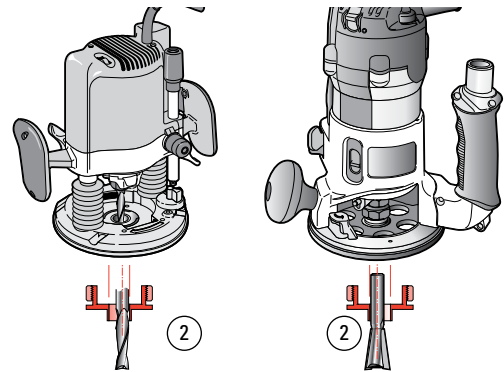
7-5 Depth of Cut: The depth of cut always refers to the actual depth of the cut into the wood beneath the guidefingers ①.



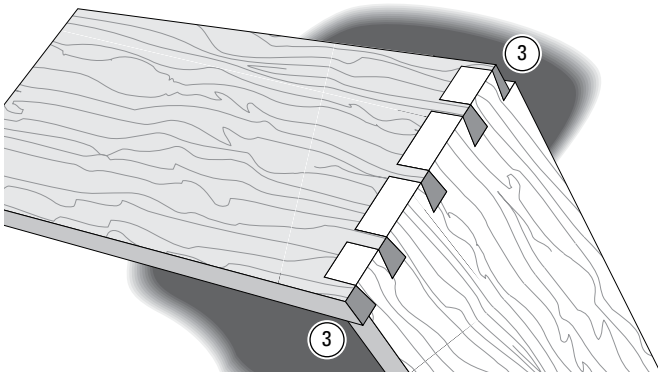
7-6 Depth of cut is **not** the distance the bit projects from the router base. This is **bit projection** ②. This guide generally refers to depth of cut. Bit projection ② is always .450" [11,5mm] more than depth of cut.



7-7 Ideally, the router collet (and bit) should be concentric (centered) to the guidebush as in figure 7-6. Regrettably, this is often not the case; the bit can be off center (eccentric to) the guidebush ①. The illustration shows the problem highly exaggerated. The good news: bit to bush alignment doesn't affect joint fit or flushness; both are "adjusted out" in normal jig setup.



7-8 Concentricity problems can only arise if two routers are used for through dovetails, (one for pins; one for tails). Routers with different bit to guidebush offsets ② (misalignment shown highly exaggerated)...



7-9 ...will cause pin to tailboard ③ misalignment (again, shown highly exaggerated).

Fortunately, some newer routers have sub-bases that can adjust for concentricity. If you don't have this type, it might pay to stick to a single router for through dovetails. ■

NOTE: Router Speed: Always use the fastest speed available on your router. The bits used on the D4R Pro are not large enough to warrant reducing router speed.



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D4R Pro - CHAPTER 8

Through Dovetails

In these instructions for the D4R Pro Dovetail Jig, we have recommended certain bits and board sizes because they are easy to work with.

Note: After you have routed some practice joints and gained confidence in your ability to get the results you want, try using the bit options on pages 71-77 Appendix II. This will help you plan the dovetail routing you want for your projects.

Concept of Jig Operation – THROUGH DOVETAILS

Start with the Finger Assembly in the  TD TAIL mode and follow these steps on your jig. Grasping the simple basic concept of operation will now greatly assist you in understanding the instructions. *Note that the active guide surface (against which the guidebush runs) is indicated in red in these illustrations.*

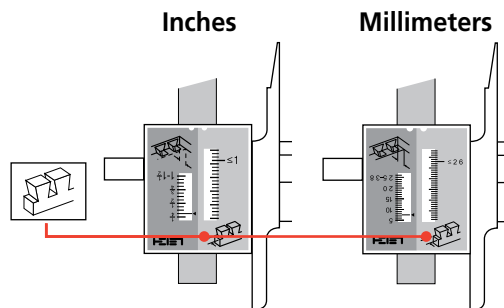
1

Start in

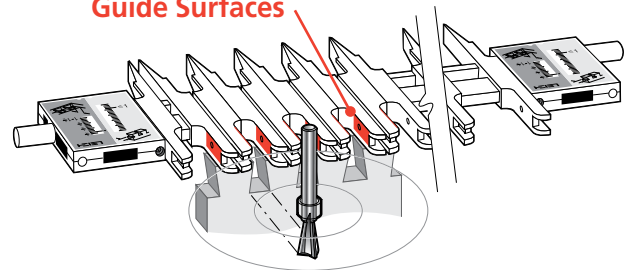
Through Dovetail Tails (TD TAILS) mode

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.

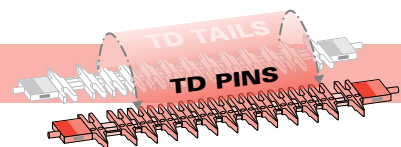


Active Guide Surfaces



2

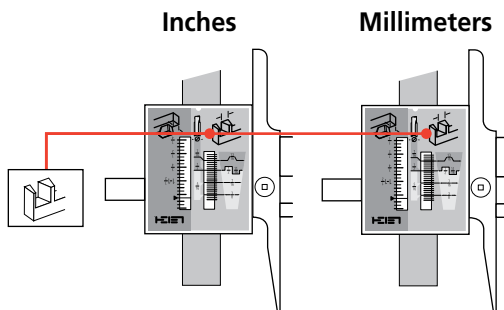
ROTATE the finger assembly toward you 180°



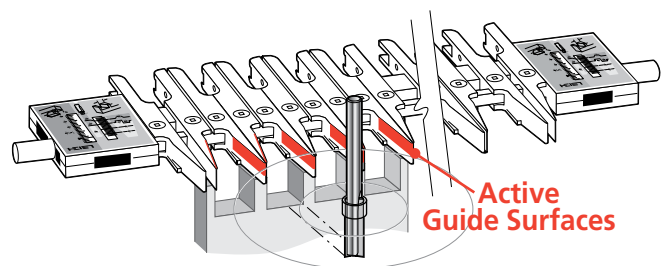
3

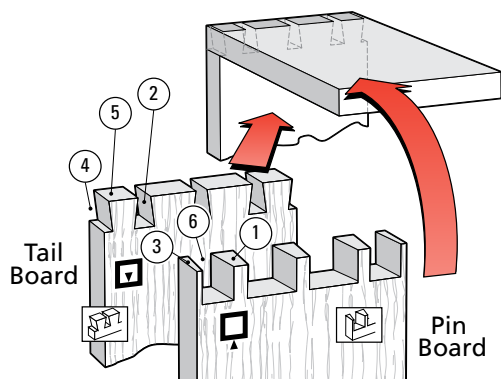
Now the Finger Assembly is in

Through Dovetail Pins (TD PINS) mode



Active Guide Surfaces

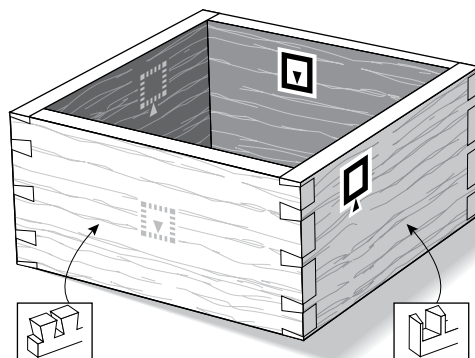




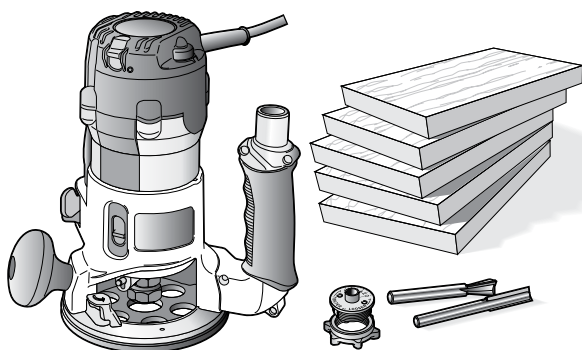
8-1 Through Dovetail Terminology:

- 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.

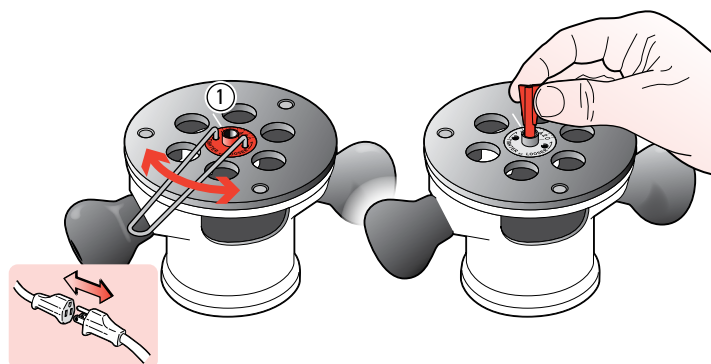


8-2 Let's look at how to make a simple square box. When you assemble the finished pieces with the faces properly oriented, any one of the pin ends will fit any one of the tail ends. In fact, the box can be put together in six different ways ...each of the four corners will fit two ways!

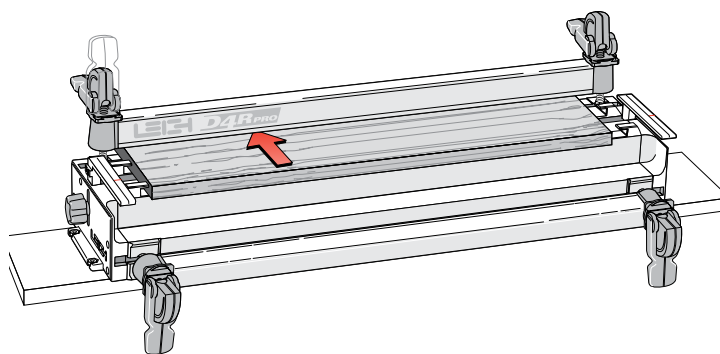


8-3 Make five identical boards $\frac{3}{4}$ " x $5\frac{1}{2}$ " [20x140mm] about 8" [200mm] long. Mark the inside faces of the two tail boards and outside faces of the three pin boards (you may not need one of the pin boards). Use Leigh e7 or $\frac{7}{16}$ " [11,1mm] O.D. guidebush with:

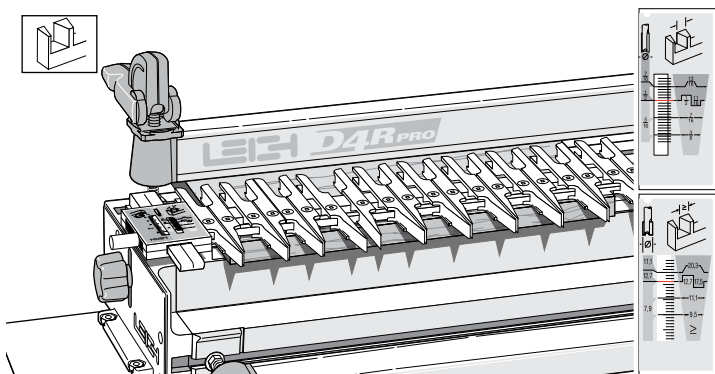
- No. 80-8 $\frac{1}{2}$ " [12,7mm] x 8° dovetail bit and
- No. 140-8 $\frac{5}{16}$ " [7,9mm] straight bit.



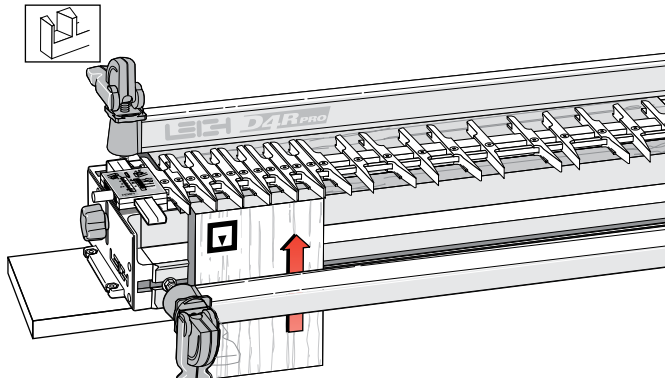
8-4 Fit the included e7-Bush or optional $\frac{7}{16}$ " [11,1mm] guidebushing securely to the router and set to the No.10 index mark ①. See chapter 3 for alignment mark positioning. Then fit the supplied 80-8 dovetail bit to the router. **Note:** The e7 guidebushing is not used to adjust joint tightness with through dovetails.



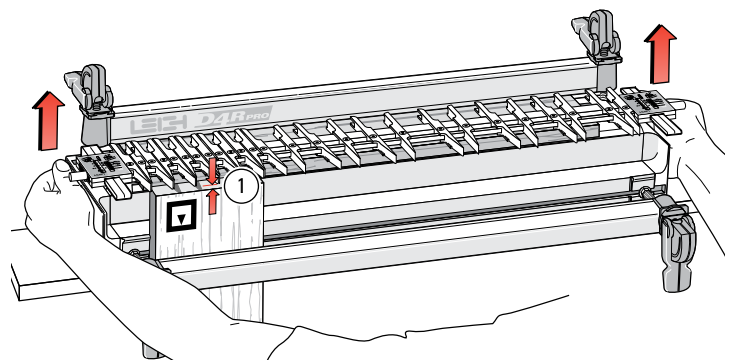
8-5 Clamp the spacer board in the rear clamp.



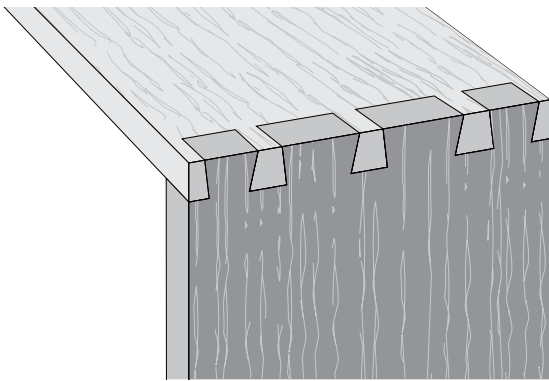
8-6 Place the finger assembly on the support brackets in the TD PINS mode, flat on the spacer board, and with the scale set on the $\frac{1}{2}$ " [12,7mm] setting for now. Don't worry about the scale's specific meaning now. Each scale's use will be fully explained in the appropriate section.



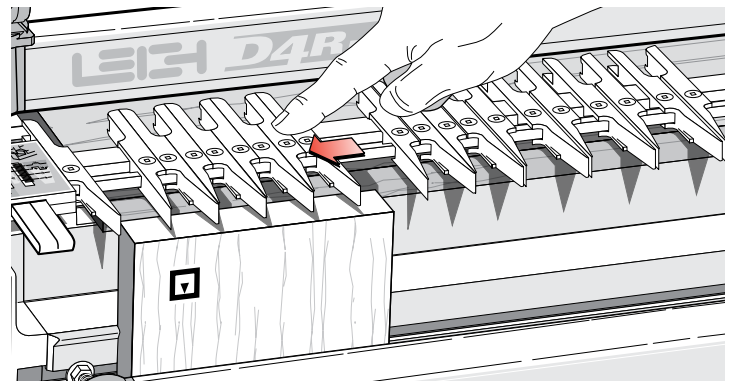
8-7 Clamp a tail board against the left front side stop, top edge touching flush under the guidefingers, inside face  away from the jig body. Although you will cut tails first, adjust the guidefinger layout in  TD PINS mode. The adjustment screws are on top in this mode, and it's easier to visualize the final joint pattern.



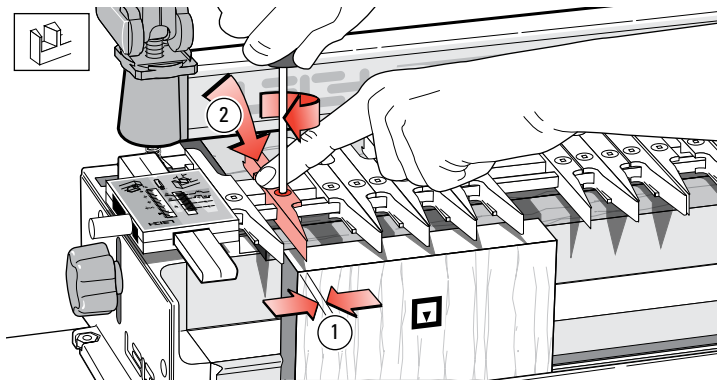
8-8 Loosen the support bracket knobs and raise the finger assembly about $\frac{1}{8}$ " [3mm] ① above the boards and retighten the knobs. This will allow easy and accurate guidefinger adjustment.



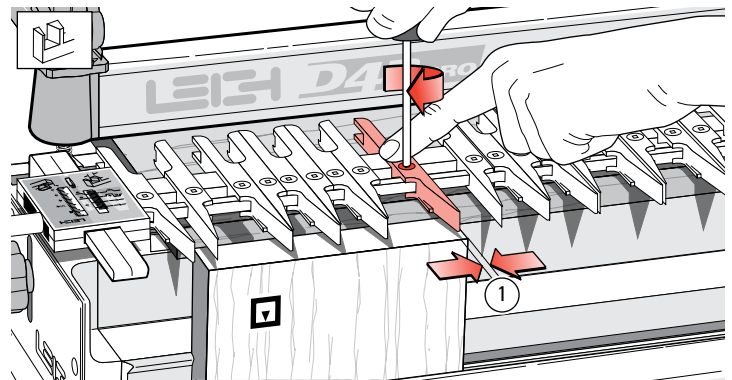
8-9 This joint layout is only a suggestion for this trial. It has a typical, traditional **symmetrical** layout of pins, with half-pins at each edge. The Leigh jig, however, allows for an infinite variety of joint designs, and boards of different thicknesses can also be joined to each other as shown in this illustration. Before attempting joints of **asymmetrical** layout, please see chapter 14.



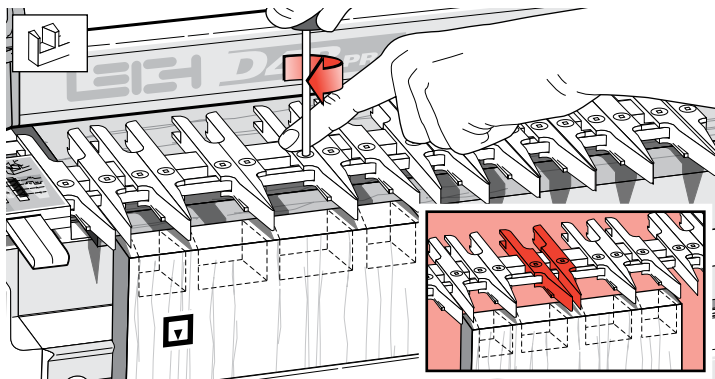
8-10 Ignoring the extreme outer guidefinger next to the scale (it just supports the router), loosen the next eight guidefingers and slide them over the workpiece. *NOTE: The first few times you use your jig, some fingers may "stick". This is normal. To "unstick", loosen the finger screw about 3/4 turn. Press down firmly on the screwdriver (in the screw) to loosen the finger locking wedge (you should feel a click).*



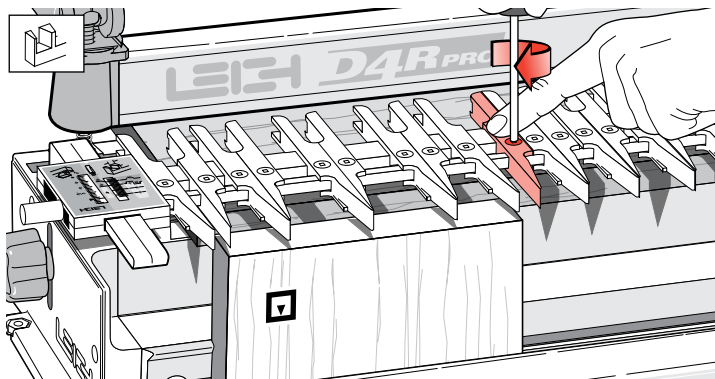
8-11 Lock the left-most half-pin guidefinger about $\frac{1}{8}$ " [3mm] ① in from the left edge of the board. Always apply light downward pressure to each guidefinger as the finger screws are tightened ②. This will ensure the fingers are flat and level on the bar.



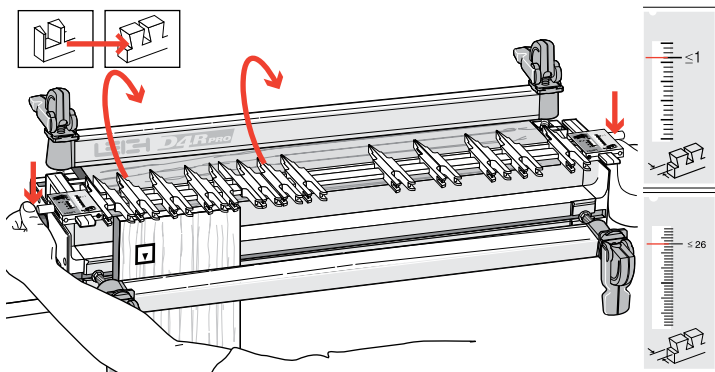
8-12 Leave three pairs of guidefingers over the board and lock the right-most half-pin guidefinger about $\frac{1}{8}$ " [3mm] ① in from the right edge of the board. Judge this distance by eye: it need not be exact. The sockets and pins will align automatically.



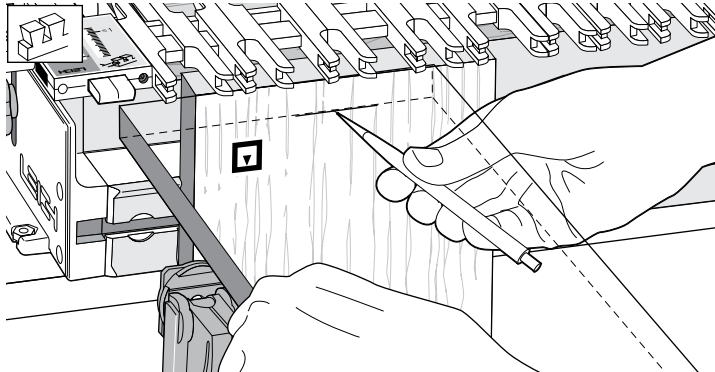
8-13 Space and lock the three remaining pairs as shown. Again, judge it by eye. If it looks right on the jig, the finished joint will look right. Note: Here we have shown pins of equal width, but with tails of increasing width. However, by opening up a pair of guides, the pin (and pin socket) can be widened for decorative or structural reasons as shown in the drawing inset.



8-14 Tighten any other loose guidefingers.



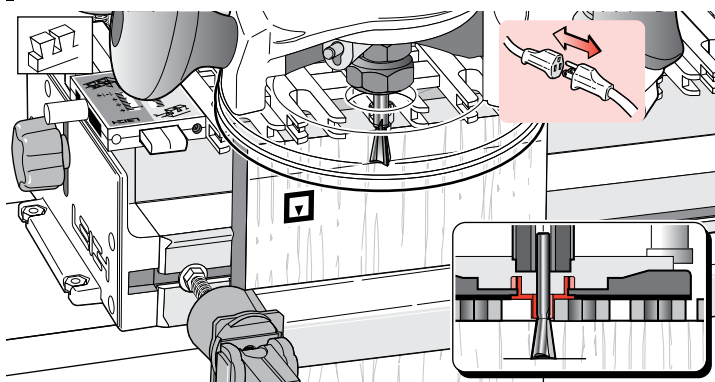
8-15 Rotate the finger assembly to the  TD TAILS mode, and set it to the $\leq 1"$ [$\leq 26\text{mm}$] position on the scale. Lower the finger assembly onto the spacer board. All TD tails are routed at this $\leq 1"$ [$\leq 26\text{mm}$] setting. (The $\leq 1"$ setting allows the dovetail bit to pass completely through all tail boards.)



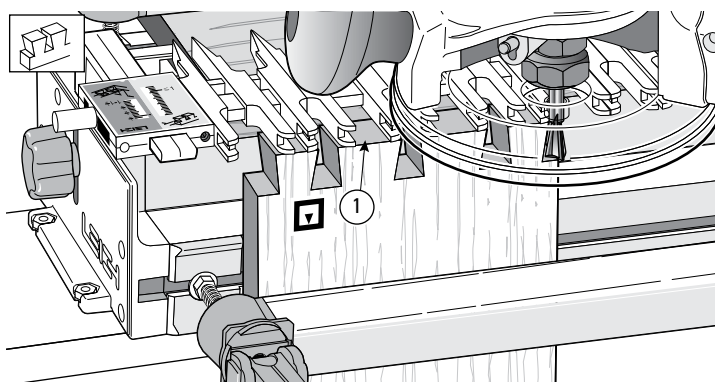
8-16 Place the end of a *pin board* horizontally flush under the guidefingers and mark a thin pencil line partly across the tail board.



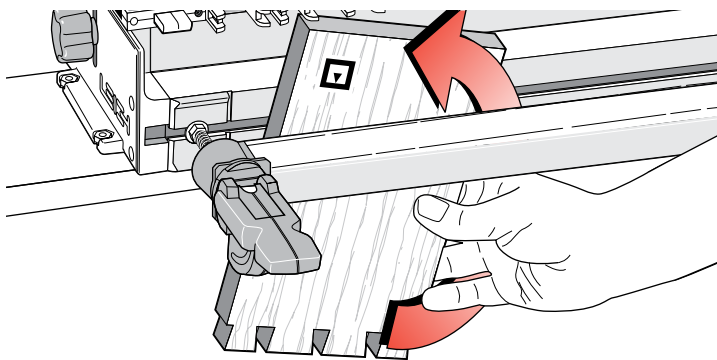
REMEMBER SAFETY!



8-17 Place the router on the finger assembly and adjust the router until the dovetail bit tip is level with the center of the pencil line. *Note: This means the pin socket will be half a thin pencil line deeper than the thickness of the pin board, leaving minimal cleanup after assembly.* Check to make sure the bit rotates freely.

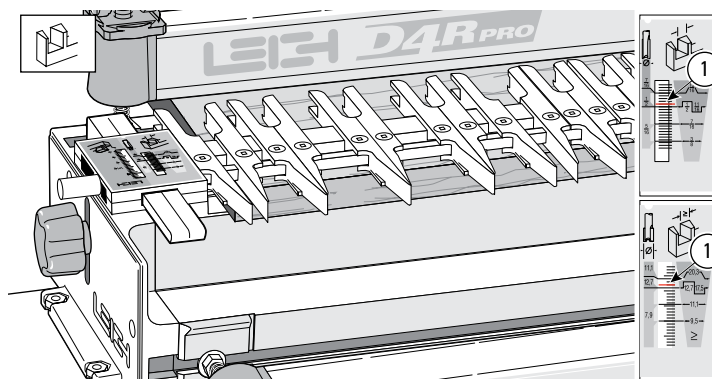


8-18 Before routing the tails, read "Hints and Tips 17-10". Plug in the router and rout out the half-pin and pin sockets. Use only **light side pressure on the guide fingers**. Take care not to rout unwanted sockets where there are gaps between the pairs of fingers ①. Rout only between the rounded guidefinger tips. See Hints and Tips 17-20.

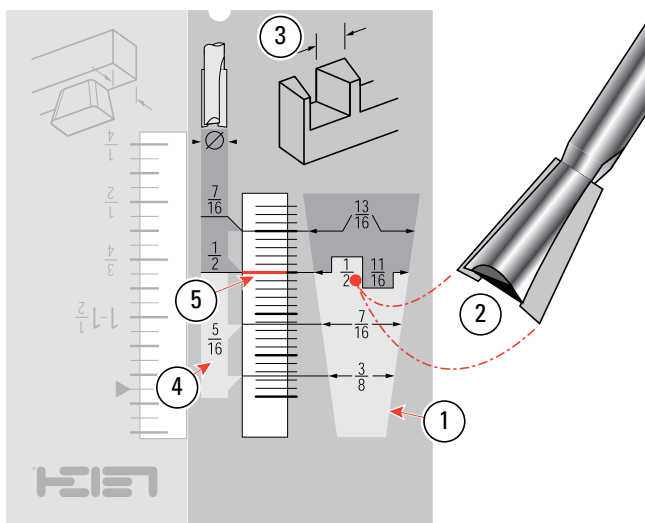


8-19 Before removing the routed board from the jig, check by eye and touch to make sure no parts have been missed. Release the clamp and reverse the tail board in the jig, keeping the same inside face  away from the jig body.

Rout the other end of this tail board and both ends of the second tail board in the same fashion, then unclamp and put them aside.



8-20 Rotate the finger assembly to the  TD PINS mode and set it one scale increment more than the $\frac{1}{2}$ " [12,7mm] mark ①. **Do not change the guidefinger layout.**

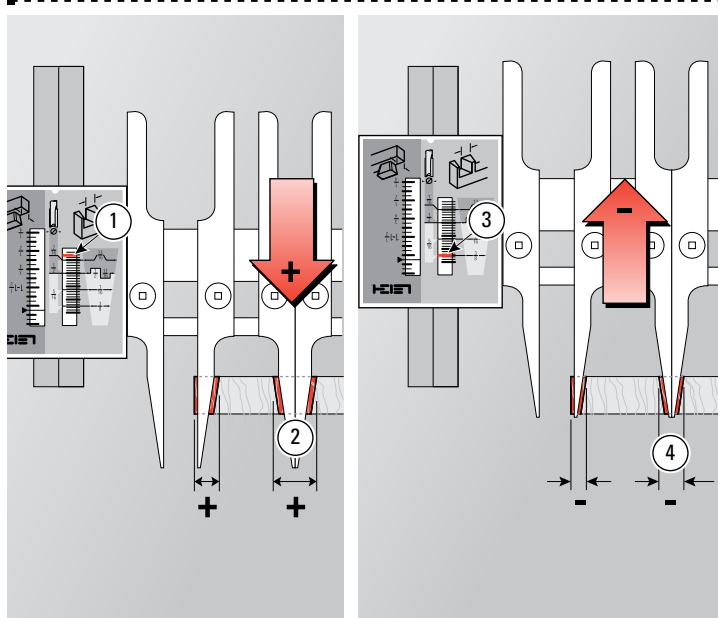


8-21 How the TD PIN Scales Work

Dimensions inside the pin shaped panel ① correspond with the diameter of the dovetail bit chosen to rout the tails ②. In this example the $\frac{1}{2}$ " [12,7mm] diameter of the #80-8 dovetail bit matches the $\frac{1}{2}$ " [12,7mm] setting on the scale. This also becomes the width of the pin ③.

Dimensions in the central panel ④ indicate which straight bit diameter is required with the selected dovetail bit, i.e. $\frac{5}{16}$ " [7,9mm] straight bit with the $\frac{1}{2}$ " [12,7mm], $\frac{7}{16}$ " [11,1mm] and $\frac{3}{8}$ " [9,5mm] diameter dovetail bits.

The increment lines in the scale window ⑤ are referenced to the index lines on the support brackets when making fit adjustments. Once the desired fit is achieved, settings can be recorded for precise setup next time.

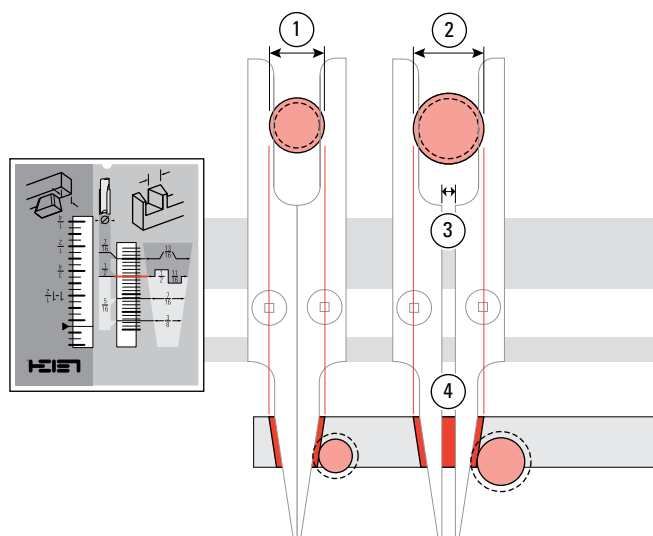


8-22 Finished Joint Tightness

The fit of the finished joint is determined in the  TD PINS mode. Moving the finger assembly outward ① increases the width of the pins ②, giving a tighter fit. Moving the finger assembly backwards ③ allows more wood to be routed, making the pins smaller ④, and the joint looser. A one increment movement changes joint fit by 0.005" [0,125mm]. A one quarter increment movement changes fit by a tiny 0.00125" [0,03mm]. Most importantly, when that fine fit is achieved, it allows recordable and repeatable settings for future joints using the same router and bits (*see page 28*).

Why can't there be specific, preset scale settings for each bit combination?

Cumulative tolerances in routers, bits, guidebushes and the dovetail jig, make it impossible to give exact jig settings for a precision glue joint. A fine fitting joint can only be attained by trial and error test cuts, and takes only minutes for each bit combination. Dimension lines on the TD PIN scale provides the starting point for testing.



8-23 Why are the 1/2" and 11/16"[12,7&17,5mm] pin widths on the same scale line?

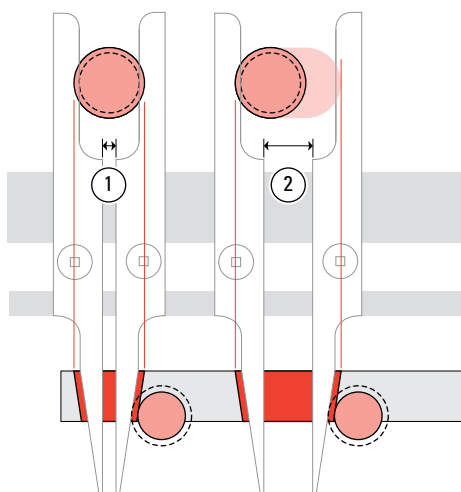
1/2" through dovetails are routed using a 7/16" guidebush ①

11/16" through dovetails are routed with a 5/8" guidebush ②.

That's a 3/16" difference in size between the two bits ...and between the two guidebushes.

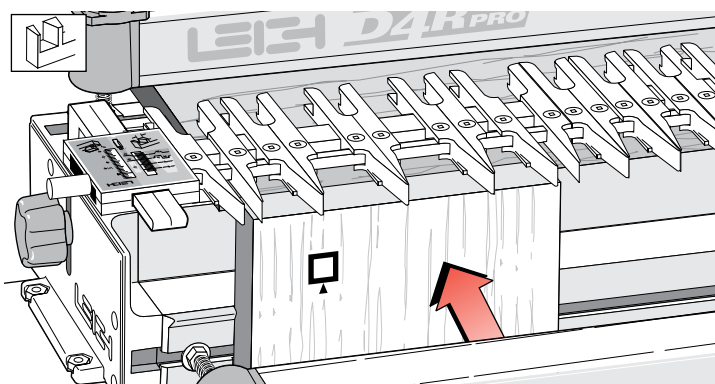
The 5/8" diameter guidebush for 11/16" joints requires that the guide fingers be opened up by 3/16" ③.

This automatically makes the pins 3/16" wider ④ but on the same scale setting. See Chapter 9: Large and Small Through Dovetails.

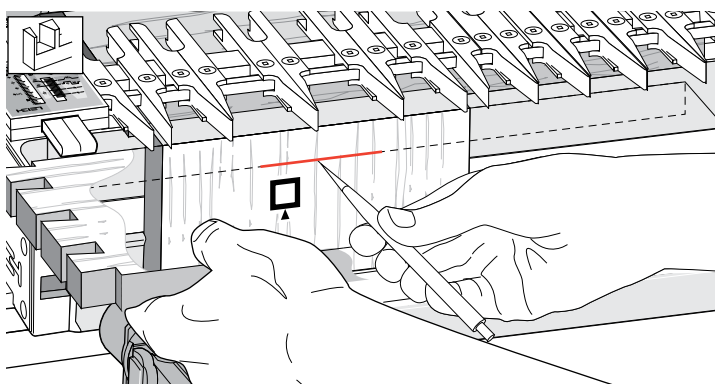


8-24 Do the guide fingers have to be opened up precisely 3/16"[4,75mm] for larger combinations?

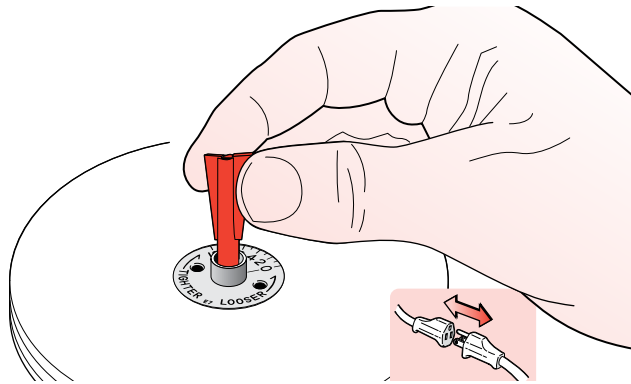
No, just so long as they are opened up by at least 3/16"(4,75mm) ① to allow the larger guidebush to enter the tail guides. Anything more than this minimum is fine ②; both the pin and matching pin socket widths will be automatically increased by exactly the same amount, whatever the spacing. Varying the pin width does not affect the joint fit or the scale setting. In fact, the pin width can be varied with all bit combinations, not just the larger bits. See Chapter 9: Large and Small Through Dovetails.



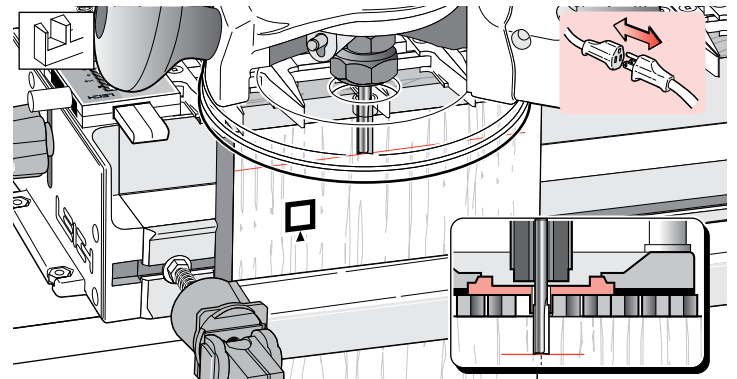
8-25 Clamp a test pin board against the left hand side stop, outside face  away from the jig, with the top end flush under the guides.



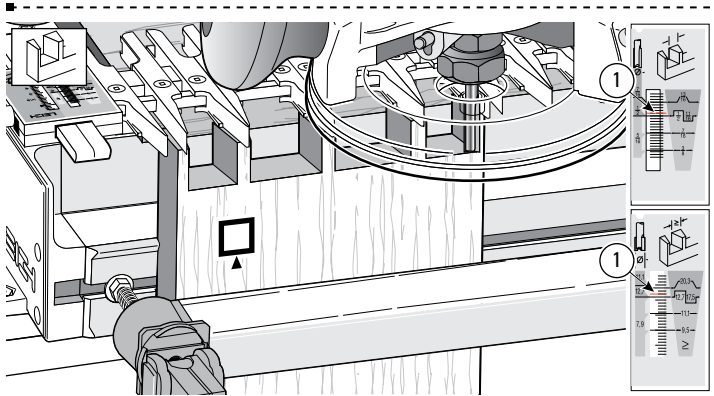
8-26 Place the side edge of one of the finished *tail boards* horizontally flush under the guidefingers and mark a thin pencil line part way across the pin board.



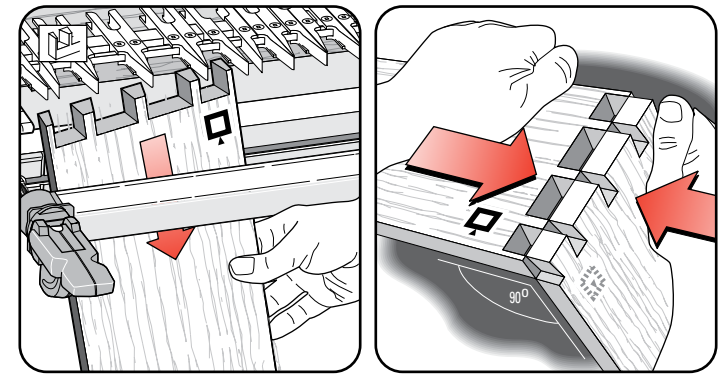
8-27 Unplug the router and remove the dovetail bit. Mount the No. 140-8 straight bit to the router. *If you are using two routers, see concentricity concerns, Figures 7-6 thru 7-8.*



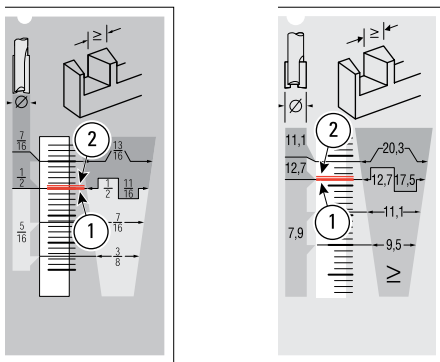
8-28 Place the router on the finger assembly and adjust the router until the tip of the bit is level with the center of the pencil line. Check to make sure the bit rotates freely.



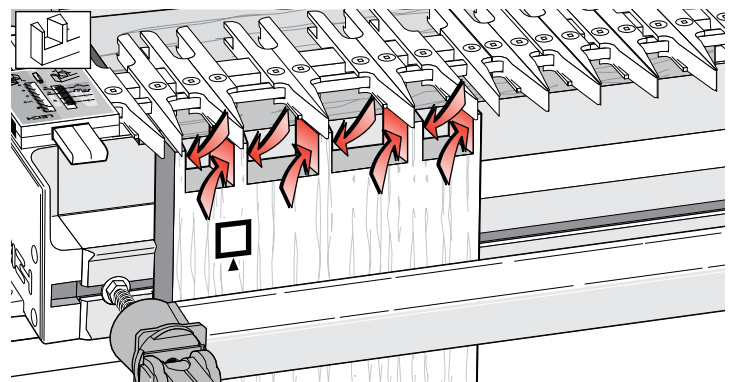
8-29 Check that the scales are set one increment above the 1/2" [12,7mm] mark ①. Rout out the waste between the pins. Check to make sure no parts have been missed. See 17-1 to 17-5, "Hints and Tips" on how to minimize tearout. Use only light side pressure on the guide fingers.



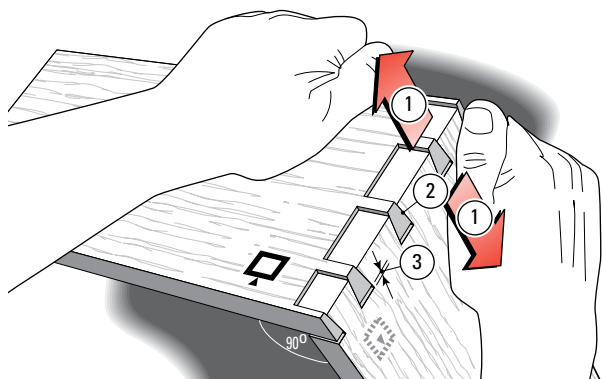
8-30 Remove the test pin board from the jig and test it for fit in one of the tail boards. *Make sure the outside faces □ face outward on both pieces.* The joint will probably be too tight. A firm push fit is perfect, perhaps a tap with the heel of your hand. But having to use a mallet means the joint is too tight to take glue.



8-31 If it is much too tight, move the finger assembly in (away from you) by one division on the scale. If it is only a little tight, adjust the scale by only half a division. If it is too loose, go to 8-33.

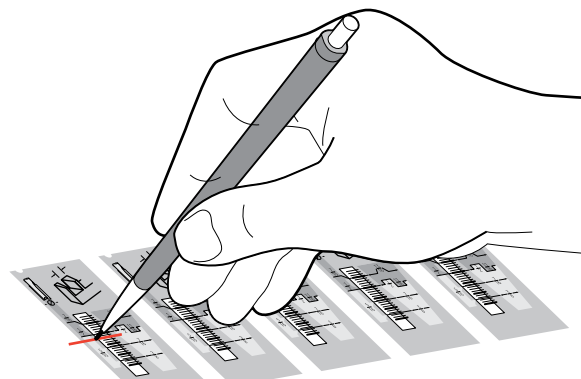


8-32 Replace the same pin board back in the jig, carefully aligned against the same side stop. Rout off the sides of the pins and test it again for fit.

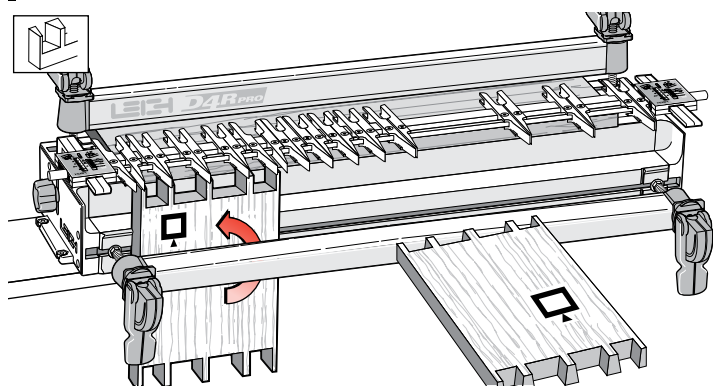


8-33 Test and repeat as required to achieve the desired fit.

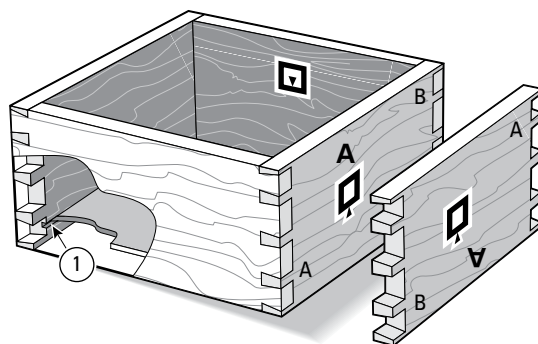
Note: If you overdo it and make a loose joint, do this test. Pull the tail board “away” from the pins ① so that the angled sides of the pins and tails jam together ②. The gap between the bottom of the pins and the pin sockets ③, is the amount to move the finger assembly out, (toward you). Reset the finger assembly and test again on the other end of this (fifth) board.



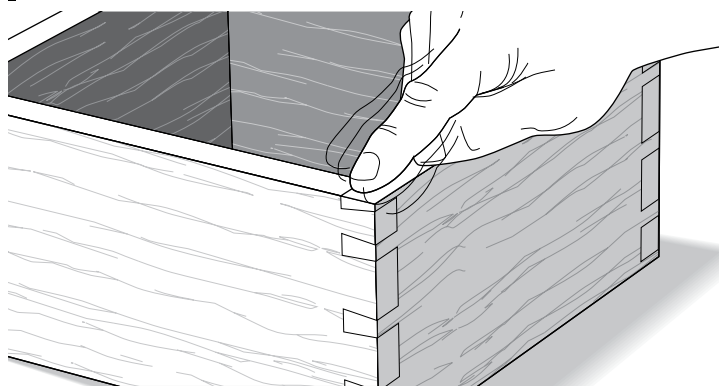
8-34 Once the correct fit is achieved, mark the final TD PINS scale setting on one of the scale prints (see page 28) for future reference. Very slight variations to the scale setting may be necessary with different wood species or hardness.



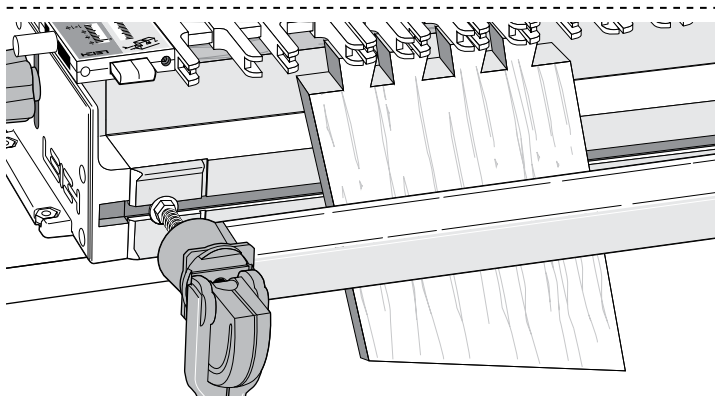
8-35 Rout all four ends of the pin boards, keeping the outside face  outwards. (With luck you may not have used the fifth board.)



8-36 Assemble the box, making sure the tail boards face the proper way, i.e. tail boards inside face in ; pin boards outside face out . Provided you haven't already routed out the drawer bottom grooves ①, it doesn't matter which edge of any of the boards are at the top or bottom, the box will still fit together i.e. pin board “A” can be up either way.

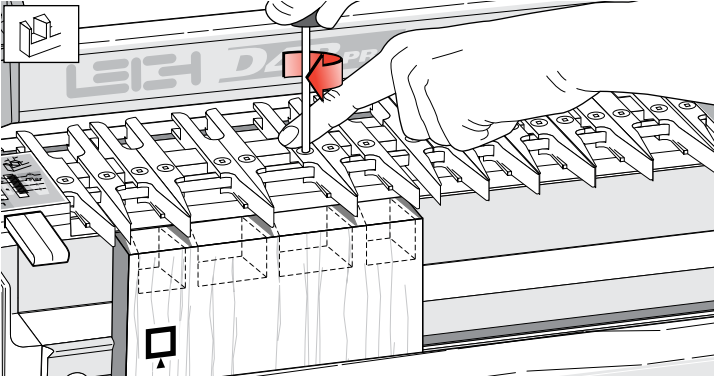


8-37 The box should be square and in plane. If it is not in plane (i.e., the side edges of each board are not in line), then either the ends of the boards are not square, the board widths are not exactly equal, or there is a concentricity problem (see 7-7 to 7-9).

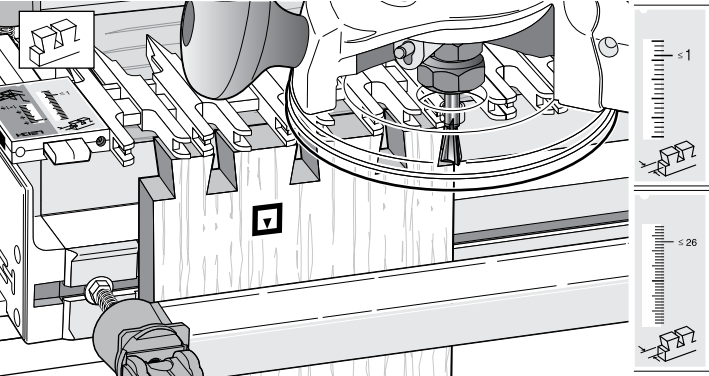


8-38 To form angled dovetails, refer to the Technical Bulletin “How to Rout Angled Through Dovetails on your Leigh Jig”. You can download this bulletin from the support page of our website: <http://Leightools.com/support.php>. ■

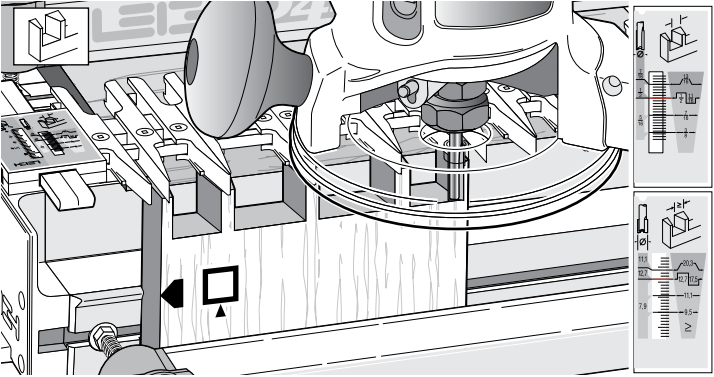
QUICK REFERENCE REMINDERS



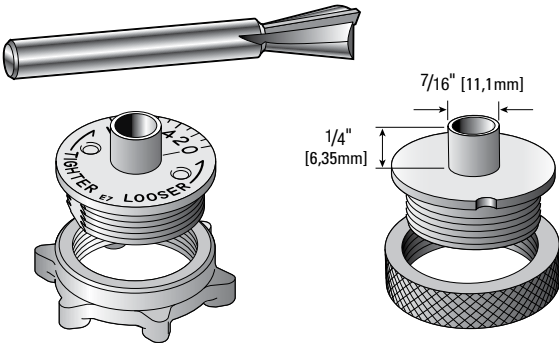
8-39 Through dovetails are laid out in the TD PINS mode with the finger assembly slightly raised above the spacer board. The outside face of the TD pins is away from the jig body.



8-40 TD tail boards are clamped vertically in the jig. The inside face of the TD tails is away from the jig body. The finger assembly is in the TD TAILS mode, set on the single $\leq 1"$ [$\leq 26\text{mm}$] setting. There is only one setting in this mode.



8-41 Clamp TD pin boards vertically in the jig. This is the only one of the four main modes that puts the outside face of the board away from the jig body. The finger assembly is in TD PINS mode, with the scale set to a recorded setting (see detailed fit instructions 8-21 to 8-34). TD pins are cut with a straight bit; the only time a straight bit is used in dovetailing.



8-42 Through Dovetail tails are always routed with an 8° dovetail bit to match the 8° guide finger. All TD routing on the D4R Pro is done with the Leigh e7-Bush, or any $\frac{7}{16}"$ [11,1mm] diameter bush (min. barrel length $\frac{1}{4}"$ [6,35mm]) for bits 50-8 through 80-8. See pg. 70 for more on routers and guide bushings. Use a 716C or $\frac{5}{8}"$ [15,9] OD bushing for all $\frac{1}{2}"$ shank TD bits. See Chapter 9.

Thickness of Tail Board	Thickness of Pin Board	Dovetail Bit	Straight Bit	Guidebush Diameter
$\frac{1}{8}" - 1"$ [3-26]	1" - 1 $\frac{1}{4}"$ [26-32]	No.100	No.150	Leigh 716C or $\frac{5}{8}"$ [15,9]
	$\frac{5}{8}" - 1"$ [16-26]	No.90	No.160	
	$\frac{1}{2}" - 13\frac{1}{16}"$ [12-20]	No.80-8	No.140-8	Leigh e7 or $\frac{7}{16}"$ [11,1]
	$\frac{3}{8}" - 5\frac{5}{8}"$ [10-16]	No.75-8		
	$\frac{1}{4}" - 1\frac{1}{2}"$ [6-13]	No.70-8		
	$\frac{1}{8}" - 3\frac{3}{8}"$ [3-10]	No.60-8		
	$\frac{1}{8}" - 1\frac{1}{4}"$ [3-6]	No.50-8		

Numbers in brackets are millimeters

8-43 Here is a quick reference selection chart for through dovetail bits and guidebushes. Please study the bit and guidebush selection appendixes for a full explanation.

PROJECT SETTINGS

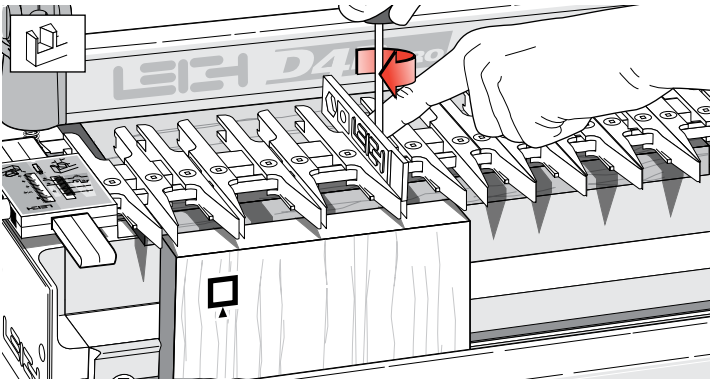
INCHES

 80-8						

METRIC

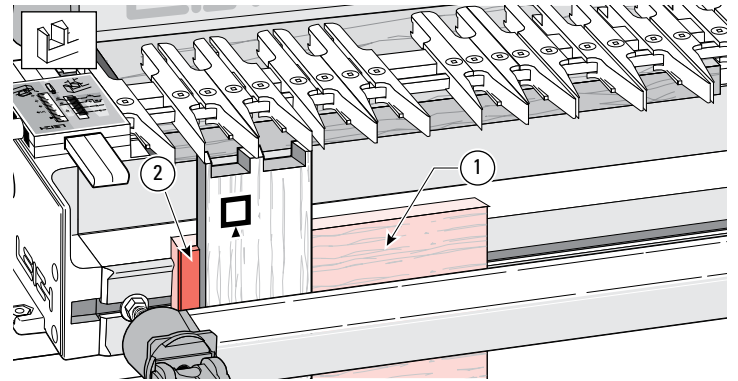
Large and Small Through Dovetails

The following procedures considerably expand the D4R Pro jig's versatility. However, before attempting them, thoroughly master the techniques of Through Dovetails in Chapter 8.



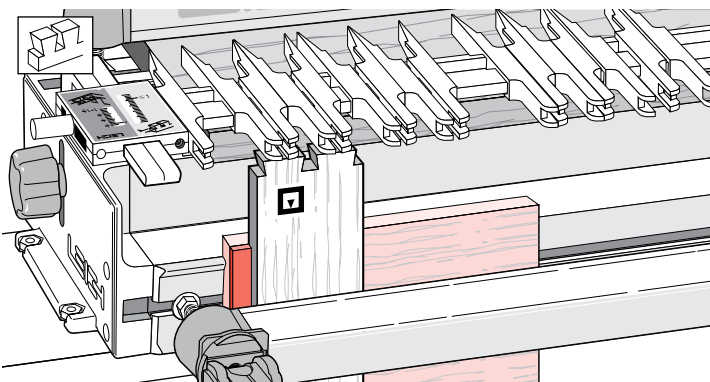
9-1 LARGE THROUGH DOVETAILS

The procedures for using bits 90 and 160 or 100 and 150 are identical to the previous figures, except that a Leigh 716C or $\frac{5}{8}$ " [15,9mm] OD guidebush is used, and *each guidefinger must be at least $\frac{3}{16}$ " [5mm] apart*. Use the Leigh wrench gauge ($\frac{3}{16}$ " [5mm] thick) to make sure there is enough separation. Note: Because the 716C or $\frac{5}{8}$ " [15,9mm] guidebush is used, the closest possible pin centers using these bit combinations is $1\frac{3}{8}$ " [35mm], instead of 1" [25,4mm].

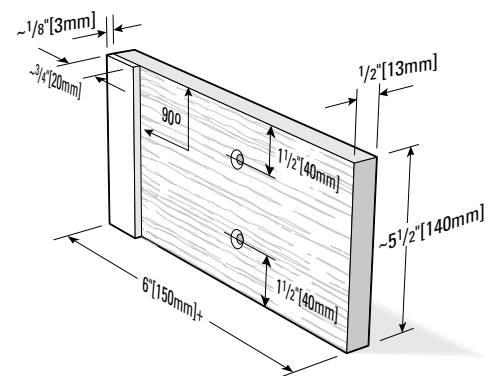


9-2 SMALL THROUGH DOVETAILS

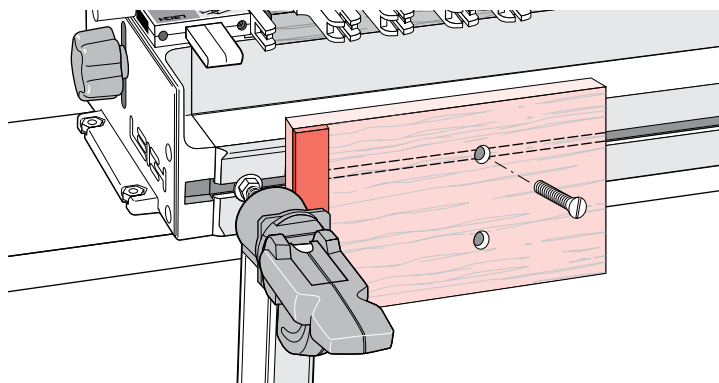
Bits 50-8 and 60-8 allow you to create tiny through dovetails in material $\frac{3}{8}$ " [10mm] or less in thickness. This procedure is an extra bonus: the Leigh jig was not originally designed for it. The TD PINS scale does not go down far enough, so you have to space the boards away from the jig face with a shop-made block ① fitted with its own side stop ② (see 9-4). Use the $\epsilon 7$ or a $\frac{7}{16}$ " [11,1mm] O.D. guidebush for these small joints.



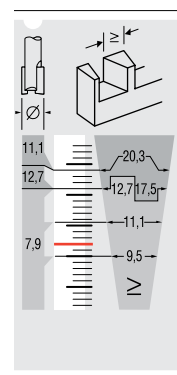
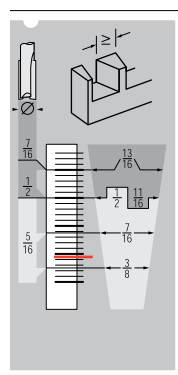
9-3 Use the same block with side stop when cutting the tails to ensure correct alignment of the pin and tail boards.



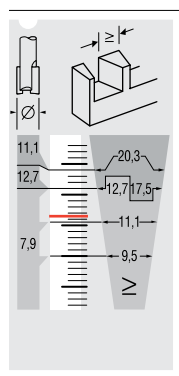
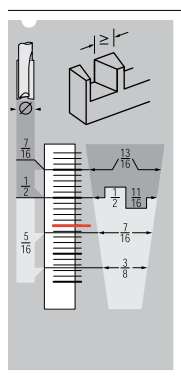
9-4 Make the block with its side stop out of $\frac{1}{2}$ " [13mm] stock as shown. Bore two $\frac{1}{4}$ " [6mm] holes, countersunk for a flat head screw (part no. 287) to allow the blocks to be used at either end of the jig.



9-5 Remove one front cam clamp, lower the clamp bar and attach the block to the jig face using the screw (No. 287) into the entrapped square nut. Replace the clamp bar and cam clamp.



9-6 For boards up to $\frac{1}{4}$ " [6mm] thick use dovetail bit 50-8 and pin bit 140-8 with the e7 or a $\frac{7}{16}$ " [11,1mm] guidebush. To cut pins matching the sockets made with bit 50-8, begin with the setting shown here. Cut test pins in scrap stock and test for fit. Adjust as necessary.

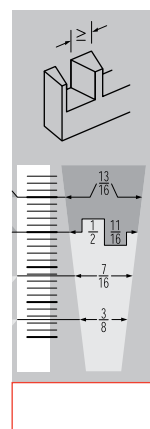
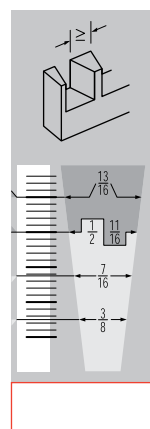
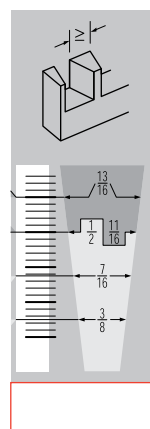
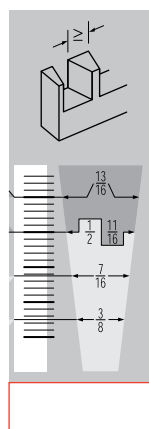
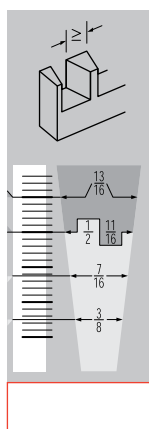
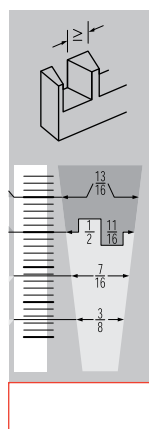
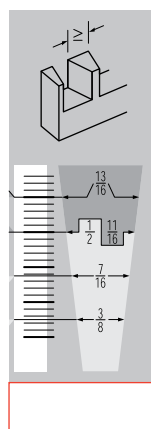


9-7 For boards up to $\frac{3}{8}$ " [9,5mm] thick use dovetail bit 60-8 and pin bit 140-8 with the e7 or a $\frac{7}{16}$ " [11,1mm] guidebush. To cut pins matching the sockets made with bit 60-8, begin with the setting shown here. Cut test pieces in some scrap stock and test for fit, then adjust as necessary. Record the actual settings for bits 50-8 and 60-8 on these scale reproductions below.

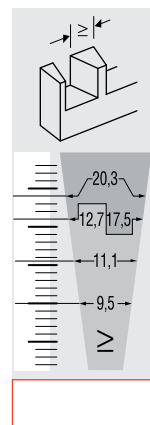
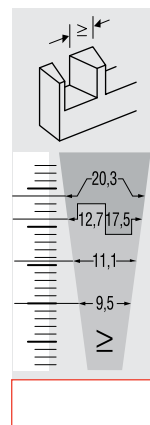
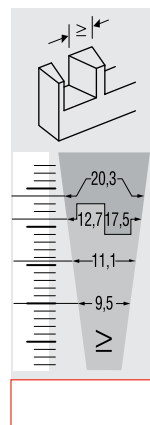
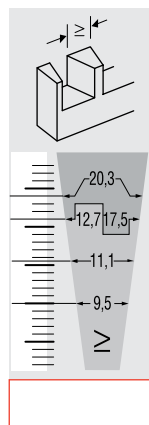
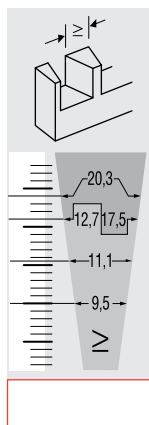
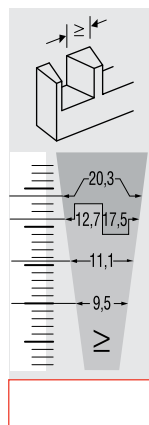
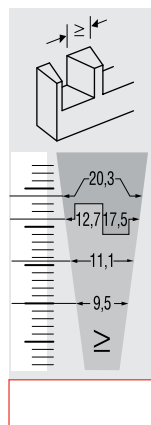
Note: You may also rout joints in boards $\frac{5}{16}$ " to $\frac{3}{8}$ " [8,0 to 9,5mm] with bits No. 70-8 and 140-8 without the use of the shop-made block.

PROJECT SETTINGS

INCHES



METRIC





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D4R Pro - CHAPTER 10

Variably Spaced Half-Blind Dovetails

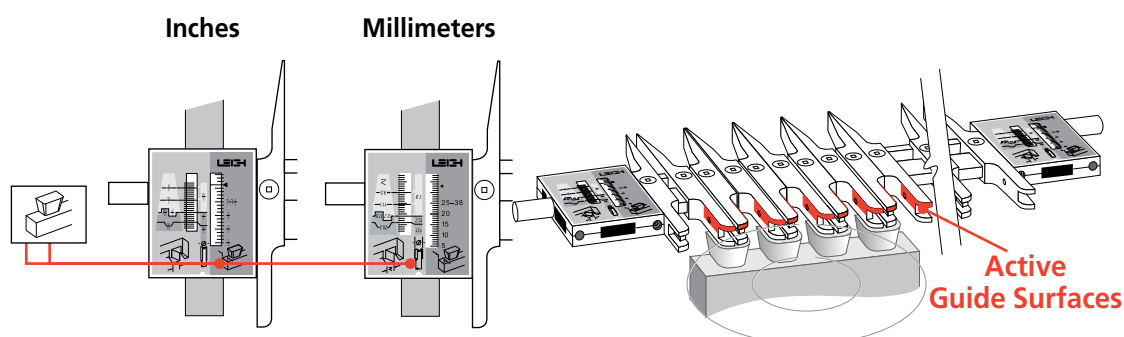
IMPORTANT The most commonly misunderstood aspect of routing half-blind dovetails is how to adjust the joint fit using the dovetail bit depth of cut, and how the angle of the bit affects that depth of cut. Review this chapter for a clear understanding of this concept.

Note: The Leigh e7-Bush or any 7/16" [11,1mm] guidebush with a min. barrel length of 1/4" [6,35mm] (see page 70), and any one of the bits listed on the next page may be used for half-blind dovetails. See Page 75 Appendix II, Half-Blind Bit selection for a full description of how to select an appropriate bit.

1

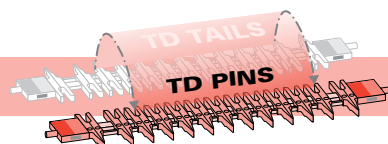
Start in

Half-Blind Dovetail Tails (HB TAILS) mode



2

ROTATE the finger assembly toward you 180°



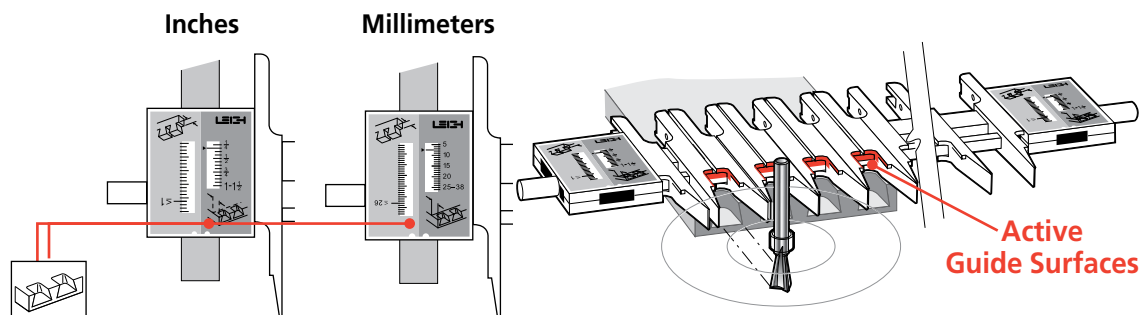
3

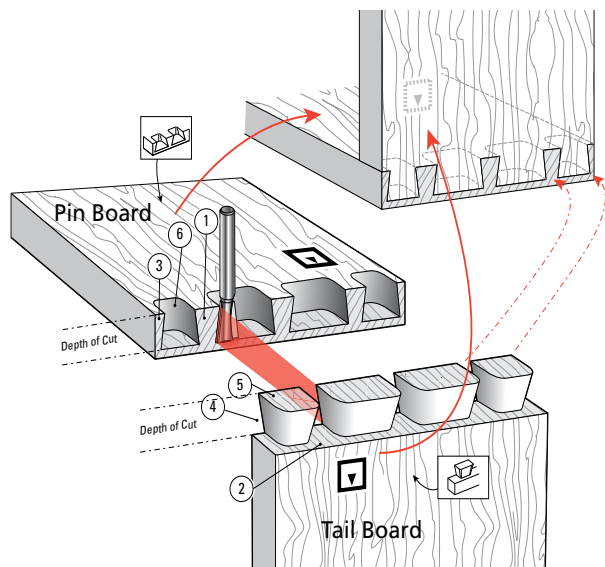
Now the Finger Assembly is in

Half-Blind Dovetail Pins (HB PINS) 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.





10-1 Half-Blind Dovetail Terminology:

① Pins

② Pin sockets

③ Half-pins

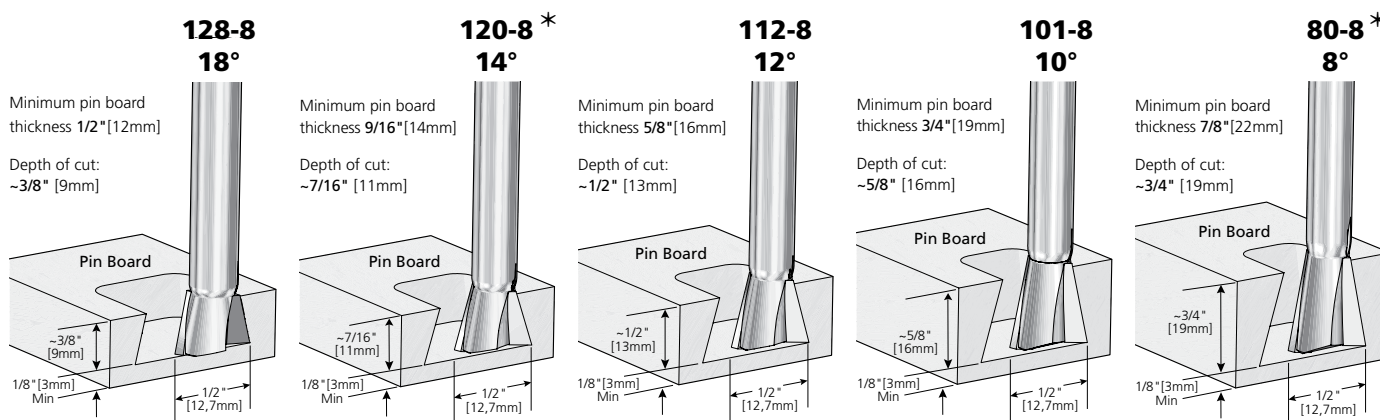
④ Half-pin sockets

⑤ Tails

⑥ Tail Sockets

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

10-2 Cutting Depth for Variably Spaced Half-Blind Dovetails



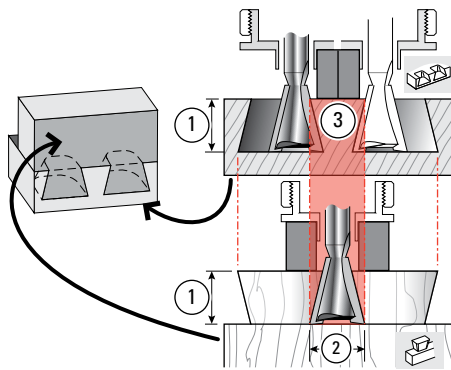
IMPORTANT: Add at least 1/8" [3mm] to the depth of cut for pin board thickness.

NOTE: See 10-35 chart on p.38 for range of tail board thickness. * Included with jig ~ Symbol for "approximately"

Important! Read This About HB Depth of Cut

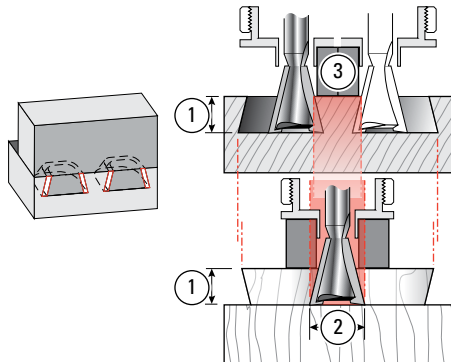
Bit selection is critical. You need to select a specific dovetail bit for your half-blind dovetail project, depending on the pinboard (drawer front) thickness you are using.

- Choose one of the five 1/2" [12,7mm] diameter dovetail bits shown above. Check bit selection in Appendix II.
- Depth of cut must be as specified for each of the five bits illustrated above. *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 change joint fit tightness. See why in Steps 10-3 to 10-5.
- Half-blind PINS and TAILS are routed with the same dovetail bit and must be at the same Depth of Cut.
- All half-blind dovetail bits work with the Leigh e7-Bush supplied with your Leigh jig or standard 7/16" [11,1mm] outside diameter guidebush.
- A dovetail bit will produce only one specific cutting depth. Only 1/2" [12,7mm] cutting diameter bits can be used for half-blind dovetails.



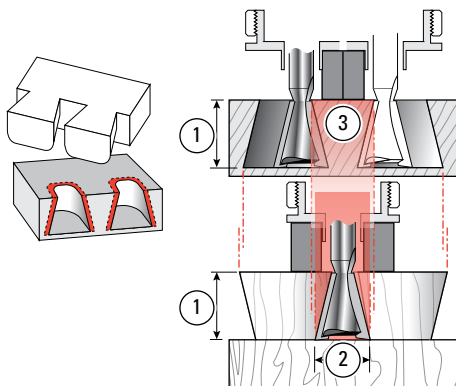
10-3 Joint Fit and Depth of Cut

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.

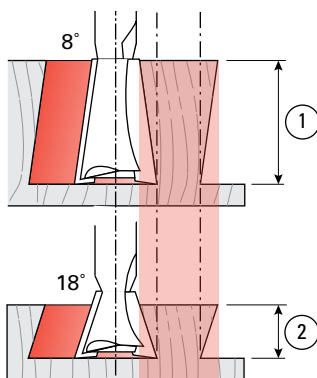


10-4 Note that decreasing the bit depth ① makes the pin ③ narrower while the pin socket ② stays the same width, producing a loose fit.

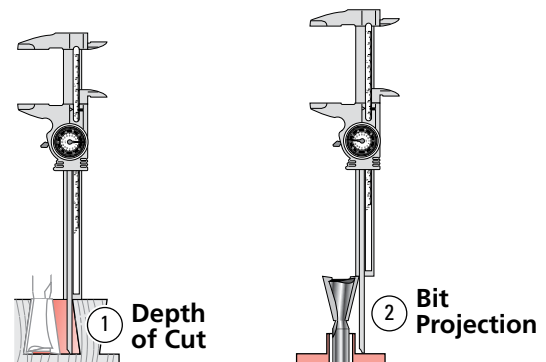
Decreasing the bit depth (i.e. raise the bit into the router) produces a looser fit.



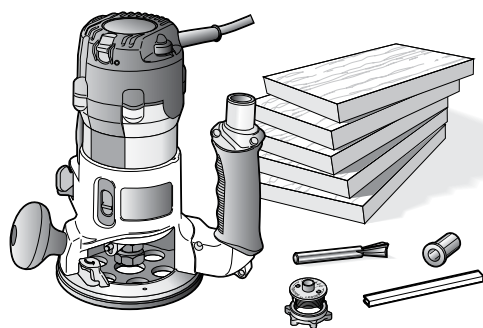
10-5 Increasing the bit depth ① makes the pin ③ larger while the pin socket ② stays the same width, producing too tight a fit. Increasing the bit depth (i.e. lower the bit) produces a tighter fit.



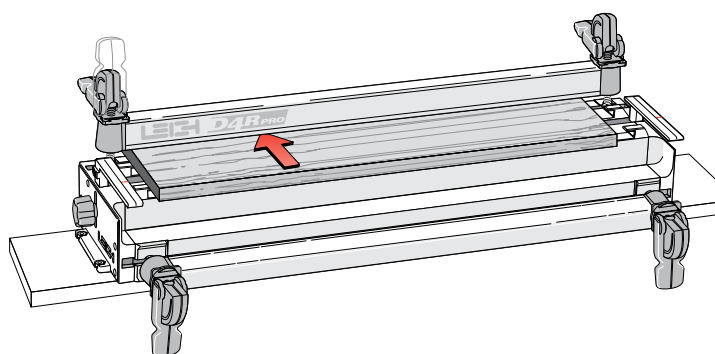
10-6 Bit Angle and Depth of Cut. Half-blind pins and tails are routed with the **same** dovetail bit, the **same** guidebush, and the **same** depth of cut. A different depth of cut requires a different angled bit. Leigh offers five different angled dovetail bits for a range of cut depths. A lesser angle, say 8°, for a deeper cut ①; a greater angle, say 18°, for a shallower cut ②.



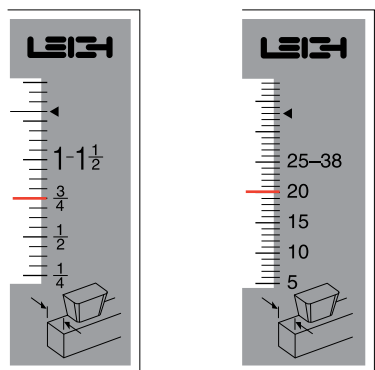
10-7 Cumulative plus/minus tolerances in routers, bits and guidebushes, make it impossible to state exact bit depth for first-time precision fit. All dovetail jigs require trial and error tests to attain fine fitting joints. The good news; we give a starting depth for each bit. Test and measure the successful 'Best fit' depth of cut ① or bit projection ②. Record for future first-time fits.



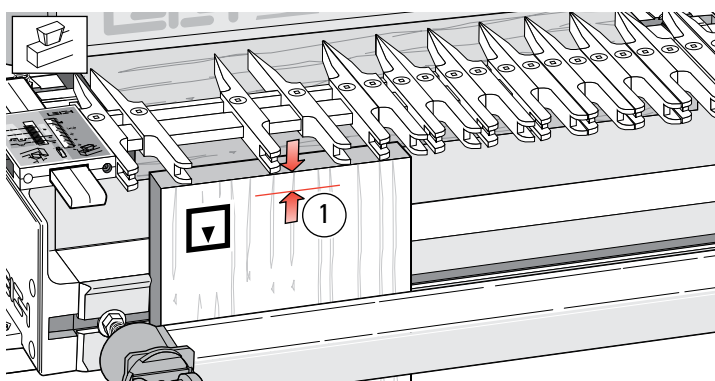
10-8 Routing a Test Joint Use the Leigh e7-Bush, and No. 120-8, 1/2" [12,7mm] 14° dovetail bit. Select several pieces of 3/4" x 5 1/2" [20 x 140mm] x about 8" [200mm], and the plastic bridge extrusion. *Note: Half-blind pin boards must be minimum 1/2" (13mm) thick to clamp. For thinner boards see fig. 10-21.*



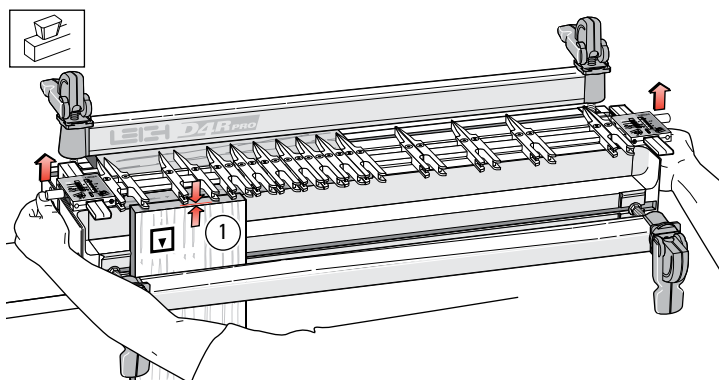
10-9 Clamp the spacer board in the rear clamp.



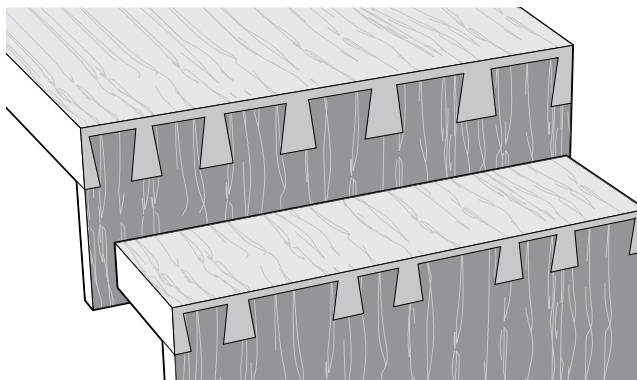
10-10 Mount the finger assembly on the support brackets in the HB TAILS mode, flat on the spacer board, *scales set on the thickness of the tail board* (3/4" [20mm] in this instance). The HB TAILS scale is always set at the tail board thickness. The scale increments above 1-1 1/2" [25-38mm] are for use on sliding dovetails (see Chapter 16).



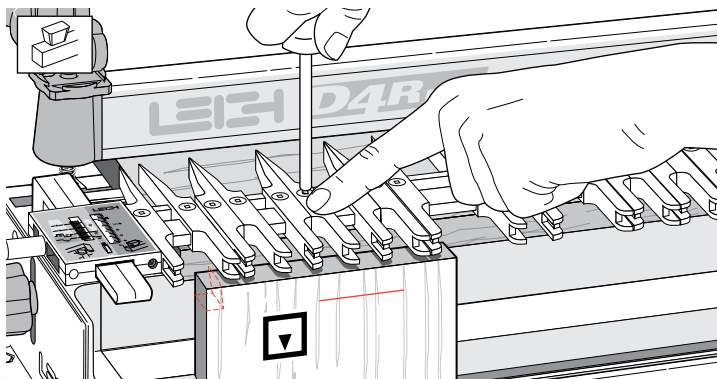
10-11 Measure and mark a line on the inside face of the tail board ① to the working depth of the bit to be used as per 10-2 of this chapter. Clamp this test tail board in the left front clamp, against the side stop with the top edge flush under the guidefingers, and the inside face □ of the drawer side away from the jig.



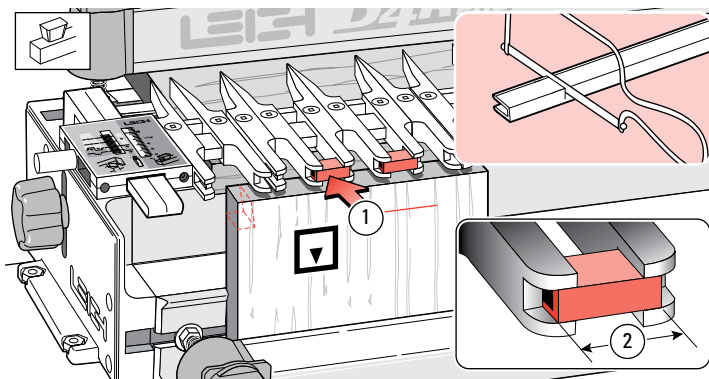
10-12 Unlock and raise the finger assembly support brackets slightly so that the finger assembly is about 1/8" [2mm] ① above the boards. This will allow easy movement of the guidefingers.



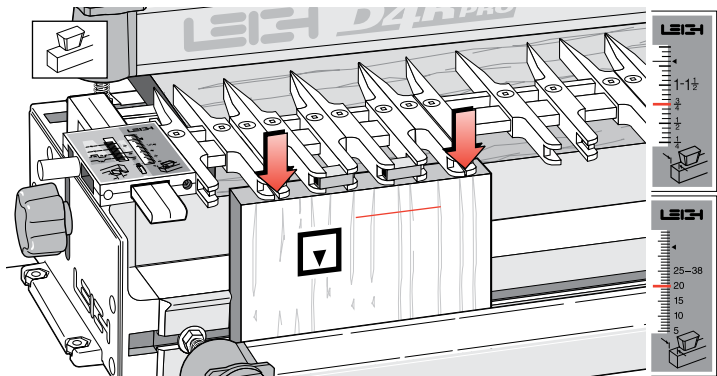
10-13 While typical traditional layouts have symmetrical pins and spacing with half-pins at each edge, the Leigh jig allows infinitely variable joint designs. Different thickness boards can be easily joined together. Pins can be various sizes and randomly spaced to suit just about any design you create. *Before attempting joints of asymmetrical design, see Chapter 14.*



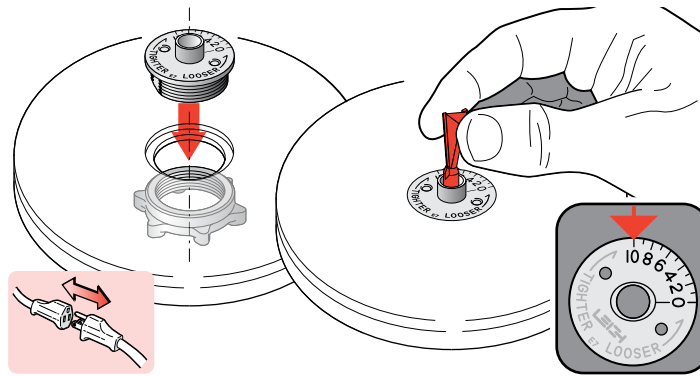
10-14 Ignoring the outer guidefinger (router support) at the scale, loosen enough guides for the desired tail layout. The illustrated half-pin guidefinger position gives a half-pin socket profile as shown (dotted lines). *NOTE: The first few uses, some fingers may “stick”. This is normal. To “unstick”, loosen the finger screw $\frac{3}{4}$ turn. Press down firmly on the screwdriver (in the screw) to loosen the finger locking wedge.*



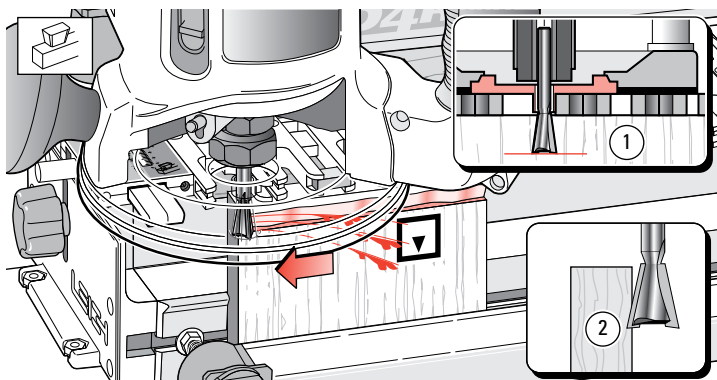
10-15 If gaps between the guidefinger tails are wider than about $\frac{1}{8}$ " [3mm], mark and cut pieces of bridge extrusion ① to fit the guidefinger tail slots. Cut slightly shorter than the space between the guidefinger shoulders ②, so guidefingers won't force apart with the bridge pieces. Squeeze the open side of the pieces and push into place for a friction fit.



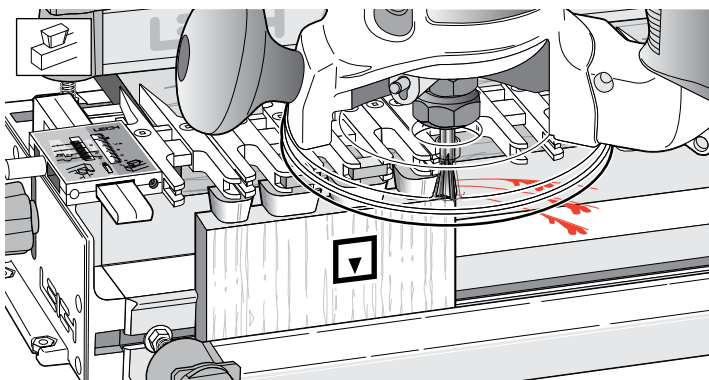
10-16 Remember to tighten any loose guidefingers. Lower the finger assembly back onto the spacer board and workpiece. It must touch the workpiece or the depth of cut will vary and the joint won't fit. The scale should be set on the tailboard thickness, in this case $\frac{3}{4}$ " [20mm].



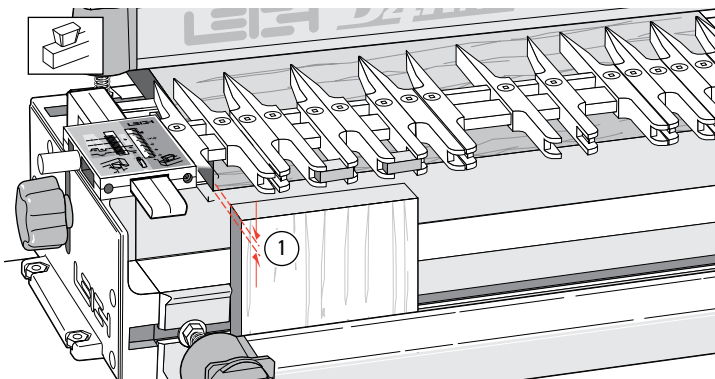
10-17 Attach the e7-Bush securely to the router and mount the supplied No. 120-8 bit to the router. Set the e7-Bush to No. 10. See Chapter 3, page 9 for details.



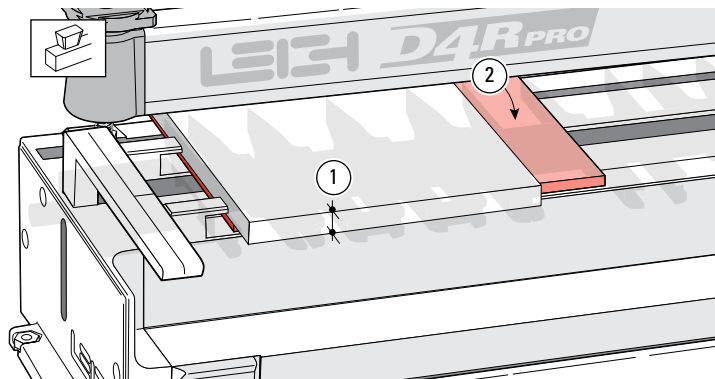
10-18  Adjust the bit height until the bit tip is level with the marked line ①. For the first light cut move the router from right to left. Make sure you control it firmly, because it is driven in this direction by the bit. Only the tip of the bit should be cutting on the first cut ②. This back or climb routing leaves a very clean shoulder in face grain.



10-19 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 fig. 17-10 “Hints and Tips”.

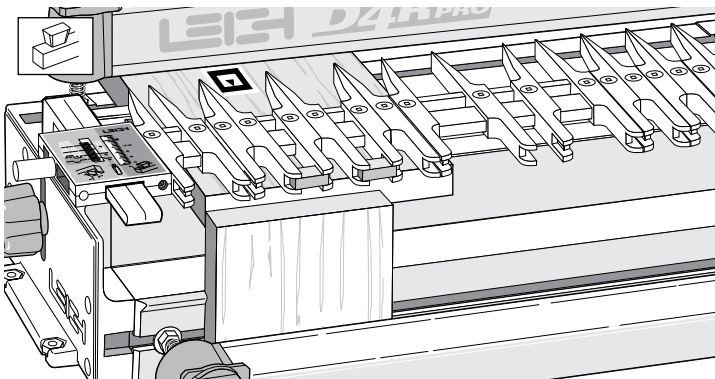


10-20 Remove the test tail board, then clamp a scrap board in the front of the jig so that the top edge projects above the top face of the jig by about $\frac{1}{8}$ " [3mm] ①. This will keep the scrap piece below the path of the bit when routing the pin board. Remove the spacer board from the rear clamp.

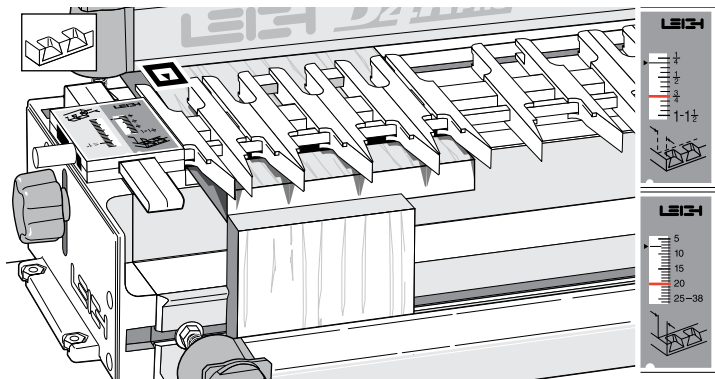


10-21 If you're mounting Thin Pin Boards:

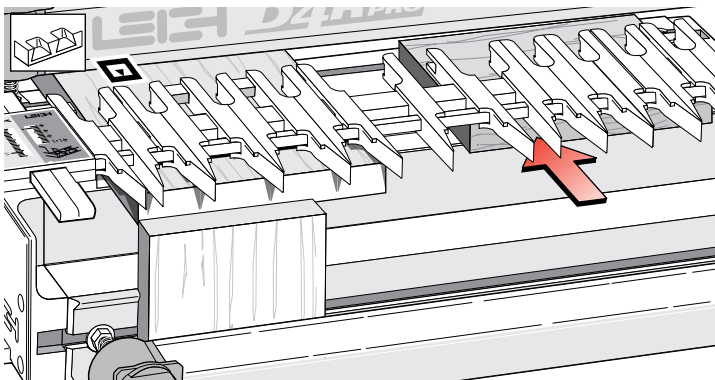
The minimum recommended pin board thickness is $\frac{1}{2}$ " [13mm]. If you wish to rout a pin board less than the minimum thickness ①, it will be necessary to pack the board up from the jig body. We suggest using a piece of $\frac{1}{4}$ " to $\frac{3}{8}$ " [6 to 9mm] plywood for this purpose ②.



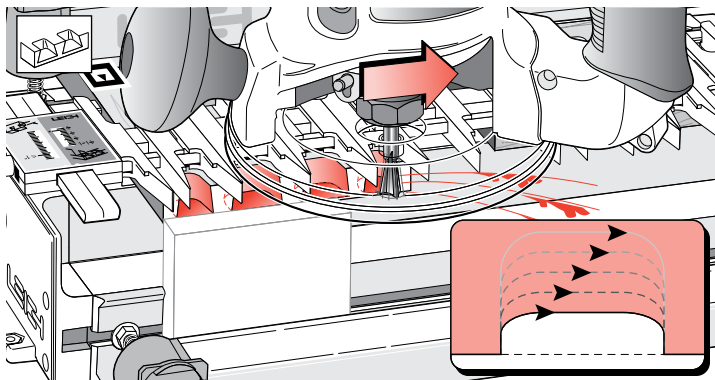
10-22 Flush Drawers Place a test pin board in the left rear clamp against the side stop, fitting its front end edge flush against the vertical scrap piece, inside face ① of the drawer front away from the jig body. The pin board is now positioned with the edge to be routed flush with the jig's front face, correctly registered for the scale readings. For drawers with rabbeted fronts, see Chapter 12.



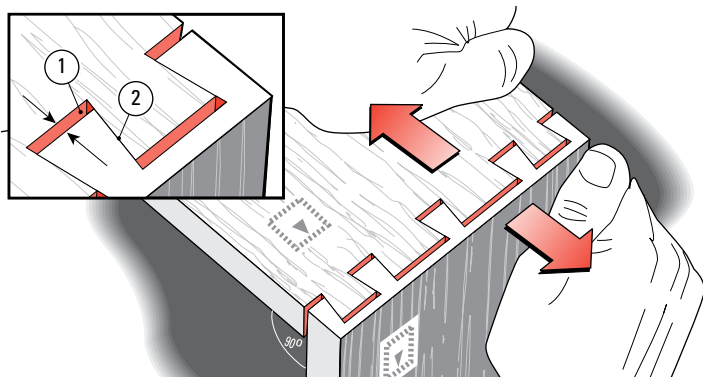
10-23 Rotate the finger assembly to the  HB PINS mode. Set the HB PINS scale *equal to tail board thickness* (i.e., same setting as tails: this example, $\frac{3}{4}$ " [20mm]). HB pins and HB tail scales are always set to tail board thickness. Make sure the finger assembly is flush and level on the pin board. The guidefingers must touch the pin board or depth of cut will vary, causing poor joint fit.



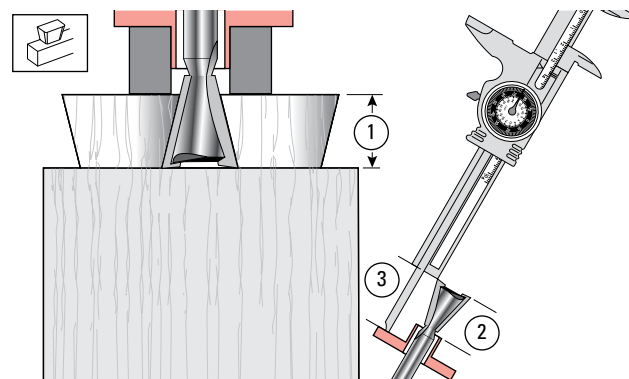
10-24 If you have difficulty leveling the finger assembly on a narrow workpiece, place a board the same thickness as the pin board under the other end of the finger assembly, *but not under the rear clamp*.



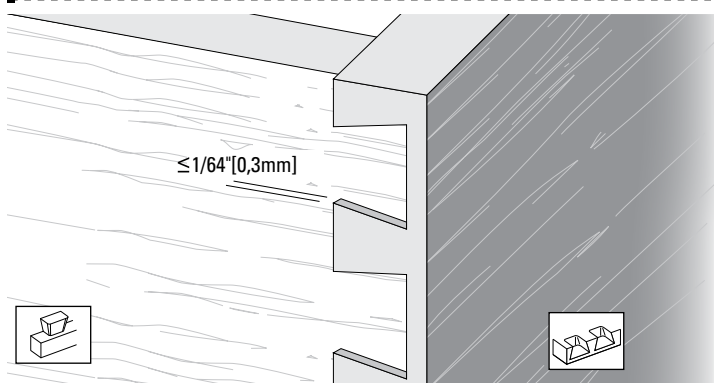
10-25  Rout out the waste between the pins. Rout each space from **left to right**. Do not back rout on end grain. If the bit enters on the right side of the opening there will be a very strong pull to the left, so... Rout each opening in at least three or four passes, left to right.



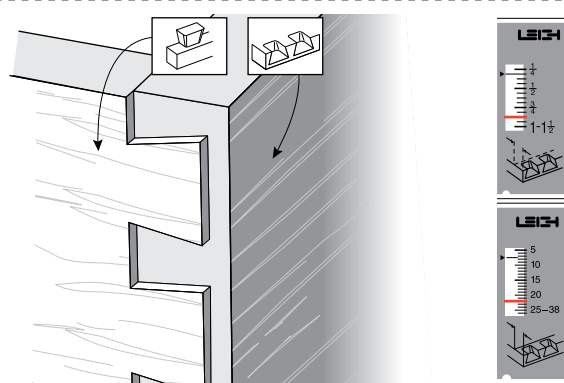
10-26 Remove the pin board and test the fit. If the joint is loose, lower the bit to increase the depth of cut, by the amount of the gap at the bottom of the pins ① (when the pins are pulled against the socket sides ②). If the joint is too tight, raise the bit slightly to decrease the depth of cut. Test again. You cannot rout the same board twice. Use two fresh board ends for each test.



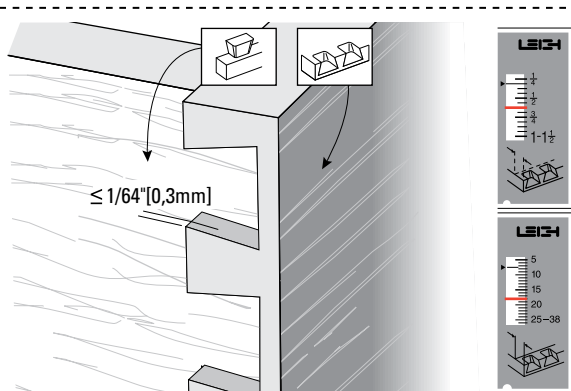
10-27 Keep the test tail board that fits well, and mark it with the number of the bit you used to rout it. For quick set-up next time, clamp this tail board in the jig as a *depth-of-cut gauge* ① to show how far to lower the bit. Better yet, measure the bit projection from the end of the guidebush ② or guidebush flange ③ and record this for fast set-ups in future.



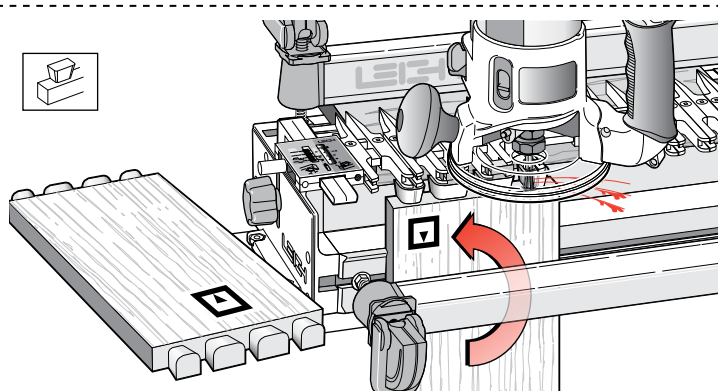
10-28 When you have the proper tightness of fit, check the flushness. The tails should be under flush to the pins by *no more than 1/64" [0,3mm] to allow for cleanup (exaggerated here)*. The concentricity of the collet and guidebush on different routers will affect this tolerance.



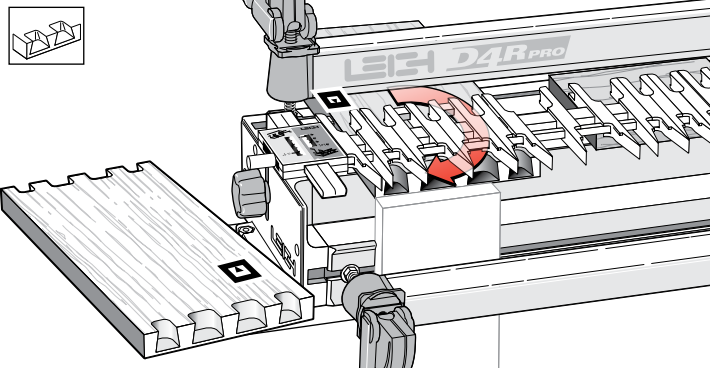
10-29 If the tails stand out from the pins, set the HB PINS scale **away from the operator** by the amount required.



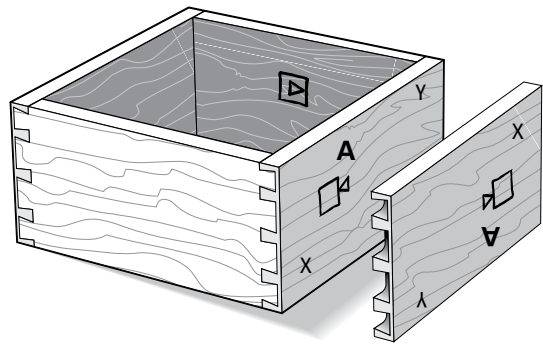
10-30 If the tails fit in too far past the pins ends, set the HB PINS scale **toward the operator** by the amount required. These adjustments for “flushness” are made only in the HB PINS mode. The tail mode scale setting remains the same.



10-31 To make a box, rout all four ends of the tail boards, keeping the inside face of the tail boards away from the jig.

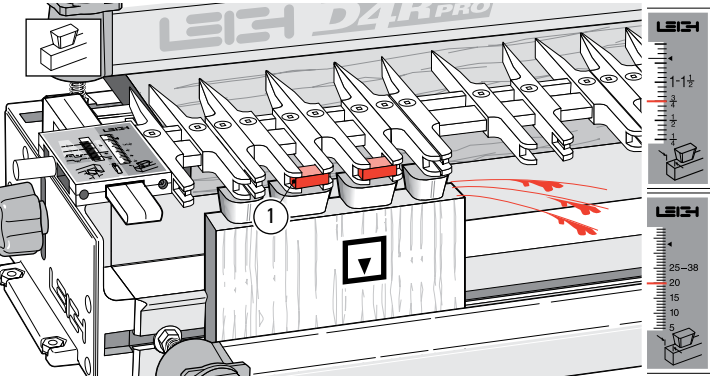


10-32 Rout all four ends of the pin boards keeping the inside face  of the boards away from the jig.
Note: When making drawers you may prefer to use through dovetails on the rear corners.

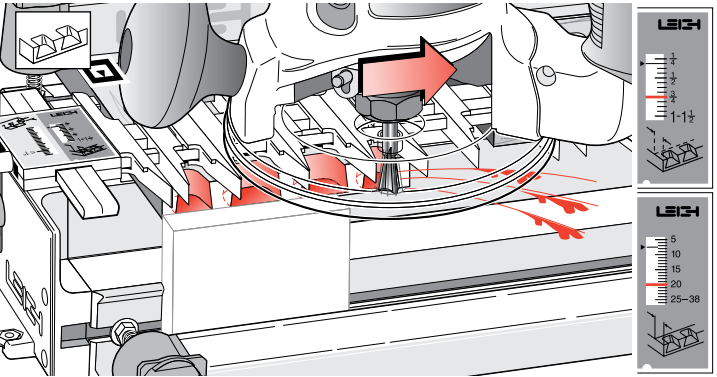


10-33 Assemble the box. As with through dovetails, it doesn't matter which edge of any of the boards are at the top or bottom, the box will still fit together e.g. pin board "A" can be up either way.

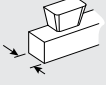
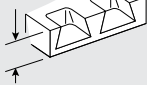
QUICK REFERENCE REMINDERS



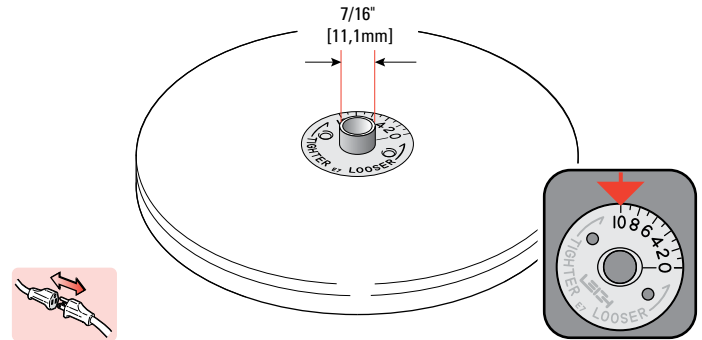
10-34 Half-blind (HB) tails: Drawer sides (tailboards) are clamped vertically in the jig. The inside face  of the drawer side goes away from the jig body. The finger assembly is in the  HB TAILS mode, set to the thickness of the drawer side. Use bridge pieces where required ①.



10-35 Half-blind (HB) pins: Drawer fronts (pinboards) are cut with the board clamped horizontally in the jig. The inside face  of the drawer front faces away from the jig body. The finger assembly is in the  HB PINS mode, and again set on the thickness of the drawer side (but adjusted for a flush fit, see 10-28 to 10-30).

				
Thickness of Tail Board	Thickness of Pin Board	Depth of Cut	Dovetail Bit	Guidebush Diameter
1/4" - 1 1/2" [6-40]	min. 7/8" [22]	~ 3/4" [19]	No.80-8	Leigh e7 or 7/16" [11,1]
	min. 3/4" [19]	~ 5/8" [16]	No.101-8	
	min. 5/8" [16]	~ 1/2" [13]	No.112-8	
	min. 9/16" [14]	~ 7/16" [11]	No.120-8	
	min. 1/2" [12]	~ 3/8" [9]	No.128-8	

Numbers in brackets are millimeters



10-36 On the Leigh D4R Pro, all half-blind dovetails are routed using the Leigh e7-Bush set at No.10 or standard 7/16" [11,1mm] diameter bush (min. depth 1/4" [6,35mm] see Appendix I). For instructions to rout end-on-end dovetails see Chapter 13. ■



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D4R Pro - CHAPTER 11

Single Pass Half-Blind Dovetails

When to rout "single pass" dovetails on a variable spaced Leigh jig. You are reproducing or restoring a late 19th or early 20th century drawer that has similar machine made joints or, you are making a lot of drawer boxes and are not concerned with the traditional "hand cut look".

Note: Routing both drawer fronts and sides together does make the job go faster.

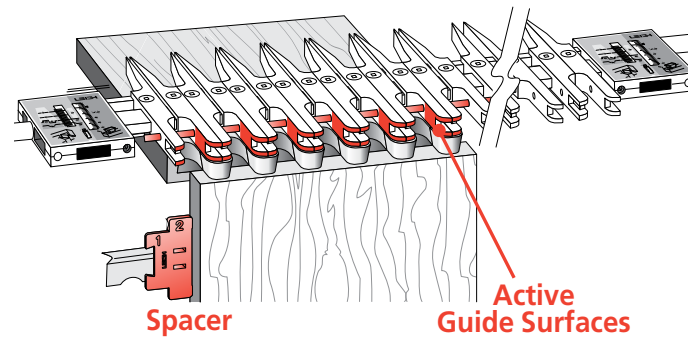
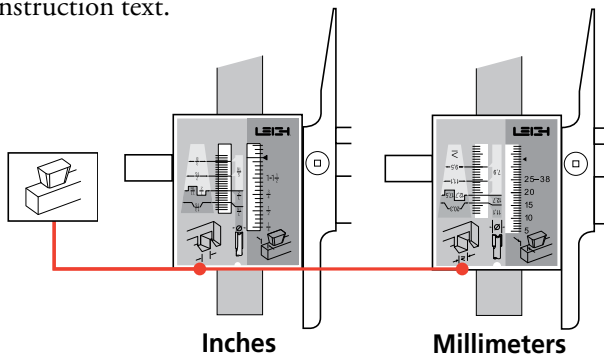
1

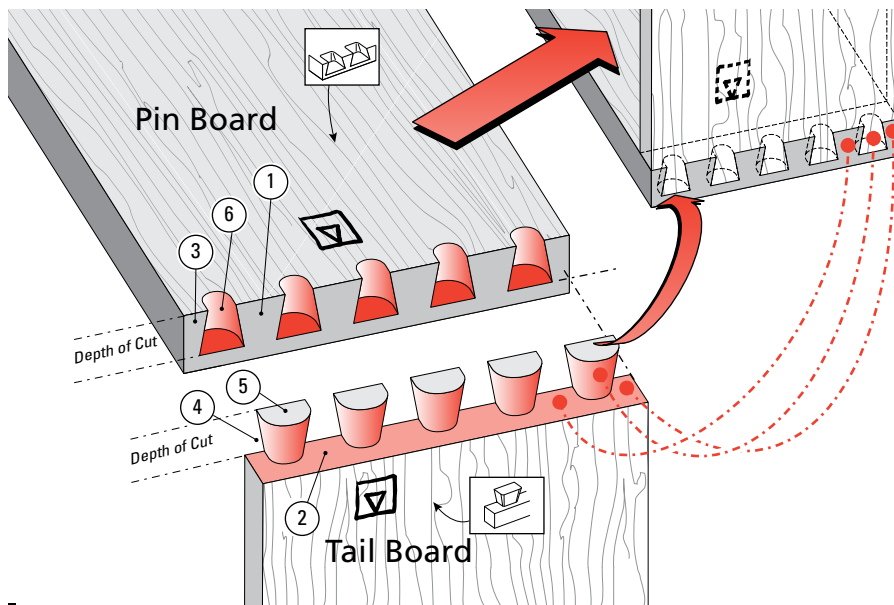
Only one mode is required:

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.



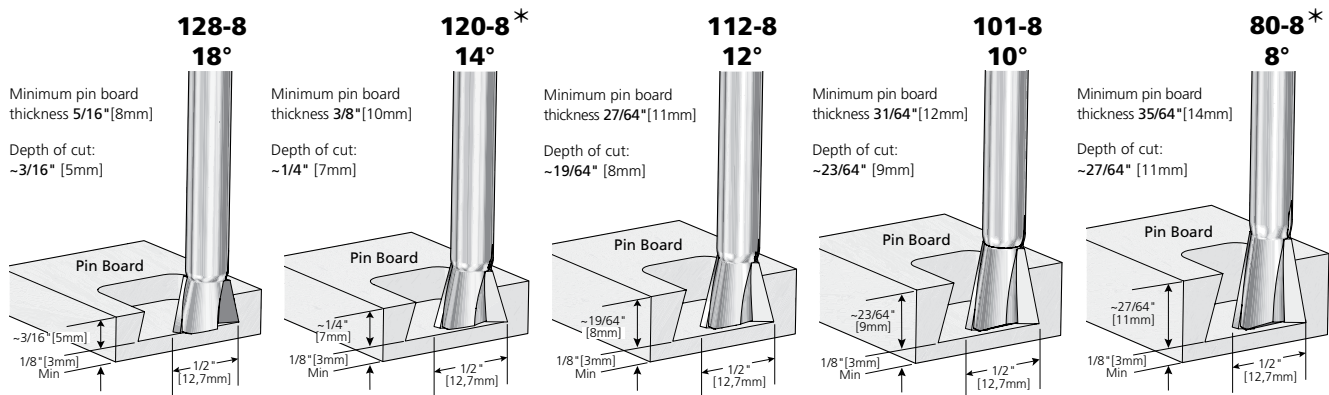


11-1 Single Pass Half-Blind Dovetails:

- 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

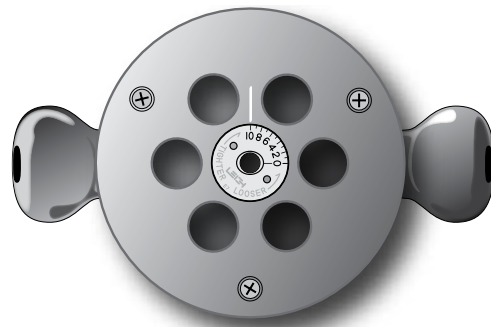


IMPORTANT: Add at least 1/8" [3mm] to the depth of cut for pin board thickness.

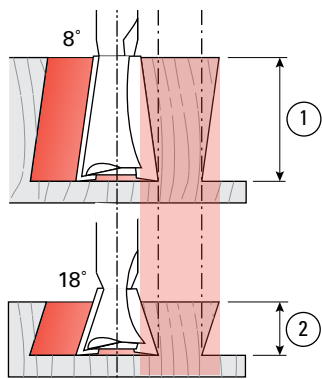
NOTE: See 11-9 chart on p.42 for range of tail board thickness. * Included with jig ~ Symbol for "approximately"

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

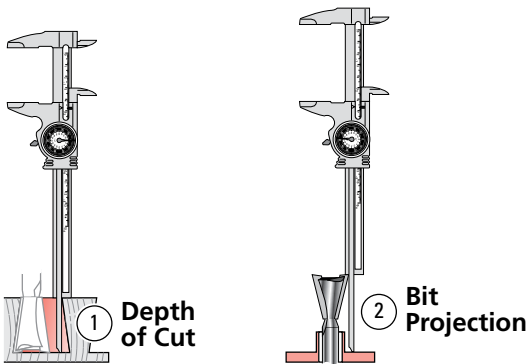
- Depth of cut must be as specified for each of the five bits shown above. *Exception: See fig.11-26. Note: Leigh bits 101-8, 112-8 and 128-8 are optional.*
- Raising the bit above its specified cutting depth will result in loose joints and may damage the jig, bit and/or guidebush. A lower setting will 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" [11,1 mm] guidebush (min. barrel depth 1/4" [6,35mm] see p.69).



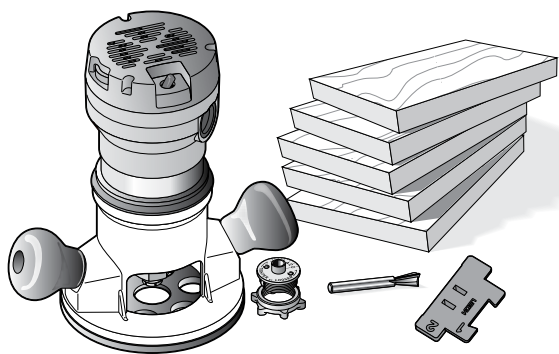
See chapter 3 for alignment mark.



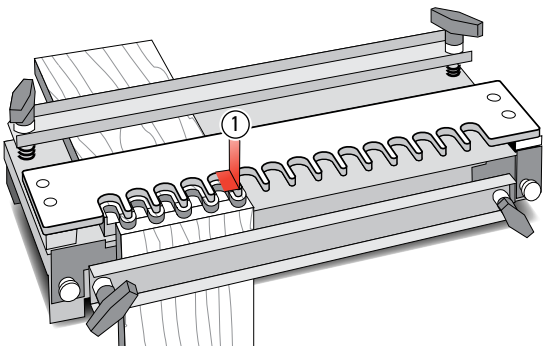
11-3 Bit Angle and Depth of Cut Half-blind pins and tails are routed with the **same** dovetail bit, the **same** guidebush, and the **same** depth of cut. A different depth of cut requires a different angled bit. Leigh offers five different angled dovetail bits for a range of cut depths. A lesser angle,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



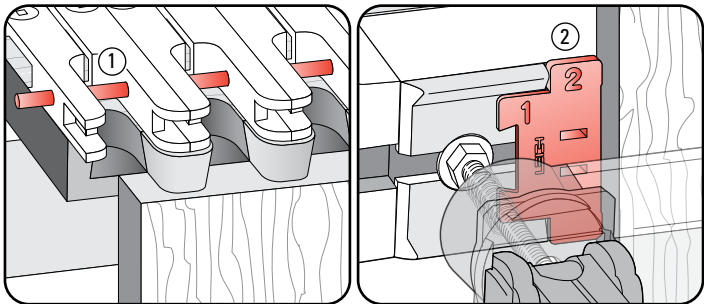
11-4 Cumulative plus/minus tolerances in routers, bits and guidebushes, make it impossible to state exact bit depth for first-time precision fit. All dovetail jigs require trial and error tests to attain a fine fitting joint. The good news; we give a starting depth for each bit. Test and measure the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



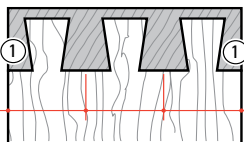
11-5 Routing a Test Joint You need a router, the **e7-Bush** set at No.10 (see chapter 3 for **e-Bush** instructions) and one of the bits listed in 11-2. For this example we used the 80-8 ½" [12,7mm] 8° dovetail bit. *Note: Dovetail bits rout at a shallower depth for single pass half-blind dovetails than for regular variably spaced half-blind joints (See Chapter 10).*



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 ½" [12,7mm].

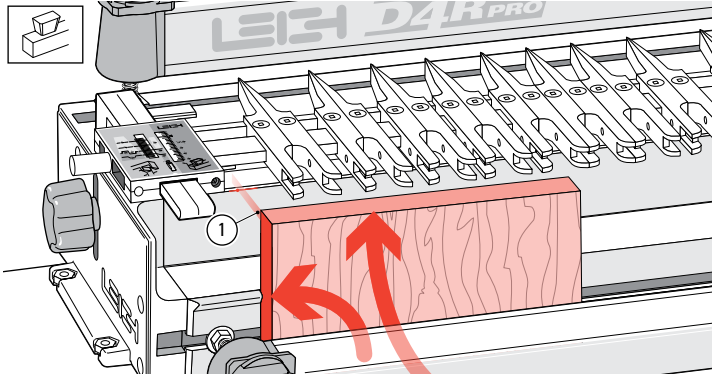


11-7 Stop Rod & Dovetail Spacer Insert the Stop Rod through the holes in the fingers ① to convert them from deep tail sockets to a shallow fixed comb. The flexible stop rod is fed through the holes in the fingers from the “far” end of the jig. The **Dovetail Spacer** (note the dovetail shaped notch) 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.



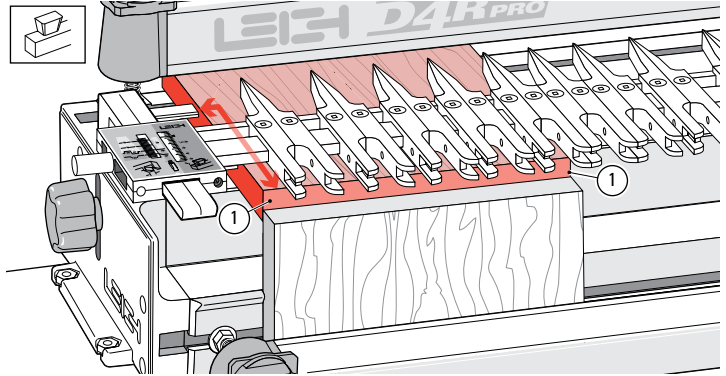
Single Pass Board Width Chart	
Add up to ¼" [6mm] or subtract up to 1/8" [3mm]	
2 3/16 [55]	8 11/16 [221]
3 1/4 [83]	9 3/4 [248]
4 3/8 [110]	10 7/8 [276]
5 7/16 [138]	12 [305]
6 1/2 [166]	13 1/16 [331]
7 5/8 [193]	-

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 ¼" [6mm] to the listed board width, or reduce it by ⅛" [3mm]. This chart covers boards up to a maximum width of 13 ½" [331mm]. Example: the 12" [305mm] can be up to 12 ¼" [311mm] or as small as 11 7/8" [302mm].

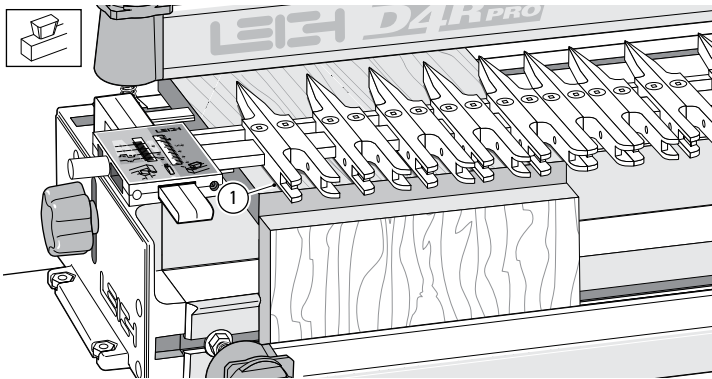


11-9 With the finger assembly raised in the  HB Tails mode, clamp a drawer side in the front left side, against the side stop and the top end edge slightly above the jig body top ①.

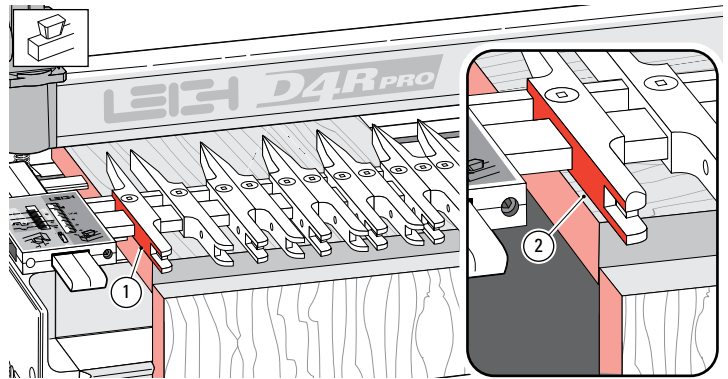
Note: Drawer side (tail board) thickness can be from $\frac{7}{16}$ " to $\frac{9}{16}$ " [11mm to 14mm]. See 11-25 re drawer side thickness greater than $\frac{9}{16}$ ".



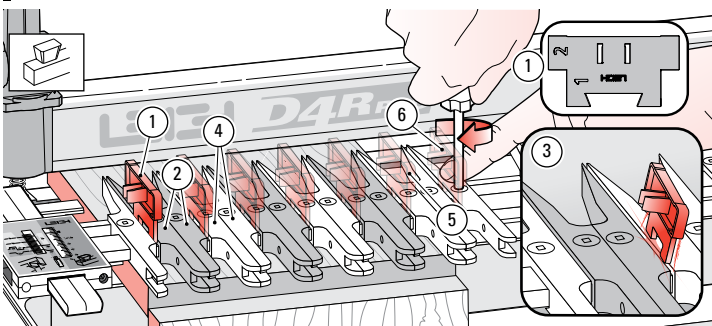
11-10 Place a sample drawer front from $\frac{5}{8}$ " to $1\frac{1}{2}$ " thickness [16 to 38mm] in the rear clamp. Clamp with the side edge against the left rear side stop, front end edge touching flush across the rear of the front board ①. Note: the $\frac{5}{8}$ " [16mm] minimum thickness can be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



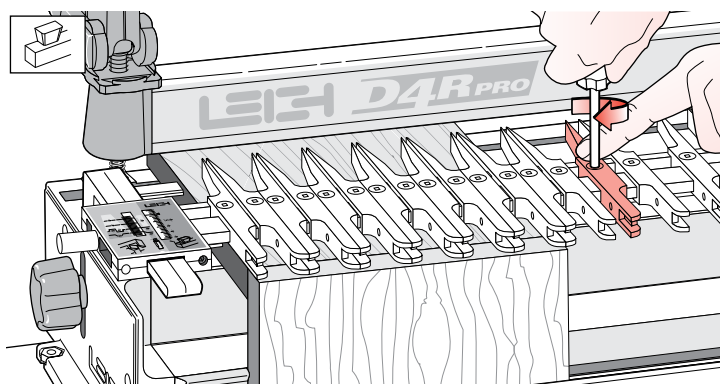
11-11 With the scale set on $\frac{1}{2}$ " [12,7mm], lower the finger assembly to about $\frac{1}{8}$ " [3mm] above the drawer front to ease adjusting the guide fingers ①. **The scale is always set on the $\frac{1}{2}$ " [12,7mm] mark for single pass dovetails.**



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.



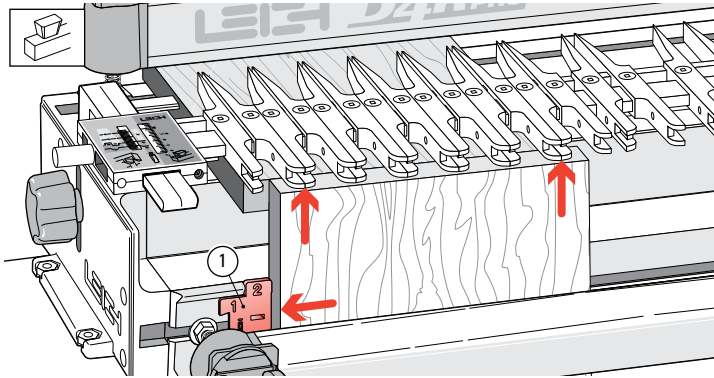
11-13 Set the dovetail spacer ① with numeral **2** facing right, against the **single** left guide finger. Move the next **finger pair** ② against the spacer and tighten. **There will be a gap between pointed ends (pin end) of fingers, not tail end.** Remove and locate spacer to right of tightened fingers.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

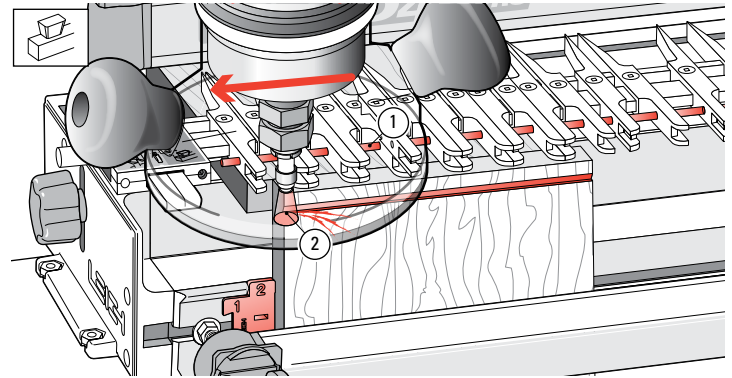


REMEMBER SAFETY!

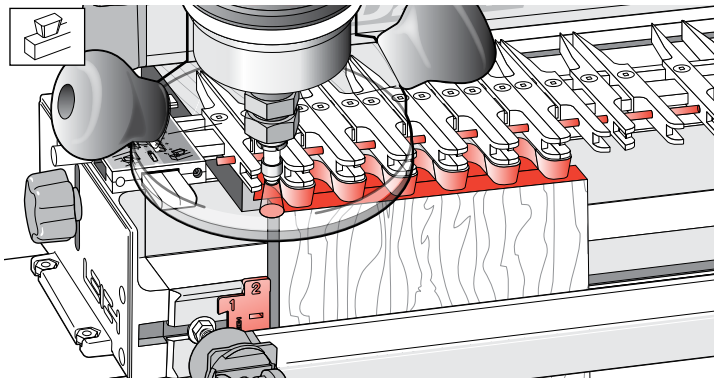


11-15 Unclamp the tail board from the front clamp and insert the dovetail spacer as shown against the side stop ①. Re-set the drawer side in the front clamp so that its top edge touches the guide fingers and is perfectly flush with the top face of the drawer front and the left edge is against the Spacer.

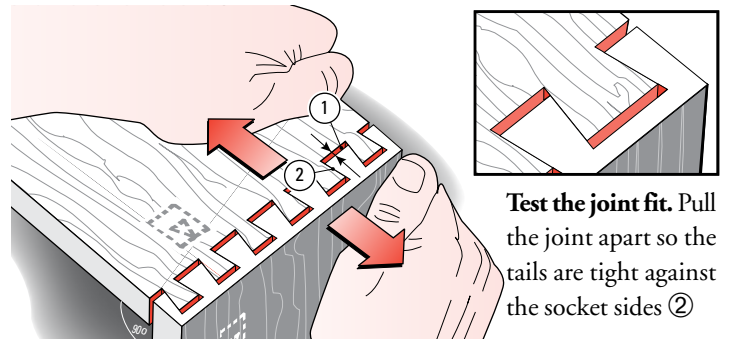
! Board edges must be square.



11-16 Insert the Stop Rod through the holes in the fingers ①. Mark a line on the board that matches the depth of cut required from 11-2. *For the first light cut, move router from right to left using firm control, as it's driven in this direction by the bit.* Only the tip of the bit should cut on the first pass ②. This back, or climb routing, leaves a very clean shoulder when routing across grain.

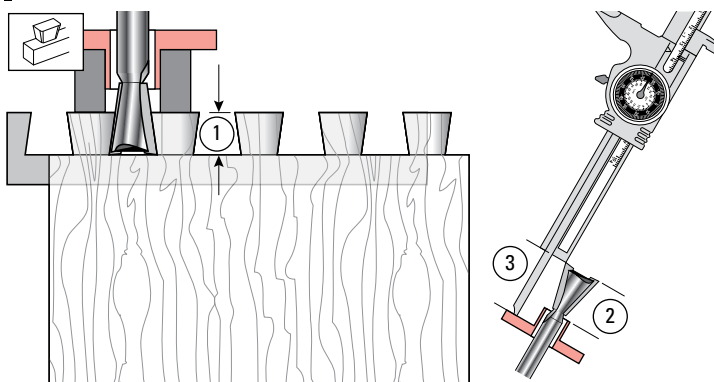


11-17 Now rout in and out from left to right. Follow the guides in on the left of each finger opening to touch the stop rod and come out on the right. The pins, tails and sockets are formed simultaneously.

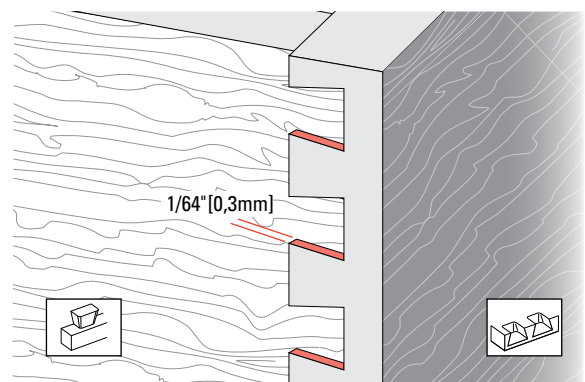


Test the joint fit. Pull the joint apart so the tails are tight against the socket sides ②

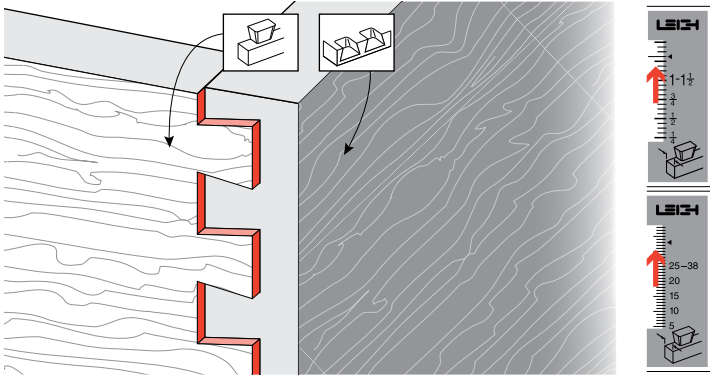
11-18 If the joint is loose, lower the bit to increase the depth of cut by the amount of the gap at the bottom of the pins ①. If the joint is tight, raise the bit slightly to decrease the depth of cut. Test again. If there is a gap at only one end of the joint, the boards have been routed at different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



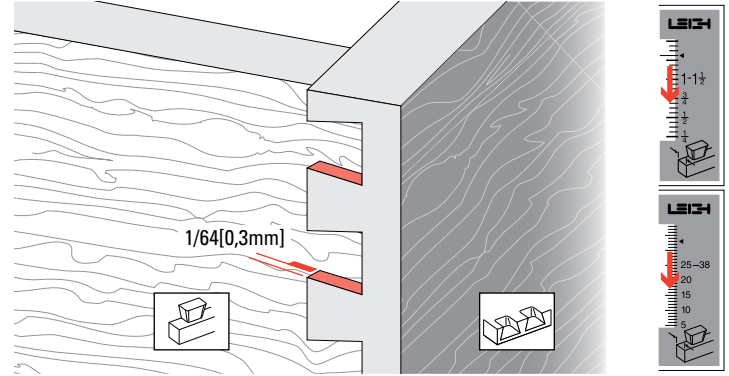
11-19 Keep the test tail board that fits well, and mark it with the number of the bit you used to rout it. For quick set-up next time, clamp this tail board in the jig as a *depth-of-cut gauge* ① to show how far to lower the bit. Better yet, measure the bit projection from the end of the guidebush ②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



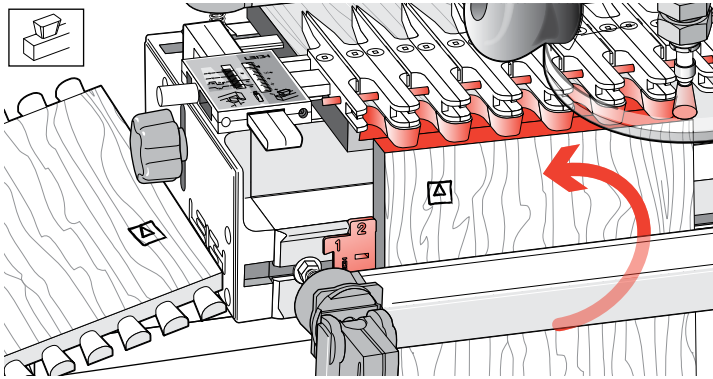
11-20 When you have the proper tightness of fit, check the flushness. The tails should be under flush to the pins by *no more than 1/64" [0,3mm] to allow for cleanup (exaggerated here)*. Any concentricity errors in the collet and guidebush on different routers will affect this tolerance.



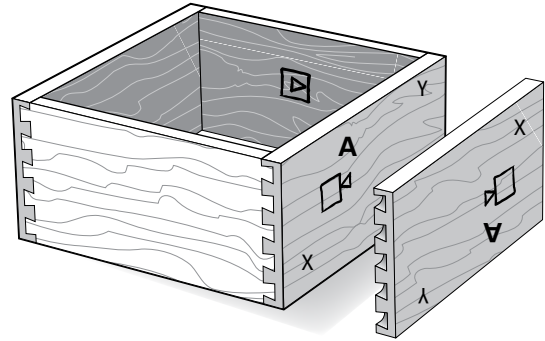
11-21 Moving the finger assembly affects the pins and tails. So, if the tails stand out from the pins, set the HB TAILS scale away from the operator by half the amount required.



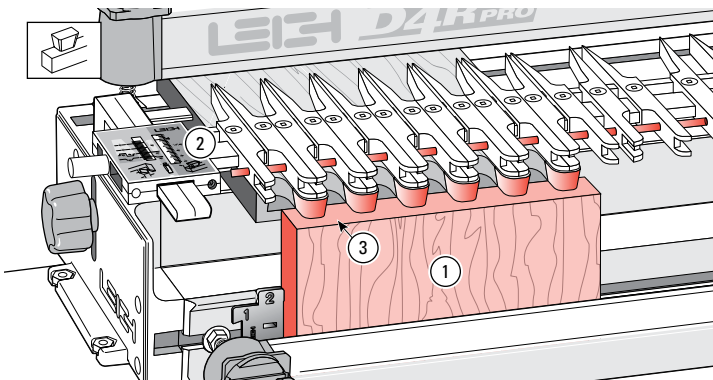
11-22 If the tails fit in too far past the pins ends, set the HB TAILS scale toward the operator by half the amount required.



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 $\frac{9}{16}$ " [14,29mm] ①, set the scale to $\frac{1}{2}$ " [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. ■



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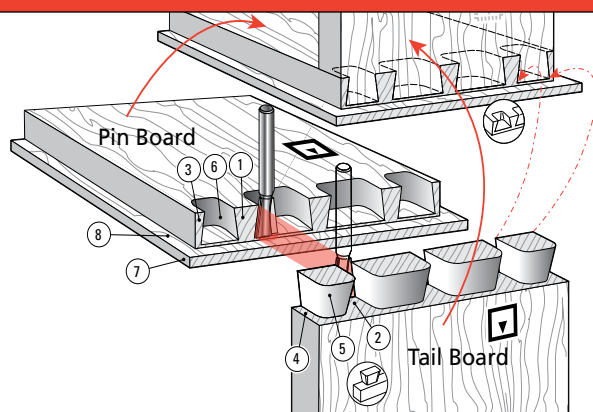
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D4R Pro - CHAPTER 12

Rabbeted Half-Blind Dovetails



Before attempting rabbeted half-blind dovetails, first master the techniques of flush half-blind dovetails in chapter 10.

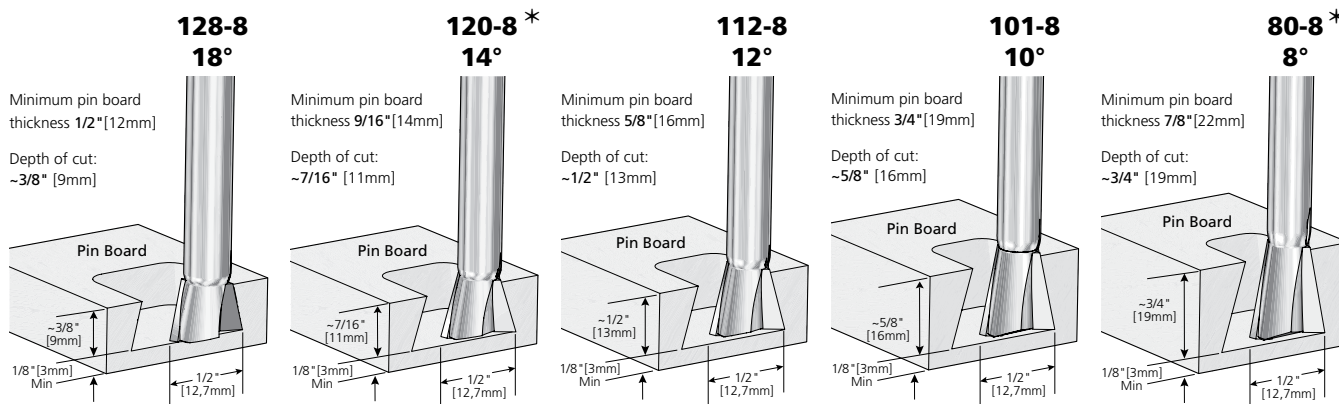
12-1 Rabbeted Half-blind Dovetail Terminology:

- ① Pins
- ② Pin sockets
- ③ Half-pins
- ④ Half-pin sockets

- ⑤ Tails
- ⑥ Tail Sockets
- ⑦ Lip
- ⑧ Rabbet (rebate)

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

12-2 Cutting Depth for Rabbeted Half-Blind Dovetails



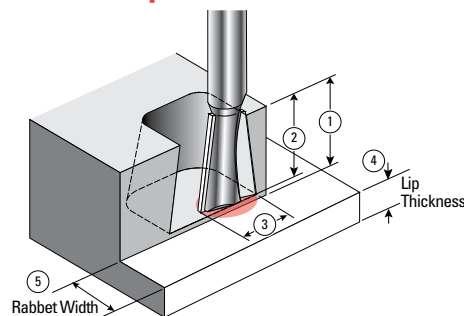
IMPORTANT: Add at least 1/8" [3mm] to the depth of cut for pin board thickness.

NOTE: See 10 - 35 chart on p.38 for range of tail board thickness. * Included with jig ~ Symbol for "approximately"

⚠ Important! Read This Section About Rabbeted HB Depth of Cut

Bit selection is critical. You need to select a specific dovetail bit for your rabbeted half-blind dovetail project, depending on the rabbet depth you are using.

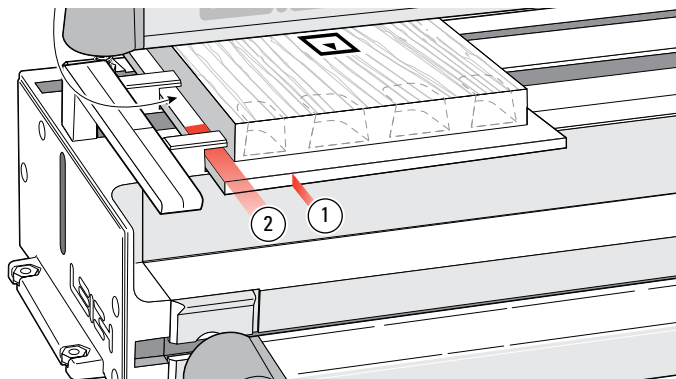
- Choose one of the five 1/2" [12,7mm] diameter dovetail bits shown above. See bit selection in Appendix II.
- Depth of cut must be as specified for each of the five bits illustrated above. *Exception:* See fig. 11-26. Note: No's 101-8, 112-8 and 128-8 are optional Leigh bits.
- Raising the bit above 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 change joint fit tightness. See 10-3 to 10-5 for why.
- Rabbeted Half-blind PINS and TAILS are routed with the same dovetail bit and must be at the same Depth of Cut.
- All half-blind dovetail bits work with the Leigh e7-Bush supplied with your Leigh jig or a standard 7/16" [11,1mm] outside diameter guidebush.
- Each dovetail bit will produce only one depth of cut. Only 1/2" [12,7mm] cutting diameter bits can be used for half-blind dovetails.



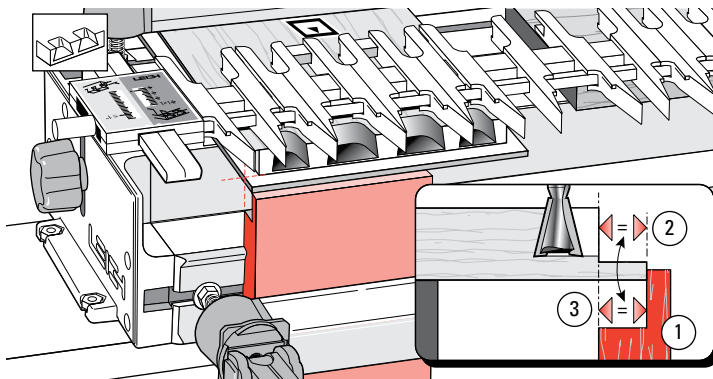
RABBET DEPTH ① determines the **maximum** depth of cut ② you can use. Select a bit with a depth of cut at least 1/16" [1,6mm] less than the rabbet depth.

Lip thickness ④ will vary depending on overall board thickness – maximum 3/8" when using undercut side stops.

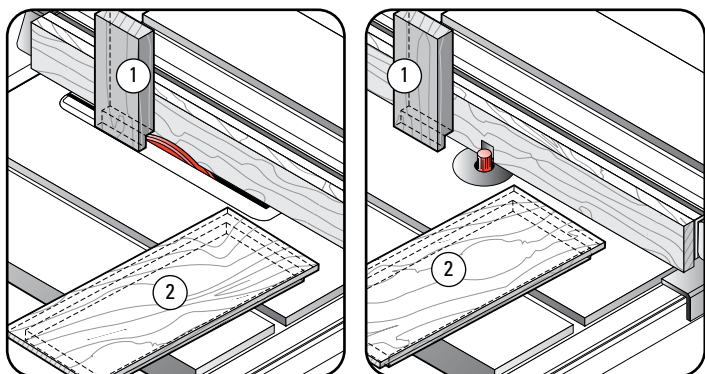
Rabbet width ⑤ is variable and set to suit each project.



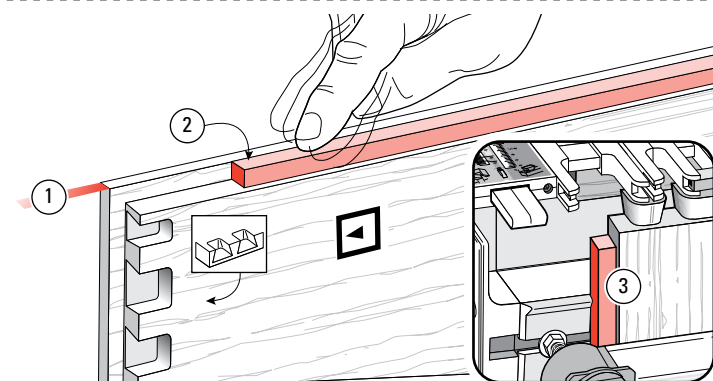
12-3 Provided the drawer front lip is $\frac{3}{8}$ " [9,5mm] or less in thickness ①, you can mount and rout rabbeted drawer fronts and sides exactly the same way as flush drawer fronts. If the lip is thicker or wider than $\frac{3}{8}$ " [9,5mm] ② see 12-6 thru 12-8.



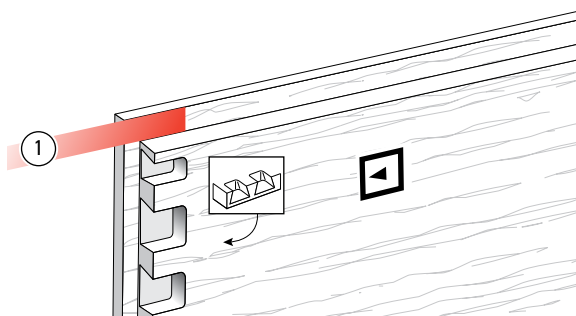
12-4 Rabbeted Pins You will need to clamp a scrap stop block ① in the front of the jig out from the jig's front face by exactly the depth of the rabbet ②. This brings the pin ends exactly in line with the front jig face ③, ensuring that the scale reading is accurate.



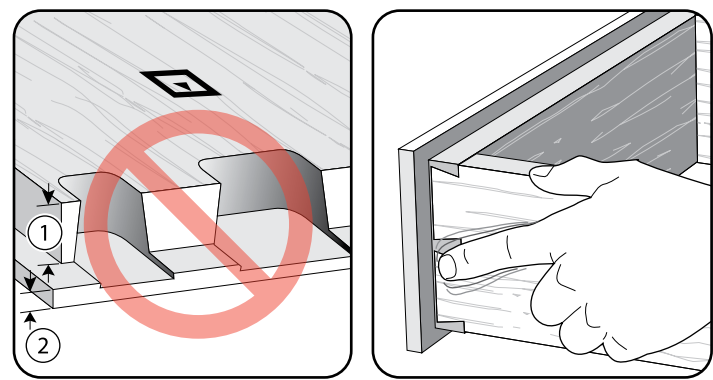
12-5 An easy accurate way to do this is to rabbet the end of a scrap piece ① vertically over a dado blade or router bit at the same time as you rabbet the drawer front (horizontally) ②.



12-6 If the lip thickness ① is greater than $\frac{3}{8}$ " [9,5mm], it will not fit under the side stop. Block the drawer side away from the front side stop by exactly rabbet depth (see 12-3). Make up a block ② and stick it to the jig face ③ with double-sided tape. Make sure it touches the side stop. This will offset the drawer side from the side stop by the width of the rabbet, and align the sockets with the pins.



12-7 If the rabbet width ① is greater than $\frac{3}{8}$ " [9,5mm], the drawer side must be offset from the front side stop by the depth of the rabbet minus $\frac{3}{8}$ " [9,5mm]. Make up a block to this measurement and stick it to the face of the jig, touching the front side stop. This will offset the drawer side away from the side stop and align the sockets with the pins.



12-8 Make sure you select a dovetail bit that has a working depth of cut less than the rabbet height ①. Otherwise, you will rout into the rabbet lip ②.

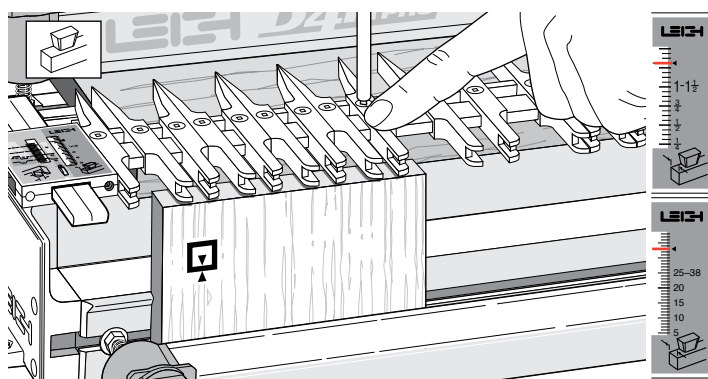
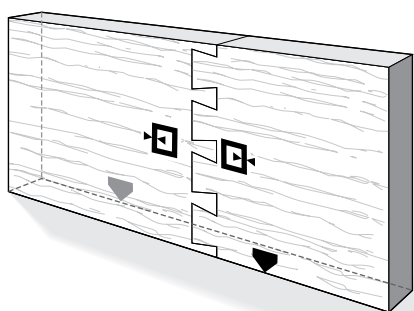
It is difficult to clean up the drawer sides and front corner after assembling a rabbeted drawer, so make sure the fit is flush before you complete the drawers (see 10-28 to 10-30). ■

End-on-End Dovetails

While you have the router set up for half-blind dovetails, it is a good time to try end-on-end dovetails.



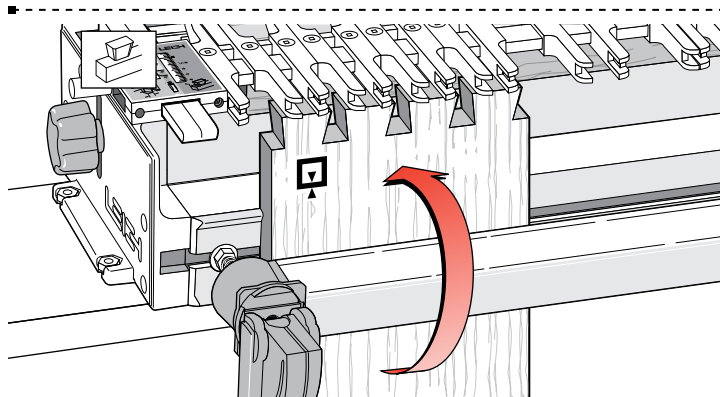
If you have not yet routed half-blind dovetails or read through chapter 11, please do so now before attempting end-on-end dovetails.



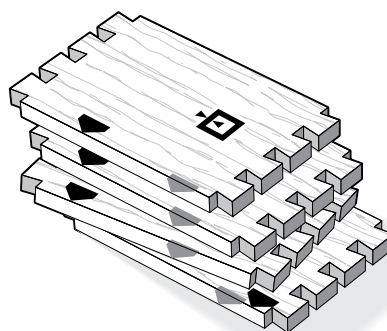
13-1 End-on-end dovetails are made in the same modes as half-blind joints, *but both boards are routed vertically in the front clamp*, alternately face side in and then face side out . Boards for end-on-end joints may be up to $\frac{3}{4}$ " [20mm] thick.

 **Use only the guidebush, dovetail bits and depths of cut as specified in Chapter 10 or Appendix II.**

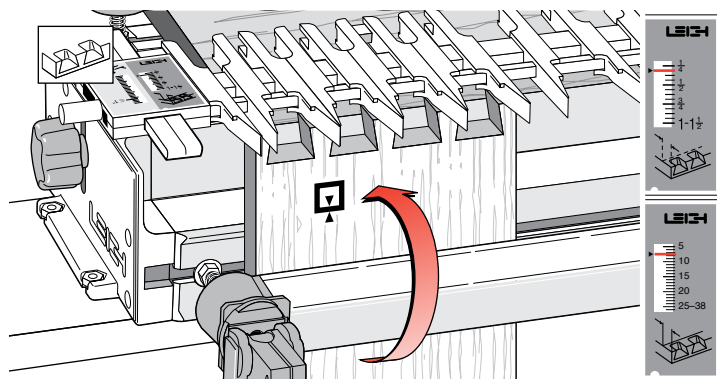
13-2 The end-on-end dovetail is laid out in the  HB TAILS mode. There is a special mark on the scale for end-on-end dovetails. *Align the support bracket line with the small arrow as shown.* Adjust the guidefingers as required.



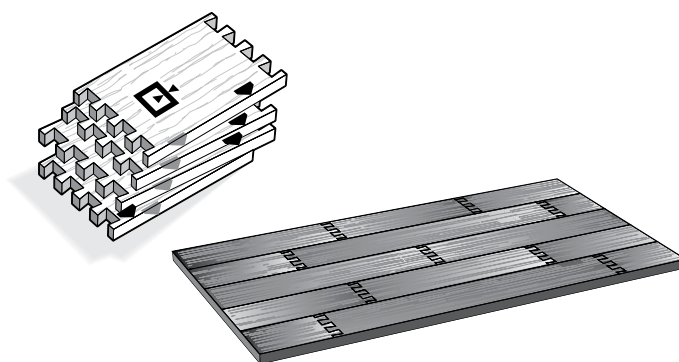
13-3 Rout the tails. Clamp end-on-end dovetail boards in the jig for routing one end face side in and one end face side out. *Keep the same edge against the side stop for both ends.*



13-4 Rout the tails on each end of the tail boards.



13-5 Rotate the finger assembly to  HB PINS mode and again set it on the small scale arrow for maximum pin board thickness ($\frac{3}{4}$ " [20mm]). There is no theoretical minimum thickness, but avoid thin board tearout, see 17-11. Rout pins on each end of pin boards, same edge against the sidestop for both ends. Narrow pins are illustrated (look like narrow tails), but guidefingers can easily adjust for even-sized tails and pins.



13-6 Always assemble end-on-end joints keeping the edges of the boards that were against the side stop all in line.

Applications for End-on-End Dovetails

As one example, you can make a flat, stable, and attractive chest lid by edge-jointing and glueing end-on-end dovetailed boards. ■



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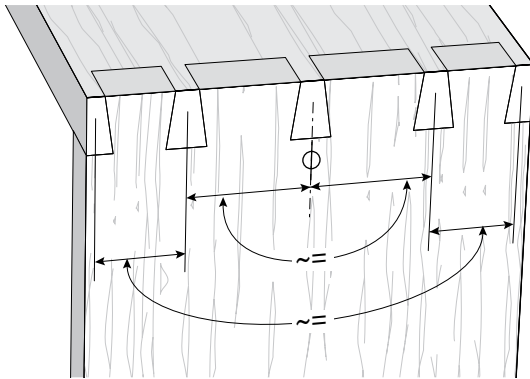
Scan QR Code

D4R Pro - CHAPTER 14

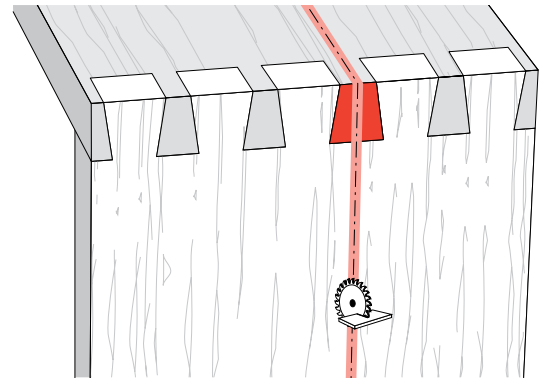
Asymmetric Dovetails

For certain procedures, you will need to use both ends of the D4R Pro jig. Asymmetrical joint layouts are one example. On the Leigh Jig, no joints will be truly symmetrical, but they can **look** symmetrical. Apparent symmetry is only required for aesthetic reasons, and not for strength.

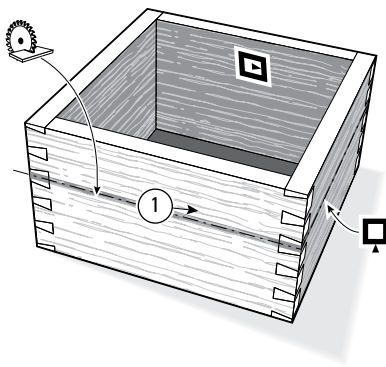
Note: Be sure you have read and understood chapters 8 through 14 before attempting these procedures.



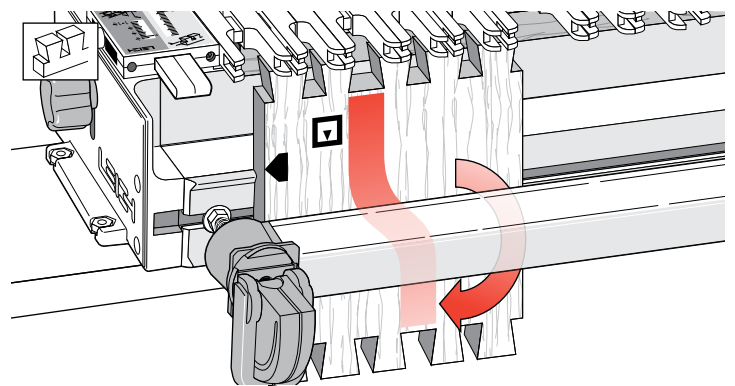
14-1 By *symmetrical* we mean a joint that looks or is approximately symmetrical about its center line but is probably not, and need not be precisely symmetrical. Using the Leigh jig, it is easy to cut a joint that looks symmetrical; the pins will always align perfectly with the tails cut at the same spacing. Remember, symmetry is only required for appearance, not for joinery reasons.



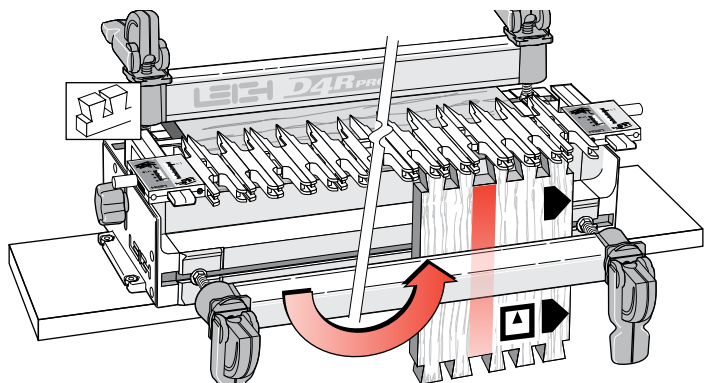
14-2 By *asymmetrical* we mean a deliberately uneven layout of pins and tails required by the project design. For example, asymmetrical joints may be used for blanket chests or boxes. One pin is made wider for a saw-cut allowance...



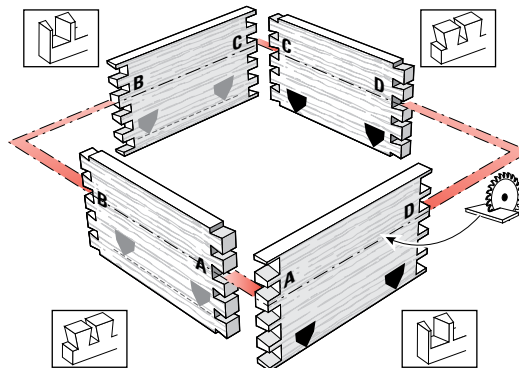
14-3 So the chest and lid half-pins all look the same width after the lid portion ① is cut off.



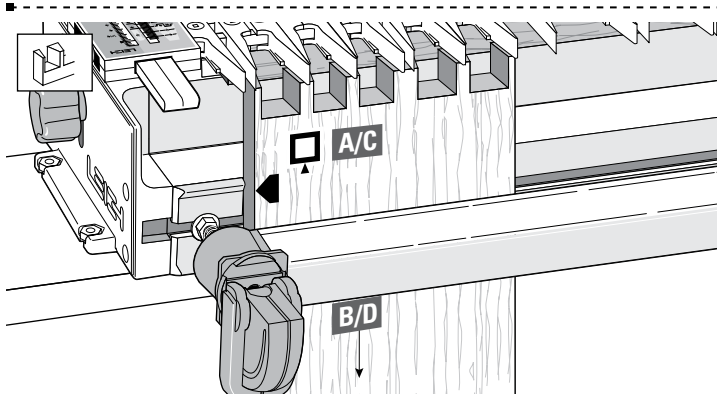
14-4 In the chest example you can see that if both ends of the board are cut under the same guidefingers, the wide sockets and pins at opposite ends will not line up. Remember, the same inside face  of the through dovetail tail board has to face away from the jig for each cut.



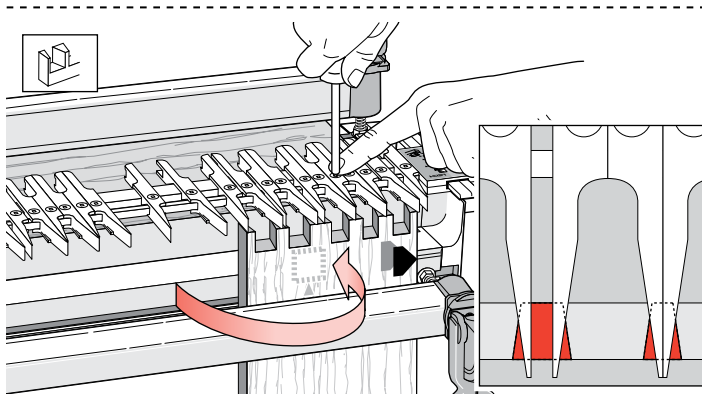
14-5 Deliberately asymmetrical joints must therefore be routed on both ends of the jig using two separate, **almost** mirror-image layouts.



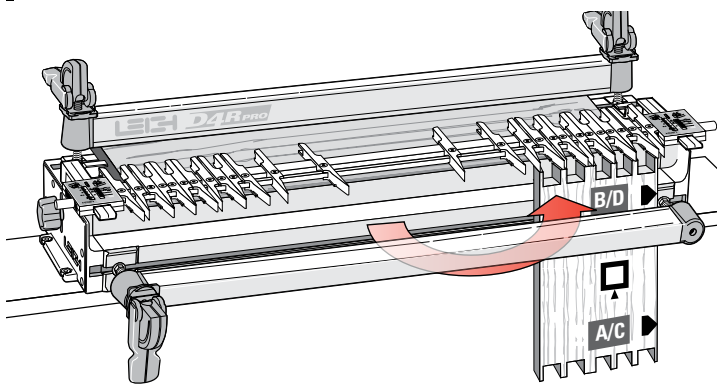
14-6 The layouts need not be exact mirror images because the parts that fit together will be made on the same end of the jig. For a typical blanket chest you would rout corners **A** and **C** on one end of the jig and corners **B** and **D** on the other end. As long as the side stop marks all face up (or all down), the box will go together.



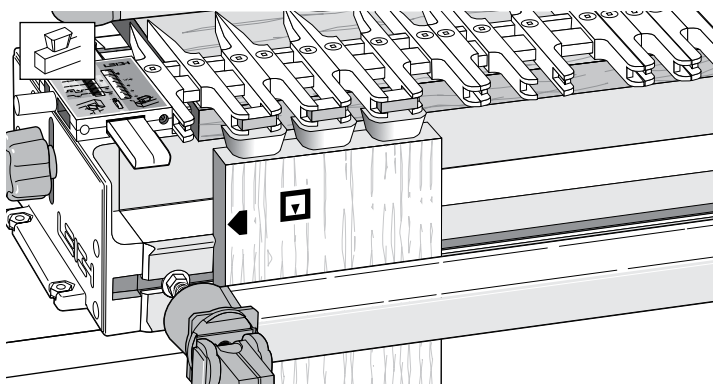
14-7 Here is an easy way to cut these near-mirror-image joints. Lay out the **A** and **C** corner joints in the usual way (i.e., in the TD PINS mode). Rout the **A** and **C** corners' tails and pins. Leave the guidefingers set and in the TD PINS mode.



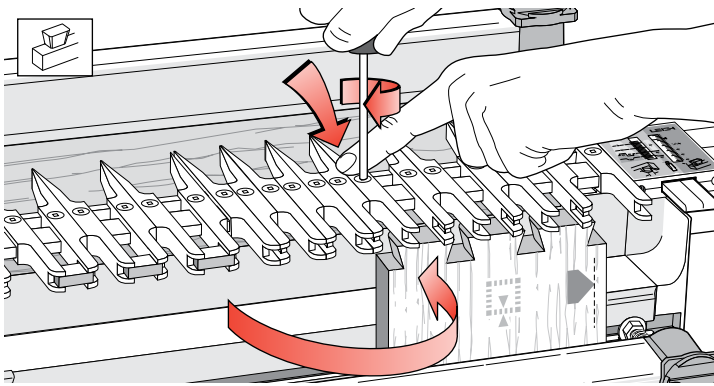
14-8 Simply flip a completed **A** or **C** pin board from one end of the jig (like turning a page) to the other end, and center each pair of guidefingers over a pin.



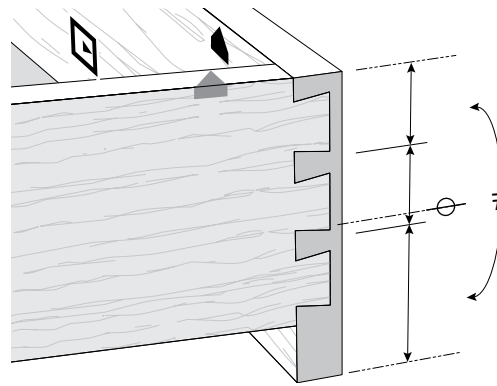
14-9 Now rout the **B** and **D** corners' tails and pins using this guidefinger pattern. When you assemble the case, the **A** and/or **C** ends will fit each other, and the **B** and/or **D** ends will also fit each other. Keep the boards inside face  inwards on the case and the side stop edges all turned the same way, and the parts are sure to match (see 14-6).



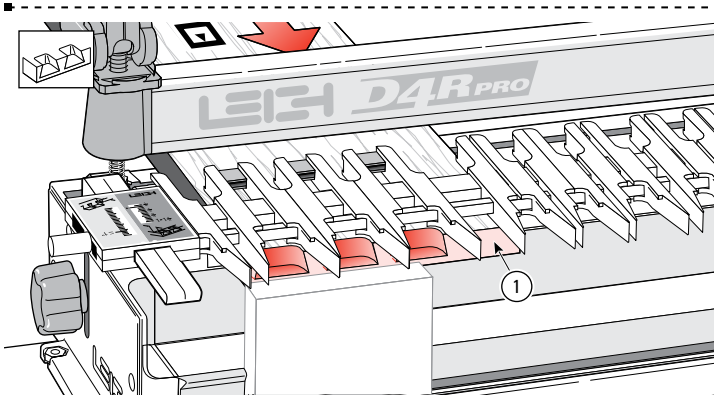
14-10 To transfer a **mirror image** asymmetrical half-blind joint...



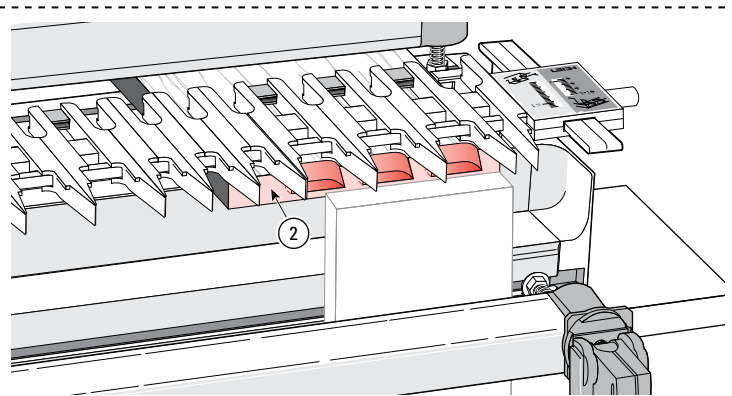
14-11 Turn the tail board (like turning a page of a book) to the other end of the jig. Position the guidefingers over the tails, then rout the tails for the other drawers. This tail board layout may look symmetrical, but as the next illustration shows, it forms part of an asymmetrical joint.



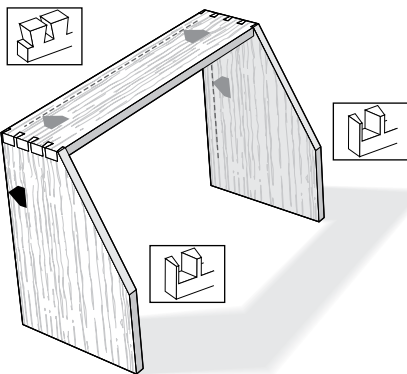
14-12 This common example of asymmetry is where boards are of a different width. In this case, a drop-front drawer, the drawer front bottom half-pin is much wider than the top half-pin. The top edges of the drawer front and sides are flush, so it makes sense to use these edges against the side stops at each end of the jig.



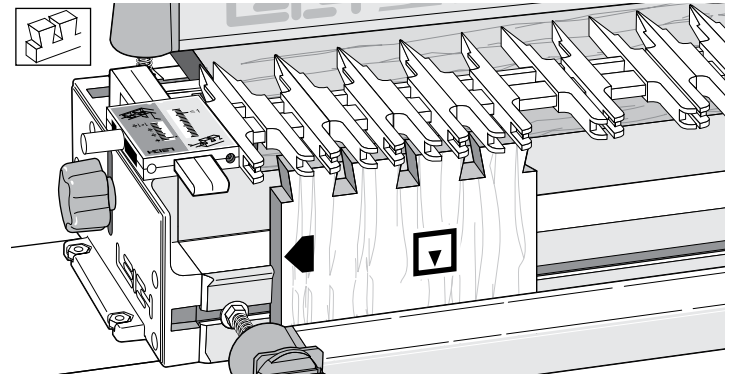
14-13 Mount the right end of the drawer front on the left end, but do not rout this opening ①.



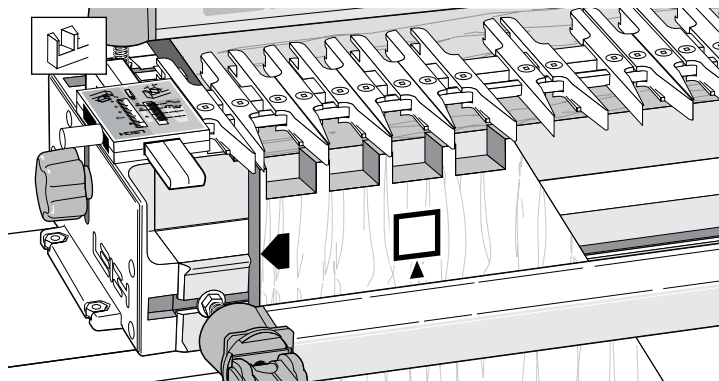
14-14 Mount the left end of the drawer front on the right end, using the **mirror-image** layouts on both ends, but do not rout this opening ②.



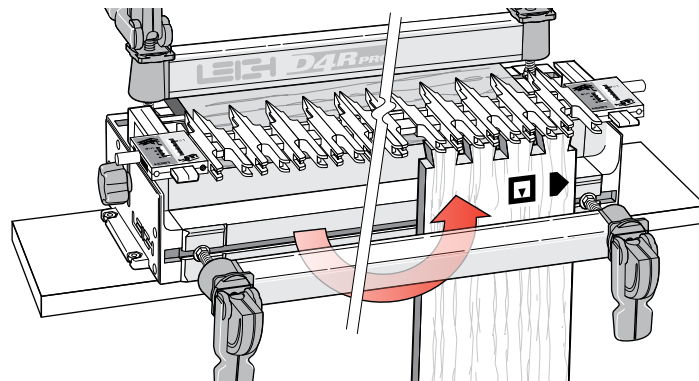
14-15 Both ends of the jig are also used for the top corners of a slant-front desk. The joints themselves may be symmetrical, but they must be routed on opposite ends of the jig because the sloped front will not register accurately against the fixed side stops.



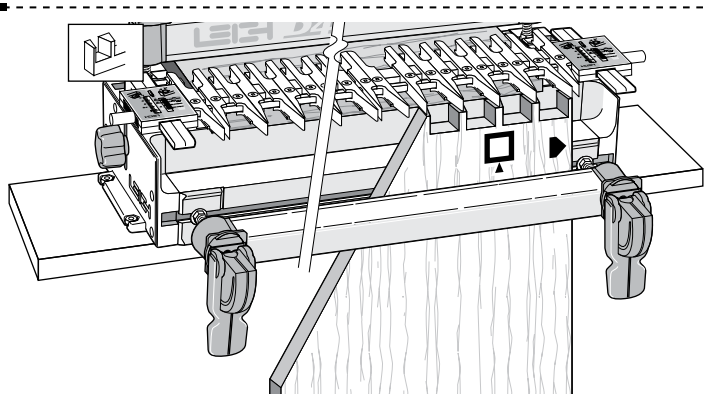
14-16 At the back of the desk both sides and top are flush, so the rear edges are set against the side stops. Place the left end of the top tail board against the left side stop ◀. Rout the tails.



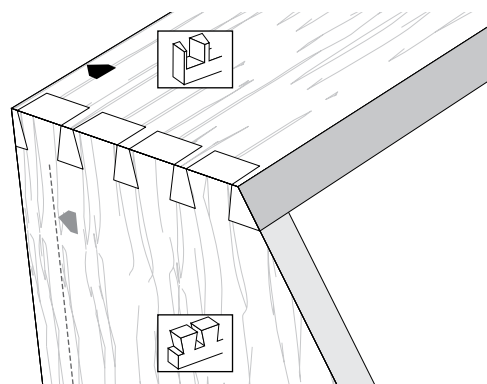
14-17 The left side of the desk goes against the left side stop ◀. Rout the pins.



14-18 Transfer the joint layout from left to right (as for 14-8 to 14-11) and place the right end of the top tail board against the right side stop ▶. Rout the tails.



14-19 Place the right side of desk against the right side stop ▶. Rout the pins.



14-20 *Note: If, in the slant-front desk example, the pins were in the desk top and the tails in the sides, then all the parts would be routed in the opposite ends of the jig to those shown above. ■*



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D4R Pro - CHAPTER 15

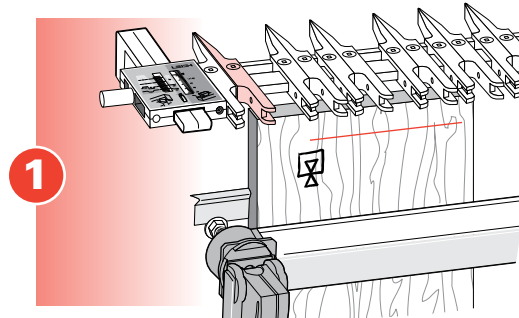
Box Joints

"Actual" Joint Sizes

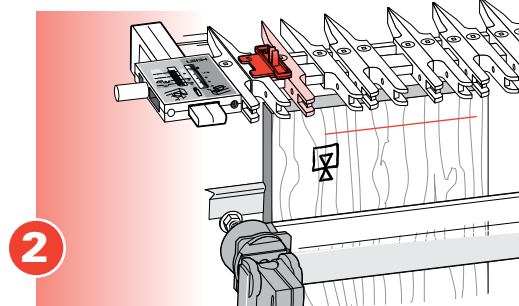
The D4R Pro finger assembly was originally designed solely for dovetailing. Adapting the assembly for box jointing was a serendipitous combination of luck (existing guides approximately the correct dimension) and clever design; the e7-Bush and Spacer. As a Result, the nominal $\frac{3}{8}$ " and $\frac{3}{4}$ " [9,5 and 19mm] box joint sizes are closer to $\frac{25}{64}$ " [9,8mm] and $\frac{49}{64}$ " [19,6mm].

Concept of Operation

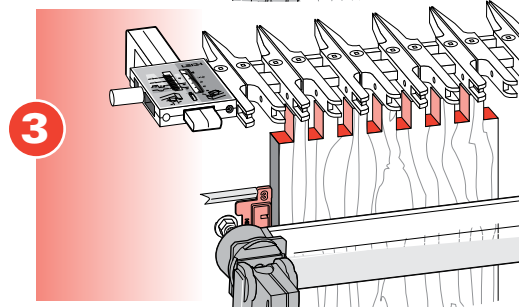
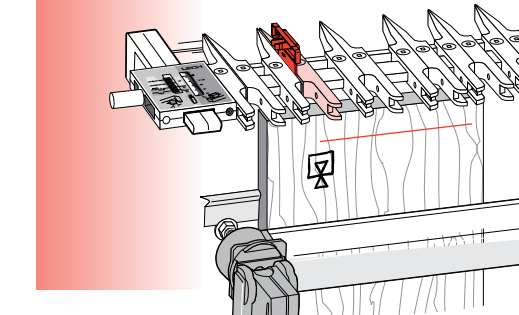
The first board is set against the side stop ①.



The Spacer is used to space the guide fingers ②.



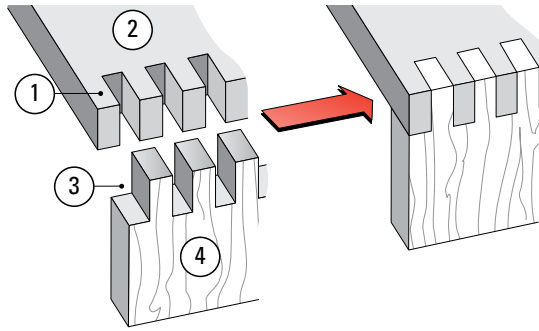
The Spacer is also used against the side stop ③ to accurately offset mating workpieces for correct board to board joint alignment.



Box Joints Terminology

- ① Pin
- ② Pin board
- ③ Socket
- ④ Socket board

The pins fit in the sockets.



Board Width Selection

Choose a joint size in the chart below: $\frac{3}{8}$ " [9,5mm] or $\frac{3}{4}$ " [19mm]. Board width is determined by the total number of pins and sockets in the joint design and whether the joint is symmetrical or asymmetrical. Use this chart to determine board widths up to $16\frac{7}{32}$ " [412mm] (limited by the number of guide fingers).



Symmetrical joints have a pin on each board edge. Total pins and sockets is always an odd number.



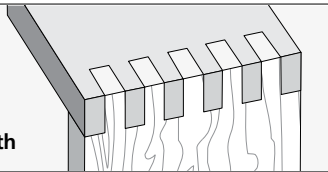
Asymmetrical joints have a pin on one board edge, and a socket on the other edge. Total pins and sockets is always an even number.

EXAMPLE

$\frac{3}{8}$ " joint size

Symmetrical layout

11 sockets and pins
= $4\frac{7}{32}$ " board width

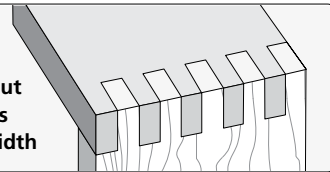


EXAMPLE

$\frac{3}{8}$ " joint size

Asymmetrical layout

10 sockets and pins
= $3\frac{27}{32}$ " board width



Board Width - INCHES

$\frac{3}{8}$ "

	Symmetrical	Asymmetrical
1		
2		
3	$1\frac{1}{8}$	
4		$1\frac{1}{2}$
5	$1\frac{29}{32}$	
6		$2\frac{9}{32}$
7	$2\frac{11}{16}$	
8		$3\frac{1}{16}$
9	$3\frac{15}{32}$	
10		$3\frac{27}{32}$
11	$4\frac{7}{32}$	
12		$4\frac{5}{8}$
13	5	
14		$5\frac{3}{8}$
15	$5\frac{3}{4}$	
16		$6\frac{5}{32}$
17	$6\frac{17}{32}$	
18		$6\frac{15}{16}$
19	$7\frac{5}{16}$	
20		$7\frac{23}{32}$
21	$8\frac{3}{32}$	
22		$8\frac{17}{32}$
23	$8\frac{7}{8}$	
24		$9\frac{1}{4}$
25	$9\frac{19}{32}$	
26		$10\frac{1}{32}$
27	$10\frac{13}{32}$	
28		$10\frac{13}{16}$
29	$11\frac{3}{16}$	
30		$11\frac{9}{16}$
31	$11\frac{31}{32}$	
32		$12\frac{11}{32}$
33	$12\frac{3}{4}$	
34		$13\frac{1}{8}$
35	$13\frac{1}{2}$	
36		$13\frac{29}{32}$
37	$14\frac{9}{32}$	
38		$14\frac{11}{16}$
39	$15\frac{1}{16}$	
40		$15\frac{7}{16}$
41	$15\frac{27}{32}$	
		$16\frac{7}{32}$

$\frac{3}{4}$ "

	Symmetrical	Asymmetrical
1		
2		
3	$2\frac{9}{32}$	
4		$3\frac{1}{16}$
5	$3\frac{27}{32}$	
6		$4\frac{5}{8}$
7	$5\frac{3}{8}$	
8		$6\frac{5}{32}$
9	$6\frac{15}{16}$	
10		$7\frac{23}{32}$
11	$8\frac{17}{32}$	
12		$9\frac{1}{4}$
13	$10\frac{1}{32}$	
14		$10\frac{13}{16}$
15	$11\frac{9}{16}$	
16		$12\frac{11}{32}$
17	$13\frac{1}{8}$	
18		$13\frac{29}{32}$
19	$14\frac{11}{16}$	
20		$15\frac{7}{16}$
21	$16\frac{7}{32}$	

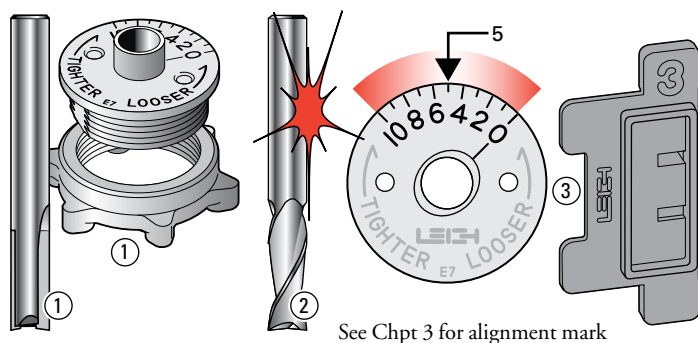
Board Width - MILLIMETERS

9,5mm

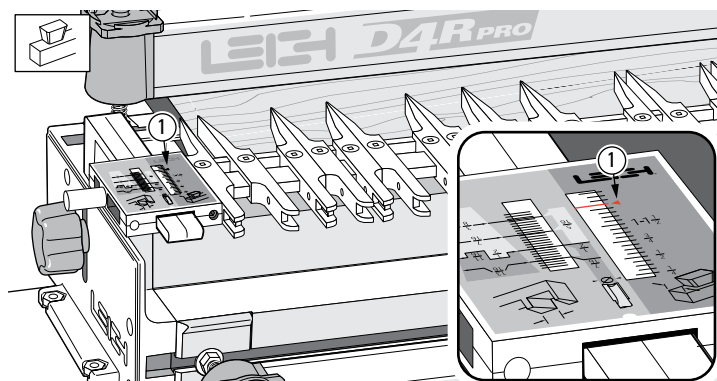
	Symmetrical	Asymmetrical
1		
2		
3	29	
4		39
5	49	
6		59
7	68	
8		78
9	88	
10		98
11	107	
12		117
13	127	
14		137
15	147	
16		157
17	167	
18		176
19	186	
20		196
21	206	
22		216
23	225	
24		235
25	245	
26		255
27	265	
28		275
29	284	
30		294
31	304	
32		314
33	324	
34		334
35	343	
36		353
37	363	
38		373
39	383	
40		393
41	402	
		412

19mm

	Symmetrical	Asymmetrical
1		
2		
3	59	
4		78
5	98	
6		117
7	137	
8		157
9	176	
10		196
11	216	
12		235
13	255	
14		275
15	294	
16		314
17	334	
18		353
19	373	
20		393
21	412	

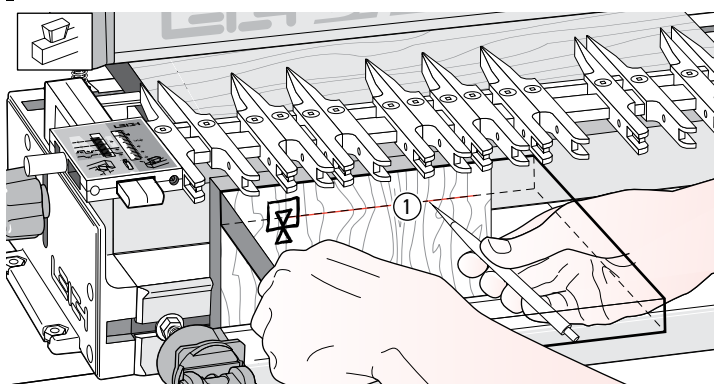


15-1 Bit and Guidebush selection Only the e7-Bush and the $\frac{5}{16}$ " bit ① that came with the D4R Pro are required for box joints. Spiral upcut router bits ② will cut cleaner than straight flute. Where metric size bits are available an 8mm straight or spiral bit may be substituted for the $\frac{5}{16}$ ". Always start test routing with the e7-Bush set on "5". *Note: the box joint Spacer ③ has a square notch.*

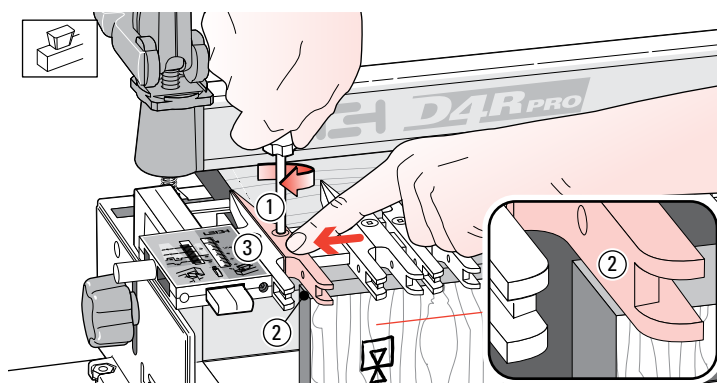


15-2 $\frac{3}{8}$ "[9,5mm] Box Joints

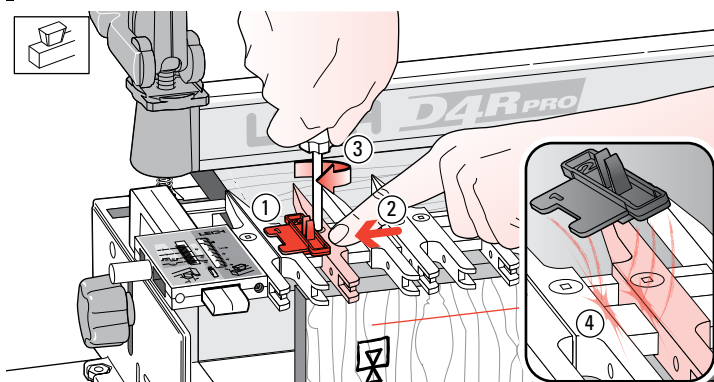
Place the finger assembly on the support brackets in the HB TAILS mode, set the scales on the **small triangular arrow** ① and lower the assembly onto the spacer board. All box joints are routed in this position. *Note: maximum board thickness is 1"[25mm].* See Chpt 3 for alignment mark.



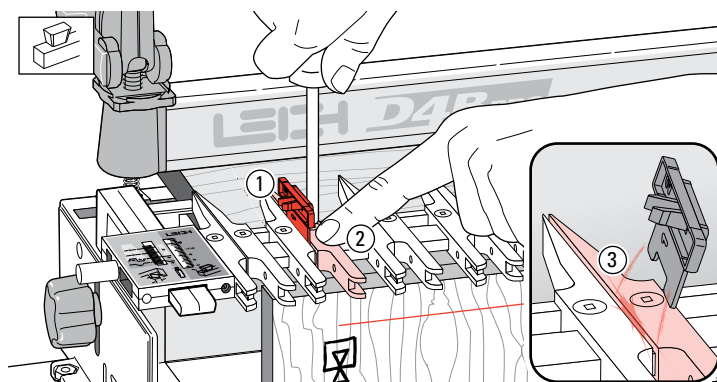
15-3 Clamp a test board in the front left clamp, against the side stop with the top edge flush under the guide fingers. The board may be clamped face side in or out. Mark and adjust the depth of cut to suit the thickness of the mating boards ①.



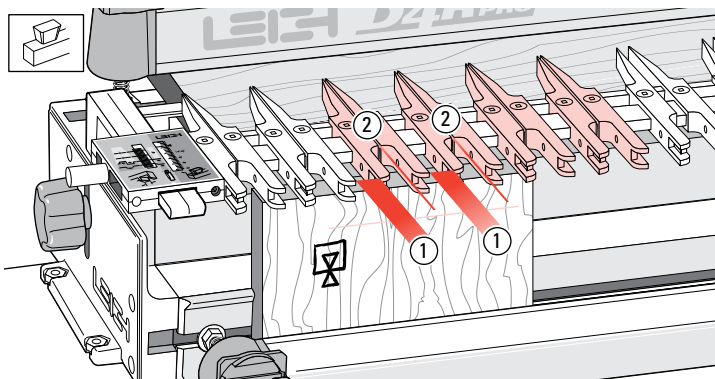
15-4 Raise the finger assembly about $\frac{1}{8}$ "[3mm] to allow ease of guide finger adjustment ①. Position the second guide finger $\frac{1}{32}$ "[1,0mm] in from the board edge ② and tighten the finger. The first finger stays against the scale block as a router support ③. *Note: Square ended boards are essential to achieve flush joint alignment.*



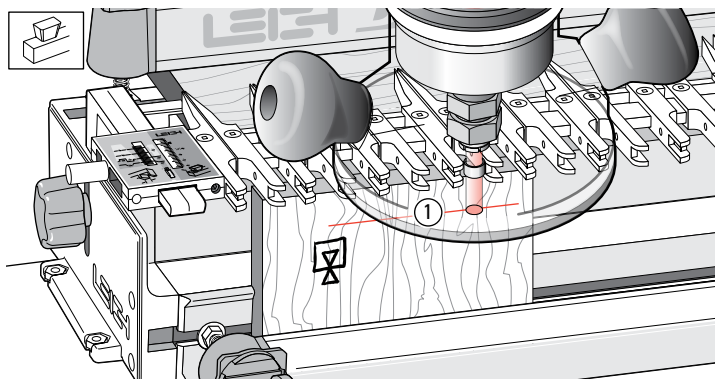
15-5 Place the Spacer on the finger bar to the right of the second finger, numeral 1 on top overlapping the locked finger ①. Move the next finger in to touch the Spacer ②. Hold the guide finger firmly against the Spacer and tighten the second finger screw ③. As you remove the Spacer you should feel some friction; this indicates that the guide finger is correctly spaced ④.



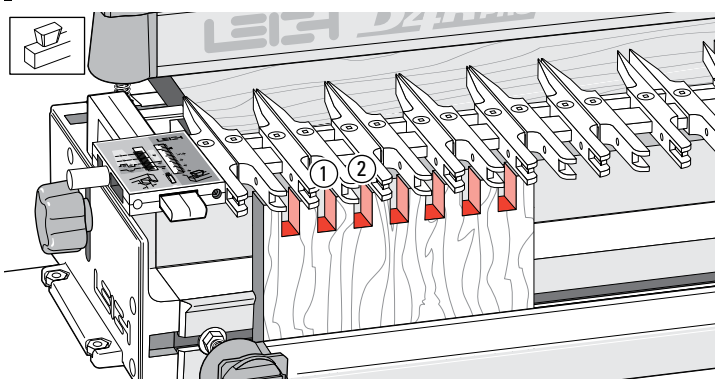
15-6 Now place the spacer vertically on the right hand side of the third finger; the prongs to the left ①. Hold the guide finger firmly against the Spacer and tighten the second finger screw ②. As you remove the Spacer you should feel some friction ③; this indicates that the guide finger is correctly spaced.



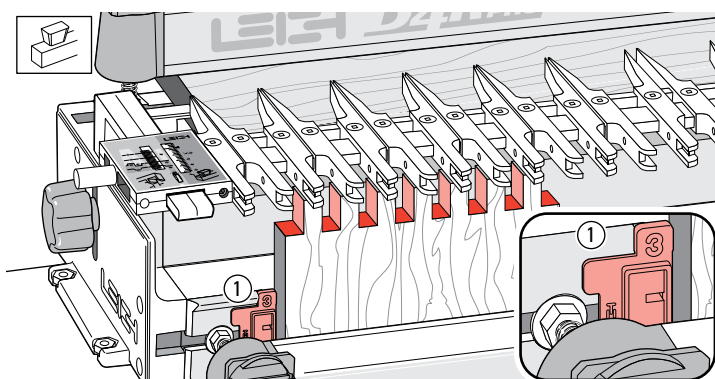
15-7 Repeat this procedure across the jig until there is at least one guide finger spaced past the right hand side of the work piece. Finger pairs should have a uniform $\frac{1}{2}$ " [12,7mm] space between them ①, and .054" [1,37mm] gap ② between fingers of the same pair. Tighten the unused guides.



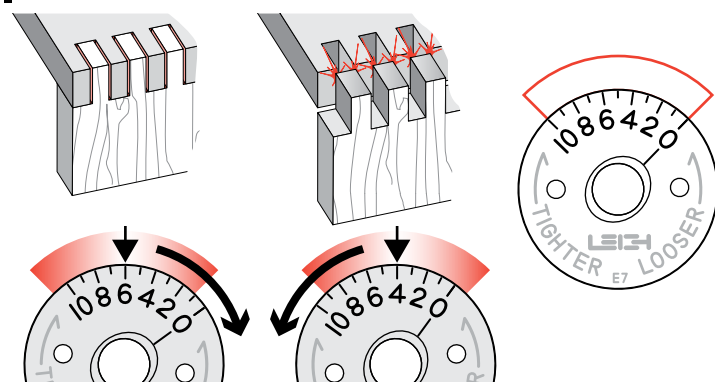
15-8 Lower the finger assembly onto the spacer board and double-check that the bit depth is down to the center of the pencil line ①. Make sure the collet does not rub on the guidebush.



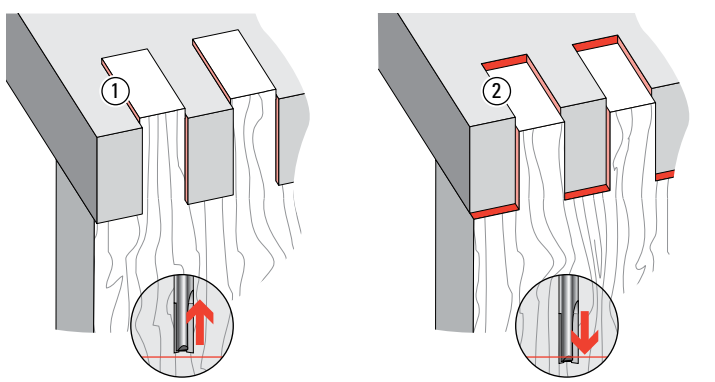
15-9 Rout one end of the scrap board. Rout into each finger opening ① and between each finger ②. Make sure to run the guidebush on both sides of each opening.



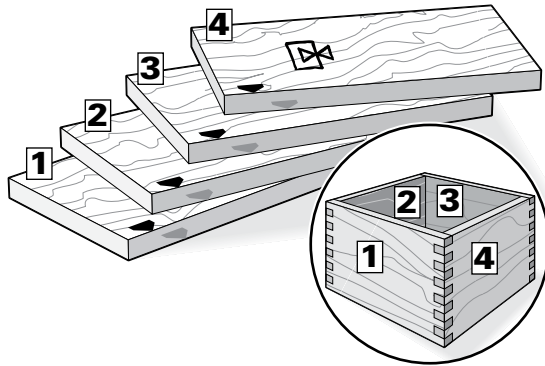
15-10 Remove the board and fit the box joint Spacer against the front side stop with the **number 3** showing ①. Make sure it is fully home. Clamp the second test board with its side edge against the Spacer and its top edge touching the guide fingers. Rout this board. *Note: Square ended boards are essential to achieve flush joint alignment.*



15-11 Test the boards for fit and flushness. If the joint is loose, turn the e7-Bush to a higher number and rout two more boards. If the joint is too tight, turn the e7-Bush to a lower number. Trial-and-error establishes the best e7-Bush setting. Record it on this bush drawing for a good result the next time. *Note: each increment adjusts glue line fit by 0.002" [0,05mm]. Retighten the eBush nut after each adjustment.*

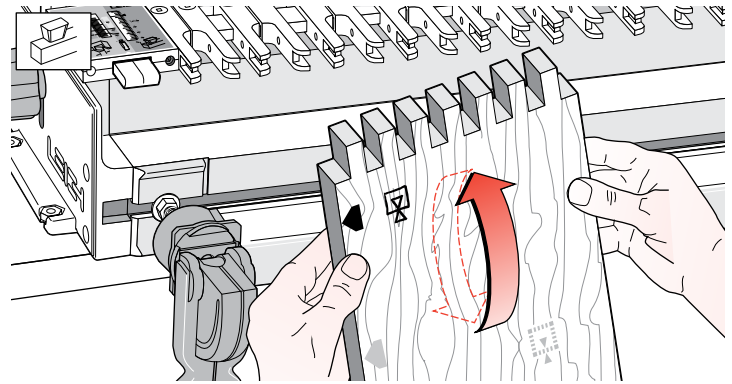


15-12 If the joint is over flush ①, raise the bit slightly. If it is under flush ②, lower the bit.

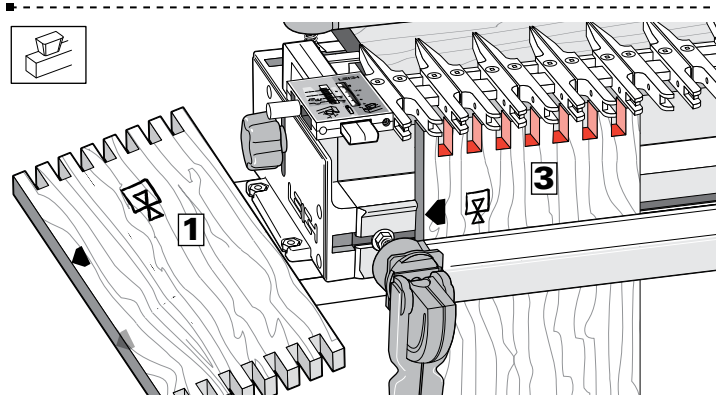


15-13 Lets make a box with $\frac{3}{8}$ " box joints..

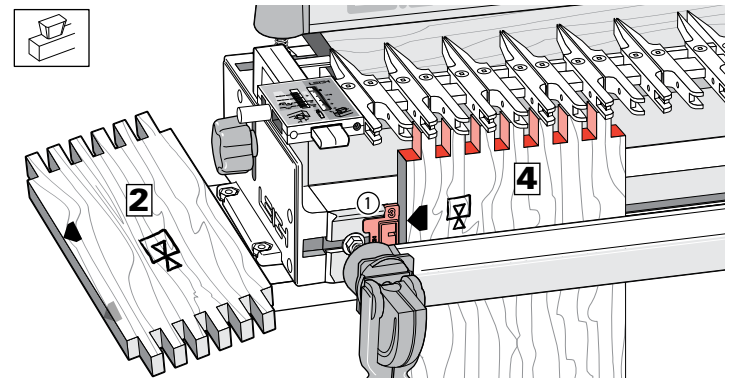
Prepare four boards and number them **1** to **4**. Then select the grain alignment and mark the common top (or bottom) edge **▶**. Don't worry about face side selection; this can be done after routing.



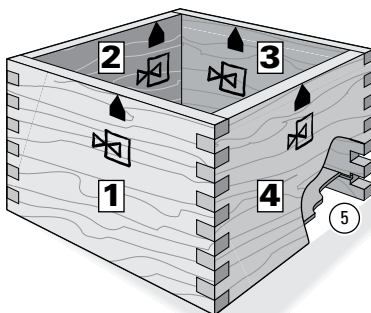
15-14 All box joint boards are clamped alternating face side in  and face side out  always with the same side edge against the side stop (or Spacer).



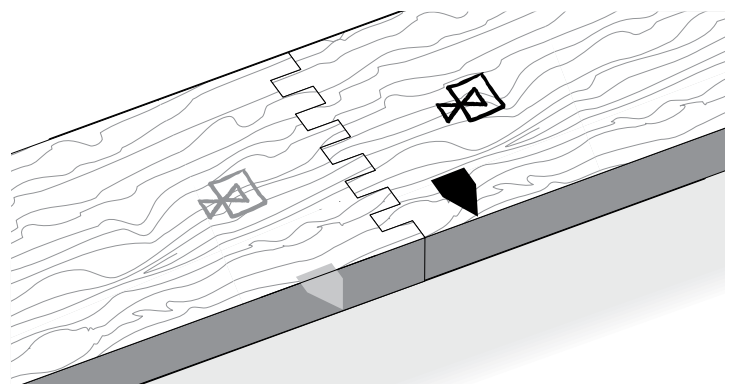
15-15 Rout both ends of boards **1** and **3** with their edges against the side stop. Be sure to keep the same edge to the stop.



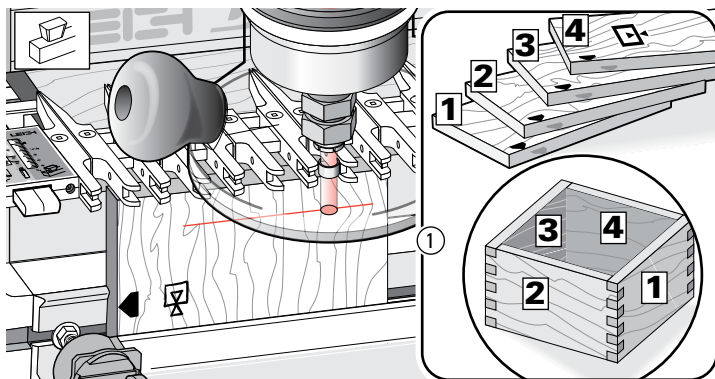
15-16 Rout both ends of boards **2** and **4** with their edges against the Spacer. Have the Spacer in the No. **3** position . Keep the same edges to the Spacer.



15-17 Keeping the marked side stop edges of all boards toward the top (or all to the bottom) of the box, select the preferred outside faces before routing the grooves  for the bottom.

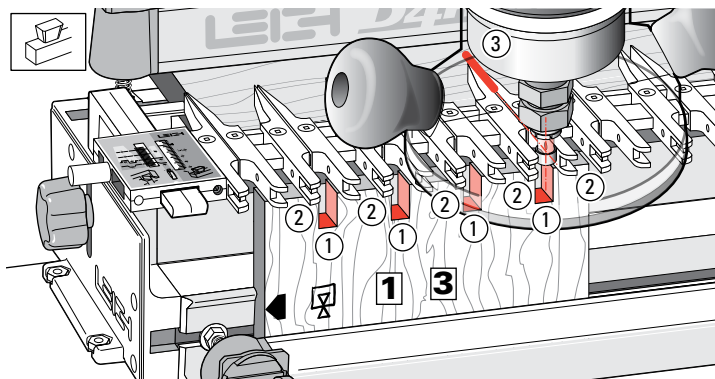


15-18 The same method will produce end-on-end joints.



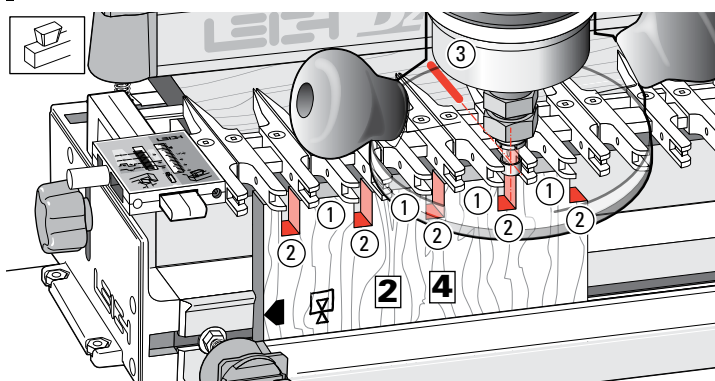
15-19 3/4"[19mm] Box Joints Set-up and space the guide fingers exactly as for 3/8"[9mm] joints. Start with the same e7-Bush setting. See 15-2 thru 15-9.

Prepare four boards using the board width chart for 3/4"[19mm] joints and number them **1** to **4** around the box **1** with the common edges marked.



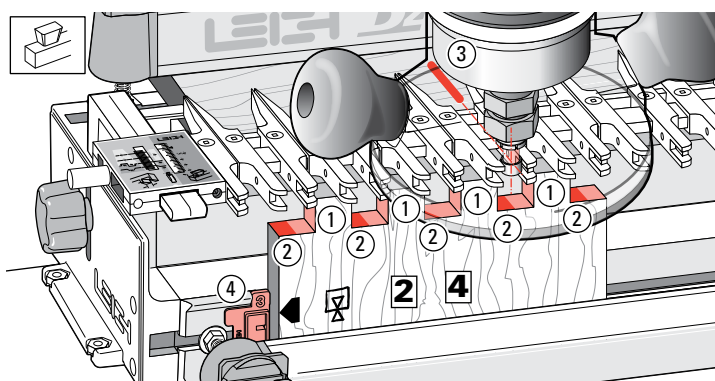
15-20 Rout both ends of boards **1** and **3** but only rout between the guide finger openings **1** not between the finger sides **2**. Keep the common edge against the side stop.

Hint: Mark the router base at the 12 o'clock position **3** and steer this mark along the pointed ends of the fingers at the rear of the assembly.

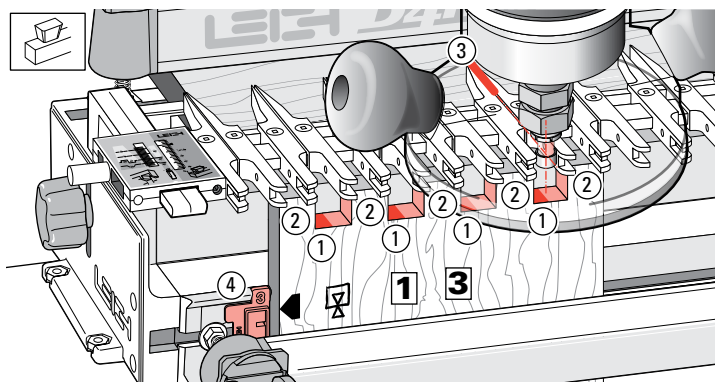


15-21 Now rout both ends of boards **2** and **4**, with the common edge against the side stop but only rout between the finger sides **2** not between the finger openings **1**.

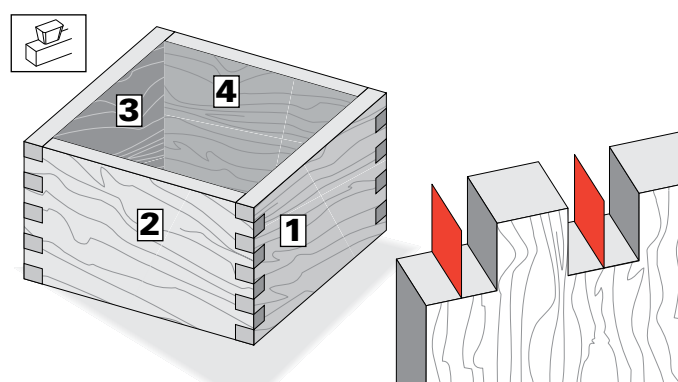
Hint: Now steer the base 12 o'clock mark between the pairs of finger points **3**.



15-22 Remove the board and fit the Spacer to the side stop with number **3** showing **4**. Now rout both ends of boards **2** and **4** again, with the common edge against the Spacer and again ...only rout between the finger sides **2**, not between the finger openings **1**, steering the router mark between the pairs of finger points **3**.



15-23 With the Spacer still in position rout both ends of boards **1** and **3**, with the common edge against the Spacer and only rout between the finger openings **1**, steering the router mark along the finger points **3**.



15-24 Joint fit Check for joint fit as usual, and repeat testing if required. Theoretically, there will be nothing in the 3/4"[19mm] sockets, literally a zero thickness wall, where the bit has passed by twice. However, routing tolerances can leave a very thin "wall" uncleared by routing. This can be quickly removed with a chisel or sandpaper. ■



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D4R Pro - CHAPTER 16

Sliding Dovetails

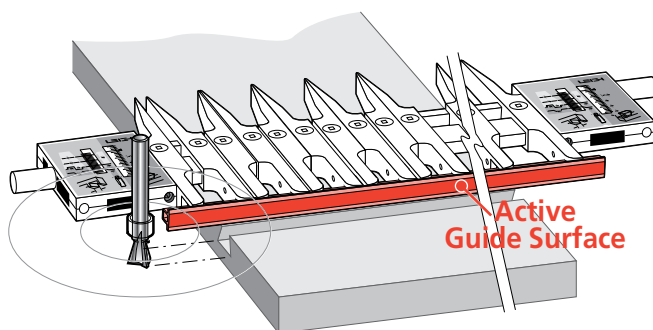
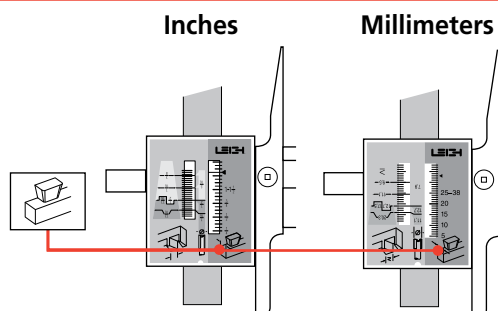
! Routing sliding dovetail "slots" across the face grain of horizontal boards is very tough on dovetail bits. **Always use the largest shank size available to you.** We recommend at least 8mm shanks, but 1/2" would be even better, with of course the appropriate guidebush. If you have to use 1/4" shanks in hardwood, use a second router with a straight bit to rough out the slot center.

Note: While we recommend 5/8" [15,9mm] as the ideal size guidebush for sliding dovetails, many users will have a 7/16" guidebush. These instructions cover both those sizes. The Leigh 7/16" e7 and 5/8" e10 guide bushes can be used to make fine fit adjustments for sliding dovetails.

1

With the Finger Assembly in **HALF-BLIND DOVETAIL TAILS (HB TAILS) mode**, install the sliding dovetail fence (cross-cut fence)

Sliding Dovetail Slots are cut across the board face.

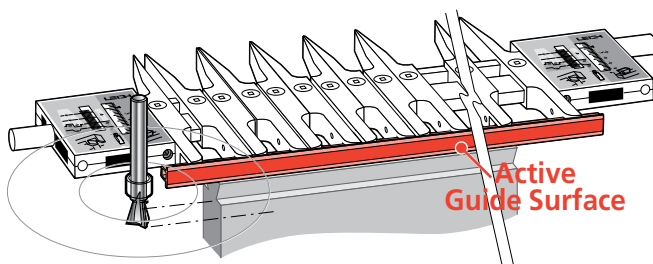
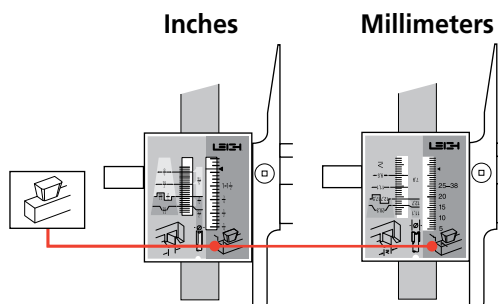


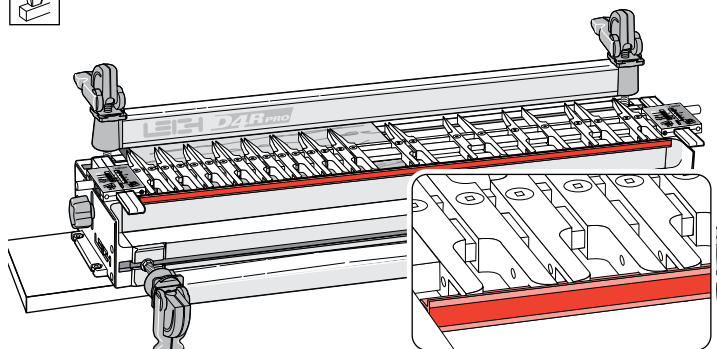
2

KEEP the finger assembly in the same mode

3

Sliding Dovetail Tails are cut across the board end edge

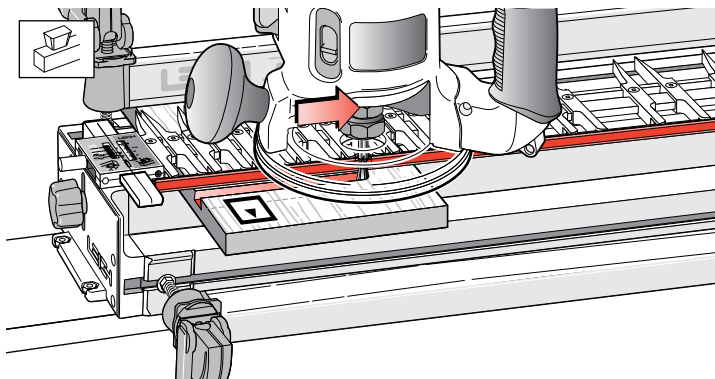




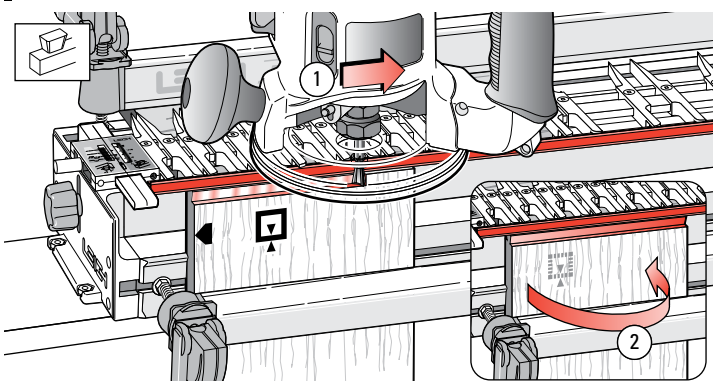
16-1 With the finger assembly in HB TAILS mode, the sliding dovetail fence fits into the recesses in the ends of the tail guides for routing sliding dovetails.



Space the guides fairly evenly across the jig. Firmly seat the fence into end of each guidefinger to ensure a straight cut.

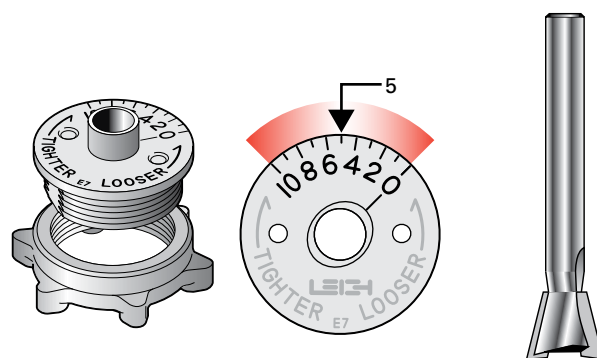


16-2 Using the sliding dovetail fence as a guide surface for the guidebush, you can make lateral router cuts across the faces of horizontal boards (we call these dovetail *slots*), and...



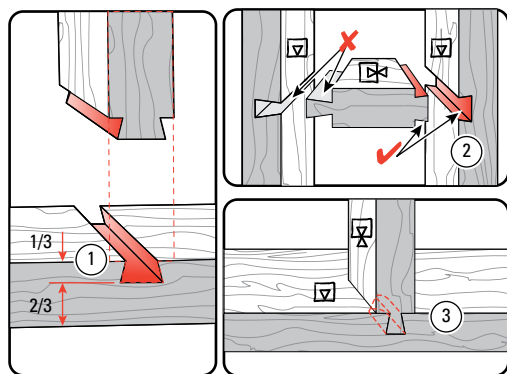
16-3 Across the top ends of vertical boards to cut the tail. First rout one side ①...

...then turn the board side-over-side ② to cut the other half of the tail.

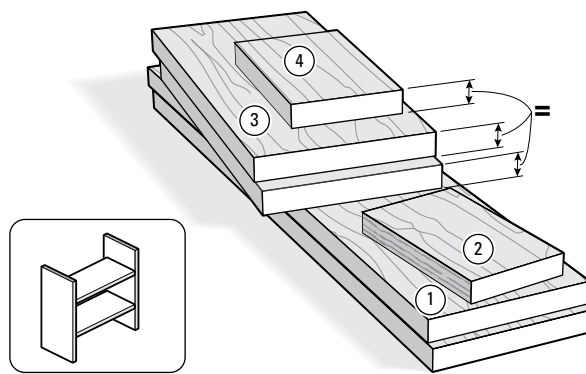


16-4 Turn the e7-Bush to “5” and use the No. 120-8, ½" x 14° bit for sliding dovetails. This e7-Bush setting will allow for fine fit adjustment of the tail later.

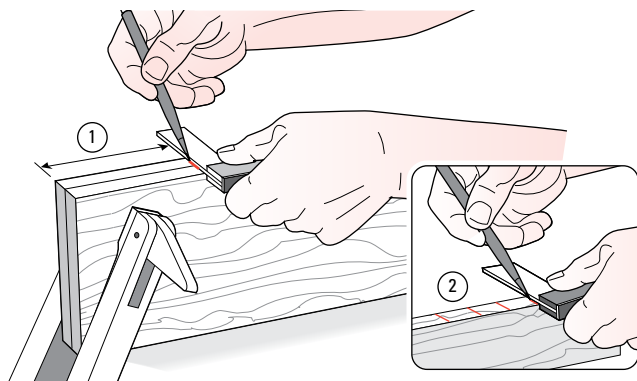
A standard 7/16" [11,1mm] guidebush (min. depth ¼" [6,35mm] see page 69) can be used but without the fine adjustment provided by the e7-Bush.



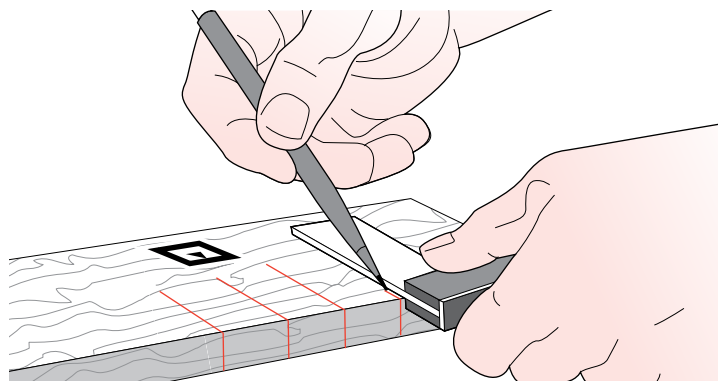
16-5 On a full width joint, the slot depth-of-cut should be no more than 1/3 the board thickness ①. If the tail board is a load-bearing horizontal member (e.g., bookshelf or step), make the tail fairly thick for good tail neck strength ②. Shorter sliding dovetails for less structural demand may be slightly deeper, with narrower profiles, especially if appearance is important ③ (e.g., where narrow rails join wider boards).



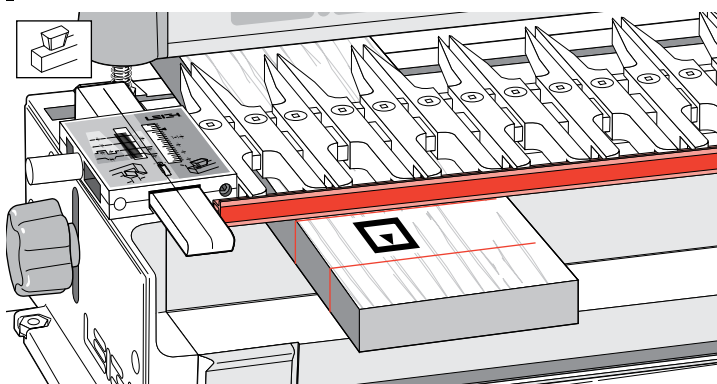
16-6 Use ¾" x 5½" [20x140mm] softwood to make two slot boards ①, plus one narrow test slot board ②, two tail boards ③ and one narrow test tail board ④. The tail boards ③ and test tail board ④ must be exactly the same thickness. This will make two uprights and two shelves.



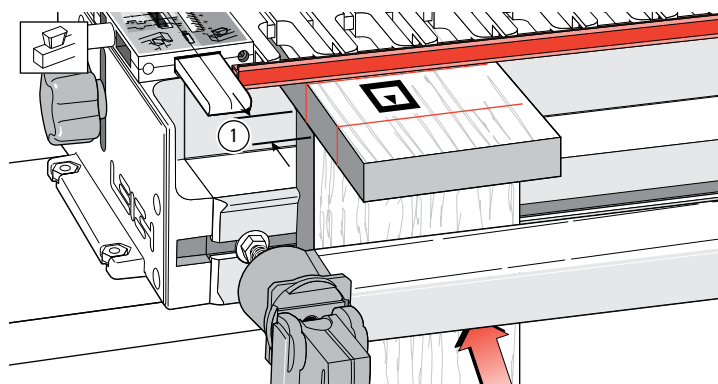
16-7 Marking Out: *Do not mark slot positions on board faces; mark the edges ① of both slot boards together for perfectly level shelves. Mark the narrow test slot board in the same way at several closely spaced random spots ②. This board is used only for setup.*



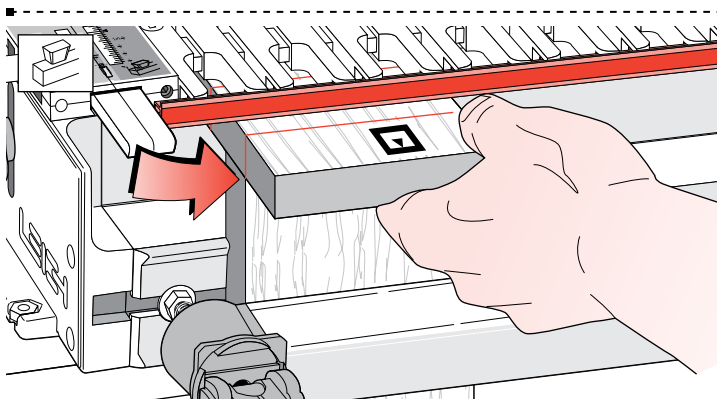
16-8 *On the test slot board only, square the marks across the face.*



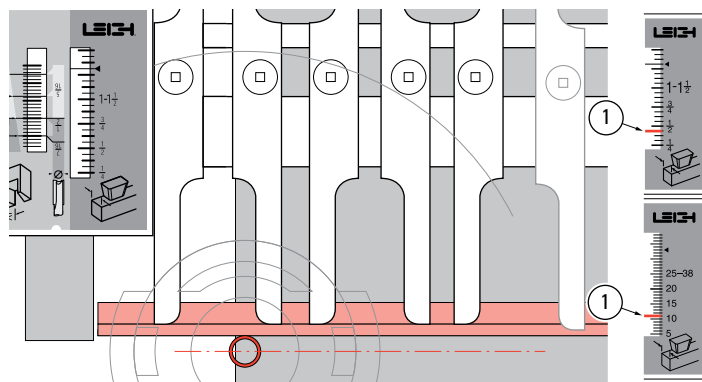
16-9 Mount the test slot board in the rear clamp, markings up.  Dovetail slots are best routed from left to right because the bit's clockwise rotation pulls the guidebush against the fence. But when routing close to both ends of a board, you may need to rout slots from right to left. *See 16-30.*



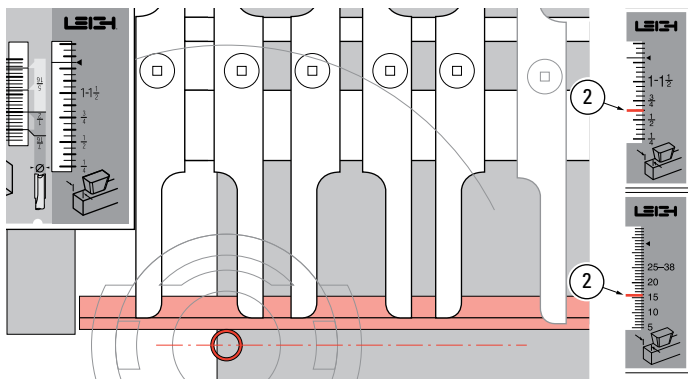
16-10 Mount a $\frac{3}{4}$ " [20mm] thick ① (*yes, the $\frac{3}{4}$ " [20mm] thickness is important*) square-ended board vertically in the front clamp against the side stop, with the top edge butting the underside of the test board.



16-11 Position and clamp the test board so that one of the edge marks is in line with the *outside edge* of the vertical board.

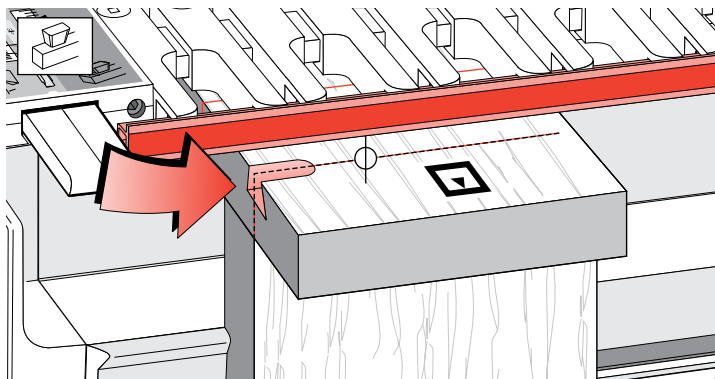


16-12 With the finger assembly (including the sliding dovetail fence) on the support brackets in the HB TAILS mode, set the scale to $\frac{7}{16}$ " [11mm] ①. *Make sure the finger assembly is level and sitting flush on top of the board.* The HB TAILS scale was not designed for this operation, but with this setting the routed slot will be close to centered on the slot line.



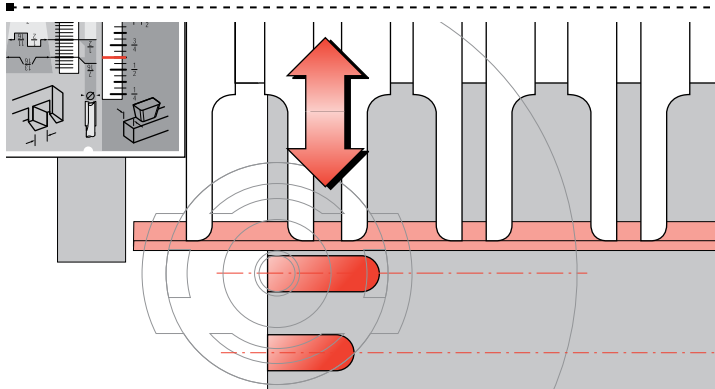
16-13 If you use a larger guidebush, for example $\frac{5}{8}$ " [15,9mm] rather than $\frac{7}{16}$ " [11,1mm], move the scale in by the difference of the two guidebush radii.

E.g., suggested scale reading for a $\frac{5}{8}$ " [15,9mm] guidebush would be $1\frac{1}{32}$ " [9mm] ②.

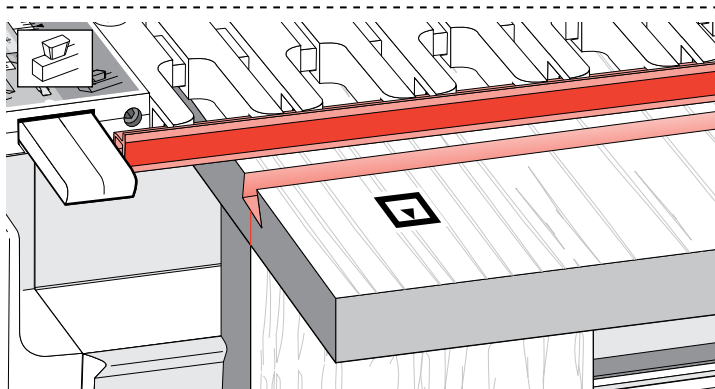


16-14 Adjust the bit so the cut depth is about $\frac{5}{16}$ " [8mm]. Rout from left to right maintaining light inward pressure of the guidebush on the fence. Rout in only about 1" [25mm] and back out again.

⚠ Do not lift the router.

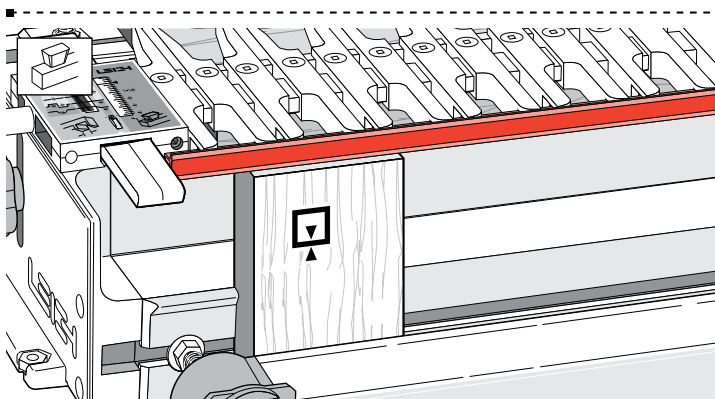


16-15 Check to see if this short slot is centered on the pencil line. If not, adjust the finger assembly in or out and retest on the other lines as necessary until the slot is centered. Lock the finger assembly in this position and record the setting for future reference.

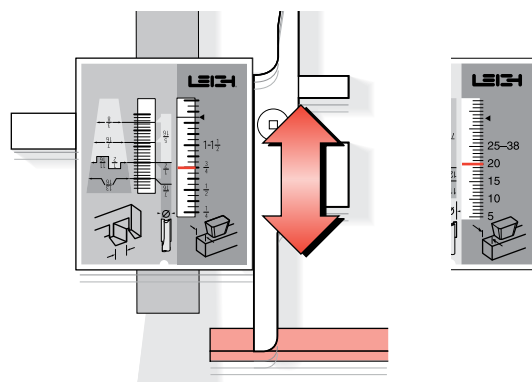


16-16 Now rout sliding dovetail slots in the two main slot boards with the boards in the horizontal position in the rear clamp, slot side, that is inside face  up.

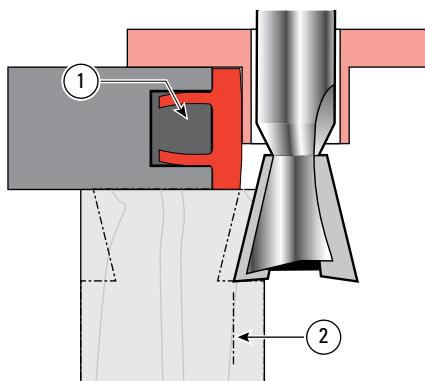
The guidefingers must be flush on the board.



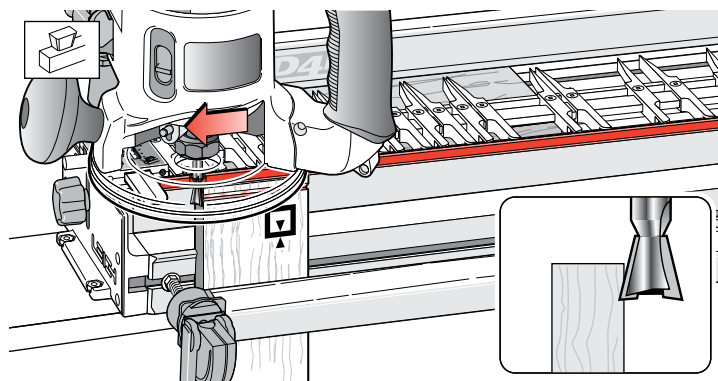
16-17 Replace the spacer board in the rear clamp, and with the finger assembly on the spacer board, mount a test tail board vertically in the front clamp, flush under the guidefingers. Either side can face out .



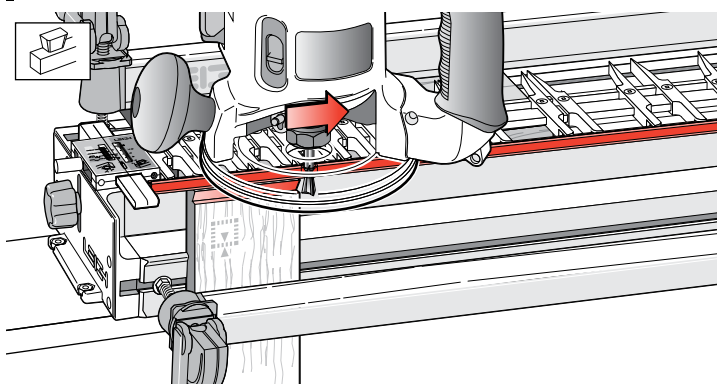
16-18 The  HB TAILS scale is not designed specifically for this mode, but it does allow you to make precise adjustments for tail size and tightness of fit on sliding dovetails.



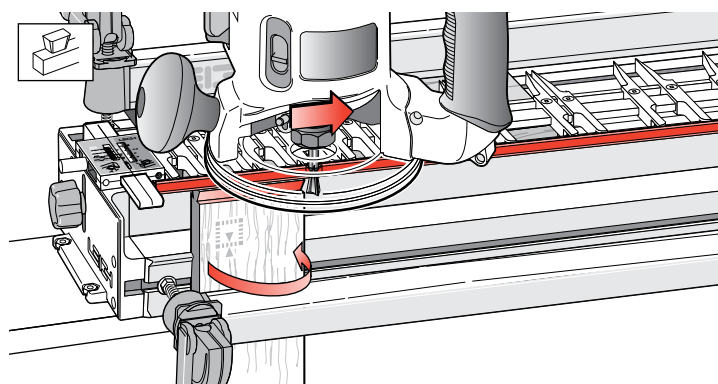
16-19 Adjust and set the finger assembly ① so it is clear that the routed tail ② will be too large for the slot.



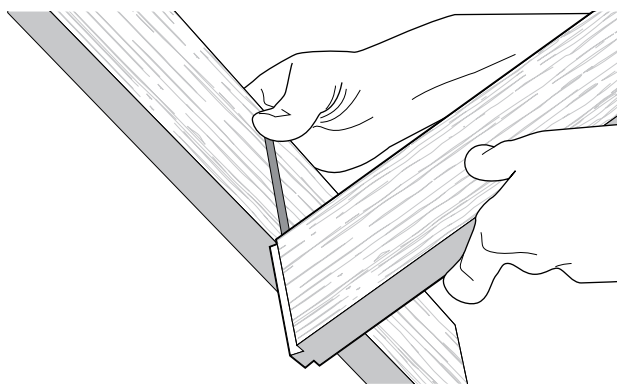
16-20 ⚠️ Rout one side of the test tail board. Make one light pass from right to left (climb routing). Make sure you control it firmly, because it is driven in this direction by the bit. Only the tip of the bit should be cutting on the first cut (see inset). This *back* or *climb* routing leaves a very clean shoulder in side grain.



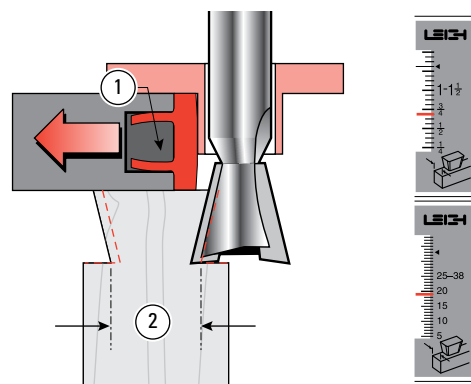
16-21 Finish left to right, with the guidebush touching the fence.



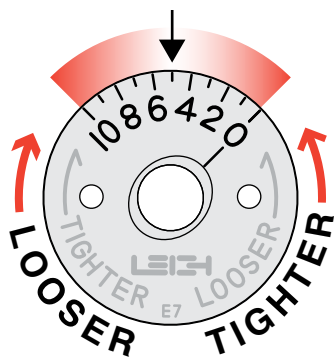
16-22 Turn the test tail board around in the jig and rout the other side as above.



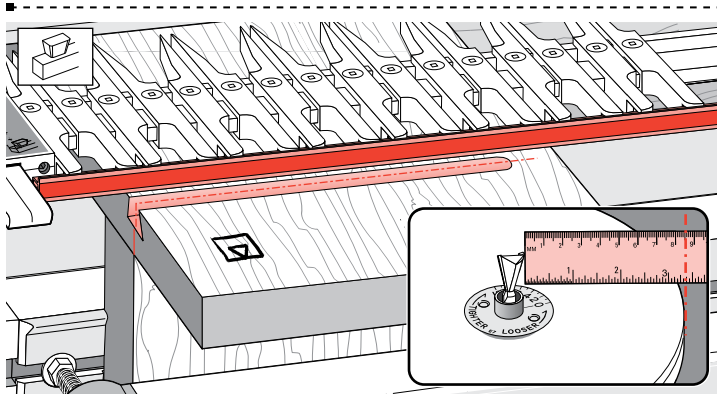
16-23 Test the joint for fit. The tail should be too big. If it is too small, adjust the finger assembly outward by at least half the difference and rout another test tail on the other end of this test board.



16-24 If the tail ② is too big, move the finger assembly ① toward the jig by half the amount the tail is too big. Rout the same test board again; keep adjusting and testing until a good fit. *Use trial and error each time. It doesn't take long, and you get a good fit. For fine fit adjustment with the e-Bush see 16-25.*

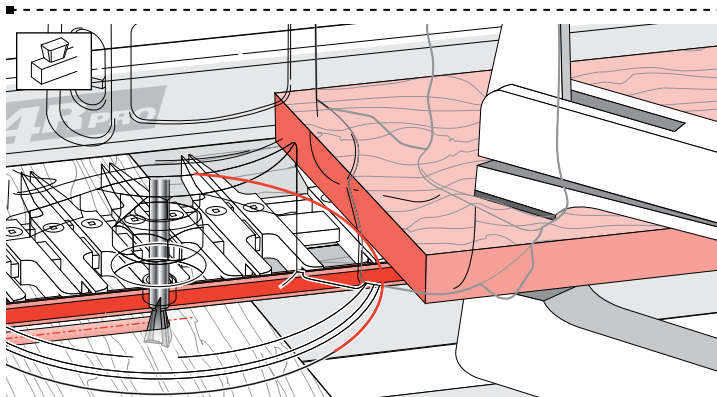


16-25 Note: the e7-Bush fit adjustment for sliding dovetails works reverse to normal. Fit adjustments are made by adjusting the tail size only, not the socket. The e7-Bush is turned down to a lower number for a tighter fit, and up to a higher number for a looser fit. Each increment changes the glue line fit by 0.001" [0,025mm] When the fit is satisfactory, rout one end of a project tail board and test again. If the fit is good, rout all tail board ends.

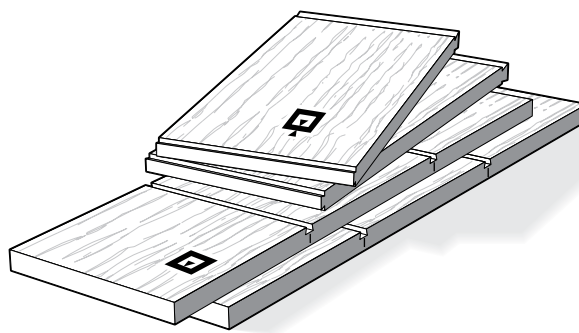


16-27 Stopped Sliding Dovetails

If a stopped sliding dovetail is called for, measure from the outside tip of the dovetail bit to the edge of the router base.

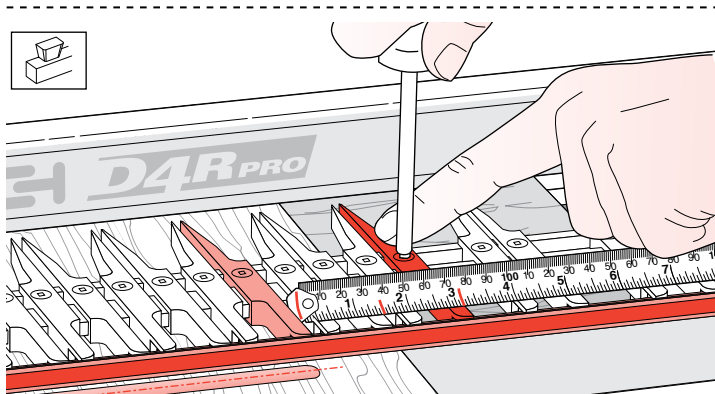


16-29 ...or lightly clamp (with a soft-jawed clamp) a short board to the finger assembly to act as a router stop.

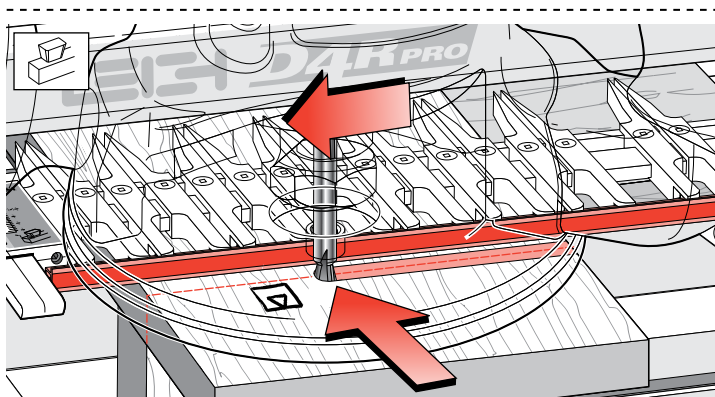


16-26 When the fit is satisfactory, rout one end of a project tail board and test again. If the fit is good, rout all the other ends.

Note: Variations in board thickness, guidebush diameter, bit depth, angle, diameter and concentricity, make it impractical to record sliding tail size settings.



16-28 Measure the same distance from where you want the slot stopped to a position on the finger assembly. Move a guidefinger to that point and mark the guidefinger with a felt pen as a visual router stop mark...



16-30 ⚠ Dovetail slots preferably are routed from left to right because the bit's clockwise rotation pulls the guidebush against the fence. However; as when routing close to both ends of a board, it may be necessary to rout slots from right to left. **Bit rotation** will tend to pull the router away from the fence. Feed slower and maintain constant guidebush pressure against the fence. ■



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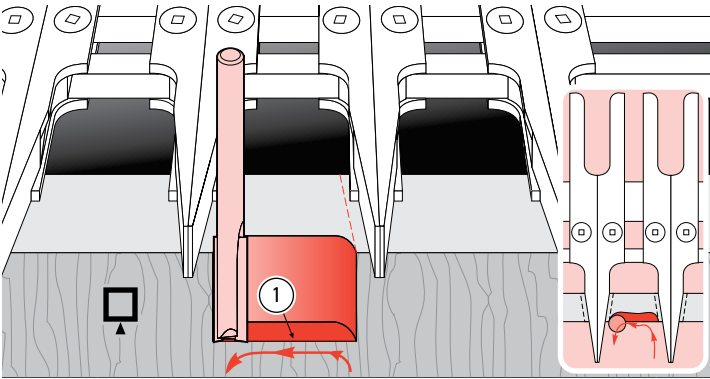


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D4R Pro - CHAPTER 17

Hints and Tips

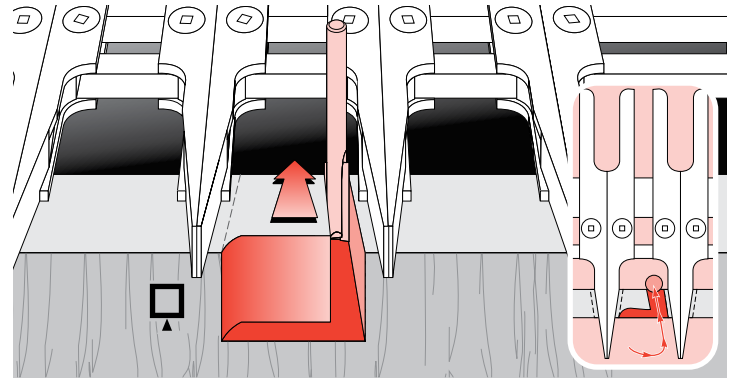
The following pages contain valuable tips that will help you get the most from your new D4R Pro Dovetail jig. Our website contains additional information and technical bulletins to further expand your jig's capabilities. Visit Leightools.com and click on the "Support" tab



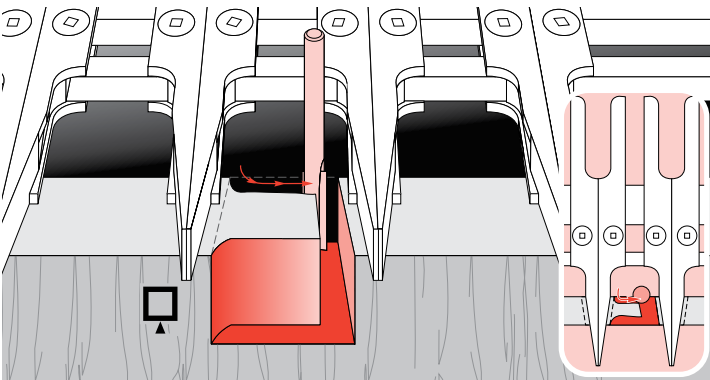
17-1 Through Dovetail Pins With the straight bit, carefully climb-rout from right to left. Make sure you control the router firmly when climb routing.

Climb routing produces a nice clean shoulder at ①.

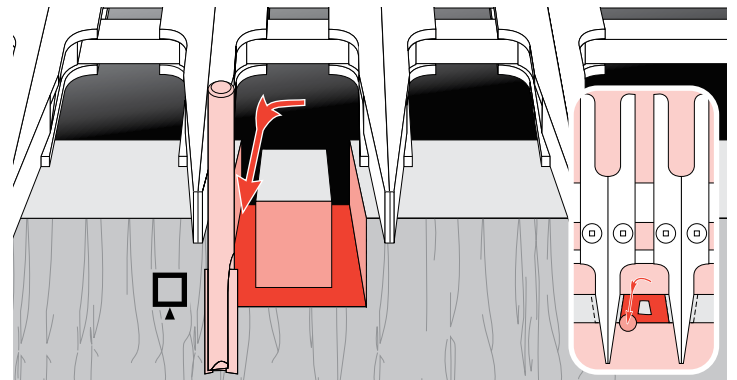
Note: For clarity, the guidebush is not shown in this sequence.



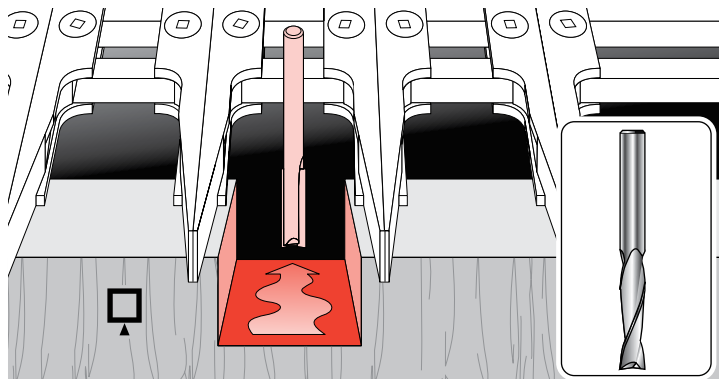
17-2  Rout through on the right side.



17-3 Climb rout from left to right from the rear of the cut. Take care to control router.

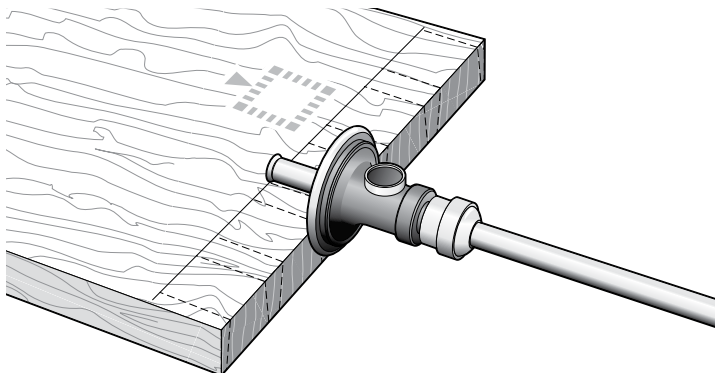


17-4  Rout back through towards you on the left side.



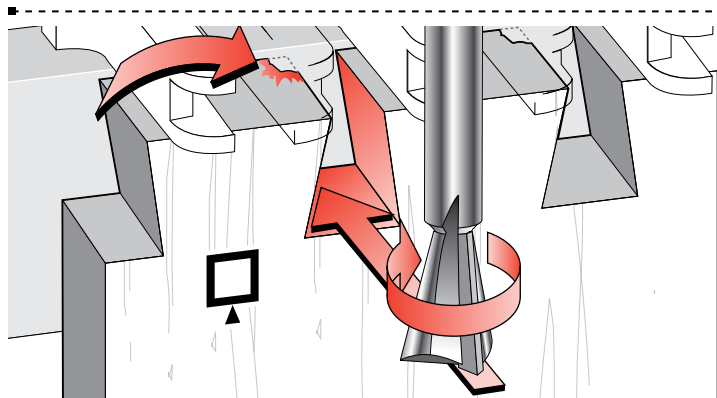
17-5 Rout away the rest of the waste.

Note: Spiral up-cut straight bits (inset) generally rout more smoothly than the two-flute carbide-tipped bits. Leigh recommends solid carbide bits.

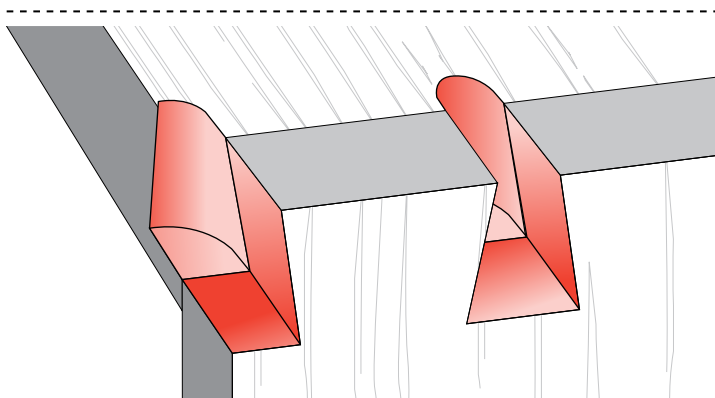


17-6 Through Dovetail Pins Tearout

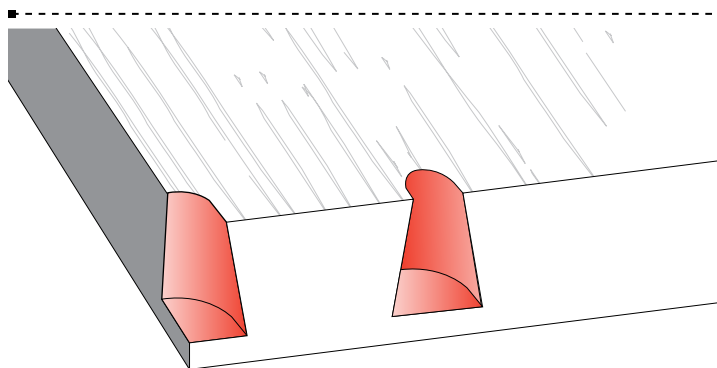
To prevent tearout at the back bottom part of a straight cut, scribe a line with your marking gauge across the back of the pin board at exactly the depth of cut.



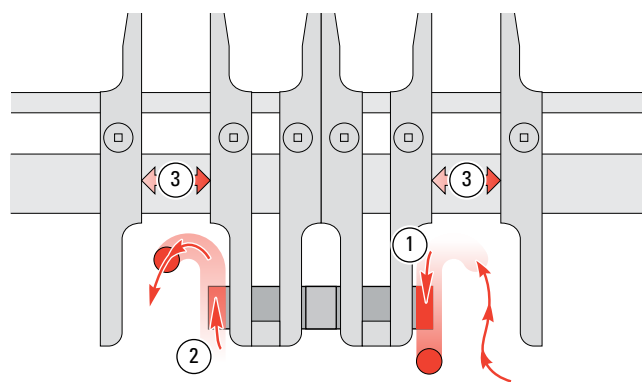
17-7 Dovetail Tails Tearout With the dovetail bit, most tearout occurs at the top left exit of the cut.



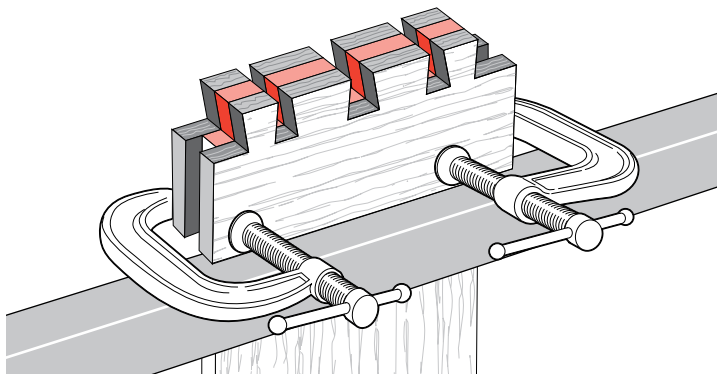
17-8 To help prevent this, back up the cut with the end-grain of a horizontal board pushed against the back of the workpiece and held in the rear clamp. This board replaces the spacer board.



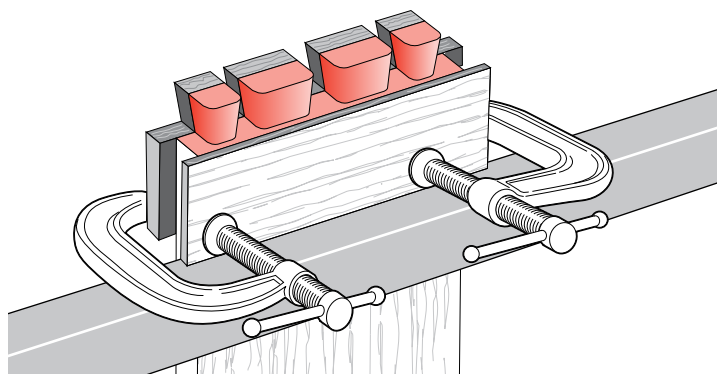
17-9 This same scrap piece can remain in place for successive cuts.



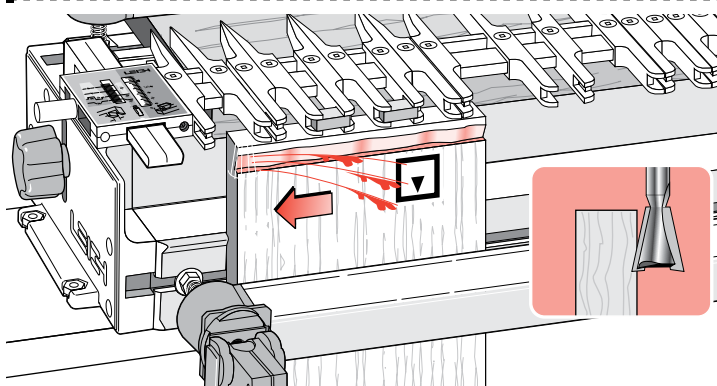
17-10 Always rout the right hand half pin socket starting from behind the board and moving the router outwards ①, and rout the left hand half pin socket from the outer face, moving the router inwards ②. Position the non-active guide fingers both sides so that they do not impede this process ③.



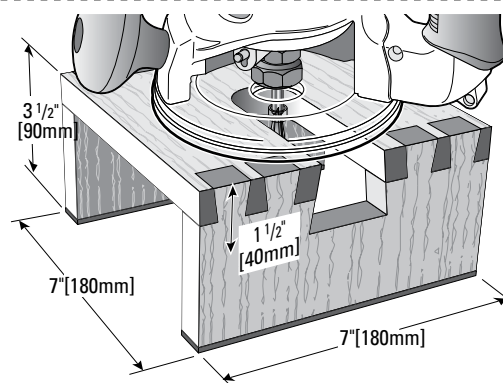
17-11 For particularly vulnerable pieces or that last piece of exotic wood, the best solution is to clamp horizontal scrap pieces to front and back of the work piece. **Make sure the clamps are below the bit depth.** **⚠️ PLYWOOD** material is **not** suitable for routing; laminates are very prone to tearout. Figures 17-10 or 17-11 are essential for plywood but do not guarantee success.



17-12 A single scrap piece can be C-clamped on the back of half-blind tails, *but make sure you protect the workpiece from the clamp pads.* Note: There is no 100% solution to tearout. It's not the jig's fault, just something that happens when machining, sawing and even chiseling wood. Important pieces fall off from where you least want them to.

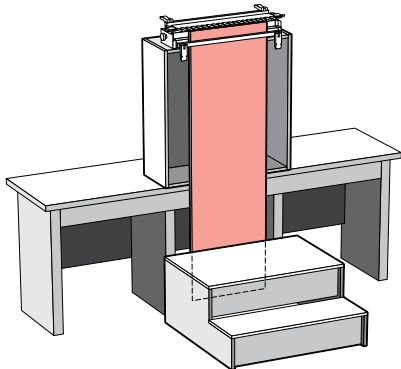


17-13 **⚠️** On face cuts, whether using a straight bit or a dove-tail bit, climb routing or back routing will leave a clean edge; **but great caution must be exercised in controlling the router's movement from right to left, as the bit rotation pulls the router in that direction anyway**

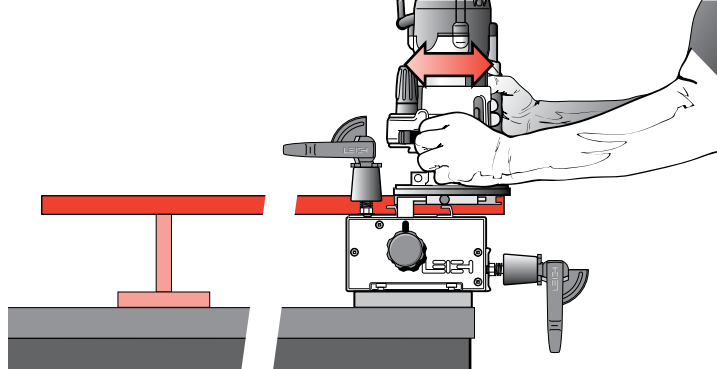


17-14 General Hints

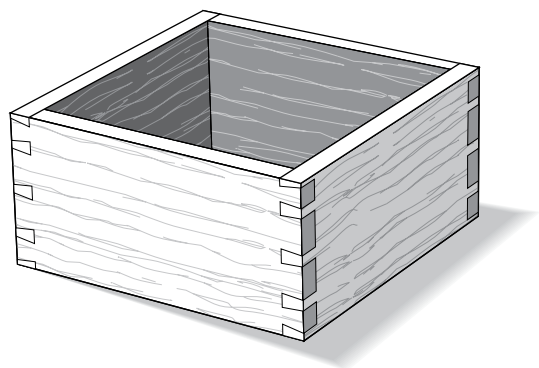
Router Stand: Make up a small router stand as illustrated, to mount the router securely on the bench when not in use.



17-15 For routing long vertical boards it may be necessary to build a jig stand to mount securely on your bench. Make the stand and bench height combination sufficient to accept the board length you have in mind. *The jig stand should be bolted securely to the bench.* Make up a stable platform to stand on as in the illustration. **Do not use a set of steps. Steps are not stable enough.**

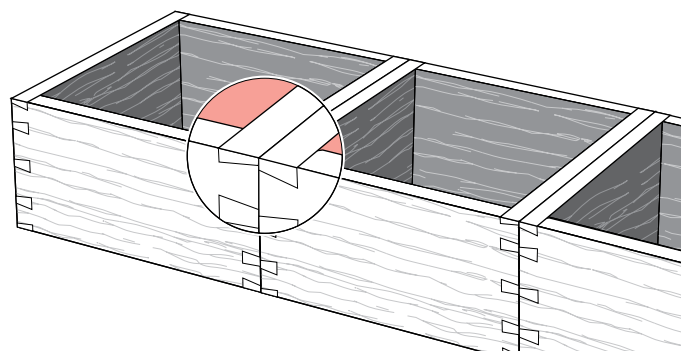


17-16 When placing long horizontal boards in the rear clamp, make sure the rear end of the board is supported to prevent unnecessary racking of the jig.

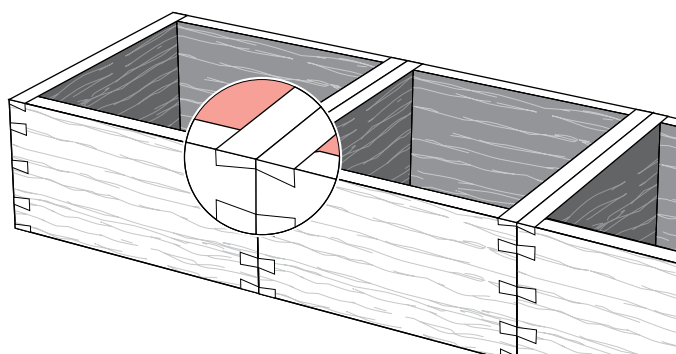


17-17 More On Symmetry

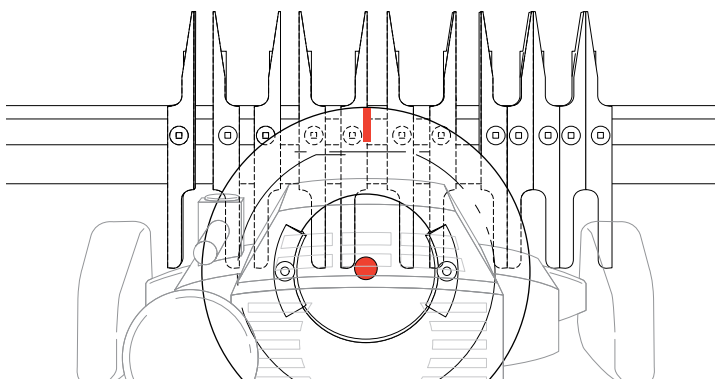
It doesn't matter if symmetrical-looking joints on a single box do not precisely mirror the adjacent corners. No one will ever know the difference. These joints look perfectly symmetrical on their own, but...



17-18 If a number of these boxes end up side-by-side, e.g. spice caddys on a kitchen shelf, the slight misalignments of the joints could be unattractive. So when making boxes or through dovetail drawers that will be lined up beside each other with the joints showing...

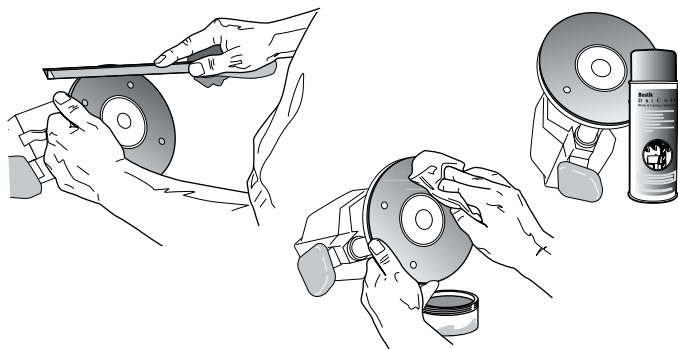


17-19 Use the asymmetrical *mirror image* aligning techniques 14-4 to 14-11 for perfectly aligned *neighbour* joints.



17-20 Using The Router Mark the router base top edge at the 12 o'clock position with a felt marker pen. Without wood or bits, try some **dry runs** in each jig mode. This will soon get you used to positioning the guidebush against the correct guide surface without looking under the router.

⚠ **Do not rout at face level.**

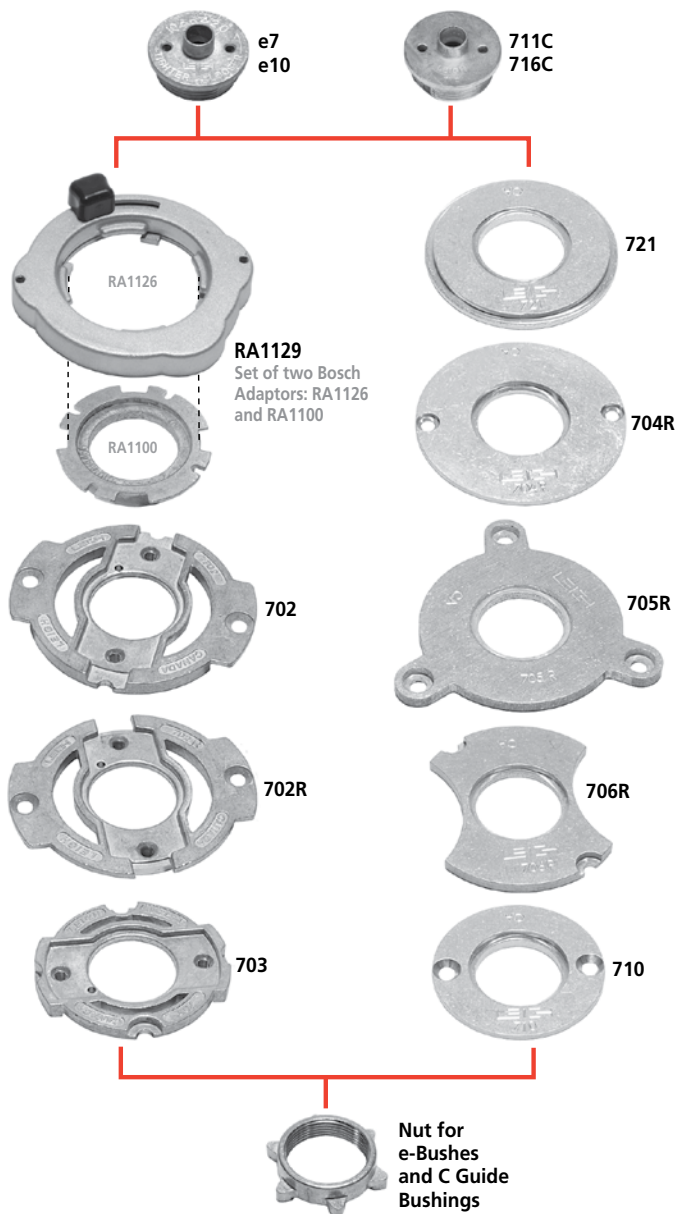


17-21 Some router bases have sharp edges on the outside and inside corners. A slight chamfer of the edges with a fine file or sandpaper block will ease router movement on the jig. An occasional light spray of "Top Cote®" application of soft wax to the router base makes for smooth, easy router movement on the jig. ■

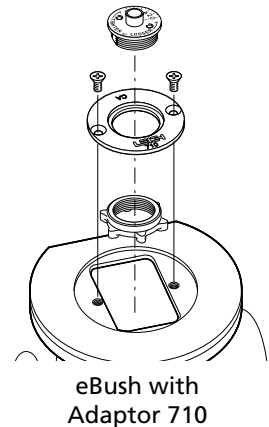
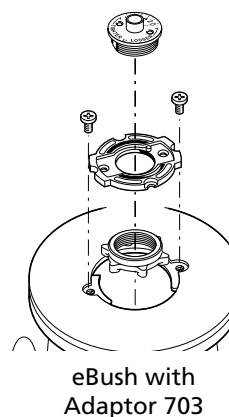
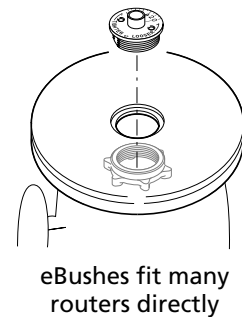
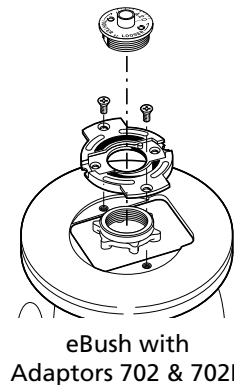
Attaching the Leigh e-Bush to the Router

The correct guidebush is the vital link between the router and your Leigh Jig. It precisely steers the router. Where possible, always use the Leigh system to **ensure correct bush length and precise diameter for accurate results**. Leigh offers the adaptors below to fit guidebushes to over one hundred router models new and old, including Porter Cable, Black & Decker, and DeWalt. Many other makes like Bosch, Fein, Festool, Milwaukee etc., include or offer base adaptors. See a list of routers in the Guide Bushing and Adaptor Selection Chart on the next page.

Leigh Guide Bushing and Adaptor System



eBush Mounting Variations



Guide Bushing and Adaptor Selection

Leigh dovetail jigs require a router fitted with a guide bushing. An adaptor may be required to fit the bushing to the router. VisitLeightools.com for a complete list of routers.

DIRECTIONS

- A.** Locate name of router maker in Column 1.
- B.** Locate router model in Column 2. If your router is not listed visit leightools.com for a complete, up-to-date list of routers.
- C.** Locate adaptor required for your router in Column 3.
- Order Leigh adaptors (part no's in red) in Column 3 from Leigh.
 - Order Bosch adaptors RA1100 and RA1126 in Column 3 from Leigh or your Bosch dealer.
 - Order all other adaptors in Column 3 from the router manufacturer's dealer.

Note: Adaptor mounting screws are included with router.

- MAFELL – Rework adaptor slightly.

- D.** Guide bushings in Columns 4 and 5 fit all adaptors listed and may be ordered if required. Note:

◆ The e7 elliptical guide bushing (7/16" [11,1mm]) is supplied with all Leigh D-series dovetail jigs for routing dovetails and box joints. Order only if you require a replacement. The 711C/711TP* guide bushing (7/16" [11,1mm]) can also be used, but only for routing dovetails.

▲ An optional 5/8" [15,9mm] 716C or 716TP* guide bushing is used with 1/2" [12,7mm] shank router bits on D4R Pro, D4R, D4, D3, D1258R, D1258, jigs. Order only if using 1/2" [12,7mm] shanks.

All 8mm shank bits work with the e7-Bush supplied with your Leigh jig, or with any 7/16" OD [11,1mm] guide bushing that has a min. barrel length of 1/4" [6,35mm]. No other guide bushing sizes can be used.

Note:

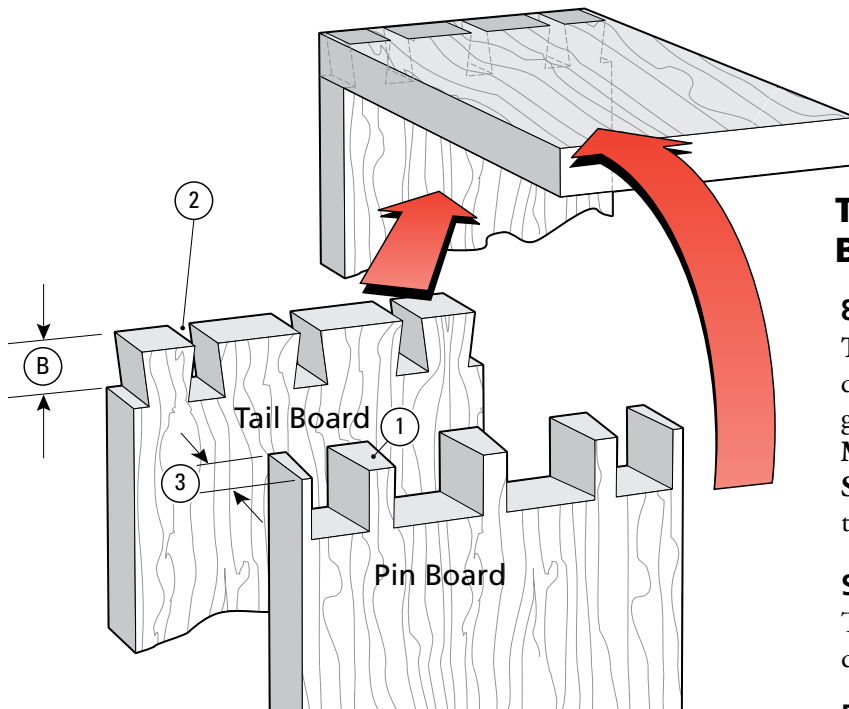
*The 711C has replaced the 711TP guide bushing. Both are 7/16" OD [11,1mm].

*The 716C has replaced the 716TP guide bushing. Both are 5/8" OD [15,9mm].

1 ROUTER MAKER	2 ROUTER MODEL	3 ROUTER ADAPTOR	4 7/16" OD BUSHING ◆	5 5/8" OD BUSHING ▲
AEG	OFE 710 in plunge base	Not Required	e7 or 711C	716C
	OFSE 2000	703	e7 or 711C	716C
	RT1350E	706R	e7 or 711C	716C
BLACK & DECKER	All Professional, HD1250, RP400K, 7614	Not Required	e7 or 711C	716C
	6200	720673-00	e7 or 711C	716C
	SR100, 7AEE, KW780 series, KW800, KW850	710	e7 or 711C	716C
BOSCH	90085, 90088, 90098, 90140, 90150, 90300, 90303, 90305, 91264	Aftermarket base plate required	e7 or 711C	716C
	1600, 1601, 1602, 1603, 1604, 1606, B1350	RA1110 required	e7 or 711C	716C
	North American ROUTERS PRODUCED AFTER mid-2010: 1613EVS, 1613AEVS, 1617, 1617EVS, 1618, 1618EVS, 1619EVS, MR23EVS, MRC23EVS, MRF23EVS, MRP23EVS	RA1100 & RA1126 required Sold only as Set RA1129 (Set includes RA1100 and RA1126)	e7 or 711C	716C
	North American ROUTERS PRODUCED BEFORE mid-2010 and others available worldwide that include the RA1126 adaptor: 1613(EVS)(AEVS), 1614(EVS), 1617EVS, 1618EVS, 1619EVS, B1450, GOF900(CE)(ACE), GOF1200, GOF1250(CE)(LCE), GOF1300(CE)(ACE), GOF1600CE, GOF2000CE, GMF1400, GMF1600CE, POF800ACE, POF1100AE, POF1200AE, POF1400ACE	RA1100 required Sold only as Set RA1129 (Set includes RA1100 and RA1126)	e7 or 711C	716C
	1611, 1611EVS, 1615, 1615EVS, B1550, GOF1600, GOF1700ACE	702	e7 or 711C	716C
CRAFTSMAN (SEARS)	All non-plunge models	Aftermarket base plate required	e7 or 711C	716C
	135275070 Plunge	See Skill 1823 or 1835		
	Other plunge models	702	e7 or 711C	716C
	MD11 Plunge & Fixed Base. MD9.5 Fixed Base	Not Required	e7 or 711C	716C
DEWALT	DW610, DW616, DW618	Not Required	e7 or 711C	716C
	DW613, DW615(UK)	710	e7 or 711C	716C
	DW614, DW615, DW621, DW624, DW625, DW626	N. America Only, Supplied w/router	e7 or 711C	716C
	DW621K, DW622 and DW626 outside N. America	706R	e7 or 711C	716C
	DW625 Type 1,2,3,5 outside N. America	702	e7 or 711C	716C
	DW624 & DW625 Type 4 outside N.America, DW625EK	702R	e7 or 711C	716C
ELU	OF15, OF15E, OF97, OF97E	706R	e7 or 711C	716C
	MOF68, MOF69, MOF96, MOF96E	710	e7 or 711C	716C
	MOF131, MOF177 Type 1, 2, & 3	702	e7 or 711C	716C
	MOF177 Type 4, MOF177EK	702R	e7 or 711C	716C
	2720, 2721, 3328	Not Required	e7 or 711C	716C
	3303, 3304	E09600 or 761 270-00	e7 or 711C	716C
	3337, 3338, 3339	702	e7 or 711C	716C
FEIN	RT1800	Supplied w/router	e7 or 711C	716C
FESTOOL	OF1E, OF2E, OF650, OF900E, OF1000, OF1010E	704R	e7 or 711C	716C
	OF2000, OF2000E	705R	e7 or 711C	716C
	OF1400 and OF2200 North America Only	Supplied w/router	e7 or 711C	716C
	OF1400 Outside North America	493566	e7 or 711C	716C
	OF2200 Outside North America	494627 O-Ring may be required to keep bushing centered	e7 or 711C	716C
FREUD	FT1700(2), FT2000, FT2200, FT3000	721	e7 or 711C	716C
	FT1700VCEK	702R	e7 or 711C	716C
HITACHI	TR8, TR12, FM8, M8, M12 Series	325211 OR 703	e7 or 711C	716C
	M12VC, KM12SC, KM12VC	Not Required	e7 or 711C	716C
	M12SA2, M12V2	325224	e7 or 711C	716C
MAFELL	LO65E	702	e7 or 711C	716C
MAKITA	M363, MRP090, RP1800(F), RP1801(F), RP2300(FC), RP2301(FC), 3612C Europe Qk Fit Base	721	e7 or 711C	716C
	3600, 3606, 3608, 3612, 3612B, 3612BR, 3612C N. America, 3620, 3621, RP0900, RP900K	703	e7 or 711C	716C
	3601B	321 493-1	e7 or 711C	716C
	RP0910, RP1110C	706R	e7 or 711C	716C
	RF1100, RF1101, RD1100, RD1101, RP1101	Not Required	e7 or 711C	716C
MASTERCRAFT	Please contact Leigh for assistance			
METABO	OF1612, OFE1812 (for all others, please contact Leigh for assistance)	704R	e7 or 711C	716C
MILWAUKEE	5615, 5616, 5619	49-54-1040 (replacement base)	e7 or 711C	716C
	5625	49-54-1026 (replacement base)	e7 or 711C	716C
	5670	Not Required	e7 or 711C	716C
PERLES	OF808 Series, OFE6990	710	e7 or 711C	716C
PORTER-CABLE (ROCKWELL)	Most	Not Required or Supplied w/router	e7 or 711C	716C
	8902	Porter-Cable Sub-Base 42186	e7 or 711C	716C
RIDGID	R2930 (for all others, please contact Leigh for assistance)	704R	e7 or 711C	716C
RYOBI	R30, R50, R150, R151, RE155, R500, R501, R502	703	e7 or 711C	716C
	R600, R601, RE600, RE601	702	e7 or 711C	716C
	R160, R161, R162, R163K, R165, R170, R175, RE175, R180, R180PL, R181, R185, ERT1150	706R	e7 or 711C	716C
SKIL	1823 or 1835	91803	e7 or 711C	716C
	SK1810, 1815, 1820, 1825	RAS140	e7 or 711C	716C
	All others	Aftermarket base plate required	e7 or 711C	716C
TREND	T3, T4, T5, T9, T10, T11 – UniBase required	710	e7 or 711C	716C
TRITON	TRC001	TGA006 or 704R	e7 or 711C	716C
	JOFO01, MOFO01, TRA001	Accessory Kit (includes adaptor) TGA001 or TGA250	e7 or 711C	716C
WEGOMA	OF850 Series	710	e7 or 711C	716C

Bit Selection

Optional router bits for variably spaced through and half-blind dovetails.



Through Dovetail Bit Selection

8° Dovetail Bit for Tails

The pins ① must fit into the pin sockets ②. Therefore the dovetail bit's depth of cut ③ must be equal to or a little greater than the pin board thickness ③.

Measure the pin board thickness ③

Select the dovetail bit with the correct depth of cut ③ from the following pages (bits must be 8° for through dovetails).

Straight Bit for Pins

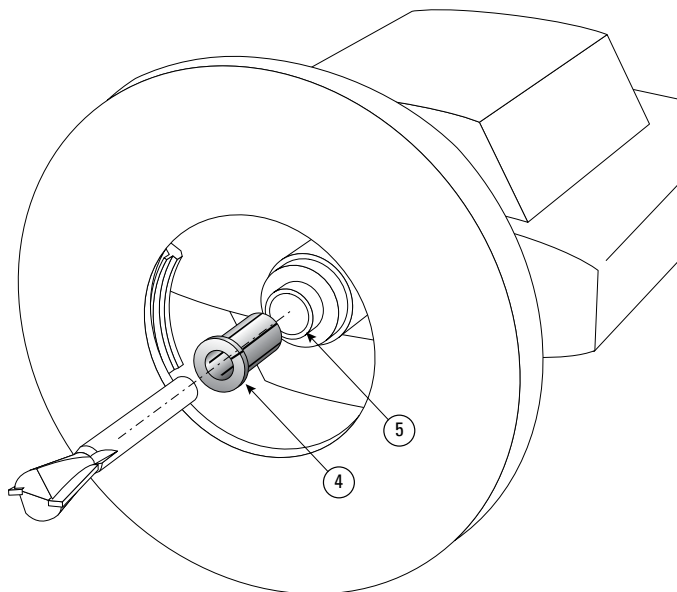
The matching straight bit is listed on the charts with the dovetail bit.

Dovetail Bit Angle

All through dovetail bits must be 8°. This angle matches the D4R Pro guide finger pin angle. If you try to use a different angle of dovetail bit, there will be a mismatch between the pins routed at 8°.

Guidebush

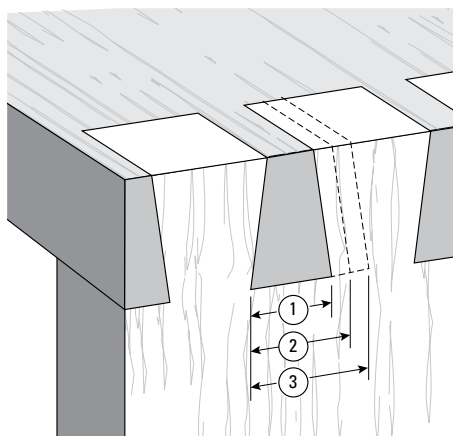
All 8mm shank through dovetail bits listed in this appendix work with the e7-Bush (7/16" OD [11,1mm]) supplied with your Leigh jig, or any 7/16" OD [11,1mm] guidebush. The optional Leigh 716C guidebush or standard 3/8" OD [15,9mm] guidebush is used with 1/2" [12,7mm] shank bits. No other guidebush sizes can be used for through dovetails. *See page 70.*



Shank Selection

The Leigh D4R Pro comes with one through dovetail bit and one straight bit, with 8mm shanks, plus a 1/2" [12,7mm] to 8mm collet reducer. The reducer ④ simply slides into the 1/2" [12,7mm] collet ⑤ of your router and the 8mm shank bit is inserted into the collet reducer. The collet is tightened as normal. The collet reducer is not required with 1/2" [12,7mm] shank bits.

Note: ④ is a collet reducer, not a collet ⑤. The reducer does not replace the collet, it slides directly into your collet.



Note that some of the dovetail bits' depths of cut overlap. For example:

No.70-8 bit ② : 1/4"–1/2" [6 - 13mm]

No.75-8 bit ② : 3/8"–5/8" [9,5 - 16mm]

No.80-8 bit ② : 1/2"–13/16" [12 - 20mm]

This means all three bits are capable of routing boards 1/2" [12,7mm] thick using one of the following combinations: No.80-8 and 140-8, No.75-8 and 140-8, or No.70-8 and 140-8.

The three bit combinations will produce slightly different-looking joints because each dovetail bit produces a different size diameter of pin:

No.70-8 ① : 3/8"

No.75-8 ② : 7/16"

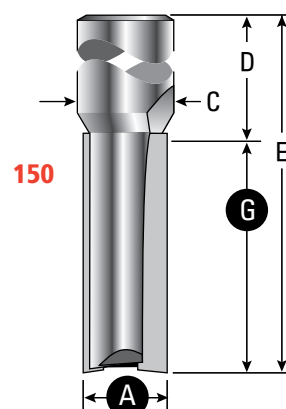
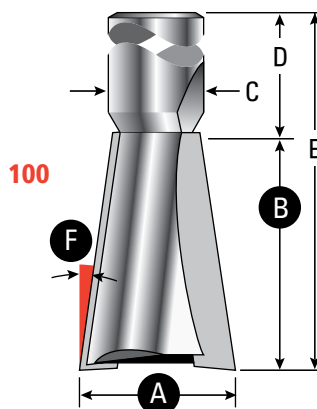
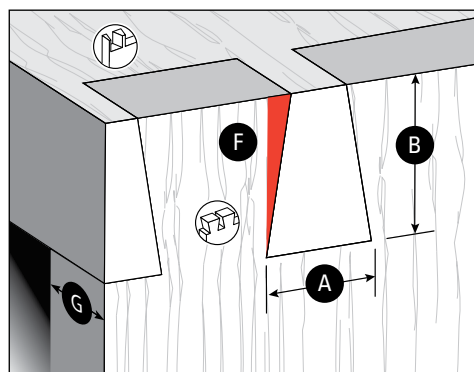
No.80-8 ③ : 1/2"



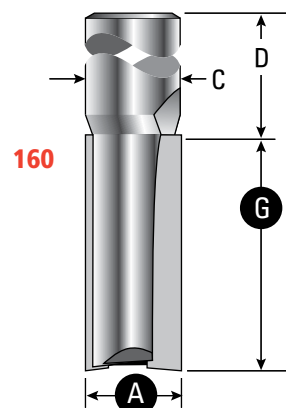
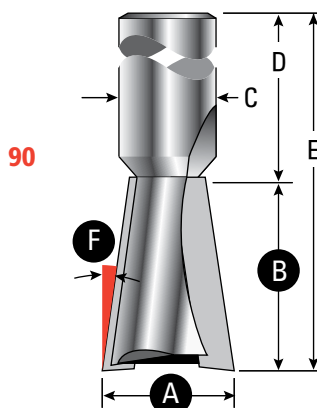
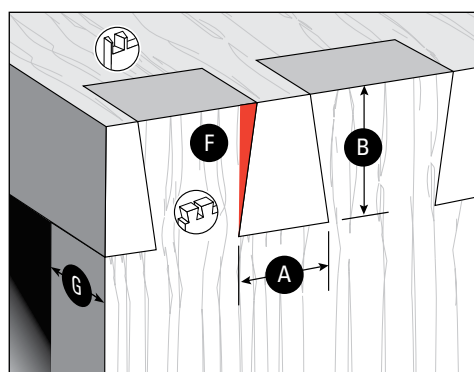
Do not attempt to rout dovetails at less than the minimum depth of cut specified, as the bit can hit the guide fingers or guide bushing.

Leigh Through Dovetail Bits

Note: Bit and joint drawings are about actual size.

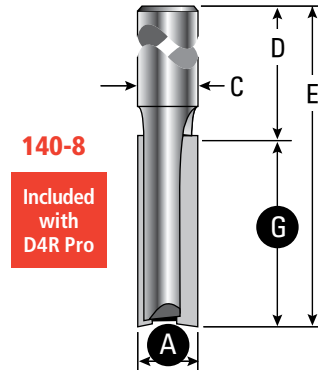
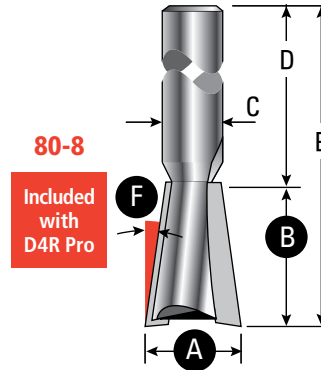
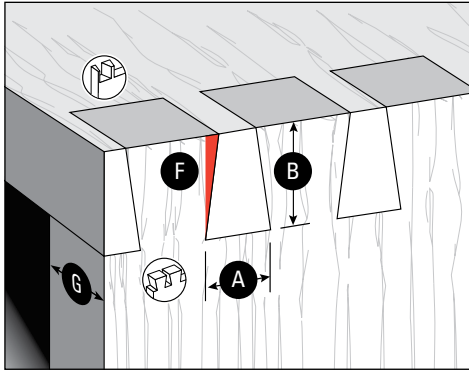


BITS	A Overall Diameter	B / G Cutting Depth Range	C Shank Diameter	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 100	13/16" [20,6]	B 1" to 1-1/4"* [26,0-32,0*]	1/2" [12,7]	1-3/4" [45,0]	3" [76,0]	8°	716C or 5/8" [15,9]
No. 150	7/16" [11,1]	G 1/8" to 1-1/4"* [3,0-32,0*]	1/2" [12,7]	1-3/4" [45,0]	3" [76,0]	–	716C or 5/8" [15,9]

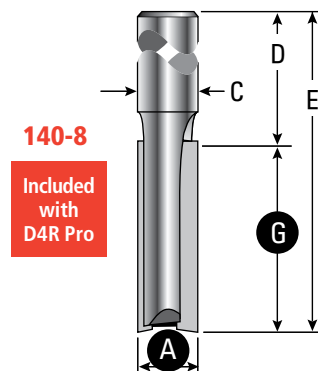
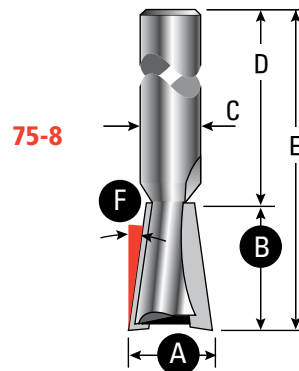
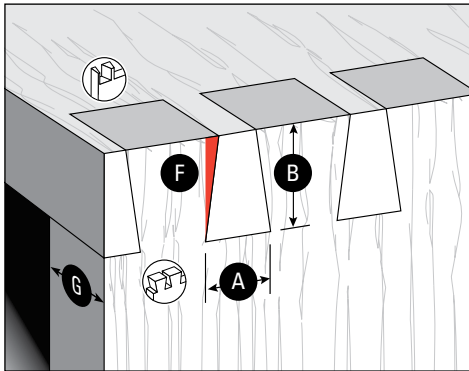


Bits	A Overall Diameter	B / G Cutting Depth Range	C Shank Diameter	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 90	11/16" [17,5]	B 5/8" to 1" [16,0-26,0]	1/2" [12,7]	1-3/4" [45,0]	2-3/4" [70,0]	8°	716C or 5/8" [15,9]
No. 160	1/2" [12,7]	G 1/8" to 1-1/4"* [3,0-32,0*]	1/2" [12,7]	1-3/4" [45,0]	3" [76,0]	–	716C or 5/8" [15,9]

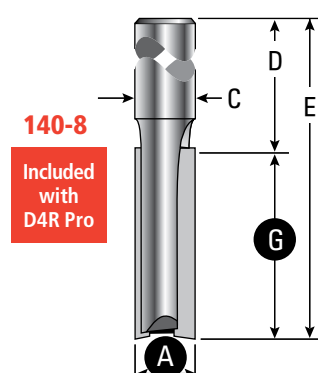
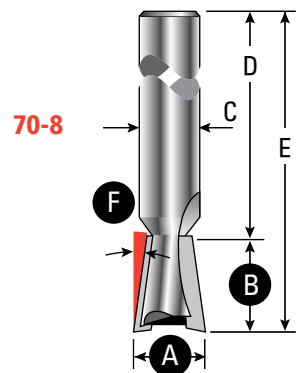
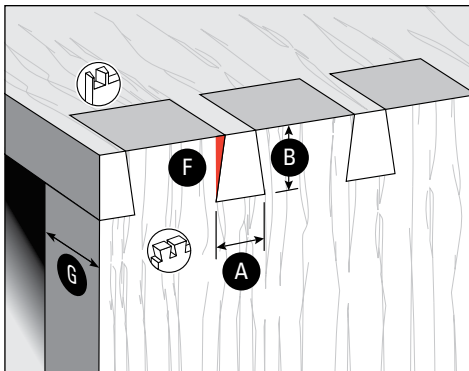
Note: Bit and joint drawings are about actual size.



BITS	A Overall Diameter	B / G Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 80-8*	1/2" [12,7]	B 1/2" to 13/16" [13,0-21,0]	8mm	1-3/4" [45,0]	2-9/16" [65,0]	8°	e7 or 7/16" [11,1]
No. 140-8*	5/16" [7,9]	G 1/8" to 1" [3,0-26,0]	8mm	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16" [11,1]



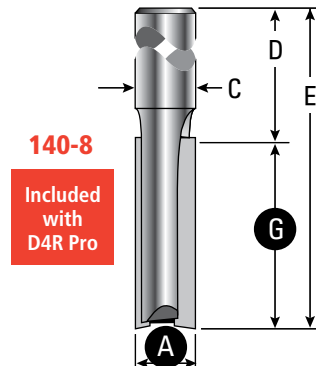
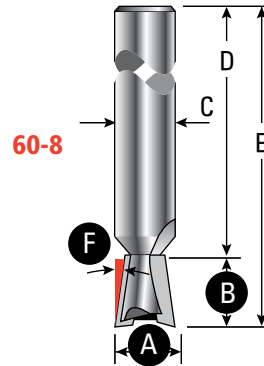
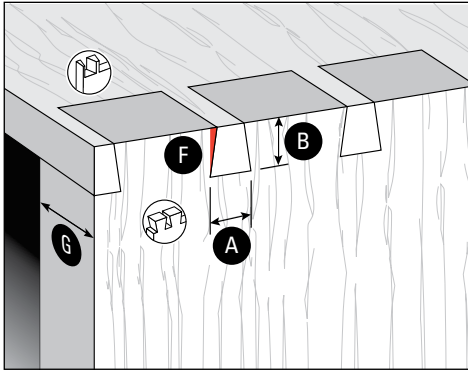
BITS	A Overall Diameter	B / G Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 75-8	7/16" [11,1]	B 3/8" to 5/8" [9,5-16,0]	8mm	1-3/4" [45,0]	2-3/8" [60,0]	8°	e7 or 7/16" [11,1]
No. 140-8*	5/16" [7,9]	G 1/8" to 1" [3,0-26,0]	8mm	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16" [11,1]



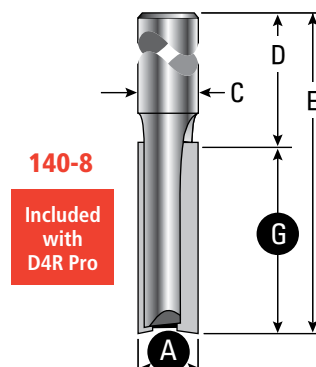
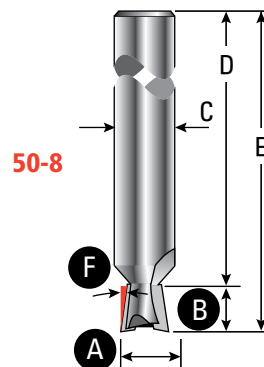
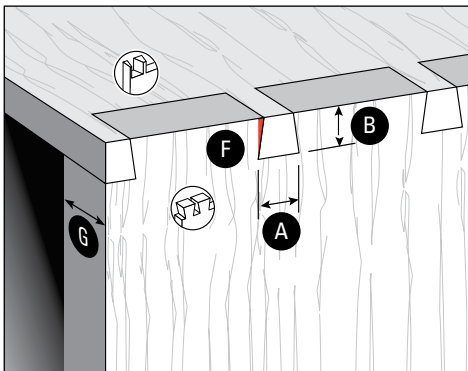
BITS	A Overall Diameter	B / G Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 70-8	3/8" [9,5]	B 1/4" to 1/2" [6,0-13,0]	8mm	1-3/4" [45,0]	2-1/4" [57,0]	8°	e7 or 7/16" [11,1]
No. 140-8*	5/16" [7,9]	G 1/8" to 1" [3,0-26,0]	8mm	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16" [11,1]

Numbers in brackets are millimeters

* Bits 80-8, 120-8, and 140-8 come standard with the Leigh D4R Pro



Bits	A Overall Diameter	B / G Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 60-8	5/16" [7,9]	B 1/8" to 3/8" [3,0-9,0]	8mm	1-3/4" [45,0]	2-1/8" [54,0]	8°	e7 or 7/16"[11,1]
No. 140-8*	5/16" [7,9]	G 1/8" to 1" [3,0-26,0]	8mm	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16"[11,1]



Bits	A Overall Diameter	B / G Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 50-8	1/4" [6,35]	B 1/8" to 1/4" [3,0-7,0]	8mm	1-3/4" [45,0]	2" [50,0]	8°	e7 or 7/16"[11,1]
No. 140-8*	5/16" [7,9]	G 1/8" to 1" [3,0-26,0]	8mm	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16"[11,1]

Half-Blind Dovetail Bit Selection

Bits:

The same dovetail bit routs both parts of a half-blind dovetail.

Flush Drawers:

The dovetail bit's working depth of cut (B) must be less than the pin board thickness (1) for flush drawers by at least $\frac{1}{8}$ " [2mm].

Rabbeted Drawers:

The dovetail bit's working depth of cut (B) must be about $\frac{1}{16}$ " [1mm] less than the rabbet depth (2) for rabbeted drawer fronts.

Drawer Sides (Tail Board):

Minimum thickness is $\frac{1}{4}$ " [6mm]. Drawer side thickness (3) does not affect bit selection.

Note: (B) is the nominal working depth for half-blind dovetails, not the maximum depth. (B) must not be varied, except for minor adjustments for joint fit. See page 37.

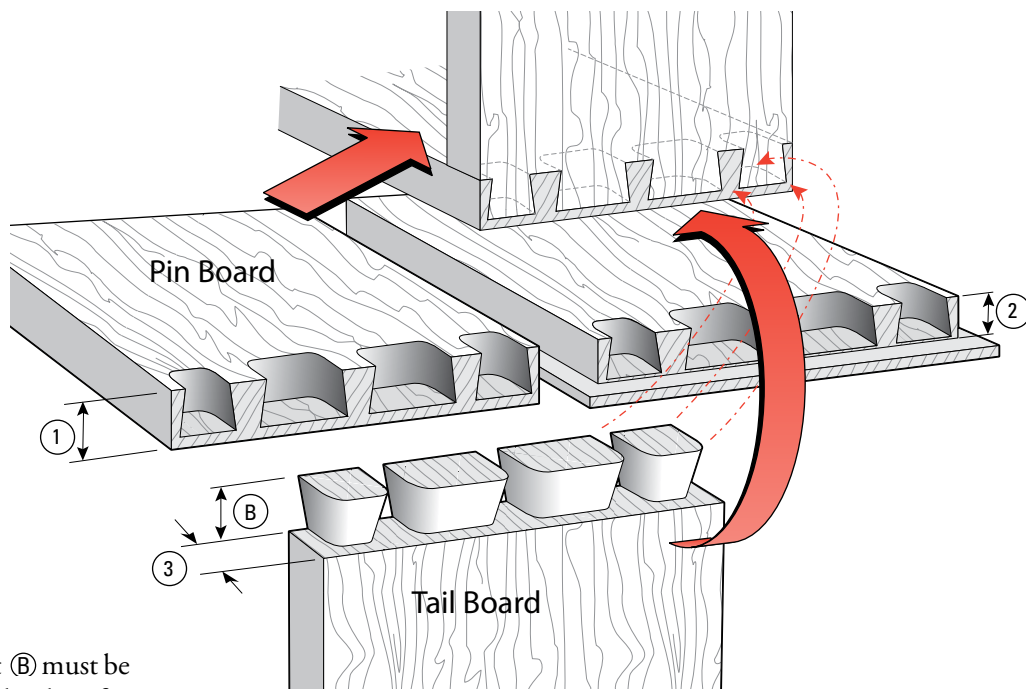
Selecting the Bit

Measure the drawer front thickness (minimum $\frac{1}{2}$ " [12mm]) (1) or rabbet depth (minimum $\frac{7}{16}$ " [11mm]) (2).

Select a bit with the appropriate depth of cut (B) from the following pages. *Can I use any dovetail bit?* No, all half-blind bits must be $\frac{1}{2}$ " [12,7mm] diameter. As the angle changes, so does the depth of cut. Using bits that are a different angle and diameter will result in joints that don't fit, and could damage the jig.

Guidebush

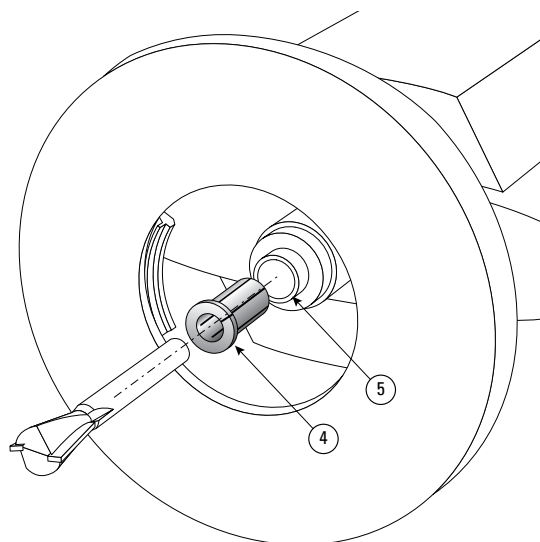
All 8mm shank half-blind dovetail bits listed in this appendix work with the e7-Bush ($\frac{7}{16}$ " OD [11,1mm]) supplied with your Leigh jig, or any $\frac{7}{16}$ " OD [11,1mm] guidebush. No other guidebush sizes can be used for half-blind dovetails. See page 70.



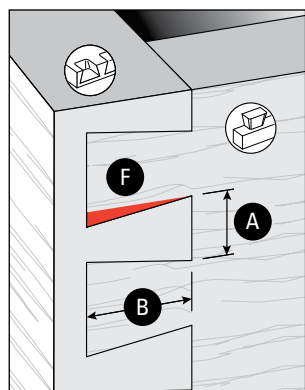
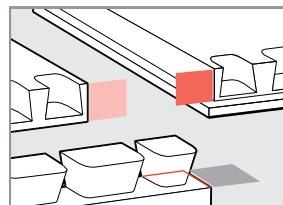
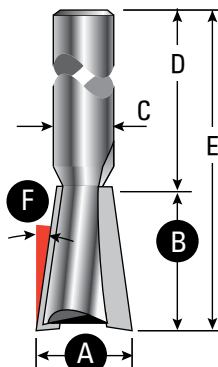
Shank Selection

The Leigh D4R Pro comes with two half-blind bits with 8mm shanks, plus a $\frac{1}{2}$ " [12,7mm] to 8mm collet reducer. The reducer (4) simply slides into the $\frac{1}{2}$ " [12,7mm] collet (5) of your router, and the 8mm shank bit is inserted into the collet reducer. The collet is tightened as normal. The collet reducer is not required with $\frac{1}{2}$ " [12,7mm] shank bits. For a $\frac{1}{2}$ " [12,7mm] collet you will require the included $\frac{1}{2}$ " [12,7mm] to 8mm collet reducer, No.172-8.

Note: (4) is a collet reducer, not a collet (5). The reducer does not replace the collet, it slides directly into your collet.



Leigh Half-Blind Dovetail Bits

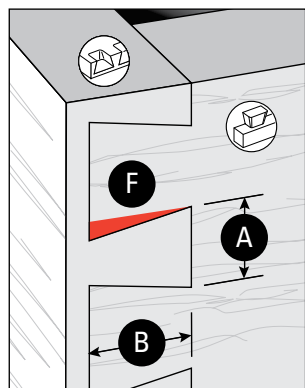
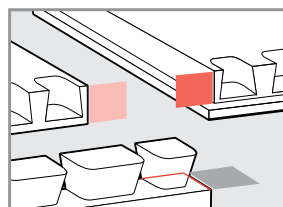
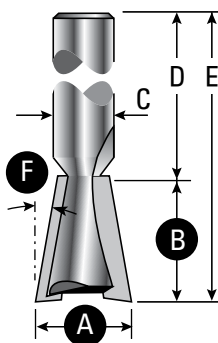
**80-8**Included
with
D4R Pro**Pin board**
Flush Drawer Front**Min Thickness**HB Variable: 7/8" [22mm]
HB Single Pass: 35/64" [14mm]**Pin board**
Rabbeted Drawer Front**Min Rabbet Depth**

13/16" [20,5mm]

Tail board
Drawer Side**Min Thickness**

1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 80-8*	1/2" [12,7]	~3/4" [19,0]	~27/64" [11,0]	8mm	1-3/4" [44,0]	2-9/16" [65,0]	8°	e7 or 7/16" [11,1]

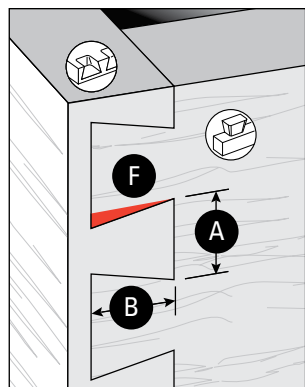
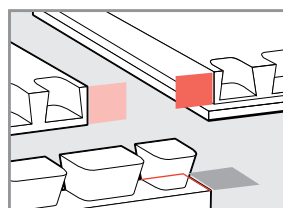
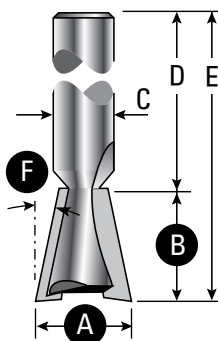
**101-8****Pin board**
Flush Drawer Front**Min Thickness**HB Variable: 3/4" [19mm]
HB Single Pass: 31/64" [12,3mm]**Pin board**
Rabbeted Drawer Front**Min Rabbet Depth**

11/16" [17,5mm]

Tail board
Drawer Side**Min Thickness**

1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 101-8	1/2" [12,7]	~5/8" [16,0]	~23/64" [9,0]	8mm	1-3/4" [44,0]	2-3/8" [60,0]	10°	e7 or 7/16" [11,1]

**112-8****Pin board**
Flush Drawer Front**Min Thickness**HB Variable: 5/8" [15,9mm]
HB Single Pass: 27/64" [10,7mm]**Pin board**
Rabbeted Drawer Front**Min Rabbet Depth**

9/16" [14,5mm]

Tail board
Drawer Side**Min Thickness**

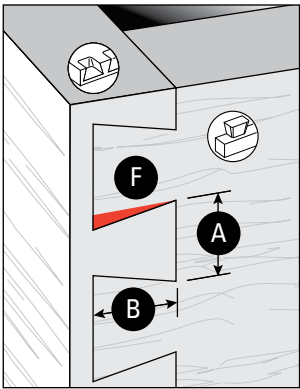
1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 112-8	1/2" [12,7]	~1/2" [13,0]	~19/64" [8,0]	8mm	1-3/4" [44,0]	2-21/64" [59,0]	12°	e7 or 7/16" [11,1]

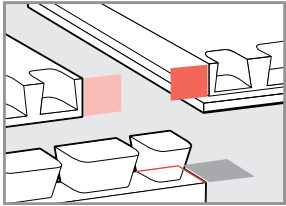
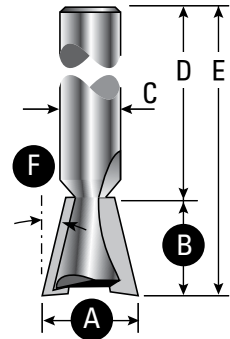
Numbers in brackets are millimeters

* Bits 80-8, 120-8, and 140-8 come standard with the Leigh D4R Pro

Note: Bit and joint drawings are about actual size.

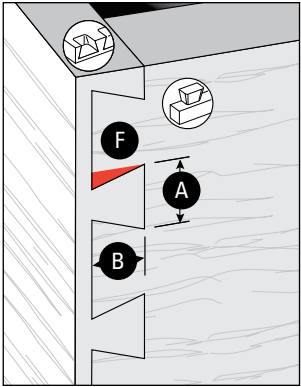


120-8
Included with D4R Pro

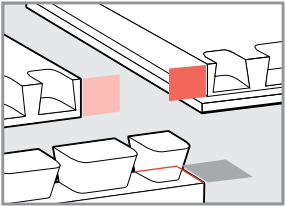
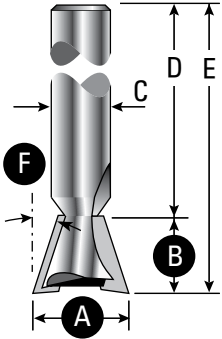


Pin board Flush Drawer Front	Pin board Rabbeted Drawer Front	Tail board Drawer Side
Min Thickness	Min Rabbet Depth	Min Thickness
HB Variable: 9/16" [14,5mm] HB Single Pass: 3/8" [10,3mm]	1/2" [12,7mm]	1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 120-8*	1/2" [12,7]	~7/16" [11,0]	~1/4" [7,0]	8mm	1-3/4" [44,0]	2-1/4" [57,0]	14°	e7 or 7/16" [11,1]



128-8



Pin board Flush Drawer Front	Pin board Rabbeted Drawer Front	Tail board Drawer Side
Min Thickness	Min Rabbet Depth	Min Thickness
HB Variable: 1/2" [12,7mm] HB Single Pass: 5/16" [8mm]	7/16" [11mm]	1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 128-8	1/2" [12,7]	~3/8" [9,0]	~3/16" [5,0]	8mm	1-3/4" [44,0]	2-1/8" [54,0]	18°	e7 or 7/16" [11,1]

Numbers in brackets are millimeters

* Bits 80-8, 120-8, and 140-8 come standard with the Leigh D4R Pro

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D4R Pro - Appendix III**Jig Parts**

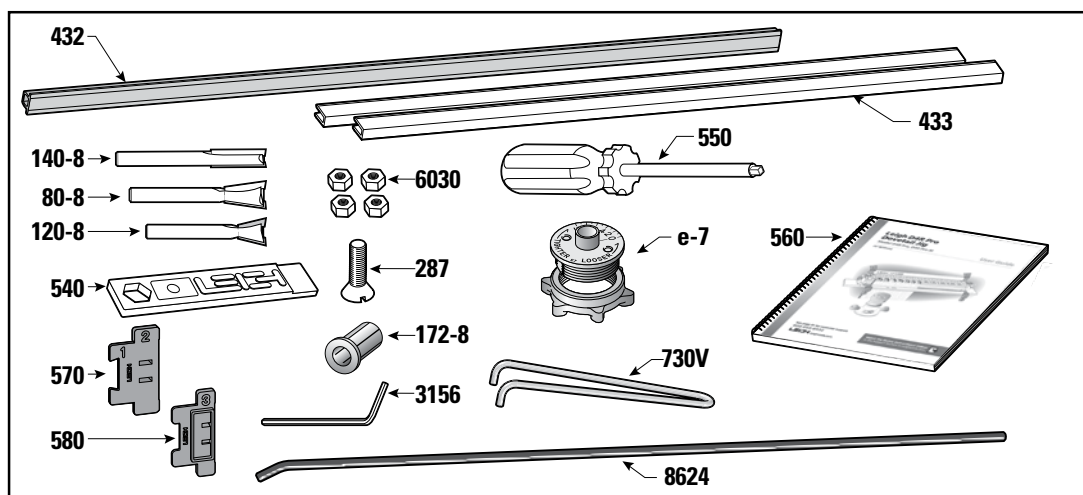
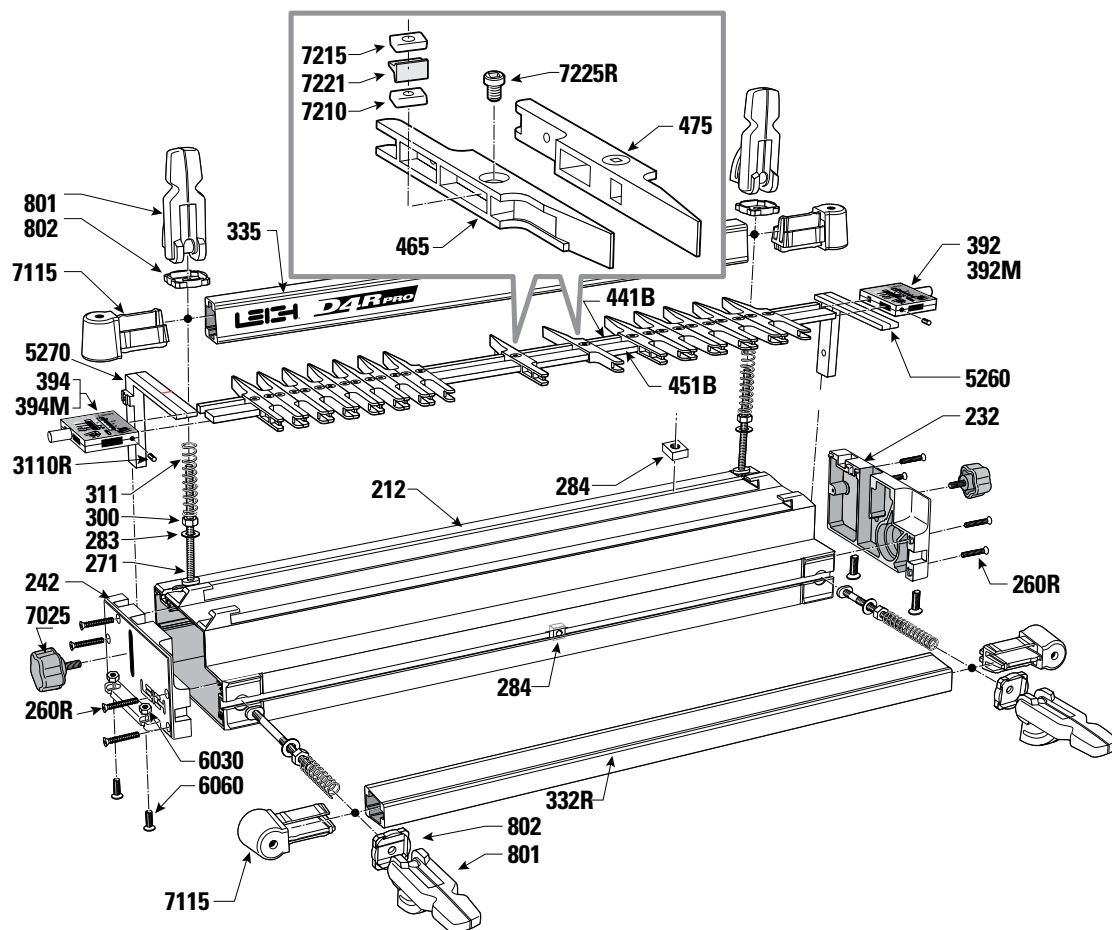
See parts list and drawing on the following pages.

Order parts directly from Leigh by calling toll-free 1-800-267-8761 — but first have your jig information ready. Please quote the jig model, serial number, part number, part description and quantity required.

How to Order Parts

Order directly from Leigh by calling toll free 1-800-267-8761 — but first have your jig information ready. You'll need the jig model, serial number, part number, part description and quantity required. **Note:** Place the finger assembly in half-blind mode to determine left hand and right hand scales.

PART DESCRIPTION	PART No.	QUANTITY
User Guide D4R Pro, English–Inch/Metric	560	1
1/2" [12,7mm] 8° Dovetail Bit, 8mm Shank	80-8	1
1/2" [12,7mm] 14° Dovetail Bit, 8mm Shank	120-8	1
5/16" [7,9mm] Straight Bit, 8mm Shank	140-8	1
1/2" [12,7mm] to 8mm Collet Reducer	172-8	1
Body Extrusion	212	1
R.H. End Housing	232	1
L.H. End Housing	242	1
8 x 1-1/2" End Housing Screws	260R	8
5/16"-18 x 4-1/4" Clamp Bar T-Bolts	271	4
Flat Washers for Clamp Bolts	283	4
1/4"-20 Square Nuts (Accessory Attachment)	284	2
1/4"-20 x 3/4" FH Machine Screw (Accessory Attachment)	287	1
5/16"-18 Clamp Bar Hex Bolt Nuts	300	4
Clamp Bar Springs	311	4
Front Clamp Bar (complete with End Plugs 7115)	332R	1
Rear Clamp Bar (complete with End Plugs 7115 and Leigh Decal)	335	1
R.H. Inch Scale Assembly, Complete (R.H. in H.B. Tail Mode)	392	1
or R.H. Metric Scale Assembly, Complete (R.H. in H.B. Tail Mode)	392M	1
L.H. Inch Scale Assembly, Complete (L.H. in H.B. Tail Mode)	394	1
or L.H. Metric Scale Assembly, Complete (L.H. in H.B. Tail Mode)	394M	1
Sliding Dovetail Fence (Cross Cut Fence)	432	1
Plastic Bridge Piece Extrusions	433	2
H.B. Pin Guide Rail, 1/4" x 1/4"	441B	1
Finger Guide Rail, 1/4" x 3/4"	451B	1
R.H. Fingers (complete with Wedges, Nuts, Washers and Screws)	465	13
L.H. Fingers (complete with Wedges, Nuts, Washers and Screws)	475	13
Finger Wedges	7221	26
8-32 Threaded Finger Nuts	7210	26
Finger Washers	7215	26
8-32 x 0.259" PH Machine Screws (Finger Lock)	7225R	26
Leigh Assembly Wrench/Gauge	540	1
Leigh Finger Adjusting, No.2 Robertson Screwdriver	550	1
R.H. Support Bracket	5260	1
L.H. Support Bracket	5270	1
Cam-Action Speed Clamps (complete with Step Washers 802)	801	4
Cam-Action Speed Clamp Step Washers	802	4
8-32 x 1/2" Hex Socket, Flat Point Set Screws (Scale Lock)	3110R	2
5/64" Hex Key (2mm may also work)	3156	1
1/4"-20 Hex Nuts (Jig Hold-Down)	6030	4
1/4"-20 x 1" FH Machine Screws (Jig Hold-Down)	6060	4
Support Bracket Knobs	7025	2
Clamp Bar End Plug	7115	4
e7 eBush (Guide Bushing) and Nut	e7-Bush	1
Pin Wrench	730V	1
Nylon Stop Rod	8624	1
D4R Pro Dovetail Spacer	570	1
D4R Pro Box Joint Spacer	580	1



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D4R Pro -Appendix IV

Customer Support

Our Commitment to You Leigh Industries takes pride in its commitment to providing excellence in customer service and support. This user guide is designed to provide you with the answers to any questions you have. However, if you require assistance, please feel free to contact our technical support staff or a distributor listed below.

Manufacturer: Canada/USA

TEL/FAX

**Customer Service
and Technical Support**

1-800-267-8761 (Canada)

1-800-267-8735 (USA)

EMAIL/WEB

Customer Service

customerservice@leevalley.com

NOTE: Email can be useful, but technical queries usually raise queries from us. A phone call is the quickest and most convenient way to get queries answered, either directly to Lee Valley (toll free in N. America) or to your national distributor. –Thanks!

MAILING ADDRESS

Lee Valley Tools Ltd.
P.O. Box 6295, Station J
Ottawa, ON
K2A 1T4

LOCATION

Lee Valley Tools Ltd.
1090 Morrison Dr,
Ottawa, ON
K2H 1C2

Distributors

AUSTRALIA & NEW ZEALAND

Carbatec - The Home of Woodworking
Unit 2, 364 New Cleveland Road
Tingalpa, QLD 4173 Australia
Tel: 07 3569 3205
Tel (Int.): +61 7 3292 0392
Email: Purchasing@carbatec.com.au
Web: carbatec.com.au

CHINA

Nanjing Haiwei Machinery Co., Ltd.
Harvey Woodworking Technology(Nanjing) Co., Ltd.
68-10 Suyuan Avenue, Jiangning District,
Nanjing, 211100 China
Tel: 86-(0)25-8666-8172 / 5792 8021
Fax: 86-(0)25-5792-8826
Email: cassie@harvey.cn
Web: www.harveymachinery.com
Web: www.harveyworks.cn

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Email: info@bordet.fr
Web: www.bordet.fr

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Holzbearbeitungsmaschinen
Traberhofstraße 103 D-83026 Rosenheim,
Deutschland
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Fax: 08031 68221
Email: hacker.rosenheim@t-online.de
Web: www.hacker-rosenheim.de

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Via Gallarate 76 Settimo,
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Fax: 39 02 335 005 27
Email: info@ferrarimacchine.com
Web: www.ferrarimacchine.com

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Off Corporation Inc.
785-1 Hirose, Shimizu-ku, Shizuoka-shi
Shizuoka Ken, 424-0102 Japan
Tel: 81-50-3816-0115
Fax: 81-54-367-6515
Email: info@off.co.jp
Web: www.off.co.jp/category/LEIGH/

KOREA

Leigh Korea
604, 13-1, Gugal-Ro 72beon-gil,
Giheung[1]Youngin-si,
Gyeonggi Republic of Korea ,
16972 South-Korea
Tel: +82-(0)31-281-1141
Fax: +82-0504-192-0629
Email: maengha@leighkorea.com
Web: www.leighkorea.com

SOUTH AFRICA

Hardware Centre, Handico PTY Ltd/A Hardware
Centre
Shop 8 Homeworld Centre
CNR. Malibongwe & Rocky ST.
Randburg, Ferndale
South Africa
Tel: +27 011 791-0844/46
Fax: +27 011 791-0850
Email: info@hardwarecentre.co.za
Web: www.hardwarecentre.co.za

SWEDEN

Toolbox Sweden AB
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Atvidaberg, 59730
Sweden
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Fax: 46 120 854 69
Email: info@toolbox.se
Web: www.toolbox.se

UNITED KINGDOM & IRELAND

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Headquarters, Unit 10. Weycroft Ave.
Millwey Rise Industrial Estate
Axminster, EX13 5PH, United Kingdom
Tel: 011 44-927-630-007
Tel: 01297 630813
Fax: 011 44-870 432-7622
Fax: 01-297-631-224
Email: procurement@axminstertools.com
Web: www.axminster.co.uk/leigh

USA

Rockler
Woodcraft
Infinity Cutting Tools
Highland Hardware

