

Lie-Nielsen
TOOLWORKS®
INC.

TAIL VISE

Installation Instructions



(revised 6/18/2019)

LIE-NIELSEN TAIL VISE INSTRUCTIONS

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QUESTIONS?

CONTACT US AT 207-273-2520 • TOOLWORKS@LIE-NIELSEN.COM

ABOUT YOUR TAIL VISE

Over the years we have built many workbenches and installed several different styles of tail vises. We've learned a lot about them and our experience has led us to design what we believe to be the most effective system for a Tail Vise.

The Lie-Nielsen Tail Vise gives you simplicity of design and function with the ruggedness needed for a hard-working vise. It is based on traditional, European-style tail vises, but we made some modifications to make it function in a simpler, more efficient fashion. Machined from Cold Rolled Steel bar stock, the sliding mechanism is a three piece construction. We also eliminated the traditional L-block from the vise.

NOTE: Our Tail Vise is made to fit a 4" bench top, but can also be mounted on a thicker top by centering the hardware on your jaw and bench. Simply adjust the position of the slide assembly and jaw mortises accordingly. If your bench is less than 4" thick, additional blocking may be necessary.

Tail Vise Installation Time: Up to 8 hours (including making your own Vise Jaw)

Total Travel Distance: 6 inches

An **Installation Kit** is available through Lie-Nielsen Toolworks for \$45, returnable for credit.

This kit includes the following tools:

Drills F, $\frac{5}{16}$ "

Taps $\frac{5}{16}$ - 18, $\frac{3}{8}$ - 16

Center Punches $\frac{3}{8}$ ", $\frac{5}{16}$ "

Allen Wrenches $\frac{1}{8}$ ", $\frac{3}{16}$ ", $\frac{7}{32}$ ", $\frac{1}{4}$ "

Hex Drivers $\frac{3}{16}$ ", $\frac{7}{32}$ ", $\frac{1}{4}$ "

Please call 1-800-327-2520 or visit www.lie-nielsen.com for more information.

IMPORTANT

- Read these instructions thoroughly before cutting into your bench and starting the installation.
 - Do not proceed without the vise parts and hardware in your possession.
 - Always clean any rough edges or debris before proceeding to the next step.
 - Do not overtighten the bolts.

TAIL VISE PARTS LIST

Part #1

UPPER RAIL (1)



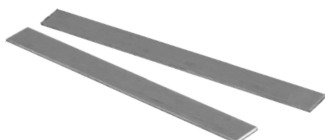
Part #2

LOWER RAIL (1)



Part #3

LOWER RAIL SHIMS
(used for set-up only)



Part #4

SLIDE ASSEMBLY (1)



Part #5

WISE SCREW (1)



Part #6

ACME NUT (1)



Part #7

RAIL BOLTS (6)

Specs: $\frac{5}{16}$ -18 x 1- $\frac{1}{4}$ "



Part #8

LOWER RAIL SET SCREWS (4)

Specs: $\frac{1}{4}$ -20 x $\frac{1}{2}$ "



Part #9

SLIDE ASSEMBLY BOLTS
(4 button head, 1 flat head)

Specs: $\frac{3}{8}$ -16 x 2"



Part #10

WISE SCREW FLANGE BOLTS (2)

Specs: $\frac{5}{16}$ -18 x 1- $\frac{1}{2}$ "

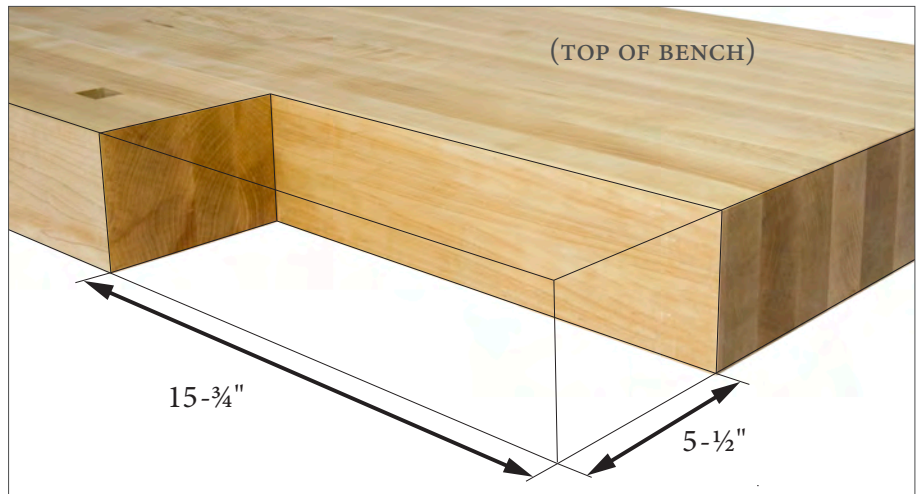


STEP 1: PREPARE YOUR BENCH TOP

Before installing your new Tail Vise, you need to cut a notch, mortise, and dado in your bench top.

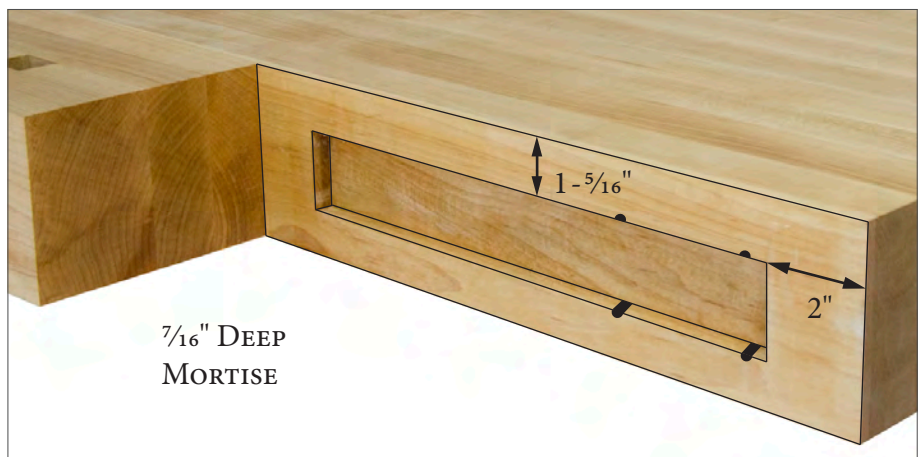
First, cut a notch in the end of your bench to fit the Vise Jaw. The notch must be 5 ½" in from the side of the bench and 15 ¾" in from the end of the bench.

Be sure that the edges are square to the top and square to each other.

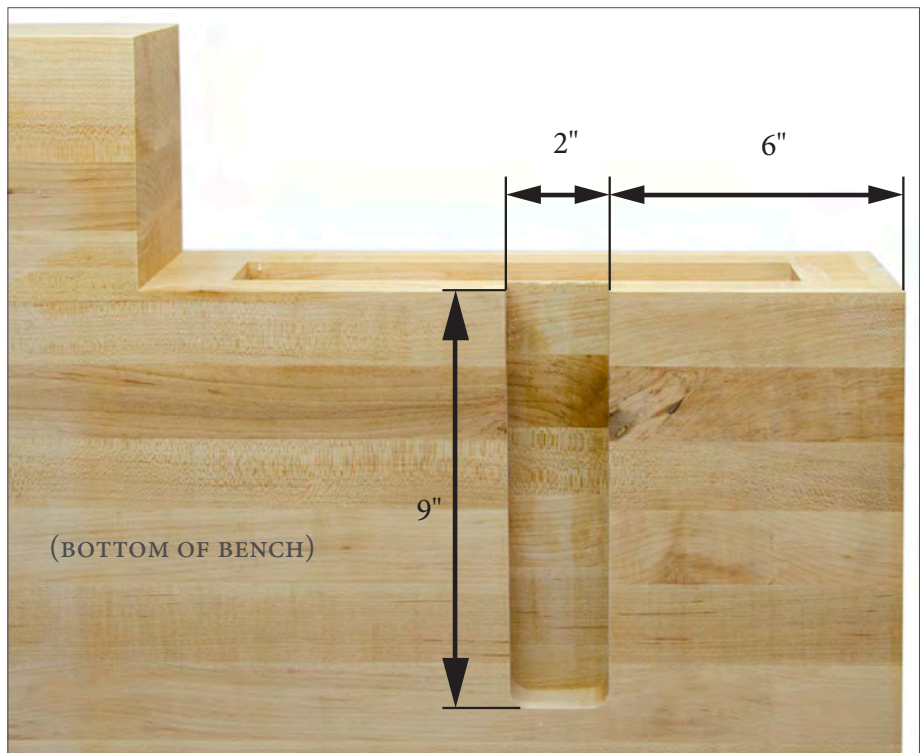


Next, cut the mortise for the Slide Assembly.* The mortise must be 2" from the end of the bench and be 11-¾" long x 1-¾" wide x 7/16" deep. The top of the mortise should be 1-5/16" from the top of the bench. It is vital that this cut is parallel to the bench top.

*IMPORTANT: Before cutting the mortise, you must drill four holes to provide clearance for the stand-off bolts of the Slide Assembly. Refer to the Diagram 5 on page 19 for a detailed illustration.



You will also need to cut a dado into the bottom of your bench to access the bolts of the Lower Rail. The dado should be 6" from the end of the bench, with dimensions of 9" long x 2" wide x ¾" deep.

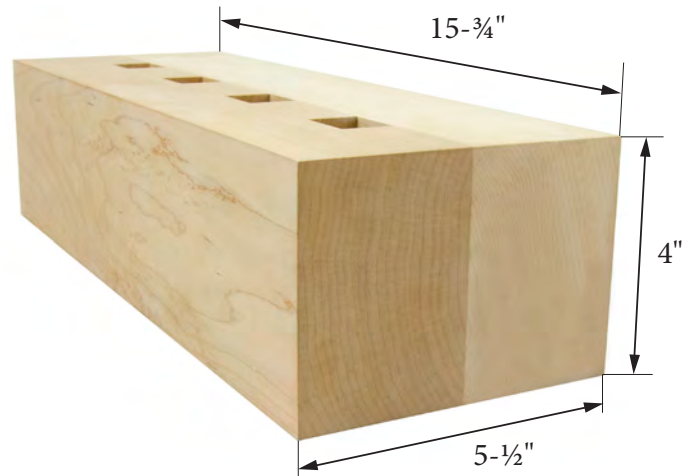


STEP 2: MAKE THE VISE JAW

The dimensions of the Vise Jaw are $15\frac{3}{4}$ " long x 4" high x $5\frac{1}{2}$ " wide.

Begin with two pieces, each measuring 16" long x 4" high x $2\frac{3}{4}$ " wide. Mill out your dog holes on the outer piece, if desired. Refer to the Diagram 2 on page 16 for details.

Glue and clamp these pieces together and make sure they are flush with each other. Once the glue has set, trim the Jaw to $15\frac{3}{4}$ " long and make sure that the ends are square.

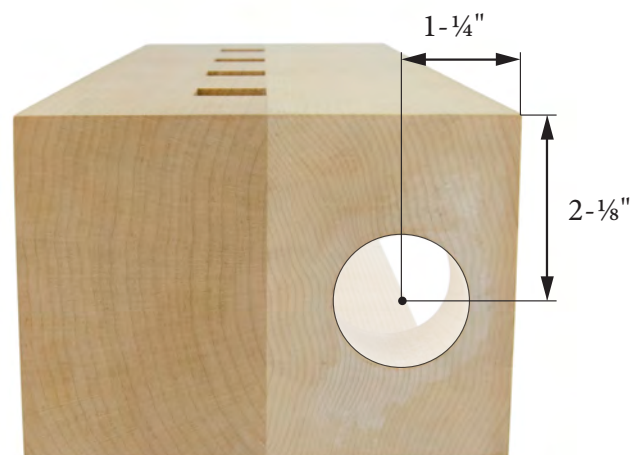


Next, mortise the slots and pockets that will house the vise hardware. Use whatever milling method that you are most comfortable with. Refer to Diagrams 3 and 4 on pages 17 and 18 for details.

NOTE: The corners of these mortises do not need to be square. Make sure to clean up any rough edges.

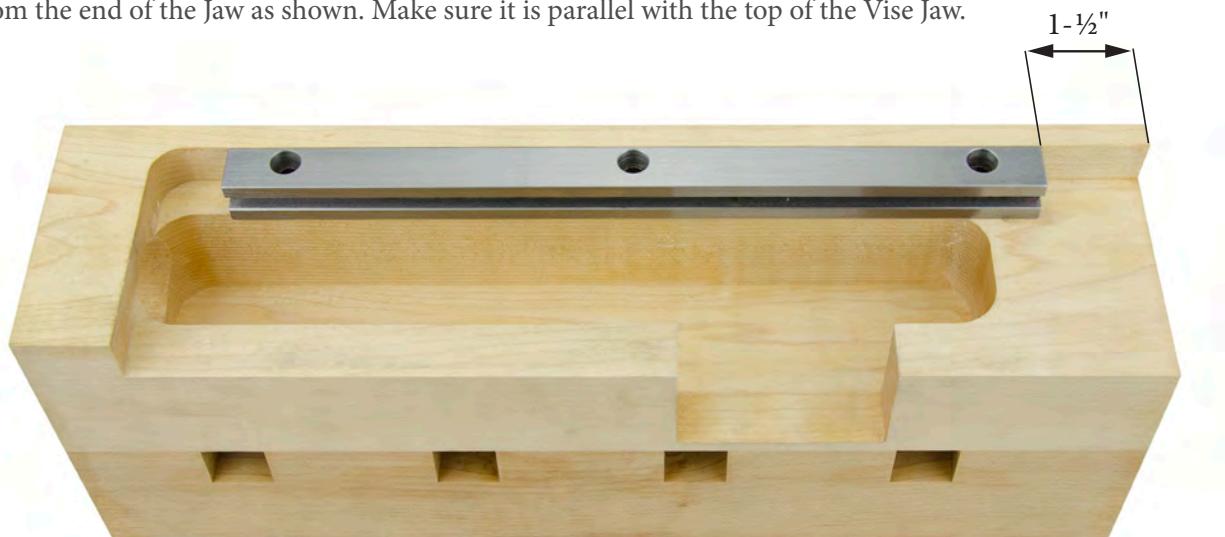


Drill a $1\frac{1}{2}$ " diameter hole for the Vise Screw. The center point of the hole should be $2\frac{1}{8}$ " from the top and $1\frac{1}{4}$ " from the inside edge of the Jaw.



STEP 3: INSTALL THE UPPER RAIL

Place the Upper Rail (Part #1) flush against the top of the cut out area of the Vise Jaw. Position it 1-½" from the end of the Jaw as shown. Make sure it is parallel with the top of the Vise Jaw.



Mark the center points of each hole in the Upper Rail using a 5/16" transfer punch.



Once the holes are marked, remove the Upper Rail and drill them 1-½" deep with a size F drill bit. Next, thread the holes using a 5/16 – 18 tap. Be sure to drill and tap square.

After the holes are drilled and tapped, clean out any debris and make sure the holes are flush with the mounting surface.



Install the Upper Rail to the Vise Jaw using the bolts (Part #7) and a ¼" hex driver. You may use a power drill to drive the bolts most of the way in, then finish by hand. Be careful not to overtighten.



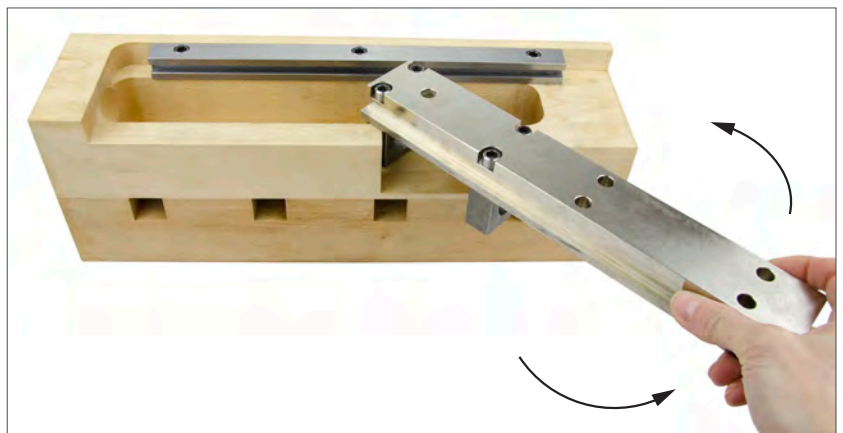
STEP 4: PREPARE THE LOWER RAIL

Mark the position of the Lower Rail (Part #2) by using a square against the edge of the Upper Rail. The inside edge of the square marks the end position of the Lower Rail.

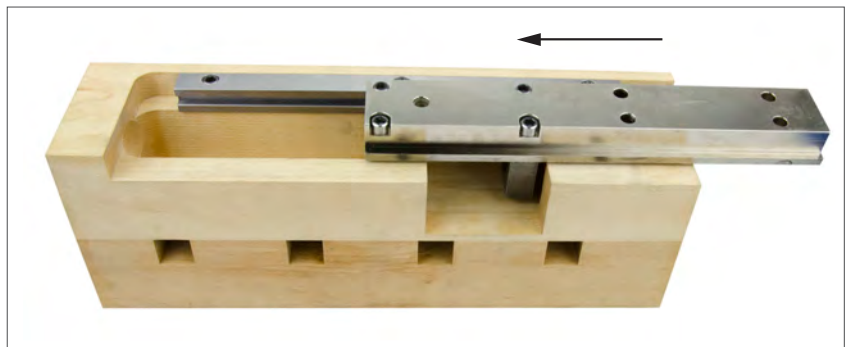


Position the Slide Assembly so that the standoffs are closest to the vise screw hole.

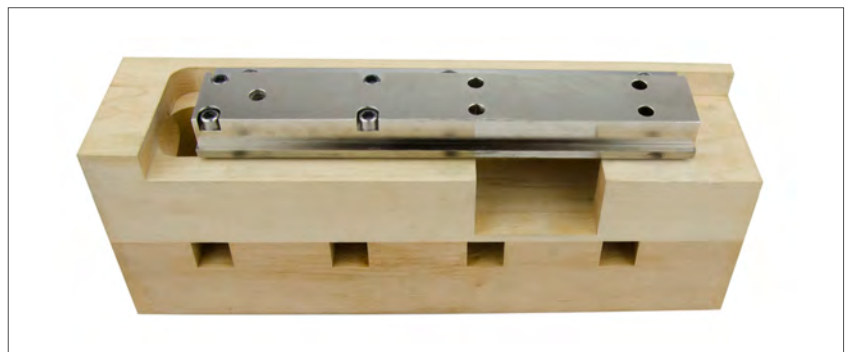
Angle the Slide Assembly to fit the standoffs through the notch in the Jaw.



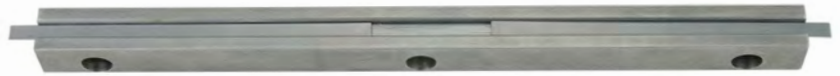
Maneuver it into the mortise in the Jaw so that the upper edge fits into slot of the Upper Rail.



Slide it all the way down until it is flush with the end of the Upper Rail.



Place the installation shims (Part #3) into the slot of the Lower Rail and allow them to project slightly on either end of the rail.



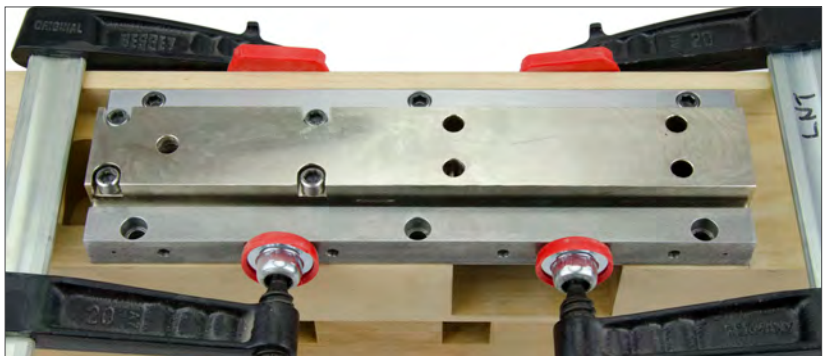
Fit the Lower Rail along the lower edge of the Slide Assembly.



Align the end of the Lower Rail with your reference mark from the Upper Rail. Make sure everything is flush end to end.



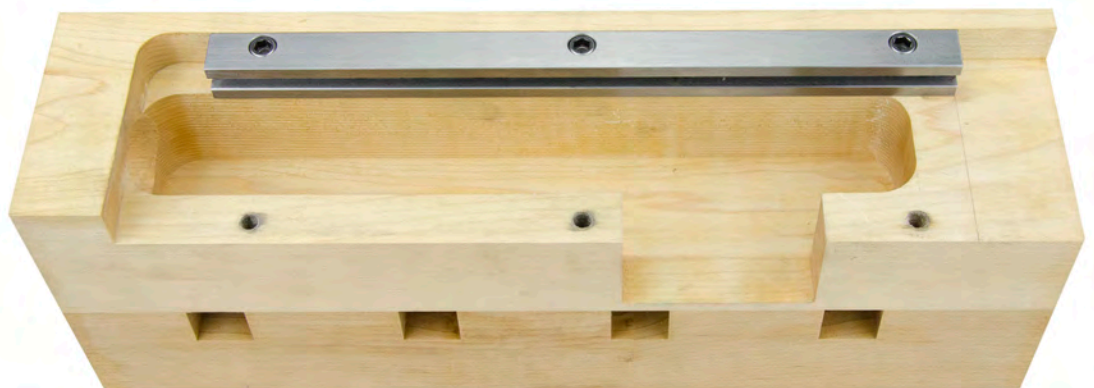
Clamp the assembly together, making sure the clamps do not obstruct access to the three mounting holes on the lower rail. Use a $\frac{5}{16}$ " transfer punch to mark the centers of the holes.



After the holes are marked, remove the clamps, Slide Assembly, and Lower Rail. Drill the holes 1- $\frac{1}{2}$ " deep using a size F drill bit. Then thread them using a $\frac{5}{16}$ - 18 tap.

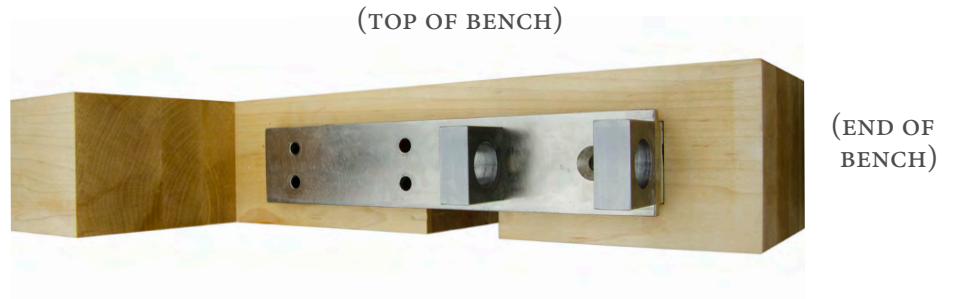
Make sure everything is clean of debris and the holes are flush with the mounting surface.

DO NOT mount the Lower Rail to the Jaw yet.



STEP 5: INSTALL THE SLIDE ASSEMBLY

Place the Slide Assembly (Part #4) into the mortise you cut in your bench. Position it so that the standoffs are facing towards the end of the bench. Make sure that it is parallel to your bench top.



Use a $\frac{3}{8}$ " transfer punch to mark the centers of the five holes. Then remove the Slide Assembly and drill the holes 2" deep with a size $\frac{5}{16}$ " drill bit. Thread the holes using a $\frac{3}{8}$ -16 tap.



Mount the Slide Assembly in the mortise and install the bolts (Part #9) as shown using a $\frac{7}{32}$ " hex driver.

Note that the flat head bolt goes in the hole between the standoffs.



STEP 6: MOUNT THE VISE JAW



Angle the Jaw and fit the notch over the first standoff on the Slide Assembly, as shown.



Lift the Jaw up and forward to guide the second standoff through the notch and into the Jaw pocket.



Once you have bypassed the standoffs, tilt the Jaw forward to engage the Upper Rail with the top of the Slide Assembly.

Then slide the Jaw forward until it is closed.

STEP 7: INSTALL THE LOWER RAIL

Place the Lower Rail (Part #2) under the Slide Assembly and align it with the holes drilled and tapped earlier.



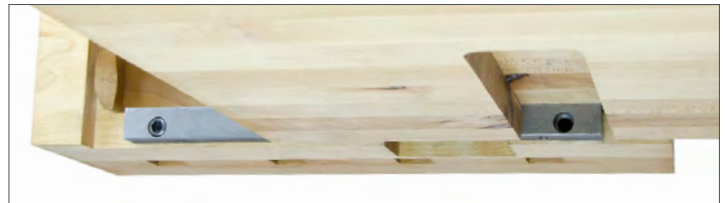
Extend the Vise Jaw far enough to access the outer mounting hole, and install the first bolt (Part #7) with a 1/4" hex driver. Tighten the bolt so it is snug but not fully tight.



Slide the Jaw over to access the remaining holes of the Lower Rail through the dado you cut on the bottom of your bench top. Install the rest of the bolts. Go back and fully tighten all bolts.



The Vise Jaw should now slide smoothly over the Slide Assembly.



The set screws (Part #8) along the bottom of the Lower Rail allow you to reduce or eliminate any up and down movement of the Vise Jaw.

To adjust, insert one set screw per hole, tighten all the way with a 1/8" allen wrench, then back off 1/10 turn.



STEP 8: INSTALL THE VISE SCREW

The next step is to mount the Vise Screw into the Jaw. This is the final step to completing your new Tail Vise!

Before you install the Vise Screw, you must mark, drill, and tap mounting holes for the flange.

Insert the Vise Screw (Part #5) into the Jaw hole and through the Slide Assembly standoffs, until the flange is flush with the Jaw.



Position the flange at an angle for the mounting holes. Use a $\frac{5}{16}$ " transfer punch to mark the centers of the holes. Remove the Vise Screw. Drill the holes $1\frac{1}{2}$ " deep with a size F drill bit, then thread them with a $\frac{5}{16}$ – 18 tap.



Now you are ready to install the Vise Screw. Start by aligning the opening on the bottom of the Jaw with the standoffs on the Slide Assembly. Slide the Acme Nut (Part #6) into the opening and in between the standoffs.



Now thread the Vise Screw through the Acme Nut until the Vise is closed.

Install each of the flange screws (Part #10) with a $\frac{3}{16}$ " hex driver.



FINAL ADJUSTMENTS & ACCESSORIES

We suggest that you run the vise in and out a few times to check for any unwanted movement before using it. You can make final adjustments of the set screws on the bottom rail to correct this, but do not tighten them too much or your vise's travel will be restricted. You may use graphite to provide extra lubrication, if needed.

Now you can flush the Vise Jaw to your bench and you are ready to use it.

We hope that you enjoy your new Tail Vise!

If you have any questions, suggestions, or feedback, please contact Lie-Nielsen Toolworks at 1-800-327-2520 or email toolworks@lie-nielsen.com.

We also offer bench dogs, vise handles, and holdfasts. For details or to place an order, please visit the Workbench Hardware section of our website at www.lie-nielsen.com.



WOODEN
BENCH DOGS



METAL
BENCH DOGS

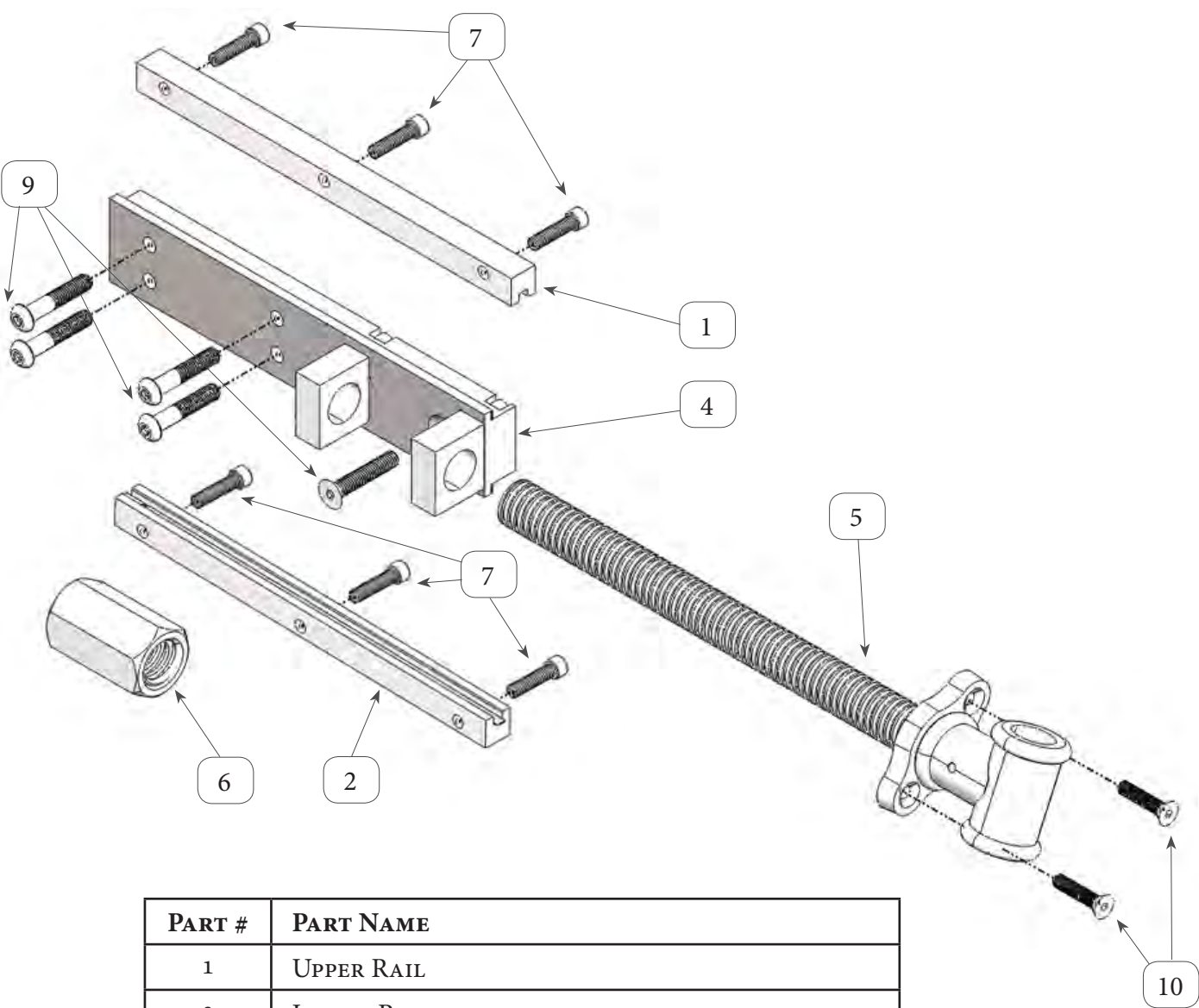


WOODEN VISE HANDLES



HOLDFAST

DIAGRAM 1. TAIL VISE EXPLODED DIAGRAM



PART #	PART NAME
1	UPPER RAIL
2	LOWER RAIL
3	LOWER RAIL SHIMS (FOR SET-UP ONLY, NOT SHOWN)
4	SLIDE ASSEMBLY
5	VISE SCREW
6	ACME NUT
7	RAIL BOLTS
8	LOWER RAIL SET SCREWS (NOT SHOWN)
9	SLIDE ASSEMBLY BOLTS
10	VISE SCREW FLANGE BOLTS

DIAGRAM 2. VISE JAW: DOG HOLE SPECIFICATIONS

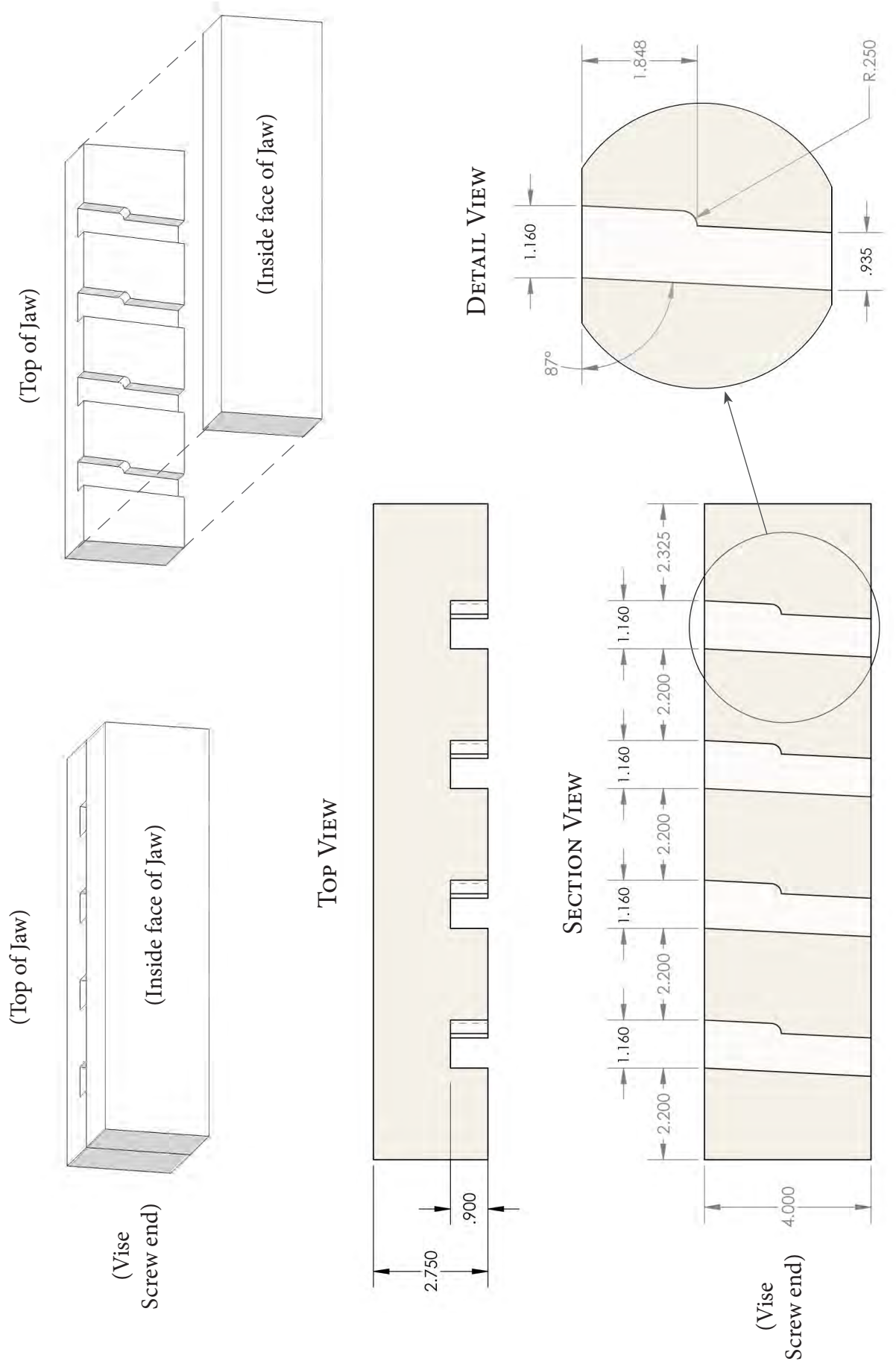


DIAGRAM 3.

VICE JAW: FIRST CUT

Mortise the blue shaded area to a depth of $2\frac{1}{2}$ ".
 Note that the corners of the mortise do not need to be square.

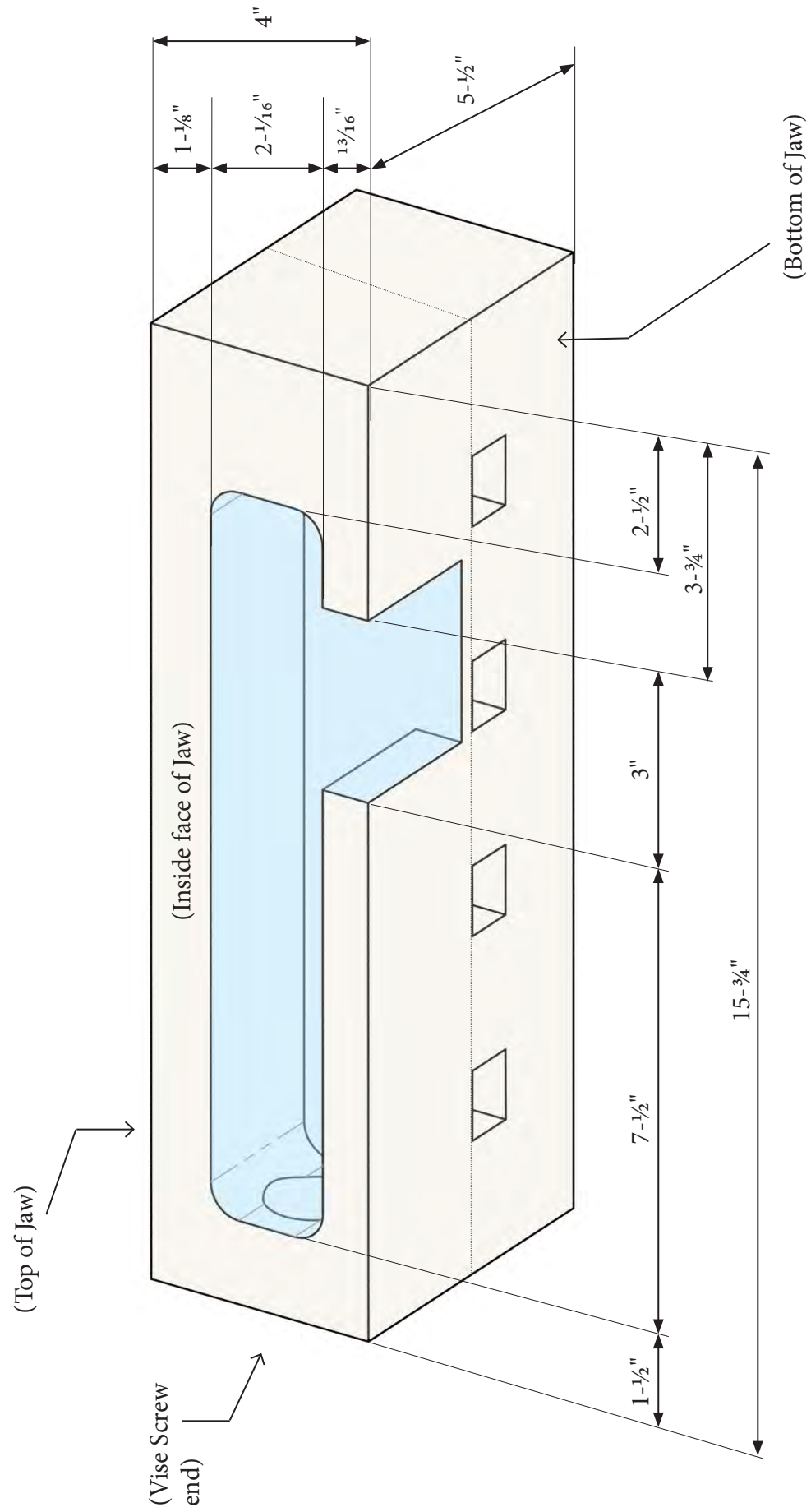
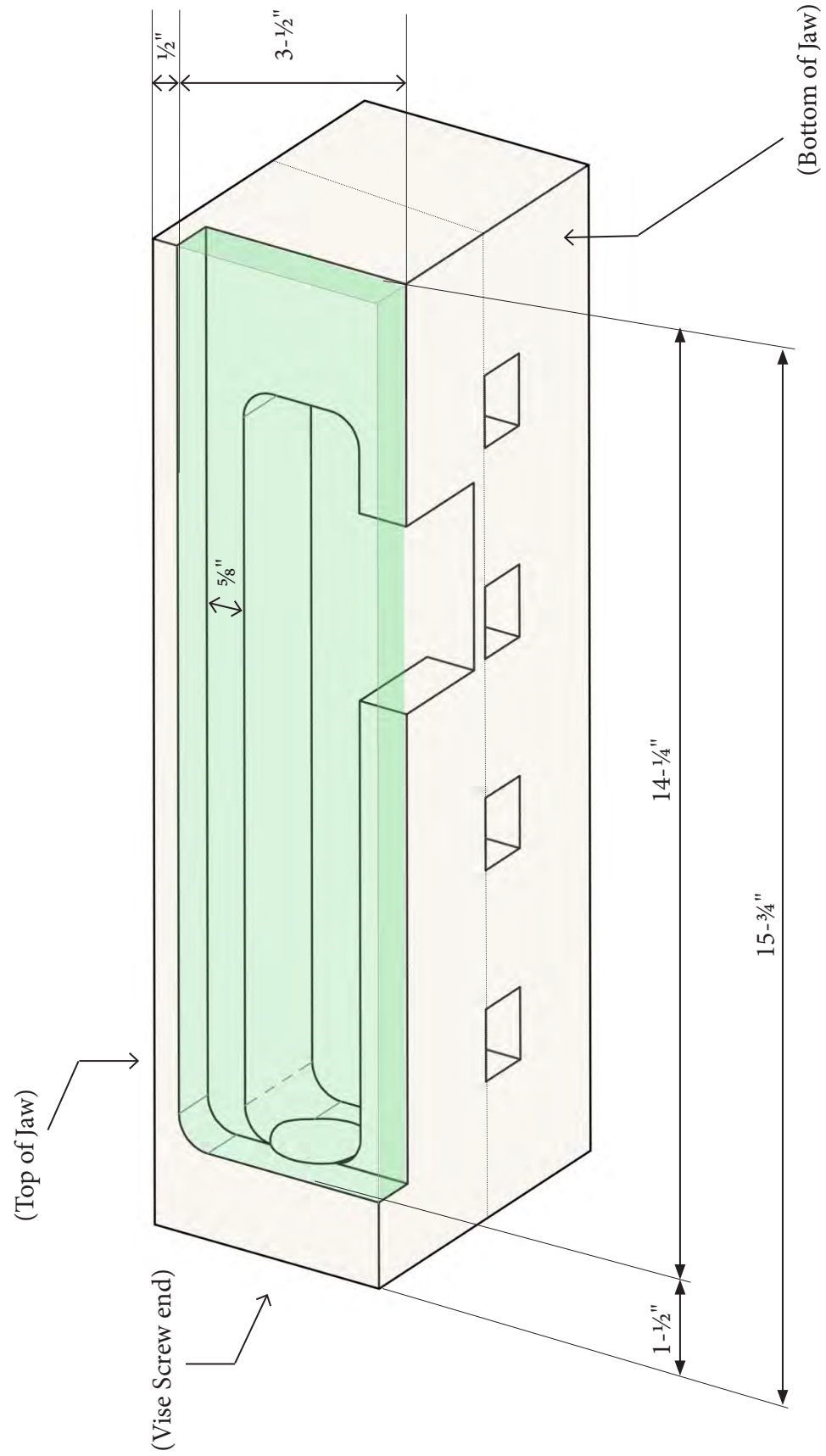


DIAGRAM 4. VICE JAW: SECOND CUT

Mortise the green shaded area to a depth of $\frac{3}{4}$ ".

Note that the corners of the mortise do not need to be square.

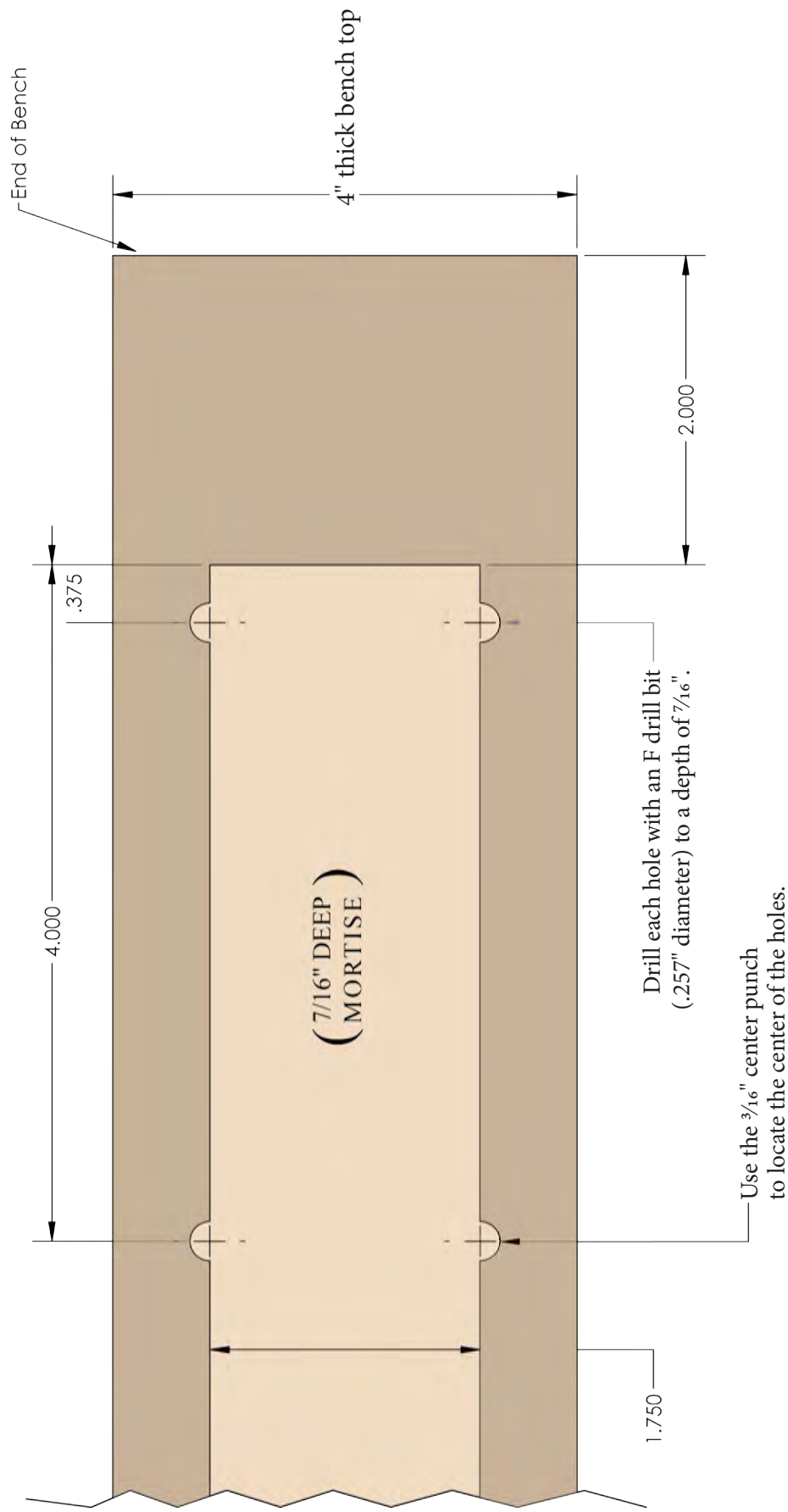


ADDENDUM

Refer to page 5.

Step 1: Prepare your bench top.

DIAGRAM 5. BENCH MORTISE DETAIL



Note: Locate and drill the four $.257$ " holes before mortising the side assembly. The F ($.257$ " diameter) drill bit and the $\frac{3}{16}$ " center punch are included in the "Tail Vise Installation Kit" if purchased.