

Figure 2: Exploded View of Bench Top & Base Assemblies

10. Vise handles are not supplied. These can be made of wood or 1" plumbing pipe threaded at both ends and fitted with end caps. They should be 12" to 14" long.
11. All hole centers can be transferred from one piece to another using an appropriately sized multi-spur or forstner bit.
12. Upon completion, the entire bench should be protected with a good-quality finishing oil.

13. All dimensions shown on the plan are in inches.
14. These plans will yield a bench 35" high, but the height should be altered to suit the user if necessary. The top of the bench should come to your wrist as you stand up with arms down; have someone measure this height for you or use the height of a table or counter that is comfortable as a reference.

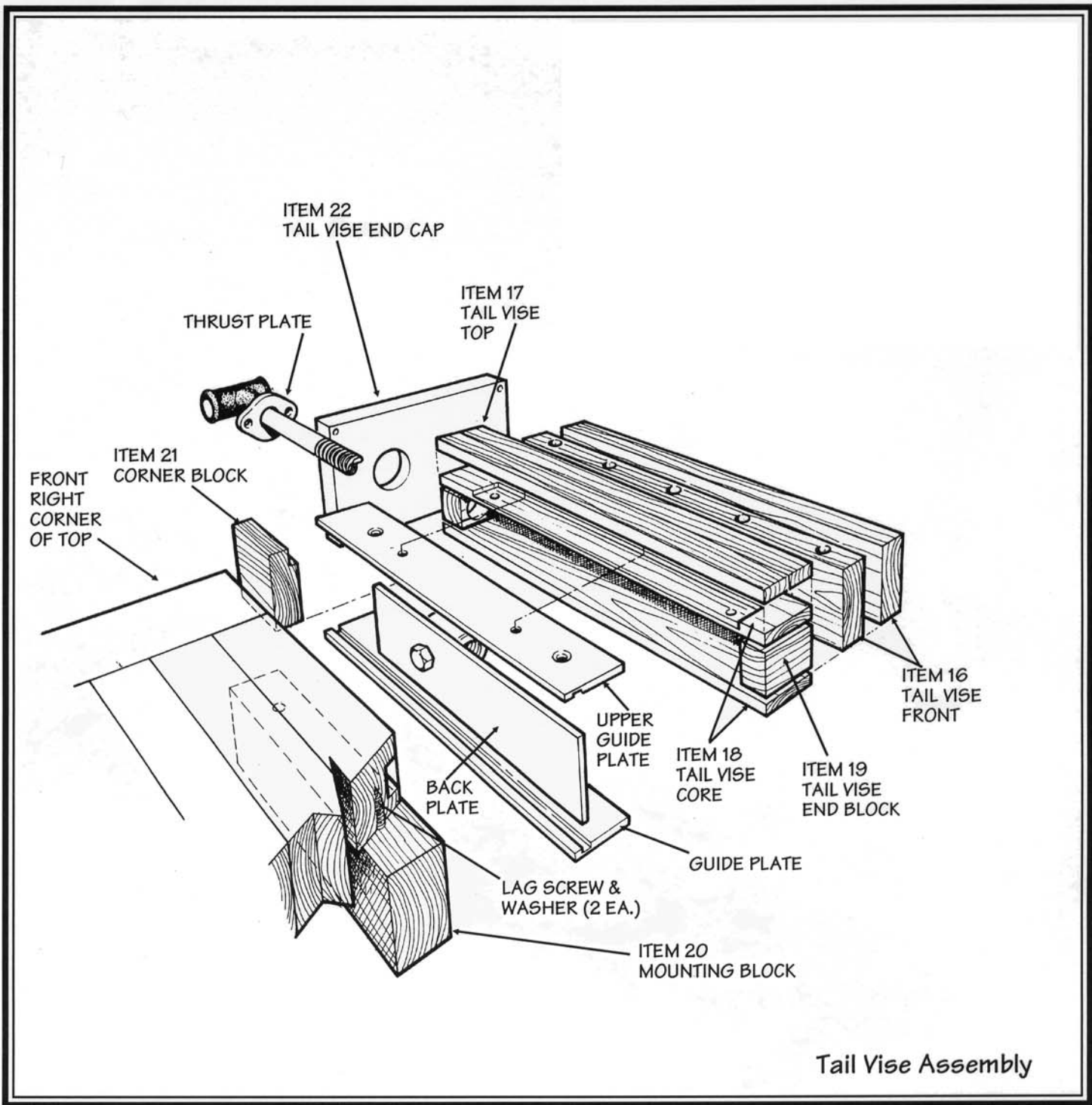


Figure 3: Exploded View of Front Vise Jaw and Tail Vise Assembly

**TAIL VISE ASSEMBLY**

**Bill of Materials**

Item	Description	Qty	Dimensions
16	Tail Vise Front . . . . .	2	23 <sup>1</sup> / <sub>4</sub> " × 4 <sup>9</sup> / <sub>32</sub> " × 1 <sup>1</sup> / <sub>2</sub> "
17	Tail Vise Top . . . . .	2	23 <sup>1</sup> / <sub>4</sub> " × 1 <sup>3</sup> / <sub>16</sub> " × 1 <sup>1</sup> / <sub>2</sub> "
18	Tail Vise Core . . . . .	2	23 <sup>1</sup> / <sub>4</sub> " × 2 <sup>13</sup> / <sub>16</sub> " × 3/4"
19	Tail Vise End Block . . . . .	2	2 <sup>13</sup> / <sub>16</sub> " × 2" × 1 <sup>1</sup> / <sub>2</sub> "
20	Mounting Block . . . . .	1	18" × 2 <sup>5</sup> / <sub>16</sub> " × 1 <sup>1</sup> / <sub>2</sub> "
21	Corner Block . . . . .	1	2 <sup>5</sup> / <sub>8</sub> " × 4 <sup>9</sup> / <sub>32</sub> " × 1 <sup>1</sup> / <sub>2</sub> "
22	Tail Vise End Cap . . . . .	1	7 <sup>5</sup> / <sub>16</sub> " × 4 <sup>1</sup> / <sub>4</sub> " × 3/4"

## Hardware Required

Description	Qty Req'd
480 mm European Tail Vise	
Hardware with guide plates . . . . .	1
#14 × 1½" Flat-Head Wood Screws . . . . .	8
#14 × ¾" Flat-Head Wood Screws . . . . .	2
#10 × 1½" Flat-Head Wood Screws . . . . .	4
5/16" × 3½" Hex Lag Screws . . . . .	2
5/16" Washers . . . . .	2

## Construction and Assembly

The drawings and instructions are based on a 480mm tail vise. A 400mm vise will also fit using these dimensions.

1. Mill all parts to the sizes specified in the Bill of Materials.
2. Place the tail vise upper guide plate (the upper plate has four holes in it) onto one of the core pieces (Item 18) centered on the length of the core and with the inside edge of the guide plate's groove flush with the edge of the core piece (see **Section A-A: Tail Vise Assembly** and **Section B-B: Tail Vise** on plan). Scribe the position of the guide plate onto the core piece. Rout a cavity in the core piece to house the guide plate (see **Figure 3** on instructions and **Section A-A: Tail Vise Assembly** on plan). Make sure the guide plate sits flush with the core piece top.
3. Drill a 1½" vise screw clearance hole in one end block (Item 19). Center the hole on the 2" dimension and 1⅝" from the back plate side (see **Section A-A: Tail Vise Assembly**).
4. Glue up end blocks and core pieces (Items 18 & 19) as shown in **Section B-B: Tail Vise** and **Figure 3**. You may want to use small finishing nails or dowels to ensure that the pieces do not move when clamping.
5. Drill two 5/16" holes centered on the 1½" dimension of the tail vise mounting block (Item 20), 2" from either end (see **Section A-A: Tail Vise Assembly** and **Detail D: Tail Vise Mounting**).
6. Clamp the mounting block flush with the outside top core piece (Item 6) and butted to the right end cap (Item 11). Spot the 5/16" hole centers onto the bench core. Drill ¼" pilot holes, 1¼" deep.
7. Glue and screw the mounting block onto the bench core with two 5/16" × 3½" lag screws and washers.
8. Continue the ¾" groove in the bench core through the end cap end grain.
9. Remove the vise nut from the back plate. Clamp the back plate to the mounting block (Item 20) and bench core as shown in **Detail D: Tail Vise Mounting**. Position the back plate, with the nut mounting hole toward the outer end of the bench, and its edge ½" from the outside edge of the end cap (Item 11). Align the back plate 15/16" below the bench top. Spot all the hole centers onto the bench, including the large hole for the vise nut mounting bolt. Drill two 7/32" dia. pilot holes for #14 × 1½" wood screws, one in the upper left corner of the plate and another in the lower right. Drill a 1" hole, 3/8" deep for the nut mounting bolt.
10. Bolt the vise nut onto the back plate and mount the plate onto the bench with two screws. Position the wood vise core assembly and guide plates onto the bench plate and clamp together with a C-clamp. Plane the lower core piece or add paper shims

between the core piece and the lower guide plate until the two guide plates are parallel when clamped.

11. Mark the two bolt hole locations in the top guide plate onto the upper core piece. Remove the vise core and drill the two 7/16" dia. bolt holes through both core pieces. Re-assemble the vise core and guide plates on the back plate and bolt the assembly together (do not over-tighten the bolts).
12. Slide the vise back and forth over its entire range. Check that the vise core does not rise or fall with respect to the bench top. Correct if necessary by drilling another back plate mounting screw hole slightly off center and pulling the plate in the direction you want. When you are satisfied with the movement of the vise, drill the remaining back plate pilot holes and drive the rest of the back plate mounting screws.
13. (If you are using square bench dogs, see the box note **Mortising for Square Dogs**). Glue up the two front pieces (Item 16). Drill the dog holes into the inner front piece as shown in **Plan View**.
14. With the vise core assembly still attached to the bench, glue the front pieces onto the core. **Note:** Leave the front pieces 1/32" proud of the bench top.
15. Glue up the two top pieces (Item 17). Fit the top piece to the cavity left between the bench core (Item 6) and the front pieces (Item 16). Once you have a good, close fit, apply a small piece of double-sided tape at either end of the exposed guide plate. Press the top piece down firmly onto the top guide plate. Remove the guide plate bolts and withdraw the vise core assembly from the back plate, being careful to maintain the position of the top piece on the upper guide plate. Spot the hole centers for the countersunk holes in the top guide plate. Drill 7/32" dia. pilot holes for #14 × ¾" screws. Drive in the two screws. Re-assemble the vise but do not glue the top piece.
16. Cut a 3/16" wide × 3/4" deep groove into one edge of the corner block (Item 21). Glue the corner block to the vise core assembly (Items 18 & 19), flush with the end of the vise assembly and top. **Do not glue to the vise top piece (Item 17).**
17. Drill and countersink 7/32" dia. clearance holes for #10 screws, 3/4" from each corner of the vise end cap (Item 21). Drill a 1½" vise screw clearance hole in the vise end cap as shown in **Side Elevation**. Fit the tail vise end cap to the assembled vise. Drill 3/16" dia. pilot holes for #10 × 1½" screws in the vise assembly. Mount the end cap with screws only — **do not glue**.
18. Thread the vise screw into the vise. Spot the hole centers for the thrust plate mounting screws. Drill 7/32" dia. pilot holes for #14 × 1½" screws. Drive in the screws.
19. Plane the vise top flush to the bench and the side to the bench skirt.

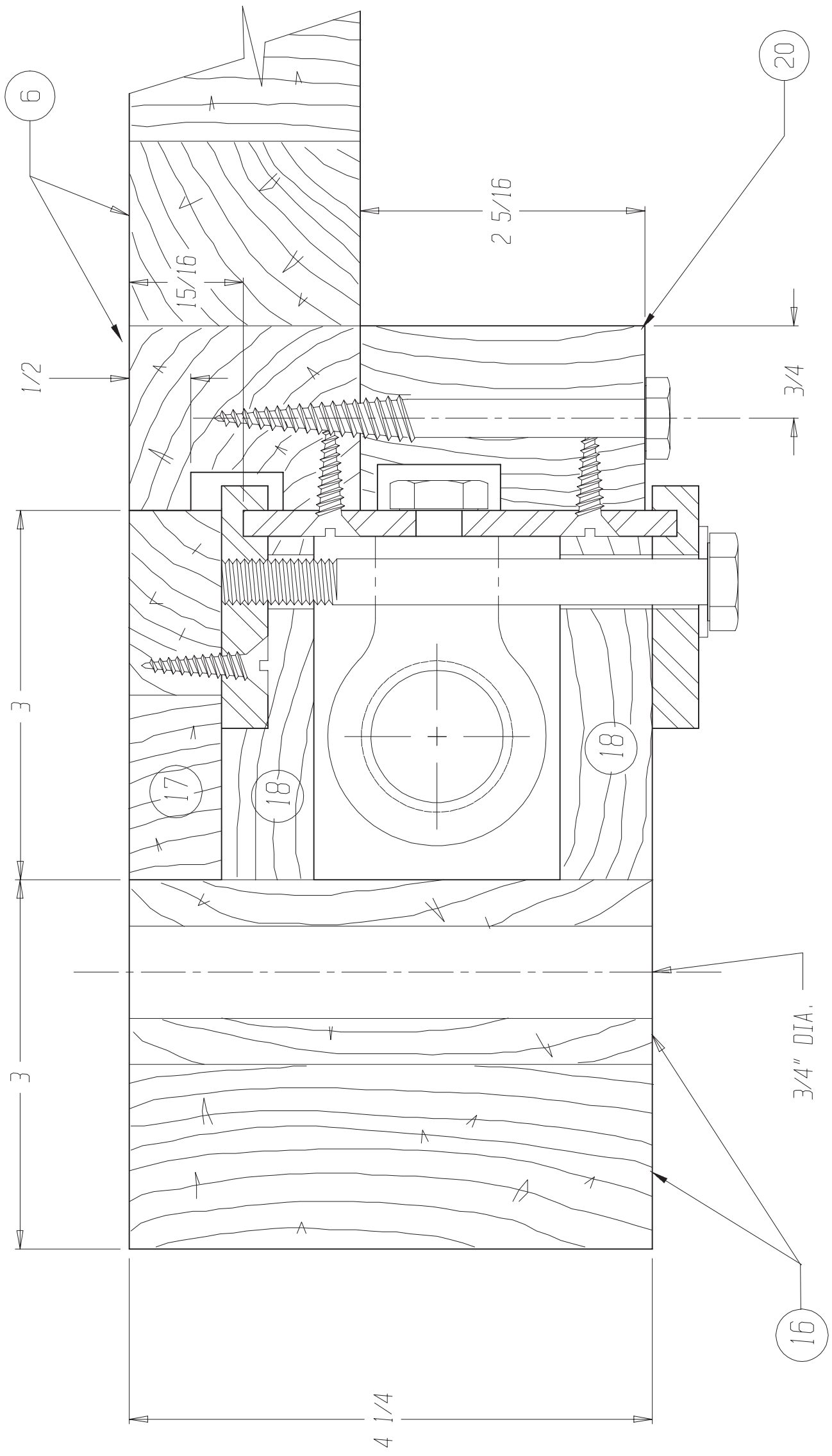
## FINAL CLEANUP

1. Chamfer all sharp edges except those that form the inside corners of the vises.
2. Sand the entire surface of the bench top while both vises are closed.
3. Apply several coats of a good-quality finishing oil such as tung oil. This finish should be renewed once a year.

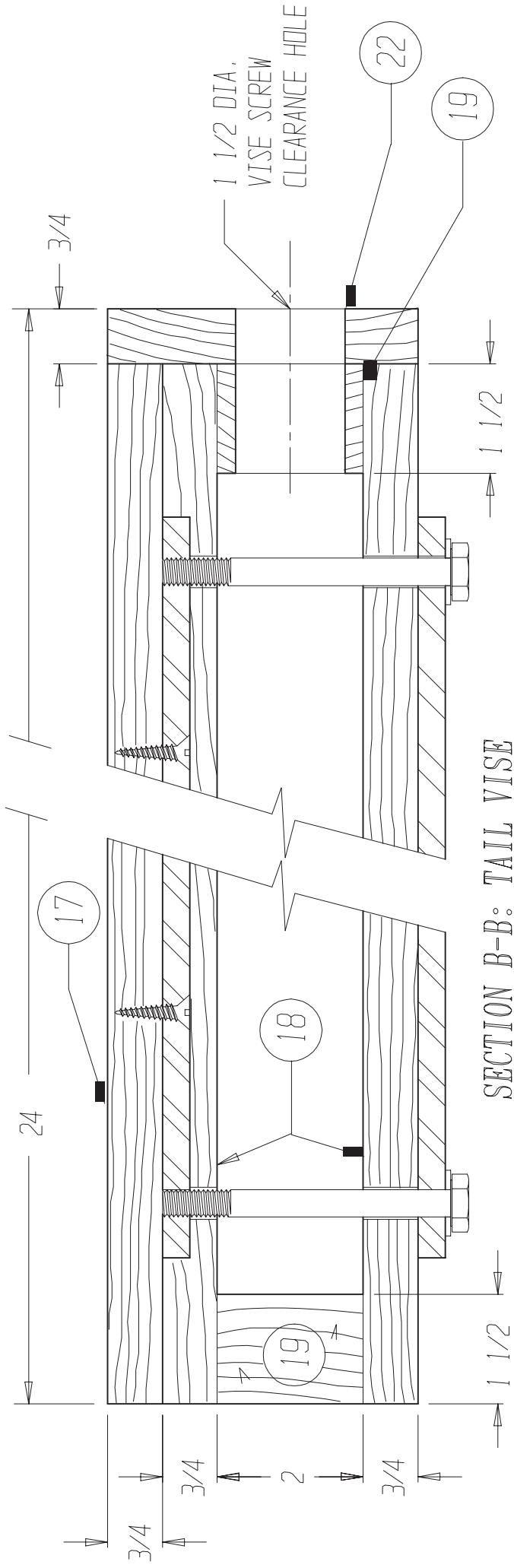
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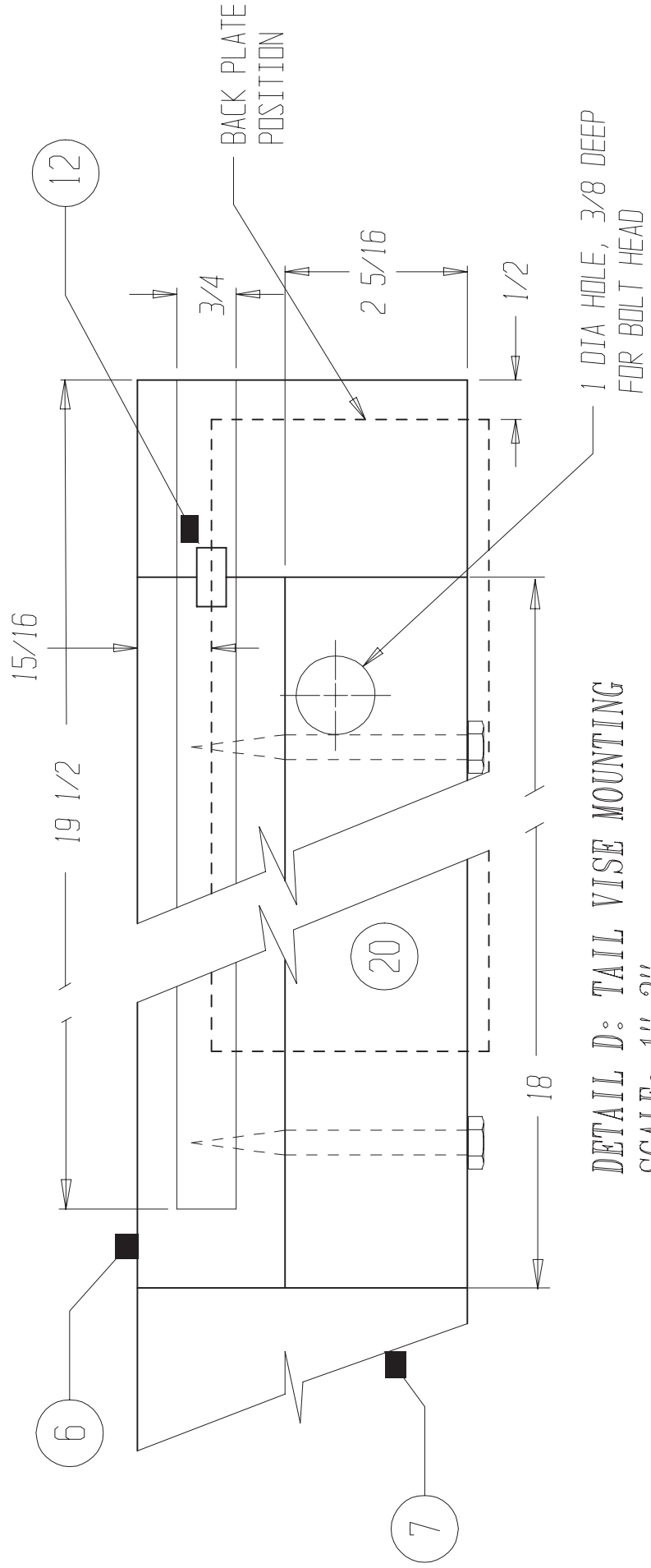
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SECTION A-A: TAIL VISE ASSEMBLY  
 SCALE: 1"=1"



SECTION B-B: TAIL VISE  
 SCALE: 1"=2"



DETAIL D: TAIL VISE MOUNTING  
 SCALE: 1"=2"