



**Morrison and Marvin Model Builders Vise  
Machining Suggestions for Vise Back Jaw (Part #2)**

Step 1

1. Saw off sprue being careful not to nick edge of swivel boss.
2. Chuck on chucking lug in rear of Back Jaw (part #2) in 4-jaw chuck. Indicate under jaw on front OD of rear Jaw hole.
3. Drill thru .609Ø.
4. Finish bore or ream to .6250 + .0005 - .0000.
5. Lightly face nose of body.
6. Face jaw to be in plane with nose. This will be reference surface for length.
7. Remove from chuck and place casting upside down in mill vise with swivel bosses resting on top of mill vise jaws. Place thin cardboard softener between mill vise jaws and inverted casting jaw. Clamp lightly.
8. Insert snug fitting mandrel into finished bore and adjust to be parallel with table. Tighten vise and remove mandrel.
9. Mill swivel flange boss face flat until outer edge cleans up. Indicate OD on perimeter of flange boss to determine center. Drill .113 x .312 deep and ream .126 pivot hole.
10. Mount Back Jaw (part #2) on stub mandrel with rear away from chuck.
11. Machine rear of Back Jaw to 2.625 length over all. Make sure rear surface is perpendicular with bore and edge is sharp.
12. Break inside edge slightly to ease fitting vise Nut Housing (part #4). Leave outer edge sharp, so joint will not show.
13. A .125 wide x .051 deep keyway needs to be machined inside the bore. Depending on your equipment this can be done with a shaper or a broach or even in a lathe or mill with an end-cutting tool hand fed with the carriage or quill. A suggested broach arbor drawing is included on sheet 17 for those wishing to broach the key slot.



**Morrison and Marvin Model Builders Vise  
Machining Suggestions for Vise Front Jaw (Part #1)**

Step 2

1. Chuck in 4-Jaw on barrel of Front Jaw part #1. Indicate on front of nose adjacent to chucking lug.
2. True up chucking lug to fit 9/16 collet.
3. Chuck in collet on front chucking lug; indicate on rear of barrel to assure alignment.
4. Carefully face rear of barrel and center drill with #3 combined drill and countersink.
5. Holding between collet and center, turn barrel to  $.6245 +.000 -.0005$  to obtain a sliding fit in Back Jaw part #2.
6. Face jaw until surface is clean.
7. Remove center and drill  $.391 \times 2.800$  deep.
8. Break inside and outside edges on back of barrel.
9. Chuck barrel in 5/8 collet.
10. Machine off chucking lug and machine seat for Screw Retainer (part #11)  
 $.744 \text{ } \varnothing \times .03$  deep.
11. Drill  $.297$  thru ream  $.3125$ .
12. Machine seat for Thrust Washer (part #13)  $.440$  dia  $\times .123$  deep from seat. This measurement should be checked against your machined parts: Screw End (part #7), Screw Retainer (part #11), and Thrust Washer (part #13). The depth of the seat should allow the thrust washer to contact when closing the vise with  $.001$  clearance on the back of the retainer.
13. Break sharp edges.
14. Clamp jaw vertically on drill table with nose up.
15. Using Vise Screw Retainer (part #11) for drill guide, with slot down, match drill and tap for #1-72 Retainer Screws (part #12) 3 places.
16. Clamp jaw, holding on barrel, upside down in mill vise and level with table. Set spindle on exact center. Using a 3/32 endmill make 2 passes  $.047$  deep to make slot  $.125$  wide  $\times 1 \frac{1}{4}$  long to cut Guide Key (part #19) seat.
17. Insert Guide Key (part #19) and match drill for Key Pins (part #20) 2 places.



**Morrison and Marvin Model Builders Vise  
Machining Suggestions for Vise Swivel Base (Part #3)**

Step 3

1. Chuck Nut Housing (part #4) in 4 jaw chuck indicating on top of feet and taper of base.
2. True up chucking lug to .625 dia.
3. Reverse and chuck in 5/8 collect on chucking lug
4. Drill .391 x 1 deep into Nut Housing (part #4)
5. Bore End Cap (part #5) hole .5469 + .0000 -.0005 x .234 deep, leave outer edge sharp.
6. Part off Nut Housing (part #4) to OA length of .625.
7. Face bottom of Swivel Base (part #3) until all 4 feet and center chucking lug are surfaced.
8. Make a fixture to hold the swivel base with screws through the feet as follows:
  - a) Center drill faced chucking lug with # 3 combined drill and countersink.
  - b) Drill 7/64 x 1/4 deep and ream .1250 for temporary dowel pin (not furnished).
  - c) Face a suitable block large enough for swivel bolt pattern, drill and ream for 1/8 dowel pin.
  - d) Insert dowel pin to align block and swivel base, match drill and tap for # 8 screws (not furnished) to anchor feet to fixture.
9. Bore bottom of Swivel Base (part #3) 1.702 dia. x .234 deep.
10. Machine out center of Swivel Base (part #3) to remove chucking lug which will be used as End Cap (part #5). A 1.125 hole saw works well.
11. Mount Swivel Base (part #3) on fixture in lathe with feet toward headstock. Finish ID to 1.483 dia. + .0005 - .0000.
12. Remove material from upper face of swivel base until outer diameter matches outer diameter on flange boss on Back Jaw (part #2).
13. Break sharp edges.
14. Finish Nut Housing (part #4) by turning a short mandrel which will make a press fit in back of the Nut Housing. Then turn a sharp shoulder right where the curve ends so the nut will blend with the Back Jaw (part #2).
15. Turn diameter from shoulder to .6250 dia. + .0005 - .0000 for press or shrink fit into Back Jaw (part #2).



**Morrison and Marvin Model Builders Vise  
Machining Suggestions for Vise Swivel Base (Part #3)**

Step 3 continued

16. Finish End Cap (part #5) by chucking remaining piece of previously used (step 3) chucking lug. Turn to  $.5474 +.0005 - .0000$  OD for a press fit into Nut Housing (part #4) and machine a convex end to blend with curve of Nut Housing (part #4).
17. Part off to OA length of approximately .250. The exact length will have to be based on measurement of your vise. When End Cap (part #5) is pressed into place it should compress Nut Cushion (part #15) against Vise Nut (part #14) to eliminate backlash but allow self-alignment.



**Morrison and Marvin Model Builders Vise  
Final Assembly**

Step 4

1. Refer to sheet 7 and machine registers for Replaceable Jaws (part #16). Separate Front Jaw (part #1) and Back Jaw (part #2) and drill screw and pin holes per sheet 3 and 5.
2. Machine desired serrations on Replaceable Jaw (part #16) and cut in half. Interlock serrations together and drill both Replaceable Jaws (part #16) per sheet 15.
3. Counterbore for screws and mount in assembled vise with ends protruding from both sides. Tighten vise and machine sides of Front Jaw (part #1), Back Jaw (part#2), and Replaceable Jaws (part #16) at the same time.
4. Remove the replaceable Jaws (part #16) and heat treat as desired. Reassemble jaws to complete vise.