

## **Morrison and Marvin Mill Vise**

### **D15-1 Body Part # 1 Machining**

1. Carefully file the lip around the body to eliminate any burrs which would prevent it from laying flat.
2. File burrs from sides of body rails so it can be held between vise jaws.
3. Support on 4 each 1/8 parallels under body lip. Pad jaws with thin cardboard.
4. Tighten securely in vise, being careful not to spring the vise rails, and skim cut bottom just enough to cleanup.
5. Using a scrap plate on table, clamp base, bottom down, loosely so it can be adjusted. The casting rails will probably show a slight taper so indicate on outside of rails and equalize to best possible position. This step is important is insure the bearing housing is aligned with the pivot hole in the X axis.
6. Determine centerline and set X0, Y0 on centerline and cast hole.
7. Ream cast hole with 3/16 endmill to ensure accurate hole for drill to follow.
8. Drill 15/64.
9. Ream .2510, this will be X0, Y0 for other operations.
10. Drill 1-72 tap drill two places on Y0. Do not tap the holes at this time.
11. Skim cut top of body just enough to cleanup.
12. Drill 11/64 two places on X0.
13. Drill 1/8 two places on X1.169.
14. Place casting upside down on parallels under machined rails. Center X0, Y0 on hole and pad and shim vise jaws so tap drill holes are also on centerline. Again be careful not to spring rails as it will affect the flatness of the base when relaxed.
15. Face mill bottom to .250 thickness.
16. Counter drill two places 1/8 holes drilled in step 13 with 7/32  $\phi$  with counter bore or endmill.
17. Drill and Tap 1-72 two places on X0.
18. Tap 1-72 two places, holes drilled in step 10.
19. Cut keyways 4 places.
20. Remove all burrs.

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21. Mount body on fixture plate as shown on sheet 17.
22. Set fixture plate with casting attached on parallels in vise.
23. Face Mill top of rails to finished height, leave allowance for grinding if desired.
24. Cut 3/32 keyway in top of rails.
25. Use 3/16 endmill cut inside rails to finished width.
26. Use 1/16 endmill to extend cut by bearing until it blends with the previously machine surface inside the rails.
27. Use #406 woodruff key cutter on Y0. Cut underside of guides to thickness until cutter marks inside of bearing support.
28. Clamp fixture plate with body vertical in vise with bearing up. Square and find exact center of plate.
29. Indicate on face of top rail and move to bearing center.
30. Drill 15/64.
31. Ream .2500.
32. Face area .438  $\phi$  for collar until cast surface just cleans up.
33. Reverse assembly so bearing is down and use long counter bore to machine bearing housing.
34. Break all edges.