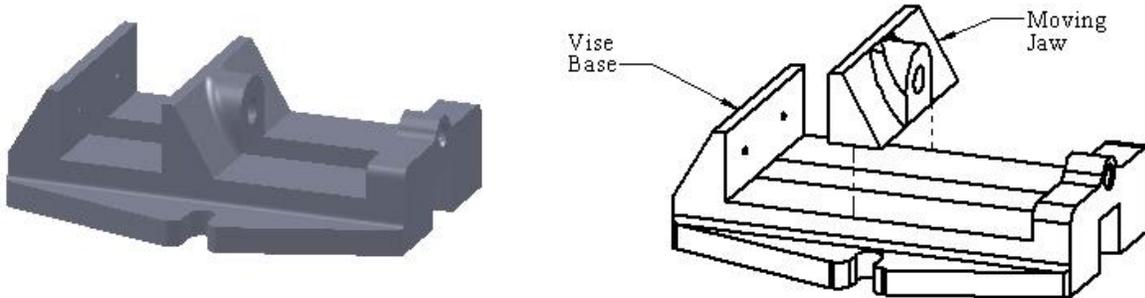


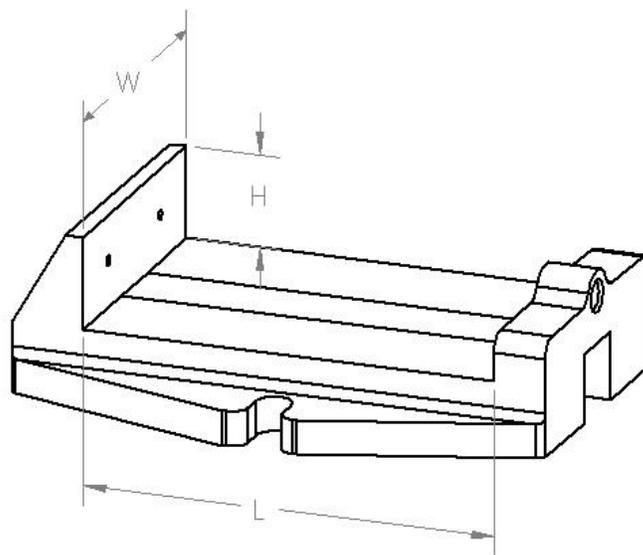
Solid Modeling Workshop

In this workshop you will be modeling a (perhaps poorly designed) machine vise.

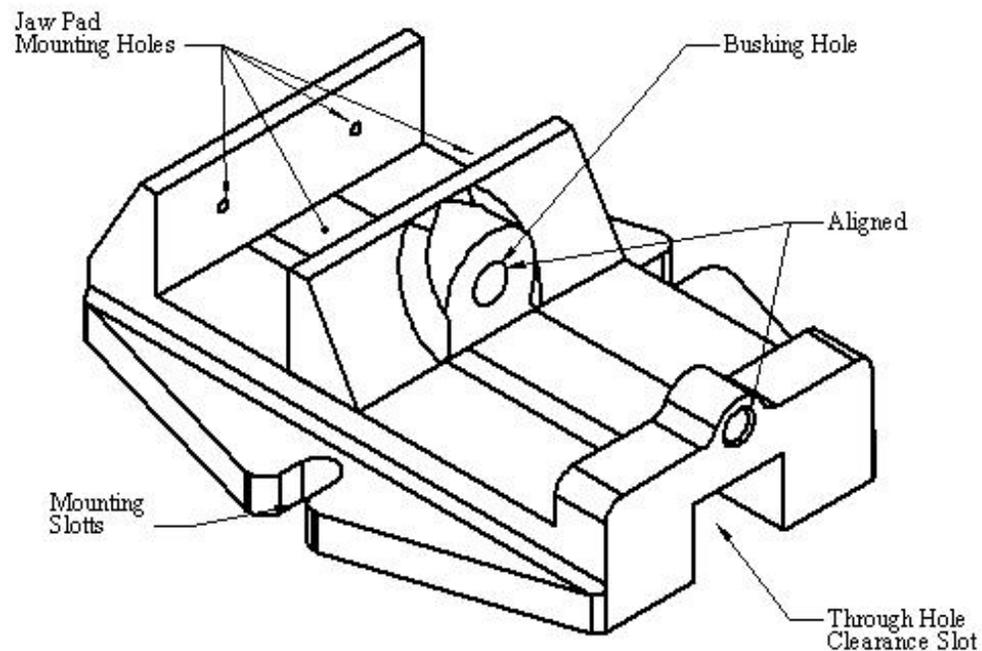


The goal of this workshop is to capture design intent with a solid model. Suppose this general vise model will be used for several different sizes of vise and the clamping width (W) is the governing independent variable. Using the dimensions provided, you need to create an assembly containing two entities: a vise base and moving jaw that incorporates the bulleted design intent points so, as the clamping width dimension of the vise changes, the criteria in all bullet points are satisfied. Additionally, the moving jaw should be properly and fully constrained (but not over-constrained) to facilitate faster rendering/solving; however, your mating scheme should contain one, well-labeled, mate that when suppressed allows the moving jaw to slide in the “L” dimension for motion analysis.

- The clamp length (L) is 1.5 times the clamp width (W)
- The clamp height (H) is $1/3$ times the clamp width (W)



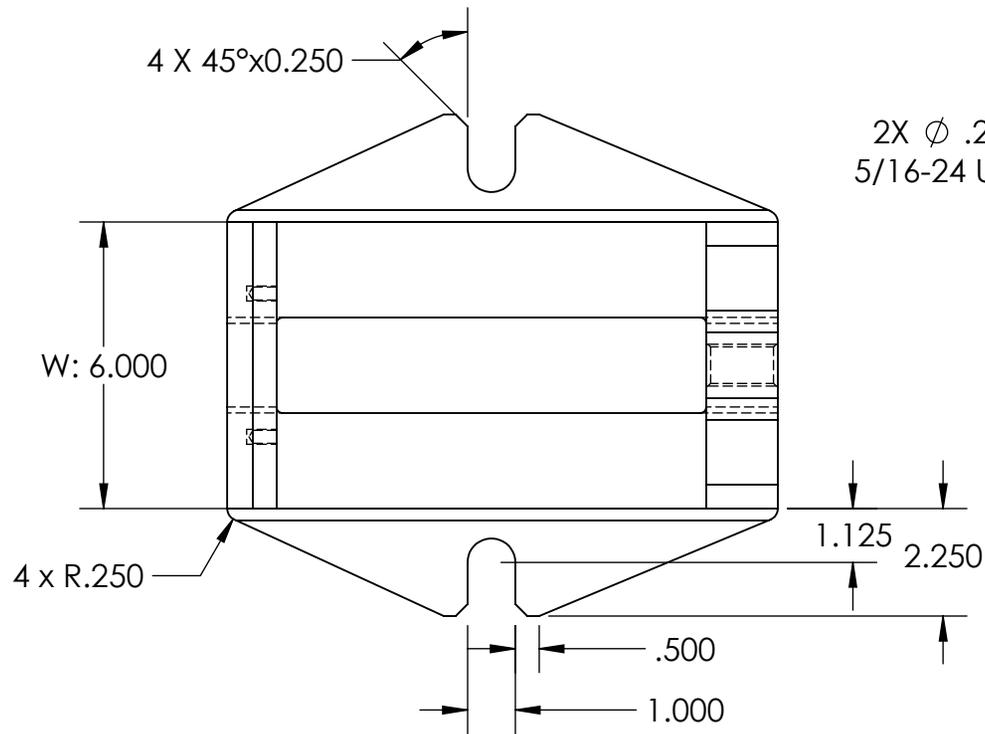
- The bushing hole in the moving jaw is centered both vertically and horizontally with respect to the moving jaw and aligned with the threaded hole in the back of the vise.
- The threaded holes for the Jaw plate are centered vertically and always $1/4$ times the clamp width (W) from the outer edge of the jaw.
- The through hole clearance slot is $1/3$ times the clamp width (W)
- The mounting slots are centered in the working volume (i.e. located symmetrically around the dimension L)
- Other than the additional features for the bushing hole, the dimensions of the moving jaw match those of the fixed jaw (height, width, thickness, angle, etc.)
- The bending stiffness of the jaws should remain approximately constant
- Fillets should be included and of appropriate size to avoid stress concentrations
- Other dimensions not covered in the design intent should remain fixed and either equal to the dimensions provided in the drawings below, or sufficiently robust to allow the model to regenerate for any width dimension in the 4-10" range.



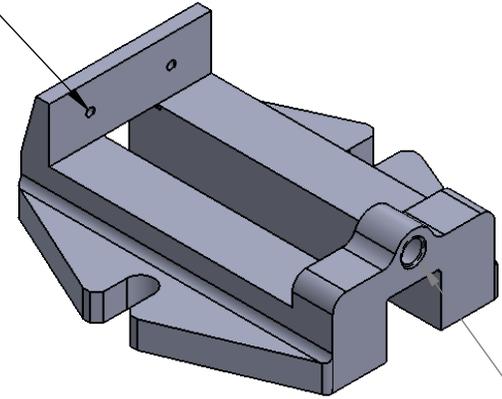
To evaluate (grade) your model:

- The width dimension in your model will be modified between 4" and 10" and the list of design intents must remain intact
- The moving jaw will be check for proper constraints.

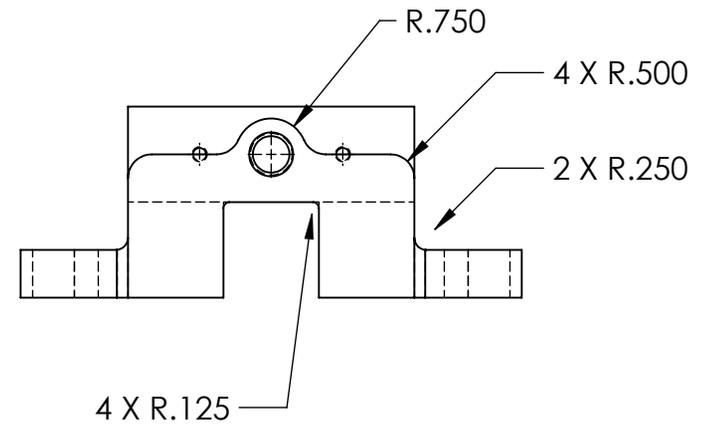
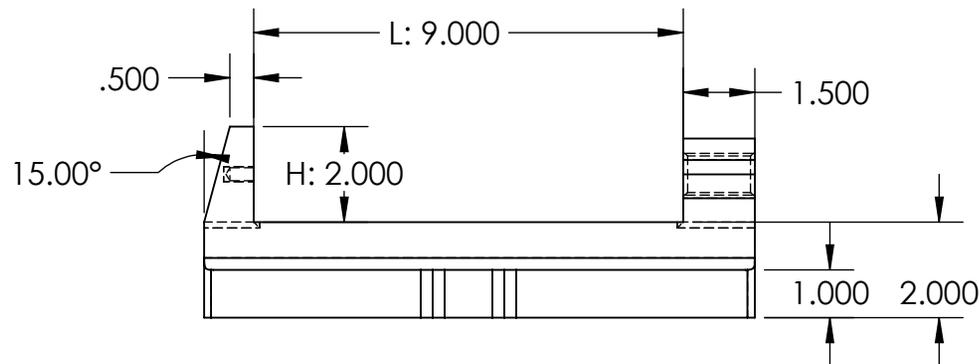
NOTE: These are not good examples of fully defined engineering drawings. In fact these drawings don't even fully define the part, but the given dimensions combined with the design intent provide enough information to create the solid models.

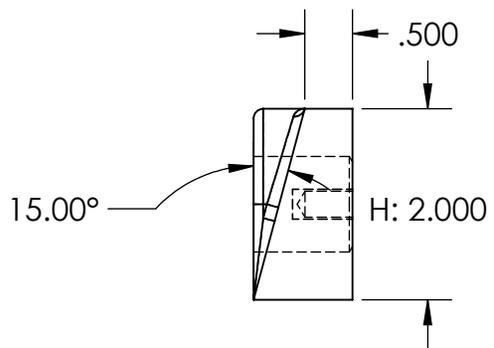
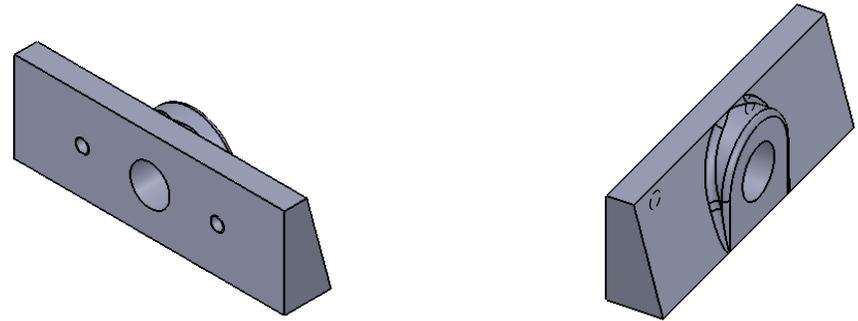
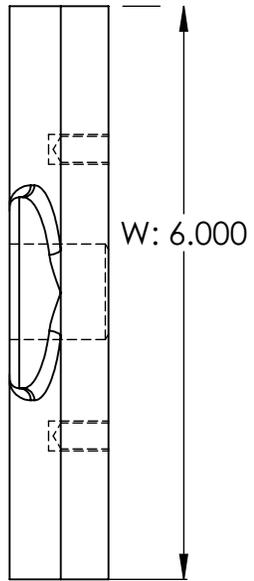


2X ϕ .272 ∇ .500
5/16-24 UNF ∇ .630



ϕ .77 THRU
7/8-9 UNC THRU
✓ ϕ .93 X 82°, NEAR SIDE
✓ ϕ .93 X 82°, FAR SIDE





2X ϕ .272 ∇ .500
 5/16-24 UNF ∇ .630

ϕ 1.000 ∇ 1.000

