

The following instructions guide you through the installation of either the Regular Front Vise (70G08.01) or the Large Front Vise (70G08.02).

The first step is to determine the placement of the vise and size of the jaws. Depending on your bench, minor alterations or the addition of spacers may be required. The installation of the vise is then a

matter of spotting and boring the holes for the guide rods and the lead screw, and mounting the vise squarely to the bench. A template is provided for spotting the guide rod and lead screw holes. Although these instructions have taken into consideration the many types of benches, every situation is different. We suggest that you acquaint yourself with these instructions prior to installation.

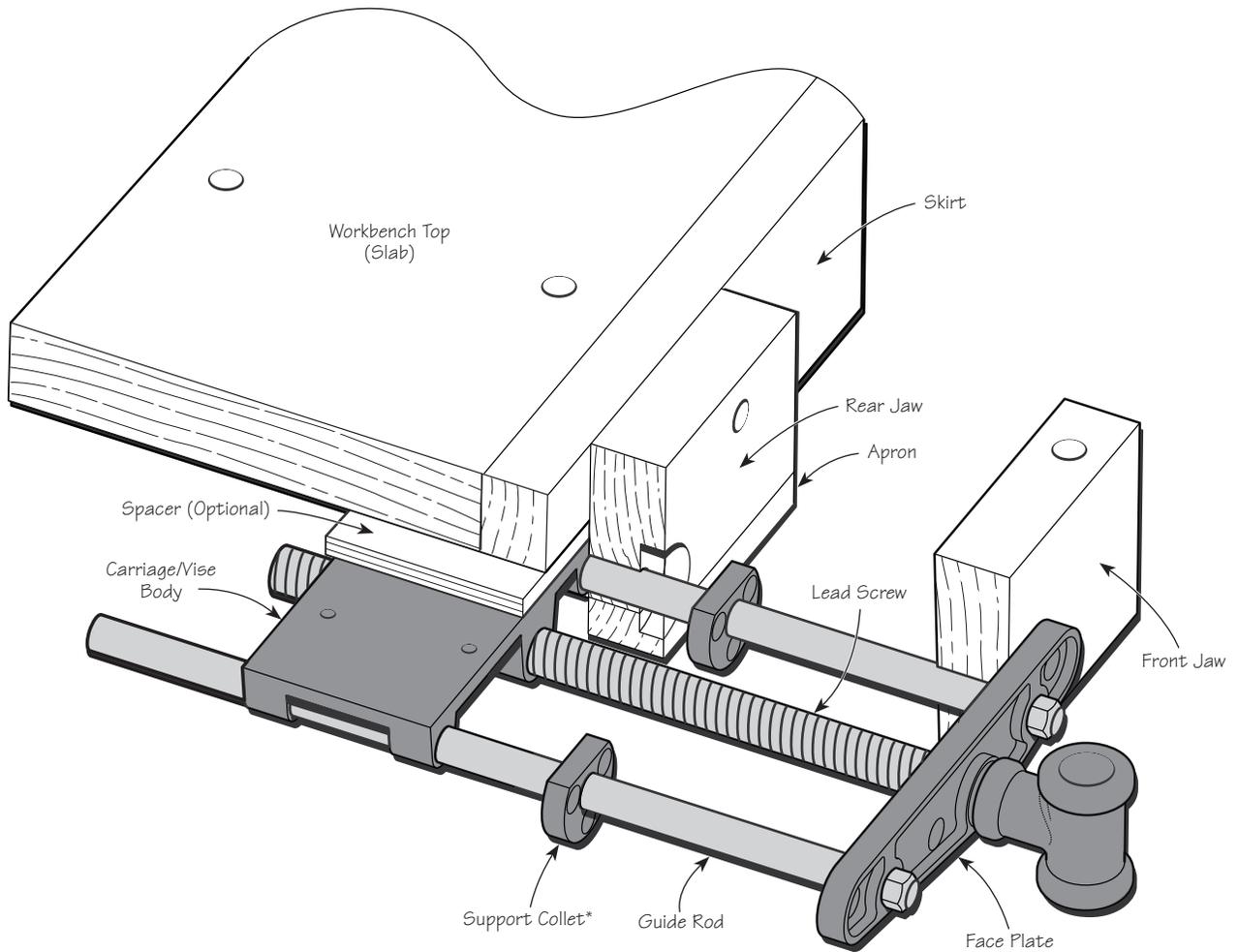


Figure 1: Vise components.

*Support Collets are supplied only on Large Front Vise (70G08.02)

General Notes

⚠ Important: The position of the vise should be determined before attempting to attach it to the workbench. Doing so will not only help to determine the length of the jaws, but also reveal any interference with bench components. See Rear Jaw Configurations and Jaw Size & Placement.

- A minimum thickness of 1 1/2" is recommended for the workbench top to ensure there is sufficient material for the mounting hardware provided with the vise.

- Unwind the vise to separate the carriage from the vise front assembly (lead screw, guide rods, and face plate). Clean the vise of any surface grease and rust preventative.
- Since installing the vise requires repeated insertion and removal of the lead screw and guide rods, we suggest that a handle be made and installed to the tee prior to mounting the vise. Use a piece of 1 1/8" dia. by 10" to 12" long dowel with end caps to prevent it from falling out (or use 05G12.03, optional handle).

Regular Front Vise (70G08.01)

Tools Required:

- Drill Press
- Hand Drill
- 7/32" Drill Stop
- 1/8" Bit
- 7/32" Bit
- 21/64" Bit
- 1/2" Bit
- 3/4" Bit
- 1 1/8" Saw Tooth Bit or Expansion Bit
- 5/8" Wrench
- 7/16" Socket and Wrench
- Hammer/Mallet
- 2 Bar Clamps (= width of bench to rear jaw clamping face)
- 2 Large C-Clamps
- Bench Hold-Down (Optional)

Hardware Required:

Qty.	Description
6	1/4" x 1 1/2" Lag Screws
6	1/4" Flat Washers

Materials Required:

Qty.	Description
2	Min. 1 5/8" thick close-grained hardwood (e.g., maple, birch) 3 1/4" wide* by 12" to 15" long <i>*One piece may be 1 3/4" min. if configured as shown in Figure 2.</i>
1	1 1/8" dia. by 10" to 12" long dowel, plus end caps (or 05G12.03, optional handle)

Large Front Vise (70G08.02)

Tools Required:

- Drill Press
- Hand Drill
- 7/32" Drill Stop
- 1/8" Bit
- 7/32" Bit
- 7/64" Bit
- 9/64" Bit
- 15/64" Bit
- 21/64" Bit
- 1/2" Bit
- 3/4" Bit
- 1" Bit
- 1 1/4" Saw Tooth Bit or Expansion Bit
- 2 5/16" Saw Tooth Bit or Expansion Bit
- 1" Wrench
- 7/16" Socket and Wrench
- #3 Square-Recess Screwdriver
- Hammer/Mallet
- 2 Bar Clamps (= width of bench to rear jaw clamping face)
- 2 Large C-Clamps
- Bench Hold-Down (Optional)

Hardware Required:

Qty.	Description
5	1/4" x 2" Lag Screws
5	1/4" Flat Washers
9	#14 x 1 1/2" Flat-Head Screws

Materials Required:

Qty.	Description
2	Min. 1 5/8" thick close-grained hardwood (e.g., maple, birch) 3 3/4" min. wide* by 18" long (or longer if using as a full-width end vise) <i>*One piece may be 2 1/4" min. if configured as shown in Figure 2.</i>
1	1 1/8" dia. by 10" to 12" long dowel, plus end caps (or 05G12.03, optional handle)

Rear Jaw Configurations

Figures 2, 3 and 4 show the three most common configurations for mounting the vise to your bench. The choice of which you should use is largely dictated by how your existing bench is made.

2: On a slab bench that does **not** have a skirt, a rear **half** jaw may be added to the underside of the bench so that a sufficiently tall, continuous edge forms the half jaw. This half jaw also helps distribute clamping loads. The rear jaw is normally the same length as the front jaw. The spacer is used to increase throat depth and is optional.

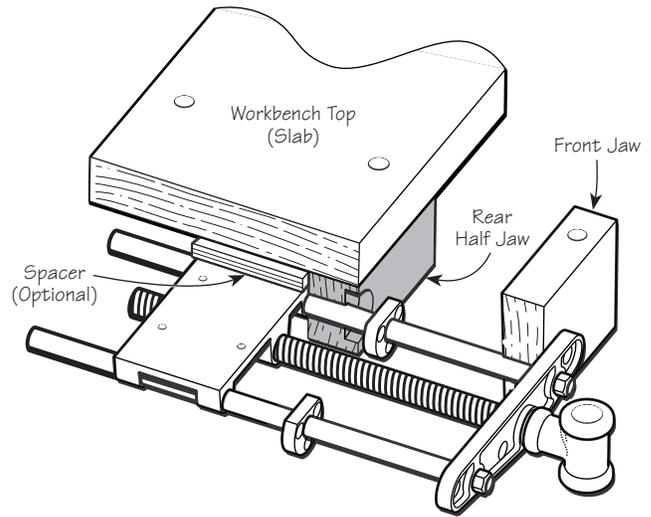


Figure 2: Bench with rear half jaw and no skirt.

3*: This configuration is for a bench that does **not** have a skirt. By making the rear jaw a single continuous piece over its entire height, the possibility of the rear half jaw (in Figure 2) shifting when clamping an object is eliminated. The disadvantage of adding a rear jaw to the edge of the bench is that clamped workpieces will be further from the edge of the work surface. If this is of concern, the rear jaw may be made the full length of the bench, in effect creating a skirt, and widening the bench in the process. The spacer is used to increase throat depth and is optional.

**Note: The step-by-step instructions that follow illustrate this jaw configuration, with the Large Front Vise installed.*

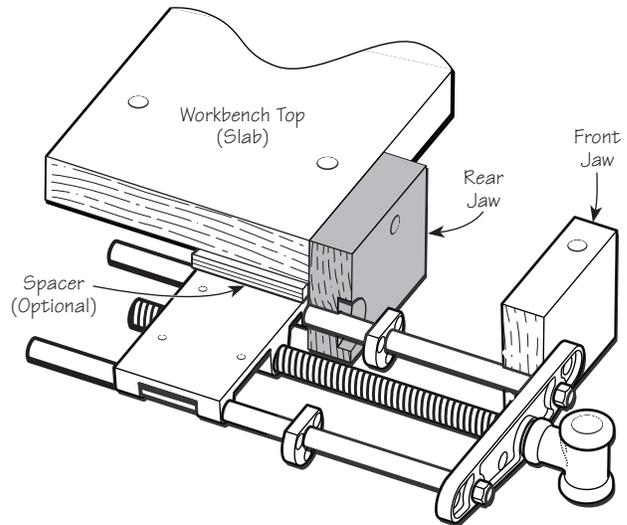


Figure 3: Bench with rear jaw and no skirt.

4: This configuration shows the vise mounted to a bench that already has a skirt. If the skirt overhangs the bottom side of the bench by more than 2 1/4" (for 70G08.02) or 1 3/4" (for 70G08.01), then you should refer to Figure 3, whereby the skirt will form the rear jaw. If the skirt is not tall enough, then you have two choices. Either glue a strip of wood to the bottom side of the skirt (creating an apron, see Figure 1) to achieve this overhang, or add a rear jaw as shown. When adding a rear jaw, a notch can be cut in the skirt to allow the vise carriage to rest right up against the rear jaw (as shown), maintaining maximum capacity of the vise.

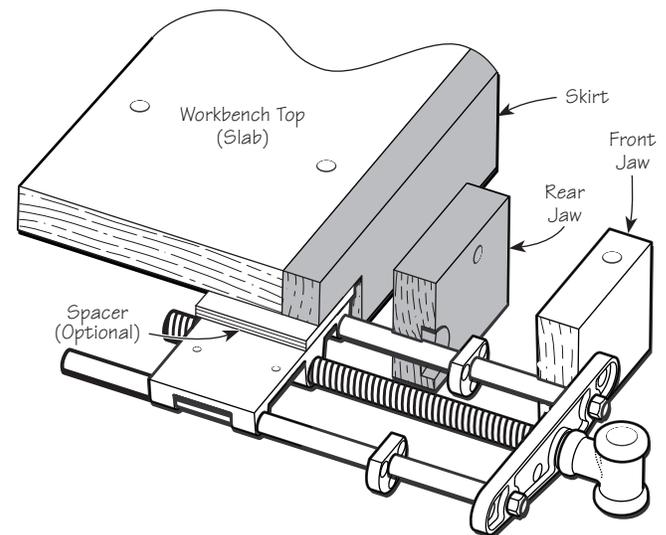


Figure 4: Bench with skirt and rear jaw.

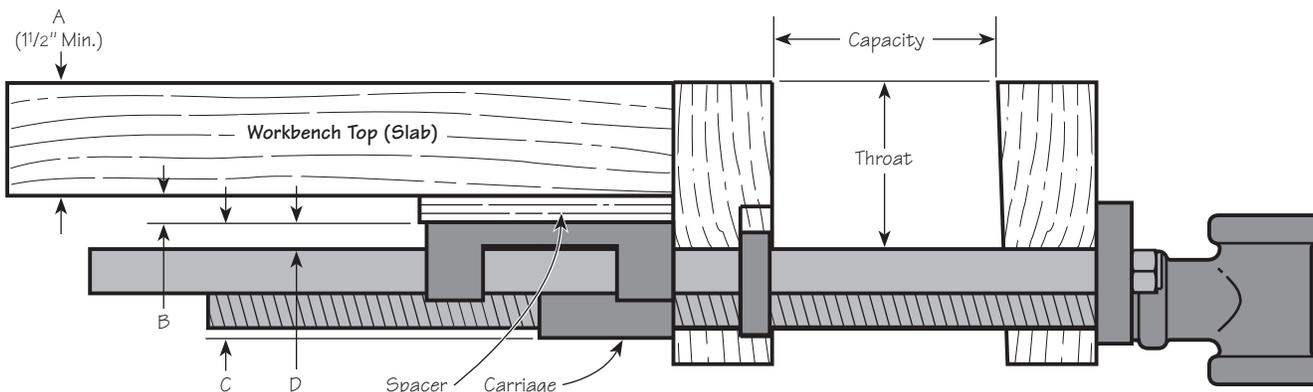


Figure 5: Vise capacity and throat.

Jaw Size & Placement

For strength, vise jaws should be made of a close-grained hardwood such as maple or birch.

Jaw Thickness

- The minimum recommended wooden jaw thickness is 15/8". This ensures the jaws are securely mounted and allows 3/4" dia. vertical dog holes to be drilled in the front jaw.

Jaw Length

- Across the flat face of the carriage, scribe a reference line between the guide rods and parallel to them. Note that the lead screw for the Large Vise is off center. Measure over 4" from the straight side for the Large Vise (70G08.02) carriage and over 3 9/16" for the Regular Vise (70G08.01) carriage. Continue to scribe this line up the front and rear of the carriage.
- With the bench placed upside down, roughly position the vise carriage on the underside of the bench where you would like it to go (see Figure 6). It is common to place the vise near a corner so that one end of the jaws will be flush with the end of the bench. This allows for crosscutting a clamped workpiece without interfering with the bench. Check for interference of the carriage mounting holes, the guide rods and the lead screw with any dog holes or the placement of the bench leg. Transfer the center line of the carriage onto the bench to determine the length of the jaws. A good length for the Regular Front Vise (70G08.01) is 12" to 15". For the Large Front Vise (70G08.02), it may be up to 18" long. Racking problems may be experienced if jaws are longer than 18" (see *Vise Racking*).

Note: One situation where you may want to make the jaws longer is for a full-width end vise. On benches up to 24" deep, you can place the vise at the end of the bench. With this set-up, your jaws can be as long as your bench is deep. This set-up offers a long clamping surface and, with rows of 3/4" dia. bench dog holes in the bench top and front jaw, it also provides a clamping capacity between bench dogs that is nearly equal to the length of your bench, plus the vise's clamping capacity.

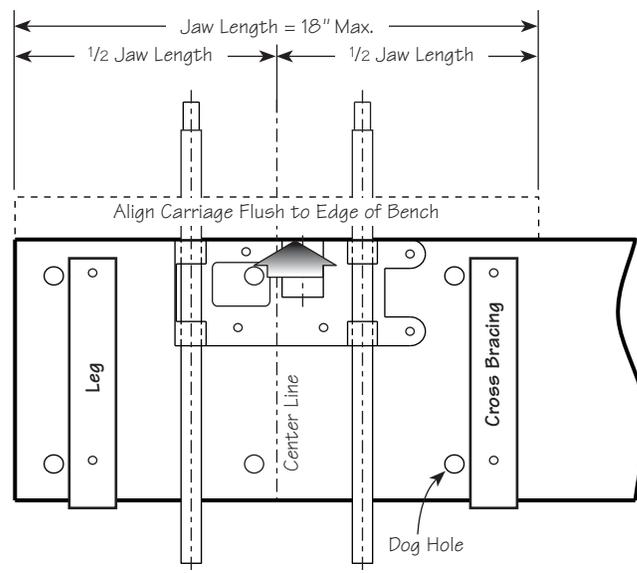


Figure 6: Positioning carriage to determine jaw length.

Jaw Height

- To determine the minimum jaw height (or composite jaw height if your situation is as per Figure 2) and resultant throat depth without the use of a spacer, refer to Figure 5 and complete Table 1 (in pencil). As with any vise, the closer the work can be clamped to the lead screw, the less stress is placed on all its parts. However, the vise is strong enough to withstand a deeper throat. If you wish to increase the throat depth, a spacer may be added between the carriage and underside of your bench top. This will increase your throat depth accordingly. An optimum throat depth is 3" to 4". Adjust your entries until you are satisfied with the throat depth and jaw height.

Note: If your jaw configuration matches that of Figure 2, your rear half jaw height will be equal to the calculated jaw height less your bench top thickness.

Table 1: Calculating jaw height.

Vise Components	Regular Front Vise 70G08.01	Large Front Vise 70G08.02
A) Bench Thickness (1½" min.)		
B) Spacer (optional)		
C) Vise Carriage Height	1¾"	2¼"
D) Vise Carriage to Guide Rod Height	½"	½"
Min. Jaw Height = A + B + C		
Throat = A + B + D		

Once you have determined the proportions of your jaws, you can cut them to size, unless you are making a full-width end vise. In this case, cut the length of the jaws 1" oversize to allow for a ½" trimming allowance on each end. This will be trimmed later (*step 16*).

If a spacer will be used, it should equal the length and width of the carriage. With the carriage flush to the edges of the spacer, spot the carriage mounting holes into the spacer and drill these as ½" dia. clearance holes.

Instructions

- Carefully fold the appropriate template along one of the dotted lines so the distance from the fold to the top edge of the guide rods matches your final throat calculation. The lowest line represents a throat of 2" (plus a 1/16" planing allowance). Lines are further spaced 1/8" apart for your convenience.
- Cut two small windows in the template (at the top and bottom of the center line) as indicated.
- Mark a vertical center line on what will become the clamping face of the **rear** jaw. Place the template on the clamping face of the rear jaw, with the fold flush to the top edge and the center line on the template lining up with the center line of your jaw. Using a sharp punch, mark the centers of the three holes. (*Note: If your jaw configuration matches that of Figure 2, you will have to temporarily affix the rear half jaw to the underside of the bench before performing this operation.*) Also mark the centers for any hardware you intend to use to mount the jaw to the bench.
- For the Large Front Vise (70G08.02) **only**: On the clamping face of the **rear** jaw, drill two counterbores for the guide rod support collets using the guide rod center marks. Use a 25/16" saw tooth bit or an expansion bit, to a depth of 9/16". (*Note: The Regular Front Vise (70G08.01) does not come with support collets.*)

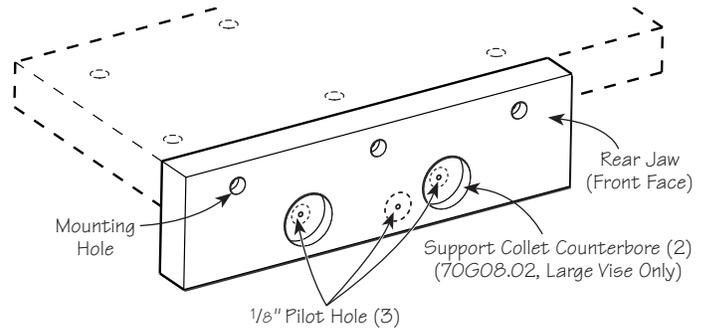


Figure 7: Counterbores and pilot holes.

- On a drill press drill three 1/8" pilot holes through the front face of the **rear** jaw where the guide rod and lead screw centers are located. At this time you should also drill and counterbore for any hardware required for mounting the rear jaw to your bench. If using lag screws, remember to make the counterbore diameter large enough to accept a washer and the appropriate drive socket. Do **not** attach the rear jaw at this time.
- Clamp the front and rear jaws together, aligned as they will be once they are fully assembled, as shown in **Figure 8**. Ensure that what will be the top and ends are flush. *Note: If your jaw configuration matches that of Figure 2, the rear half jaw will have to be offset from the top of the front jaw accordingly.* Place the jaws in a drill press and, picking up on the 1/8" pilot holes from the **rear face** of the **rear** jaw, bore the guide rod and the lead screw clearance holes through both pieces. **Table 2** shows the clearance hole diameters. These diameters have been rounded off to the nearest 1/8" oversize. To reduce tear-out, support the underside of the front jaw with a piece of scrap wood.

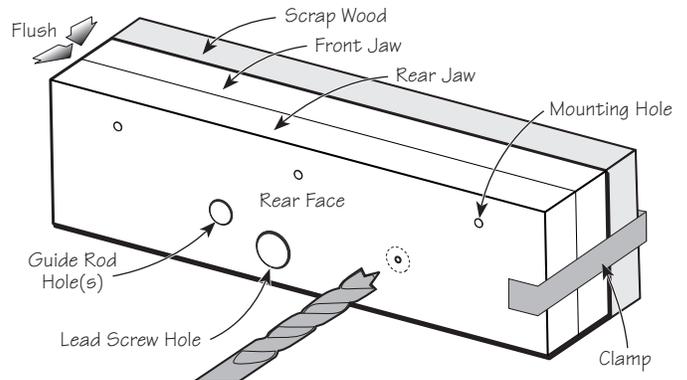


Figure 8: Clearance holes.

Table 2: Guide rod and screw clearance hole diameters.

Vise	Guide Rod Hole Dia.	Lead Screw Hole Dia.
70G08.01 Regular Front Vise	¾"	1 1/8"
70G08.02 Large Front Vise	1"	1 1/4"

- Attach the rear jaw to the bench using large (#14) screws or 1/4" lag screws, additionally gluing if desired. Leave a 1/16" planing allowance by keeping it slightly proud of the top of the bench. (*Note: If your jaw configuration matches that of **Figure 2**, ensure that the clamping face of the half jaw is flush with the front edge of your bench.*)
- Flip the bench upside down.
- Place the carriage and any spacer(s), on the underside of the bench, with the lead screw boss toward the rear jaw as shown in **Figure 9**.

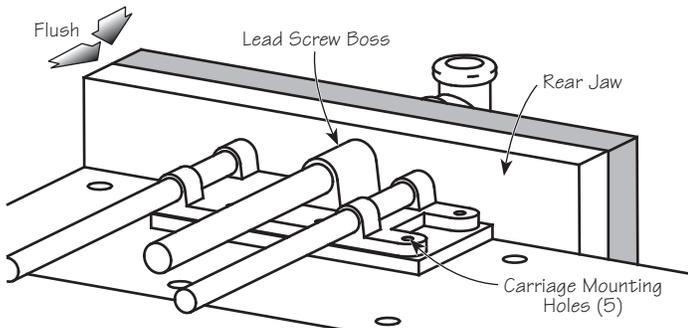


Figure 9: Mounting the carriage.

- Place the front jaw (then the collets for 70G08.02) onto the guide rods. Insert the front assembly through the rear jaw and thread it into the carriage. Bring the carriage tight against the back face of the rear jaw. With the jaws open a few inches, center the guide rods in their clearance holes. Clamp the carriage in place. A bench hold-down works well for this. Close the vise until snug.
- Tap the **front** jaw so that the ends and top edge are flush with the rear jaw (or bench top if your jaw configuration matches that of **Figure 2**). Firmly tighten the vise. Check that the carriage is in contact with the **rear** jaw.
- Spot the carriage mounting holes into the bench using a 21/64" drill bit. (**Do not** attempt to drill the center mounting hole for the large vise as it will be obstructed by the lead screw. You will be instructed to do so at *step 20*.) Use a 7/32" bit and a drill stop to drill the holes 1 1/4" deep. When setting the depth of the drill stop, remember to account for the carriage thickness of about 3/8". Bolt the carriage to the bench with the lag screws and washers. Tighten firmly but **do not overtighten**, or the bolts may snap.
- Spot the face plate holes, on the front jaw, using a 21/64" drill bit. Use a 7/32" bit and a drill stop to drill the pilot holes 1 1/4" deep. When setting the depth of the drill stop, remember to account for the face plate thickness of about 9/32" (for 70G08.01) or 7/16" (for 70G08.02). Screw the face plate to the front jaw.
- Flip the bench right-side up. Check the alignment and action of the vise. Open the vise at least halfway. Does it operate smoothly? Close the vise to about 1/16". The clamping faces should be parallel to one another. See *Troubleshooting* for remedies.

- If you are making a full-width end vise, now is the time to scribe a line at both ends of the rear jaw where it intersects the front and rear of the bench. If you intend to drill 3/4" dia. bench dog holes in the **front** jaw to align with any rows of similar holes in the bench top, now is the time to mark these as well.
- Remove the vise front assembly, then the front jaw from the vise front assembly. **Do not remove the carriage or rear jaw from the bench.** If required, trim the jaws to length and drill any desired 3/4" dia. bench dog holes. Plane a 2° taper on the **clamping** face of the **front** jaw, so that it is thinner at the bottom than at the top, as shown in **Figure 10**. This will ensure that pieces clamped in the vise will always be gripped at the top of the jaws. This can be achieved by using a hand plane or a belt sander. Or, by temporarily adding a scrap of wood to the opposite side (using glue or double-sided tape), the jaw can be passed through a thickness planer.

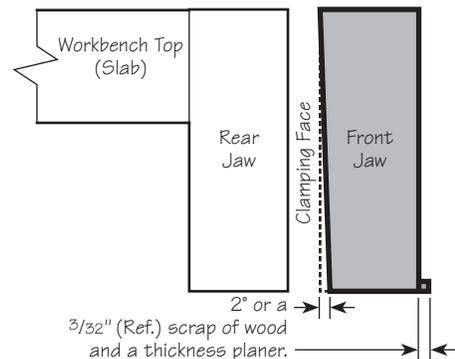


Figure 10: Front jaw taper.

If installing the Regular Front Vise (70G08.01), proceed to *step 21*.

- Place the guide rod support collets over the guide rods, with the countersunk holes facing out. Feed the front assembly (minus the front jaw) into the carriage until the guide rods are fully engaged with the carriage. Orient the flat of the collets toward the top of the bench.
- Spot the three holes in each collet using a 15/64" drill bit. The drill bit may have to be lightly spun by hand due to the proximity of the guide rods. This should not require much effort, as only a centerpoint need be established.

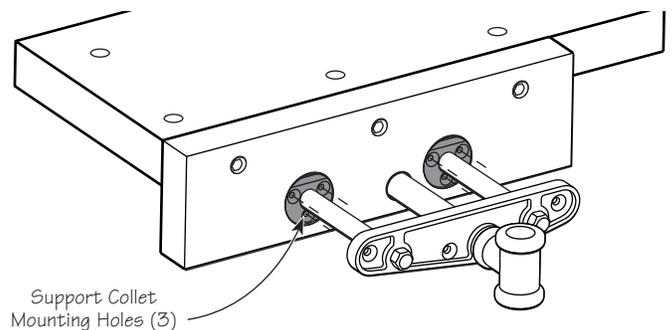


Figure 11: Spotting the support collets (front jaw removed).

19. Remove the vise front assembly and the collets. Drill appropriate pilot holes for #14 × 1½" flat-head screws (9/64" in hardwood, 7/64" in softwood), 1¼" deep. Mount the collets with the #14 flat-head screws.
20. Transfer the fifth carriage mounting hole that was obstructed by the lead screw, drill the appropriate pilot hole and install the remaining lag screw (see *step 12*).
21. Slide the front jaw over the guide rods and screw it to the face plate with #14 flat-head screws.
22. Thread the vise front assembly into the carriage. See *Troubleshooting* if there are any difficulties. Check the alignment and action of the vise.

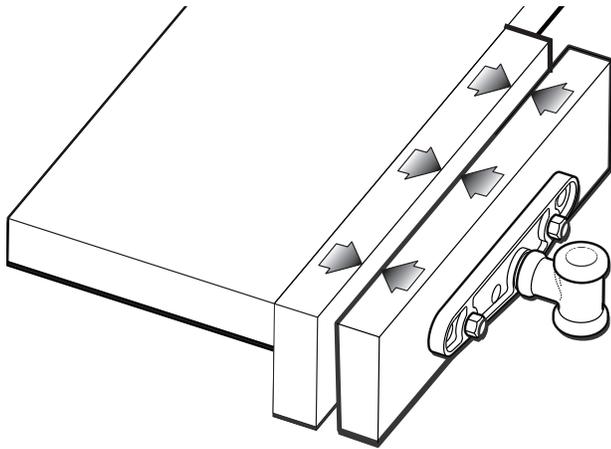


Figure 12: Jaw alignment.

23. When all is satisfactory, close the vise and plane the top of the jaws flush with the top of the bench.
24. Apply a dry-film lubricant to the guide rods and lead screw.

Vise Racking

When a piece of wood is clamped into one side of the vise, the other side of the vise will toe in. This is known as “racking”. Racking creates uneven pressure on the workpiece, often allowing it to spin or slip. Racking also creates a strain on the vise. To prevent excessive racking, try to clamp workpieces in the central area of the vise, or place a wedge or stepped block in the opposite side of the vise to equalize the pressure.

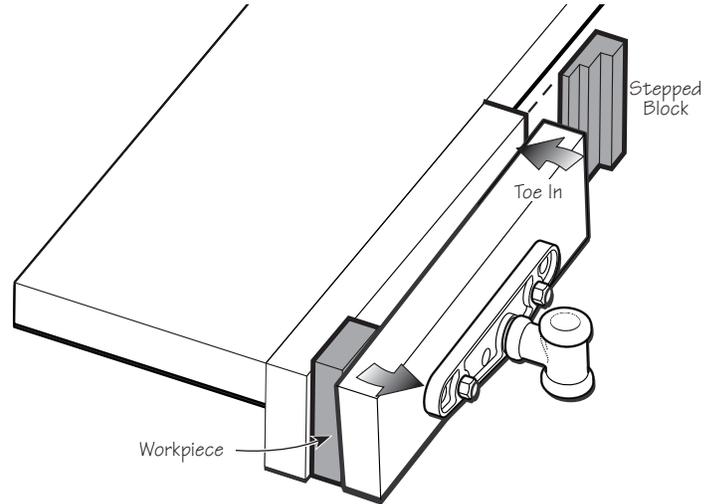


Figure 13: Vise racking.

Troubleshooting

Problem	Solution
Jaw faces are not parallel. Vise is open at one side and closed at the other.	Loosen the carriage mounting screws. Close the vise until the top edge of the jaws just make contact. Place a flexible spacing material (e.g., a ¼" rubber hose) between the bottom edges of the jaws to take up the space due to the tapered front jaw's inner face. Firmly tighten the vise. Tighten the carriage lag screws. Do not overtighten. Test action and alignment.
Vise is very stiff to open or close. T-handle binds with carriage.	(70G08.02) Check for paint in the support collet bores. Apply a drop or two of light machine oil at the T-handle/carriage interface. If this does not help, remove the spring pin from the tee with a straight punch – 3/16" for 70G08.01, 5/16" for 70G08.02. Check for dirt or other debris. Reassemble and re-oil. Note: When reassembling, ensure that the cross-drilled hole in the tee and main screw are aligned properly. Failure to do so may cause the tee to sit crooked, or damage either hole.