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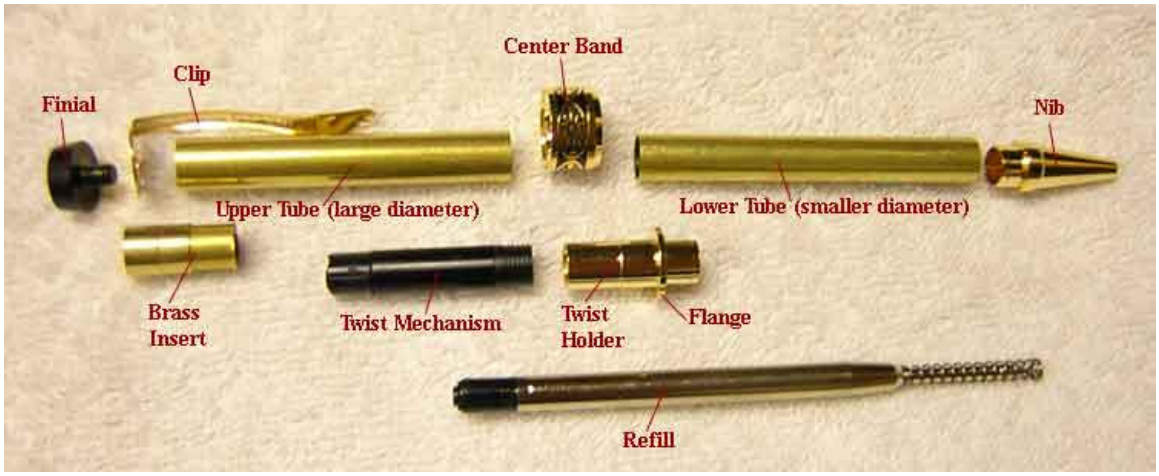
Berea Hardwoods Co., Inc.
Pen Instructions



# Perfect Fit Convertible Ballpoint Pen/Pencil (Berea #58051/B-*xxx*)

Needed: Mandrel-B
Drills-O and 11/32”
Bushings-14B
Wood size- 5/8” x 5/8”




1. Cut the wood the length of each brass tube giving a little extra length for the facing of the blank after the tubes have been glued in.
2. Drill the upper blank, the shorter one, with the 11/32” drill bit. This will be the larger bit.
3. Drill the lower blank, the longer one, with the letter O drill bit. This will be the smaller bit.
4. Polish the brass tubes with sandpaper. This can be done by hand or on a power machine such as a belt sander. The purpose of the sanding is to clean off the oxidation and roughen the tube so that the glue will have a better adhesion surface.
5. Plug the ends of the tubes with the material of your choice. Some use base wax or Play Dough or even a slice of potato. Just push the ends of the tubes into a thin

section of the material. This will form a plug to keep the glue from getting into the tube.

6. Clean the tube, after plugging, with acetone or alcohol on a rag.
7. Prepare your glue. I recommend 15-minute epoxy. Be sure to mix it thoroughly. (A Post-it Note Pad makes an excellent mixing place. When you are finished just tear it off and throw it away.) Polyurethanes or CA's can be used, but they each have their drawbacks.
8. Place some of the epoxy into the blank using a small piece of dowel or other small stick.
9. Roll the appropriate tube in the epoxy.
10. Insert the tube with a twisting motion until it is almost in the material blank. Then use the dowel to push it until the end is flush with the blank. Use the stick to rake off the excess glue even with the blank and the tube.
11. Push the brass tube through the blank until the other end is flush with the blank. Then rake the glue flush with that end. Now push the tube back into the blank until the tube is equidistant between both ends of the blank.
12. Move it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
13. If you are using CA glue, the wait is much shorter. When using polyurethane the wait will be about 24 hours.
14. When the glue has cured, use a hobby knife to remove the plugs from the ends. It is also a good idea to clean the tubes with a brass gun cleaning brush to remove any glue that may have gotten into the tubes.
15. Using a barrel trimmer of the proper size, face off the ends of the blanks until you can just see bright brass. STOP facing at this point. Your pen's proper operation is dependent on having the proper length tubes. This facing operation can also be done with the proper jig and a disk or belt sander.

## Turning the Blanks


1. Assemble the blanks on the mandrel with the right bushings in the right place. The right bushing can be found by comparing the diameter of the bushing to the piece of hardware that will be placed in that place. For instance, the bushing that is the same size as the clip will fit on the end of the blank that will eventually become the top of the cap. The approximate diameters of each bushing are given above.
2. Tighten the tailstock before tightening the blanks on the mandrel. This will center the mandrel first. Then tighten the nut that holds the blanks.
3. Turn the blanks to the desired contour making sure that the area next to the bushing is turned to the size of the adjacent bushing.
4. After turning the blank, sand the surface in progressive steps until you get to 440 grit.

5. After sanding with the 440 grit, stop the lathe and measure 1 7/8" from the cap clip end and mark. With a sharp parting tool cut a groove all the way to the brass tube on the cap center band end. This will receive the center band of your pen.
6. Continue sanding with Micro Mesh through 12000 grit. Apply the finish of your choice and polish.
7. Remove the blanks from the mandrel.

**Pen Assembly**

1. Press the nib into the smaller end of the longest blank.
2. Press the twist holder into the other end. DO NOT press on the end of the holder. Use a press block made by drilling a hole, a 5/16" will do, in a piece of wood. Slip the longer end of the holder into the block for pressing. This will allow the pressing force to be on the flange and not the thin threaded end.
3. Place the chosen insert into the barrel. If a pen is chosen be sure the spring is in place on the refill. The pencil mechanism will need not spring.
4. Place the twist mechanism over the insert and screw into place.
5. Check the operation of the mechanism.
6. Lay this piece aside for a moment.
7. Press the 3 piece center band onto the exposed brass tube.
8. Press the brass insert into the other end of the brass tube until it is flush.
9. Place the finial threads through the clip and screw into the brass insert.
10. Slide the cap on the mechanism.
11. Check for correct operation again.

**Changing Inserts**

1. Unscrew the cap from the pen.
2. Remove the present insert and replace with the chosen one. When removing a pen insert be sure that the spring comes out also. When replacing with a pen insert be sure the spring is in place.
3. Screw the cap back on the pen.

Now, isn't that a beautiful piece of work!

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