

Berea Hardwoods Co., Inc. Pen Instructions

Carbara Ballpoint Pen (Berea #0401-xxx-x)



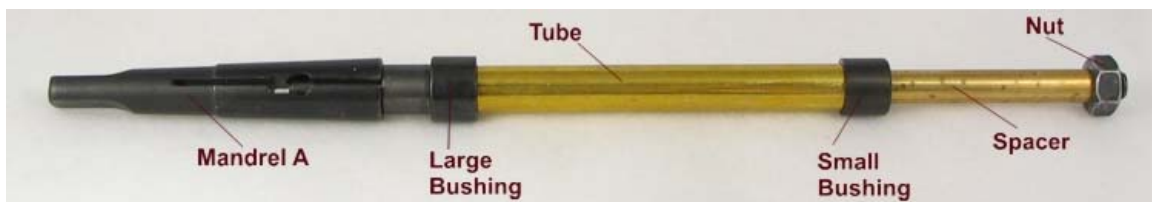
Needed: Mandrel-A
Bushings-16A
Drill-V
Wood Size-3/4" x 3/4" Square x 3 1/2" Long

Preparing the Material Blanks

1. Cut the material blank a little longer, approximately 1/4", than the pen tube.
2. Drill the blank through the center, lengthwise, with a V bit.
3. Polish the brass tube 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.
4. Plug the end of the tube with the material of your choice. Some use base wax, a dental product, 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.
5. Clean the tube, after plugging, with acetone or alcohol on a rag.
6. Prepare your glue. We recommend two-part epoxy glue that is available in all hardware stores. Use a fast drying type, one hour or less. 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 and thick flexible CA's can be used, but they each have their drawbacks.
7. Place some epoxy into the blank using a small piece of dowel or other small stick.
8. Roll the tube in the epoxy.
9. Insert the tube with a twisting motion until it is almost in the material blank. Then use the dowel to push it in until the end is flush with the blank. Use the stick to rake off the excess glue even with the blank and the tube.

10. 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 an equal distance from both ends of the blank.
11. Move it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
12. If you are using CA glue, the wait is only about 60 seconds. When using polyurethane the wait will be about 24 hours.
13. 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.
14. **Not cleaning out all glue from the tubes is the most common cause of pen failure. BE CERTAIN that all dried glue is removed from inside the tubes before proceeding.**
15. Using a barrel trimmer of the proper size, face off the ends of the blank until you can just see the bright brass end of the tube. 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.
16. **Not having the proper tube length is the #2 cause of pen failure.** Sanding, on a disk sander, using a jig to hold the tube square with the disk, is a more sure way of getting the proper length. It should be tried if you have any doubt as to your abilities to square the material with the barrel trimmer.
17. Another good method of squaring the ends of the blank is to turn the blank until it is just round. Using a miter gauge to maintain the blank perpendicular to the sanding disk, just touch the ends to the disk. Once the blanks are square and you can see the ends of the tubes brighten, then return the blanks to the mandrel and finish the turning until the desired contour is accomplished.

Turning the Blanks

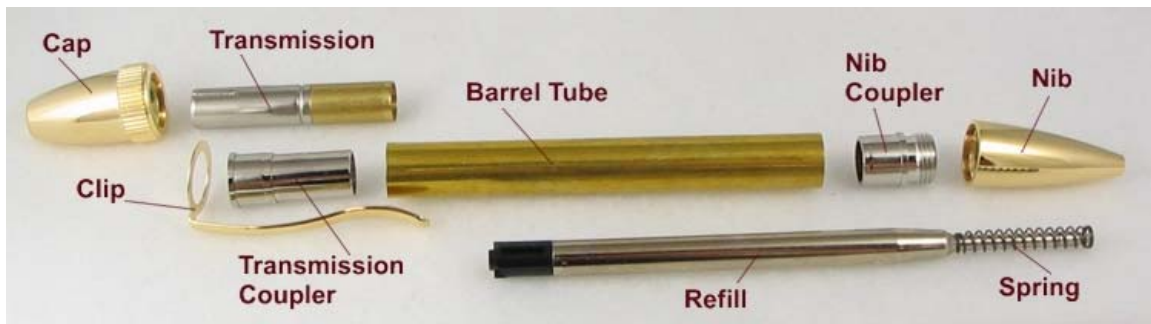


Since this pen uses a very short blank you will have to use a spacer of some sort to fill the extra mandrel space. You could make one out of wood by drilling a 1/4" hole in a small piece of wood or you could use a series of 7 MM bushings to take up the space. Of course, if you have an adjustable mandrel then simply adjust it for the appropriate length.

1. Assemble the blank on the mandrel using 16A bushings. With these bushings it is necessary to be particular with the order they go on the mandrel. The larger bushing is the Cap end bushing and the smaller one is the Nib end bushing.
2. Tighten the tailstock before tightening the blanks on the mandrel. This will center the mandrel first. Then tighten the nut that holds the blank.
3. Turn the blank 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 400 or 500 grit.

5. If a higher polish finish is desired continue sanding with Micro Mesh through 12000 grit.
6. Apply the finish of your choice and polish.
7. Remove the blank from the mandrel.

Assembling the Pen



Pen Parts Diagram

Please refer to the Pen Parts diagram

The third most common error resulting in a non-functional or damaged pen is the misalignment of the parts when pressing them in place. The use of a good pen press or small arbor press is recommended, but it can be accomplished with a good “C” clamp and much care. When pressing in the various parts, by any means, BE SURE that the parts are straight and in line with the blanks. If the part is cocked or otherwise misaligned, at the very least, a poor fitting pen will result. At the worst, you may have a pen that is not usable. Exercise caution here!

One other word about pen parts. Occasionally, you will encounter parts that are a little loose fitting. This can be corrected by using a SMALL spot of glue, usually CA, on these parts before pressing them home.

1. Press the Nib Coupler into the smallest end of your blank.
2. Slide the Clip ring over the smallest end of the Transmission Coupler all the way to the top. This will have the clip and the Transmission Coupler extending the same way and parallel.
3. Press this assembly into the largest end of the blank.
4. Press the transmission into the transmission coupler, **brass end first**, until it reaches the shoulder inside the coupler. It will stop at the shoulder.
5. Insert the refill into the pen through the Nib Coupler inserting the black end first. Make sure the spring is in place as shown.
6. Now screw on the Nib until it is tight.
7. Check the extension of the refill tip with it fully extended. It should stick out about 1/8” past the nib. If it doesn’t then carefully press the transmission a little deeper checking the tip extension each time you press until the extension is satisfactory.
8. Push the cap over the exposed end of the Transmission and your pen is done.
9. Check for proper operation of the mechanism.

Copyright©-2006 Robert W. Keyes