

Berea Hardwoods Co., Inc.
Pen Instructions

Flat Top Push Pen (Berea # 4160/JB-xx-x)



Needed: Mandrel-B
Bushings-4B
Drills- 11mm, "O"
Wood Size- 5/8" x 5/8"
Barrel Trimmer Size (lower barrel only) TCS-073

There are 2 methods for turning this pen. While one method may be suitable for one craftsman the other may fit someone else better. Read both methods and choose the one that best fits your style.

Preparing the Material Blanks

Method 1. Cut the upper blank for the cap exactly 1 ¼" long. Drill this blank with the 11mm bit. This will leave some brass tube exposed to receive the center band. Cut the lower barrel blank the same length as the smaller diameter brass tube leaving a little extra for squaring off.

Method 2. Cut the upper blank for the cap the same length as the large diameter brass tube leaving a little extra for squaring off the blank. Drill this blank with the 11mm bit. Cut the lower barrel blank the same length as the smaller diameter brass tube leaving a little extra for squaring off.

1. 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.
2. Plug the ends of the tubes 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

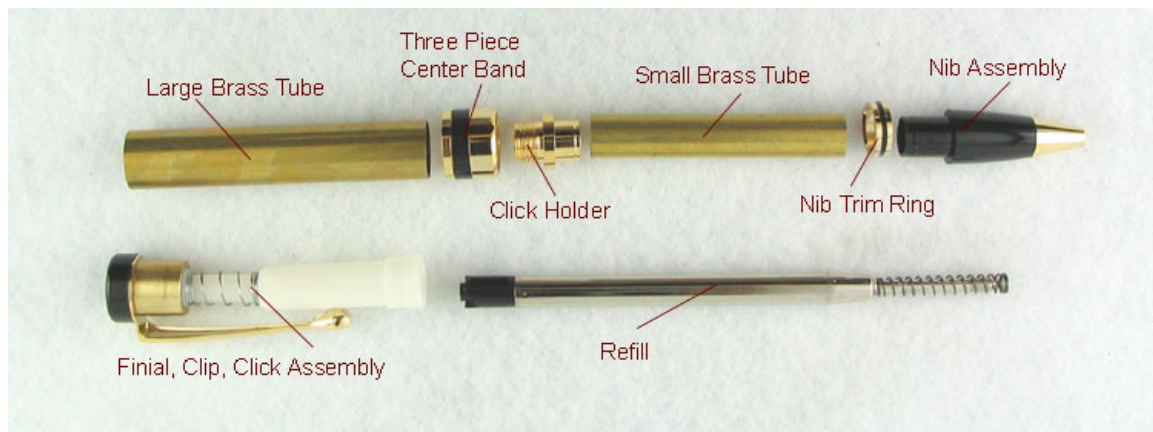
- tubes into a thin section of the material. This will form a plug to keep the glue from getting into the tube.
3. Clean the tube, after plugging, with acetone or alcohol on a rag.
 4. Prepare your glue. We recommend two part epoxy glue that is available in all hardware stores. Use a fast drying type, 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.
 5. Place some epoxy into the blank using a small piece of dowel or other small stick.
 6. Roll the appropriate tube in the epoxy.
 7. 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.
 8. 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.
 9. Move it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
 10. If you are using CA glue, the wait is only about 60 seconds. When using polyurethane the wait will be about 24 hours.
 11. 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.
 12. 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.
 13. Using a barrel trimmer of the proper size, face off the ends of the blanks 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.
 14. 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.
 15. 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



1. Assemble the blanks on the mandrel using the 4B bushings. Assemble as shown in the diagram above, using the 2 largest bushings on the cap and the 2 smallest on the barrel.
2. If using method #1, you will need to use the extra, large bore, bushing to slip over the exposed tube so that the bushings will tighten on the mandrel.
3. Tighten the tailstock before tightening the blanks on the mandrel. This will center the mandrel first. Then tighten the nut that holds the blanks.
4. 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.
5. If using method #2, you will now need to turn a tenon on the end of the cap blank to receive the center band.
6. Measure exactly 1 ¾" from the clip end of the blank and make a mark.
7. Using a sharp parting tool remove the wood, down to the brass, from the mark to the opposite end of the tube that you measured from.
8. One word of advice. The small blank must fit inside the tube of the large blank on the end where you have turned the tenon. It must be able to slide inside the tube about ½" without interference. This will allow the push/click mechanism to work properly.
9. After turning the blanks, sand the surface in progressive steps until you get to 400 or 500 grit.
10. If a higher polish finish is desired continue sanding with Micro Mesh through 12000 grit.
11. Apply the finish of your choice and polish.
12. Remove the blanks from the mandrel.

Assembling the Pen



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. Place the nib trim ring on the black end of the nib assembly.
2. Press this assembly into the appropriate end of the small blank using grain and pattern matching techniques as necessary.
3. Press the click holder into the other end leaving the threaded end exposed.
4. Place the refill, with the spring in place, into the barrel.
5. Lay this assembly aside for a few minutes.
6. Assemble the 3 piece center band as desired and press it onto the exposed brass tube on the cap blank.
7. It is a good idea here to use a piece of rolled sandpaper to smooth out the inside of the brass tube where the center band is so that it will not scratch the finish on the lower barrel. It is also wise to check this fit at this time to be sure that the cap will fit easily over the lower barrel.
8. Press the finial, clip, click assembly into the other end of the cap.
9. Now, gently place the click assembly over the exposed refill and screw it onto the threads of the click holder until tight.
10. Check the operation of the pen. One push on the cap should expose the writing tip and a second push should retract it.
11. Now look what a really beautiful pen you have made.

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