

Berea Hardwoods Co., Inc.  
Kit Instructions

## **Berea Hardwoods 45 Caliber Pen (1408/B-xx)**



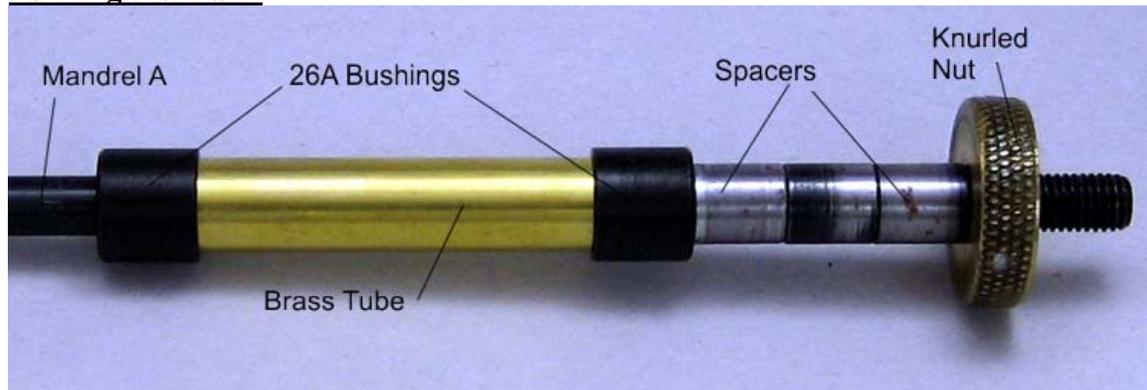
Needed: Mandrel-A  
Bushings-26A  
Drill-10 mm  
Wood Size- 3/4" x 3/4"

### **Preparing the Material Blank**

1. Cut the material blank, there is only one, a little longer, approximately 1/4", than the LARGE pen tube.
2. Drill the blank through the center, lengthwise, with a 10 mm 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 ends 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 tube 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 appropriate 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 tube.
14. Not cleaning out all glue from the tube 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 Blank



1. Assemble the blank on the mandrel using the 26A bushings. With these bushings it is not necessary to be particular with the order they go on the mandrel. They are both identical. Use a spacer take up the extra mandrel space.
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. **IMPORTANT: Turn the blank straight from bushing to bushing. Turning any type of contour will interfere with operation of the pen. Check and make sure that the metal barrel slides over the finished blank \*\*BEFORE\*\* removing it from the mandrel to assure there is enough clearance for it to slide over the blank easily.**
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



Please refer to the Pen Parts diagram above.

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 adaptor into one end of your blank.
2. Press the threaded transmission adaptor into the other end.
3. Now press the nib into the nib adaptor. Lay this assembly aside for a moment.
4. Press the clip/transmission into one end of the metal barrel. **TAKE CARE HERE** that the notch in the clip adaptor/transmission is lined up with one of the smooth areas of the metal barrel. If this part does not fit in tightly you will need to use a small amount of CA glue, epoxy, or thread lock to hold it in place.
5. Now slide or press the decorative ring onto the other end of the metal barrel. If the ring is loose, a TINY amount of CA glue, epoxy, or thread lock will secure the ring. Let either of these set for a few minutes before proceeding.
6. Place the clip onto the clip bushing and press this into the clip adaptor/transmission. TAKE NOTE to be sure the clip is seated into the notch in the clip adaptor/transmission before pressing this home.
7. Place the refill and spring into the assembly that we laid aside.
8. Screw on the transmission/metal barrel and check its operation.
9. Wax and polish it up and you can sell it to an avid sportsman.

Copyright Robert W. Keyes 2014