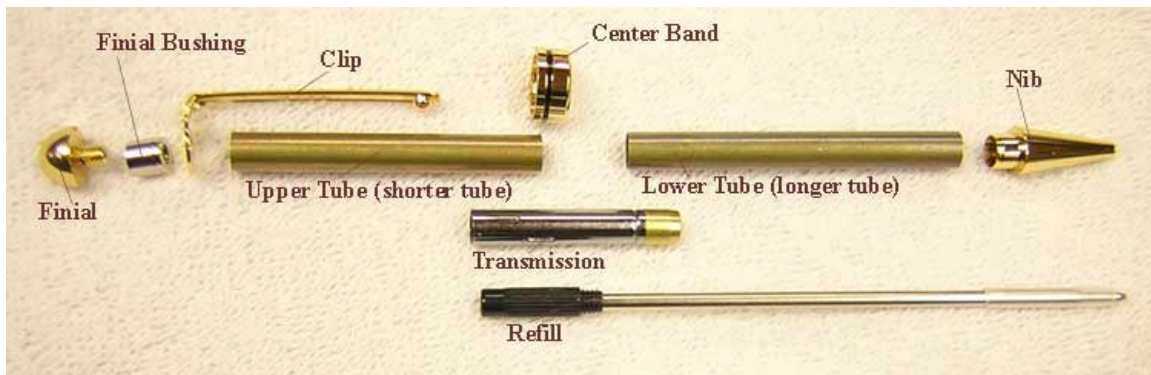


Berea Hardwoods Co., Inc.
Pen Instructions

7 MM Gold Top European Pen Kit (Berea #WCO-301-HP+C-1)



Parts Diagram

Needed: Mandrel-A
Bushing Set-10A
Drill-J or 7mm
Blank Size- 5/8" x 5/8"

Preparing the material blanks

1. Cut the blanks the length of each brass tube giving a little extra length for the facing of the blank after the tubes have been glued in. Drill each blank with the letter "J" drill bit.
2. 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.

3. 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.
4. Clean the tube, after plugging, with acetone or alcohol on a rag.
5. 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.
6. Place some of the epoxy into the blank using a small piece of dowel or other small stick.
7. Roll the appropriate tube in the epoxy.
8. 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.
9. 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.
10. Move it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
11. If you are using CA glue, the wait is much shorter. When using polyurethane the wait will be about 24 hours.
12. 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 or a rolled up piece of sandpaper to remove any glue that may have gotten into the tubes.
13. 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.
14. 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.
15. 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.
16. 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 right bushings in the right place. Place the second largest bushing on the mandrel first. Then, place the short blank on the mandrel.
2. Next, place the largest bushing on the mandrel and then the long blank.
3. Now place the smallest bushing on the end. Add spacers as appropriate and then the washer and nut.
4. Tighten the tailstock before tightening the blanks on the mandrel. This will center the mandrel first. Then tighten the nut that holds the blanks.
5. When turning the cap blank, the short one, turn the blank round to a diameter of 0.515". Now taper it to the diameter of the second largest bushing using the classic European contour. **DO NOT turn the other end of the short blank to the diameter of the bushing. Leave it at 0.515"**.
6. Measure from the edge of the blank, at the large end, back 0.240" and make a mark.
7. Turn a tenon on this end to a diameter of 0.412". Take this cut a little at a time. You don't want to undercut the tenon as this should fit the center band of the pen.
8. Try the center band on the tenon for fit and adjust as necessary. It should fit snugly.
9. If the band is a little too loose a drop of glue can be used to hold it tight.
10. After turning the blank, sand the surface in progressive steps until you get to 400 or 500 grit.
11. If a higher polish finish is desired continue sanding with Micro Mesh through 12000 grit.
12. Apply the finish of your choice and polish.
13. Remove the blanks from the mandrel.

Pen Assembly

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 center band onto the tenon you cut on the short blank. Again, if it is a little loose a drop of glue will snug it right up.
2. Unscrew the chrome finial bushing from the finial.
3. Press it into the other end of the short blank.
4. Attach the clip to this end by threading the finial stud through the hole in the clip and into the bushing.
5. Press the nib into the small end of the long barrel.
6. Press the transmission into the other end until about 13/16" remain exposed. It is best to "sneak" up on this, trying the refill in the mechanism until the appropriate amount, about 1/8", of the tip is showing when the transmission is twisted and when the tip is fully covered when the transmission is closed.
7. Install the refill.
8. Slide the cap over the transmission aligning the grain or pattern as desired.

Now, wasn't that all worth it!

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