

Berea Hardwoods Co., Inc.
Kit Instructions

LED Flashlight (Berea # LED-1203-xxx)



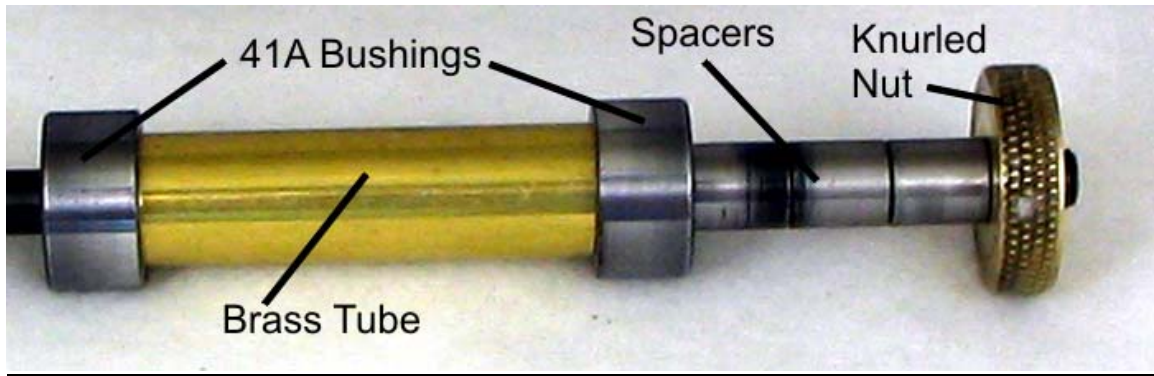
Needed: Mandrel-A
Bushings-41A
Drill-33/64
Wood Size- 3/4" x 3/4"

Preparing the Material Blank

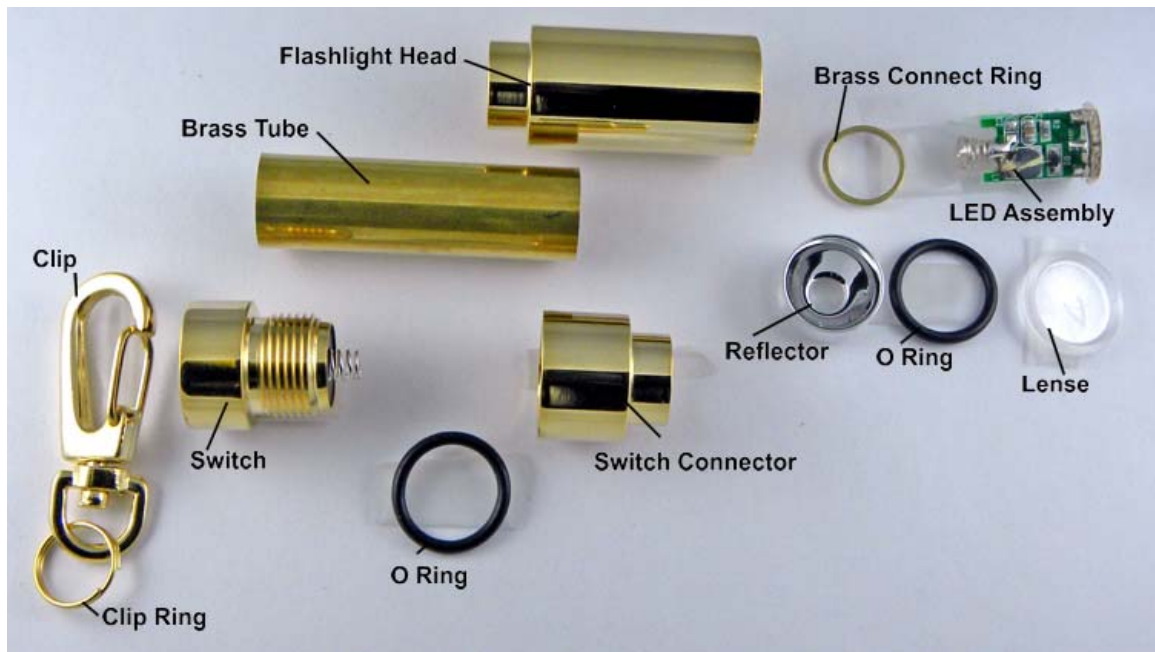
1. There is only one blank to cut for this kit. Cut the material blank a little longer, approximately 1", than the kit tube.
2. The drill hole is very large. We recommend drilling as follows. Drill the blank through the center, lengthwise, with a 3/8" bit. Then follow this pilot hole with the 33/64" bit. This will lessen the chance of splitting the blank.
3. Once the blank is successfully drilled then cut it to the length of the tube plus about 1/8".
4. 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.
5. 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.
6. Clean the tube, after plugging, with acetone or alcohol on a rag.
 7. 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.
 8. Place some 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 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.
 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 an equal distance from 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 only about 60 seconds. 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. Not cleaning out all glue from the tube is the most common cause of kit failure. **BE CERTAIN** that all dried glue is removed from inside the tube before proceeding.
 16. 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 kit's proper operation is dependent on having the proper length tube. This facing operation can also be done with the proper jig and a disk or belt sander.
 17. 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.
 18. 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 41A bushings. With these bushings it is not necessary to be particular with the order they go on the mandrel. They are both identical.
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 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.



Parts Diagram

Assembling the Flashlight

Please refer to the Flashlight Parts diagram above.

The third most common error resulting in a non-functional or damaged kit 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 kit will result. At the worst, you may have a kit 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. Push the Brass Connect ring into the head of the flashlight.
2. Carefully remove the LED from the plastic tube and the white protective paper also. Insert the LED assembly into the head with the spring going in first.
3. Next, seat the reflector, small end first, into the head making sure the LED is centered in the reflector hole.
4. Now place an “O” ring on top of the reflector.
5. Remove the lens from it’s protective plastic bag. The lens is beveled. CAREFULLY push or press the beveled end of the lens into the end of the head until it is flush, or just a little past flush, with the end of the head. It should rest on the O ring.
6. Press this entire assembly into one end of your finished blank.
7. Press the switch connector into the other end of the blank.
8. Push the other “O” ring into the connector.
9. Drop a AAA battery, not provided, into the flashlight + end first.
10. Screw on the switch assembly and test your light. It should burn brightly when you push the button on the end of the switch.
11. You will see a hole in the switch assembly. Thread the clip ring through this hole and then through the clip ring.
12. Your flashlight is ready for the dark of night!!

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