
EDWARDS MOUNTAIN WOODWORKS, LLC

fine handtool woodworking: creating and teaching in wood

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Taper Reaming for Bow Saw Pins

Taper Reamer. The hand reamer I have used is a 6 flute, straight taper reamer made by Brown and Sharp. You will need a No. 2 taper for the Howarth bowsaw or a No. 1 taper reamer for the Melhuish bowsaw (both 1/2" per foot). The cheapest source I have identified is at www.aircraft-tool.com, phone 800-248-0638. The cost is about \$38. For the handles of each bowsaw, the taper reamer is too long. Cut the reamer to length, where the final reamer diameter is just a bit less than the smallest diameter of the short end of the pins, and then grind it sharp and square on the cut end. This shortened reamer will thus ream both the handle holes and the arm holes. Note: this is hardened steel, so a hacksaw and file will not work here. Cut-off wheel from any big-box hardware store will work well. Install this in a 6" grinder, for example.

General Procedure for Using a Reamer. You will need to use the reamer with a tap wrench. These are available in any tap and die set or can be purchased from stores like Harbor Freight or Northern Tool or online from MSC Tools or McMaster-Carr. Do not use the reamer in a drill press, only ream by hand. The best technique to use a reamer is to hold the wrench handles with both hands, applying equal pressure straight down with moderate but not excessive force. Turn the handles 1/2 turn at each iteration, reposition your hands and turn again. As you get close to the final reamed dimensions, check your progress with a bowsaw pin with each 1/2 or even 1/4 turn.

Making and Reaming the Bow Saw Handles. Any tight straight grained wood would be suitable for handles, but boxwood is very often used. Some options might include dogwood or Osage orange. Walnut, maple and ebony are also good choices. Cut your blanks to a length suitable for turning on the lathe (i.e., at least 1" longer than the final length), but leave the blank square or rough at this point. Mark the centers of the blank as well as possible, and on the lathe, drill the blanks to 9/32" (the small diameter of the brass pins). Drill both handles to a depth that is about 1/2" longer than the short end of the bow saw pin (e.g., drill to about 2 1/4" for the Howarth bowsaw). Fix the blank straight up in a shoulder vise on your bench. Ream the holes using a hand reamer until the pin is just shy of seating completely (a skinny 1/8" or so). Return to the lathe and turn the handle to final dimensions, using a cone center for the hole. You may want to square up the hole end of the blank so that the face is square to the hole. The handle is then reamed carefully to fit the pin so that the flange seats against the end of the handle with a light tapping. Coat the pin with hide glue or epoxy and tap it into place. Additionally, you can drill a cross pin hole through the minor diameter of the handle and tap in a small brad cut to length to lock the pin and handle together. I would do this on the drill press with a specially made vee-block to hold the handle securely. Choose a bit and a brad so that the brad fits in tightly. You may need to carefully file the brad after it is tapped in for a smooth fit.

Drilling and Reaming the Bow Saw Arms. The goal is to seat the handle so that it is locked in by the taper and not by abutting the pin flange against the arm. This is a "trial and error" process until the gap between the arm and the handle flange is 1/8" to 1/4". If you taper too deeply and the flange makes contact with the arm, take a few plane shavings from the outside face of the arm until the handle seats properly. You will correct for this when you make the stretcher. To begin, layout the points for drilling square around both faces of the bow saw arm, and center these points across the thickness of the arm. Ideally, use a marking gauge set first to scribe the distance up from the bottom edge of the arm. Reset the gauge to scribe down the centerline, and reference the marking gauge from the same face of the arm to make both marks. In this way, both marks on the arm will be in a straight, square line. With a brace and bit, drill a 7/64" or as much as a 9/32" hole halfway in from both faces of the arm to meet in the middle. Use a square to aid in sighting and keeping the drill square. Ream from the outside face towards the inner face of each arm. Carefully check the fit of the pin as you come close to the final fit. This will happen very quickly, so caution is the word here. Make sure that the bowsaw arms are sized in width so that the pins will protrude enough to allow a blade to be attached. With the blade attached to each arm at the pins, measure the distance between the opposing bow saw arm faces. This is the shoulder-to-shoulder length of the stretcher. If you intend to have a curved shoulder mortise and tenon for the stretcher, be sure to allow for the extra length accounted for by the curvature, as well as for the two tenon lengths.