



OK, now you've got your first bow tillered, you've shot a bunch of arrows through it, and it's survived. *Congratulations - you're already ahead of many first-time bowyers.* Our sample bow for these build-alongs was at this stage a couple of weeks ago; 69.75" NTN, pulling 42# @ 28", with perfectly even tiller (top and bottom limb equidistance from the string) and shooting nicely. I'd even pulled it to 29" for insurance without damage, and string follow (after relaxing) was only an inch from where it started.

Here you face a choice - accept what you have, (proceeding now to final sanding, grip and arrow rest shaping and finishing) or try to improve it. I strongly recommend the former - years from now you'll be able to proudly show your very first bow, and compare it to later ones.

But some folks will swing for the fences. Participants in this year's session wanted higher draw weights, so I decided to see what some common tweaks would do to our sample bow.

My first step was to steam-bend a reflex into the limb tips. Since a curved limb is stronger than a straight one, this can add 3-5# of draw weight. But it's important to remember, we're not adding more wood to the limb, so the existing wood will be stressed more.

I use a simple wooden form originally shaped on a belt sander (A band saw would do a better, flatter curve but I've not bothered so far). The limb tip is inserted under a clamp at the end of the form so that as the wood becomes more pliable, it will bend down over the form. Then I use aluminum foil or ducting insulation to form a sleeve around the limb tip, and stick the end of a wallpaper steamer hose into it. After 20-30 minutes the wood begins to bend by itself, I give it a little more time then bend the wood gently down into position and clamp it, leaving it overnight before doing the other limb.

At this point I could have tested the draw weight, but decided not to because

- (a) the tips were too damp for reliable measurement and would have lost much of their reflex.
- (b) the limbs might be damaged by the extra stress.

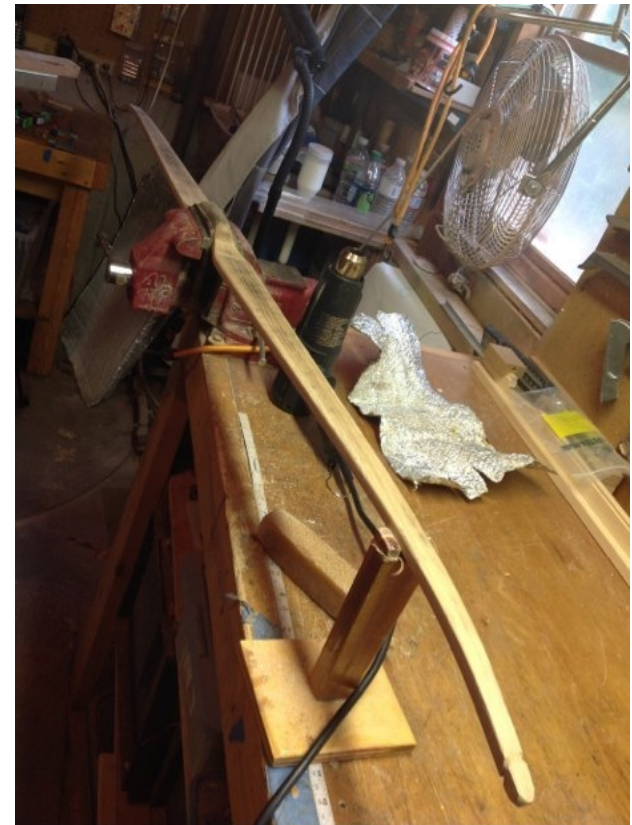
Heat-treating the belly now could resolve both problems, so that's next.



Heat-treating bow limbs is an ancient practice explored and popularized again by Glen St. Charles in "TBB" - the Traditional Bowyer's Bible. White Oak and Maple are two woods that he found responded very well, so I decided to strengthen our example bow's limbs to handle the extra stress of reflexed tips.

The goal of heat-treating the limb is different than bending; instead of using oil and ensuring the limb is evenly heated through (as we did when straightening the staves) here we want to get the limb surface hot just to the point of browning, but not charring. I use the same heat gun, but work it only on the belly surface a small section at a time until the wood gives off a chocolatey odor, and starts to brown.

Here's the example bow with both limbs heated. After heating, the bow was probably far too dry (with heat driving out moisture) to bend safely. This is a good place to remind you that unfinished wood bows in new England need about 9-12% moisture content (which they will stabilize at after some weeks at 40-50% humidity) to bend properly. Higher moisture content leads to a weaker draw and increased string follow, lower moisture makes the wood stronger but brittle and subject to cracking. I know this because I broke lots of Winter bows before getting adequate humidity in my shop.



In this case I rubbed the bow down with a damp cloth, and let it sit (with 50%-80% MC air blowing over it) for a couple of rainy days. But rather than waste the drying time, I went ahead with another draw-weight-increasing tweak, "piking" or shortening the limbs.

My trial nocks were 69.75" apart, so I decided to shorten the bow to an even 68" before adding tip nocks. For longbows, reducing each tip by 1" should add about 5# draw weight, with the reflex perhaps somewhat less, I'm guessing on this bow perhaps 2-3# more.

So to sum up: I've now reflexed and shortened the tips, and heat-treated the belly. Next step is to see how much draw weight has increased, and whether the bow can take it.



I can certainly attest that with these changes, the bow was a whole lot harder to brace than before. As usual, I did 20-30 pulls before putting the bow on the scale. At 15” of draw, it pulled about 23#, 2-3# more than earlier. A rule of thumb tells us that the draw at 28# is usually about twice the draw at 15”, so this suggests a final draw weight of 45-47#, a bit less than expected.

More importantly, I began to hear creaking noises as the bow was bent. In bow making, this is not good. In my experience, creaks rarely leave quietly; usually a limb or two goes with them. Sometimes it may be a string rubbing, but it’s always worth careful exploration; look and feel along the back for any splinters lifting, and along the belly for signs of “chrysalis”, dots or lines where the wood cells are beginning to collapse.

In this case, I found the culprit right at the end of the pyramid’s handle where the fade starts to widen. An unfortunate grain runout there had started to lift (see right). Simply put I stressed this point beyond what the bow design could handle. That’s what we risk when adding draw weight.

I don’t know if a linen backing would have stopped this, but it would not have hurt. A wood backing could well have prevented it, while putting more stress on the rest of the belly wood, but this wasn’t meant to be a laminated bow project.



Even so, we’re not totally out of the game at this point; I decided to flood the crack with penetrating super glue, then install a wooden fore-grip that would cover the weakened area like a wood backing.

Here’s a shot of the grip, laminated to match the tip nocks. The tapered ends covering the crack are bound with artificial sinew set into Titebond III wood glue; this to keep the thin wood there from breaking loose from the limbs at the stress point. If all goes well, this will strengthen the stress point and make the limbs bend more farther away from the center - a bit more sanding midlimb should also help reduce stress inboard at the cost a a pound or two more draw. I was at 42# before the tweaking began, we’ll soon see if all this work gained anything.

