Merlin Bows

Technical Advice Sheet

Torque

First of all I want to make sure we all no what torque is.

My definition of torque is: An external force disrupting the natural line of the bow. There is no such thing as a torque free bow.

If you are holding it, then there is some degree of torque being applied to the bow. What we can do is reduce the torque to a minimum.

Torque can be applied to several areas of a bow, and if it becomes excessive it can effect tuning, and cause poor performance.

The first is via the bow hand on to the grip. When a bow is torqued, the bow rotates left and right. The hinge point is where the cam contacts with the string at full draw. If you look up at the cam while at full draw, and try to move the stabilizer to the side, you will see that bow handle, limbs and cams all stay as one entity, as everything rotates around the top of the string.

It does not take a great deal of pressure to move the bow from side to side, and it is this that can cause some tuning problems.

If you have a large grip, it is possible to place your hand in different positions that will cause the bow to sit differently at full draw. If the bow has been moved to the side at full draw, it also moves the arrow rest. The arrow is then not in line with the string as originally set at brace height. On release, the bow will bounce back as the tensions on the grip relaxes. This, combined with the sideways movement of the rest, causes a sideways tear through the paper.

It becomes impossible to tune as you can not keep the string in line with the arrow as it travels forward. You should try using a slimmer grip, or even remove it completely and shoot off the metal of the riser to see if there is an improvement.

The second area of torque, and probably the most over looked is the drawing of the bow. Most people assume that the main area of torque is on the bow riser caused through inconsistent hand position on the grip. Another problem is the bow string being pulled out of its natural line during the draw cycle to the point of anchor.

This was proven to me quite dramatically in a tuning session I had with an archer who was unable to obtain those elusive bullet hole tears through paper and would be an interesting test for anyone who is unable to obtain a reasonable tear when paper tuning.

No matter what centre shot adjustment or grip position we worked on, only a marginally respectable tear could be obtained through the natural tune ability of arrow rest and bow, but perfect bullet holes could be shot by myself with the same bow. What was happening was that the archer was drawing the bow and instead of drawing directly to his anchor point, or drawing the bow and then moving the head slightly to the point of anchor, the archer was taking the draw away from the body, and then pulling the string to the anchor point.

This resulted in the bow string being taken away from its natural line. The pressure the archer had on the grip did not allow the bow to rotate in his hand to compensate for the misalignment. The archer WAS able to shoot a bullet hole at the position at full draw prior to pulling the string to his anchor point.

It is also interesting to note that many archers have probably got a too long draw length. People with inconsolably bad tuning problems can be cured by shortening the draw length. As people who overdraw tend to pull the bow string more out of line as they anchor to their draw length.

Slimmer grips reduce the amount you can drag a string off line. Its is the friction of the bow hand on the grip that prevents the bow from rotating in the same plane as the string. The wider the grip, the more area of hand contact there is, and so the greater the friction.

If the friction on the grip is greater than the force it takes to move the string off line, then the string will move. There is no arrow in the world that will come out of a bow straight if the bow string is not drawn and returned in its natural line.

In the perfect world we could have the grip the thickness of a razor blade, and it would be impossible to torque the bow. The problem is you wouldn't have much of a hand left.

Also see the section on Reflex or Deflex? for a detailed explanation of the mechanics of torque.