

Bad to the Bow



How to Look for Trouble in Traditional Archery Equipment

By Manigarm the Scythian

Any time a bow is brought onto the archery range for the first time, it must be thoroughly inspected for wear and tear, and any number of common defects that can make the bow dangerous or unusable during the shoot.

If you are a marshal, a marshal-in-training, or just an archer interested in learning to inspect your own equipment, I've outlined the standard bow inspection process and included images and a brief discussion of common defects found in traditional bows.

The majority of the material I've included here is available in the archery handbook, however, this document is meant to serve as a quick reference for inspecting traditional archery equipment.

Step 1: The Unstrung Bow

Start by examining the unstrung bow close up. Carefully go over the bow and look for cracks, loose screws (if it is a take-down type), broken strands in the string or serving, warpage in the limbs (limb twist), dirt and other debris lodged in the string groove or handle wrap, and anything that looks out of the ordinary. Fiberglass and laminate bows should be thoroughly checked for cracks and splits. Also pay careful attention to laminate bows if they appear to have a wavy or "bubbling" effect on their limbs, because this can be a sign of delamination (refer to the Common Bow Defects section below). Wood bows should be carefully examined for water/weather damage, warping, and limb curve (also called "following the string").

Feel along the limbs for bumps, grooves, or pits in the bow material. Then, rest one end of the bow on the ground, balance the other end lined with up with your chin, and look down the bow from end to end. From this vantage point you should be able to see any evidence of limb twist (the two ends of the bow not lining up in a straight line) and warping. This is also a good opportunity to see if the bow is beginning to curve ("follow the string"). While following the string is not necessarily a criterion for outright failure, it is a natural degeneration of a well-used bow that will eventually render the bow unusable when the limbs have bent too far to safely hold the string. Next, keep the bow in the same position and turn it over so that the front (target-facing) side of the bow is facing upward. Examine the ends of the bow (especially the area where the string rests) for tilting, twisting, or warping. Twisted bow tips can result in the bow string failing to return to center after the bow has been fired. Movement in the string will eventually result in the string wrapping around the end of the bow and breaking, or severely damaging the bow during a shoot.

Step 2: The Strung Bow

Following your close-up inspection, have the archer string the bow and watch for any strange limb movement during the stringing process.

Then, instruct the archer to draw the bow to a full length facing toward you and have them slowly ease off (obviously, this should be done without an arrow).

Have them repeat this motion facing to the side of you (the archer is then standing in profile). Watch the bow as it moves and ensure that each limb is bending and returning to a resting position symmetrically (this might not apply exactly for certain kinds of asymmetrical bows, but such bows have marked differences in the length of their limbs). Each limb should bend in the same place as the other and return to a resting position at the same time.

Once this inspection is complete, take the strung bow from the archer and re-inspect the string. Ensure that the string has returned to a central position on the bow limb and is not in danger of rolling off or appears to have returned to the bow crooked. This is usually an indication of limb twist or a string with loops that are not properly sized.

Strings should have at least 2 inches (about three fingers worth) of twist at each end from the bottom of the end loop to the end of the string. Do not use strings that do not have any or adequate serving, or are made of twine, thread, or other unsafe materials.

Also be attentive to any evidence of strand breakage. This breakage usually looks like small "fuzzies" around the end loops of the string or near the arrow nock point.

Step 3: Vigilance

At some point, pay attention to the sound the bow makes when fired. Oftentimes, bows will have an unusual snap, crackling, or reverberating string sound right before something goes wrong. If you notice a bow making a strange sound, step off the line and re-inspect it.

Practical Inspection Points for Certain Bow Types:

HORSE BOWS

Many horse bows (also called Magyar or Asian Reflex Bows) have limbs wrapped in leather or cloth (These materials are attached to the bow, therefore, the archer is not able to remove them). This can make it difficult to determine if there is any surface damage to the bow. For horse bows, always take extra care to feel along the limbs for uneven bumps or breaks under the material.

Horse bows are typically constructed in three parts: the central body of the bow and the two reflexed limbs (called siyah). Be sure to check the limb joint areas in bows of this type to inspect them for breakage or damage.

It is not uncommon to see bows of the type that are constructed asymmetrically. This means that one limb (typically the top limb) is longer and curves further backward by design. Inspecting asymmetrical bows can be tricky, but be sure to pay close attention to the motion of each bow limb during inspection to ensure that the bow is working properly.



Magyar Horse Bow



Recurve Longbow

RECURDE LONGBOWS

Longbow inspection is relatively straightforward. However, in the case of recurves (longbows with a noticeable forward curve at the ends of each limb), be sure to inspect the bow string carefully after the bow has been strung. In most cases, the string should not be resting completely against the bow tip curve (this often causes a loud "thwop" noise when the bow is fired, as well as some significant hand shock). Bow strings that rest too far down the body of the bow are usually a sign that the bow string is too long or has relaxed from use and needs to be tightened.

In the case of longbows and similar bow types, the center of the string should be about 6 inches away from the center of the bow (usually measured by resting the bottom of your fist on the inside center of the body of the bow and extending your thumb toward the string. The string should sit slightly above the end of your thumb).

LONG BOWS - FLAT BOWS

Flat bows (longbows with a distinctly flat body shape and no forward curve at the tip) are particularly prone to "following the string". Carefully inspect all flat bows for unusually deep curvature resulting from use, wear, or improper storage.



A Flat Bow Tip

SINGLE STAFF OR SELF BOWS

Single staff or Self bows are made from a single piece of wood and are not laminated. For single staff bows, pay extra attention to the natural wood knots present in the limbs. Over years of use, these wood knots can shake loose, fall out, or otherwise compromise the integrity of the bow. Some bow-makers compensate for this fact by backing single staff bows with linen cloth or by wrapping the nocks in sinew. In either case, the more wood knots a bow has, the more cautious you will have to be while inspecting it.



A Single Staff Bow with Linen Backing



Single staff bows also typically have some noticeable color variation, particularly where the outer wood transitions into the inner (or heart) wood. Be sure to inspect this transitional area to ensure that the two sections of wood are not beginning to separate or peel apart.



A Single Staff Yew Bow with Knot Wraps

A Single Staff Yew Bow Showing Wood Color Variation

Common Bow Defects:

Delamination

Delamination occurs when the layers of material that make up the body of the bow (usually wood or fiberglass) begin to separate. Delamination is typically caused by normal use and wear and is an inevitable consequence as the bow ages. Bows that have begun to delaminate are not safe to shoot, as it is likely that the bow will catastrophically shatter if drawn, and should not be allowed on the archery range.



In the picture at right, notice the "bubbling" appearance on the limb. To the touch, the surface of the limb is rough and slightly uneven. This wood bow is beginning to delaminate.

In the red bow at left, there are two noticeable lines of discoloration in the limb. To the touch, these lines are raised and feel like large, elongated, bumps in the fiberglass. These lines are sections of delamination.



Límb Twíst

When the limbs of a bow have begun to warp and turn, this is called limb twist. Limb twist is another common consequence of aging. You can inspect bows for limb twist by resting one end of the bow on the ground and looking straight down the body of the bow from tip to tip. Bows that have begun to twist will have noticeable asymmetry in their limbs as the two ends of the bow will no longer line up in a straight line. This often causes the bow string to fail to return to the center of the bow when the bow is fired and can result in sudden breakage of the bow. Bows with significant limb twist are not safe to

shoot and should not be allowed on the archery range.

The string at right has failed to return to the center of the bow. This is referred to as "rolling" and is a strong indication of limb twist.





In the recurve longbow at left, the body of the bow is resting perpendicular to the archery marshal. The marked right-ward curvature of the top limb (the tips do not line up in a straight line) indicates that this bow has significant limb twist and is unsafe to shoot.

SPLÍTS AND GRACKS

Splits, cracks, breaks, and other damage can occur easily in traditional archery equipment, either from normal handling and use or from accidental sources. Carefully check each bow you inspect for any damage that compromises the bows integrity and safety. In the fiberglass bow below, a large split is easily seen starting on the left and advancing toward the string groove in the tip.



Note that simple surface cracks (cracks in the bow's outer finish or scratches that do not penetrate all the way through the bow) do not automatically fail a bow. However, even minor damage should be closely monitored to ensure that it doesn't worsen.

Failed Strings

Bows strings should consist of several strands of Dacron, Kevlar, linen, sinew, or other standard bow string materials. Strings should also have at least 2 inches, though 3 inches is preferable, of twist at each end (three fingers are often used to measure string twist on the field) and about 6 inches of serving in the center.

In the recurve longbow on the right, the Flemish twist string has a small, snug, loop and plenty of extra twist shown by the red arrow. This string passes inspection.



The string below was failed during inspection because of end loop breakage and no central serving:



The following string was failed for twist separation:

