



# OWNER'S MANUAL

SERIAL NUMBER \_\_\_\_\_

SHIPPING DATE \_\_\_\_\_

**⚠ WARNING!** A bow must be considered a lethal weapon capable of killing large game animals....and people! the same caution and courtesy should be followed as if it were a high powered rifle.

*Never point a bow at someone, rather drawn or un-drawn; with or without an arrow on the string.*

*When shot at an elevation of about 45° a bow is capable of shooting an arrow 200 or more yards. This type of shooting should only be done in large open fields without any visual obstructions. Even when shooting at relative close targets, an arrow may glance or ricochet off of the ground, a rock or some other object and fly somewhere not intended and hit something or someone much further away than expected.*

*If an arrow nock should fracture upon releasing the bowstring, the arrow can come out of the bow far to the left or far to the right of the intended target. Therefore, anyone or anything 90° to the left or 90° to the right of the intended target should be considered in the "line of fire" before the decision is made rather or not it is safe to draw and fire an arrow.*

**SERIOUS INJURY** can result from the improper stringing or unstringing of your bow. **Read the WARRANTY on the back cover and the DIRECTIONS in this manual before assembling, stringing and shooting your bow.** Bows damaged or destroyed during the stringing process are **NOT COVERED** by this Warranty.

*We encourage our customers to take the International Bowhunter Education Program offered by the National Bowhunter Education Foundation. For details, contact N.B.E.F., R.D. 3, Box 318, Newton, NJ 07860 or visit [www.nbef.org](http://www.nbef.org).*



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**CONGRATULATIONS!** We hope you are as proud of your new *Black Widow* bow as we are. This fine bow has been crafted with great precision by people who take special pride in their workmanship. Please read and follow the recommendations contained in this manual to assure the best performance and longest possible use of your *Black Widow* bow.

After you receive your bow if you have any questions or problems, please do not hesitate to contact us.

If at any time for any reason you need to return your bow to the *Black Widow* Factory for inspection or repair, we will be pleased to do so at a nominal charge (usually free) plus shipping. Perhaps you may wish to save the shipping container should you later need it.

We sincerely want to do our very best to make your adventure with traditional bowhunting an exciting and rewarding experience.

The TEAM,

*Roger Fulton, Pres.*

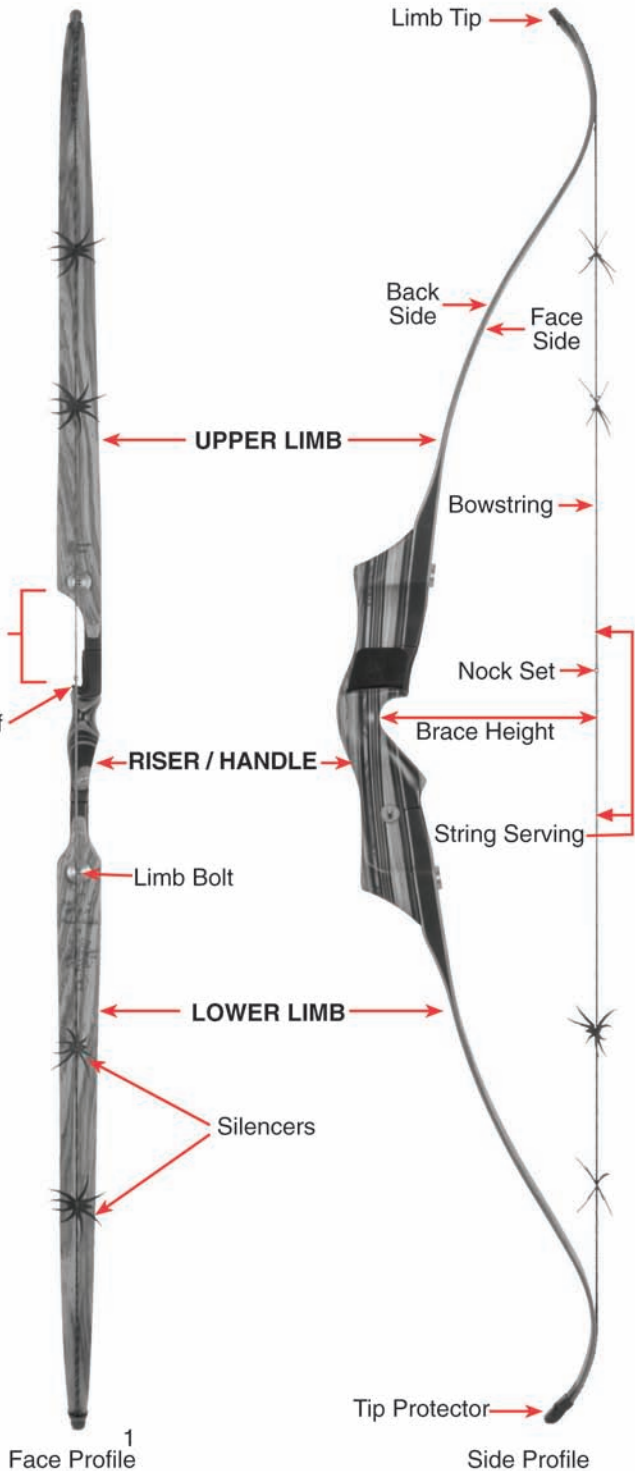
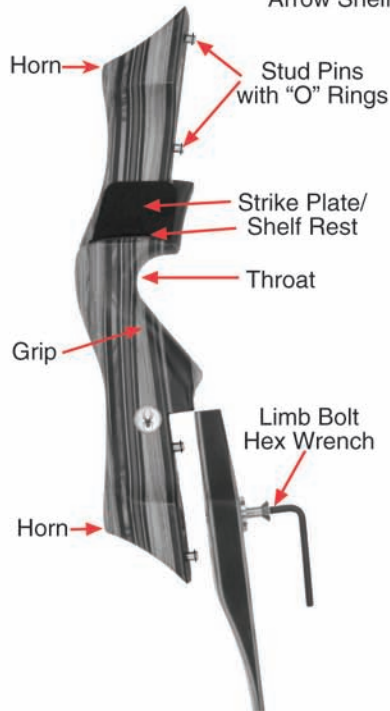
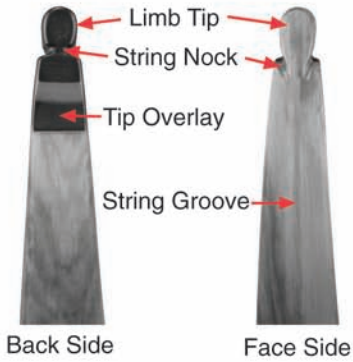
*Toby Essick, V.P.*

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# Bow Parts and Terminology





## **ASSEMBLING THE THREE-PIECE TAKE-DOWN BOW**

The *Black Widow* PMA, PSA and PCH series limbs mount on the face of the handle / riser. This design adds to the smoothness, stability and performance of your bow. It also insures that you will mount the upper and lower limbs in the proper positions. You will notice that there is a rubber "O" ring around each brass stud pin. When compressed they serve as a gasket to prevent moisture from entering the stud pin holes in the limbs (which are also sealed by hand with a special penetrating sealant). Fit the stud pins of the handle into the stud pin holes of the limbs and then screw in the limb bolt. The limb bolt should be tightened with the allen wrench until snug against the "O" rings. When you feel this happen you usually can tighten the bolt another quarter turn (when the "O" rings are new). If you are that rare person who has a torque wrench that measures in "inch pounds" (not "foot pounds"), you should torque the limb bolt to 50 inch pounds. You probably will still be able to see a slight amount of daylight between the limbs and handle / riser. This means the "O" rings are doing their job. Should you need to replace any damaged "O" rings they are catalog #355. Needless to say, if you crank down on the limb bolts with too much force, it is possible to crush the fiberglass on the face of the limb around the insert.

When removing limbs care should be taken to keep the limbs parallel to the handle face as you pull it from the handle (figure 1). Otherwise, it is possible to split the fiberglass around the stud pin hole if removed at an angle (figure 2).

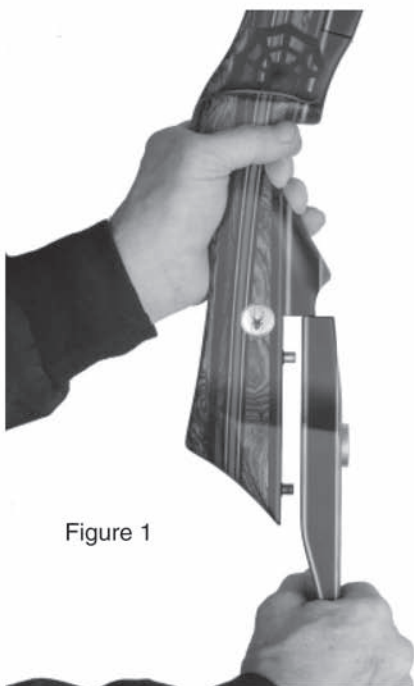


Figure 1

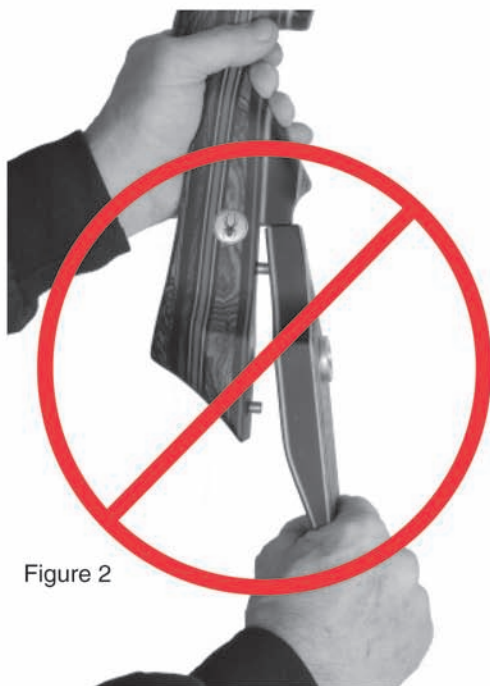


Figure 2

## **ASSEMBLING THE TWO-PIECE TAKE-DOWN BOW**

The beauty of the precision fitted *Black Widow Locket-Socket* TD system is its simplicity and durability. There is no hint that it is a take-down, it utilizes no hardware, requires no tools, locks in position and, with proper care, we believe will last the lifetime of the bow.

To assemble, simply insert the stub into the socket and press together until it is fully seated (figure 3).

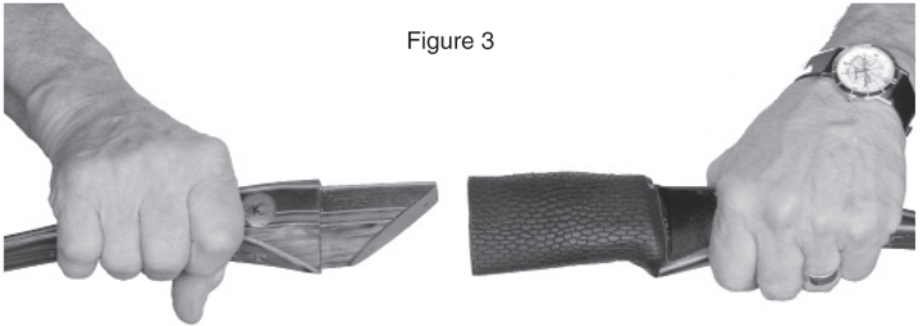


Figure 3

To disassemble, grip the upper half of the bow by the sight window with one hand and with the other hand grip the lower half at the horn below the grip and pull apart (figure 4).

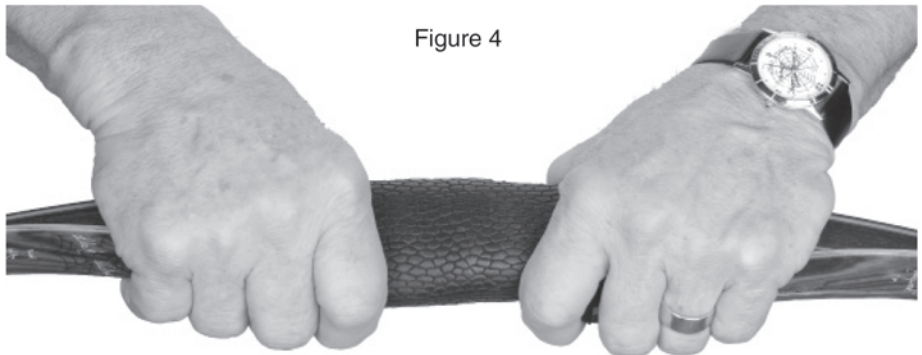


Figure 4

If you have difficulty uncoupling your *Locket-Socket* TD, place the bow behind your knees (either standing or sitting) and with your forearms on the outside of your thighs, again gripping the upper half of the bow by the sight window with one hand and with the other hand grip the lower half at the horn below the grip (figure 5). Now spread your legs apart using their strength to separate the two halves.



Figure 5

We have included a tube of *String Wax* (catalog #316) with your new *Locket-Socket* TD bow. Occasionally apply a coat of wax to the stub end of your bow. This will provide lubrication (particularly important to prevent creaking in extremely cold temperatures), plus repel moisture and insure long, quiet and trouble-free use of your take-down system. In a pinch, Vaseline or vegetable oil will work also.

If, over time and use, the fit of the stub into the socket needs to be tightened, this can easily be done by *Black Widow* craftsman.



## **INSTALLING STRING SILENCERS**

A package of four *Spider* silencers (catalog #308) has been included with your bow. They are impervious to water and stick-tights. They are light weight and do a great job of silencing with less performance loss than cat whiskers. Plus, they will last a very long time and without deterioration.

*Spider* silencers are extremely easy to install. Simply separate the Flemish Twist into two sections (colors) and insert one section of string through each eye of the *Spider* (figure 6). Place one *Spider* about 9" to 10" from the string loop and another one 14" to 16" from the loop. Then repeat the procedure at the opposite end of the string and you will have silencers at four locations for maximum effect (figure7).



Figure 6



Figure 7

## STRINGING YOUR BOW

There are more recurve bows damaged or destroyed while stringing and unstringing than from any other cause. Any recurve bow capable of superior performance is subject to twist if not treated properly. Limbs faced and backed with fiberglass can withstand tremendous stresses while being pulled to full draw. **However, twisting as a result of improper stringing or unstringing can cause delamination even though the limbs are flexed only a limited amount. Since we cannot be responsible for the manner in which *Black Widow* bows are strung or unstrung, limbs damaged or destroyed during the stringing or unstringing process are not covered under the warranty. Limbs destroyed in this fashion can easily be recognized by the angle of delamination. It is, therefore, very important that you read and execute the following instructions very carefully. It may save you the cost of a new bow or a new set of limbs!**

To put the string on the bow, slip the string loop over the upper limb tip and slide it down the limb (figure 8). Seat the lower string loop in the nock grooves of the lower limb tip and then slide the rubber tip protector on the bottom limb tip (figure 9). This will help keep the string in the string nocks while you string the bow. Always keep a tip protector on the lower limb to protect the finish. If the finish wears off and moisture invades the wood limb core, it can cause serious damage to the limb tip. Periodically inspect the limb tips. If you notice the tip area or the nock grooves (“dog ears”) turning a “milky” color, please return the limb (or bow) to us ASAP for free repair (shipping only). Remember, “A stitch in time saves nine”.

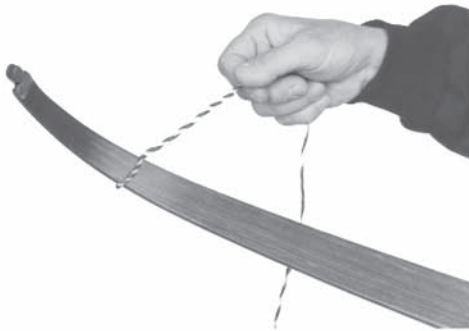


Figure 8



Figure 9

There are several methods used to string a bow. The “Push-Pull” (figure 10) and “Step Through” (figure 11) methods, shown as incorrect below, can result in damage to your bow and serious injury to you. People have been blinded when their hand slipped from the upper limb when attempting the “Push-Pull” method. The correct method is to use the bow stringer furnished by *Black Widow* as illustrated later (figure 12).

The length of the bow stringer should be adjusted to allow you to work at a level slightly above the knees (figure 12). If you have to pull the handle of the bow too high (waist level), you risk torquing the bow and causing it to twist or even turn over and thus twisting or destroying the limbs.



Figure 10



Figure 11

To string the bow, place the larger of the two leather boots on the lower limb nock (bow tip) with the nylon cord hanging down. Place the smaller leather cup on the upper limb nock. **If you are stringing a long bow, use one foot on the stringer cord. If you are stringing a recurve, use both feet on the cord of the stringer and about shoulder width apart. Make certain the boots are centered on the tips and the cord is centered on the limbs before flexing the limbs with the stringer. If the bow string or stringer cord slips off the side of the recurve area, or if a boot slides around the tip of the limb as you flex the bow limbs, it can cause the limbs to twist and even delaminate.** Pull straight upward on the bow handle with one hand, making certain not to torque or twist the handle as you flex the limbs. When the limbs are adequately flexed, use the other hand to slide the bow string up the limb and slip the loop of the bowstring firmly into the upper string nock grooves (figure 12). Feel the nock tip to make certain the bowstring is properly seated in the nock grooves (figure 13) before relaxing pressure on the bow stringer. Quickly flexing and relaxing the limbs (with the bow stringer) two or three times will determine if the string is properly seated, and if not, you still have control of the bow to prevent it from becoming unstrung and possibly twisting a limb.

Some people like to draw their bow after they have strung it to be sure the string loop is centered on the limb tip. When doing this (or anytime you draw the bow simply to stretch your muscles) always hold the bow with a loose bow hand when letting down to avoid torquing the riser which can cause the string to miss the string groove and/or twist the limbs out of alignment.

**If you wish to visually inspect the tip of the limb of a strung bow for any reason, always look from the string groove (face) side of the limb. Never look from the opposite (back) side, because if the string is not properly seated in the nocks and should slip out, the bow may violently jump into the unstrung position. This could result in serious injury to you, especially to your face or eye. If, for some reason, it is necessary to inspect the back side of the limb or limb tip, always unstring the bow first.**

Figure 12

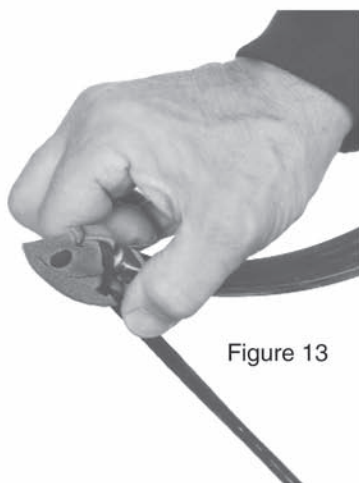


Figure 13



The procedure for unstringing the bow is just as crucial as that of stringing and should be done with the same care and concern.

**Never shoot your bow without an arrow on the string. "Dry Firing" your bow may cause damage and could void your warranty.**

After the bow is strung, check the brace height by measuring from the string to the deepest part of the grip (figure 14). See the *Black Widow* Catalog for the recommended brace height of your model. A new string may brace your bow 1/2" to 1" too high until it is shot in. **This Flemish-twist string is made with about 60 to 70 twists in it (depending on length) and never should be untwisted to have less than 30 twists because it can unravel and come apart at the splice.** As you shoot the bow, the wax will squeeze out of the string and allow the string to lengthen. You can raise the brace height as needed by adding up to another 60 to 70 twists, depending on the length of string, until you have a maximum of about two twists per inch of string.

You may wish to experiment with the brace height of your bow to determine what suits you best. A lower brace height may slightly increase arrow speed but may cause excessive wrist slap by the bow string, and may also make your release more critical. On the other hand, a higher brace height may make your bow more stable and more forgiving of a poor release. However, always stay within the *Black Widow* recommendations. It is possible that you may find a certain brace height will dampen the harmonics and give you a quieter bow. As you can see, the brace height is a personal thing that you will have to determine for yourself through experimentation.

Your bow is designed and approved for the use of a *DynaFLIGHT 97* bowstring (catalog #300), which will add several feet per second of performance. Because the string will transfer more energy from the bow it will be necessary to use an arrow that is five to ten pounds stiffer in spine than needed for a dacron string.

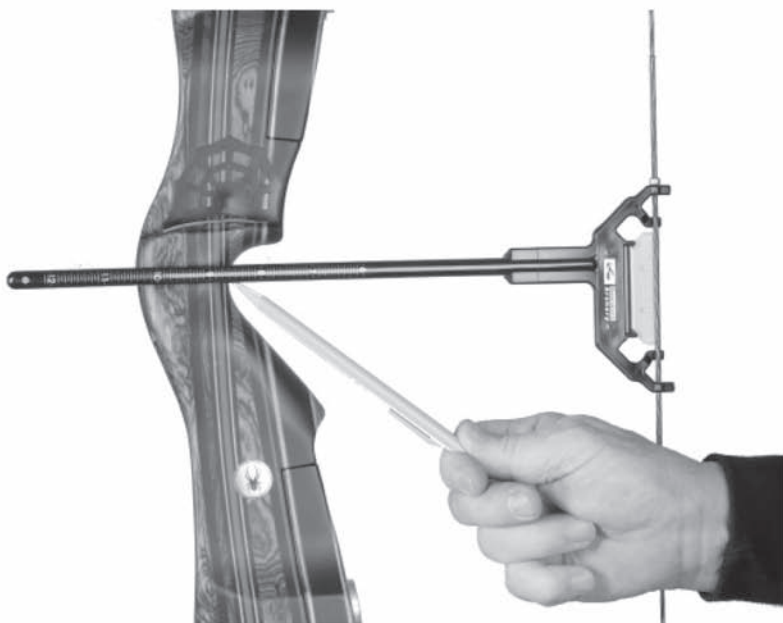


Figure 14

## **CHECKING AND MAINTAINING LIMB ALIGNMENT**

The limbs of your bow were drawn and stressed many times at the factory while being tillered to test their strength and check for straightness. Every time you string your bow, or before each shooting session, you should check the limb alignment. The best way to do this is to lay one limb tip on the floor or ground out in front of you while holding the nearest limb (the one your are checking) in the palm of your hand. With one eye closed, sight up and down the string where the string enters the string groove nearest to you. If the limb is in proper alignment the string will continue on a straight line as it enters the string groove. On the other hand, if the limb has a twist in it, the string will turn slightly to the left or to the right (as in figure 15) to follow the string groove of the twisted limb. **DO NOT shoot your bow with a twisted limb because the leverage from the misaligned limb will probably cause the twist to become worse and can even cause delamination of the limb.**

Imagine that you are on a dream hunt in the mountains of Montana. After traveling by plane, pickup truck and pack horse, you finally get to your hunting camp. You get your bow out, put it together, string it up and it looks like figure 15. Panic city! All is lost! No, not if you know how to correct the problem. Even though your *Black Widow* limbs were made to draw straight, when they leave the factory they can easily get out of alignment for a variety of reasons: shipping, stringing, storage, atmospheric changes and who knows what else (longbow limbs are much less susceptible to limb twist than are recurve bow limbs). The good news is they can just as easily be realigned. Here's how. After checking both limbs (as previously described) and determining that one (or both) limbs need correcting, put a piece of tape on the limb and draw an arrow on it pointing in the direction the tip needs to be moved. This can help you not to get confused and may be useful for further reference. A slight twist can be corrected by twisting by hand in the opposite direction with the bow strung (figure 16). Don't be timid. Your main concern is to not let the string slip off the edge of the limb causing the bow to accidentally become un-strung. Quite often it is necessary to over correct the tip and then work it back to center. Or you may wish to leave it in the over corrected position for a few hours to see if it settles back on its own. This is a process of trial and error until you are satisfied that the string enters the string groove on a straight line when you sight up and down the string with one eye closed as previously described. Most twists can be corrected in this manner.

More pronounced twists or stubborn limbs (heavy limbs can be more difficult) may require a different approach. With the bow unstrung, clamp the handle / riser in a padded vise or, if you are in the mountains of Montana, have your buddy grip the handle / riser while you counter-twist the limb with greater force than you were able to apply with the bow strung. String it back up and check the alignment. Hopefully, it is close enough that you can tweak it with the bow strung. Again, this is a process of trial and error and don't be afraid to over correct it and then work it back to center.



Occasionally we have someone send us an old bow (one that has probably been in the attic for twenty years) that is really twisted and really stubborn. We put it in our low temperature oven (150°) for about fifteen minutes to slightly soften the resins in the glass. You can use hot tap water or carefully warm the bow limb with an electric hair dryer. Then, using the above “buddy” method, we counter-twist it and hold it in the reverse twist position while we quench it with cold water from the drinking fountain that is in the shop. Our Montana Mountain Men might have to use hot coffee and some snow.

Of course you can send your bow back to *Black Widow* and we will be happy to re-align the limbs for you. But, if you have the knowledge and confidence to do it yourself, you can stay on the mountain and in the woods and keep on hunting.



Figure 15



Figure 16

## STORING YOUR BOW

Although contrary to popular belief, it is not necessary to unstring your recurve bow if you are shooting it regularly. **We do suggest that you unstring your longbow between shooting sessions because they tend to lose weight when left strung due to the greater thickness of the wood limb core.**

To store a strung bow properly, we suggest hanging the bow horizontally by the string on two nails or pegs which are long enough to allow your bow to hang freely (figure 17). An unstrung bow can be stored horizontally (similar to a strung bow as shown in figure 17) provided the pegs support the bow near the thicker riser section of the limb. **Caution: If the pegs are further apart and not parallel they will cause the thinner sections of the limbs to twist as they conform to the unparallel pegs.** An unstrung bow can also be stored by laying it horizontally with no pressure on the curved portion of the limbs. Likewise, bows in a take-down configuration should be free of any pressure that could cause torque.

**Never store your recurve bow standing on a limb as this may cause the lower limb to twist.**

Fiberglass is an extremely durable material and impervious to most abuses. However, it is very sensitive to abrasion, so care should be taken not to damage the glass by subjecting it to blows from sharp objects. **Fiberglass is also sensitive to high temperatures, so of course, a strung bow should never be left in a hot automobile or stored (strung or unstrung) where it would be exposed to extreme heat.**



Figure 17

## CARING FOR THE BOWSTRING

You have been furnished a Flemish-twist bowstring made of *DynaFLIGHT 97* material. This high quality string will add performance to your bow and will last an extremely long time. **You should not use *DynaFLIGHT 97* strings (catalog #300) on older *Black Widow* bows made prior to 1988 or on other bows without checking with their manufacturer because it may damage or destroy the limbs.**

Occasionally wax with a quality bowstring wax, as needed. You should replace the string after about 10,000 shots or each year just before hunting season. Breakage of a bowstring can result in bow damage. Don't sacrifice a bow for the price of a bowstring.

Just as a broken bowstring is like "dry-firing" a bow, a broken arrow nock can also cause bow damage. Replace an arrow nock if you think there is a chance it might be cracked. Always inspect your arrow shafts for damage. **Don't shoot a damaged arrow because it could splinter and cause injury.**

## CARING FOR THE FINISH

The epoxy finish on your bow is extremely durable and is impervious to moisture in most situations. We call it the "Frost" finish. We start with a tough, scratch resistant, marine grade epoxy. Then we apply an additional matte coating that makes it feel and look slightly grainy, is non-reflective and gives it the look of autumn's "frost on the pumpkin." If you prefer a smoother feel with slightly more sheen you can simply apply a coat or two of *Widow Wax* (catalog #373) periodically. However, your bow should not be stored in a wet case or left exposed to high humidity conditions. An accumulation of moisture left in the stud pin alignment holes can cause the wood laminations under the fiberglass to swell and thus crack the fiberglass running out from the holes. Therefore, after a wet day in the field, give your bow an opportunity to dry out. If you have a three-piece take-down model, removing the limbs from the handle will allow moisture to evaporate from the stud pin alignment holes. We use a special sealant in all the stud pin holes and, as an additional precaution, we place a rubber "O" ring over the stud pins that forms a moisture gasket. Occasionally apply a little *Widow Wax* in the stud pin holes to help repel moisture and to eliminate noise.

Should any of the wood or fiberglass become nicked or scratched, our *Super Spider Goo-Thin* (catalog #552) or Super Glue works very well to mend and seal. If an edge of the fiberglass limb is chipped or splintered, first apply *Super Spider Goo-Thin*, then lightly sand to remove roughness. Apply another coat of *Super Spider Goo-Thin* to seal. To match your bow's dull finish you can lightly buff the repaired area with a small bit of very fine steel wool to remove the gloss of the *Super Spider Goo*. Do not touch or blow on the *Super Spider Goo* (or Super Glue) while it is still tacky because moisture will cause it to turn "milky". Be careful not to buff the dull finish of the bow around the *Super Spider Goo* because it will make it glossy. **A word of warning! Use caution when using insect repellent. Do not get any on your bow and be sure there is none on the palms of your hands as it may seriously damage the epoxy finish.**

## SHOOTING OFF THE SHELF

There are several important things we must remember if we wish to shoot off-the-shelf, some of which we will discuss in the next "Tuning" section. First of all, it is necessary to use feather fletching. If you decide to use plastic vanes you need an elevated rest such as our catalog #323 or #324. Next, if you are right handed, the normal feather configuration is a 9 o'clock cock feather and 1 o'clock and 5 o'clock hen feathers. The problem with this is that the hard quill of the 5 o'clock hen feather will wear the outside edge of the shelf rest. This happens because the shaft flexes horizontally (the "paradox") with the nock end flexed away from the bow and slightly downward as it passes through the window and over the shelf. Worse than the wear, this may also causes the nock end to deflect or "bounce" up and come out of the bow nock high. One possible solution is to turn the 9 o'clock cock feather 180° to 3 o'clock (vice-versa for left handers).



Another solution is to position the arrow nock so that the 5 o'clock hen feather is rotated to a position anywhere between 3 and 4 o'clock (figure 18). We have our *Black Widow Signature* arrows fletched at 4, 8 and 12 o'clock with the cock feather at 12 o'clock (this works for both right and left handers). If we use 5" to 5 1/2" medium helical fletching (rather than a maximum helical) the bottom of the shaft is "smooth" without a quill protruding down that will drag on the shelf. We do not recommend 90° x 90° four-fletch for shooting off-the-shelf because at least one of the hard quills will drag and cause deflection. If you use four-fletch it should be 60° x 120° (2, 4, 8, and 10 o'clock) to allow clean passage of the quills. We furnish the #322 *Calf Hair* (figure 19) or #321 *Spider Webb* (figure 20) shelf rest/strike plate with all our models.

To Install:

1. Punch out all of the chads.
2. You may wish to have a pressure point for the arrow. If so, peel the paper backing off of the longer chad. Then place it vertically on the bow window straight above the deepest part of the throat (this is not necessary on PL longbows or PSR recurves).
3. Dampen the bow surface with water to allow positioning.
4. Peel off the paper backing.
5. Position the shelf rest/strike plate on the bow and adjust as necessary.
6. As the moisture evaporates continue to press the leather to the bow using a round pencil or arrow shaft to form and adjust the leather to the bow.
7. Repeat step #5 about an hour later after the moisture is totally evaporated.

If you prefer to use a different material on just the shelf area (such as our catalog #320) simply cut off the lower part (shelf rest) and install the upper portion (strike plate) only.



Figure 18

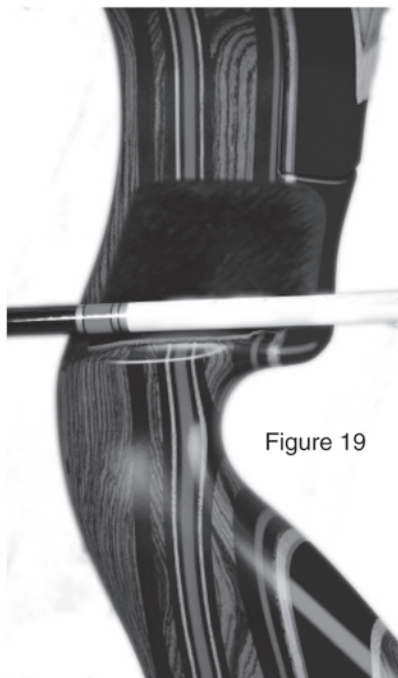


Figure 19

## TUNING SUGGESTIONS

There are many benefits of “perfect” arrow flight to the bowhunter. The most obvious, of course, is accuracy. Just as important is the fact that an arrow that is not “porpoising” or “fishtailing” will achieve maximum penetration. But perhaps the most important benefit of all is the feeling of confidence that comes from knowing that the broad-head-tipped arrow will fly true and straight.

To pursue the goal of perfect arrow flight, start with a bare (unfletched) shaft 2” to 3” longer than your draw length and thus, more limber. This is test arrow #1 (figure 20). Select field points of the same weight as the broadhead with which you intend to hunt. Shoot the test arrow into some type of soft target that will not bend or break the arrow if it hits at an angle. It is best to start with the nocking point too high, perhaps about 3/4” to 1” above square. **This is because, if nocked too low, the arrow may deflect upward off the shelf and appear to be nocked too high, when, in fact, it is nocked too low. This may also cause the nock end to deflect outward off of the rounded edge of the shelf and cause the arrow to appear underspined even though it is not.** Therefore, we suggest solving the problem of “fishtailing” (nock left or right) before dealing with “porpoising” (nock high or low). Assuming that the extra long arrow is too limber, you should see the arrow fly down range in a nock left position. This applies to a right-handed shooter (left-handed will be opposite). To eliminate this “fishtailing” problem, you should cut 1/4” off the shaft and test again. This step should be repeated until the arrow is stiff enough to fly reasonably straight to the target at a distance of about 15 to 20 yards. Of course, if you run out of arrow before it becomes stiff enough, it will be necessary to start all over with an arrow of greater spine or try a lighter weight field point which in turn, would require a lighter broadhead to hunt with. If, on the other hand, the arrow goes nock right as it flies down range you should start over with a shaft that has a weaker spine (less stiff). Another possibility would be to try a heavier field point, if that is an option. Remember, we should expect nock high because we intentionally set the nock too high.

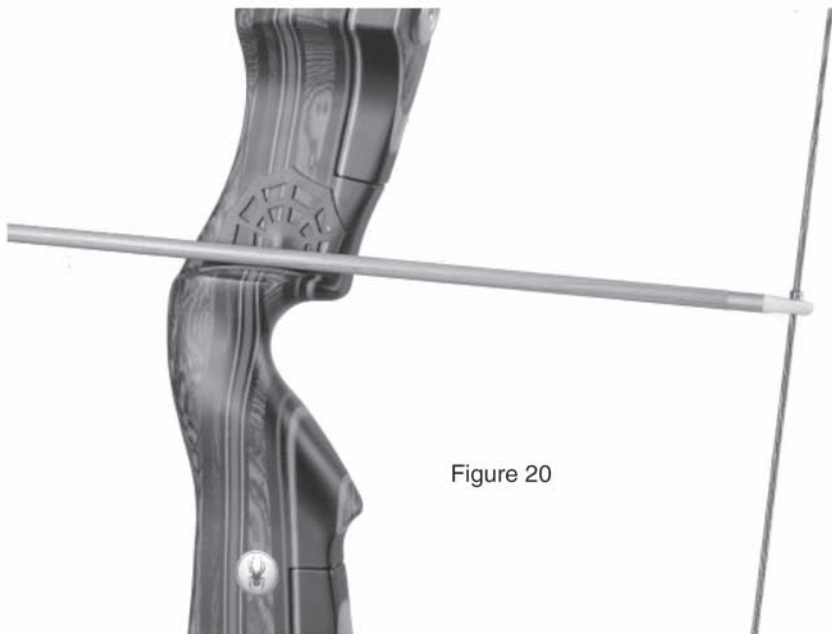


Figure 20

When you find an arrow of proper spine (neither nock left or right) you are ready to adjust the nocking point down to the "sweet spot", eliminating the nock high flight of the arrow. Because some shooting styles (excessive heel pressure of the bow hand, high elbow, torquing the arrow with the string hand, too much tension in the string fingers, a "lazy" third finger, etc.), induce an excessive amount of vertical flexing of the arrow shaft that may make it impossible to totally eliminate the nock high problem while shooting a bare shaft off-the-shelf. If the nocking point is set too high we can expect the arrow to come out of the bow nock high. But when someone with the above shooting style problems moves their nocking point down to get their "sweet spot", the excessive vertical flex of the shaft causes the tail end of the shaft to make contact with the outside edge of the shelf (it also does a horizontal, paradox flex). When this happens the tail end deflects or "bounces" nock high. Obviously, this can be very confusing and frustrating. The PMA, PSA, and PCH take-down models are relieved on the outside edge of the shelf to allow the shaft to pass by the shelf without making contact, thus making it easier to achieve good arrow flight off-the-shelf. Most shooters will end up with a nocking point  $3/8"$  to  $3/4"$  above square (figure 21). However, a few need to go even higher to accommodate their shooting technique. **Make certain that the nock set is clamped securely to prevent it from flying off and possibly causing injury.**

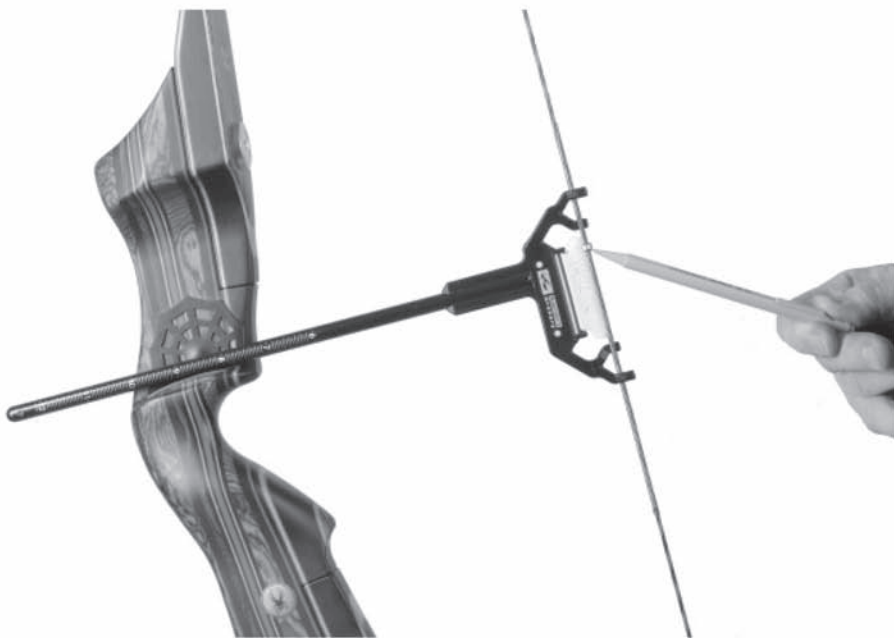


Figure 21



If there is a deflection problem, a fully fletched arrow tipped with a field point corrects so quickly that it is difficult to identify the problem. However, when tipped with a broadhead, it takes much longer for the fletching to stabilize the arrow, thus adversely affecting both accuracy and penetration. In order to confirm that the quills of a fletched arrow are passing cleanly over the shelf, cut all but 1/8" of the feather off each of the three quills for use as test arrow #2 (figure 22). Test arrow #2 should be cut the same length we arrived at using test arrow #1 (bare shaft). If arrow #1 flew well, but arrow #2 does not, it is because of deflection from the quills due to the arrow nock not rotated to the proper position to allow clean passage of the quills. The solution is to experiment by trial and error until arrow #2 will also fly straight to the target at a distance of about 15 to 20 yards. You are now ready to shoot a fletched arrow tipped with a broadhead of the same weight as the field points used on test arrows #1 and #2. If you use a broadhead that needs a screw-in adapter (such as a Magnus or Zwickey), be sure to match the weight of the field point to the total weight of the broadhead plus the broadhead adapter.

If you use a bow quiver, be sure to tune your bow and practice with arrows in the quiver because the extra mass weight may effect the spine that is needed and the way the bow shoots.



Figure 22

If you have a question or problem that you cannot solve, call *Black Widow Custom Bows* for assistance.

See Page 22 for a comparison of arrow shaft spine deflection and arrow weight.

## TUNING THE GOLD TIP AND CARBON EXPRESS SHAFT

We feel very strongly about adequate mass weight of an arrow to absorb more of the bows stored energy for the purpose of penetration and longevity of the bow. **The *Black Widow* Warranty requires a minimum of 8 grains of arrow weight per pound of draw weight.** We recommend 9 to 12 grains, especially with long draw lengths of 29 inches or more, which can significantly increase the possibility of limb tip damage when using a high performance bowstring and lighter weight arrows.

We prefer the Gold Tip graphite shaft because of it's unique system of adding mass weight to both the point and nock ends of the shaft, or the Carbon Express graphite shaft, which accepts weight to the point end only, over other graphite shafts because this system makes it possible to not only add mass weight, but to fine-tune the shaft for perfect arrow flight. Adding weight to the point end of a Gold Tip or Carbon Express causes the shaft to have a weaker "dynamic" spine because the arrow is "pushing" more weight. Adding weight to the nock end (Gold Tip only) causes the shaft to have a stiffer "dynamic" spine by absorbing more of the bow's energy.

**The following exercise illustrates adding mass weight to build a Gold Tip tuning shaft. All of this illustration also applies to the Carbon Express with differences and exceptions as noted at the bottom of page 20.**

Gold Tip graphite shafts are available in sizes 1535, 3555, 5575 and 7595. A 1535 weighs 7.6 grains per inch, a 3555 weighs 8.6 grains per inch, a 5575 weighs 9.3 grains per inch and a 7595 weighs 11.5 grains per inch. After calculating the total weight needed to equal 8 to 12 grains of arrow weight per pound of draw weight you can then determine approximately how much weight you need to add to the Gold Tip shaft. You can add this weight to just the point end or you can add it to both the point and nock ends in various combinations to "weight tune" the Gold Tip shaft to achieve perfect arrow flight.

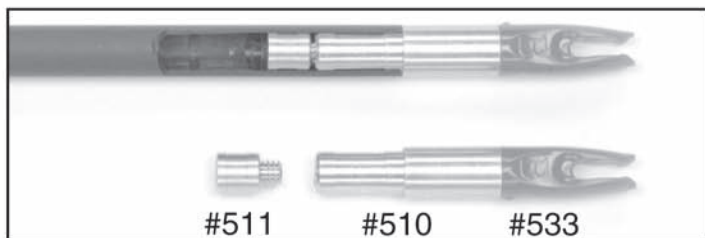
In preparing your Gold Tip tuning shaft start with a shaft about an inch longer than your draw length (longer if you wish). In the following example we begin by adding 70 grains to the point end and 40 grains to the nock end. Install the field point of choice into a #512 fully-threaded R.P.S. insert\*. If you plan to hunt using a traditional type broadhead with a broadhead adapter we suggest using a #560 @ 145 grains or 175 grains, 5/16" field point. In the following example, we will install two #511 weights (one 50 grain and one 20 grain) for a total of 70 grains additional weight. If you have difficulty starting the thread into the R.P.S. you may have to remove the thread shaving from the end of the R.P.S. with your fingernail or pen knife. Use a Q-tip dipped in alcohol to remove graphite dust from the inside of both ends of the *Gold Tip* shaft. Now we are ready to heat the entire assembly and apply hot melt to both the R.P.S. and the weights, then insert the assembly into the shaft. **NEVER APPLY FLAME HEAT DIRECTLY TO THE GOLD TIP SHAFT.** To insure a good bond, heat a pan of water to the boiling point and immerse two or three inches of the arrow tip in the boiling water for about one minute. To later remove the assembly (or rotate your broadhead) use the same procedure with boiling water.



# Refers to *Black Widow* catalog number.

\* The #512 R.P.S. insert and the #533 nock each weigh 13 grains.

Now you are ready to add weight to the nock end of your *Gold Tip* shaft. Press the #533 nock\* into the #510 threaded nock adapter (20 grains) by using the nock tool (included with the Boning Signature Nock) and a hammer to drive the nock into the nock adapter. Apply a dab of hot melt on the thread of the heated #511 weight (20 grains) for a total of 40 grains additional weight. Use the nock tool to press the entire nock assembly into the *Gold Tip* shaft. If it does not fit tightly enough, smear a little #533 *Super Spider Goo* or *Fletch-Tit* inside the shaft or on the barrel of the nock adapter and let it dry. Then press the nock assembly into the shaft again. This "press-fit" is satisfactory to use permanently and allows you to rotate the nock to the preferred position or later add or remove weight on the nock end to tweak the dynamic spine.



Example:

60# @ 29" bow x 10 grains per pound.....	600 grains
5575 <i>Gold Tip</i> @ 9.3 grains per inch x 29" (+ 1" of nock & adapter = 30") .....	270 grains
R.P.S. (13), nock (13), glue & fletching (19).....	45 grains
Screw-in field point .....	175 grains
	Total: 490 grains
	Additional Weight Needed: 110 grains
Point end: two adapter weights (50 and 20) .....	70 grains
Nock end: nock adapter (20) and one adapter weight (20).....	40 grains
	Total Weight Added: 110 grains

You are now ready to test your *Gold Tip* bare shaft.

If, after testing your bare shaft, you find that the spine is too stiff (nock right for a right hand shooter and nock left for a left hand shooter) you will need to reduce the dynamic spine. To do this your options are:

1. Use a heavier field point (if feasible).
2. Remove the entire R.P.S. assembly (using boiling water) and add more weight with an additional #511 adapter weight.
3. Extract the nock assembly and remove the #511 adapter weight (if applicable).
4. Start over with a *Gold Tip* shaft of less spine (if you did not start out with the weakest spine).
5. Start over with the same size *Gold Tip* shaft but of longer length.

If, on the other hand, you find that the spine is too weak (nock left for a right hand shooter and nock right for a left hander) you will need to increase the dynamic spine. To do this your options are:

1. Remove the nock assembly and add more weight with an additional #511 adapter weight.
2. Use a lighter field point (if feasible).
3. Shorten the shaft if you started with enough extra length (cut off in 1/4" increments).
4. Start over with a *Gold Tip* shaft of greater spine (if you did not start out with the stiffest spine).

If, at some point in your bare shaft testing, you have achieved satisfactory arrow flight with a *Gold Tip* arrow, but you determine that you want an arrow of heavier mass weight, you cannot simply add equal additional weight to both ends. It will be necessary to add approximately three to four times more weight to the nose than to the tail to maintain good arrow flight.

As you experiment with the placement of these weights, you may find it necessary to slightly adjust the nocking point to correct nock high or nock low.

Some people like to add 20 grains of weight to the tail end of their Gold Tip bare shaft to compensate for the weight of the fletching. Others feel that this is not necessary.

When you prepare your hunting arrows be sure that you closely match the weight of the field point you selected for your bare shaft tuning arrow with the weight of the broadhead you select (including the weight of the broadhead adapters if you choose a traditional type broadhead). If you do choose a traditional type broadhead with broadhead adapter, here are several options for you to consider:

- #572 Grizzly, #574 Magnus or #585 Snuffer @ 100 grains, 11/32" (ferrule) broadhead (the 11/32" ferrule diameter is slightly larger than the *Gold Tip* shaft), plus #566 short, 25 grains, 11/32" broadhead adapter (125 grains total).  
Practice with #560 @ 125 grains, 5/16" field point.
- #574 Magnus or #577 Zwickey @ 110 grains, 5/16" (ferrule) broadhead, plus #566 medium, 35 grains, 5/16" broadhead adapter (145 grains total).  
Practice with #560 @ 145 grains, 5/16" field point.
- #571 Eclipse, #572 Grizzly, #574 Magnus, #576 Wensel Woodsman, #577 Zwickey or #585 Snuffer @ 125 grains, 11/32" (ferrule) broadhead, plus #566 short, 25 grains, 11/32" broadhead adapter (150 grains total).  
Practice with #560 @ 145 grains, 5/16" field point, plus #557 @ 5 grains, 5/16" weight washer (150 grains total).
- #571 Eclipse, #572 Grizzly, #574 Magnus, #576 Wensel Woodsman, #577 Zwickey or #585 Snuffer @ 125 grains, 11/32" (ferrule) broadhead, plus #566 long, 45 grains, 11/32" broadhead adapter, plus #557 @ 5 grains, 5/16" weight washer (175 grains total).  
Practice with #560 @ 175 grains, 5/16" field point.

We prefer the latter option (175 grains) because you will not need to add as many weight adapters to the point end and it allows you to use the long broadhead adapter with a variety of broadheads.

All of the above illustrations using the Gold Tip shaft is applicable to the Carbon Express shaft with the following differences and exceptions:

The Carbon Express graphite shafts are available in sizes 90, 150, 250 and 350. A 90 weighs 9.4 grains per inch, a 150 weighs 10.7 grains per inch, a 250 weighs 11.5 grains per inch and a 350 weighs 12.0 grains per inch.

Because there is not a nock adapter available for the Carbon Express, it is not possible to add weights to the tail end of the shaft. However, since the Carbon Express R.P.S. insert #516 is fully threaded, you can add the #511 weights to the point end just as described above for the Gold Tip shafts.

Not everyone has the passion or patience to go through the above exercise of testing and tuning. But if you are a bowhunter who pursues perfect arrow flight to improve accuracy, consistency and enhance penetration, then you will find this pursuit rewarding.

See Page 22 for a comparison of arrow shaft spine defraction and weight.



## WOOD SHAFTING

When selecting wood shafting you need to remember that spine tables still being used today were developed years ago for bows of modest performance with shallow sight windows and calculated at 28" arrow length. Some of you will not be able to get a spine heavy enough for your modern high performance bow, especially if you need a long arrow. For comparison, a 2016 aluminum spines out on a Flite Rite spine tester at about 61# , a 2020 at about 80#, a 2117 at about 87# and a 2216 at about 97#. To determine the approximate arrow spine needed for your *Black Widow*, multiply the draw weight (at your draw length) by a *Black Widow* factor of 1.2 or 1.3. Much depends on your form and release, weight of arrow shaft(heavier shafts absorb more of the bows stored energy), even the effect of a bow quiver, as well as other factors. Next, add 15% spine per inch of arrow length over 28" or subtract 15% spine per inch of arrow length under 28". If you are using points or broadheads heavier than 100 grains add another 1# spine for every 5 grains of extra point weight. The arrow length is measured from the bottom of the nock groove to the end of the shaft. This formula is not perfect for everyone, but should get you in the ball park.

A 1.2 *Black Widow* factor was used in the following examples.



### EXAMPLE: 50# Draw Weight @26" and 27" Arrow

Bow	50# @ 26" x 1.2 ( <i>Black Widow</i> Factor)	=	60#
Arrow	27" - 28" = - 1 x 15% x 60	=	- 9#
Point	125 grains - 100 = 25 ÷ 5	=	5#
Approximate SPINE needed			56#
<i>Our Recommendation : 55#-59# SPINE</i>			

### EXAMPLE: 50# Draw Weight @29" and 30" Arrow

Bow	50# @ 29" x 1.2 ( <i>Black Widow</i> Factor)	=	60#
Arrow	30" - 28" = 2 x 15% x 60	=	+ 18#
Point	145 grains - 100 = 45 ÷ 5	=	+ 9#
Approximate SPINE needed			87#
<i>Our Recommendation : 85#-89# SPINE</i>			

If you are currently using aluminum and wish to convert to wood shafting, you will find it useful to review the spine deflection of aluminum shafting on Page 22. If you already know what aluminum size works best for your bow, simply select wood shafts with about the same spine deflection values. Again, this should get you in the ballpark.

**ARROW SHAFT DEFLECTION  
AT 26" SPAN FOR 28" ARROW AND SHAFT WEIGHT**

Size	Deflection @ 26"	Grains Per Inch
<b>Easton Aluminum</b>		
1816	.600	9.3
1916	.495	10.0
2016	.420	10.6
2114	.405	9.9
2018	.370	12.3
2213	.365	9.8
2115	.370	10.8
2020	.340	13.5
2215	.335	10.7
2117	.325	12.0
2216	.305	12.0
2315	.275	11.7
2219	.270	13.8
2317	.240	13.3
2419	.220	14.6
<b>Gold Tip Traditional</b>		
1535	.480	7.6
3555	.410	8.6
5575	.330	9.3
7595	.230	11.5
<b>Carbon Express Heritage</b>		
90	.420	9.4
150	.375	10.0
250	.300	11.0
350	.260	12.0
<b>Carbon Express ThunderStorm</b>		
SE	.455	8.2



# EASTON SELECTION CHART FOR *Black Widow* Bows WITH *DynaFLIGHT* 97 STRINGS

## CORRECT HUNTING ARROW LENGTH (Your Draw Length Plus 1" Clearance)

21½"-22½"		22¼"-23¼"		23¼"-24¼"		24¼"-25¼"		25¼"-26¼"		26¼"-27¼"		27¼"-28½"		28½"-29½"		29¼"-30¼"		30¼"-31½"		31½"-32¼"		32¼"-33¼"		33¼"-34¼"		90-110 Grains		115-135 Grains		140-160 Grains		165-185 Grains		
Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	Shaft Size	Arrow Weight	At Draw	At Draw	At Draw	At Draw	At Draw	At Draw	At Draw	At Draw	
1713	206	1713	215	1815	255	1815	264	1915	269	1818	335	1917	351	1918	364	2018	421	2013	366	2132	391	2014	432	2113	439									
1713	208	1813	227	1815	256	1913	261	1818	324	1917	340	1918	373	2018	409	2213	358	2312	382	2314	422	2216	459	2413	439									
1813	219	1815	247	1913	253	1915	259	1916	312	2016	331	2016	344	2016	353	2112	322	2020	403	2112	441	2216	484	2313	459									
1813	220	1815	248	1913	254	1915	260	1916	313	2016	332	2016	345	2016	354	2112	323	2021	404	2113	442	2217	485	2314	460									
1813	221	1815	249	1913	255	1916	261	1917	314	2016	333	2016	346	2016	355	2113	324	2022	405	2114	443	2218	486	2315	461									
1813	222	1815	250	1913	256	1917	262	1918	315	2016	334	2016	347	2016	356	2114	325	2023	406	2115	444	2219	487	2316	462									
1813	223	1815	251	1913	257	1918	263	1919	316	2016	335	2016	348	2016	357	2115	326	2024	407	2116	445	2220	488	2317	463									
1813	224	1815	252	1913	258	1919	264	1920	317	2016	336	2016	349	2016	358	2116	327	2025	408	2117	446	2221	489	2318	464									
1813	225	1815	253	1913	259	1920	265	1921	318	2016	337	2016	350	2016	359	2117	328	2026	409	2118	447	2222	490	2319	465									
1813	226	1815	254	1913	260	1921	266	1922	319	2016	338	2016	351	2016	360	2118	329	2027	410	2119	448	2223	491	2320	466									
1813	227	1815	255	1913	261	1922	267	1923	320	2016	339	2016	352	2016	361	2119	330	2028	411	2120	449	2224	492	2321	467									
1813	228	1815	256	1913	262	1923	268	1924	321	2016	340	2016	353	2016	362	2120	331	2029	412	2121	450	2225	493	2322	468									
1813	229	1815	257	1913	263	1924	269	1925	322	2016	341	2016	354	2016	363	2121	332	2030	413	2122	451	2226	494	2323	469									
1813	230	1815	258	1913	264	1925	270	1926	323	2016	342	2016	355	2016	364	2122	333	2031	414	2123	452	2227	495	2324	470									
1813	231	1815	259	1913	265	1926	271	1927	324	2016	343	2016	356	2016	365	2123	334	2032	415	2124	453	2228	496	2325	471									
1813	232	1815	260	1913	266	1927	272	1928	325	2016	344	2016	357	2016	366	2124	335	2033	416	2125	454	2229	497	2326	472									
1813	233	1815	261	1913	267	1928	273	1929	326	2016	345	2016	358	2016	367	2125	336	2034	417	2126	455	2230	498	2327	473									
1813	234	1815	262	1913	268	1929	274	1930	327	2016	346	2016	359	2016	368	2126	337	2035	418	2127	456	2231	499	2328	474									
1813	235	1815	263	1913	269	1930	275	1931	328	2016	347	2016	360	2016	369	2127	338	2036	419	2128	457	2232	500	2329	475									
1813	236	1815	264	1913	270	1931	276	1932	329	2016	348	2016	361	2016	370	2128	339	2037	420	2129	458	2233	501	2330	476									
1813	237	1815	265	1913	271	1932	277	1933	330	2016	349	2016	362	2016	371	2129	340	2038	421	2130	459	2234	502	2331	477									
1813	238	1815	266	1913	272	1933	278	1934	331	2016	350	2016	363	2016	372	2130	341	2039	422	2131	460	2235	503	2332	478									
1813	239	1815	267	1913	273	1934	279	1935	332	2016	351	2016	364	2016	373	2131	342	2040	423	2132	461	2236	504	2333	479									
1813	240	1815	268	1913	274	1935	280	1936	333	2016	352	2016	365	2016	374	2132	343	2041	424	2133	462	2237	505	2334	480									
1813	241	1815	269	1913	275	1936	281	1937	334	2016	353	2016	366	2016	375	2133	344	2042	425	2134	463	2238	506	2335	481									
1813	242	1815	270	1913	276	1937	282	1938	335	2016	354	2016	367	2016	376	2134	345	2043	426	2135	464	2239	507	2336	482									
1813	243	1815	271	1913	277	1938	283	1939	336	2016	355	2016	368	2016	377	2135	346	2044	427	2136	465	2240	508	2337	483									
1813	244	1815	272	1913	278	1939	284	1940	337	2016	356	2016	369	2016	378	2136	347	2045	428	2137	466	2241	509	2338	484									
1813	245	1815	273	1913	279	1940	285	1941	338	2016	357	2016	370	2016	379	2137	348	2046	429	2138	467	2242	510	2339	485									
1813	246	1815	274	1913	280	1941	286	1942	339	2016	358	2016	371	2016	380	2138	349	2047	430	2139	468	2243	511	2340	486									
1813	247	1815	275	1913	281	1942	287	1943	340	2016	359	2016	372	2016	381	2139	350	2048	431	2140	469	2244	512	2341	487									
1813	248	1815	276	1913	282	1943	288	1944	341	2016	360	2016	373	2016	382	2140	351	2049	432	2141	470	2245	513	2342	488									
1813	249	1815	277	1913	283	1944	289	1945	342	2016	361	2016	374	2016	383	2141	352	2050	433	2142	471	2246	514	2343	489									
1813	250	1815	278	1913	284	1945	290	1946	343	2016	362	2016	375	2016	384	2142	353	2051	434	2143	472	2247	515	2344	490									
1813	251	1815	279	1913	285	1946	291	1947	344	2016	363	2016	376	2016	385	2143	354	2052	435	2144	473	2248	516	2345	491									
1813	252	1815	280	1913	286	1947	292	1948	345	2016	364	2016	377	2016	386	2144	355	2053	436	2145	474	2249	517	2346	492									
1813	253	1815	281	1913	287	1948	293	1949	346	2016	365	2016	378	2016	387	2145	356	2054	437	2146	475	2250	518	2347	493									
1813	254	1815	282	1913	288	1949	294	1950	347	2016	366	2016	379	2016	388	2146	357	2055	438	2147	476	2251	519	2348	494									
1813	255	1815	283	1913	289	1950	295	1951	348	2016	367	2016	380	2016	389	2147	358	2056	439	2148	477	2252	520	2349	495									

## **NOTES**

BRACE HEIGHT:

ARROW

Size/Spine:

Length:

Weight:

FIELD POINT

Size:

Weight:

Total Weight:

NOCKING POINT:

GOLD TIP WEIGHTS

Point End:

Nock End:

Total Added Weight:

BROADHEAD

Weight:

Adapter Weight:

Total Weight:

MISCELLANEOUS

## **FIVE YEAR PRO-RATED LIMITED WARRANTY**

Should damage or failure occur to a *Black Widow* bow within a period of one year from the date of shipment due to inferior materials or workmanship we will make free repair, or replacement if repair is not possible. After the one year period, repair will be made at a reasonable charge. If, at the discretion of *Black Widow Custom Bows* repair is not possible, replacement will be made on the basis of 1/48th of the current retail price per month from the first anniversary of the date of shipment. For example, if the current price of a set of bow limbs at the time of replacement is \$588.00, the per month replacement charge from the first anniversary date of shipment would be \$12.25 per month. If this were to happen after 24 months from the date of shipment (12 months from first anniversary date) the replacement cost would be \$147.00 (\$12.25 x 12 months). Replacement will be made with a bow of the same model, or as near as possible if models have changed.

*THIS WARRANTY APPLIES TO THE ORIGINAL OWNER ONLY.*

The above provisions will apply unless the bow shows evidence of misuse, abuse, alteration, damage during the stringing or unstringing process, or damage as a result of shooting arrows weighing less than 8 grains per pound of draw weight. (We recommend 9 to 12 grains, especially with long draw lengths of 29 inches or more, which can significantly increase the possibility of limb tip damage when using a high performance bowstring and lighter weight arrows.) No adjustment can be made until the bow is returned to *Black Widow Custom Bows* for inspection.

If it is necessary to return your bow to the factory for repair be certain to pack it carefully to prevent damage from shipping.

To insure that you do not do something that will void your warranty be sure to read and follow the instructions in the Owners Manual before assembling, stringing and shooting your bow.