

BOW — REPORT

CSS Encore II *by Richwood Archery*

Chuck Nease, the founder of CSS Archery and now the chief designer at Richwood Archery, is forging ahead with the Encore II. Building on the popular Encore the new version incorporates several improvements including their new Trinary Articulated Cam (TAC) system, which allows three separate cam systems (single, dual and hybrid) to be used on one rig.

Following is a breakdown of the Encore II's construction and an in-depth evaluation of its performance characteristics.

The Basics:

Riser: Serving as a solid building block for the Encore II is a 22 ½ inch long reflex riser. The reflex geometry measures 2 inches providing more power stroke, which results in greater speed. CNC machining forms the riser from a solid block of 6061-T6 aircraft grade aluminum. CSS is meticulous in their riser design holding machining measurements to exacting tolerances.

The Encore II is available in four polished finishes (red, blue, black and platinum) for target shooters and in Mossy Oak Obsession Camo for bowhunters. Target colors are applied through anodizing and the camo is applied through a film dipping process. In this process a piece of film with the camo pattern printed on it is placed flat on the surface of the water in a stainless steel tank. The film base is dissolved by the water leaving only the camo pattern lying on the water's surface. A cleaned and powder coated part, in this case a riser, is lowered through the ink and into the water. The ink pattern wraps around the part creating a seamless and flawless finish. The riser is then removed, rinsed and dried before a hard protective coat is added.

Keeping the weight as low as possible, CSS machines four cutouts above the grip and four more below. These along with a thin handle design results in a mass weight of only 3.7 pounds. Attached to the riser is Richwood's 2-piece walnut grip. CSS also makes available a 1-piece walnut grip and a 1-piece rubber grip. Just below the grip a stainless steel insert is used for a consistent and reliable stabilizer connection.



The Encore II is outfitted with a fully adjustable carbon cable guard that allows the archer to set the clearance specifically for their set-up. CSS uses the Bomar Super Cable Slide on their cable guard.

Customer Connection:

Sell the mass weight! It seems as if many bows are trending toward a heavier design in the past couple of years. I do not feel comfortable with something too light however rigs well over four pounds are getting to be too much. Most hunters will appreciate a 3.7-pound mass weight, especially in a bow where the riser is significantly reflexed for speed. CSS offers a grip to fit almost any archer. If a customer doesn't like the grip, find the one they do! Stock all of the grip styles.

It may be a small feature but the stainless steel stabilizer insert is one of my favorites. It makes sense and you will never have to worry about cross threading drilled and tapped riser holes.

You can sell the adjustable cable guard. In the past two years I have tested bows that could not obtain

center shot because they had incorrectly adjusted cable guards that were permanently affixed.

Limbs/limb pockets:

CSS relies on the reputation and proven track record of Gordon composite materials when selecting their limb material. Gordon's Power-Tuff has proven to be one of the most durable and reliable composites in

the industry. Richwood CNC machines their limbs to exacting tolerances and then performs a final sanding operation for a perfect fit. Limb sets are matched for each bow based on weight ratings and registered to the individual bow build sheet.

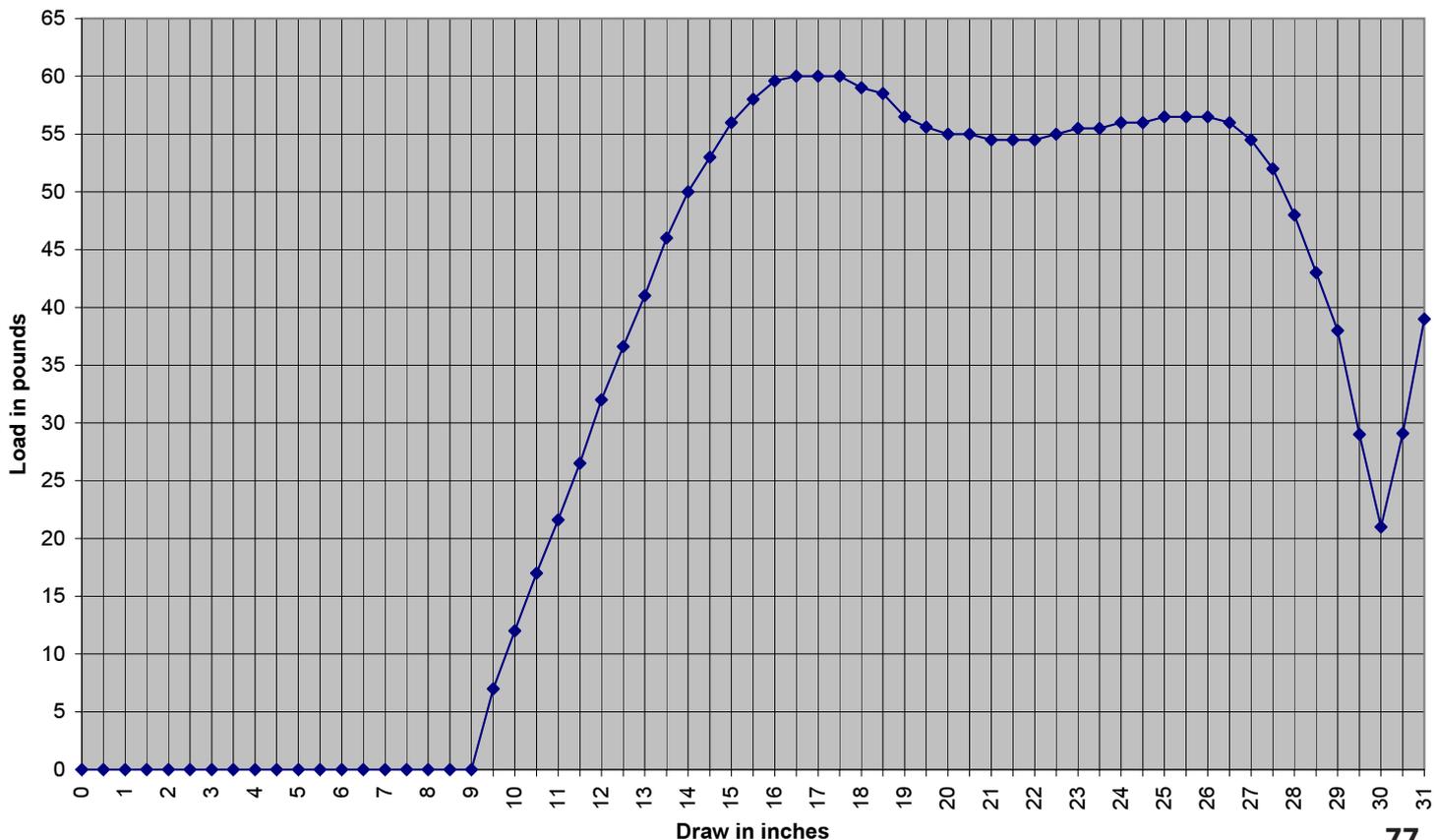
Hunting limbs are finished in Mossy Oak Obsession Camo through the same Hydro-Graphics process as

About The Author

Jon E. Silks has a degree in Quality Engineering and works in the area of non-destructive testing technology. His entire career has centered around the testing and evaluation of products. Now 36, he's been bowhunting since age 12. Silks started writing for magazines and websites four years ago and since then has done more than 225 product reviews. Manufacturers who appreciate his thoroughness and frankness have often asked him to review products that are still in the development stage. Silk's work has appeared on Bowhunting.net and Bowsite.com and has been published in Petersen's Bowhunting, Bowhunter, Arrow Adventure, and Whitetail Fanatic, along with ArrowTrade. Jon and Jennifer Silks have six children Silks can be reached by email at silksoutdoors@lazerlink.net



CSS Encore II Force Draw Curve



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the riser. Target limbs are custom painted in high gloss black and silver with the CSS logo.

CNC machined from 6061-T6 aluminum the closed-end limb pockets employ a three-point locking system that guarantee an unmoving interface. Two sizes of rockers/limb pivots are used to increase peak weights without increasing limb weights.

Customer Connection:

Gordon's composites are leaders in the industry. Sell the durability and reputation of the limb material.

Eccentrics: The Encore II features Richwood's new cam system that is unique in that it can be

switched from a 2-cam configuration to a hybrid model or even a one cam by simply changing modules and strings. Eight modules with one inch of adjustment each, marked OSA through OSH, give the 35 inch axle-to-axle Encore a draw length range of 25 to 32 inches. The 33 inch axle-to-axle version ranges from 24 to 31 inches. Four posts and an adjustable Pro-Stop allow for an additional fine tune adjustment from 1/1000 of an inch to 1/2-inch.

The cam systems that power the Encore II ride on heat-treated stainless steel axles that are designed to eliminate bending and wear. Teflon impregnated compression bushings are installed to compliment the axles and improve efficiency.

CSS's all new TAC (Trinary Articulated Cam) System allows three totally different cam set-ups on one bow without removing cams. This is accomplished by simply changing the cable and modules. With a TAC system bow you get 3 bows in one - a single cam, dual cam and hybrid cam.

Customer Connection:

Modular cam systems are cer-

tainly a benefit in that all that is needed to set up a particular customer is a module rather than an entire bow or cam.

Three bow styles in one - sell the diversity of this bow and stock the few parts you need to deliver it any of three ways!

Silencing/Shock reducing features: Introduced last year, the CSS Tunerz System is designed to reduce oscillations and vibrations. Tunerz can be used on your bow limbs riser and accessories. There are Tunerz specifically designed for string silencing as well. All Tunerz products are molded from a special Accu-flex material that has proven vibration and oscillation dampening characteristics. Tunerz do not require any adhesives or screws to attach them and are therefore quick and easy to adjust. More information is available in the Richwood Archery 2006 Bow Lines coverage that appears in this issue.

Customer Connection: Tunerz give you the ability to fine tune their position based on performance. The lack of adhesives and screws allows



Chuck Nease designed the TAC Cam System so a minimum of components are needed (below) to make the switch between twin cam and hybrid systems. If you order the Encore II as as Twin Cam model, you can press the bow and remove a module from the lower cam, then replace one cable with a take-up string. You'll make some adjustments on cable and take-up strings to get things set up but in most cases, you won't need to adjust the nocking point.



for simple adjustments. They are also more durable than many other dampening devices because they will not be rendered useless when the adhesive dries out.

Strings/Cables: CSS has chosen to use custom-built Vapor Trail strings and cables because of their incredible performance record. The folks at Vapor Trail have eliminated all other material from their inventory besides BCY 8125. They believe the material to be superior in every way and see no reason to use any other. The Encore II's pre-stretched and pre-twisted strings promise to eliminate peep sight twisting and are ready to go right out of the box.

CSS uses a new duplex yoke system, which is two times as strong and self-aligning.

Customer Connection: With Vapor Trail behind the Encore II's strings and cables you can certainly use this as a selling point!

Testing:

The evaluation of the Encore II started as all of my evaluations do - with a thorough inspection of the mechanics, machining, finish and overall workmanship. From tip to toe the Encore II was spotless in finish, free of machining defects and mechanically sound. All moving parts cycled cleanly and CSS's attention to detail was apparent.

A string nock, QuikTune 3000 arrow rest, 60-pound pull and 30 inch draw constitute my standard set-up for Arrow Trade reviews. All shooting was done with a T.R.U. Ball Pro Diamond release aid. Also, standard to the testing set-up is a 540-grain Easton XX78 Super Slam aluminum shaft.

To ensure accurate test results the Encore II was paper tuned to a slightly high tear.

Generally I like to have at least three other bows to compare subjective aspects of the test bow to, however, at this time when 2006 models were mostly still under wraps, I only have one that has similar specs. Since one bow is not sufficient for a fair comparison I decided to forego the head to head evaluation and analyze the Encore II based on my

past experience with similar rigs. The subjective aspects to be evaluated are noise level, smoothness of draw, feel/balance and shock/vibration.

Noise level was tested by listening to the shot noise from various positions as a friend fired an AMO rated arrow from the Encore. As in my annual head to head test I found that the noise detected from down range, the animal's perspective, is surprisingly minimal for any bow. The Encore II reaffirmed this finding. From other positions I found the CSS to be average in noise level. As a note though I think it is important to point out that noise levels today are far quieter than those of just five years ago. In other words, a bow deemed to be loud by today's standards would most likely be one of the quietest bows made in 2000. Still, the Encore II is a quiet bow by any standards when all of the Tunerz options are applied.

To determine the smoothness of the draw I simply pulled the bow slowly through its cycle approximately 20 times. This is one area that the Encore II did not excel at. It has a defined second peak in draw weight after the initial max peak weight. The force draw curve attached shows this to be the case.

The two-piece wood grip provided with the test rig fit well in my hands and was comfortable to handle. Unlike some other models on the market the Encore II grip area leaves plenty of room for your whole hand to interface with

the handle. That makes the CSS comfortable when shooting or just carrying around the woods. The relatively light weight of this bow also adds to the good score in the feel/balance category. When the bow first arrived my daughter got it out of the box and her first words were, "wow, it is really light!" At full draw the CSS is solid and settles into an aiming point easily. The Encore II is a standout in both feel and balance.

Shock and vibration, while at times related, are totally different animals. In the past we have tested rigs that are loud as thunder but have minimal shock while others that rattle your teeth have barely perceivable kick. Another obstacle in accurately assessing these two characteristics is noise. It can be tricky to separate what you feel from what you hear. In order to eliminate the noise factor I wear earplugs to do this test. After many shots the Encore II proved to excel in the area of vibration and was average in the kick/shock arena.

Patton Archery
MFG., INC.

P.O. Box 161 • Norway, MI 49870
(906) 563-5990 • Fax (906) 563-7344
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Speed was measured using an Oehler Research Inc. M35 Chronograph. Through ten shots fired into my Block Target, the average reading taken with a 540-grain arrow was 235.5 fps. This is 1.5 fps faster than advertised - yes, I said faster. Now, that is something I don't run into often!

The Richwood Archery CSS Encore II is a solid performer in most every respect. The only draw back (pun intended) is the draw cycle. It isn't particularly bad just different from the norm. The handling is great with a super comfortable grip and low mass weight. I found that the bow aimed well for me. Some bows seem to fight my effort to shoot accurately, always moving off of the aiming point while others settle in nicely and lend themselves to consistent and accurate shooting. The Encore II is a shooter.

Test Bow Tech Info:

(540-grain arrow/ 60 pound peak draw weight)

Stored Energy: 81.41 foot-pounds

(When you draw the bow you supply power/energy into the limbs. The amount of energy that the limbs can hold is known as the stored energy.)

Efficiency Rating: 81.7 percent

(This is the amount of the stored energy (in percent) that can be successfully transferred into propelling the arrow upon release. The bow design, including limbs, limb pockets, cam systems, and axle types play into the bow's efficiency. An example would be a sealed ball bearing in the idler wheel verses a simple unsealed



Stainless steel stabilizer bushing and three grip options are nice touches on the Encore II. So is the adjustable cable guard rod and generous clearance for broadheads.



rod bearing. It takes more energy to rotate the unsealed rod bearing (more friction) verses the sealed ball bearing (less friction) so more of the bow's potential energy is used. The end result is a lower efficiency rating because less stored energy is left over to propel the arrow.)

Kinetic Energy: 66.52 foot-pounds

(This is the energy that actually

goes into propelling the arrow. Basically it is the energy that is left over from the stored energy after all of the bow system friction is accounted for.)

SE/PF Ratio: 1.36

This is the ratio of stored energy to peak force. In other words what return are you getting for the power you supply.



Specifications for 2006 CSS Encore II by Richwood Archery

Draw weights: 50, 60, 70 or 80 pound max

Draw Lengths: 25 to 32 inches

Axle-to-axle length: 35 inches as tested (33 inch also available)

Brace Height: 7.6 inches

Mass Weight: 3.7 pounds

Let-off option: 75 normal with 65 to 80 percent adjustment

Eccentrics: OS-3 Trinary Cam System

AMO speed: 234 advertised

IBO speed: 310

Available finish: Mossy Oak Obsession plus target colors

Cable: Vapor Trail 8125

String: Vapor Trail 8125 - 20 strand @ 59 inches

Grip: 2-piece walnut

Riser: CNC machined 6061-T6 aluminum - reflex

Limb pockets: Tri-Loc CNC machined 6061-T6 aluminum

Limbs: Straight, Gordon Power Tuff fiberglass

Cable Guard: Carbon - Straight

Warranty: Lifetime to original owner

MSRP: \$625.00