BOW REPORT

Switchback

by Mathews, Inc.

Over the past two years the design team at Mathews has put together an archery duo that awed the bowhunting community – The LX and Outback. The LX had great speed but lacked, to some degree, the "no kick" thrill that made Mathews famous. In response, the next year the Outback was birthed. This has been one of the finest bows I have ever tested. It was unbelievably smooth and quiet but did not generate the speeds attained by its predecessor.

Year after year I am impressed by the ability of top bow companies to push the envelope, surge ahead and improve on bows that seem to be almost unbeatable. Mathews has a knack of not only improving on past year's models but also offering true innovation and real solutions to difficulties in the process.

2005 is no exception as Mathews introduces the Switchback, a blend of the qualities that made the LX and Outback excellent hunting rigs. The Switchback brings remarkable speed along with a quiet and shock free shooting experience to the table that will be sure to increase the sales at any shop fortunate enough to carry the Mathews line.

The Basics:

Riser: The Switchback is built around a reflex riser that is fully CNC machined from a solid block of aircraft-grade 6061-T6 aluminum. Reflex geometry measures approximately 3.25 inches. The length of the riser is dotted with cutouts, some of which are intended to reduce the overall mass weight and others to house the harmonic dampeners, emblems, quivers and center-line wood grip. There are also a few shallow decorative machining pockets. Two oval emblems located on either side of the riser, just below the grip are engraved, "Mathews Solocam". Threaded brass inserts are located on the front and back of the riser in the same position as the emblems. These inserts provide a consis-

tent and long lasting connection for stabilizers.

Mathews applies the finishing touch, Realtree Hardwoods HD, through a film-dipping process. This process employs film and water. Each riser is first cleaned, dried and then covered with a powder coating. The decorative pattern intended for use is printed on film. Each piece of film is cut to the proper size in reference to the part being finished. The film is placed on top of the water in the stainless steel dip tank. Water dissolves the film leaving only the ink lying on top of the water. The part is then submerged through the ink which wraps around it creating a seamless, flawless no-bubble finish. Parts are removed from the dip tank and rinsed before being cycled through a series of blowers, ovens and dryers. A hard coat is then applied followed by another trip to the ovens. Mathews added a 10,000 square foot facility a year or two back that enables them to do their own finishing processes.

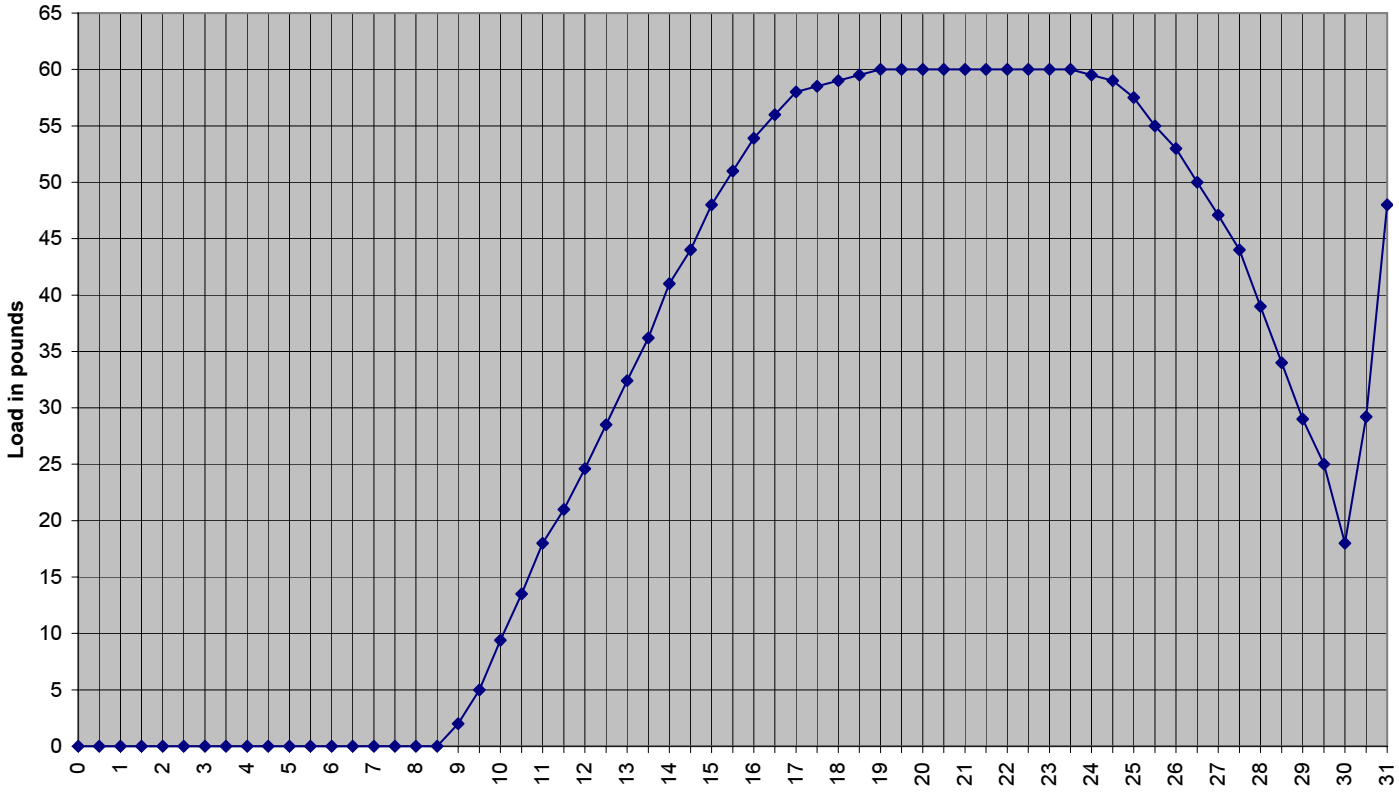
The Switchback sports a competition grip with positively marked centerline. The grip is constructed of stained walnut wood and engraved on one side with the words "Mathews Solo Cam" and on the opposite side with "Switchback".

Mathews' unique cable guard system, the Roller Guard, measures approximately 5 ½ inches in length, 15/16 inch wide and 5/16 inch thick. The end of the bracket is cut out into a U-channel and is angled toward the centerline of the bow. This is done to match the natural tension and movement of the cables. The U-channel houses two machined wheels that ride on a stainless steel axle and sealed ball bearings for friction free movement. Two small

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 Petersens Bowhunting, Bowhunter, Arrow Adventure, and Whitetail Fanatic. Jon and Jennifer Silks have six children and the family moved in 2003 from central Pennsylvania to Ohio. Silks can be reached by telephone at (937) 383-8888 or by email at silksoutdoors@core.com

Force Draw Chart
Mathews Switchback



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screws, removable with a 1/8 hex head wrench, attach the CNC machined, 6061-T6 aluminum Roller Guard system to a fitted pocket in the riser. For 2005 Mathews has included a "Double Damper" harmonic damping system to the Roller Guard bracket for increased reduction in noise and vibration.

Customer Connection: The overall quality should be brought out to any potential customer. The effort put forth by Mathews to perfect every detail is evident in every single component mentioned above.

The Roller Guard is a more efficient cable placement device than a simple slide type and employs sound destroying harmonic dampers. Certainly a selling point.

The finish is seamless and attractive. I have yet to see even one camo finish blemish on any Mathews I have tested.

Well fashioned, quality constructed and functional, the centerline walnut grip is yet another selling point.

Point to the "extras" and incredible detail in the riser's machining to peak your customer's interest.

If a customer brings up the mass weight of the Switchback, be quick to point out that they will not have to add any sound or vibration damping products, which will even this out.

Limbs/limb pockets: Mathews understands that the interface point between the limbs and riser, the limb cups, are of the utmost importance when considering performance and accuracy. The firm attacked this area with the patented V-Lock limb cup system. The V-Cups are fully machined from 6061-T6 aluminum and are held to super tight tolerances. These, along with the V-shaped ends of each limb, take advantage of the inherent fit-up benefits naturally provided by the "V" configuration.

For each Switchback manufactured, there is a set of limbs that have been matched based on their deflection value. Mathews' straight limbs are CNC machined from a solid block of proprietary blend of Gordon's Power Tuff composite material. Gordon has built a reputation in the industry for providing materials of high durability and strength. The real key to Mathews' limbs though is not necessarily their material but rather their position. Basically, the limbs move in opposite directions when released rather than both moving forward. This motion effectively cancels out the energy of each limb and in turn drastically reduces shock, recoil and noise. Parallel Limb Technology has had a tremendous positive impact on the bow making market and is vital to the quietness and shock free shooting experience found in many Mathews bows.

While the Switchback continues with the riser-mounted harmonic dampers that have become standard with this line, the new model also gets twin dampers in the roller guard.

Attached to the tip of each limb, near the eccentrics, is a String Suppressor, which will be discussed in more detail under the "Silencing System" section below. The limbs, like the riser, are film dipped in Realtree's Hardwoods HD camo pattern.

Customer Connection: The tight tolerances of the V-cups and natural benefits of the "V" design can be used as a selling tool when dealing with a customer who is focused on accuracy and consistency.

Parallel limbs are a major selling point. It is in part responsible for the benefits that most customers rave about – quietness, no shock and no kick.

Eccentrics: The latest cam design from Mathews, the Straightline Cobra Cam, employs dual perimeter weights and is the engine that powers the Switchback to IBO speeds reaching 318 fps. The advertised AMO speed is 241 fps. The Cobra is draw specific and offers no adjustment in let-off. Draw lengths are available from 26 to 30 inches in 1 inch increments and from 26 ½ to 29 ½ in half inch sizes. Unlike the Outback which had a draw-stop that allowed for let-off adjustment, you must choose between 65 or 80 percent let-off for each cam. To achieve the correct performance characteristics Mathews uses one sealed bearing and one bushing for the Cobra

Cam and sealed ball bearings for the 4 inch idler wheel.

Customer Connection: With no adjustability the Cobra Cam will need to be sold on the performance it provides to the overall system. It is indeed another design victory in a long line of high performance Mathews Solo Cams.

For those customers that love speed the Switchback should be a nice fit.

Strings/Cables: The Switchback comes standard with Mathews' new Barracuda string and cable. The Barracuda string, like other premium Zebra strings, utilizes the patented ZS-Twist Technology. This technology involves twisting the individual strands that make up each of the two colored bundles in opposite directions and then counter twisting the bundles. This is done to eliminate the twisting of the string when the bow is drawn, which can throw peep sights out of alignment. In addition, Barracuda strings feature the patent-pending TwistLock™ center-serving technology, which secures the center serving. The Switchback string is 18 strands and 91 ¾ inches long while the cable is 30 strands and 35 ½ inches long.

Customer Connection: Archers who use a peep sight will love the Barracuda – no need for rubber tubing to keep things straight!

Any improvement on the already popular Zebra String is definitely a positive selling point. Matt McPherson has said because of the manufacturing process used on the Barracuda, the string stretches less at each shot. As part of the overall design, this new string is part of the reason for this bow's excellent speed.

Silencing System: The people at Mathews have made it their business to outshine the competition when it comes to manufacturing a quiet bowhunting rig. The Parallel Limb design is in large part responsible for the noiseless shooting experience; however Mathews doesn't stop there. For 2005 they bring it all together with the addition of harmonic dampers in the Roller Guard. These combined with the harmonic dampers in the riser and the string suppressors at the end of each limb make up the Switchback's silencing system. The Harmonic Damping system is built directly into each end of the riser and employs suspended weights secured by a rubber web. The weights are available in aluminum, brass or super dense carbide. The String Suppressor, which is mounted at the tip of each limb, quiets the string vibration through a proprietary rubber compound molded in the shape of a hook at the end of an aluminum bracket.

Customer Connection: A quiet bow is golden in the Bowhunting world and the Switchback is the treasure chest. If a customer is looking for a quiet bow then their search is over.

Instead of the single large carbide weight he used to counter recoil and add speed to the Outback, Matt McPherson integrated two carbide weights into the Straightline Cobra Cam. That helped move their center of mass further from the axle than he would have gotten with a single larger weight, allowing for more vibration reduction.

Testing

Any product that comes through Silks Outdoors for testing is given an extremely thorough quality inspection. The finish, mechanics, machining and overall workmanship of the Switchback were subject to the evaluation. I had the fortune of testing two Switchback bows for this report and both were absolutely flawless in every one of the above categories. I am particularly impressed with the finish on the Mathews bows I have tested.

The test bow was set up with a string loop, a New Archery Products QuickTune 3000 arrow rest, 60 pound pull, and a 30 inch draw length, the standard rigging for my bow tests. A T.R.U. Ball Pro Diamond release aid was used for all testing. Also, standard to the testing set-up is a 540-grain Easton XX78 Super Slam aluminum shaft.

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After tweaking the set-up, a series of paper tuning tests were conducted to ensure proper arrow flight. This is necessary to validate the results in the remainder of the report. The tuning process proved to be easier than that of the Outback. As a side note, I also tuned the Switchback with two drop away arrow rests following the main testing because of some concern expressed in tuning last year's Outback with such rests. I found no problem getting perfect paper tears with either the Trophy Taker Shakey Hunter rest or Trophy Ridge Drop Zone. All in all, the tuning of the Switchback was relatively simple.

When considering the purchase of a bow, many customers will ask about speed but the majority of the decision is often based on subjective aspects of the bow's performance. These performance variables are hard to evaluate and are best measured alongside other rigs in the same class. With that in mind the Switchback was compared on the points of quietness, feel/balance, draw cycle, kick and vibration with two other bows that are here for my yearly Head-to-Head Bow Test.

From various stations I listened for shot noise as a friend fired the three bows one right after the other. The Switchback ran neck and neck with one of the rigs while the third bow fell well behind. In the end though, I gave the edge to the Mathews as it launched arrows with an amazing lack of noise. It is amazing to me how unbelievably quiet a machine harnessing so much energy can be when that energy is released. The Switchback outdistances every bow that I have tested in this category to date, including all previous Mathews models.

"Practice makes perfect" the saying goes and no one likes to practice anything if it isn't fun. A bow's draw cycle can provide a major boost to what I call the "Fun Factor" if it is smooth and even. The draw cycle of the Switchback is exceptionally so and again rated at the top when compared to the others. A 60 pound pull on this bow feels more like 50!

The kick and vibration category has long been dominated by Mathews and the Switchback will keep them in that position! I was impressed with this characteristic of the Outback but can confidently say that the Switchback takes this quality to an all new level. My expectations were exceeded. Comparing it to the other rigs in this category it edged out one of the two and far outpaced the other. Just when I thought the bow manufacturing industry had reached a holding point with respect to this aspect of performance …

The balance and feel of the Switchback was actually the only category that I placed the Switchback last in when compared to the other two rigs. Don't get me wrong, it has a good feel and balance but the competition grip was not as comfortable in my hand as were the other two. In my opinion it would benefit Mathews to narrow their competition grip somewhat.

Speed was measured using an Oehler Research Inc. M35 Chronograph. Through twenty shots, the average reading taken with a 540-grain arrow was 241 fps AMO. That is the exact speed as advertised by Mathews. These numbers were confirmed with a ProChrono Chronograph. I will make the assumption that if the AMO speed has been correctly advertised that the IBO is most likely close as well, if not right on. I remember a day when arrow velocities of this caliber were not even in my realm of thinking. When technology advanced far enough for 300+ IBO speeds to be possible it was only achieved with high poundage bows that sounded like a rifle when they "exploded"! Now, a few years down the road, we have the Switchback that can easily eclipse the 300 barrier and the event can barely be detected!

What would I change about the

Specifications For 2005 Mathews Switchback

Draw weights: 40 – 70 pounds
Draw Lengths: 26 -30 inches, non-modular/cam specific, half sizes available
Axle-to-axle length: 33 inches
Brace Height: 7 inches
Mass Weight: 4.34 lbs
Let-off option: 65 or 80 percent - cam specific
Eccentrics: Straight-line Cobra Cam
AMO speed: 241 fps advertised – 241 fps tested
IBO speed: 318 fps advertised
Available finish: Realtree Hardwoods HD
Cable: Barracuda, 35 ½ inch, 30 strand
String: Barracuda, 91 ¾ inch, 18 strand
Grip: Competition Walnut, defined centerline
Riser: 25 inch long CNC machined 6061-T6 aluminum - reflex
Limb pockets: V-Lock; CNC machined 6061-T6 aluminum
Limbs: Straight, proprietary Gordon Composite
Cable Guard: Roller Guard
Warranty: Lifetime to original owner with a few exceptions
MSRP: $769.00

Switchback? If it were possible to maintain the performance as is, I would like to see the overall mass weight reduced by approximately ½ pound. The other item that can indeed be changed is the grip geometry. It would most likely be better accepted by more archers if the throat were trimmed to a slightly smaller size.

Anyone in the business of selling a product likes it when that product virtually sells itself. The problem with the Switchback, with all of its features and performance characteristics, will not be selling it but rather, keeping it on the shelf. It did what I thought would not be done for some time – performed better than the Outback. The Switchback is a dream to shoot, packs an impressive punch and is definitely one of the top compounds of all time.

Test Bow Tech Info:

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

Stored Energy: 79.6 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: 87.5 percent

(This is the amount of the stored energy (in %) that can be successfully transferred into propelling the arrow upon release. The bow design, including limbs, limb pockets, cam systems, and axle type plays a part in the bow's efficiency. An example would be a sealed ball bearing in the idler wheel verses a simple unsealed 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: 69.66 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: 1.32

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

Mathews Offers More Than Compounds

The Mathews Heritage line that was launched last year was on display with the company's compound bows at the 2005 ATA Show in Indianapolis. Kevin Stay, President of Brennan Industries, oversees the bowyers who work in the same plant that builds the limbs for Mathews bows. But instead of using a big waterjet machine to cut out fiberglass limb blanks and profiling machines to shape them, these craftsmen are using laminations of fine wood and fiberglass, and bow presses the late Earl Hoyt designed back when he was operating Sky Archery. Leather softcases are included with each model, and your customer can also get a custom oak wall display or oak display case.

Matt McPherson's first bow designs were for recurves, and while these models borrow from some of Earl Hoyt's designs they also include elements McPherson and Stay felt were important for today's collectors and shooters of traditional bows. The Mathews Heritage longbow (left) uses bamboo laminations and a Diamondwood riser. It is made in the same press Sky Archery used for the Trophy Longbow, but instead of a broomstick style grip this one has been contoured to feel more like a Mathews compound grip. The new Hawk (right) is a modified longbow based on the Sky Rouge, but "we slenderized it and put more beauty swirls in it," Stay said. For more information, call (608) 269-2728.