

Darton DS-3800 Bow Report

Darton is a quiet player in the industry, consistently producing fantastic equipment without a bunch of hype. They are like the tailback that displays jaw dropping skill and physical talent while rushing the ball into the end zone from 20 yards out, turns and simply hands the ball to the ref before quietly rejoining his team on the sideline – classy. It’s like he has been here before and knows he will be here a hundred more times. That is Darton – a classy, get-the-job-done type of company. Even though I know this about Darton I still seem to have that “wow, I didn’t expect that” reaction to their bows when first shooting them. As far as the DS-3800 is concerned, I know this bow, have officially and unofficially tested it many times and have had at least one in my shop ever since they have hit the market.

The DS-3800 is loaded with features including the DualSync cam system, laminated split limbs, new curved cable rod, pivoting limb pockets, custom VibraGrip, Darton’s Bowstring Noise Suppression System, set of LimbSaver’s Split Limb Super Quad dampeners and Realtree’s HD Green camo pattern.

Cornerstone

The cornerstone of the DS-3800 is a CNC machined True Center Riser. With this design Darton aligns the limbs, grip and bow string to provide a real center shot alignment reference for accurate and easy tuning. You should be able to get behind the bow (string closest to you) and align the string down the middle of the handle and lower riser and determine where your arrow needs to move left or right to

get in line with the string, riser and cams. That is an easy to achieve starting point. This simple method does not work on all bows as their risers, cams, etc are offset from one another. There is still a center to all bows – it just may take a few extra minutes and an alignment tool to get you where you need to go. Darton gets you there quicker.

Darton uses a machined 6061-T6 aluminum forging to build the base of their flagship. A complex CNC machining operation yields smooth transitions, detailed features and flowing



The DS 3800 is driven by Darton’s DualSync High Efficiency Synchronized Dual Cam System. Working with other technologies on the bow this cam system cranks out advertised IBO speeds between 345 and 350 fps. Draw lengths are easily adjusted through a set of modules that do not require a bow press to change out. This view also shows the cable straddling the cam to equal out the tension and reduce limb twisting torque.



Bow Specifications

Manufacturer:	Darton Archery		
Model:	DS 3800		
Website:	www.dartonarchery.com		
Draw Weights	40, 50, 60 and 70 lb peak	Finish	Realtree HDG/Shadow Blk
Draw Lengths	25-31" in .5" inc- modular	Grip	VibraGrip molded rubber
Axle-to-axle length	33-13/16"	Riser	Reflex, CNC Machined
Brace Height	6"	Limb Pockets	Pivoting, aluminum
Mass Weight	4.1 lbs	Limbs	Gordon Core + Skins
Let-off	80 percent, adjustable	Cable Guard	Curved Rod with Slide
Advertised IBO	345 - 350 fps	Warranty	Limited Lifetime
Eccentrics	DualSync	MSRP	\$829.99
Strings/Cables	Scorpion Premium		

lines that span the length of the riser. Almost a dozen cutouts are positioned along the riser's structure and serve to reduce the overall mass weight and add to the aesthetic value as well. Structurally, the riser is reflex in geometry. A riser's configuration is determined by the position of the grip's deepest point as it relates to an imaginary line drawn through both limb pocket pivot points. If the deepest part of the grip is in front of this line then the riser is considered to be deflexed. However, if the throat of the grip is behind the line (closer to the archer) the bow is considered to be reflex. Reflex versions increase what is known as the power stroke. Power stroke is the actual distance that the archer moves the string from its resting position to full draw. All else being equal, the longer the power stroke the faster the bow.

Now that we have looked at the physical properties of the riser itself it is time to review the other features located/based on the riser. Darton introduced a new patent pending Progressive Torque Reduction (PTR) curved cable guard rod for 2011. At rest (brace height) the tension on the cables is at its lowest point in the cycle. It is here that the new rod positions the cables for maximum clearance. As the bow is drawn to full draw the cable slide moves into the curved section of the rod and closer to the centerline of the bow thereby reducing torque in the system. Reduced torque will generally translate into increased accuracy.

Darton has a history of featuring super comfortable grips on their bows. I still think back to the Maverick I shot a long time ago – the grip was soft, warm and comfortable. While the DS-3800 grip may not be as soft as that on my old Maverick it is an even better blend of comfort and functionality. The Custom Molded VibraGrip consists of two contoured, hard rubber side plates secured by four small screws. The handle portion of the riser adjacent to the rubber plates is chamfered and contoured to compliment the overall grip.

Another riser-based feature is the vibration killing Bowstring Noise Suppression System. The system mounts opposite the stabilizer and uses an aluminum rod outfitted with a pliable rubber stop on the end. When the string is released the rubber stop “catches” the string and reduces the time it takes for the string to stop oscillating. A second string suppression system is included with each bow that can be attached to the cable rod to reduce string vibration above the nocking point.

Darton decks out their new flagship bow in your choice of either Realtree's HD Green pattern or “Shadow Black”.



Mach I Quad Limbs consist of a machined Gordon material core and S-Glass skins laminated on the compression and tension surfaces. Limbs are pre-loaded and stressed to allocate the energy storage evenly across the entire limb resulting in durability and dependability. Darton minimizes the shock, vibration and noise levels of the DS 3800 by equipping it with a set of these radical past parallel limbs.



About The Author

Jon E. Silks has a degree in Quality Engineering and much of his career has centered around the testing and evaluation of products. Now 41, he's been bowhunting since age 12. Silks started writing for magazines and websites 10 years ago and since then has done more than 500 product reviews. Manufacturers who appreciate his thoroughness and frankness have often asked him to conduct third-party testing of their prototypes. Silk's work has appeared on the web 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 and live in Pennsylvania. Silks can be reached at jon@silksoutdoors.com.





Bowhunters demand a quiet shooting rig and to that end Darton has outfitted their 2011 flagship with a low-mount string silencing fixture. The machined aluminum rod that attaches to the riser has a pliable rubber stopper on the end facing the string, which deadens string vibration at the shot.

Darton's new, patent pending Progressive Torque Reduction (PTR) Curved Cable Rod reduces torque at full draw while allowing for maximum clearance when the arrow's fletching passes by.

Talking Points – Riser (Notable bow features and characteristics to bring up during the selling process)

Get the bow into your customer's hand so they can experience the comfort and functionality of the Darton grip.

Noise is definitely helped with the string suppression system. Most every bowhunter is looking for as quiet a shot as possible.

One of my personal favorites is Darton's True Center Riser feature. Anytime a manufacturer does something to make life simpler for the users of their products it shows that they have the right things in mind during the design process.

The curved cable rod is a bonus – less torque at full draw means a solid lock on the target.

The Heavy Lifting

Darton's DualSync synchronized dual cam system is a workhorse and does most of the "heavy lifting". In other words, it is the key component in producing the excellent IBO speeds advertised (and tested) for the DS-3800. Beyond the speed it is also designed for versatility with a series of modules that provide a draw length range from 25 to 31 inches in one half inch increments. Modules are easy to switch out as they do not require a bow press to access the screws. Standard letoff for the 3800 is 80 percent, however, an additional three sets of modules are provided that can be attached to each draw stop of the modules to reduce the let-off up to 10 percent. Darton outfits the cam system with heat treated steel axles and stainless steel ball bearings for a smoother rotation and increased efficiency. Also included is Darton's patented Tuning Mark System that consists of two engraved lines on each cam within which the cables should be positioned while the bow is at rest. A quick glance lets the shooter know if their cables either need to be lengthened or shortened to achieve top performance. Like the True Center Riser feature this is a user friendly feature that shows Darton is thinking of the customer

during the design phase.

Let's look at the workings of the cam system. Each cable is anchored at one end to a single post on one cam and a y-harness at the opposite end. A second, much smaller, cable is threaded through the harness fixture with each "leg" wrapping around a groove on either side of the cam and terminating at a post. Why split one end of the cable and run it to posts on opposite sides of the cam? First, it distributes the tension equally on either side of the cam to reduce torque and limb twist (cam lean). Second, it ties the functionality of both cams to one another. They are essentially locked together and operate as a single unit automatically compensating for variances in the system. This is not to say that these cam types cannot stray from optimal tune – it just means that if they do the effects are evenly distributed and basically neutralized.

Talking Points – Cam System

Speed, while not the be all and end all, is certainly a nice addition to an already good bow. Anyone can appreciate the flat shooting characteristics afforded by speed and the impact it has on judging distances, penetration, etc.

Darton consistently hits their advertised speeds – my tested speeds are statistically within the range of Darton's advertisement. I appreciate real numbers from the manufacturers as I am sure your customer does as well.

Features like the True Center Riser and Tuning Mark System are strong indicators to me that Darton is truly trying to make my shooting experience a better one – I like that and so will your customer.

Velocity Test Results			
	350 Grain Arrow	425 Grain Arrow	540 Grain Arrow
Shot # 1	344	316	282
Shot # 2	344	315	283
Shot # 3	344	315	282
Shot # 4	345	315	282
Shot # 5	345	316	282
5 Shot Total	1722	1577	1411
Average Velocity	344.4	315.4	282.2

Compact and Curled

DS-3800 Quad Limbs measure only 12.75 inches in length and are highly pre-stressed so that they are curled to a nearly parallel position while the bow is at rest. This creates a compact footprint that enhances the bow's maneuverability. When drawn the limbs move significantly past parallel, which is also important to the shooting experience. Limbs that reach beyond parallel at full draw act in opposition to one another distributing the force from release in equal and opposite directions. This greatly reduces any excess energy in the system once the arrow is released. The result that matters – less kick and vibration at the shot.

DS 3800 Quad limbs are manufactured with a two part configuration including a Gordon E-Glass core and laminated E-Glass skins. The Gordon core is machined to a precise thickness, length and width and the skins are added to the tension and compression sides providing further resilience, flexibility and strength. To create consistency within the limb sets Darton tests each limb, marks it with a deflection number and then pairs it with three other limbs of the same number.

Your customer has a wide range of draw weight choices in the DS-3800 with limb sets available in 40, 50, 60 and 70 pound peak draw weight options. The limbs are either film dipped in Realtree's HD Green camo pattern or finished in black to match the Shadow Black option. Each of the Quad limbs is decorated with the Darton Logo and "Mach I".

Darton DS-3800 limb pockets are designed to pivot

during the draw weight adjustment process meaning the pocket is mobile while the limb and pocket interface remains constant. A system that utilizes a pivoting pocket rather than a moving limb is generally considered to be more consistent and precise and therefore superior. Each pocket also has a lock down feature that ensures a rock solid adjustment. Limb pockets are CNC machined from 6061 aluminum and finished to match the limbs and riser.

Talking Points – Limbs and Limb Pockets

Most bows now include parallel or past parallel limbs because that is what the majority wants. It is a technology that is expected and the DS-3800 delivers.

Gordon Glass materials are well known for their durability and reliability.

A pivoting pocket is another technology I expect on top-end rigs and again Darton delivers.

Testing

A single brass nock and QuikTune 300 Arrow Rest were attached to the bow – nothing more. With the exception of these two items every bow is tested, as it would be shipped to the dealer or customer. In other words, if it has string silencers or other components pre-installed it is tested with them installed. While the "official" velocity rating for our calculations will be taken with an arrow as defined below, we will also use two other test arrows as reference points. This will be done to bring a bracketed picture of the bow's speed performance to the reader. Test arrows

Test Parameters

- Bow weight: 70 pounds +/- 0.1 pounds
- Draw Length will be set to 30" (+ 0.25" -0.00")
- Properly spined arrows will be selected according to the formula set out in the I.B.O. rules for minimum grains per pound (350 grains)
- All arrow velocity ratings must be measured using a shooting machine with mechanical release
- A minimum of five shots must be chronographed using an arrow as defined above. The five shots will then be averaged to obtain the final result. All velocity values for a given arrow must fall within a range of 2 ft/sec
- A chronograph with a minimum of two gates set no more than 48" apart will be used. The initial gate will be set at 36" from the front of the bow's handle.

Test Method

- Just to make sure the bow is at least in the right ballpark the draw weight and draw length are roughly verified with the system described below before anything else is done. This saves me a lot of setup time if the bow is not close to the right draw length or draw weight. Any issues with draw length, draw weight, timing, etc. are taken to the manufacturer for resolution.
- Brace height is tested using calibrated dial calipers
- Install New Archery Products Quik Tune 3000 Arrow Rest
- Set nock point
- Verify draw weight using a calibrated digital force gauge backed up with the Easton Bow Force Mapper (BFM) System handheld unit
- Verify draw length using the Silks Outdoors Bow Analysis Program, which is a combination of a custom software package, Elite Archery Draw Board, Chatillon digital force gauge, calibrated 36" steel rule and trammel point
- Mark cams at full draw
- Paper tune by hand
- Set bow on Spot Hogg's Hooter Shooter portable shooting machine – draw to cam marks and fire through two chronographs – Pro Chrono and Easton. Both chronographs are equipped with indoor lighting kits.
- Speed is recorded from the average of 5 shots.



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include a lightweight 350-grain arrow, a mid-weight 425-grain arrow and a relatively heavy 540-grain arrow. Before recording speeds with these arrows the bow was first paper tuned with each one. Most every bowhunter/archer will be able to extrapolate their approximate arrow speed in relation to similar set-up parameters and results presented from the three test arrows.

The speed result from the 350-grain arrow is entered into the Silks Outdoors Bow Analysis Program, which then automatically calculates Kinetic Energy, Stored Energy, and Efficiency.

Potential customers will generally make their bow purchase choice based on several factors including the

cost, speed, shot noise, shock/vibration level, grip and the draw cycle.

In our testing for *ArrowTrade Magazine* we try to give you a feel for how a bow performs in the "subjective" areas mentioned above. You can then focus on the bow's notable subjective points when interacting with your customer. The term "subjective" can basically be translated into "opinion".

Getting Down to Brass Tacks

The Darton DS-3800 has the feel and performance of a bow that can do it all. I would not hesitate to chase a gobbler or a cape buffalo with this rig. It is solid in every respect and packs a tremendous punch. ←

Objective Test Categories

Kinetic Energy: 92.20 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.

Stored Energy: 109.16 foot-pounds

When a bow is drawn energy is supplied to the limbs. The amount of energy that the limbs can hold is the stored energy

Efficiency Rating: 84.47 percent

This is the amount of 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 types play into the bow's efficiency.

SE/PF Ratio: 1.56

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

Subjective Test Results

Shot Noise:

Shot noise is quite good for such a fast bow - even better with a couple of added string silencers.

Grip Comfort and Function:

Darton is known for their super comfortable grips and this one lives up to the reputation. It has a measure of warmth while remaining functional.

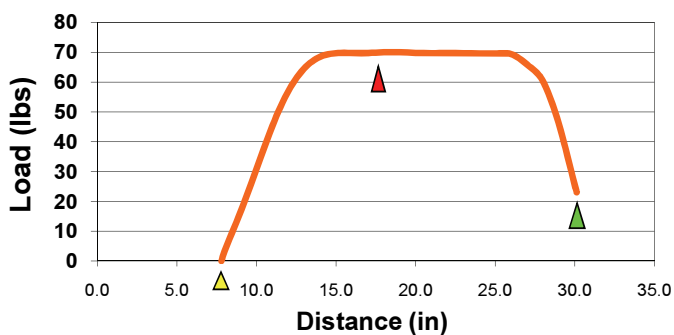
Draw Cycle "Feel":

Darton's DS 3800 is a fast, fast bow with a necessarily aggressive draw cycle. Fortunately, as you will notice with the attached force draw curve, the transitions to and from peak are rounded making the bow feel relatively smooth.

Shock and Vibration Levels:

The DS 3800 has some handle kick when shot followed by low level, short lived vibration.

TestID:	drt3800at	Draw Length:	30.125"	Speed:	344.4 ft/sec
Tested By:	jes	Brace Height:	6.04"	Power Stroke:	1.86'
Min Load:	23.1 lbs	Max Load:	70 lbs	Kinetic Energy:	92.20 ft-lbs
Min Pos:	30.125"	Max Pos:	18.00"	Stored Energy:	109.16 ft-lbs
				Dynamic Eff.:	84.47%
Distance (in)	Load (lbs)			Brace Height:	▲
7.79	0.00			Peak Draw Weight:	▲
8	3.50			Full Draw Condition:	▲
9	16.60				
10	30.90				
11	45.40				
12	57.00				
13	64.60				
14	68.50				
15	69.70				
16	69.80				
17	69.80				
18	70.00				
19	70.00				
20	69.80				
21	69.70				
22	69.80				
23	69.70				
24	69.60				
25	69.60				
26	69.40				
27	65.90				
28	60.30				
29	46.00				
30	25.40				
30.13	23.10				



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