2009 Compound Hunting Bow Evaluation

Hoyt AlphaMax 32 Test Results

By *Anthony Barnum*

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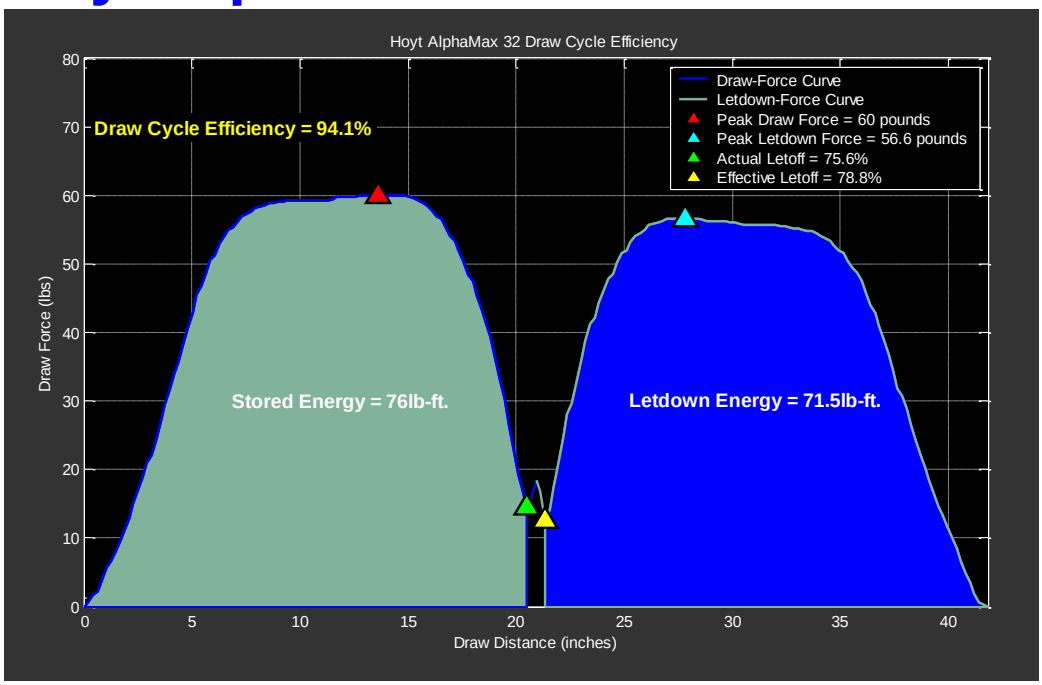
Hoyt AlphaMax 32



Introduction:

For Hoyt's 2009 flagship offering, the AlphaMax 32, some significant changes have been made. These changes come in the form of the new ZT Lock limb pocket system, XTS parallel split limbs, and the XTR Cam & ½ system. The ZT Lock system offers a forked limp pocket, which extends the limb to riser connection point, helping to provide tighter tolerances for attachment of the 5/8" XTS split limbs. The XTR Cam & ½ system provides the ability to make modular adjustments to draw length without the use of a bow press or sacrificing performance; in years past, a complete swap of the cam system was required as draw length specific cams were employed. These updates not only make the AlphaMax 32 more user friendly for both the consumer and the shop owner, but also help to provide a lower overall mass weigh which advertised at 3.9 pounds. Even with these changes, the AlphaMax 32 is immediately recognizable as a Hoyt because the Total Engineering Concept® (aka TEC) riser, StealthShot® string suppressor, Shox damping accessories and Pro-Fit custom grip have been maintained from previous model years.

The AlphaMax 32 sample that was provided to Archery Evolution was measured to have a brace-height of 6.938 inches, while the axle-to-axle length was measured to be 32 7/16 inches. The requested 29 inch, 60 pound model was measured straight out of the box to have a 29 3/16 inch draw length and peak draw-weight of 62.9 pounds. At these settings, The AlphaMax 32 achieved an average speed of 317.6 fps when shot by hand in the out of box configuration with a 300 grain arrow. When shot from the shooting machine with the addition of a string loop, the AlphaMax 32 achieved and average speed of 315.1 fps at these settings. Per Hoyt's request, the AlphaMax 32 was set to exactly 60 pounds peak draw weight through a slight adjustment to the limb bolts.

Hoyt Alphamax 32

Contact Info: Hoyt Archery
www.hoyt.com

MSRP:	$899	**Draw Length:**	23 ½ "-30" *
Cams:	XTR Cam & ½, Z3 Cam & ½	**Draw Weight:**	40-80*
Limbs:	XTS Laminate Split Limb	**Brace Height:**	7" *
Grip:	Pro-fit Custom grip	**Axle to Axle:**	32" *
Let-off:	75%*	**Mass Weight:**	3.9 *
String:	Fuse		
Damping:	String Shox, Alpha Shox, StealthShot®		*Advertised
Finish:	Realtree® APG® HD		^Measured

Performance at a Glance (60 lbs, 29 3/16"):

Arrow	Speed	K.E.	Momentum
300 Grains	305.9	62.3	13.1
360 Grains	282.1	63.6	14.5
420 Grains	262.8	64.4	15.8
540 Grains	234.9	66.1	18.1

Arrow (Grains):	300	360	420	540
Dynamic Efficiency:	82.0%	83.7%	84.8%	87.0%
Speed Per Inch of PS:	14.9	13.8	12.8	11.5
Noise Output (dBA):	89.7	88.2	86.5	85.5
Total Vibration (G):	153.7	125.4	123.4	124.1

A thorough examination of the finish quality showed only minor imperfections, most notably on the riser. Specifically, there was a small scrape in the riser near the back fork of the top limb pocket where bear aluminum was noticeable. Also, some very small areas void of camo finish were noticed on the front of the riser near the grip area as well as in the recessed areas near the limb pockets. Finally, some machining marks were noticed on the interior portions of the lower eccentric. Other than these small items, the finish on the AlphaMax 32 was quite nice with great coverage on the interior portions of the riser cutouts. The grainy texture of the finish conveys an additional element of durability and is quite appealing to the touch.

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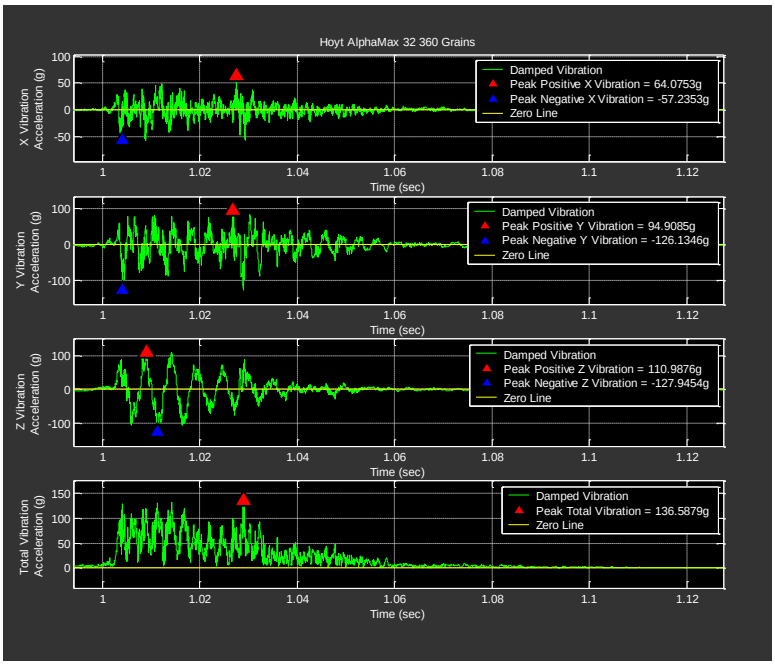
Detailed Test Results:

Speed / Performance Measurements:

Speed measurements were made with 4 different arrow weights to determine the average speed of the bow per inch of Power Stroke. Utilizing the stored energy obtained from the Force-Draw curve, average dynamic efficiency was calculated.

Speed per inch of Power Stroke: 13.2
Dynamic Efficiency: 84.4%

Speed Point Blank - 29" ± 1/4", 60# ± 1#	Hoyt AlphaMax 32							
	Brace Height = 6.938		Draw Weight = 60.0		Draw Length = 29 3/16		Axle-to-Axle = 32 7/16	
Grains	300 Grains		360 Grains		420 Grains		540 Grains	
Chronograph	BFM	Pro-Chrono	BFM	Pro-Chrono	BFM	Pro-Chrono	BFM	Pro-Chrono
1	~~305.5~~	305	281.9	281	~~262.5~~	262	~~235.2~~	235
2	306.0	305	282.1	282	~~263.0~~	262	235.1	235
3	305.8	305	~~281.8~~	281	262.9	262	~~234.7~~	234
4	~~306.1~~	305	282.2	282	262.8	262	234.8	234
5	305.8	305	~~282.3~~	282	262.8	262	234.8	234
Avg. Speed	305.9	305	282.1	282	262.8	262	234.9	234
Kinetic Energy	62.3	62.0	63.6	63.4	64.4	64.0	66.1	65.8
Momentum	13.1	13.1	14.5	14.5	15.8	15.7	18.1	18.1
Power Stroke	20.500							
Speed per inch of Power Stroke	14.9	14.9	13.8	13.7	12.8	12.8	11.5	11.4
Avg. Speed per inch of PS	13.2							
Stored Energy	76.0							
Dynamic Efficiency	82.0%	81.5%	83.7%	83.4%	84.8%	84.2%	87.0%	86.6%
Avg. Dynamic Efficiency (BFM)	84.4%							



Vibration Measurements:

Vibration measurements were made with 4 different arrow weights to determine the average vibration in 3 dimensions as well as the total average vibration.

Positive X-Vibration: 50.0 g
Negative X-Vibration: -51.1 g

Positive Y-Vibration: 103.8 g
Negative Y-Vibration: -108.8 g

Positive Z-Vibration: 104.7 g
Negative Z-Vibration: -120.1 g

Total Vibration: 134.1 g

The addition of a 12 inch B-Stinger Pro Stabilizer with a 14 ounce weight yielded a significant reduction of peak total vibration when measured with a 360 grain arrow.

B-Stinger Reduction: 11.0%

Sound Measurements:

Sound measurements were made with 4 different arrow weights to determine the average sound output, the average A-Weighted sound output (mimicking the human ear) and the average C-Weighted sound output.

Unweighted Sound Output: 105.0 dB
A-Weighted Sound Output: 87.5 dBA
C-Weighted Sound Output: 96.5 dBC

The addition of the 12 inch B-Stinger Pro Stabilizer with a 14 ounce weight yielded a reduction of peak A-weighted sound Output when measured with a 360 grain arrow.

B-Stinger Reduction: 2.1%

Noise & Vibration	Hoyt AlphaMax 32											
	Brace Height = 6.938				Draw Weight = 60				Draw Length = 29 3/16			Axle to Axle = 32 7/16
Parameter	Peak Noise Output (dB)				Peak A-Weighted Noise Output (dBA)				Peak C-Weighted Noise Output (dBC)			
Grains	300 Grains	360 Grains	420 Grains	540 Grains	300 Grains	360 Grains	420 Grains	540 Grains	300 Grains	360 Grains	420 Grains	540 Grains
Measurement	Max				Max				Max			
1	106.8	106.0	103.8	102.8	~~90.6~~	~~87.8~~	~~84.6~~	85.6	98.8	97.4	~~95.1~~	93.7
2	106.9	106.1	~~103.6~~	102.5	90.3	87.9	85.8	~~84.8~~	98.4	98.0	95.5	93.9
3	107.3	~~106.5~~	104.6	~~102.4~~	88.4	88.6	86.1	84.8	99.0	~~98.1~~	~~96.2~~	~~93.0~~
4	~~106.0~~	~~105.7~~	~~105.7~~	~~103.1~~	~~87.4~~	88.1	~~88.1~~	86.0	~~97.5~~	~~97.3~~	96.1	94.0
5	~~107.9~~	106.0	104.5	102.9	90.4	~~89.7~~	87.5	~~86.8~~	~~99.5~~	97.6	96.1	~~94.1~~
Average	107.0	106.0	104.3	102.7	89.7	88.2	86.5	85.5	98.7	97.7	95.9	93.9
Total Average Max	105.0				87.5				96.5			

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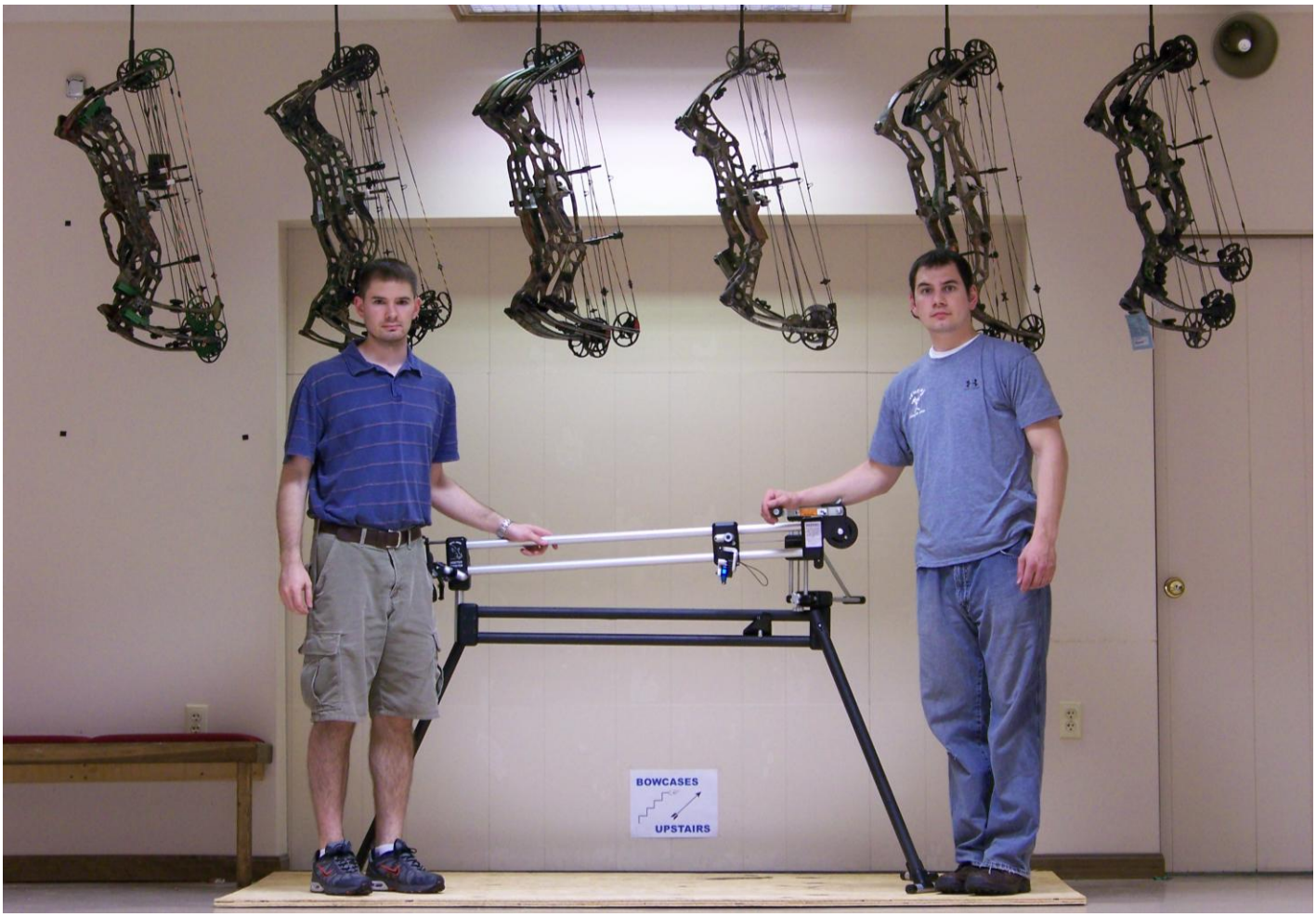

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