2011 American Snowmobiler/ DTR Adirondack Shootout sleds

This year, our Shootout media partner American Snowmobiler suggested two classes—120 HP and 150 HP. The 120 class would comprise of the Etec 600, Polaris Rush 600, Yamaha Vector, and the Cat F1100 which is a normally aspirated version of the Z1/ F1100T.

Prior to the DynoTech stock dyno certification for the 2011 Adirondack Shootout, I've had the opportunity to test only the new Arctic Cat ProCross 800, so we knew what to expect on this day. The Arctic Cat F1100 normally aspirated engine is new to us—never having been tested here so we were anxious to see how peak HP and HP curve would compare to the other 120ish HP sleds.

My engineering contacts at Polaris suggested that there were no port timing changes to the 2012 model year Polaris ProRide/ Rush 600/800 engines, but there have been calibration changes in part due to a change in fuel injector supplier.

This year, the Yamaha Vector was selected by AmSnow to represent Yamaha in the 120 class. It's similar to the Nytro but milder cam timing makes it closer in sled pounds per HP to the 600 two-strokes. And what about the EXUP Apex? Remember, Yamaha had a preproduction EXUP Apex tested here and it made over 160HP. Those test results were posted on DTR—along with the usual "preproduction disclaimer" and those HP numbers were also used in Yamaha ads/ press releases. But when we tested a true bone stock production Apex for the 2010 Adirondack Shootout it was down by 10 HP. We have not seen a bone stock Apex since then. But D&D would bring their box stock Apex here for this year's Shootout certification, and that would help us determine if the preproduction Apex was too powerful, or if last year's Shootout Apex was off the mark.

As we've seen last season, the SkiDoo 600/800 Etecs are sometimes cantankerous on the dyno. It appears that if the muffler temp probe gets too hot, airflow and HP drop. Is it just an overheated muffler choking airflow, or is the ECU knocking exhaust valves down to the middle position to reduce exhaust energy into the muffler? I'm thinking it's half closed valves cooling things down, and dropping HP. And remember last season we were wondering if, by sending fuel flow through the ECU, Bombardier was preheating the fuel to improve vaporization? Or were they really using cold fuel to cool the ECU? Now I understand that Etec outboard boat engines cool their ECU's with water, so that settles it!

Here are the dyno test results of the 120 and 150 class sleds, in alphabetical order, with observations.

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120 HP class sleds

Arctic Cat F1100

When Dale Fredericks was loading up the F1100 to come to DTR, he had trouble with the sled failing to engage reverse gear. No code on the dash, but something was awry. When we set it up here on the dyno it refused to rev to 6000 RPM and beyond—hitting some strange rev limiter there. Unable to rev to peak HP, we aborted the certification test. The next day back at his shop, Dale was able to clear a trouble code that was seemingly making the ECU think it was in reverse gear, even though we were just trying to measure torque and HP on the dyno. Here are the dyno test results with the ECU thinking the sled is in reverse. Note how the ECU alters fuel flow and probably ignition timing to create a flat 108 HP plateau for backing up the sled at WOT, in case anyone desires to do that! Also this is a good example of how torque numbers are meaningless in determining the acceleration capabilities of an engine. HP is what matters! I would submit that if you tuned the clutches of this sled for max reverse acceleration, it would back up just as quickly at 5700 RPM with only 98.5 lb/ft of torque as it would at 5100 where torque is 110 lb/ft. As we can see HP at both RPM readings is identical at 106.8/9 and HP is what creates acceleration—even in reverse!

EngSpd	STPPwr	STPTrq	BSFA_B	FulA_B	AFRA_B	Air_1s	FulPrA	AirInT
RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	SCFM	psig	DegF
5100	107.5	110.7	0.513	53.3	3.77	43.9	43.6	41.4
5200	107.2	108.3	0.521	54.0	3.66	43.2	43.5	41.5
5300	107.1	106.1	0.524	54.3	3.62	42.9	43.5	41.5
5400	108.1	105.1	0.523	54.7	3.58	42.8	43.6	41.5
5500	107.7	102.8	0.535	55.7	3.52	42.8	43.5	41.5
5600	107.1	100.5	0.542	56.1	3.48	42.7	43.5	41.5
5700	106.9	98.5	0.550	56.8	3.44	42.6	43.5	41.5
5800	107.1	96.9	0.553	57.2	3.44	43.0	43.5	41.4

Last year's Shootout **Polaris Rush 600** was wickedly lean and powerful. But the 2012 Rush 600 brought here by new Shootout dealer Bill Lutz of Fun Unlimited is calibrated much safer, much richer at about 11/1 A/F ratio. Power is still good, but lower than last year's Shootout Rush/ ProR 600 as a result. If the 2012 calibration is that much higher in fuel flow, then smart riders who pay attention to octane, coolant temp, and time at WOT will see great benefit it reducing top end fuel flow with Boondockers/ PCVs! Note that with the hood removed, we were able to feed cold dry air to the airbox inlet from the dyno refrigerated intake air system.

EngSpd	STPPwr	STPTrq	BSFA_B	FulA_B	AFRA_B	Air_1s	FulPrA	AirInT
RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	SCFM	psig	DegF
6000	71.0	62.2	0.798	56.3	10.89	134.0	64.8	21.1
6100	71.6	61.7	0.782	55.7	11.17	135.9	64.7	21.0
6200	73.2	62.0	0.773	56.3	11.32	139.1	64.6	20.9
6300	75.1	62.6	0.757	56.6	11.36	140.4	64.6	20.8
6400	76.9	63.1	0.777	59.5	11.02	143.2	64.6	20.7
6500	79.1	63.9	0.768	60.4	11.08	146.3	64.6	20.6

6600	81.0	64.4	0.776	62.6	11.13	152.1	64.4	20.5
6700	87.8	68.9	0.761	66.5	11.24	163.4	64.4	20.4
6800	93.8	72.5	0.753	70.4	11.13	171.2	64.3	20.3
6900	97.3	74.1	0.750	72.7	11.08	175.8	64.3	20.2
7000	101.3	76.0	0.724	73.0	11.30	180.2	64.2	20.1
7100	105.2	77.9	0.703	73.7	11.49	185.0	64.2	20.1
7200	109.6	80.0	0.696	76.0	11.31	187.8	64.1	20.0
7300	113.5	81.6	0.698	78.8	11.12	191.5	64.1	19.9
7400	116.6	82.7	0.667	77.5	11.46	193.9	64.1	19.8
7500	118.5	83.0	0.655	77.4	11.57	195.5	64.3	19.8
7600	120.3	83.2	0.629	75.4	11.92	196.4	64.1	19.7
7700	121.2	82.7	0.637	77.0	11.72	197.2	64.1	19.6
7800	121.4	81.8	0.644	78.0	11.55	196.8	64.0	19.6
7900	120.8	80.3	0.660	79.4	11.33	196.6	64.0	19.5
8000	119.7	78.6	0.666	79.4	11.27	195.4	64.0	19.5
8100	109.2	70.8	0.730	79.5	11.04	191.6	63.9	19.4

The new 2012 **SkiDoo Etec 600** would make less HP today than the 2011 Etec 600 tested last year. We ran five dyno tests with varying muffler temp/ coolant temp and this is the best we could get. Field experience will tell us if the 600 and 800 engines have been detuned somehow with lower compression and/ or ECU tuning! Or is this lower HP curve just the result of the ECU opting to hold valves partially closed even to the HP peak and beyond? Note how, at the beginning of the dyno test, HP and airflow are very high then suddenly HP drops hard at 6400 as seen on the final graph. Did the ECU opt to take HP away from there to peak revs and beyond? We were able to feed unmeasured winter air to the single outside air inlet on the hood, hence the good air intake temperature during the tests.

EngSpd	STPPwr	STPTrq	BSFA_B	FulA_B	AirInT	DenAlt	FulPrA
RPM	CHp	Clb-ft	lb/hph	lbs/hr	degF	Feet	Psig
6000	74.0	64.8	0.568	42.1	25.6	-1389	46.4
6100	74.4	64.0	0.590	44.0	25.5	-1396	46.3
6200	76.4	64.7	0.570	43.7	25.5	-1401	46.2
6300	78.1	65.1	0.581	45.5	25.4	-1406	46.2
6400	79.7	65.4	0.571	45.6	25.4	-1409	46.2
6500	78.0	63.0	0.572	44.7	25.3	-1415	46.0
6600	76.7	61.0	0.594	45.7	25.3	-1417	45.9
6700	76.3	59.8	0.630	48.2	25.2	-1422	45.9
6800	77.9	60.2	0.631	49.3	25.2	-1424	45.9
6900	81.8	62.2	0.637	52.2	25.2	-1429	45.7
7000	84.3	63.3	0.615	52.0	25.1	-1432	45.7
7100	86.6	64.0	0.624	54.1	25.1	-1435	45.5
7200	90.1	65.7	0.633	57.2	25.0	-1439	45.6
7300	92.6	66.6	0.627	58.2	25.0	-1443	45.9
7400	94.3	66.9	0.633	59.9	24.9	-1447	45.7
7500	96.3	67.5	0.626	60.5	24.9	-1452	45.6
7600	98.1	67.8	0.650	64.0	24.8	-1455	45.5
7700	103.9	70.9	0.637	66.3	24.8	-1460	45.6
7800	105.5	71.0	0.648	68.6	24.7	-1464	45.5
7900	108.9	72.4	0.647	70.7	24.7	-1471	45.7
8000	112.3	73.7	0.652	73.5	24.6	-1475	46.0

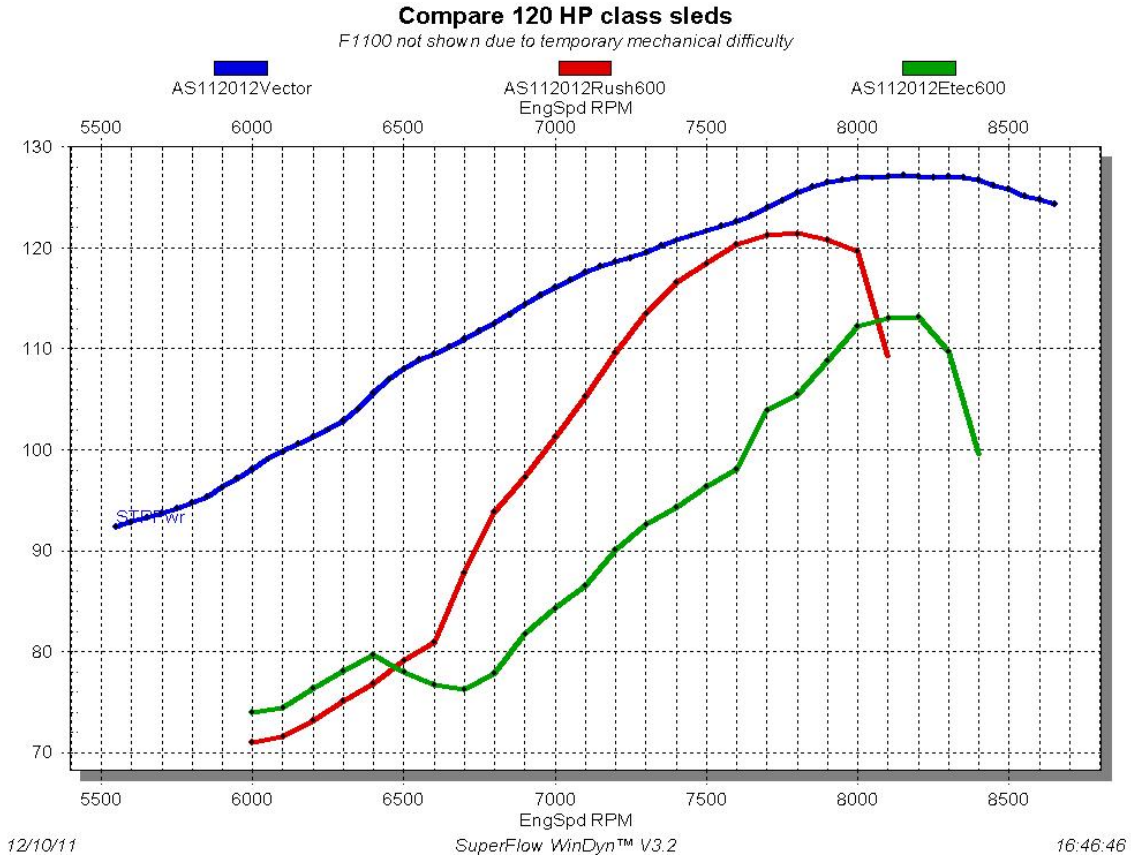
8100	113.0	73.3	0.635	72.0	24.5	-1480	46.2
8200	113.1	72.5	0.609	69.1	24.5	-1484	46.1
8300	109.7	69.4	0.599	65.9	24.5	-1488	45.5
8400	99.6	62.3	0.618	61.8	24.4	-1493	45.4

Finally, the **Yamaha Vector** has replaced the more powerful Nytro in the 120 HP class. Virtually the same engine with reduced cam timing/ lift makes this a better match for the 120 class. Heavier sled, but with a bit higher peak HP but the broad HP curve allows for forgiving clutching—being within a few % of peak HP even if you're several hundred revs higher or lower can be a great advantage as the final graph shows. On this test, I goofed and had the dyno recording every 50 RPM hence the lengthy stream of data. And with the Vector airbox inlet configuration, it was not practical to feed refrigerated air into it.

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	LamAF1 Ratio	AirInT degF	ElpsTm Secnds	DenAlt Feet
5550	92.4	87.4	13.53	42.6	0.71	66
5600	92.9	87.1	13.49	42.6	0.95	65
5650	93.3	86.7	13.47	42.6	1.14	64
5700	93.7	86.4	13.43	42.6	1.30	64
5750	94.2	86.1	13.39	42.6	1.47	64
5800	94.8	85.8	13.33	42.6	1.62	66
5850	95.4	85.6	13.26	42.6	1.80	66
5900	96.3	85.7	13.18	42.6	1.99	65
5950	97.2	85.8	13.12	42.6	2.18	66
6000	98.1	85.9	13.07	42.6	2.42	66
6050	99.1	86.0	13.05	42.6	2.59	67
6100	99.8	86.0	13.04	42.6	2.73	67
6150	100.6	85.9	13.05	42.6	2.88	68
6200	101.2	85.8	13.07	42.6	3.03	68
6250	102.0	85.7	13.10	42.6	3.16	68
6300	102.9	85.8	13.13	42.6	3.33	70
6350	104.1	86.1	13.15	42.6	3.53	70
6400	105.6	86.7	13.21	42.6	3.74	70
6450	107.0	87.2	13.27	42.6	3.93	70
6500	108.0	87.3	13.33	42.6	4.07	69
6550	108.9	87.3	13.39	42.6	4.22	67
6600	109.5	87.1	13.46	42.6	4.39	67
6650	110.2	87.0	13.53	42.6	4.55	66
6700	111.0	87.0	13.58	42.6	4.70	65
6750	111.8	87.0	13.61	42.6	4.84	64
6800	112.5	86.9	13.61	42.5	5.03	63
6850	113.4	87.0	13.57	42.5	5.22	62
6900	114.4	87.1	13.51	42.5	5.43	62
6950	115.3	87.2	13.43	42.5	5.64	62
7000	116.1	87.1	13.33	42.5	5.84	61
7050	116.8	87.0	13.23	42.5	6.05	62
7100	117.6	87.0	13.16	42.5	6.22	62
7150	118.2	86.8	13.10	42.5	6.39	63

7200	118.6	86.5	13.06	42.5	6.55	63
7250	119.0	86.2	13.01	42.5	6.72	63
7300	119.6	86.0	12.98	42.5	6.91	63
7350	120.2	85.9	12.96	42.5	7.07	62
7400	120.8	85.7	12.95	42.5	7.20	61
7450	121.2	85.5	12.94	42.5	7.34	60
7500	121.7	85.2	12.95	42.5	7.49	59
7550	122.2	85.0	12.96	42.5	7.62	59
7600	122.6	84.7	12.98	42.5	7.78	59
7650	123.2	84.6	12.99	42.5	7.97	58
7700	124.0	84.6	13.01	42.5	8.14	58
7750	124.7	84.5	13.03	42.5	8.31	58
7800	125.5	84.5	13.04	42.5	8.49	58
7850	126.1	84.4	13.05	42.5	8.65	58
7900	126.5	84.1	13.06	42.5	8.82	58
7950	126.8	83.8	13.06	42.5	8.98	58
8000	127.0	83.4	13.06	42.5	9.15	59
8050	126.9	82.8	13.05	42.5	9.32	59
8100	127.1	82.4	13.04	42.5	9.48	59
8150	127.2	82.0	13.02	42.5	9.65	59
8200	127.1	81.4	12.98	42.5	9.85	59
8250	127.0	80.8	12.93	42.5	10.06	59
8300	127.1	80.4	12.90	42.5	10.19	59
8350	127.0	79.9	12.89	42.5	10.32	60
8400	126.7	79.2	12.87	42.5	10.45	61
8450	126.2	78.4	12.84	42.5	10.61	61
8500	125.8	77.7	12.81	42.5	10.74	60
8550	125.2	76.9	12.77	42.5	10.91	61
8600	124.8	76.2	12.72	42.5	11.06	61
8650	124.3	75.5	12.68	42.5	11.23	61

GRAPH 120 HP CLASS…note how the Etec 600 HP begins stoutly—more powerful at 6000 than the Rush 600, but at 6400 suddenly HP dips and stays that way for the duration of the test.



150 HP class sleds

Arctic Cat ProCross 800 supplied by Ed Fredericks and sons Arctic Cat, Little Falls NY

We've dyno tested two of the 2012 ProCross 800s and each has made about 158 HP with the hood and pod removed, and cold dry dyno air fed into the airbox inlet in front of the

sled. This time with the hood and pod installed, intake air comes from behind the windshield and is ducted through the pod air passages just over the hot single pipe into the airbox. There is a good possibility that on the dyno the inlet air is heated to a temp somewhat higher than outside air where dyno correction is determined! So this being the first 800 Cat we've tested with the hood on, 155HP is reasonable compared to what we might have made with the hood/ pod removed in favor of cold winter air being fed into the stock airbox.

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFCAB lb/hph	FulAB lbs/hr	AFRAB Ratio	AirInT degF	ElpsTm Secnds
6000	97.4	85.2	0.594	56.0	0.82	39.3	0.27
6100	98.7	85.0	0.603	57.7	0.79	39.3	0.95
6200	102.7	87.0	0.591	58.8	0.78	39.3	1.60
6300	105.5	87.9	0.586	59.9	0.77	39.3	2.10
6400	108.1	88.7	0.578	60.5	0.78	39.3	2.61
6500	109.8	88.7	0.568	60.4	0.81	39.3	3.19
6600	110.7	88.1	0.562	60.3	0.82	39.3	3.63
6700	110.8	86.8	0.557	59.8	0.83	39.3	4.16
6800	112.0	86.5	0.578	62.6	0.79	39.3	4.55
6900	115.9	88.2	0.597	67.0	0.72	39.3	5.08
7000	121.0	90.8	0.596	69.8	0.68	39.3	5.65
7100	123.0	91.0	0.610	72.6	0.66	39.3	6.14
7200	123.3	89.9	0.634	75.7	0.63	39.4	6.67
7300	124.4	89.5	0.662	79.7	0.60	39.4	7.03
7400	129.4	91.8	0.683	85.5	0.57	39.4	7.56
7500	136.5	95.6	0.678	89.6	0.56	39.4	8.07
7600	141.8	98.0	0.671	92.1	0.55	39.4	8.55
7700	147.0	100.3	0.665	94.7	0.56	39.4	9.13
7800	150.2	101.2	0.650	94.5	0.57	39.4	9.58
7900	153.3	101.9	0.640	95.1	0.57	39.4	10.17
8000	155.1	101.8	0.633	95.1	0.57	39.4	10.64
8100	155.5	100.9	0.637	95.9	0.57	39.4	11.20
8200	154.4	98.9	0.646	96.6	0.57	39.5	11.79
8300	151.6	95.9	0.643	94.3	0.59	39.5	12.29
8400	145.2	90.8	0.654	91.9	0.60	39.6	13.03

Polaris Rush 800 as supplied by Fun Unlimited, Gouverneur NY

The Polaris 800 is delivered with a "breakin" mode that adds extra fuel for the first few hours of operation. We obtained an ECU from Polaris with the "breakin" mode burned out and it, indeed reduced fuel flow and created close to 150 HP on this engine. As it was dyno tested with Bill Lutz' Gouverneur, NY 93 octane pump gas which contained 4% ethanol as measured here. And the sled's fuel plug was set in ethanol mode, which can compensate for up to 10% ethanol. Had the fuel truly had 8-10% ethanol the sled likely

would have produced 1-2 HP more. Since the SkiDoo Etec 800 was stuck in a similarly very safe breakin mode with no means of changing that, the Rush 800 was required to keep it's stock breakin mode, and set the plug in methanol mode.

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	AFRA_B Ratio	Air_1s SCFM	FulPrA psig	AirInT DegF
6000	89.1	78.0	0.621	55.1	12.93	155.7	65.3	19.3
6100	89.9	77.4	0.607	54.4	13.31	158.1	65.2	19.2
6200	92.0	78.0	0.582	53.4	13.81	161.1	65.3	19.1
6300	94.4	78.7	0.574	54.0	13.88	163.7	65.2	19.0
6400	96.9	79.5	0.580	56.0	13.54	165.6	65.1	18.9
6500	99.0	80.0	0.569	56.2	13.74	168.5	65.1	18.9
6600	101.1	80.5	0.575	57.9	13.52	171.0	65.1	18.8
6700	103.4	81.0	0.604	62.2	12.90	175.3	64.9	18.8
6800	107.6	83.1	0.654	70.2	11.93	182.9	64.4	18.7
6900	112.0	85.3	0.667	74.5	11.53	187.7	64.5	18.6
7000	115.3	86.5	0.671	77.2	11.38	191.9	64.4	18.6
7100	118.6	87.7	0.665	78.6	11.42	196.2	64.4	18.5
7200	121.5	88.6	0.658	79.7	11.45	199.3	64.3	18.5
7300	125.5	90.3	0.629	78.7	11.81	202.9	64.3	18.4
7400	130.7	92.8	0.629	82.1	11.49	206.0	64.3	18.3
7500	135.2	94.7	0.628	84.7	11.27	208.4	64.1	18.3
7600	139.6	96.5	0.613	85.4	11.31	210.9	64.1	18.2
7700	142.5	97.2	0.615	87.4	11.16	213.1	64.1	18.2
7800	144.3	97.1	0.624	89.8	10.87	213.4	64.1	18.2
7900	145.7	96.9	0.604	87.9	11.19	214.8	64.1	18.1
8000	146.1	95.9	0.594	86.6	11.38	215.4	64.1	18.1
8100	145.9	94.6	0.596	86.8	11.34	215.0	64.0	18.0
8200	145.7	93.3	0.594	86.4	11.42	215.5	64.1	18.0
8300	144.1	91.2	0.600	86.3	11.55	217.8	64.1	18.0
8400	137.7	86.1	0.632	86.8	11.36	215.4	64.0	17.9

2012 SkiDoo Etec 800 from Smith Marine on Old Forge NY

Both the Etec 600 and 800 were down on HP this year compared to the sleds from last shootout. It's conceivable that calibration has been changed to create even better reliability for these clean two-stroke sleds. But here is the Etec 800, in "breakin" mode. Expect that fuel flow to drop, and HP to rise as breakin is completed.

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	AFRA_B Ratio	Air_1s SCFM	FulPrA psig	AirInT DegF
5600	77.9	73.1	0.626	48.8	15.18	161.9	46.8	26.5
5700	83.9	77.3	0.579	48.6	16.21	172.1	46.8	26.1
5800	87.5	79.2	0.577	50.5	16.33	180.3	46.6	25.8
5900	90.1	80.2	0.577	52.1	16.26	185.1	46.6	25.7
6000	90.8	79.4	0.641	58.3	14.65	186.6	46.7	25.4
6100	89.8	77.4	0.673	60.6	14.52	192.4	46.7	25.2
6200	91.3	77.3	0.671	61.4	14.70	197.4	46.7	25.1
6300	94.9	79.1	0.686	65.3	14.16	201.9	46.7	24.9
6400	98.8	81.1	0.669	66.3	14.38	208.2	46.6	24.7

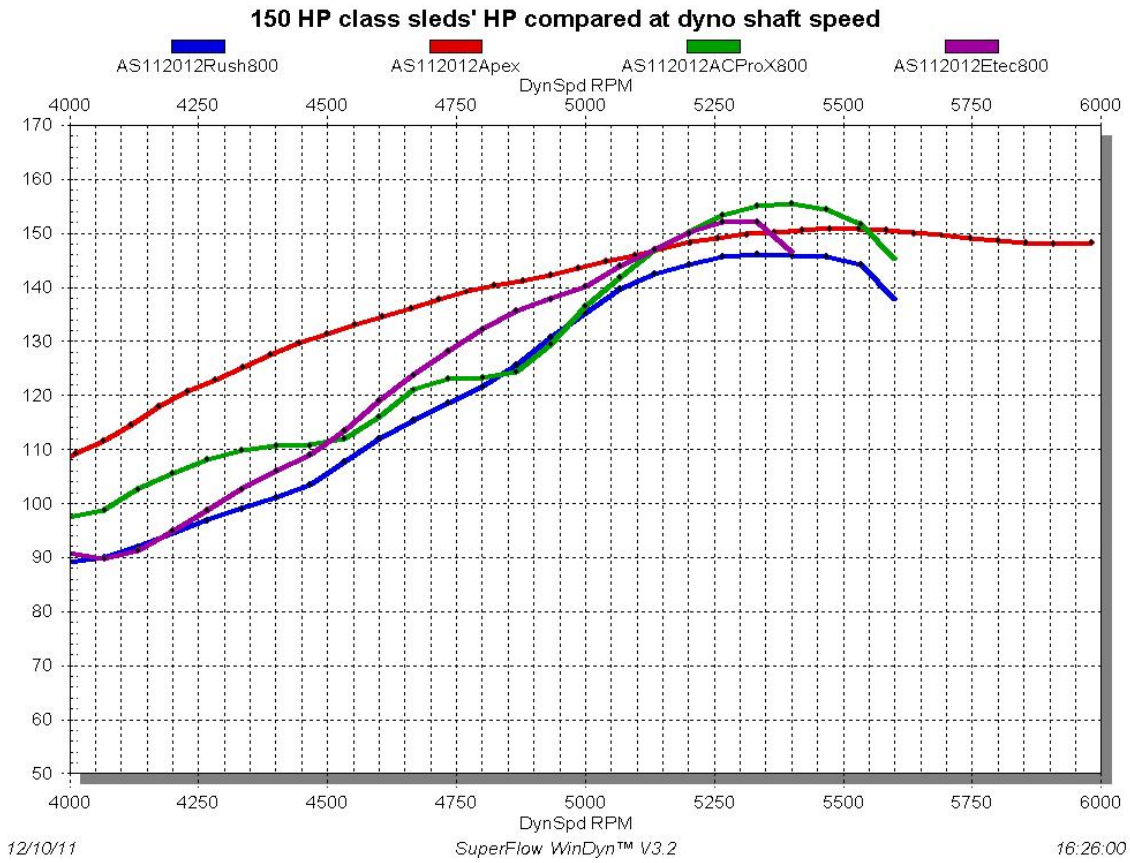
6500	102.7	83.0	0.653	67.3	14.52	213.3	46.6	24.4
6600	106.0	84.3	0.641	68.2	14.51	216.1	46.8	24.3
6700	109.0	85.5	0.620	67.9	14.78	219.1	46.8	24.1
6800	113.4	87.6	0.611	69.6	14.66	222.9	46.7	23.9
6900	119.0	90.6	0.604	72.2	14.39	226.8	46.6	23.8
7000	123.8	92.9	0.599	74.5	14.22	231.5	46.4	23.6
7100	128.1	94.8	0.594	76.4	14.10	235.4	46.4	23.4
7200	132.2	96.5	0.577	76.6	14.34	239.9	46.4	23.2
7300	135.6	97.6	0.556	75.8	14.73	244.0	46.4	23.0
7400	137.9	97.9	0.556	77.1	14.72	247.9	46.3	22.8
7500	140.2	98.2	0.559	78.8	14.67	252.6	46.1	22.7
7600	144.0	99.5	0.563	81.5	14.43	256.8	46.2	22.5
7700	146.9	100.2	0.562	83.0	14.41	261.3	46.1	22.4
7800	150.0	101.0	0.571	86.1	14.13	265.7	46.3	22.3
7900	152.1	101.1	0.549	84.0	14.66	269.0	46.3	22.2
8000	152.0	99.8	0.540	82.5	15.01	270.7	46.2	22.0
8100	146.4	94.9	0.544	80.2	15.39	269.5	46.3	21.9

Yamaha Apex as supplied by D&D Powersports Arctic Cat/ Yamaha, Loweville, NY
Remember the preproduction EXUP Apex made 160 HP, the 2011 model year Apex made 151 HP, and the 2012 model year Apex made 151 HP. Did we get snookered (for our non-English speaking members "snookered" is like being tricked or fooled) with the preproduction EXUP Apex? Perhaps.

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LamAF1 Ratio	LM1Air SCFM	AirInT degF	DenAlt Feet
6000	83.9	73.4	0.426	34.9	14.47	110	47.3	189
6100	83.4	71.8	0.436	35.5	14.35	111	47.3	189
6200	84.7	71.7	0.442	36.5	14.23	114	47.3	189
6300	89.5	74.6	0.432	37.8	14.08	116	47.3	189
6400	92.9	76.2	0.428	38.8	14.03	119	47.3	189
6500	92.8	75.0	0.439	39.8	13.96	122	47.3	189
6600	92.8	73.9	0.450	40.8	13.86	124	47.3	189
6700	93.5	73.3	0.447	40.8	13.68	122	47.3	189
6800	95.2	73.5	0.439	40.8	13.50	121	47.3	189
6900	97.5	74.2	0.435	41.4	13.35	121	47.3	189
7000	98.4	73.9	0.433	41.6	13.26	121	47.3	189
7100	99.9	73.9	0.434	42.4	13.19	122	47.3	189
7200	102.7	74.9	0.429	43.1	13.17	124	47.3	189
7300	106.9	76.9	0.426	44.5	13.30	129	47.3	189
7400	109.5	77.7	0.424	45.3	13.41	133	47.3	190
7500	111.2	77.8	0.429	46.5	13.50	137	47.3	188
7600	114.0	78.8	0.436	48.6	13.57	144	47.3	189
7700	118.7	81.0	0.432	50.1	13.67	150	47.3	188
7800	120.9	81.4	0.430	50.8	13.81	153	47.3	189
7900	122.4	81.4	0.445	53.2	13.94	162	47.3	189
8000	125.2	82.2	0.455	55.7	14.00	171	47.3	189
8100	127.9	83.0	0.461	57.6	13.96	176	47.3	189
8200	129.6	83.0	0.459	58.1	13.88	176	47.3	190
8300	131.6	83.3	0.458	58.8	13.92	179	47.3	190

8400	133.0	83.2	0.461	59.9	13.95	183	47.3	190
8500	134.6	83.2	0.462	60.8	13.94	185	47.3	190
8600	136.4	83.3	0.461	61.4	13.99	188	47.3	190
8700	137.4	83.0	0.459	61.6	13.93	188	47.3	190
8800	139.7	83.4	0.452	61.7	13.79	186	47.3	191
8900	140.3	82.8	0.457	62.6	13.74	188	47.3	191
9000	141.0	82.3	0.456	62.8	13.68	188	47.3	191
9100	142.1	82.0	0.458	63.6	13.60	189	47.3	191
9200	143.9	82.1	0.454	63.7	13.52	188	47.3	191
9300	144.6	81.7	0.455	64.2	13.51	190	47.3	191
9400	146.0	81.6	0.447	63.7	13.48	188	47.3	191
9500	147.4	81.5	0.446	64.2	13.45	189	47.3	191
9600	147.9	80.9	0.453	65.4	13.42	192	47.3	191
9700	149.5	81.0	0.456	66.6	13.44	195	47.3	191
9800	149.8	80.3	0.461	67.4	13.48	199	47.3	192
9900	150.0	79.6	0.464	67.9	13.48	200	47.3	193
10000	150.7	79.2	0.465	68.3	13.53	202	47.3	193
10100	151.1	78.5	0.465	68.5	13.57	203	47.4	194
10200	150.7	77.6	0.469	69.0	13.63	205	47.4	194
10300	150.5	76.7	0.468	68.7	13.68	206	47.4	195
10400	150.2	75.9	0.471	68.9	13.71	207	47.4	195
10500	149.3	74.7	0.487	70.9	13.73	213	47.4	196
10600	149.3	74.0	0.481	70.1	13.66	209	47.4	197
10700	148.7	73.0	0.490	70.9	13.64	212	47.4	198
10800	148.1	72.0	0.492	71.1	13.58	211	47.4	198
10900	147.8	71.2	0.497	71.6	13.55	212	47.4	199
11000	148.2	70.8	0.507	73.2	13.56	217	47.4	200

This is a more appropriate way to compare the 150 HP class sleds' HP curves—by comparing engine output shaft HP curves. In this case, since the Apex has a crankshaft to output shaft reduction, we can use dyno absorber speed to make a more accurate comparison. To convert this to engine clutch speed just multiply by 1.5 which is the dyno drive reduction ratio. Here we can see that the Apex, with peak HP lower than the Cat or SkiDoo, enjoys an incredibly broad HP curve that will provide good performance even if clutch calibration is hundreds or RPM lower or higher than optimal. And also note that the Rush 800, with less peak HP than the other 800 two-strokes has a broad forgiving HP curve that should create good performance even when over or underrevving from best HP RPM.


150 HP class sleds' HP compared at dyno shaft speed
AS112012Rush800
AS112012Apex
AS112012ACProX800
AS112012Etec800
DynSpd RPM
4000
4250
4500
4750
5000
5250
5500
5750
6000
170
160
150
140
130
120
110
100
90
80
70
60
50
DynSpd RPM
12/10/11
SuperFlow WinDyn™ V3.2
16:26:00