

Terra Alps Axys 800 HO/ 840cc stroker engine

Heath Lynk brought this 840cc stroked engine built by Ted at Terra Alps Racing in Kelowna BC Canada, with 1100 reliable trail miles running hard with our Canadian pals Brock Ratch and Rich Lys. Conrod pins are moved outward on the stock crank, different rods and a shim raises the cylinders to accommodate the longer stroke. A TA billet head with low temp Tstat is included. A TA custom Y pipe is said to help with airflow and provides additional clearance with the aluminum chassis crossmember above the Ypipe.

This is a great example of what the Polaris faithful hope Polaris will bring out in 2018 model year to compete with the Etec 850. This is hugely more powerful than big bore stock stroke versions of 800 Polaris' tested here. The last time Jaws' Greg Balchin was here he tried to explain to me the advantages of long stroke vs big bore--long stroke improving on port dwell time, whereas big bores maintain existing port timing and can compromise transfer port shapes/ angles. That helps explain why the best long stroke PS1000 triples can make 280HP and the best stock stroke PS1000 triples are 15-20 HP shy of that.

Ted has been an innovator/ follower of DTR and a few years ago he emailed me pics of his LOW COOLANT VOLUME billet cylinder head. Restricting coolant volume properly ensures that coolant pumped by the high flowing Polaris coolant pump will travel over the combustion chamber domes at the highest possible velocity--providing turbulence that is best in scouring heat from the domes preventing torque-limiting detonation on pump gas. Antique "high volume" bathtub billet heads often create stagnant areas of coolant that can create localized boiling and detonation even at low torque levels. A secondary advantage of the tight shrinkwrapped passages is creating coolant pressure around the domes preventing cavitation from the coolant's pressure drop from coolant pump inlet to pump outlet into the engine. Cavitation can create air bubbles that insulate hot domes from coolant, inviting heat buildup in the combustion chambers and deto!

In addition, Ted uses low temp high flow Tstats in the 840 billet head that begin to open, wisely at 80f instead of stock 120f. Many CFI2 and CFI4 owners are using TA 80f Tstat kits that help increase HP and reduce deto on those early but still competitive engines.

Here are two dyno tests on the TA 840 with optimal PCV fuel and spark maps--one with stock pipe and muffler [pleeeze Polaris--make this the 2018 Axys 8xx HO engine--the only cost is taller cylinders and revised crankshaft machining dimensions!] and one with Heath's Jaws single pipe and stock muffler. Never one click of deto on pump gas even on too-lean tests. Compare all these numbers to the new Etec 850!

The overlay graph following includes the AmSnow/DTR Shootout-winning 2017 Axys 800 that Joe DiSpirito had broken in properly on the Sports Unlimited track dyno.

POLARIS AXYS HO 840 ENGINE STOCK PIPE AND MUFFLER

EngSpd STPPwr STPTrq BSFA_B FulA_B LamAF1 DenAlt AirInT Air_1c

RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	Feet	degF	CFM
6700	112.0	87.8	0.501	54.5	15.57	340	44.0	193.0
6750	112.8	87.7	0.516	56.5	15.51	342	44.1	195.9
6800	113.6	87.7	0.534	58.8	15.29	343	44.1	198.1
6850	114.7	87.9	0.551	61.3	14.88	343	44.1	200.5
6900	116.7	88.8	0.559	63.3	14.37	344	44.1	203.6
6950	118.6	89.7	0.556	64.0	14.18	345	44.1	205.8
7000	120.2	90.2	0.553	64.5	14.10	346	44.1	207.9
7050	121.7	90.7	0.552	65.2	14.10	347	44.1	210.6
7100	123.0	91.0	0.553	66.0	14.12	347	44.1	213.0
7150	124.3	91.3	0.555	66.9	14.14	347	44.1	215.0
7200	126.0	91.9	0.566	69.2	14.15	348	44.1	218.1
7250	131.0	94.9	0.582	74.0	13.93	349	44.1	227.4
7300	134.1	96.5	0.581	75.6	13.77	349	44.1	230.9
7350	139.9	100.0	0.567	76.9	13.50	351	44.2	238.4
7400	142.5	101.1	0.565	78.2	13.45	351	44.2	241.5
7450	144.8	102.1	0.560	78.8	13.40	352	44.2	244.6
7500	147.3	103.2	0.570	81.6	13.29	353	44.2	248.9
7550	149.6	104.1	0.567	82.3	13.17	354	44.2	252.2
7600	152.6	105.4	0.569	84.3	13.00	354	44.2	256.0
7650	155.4	106.7	0.564	85.1	12.85	354	44.2	259.1
7700	158.1	107.8	0.566	86.9	12.69	355	44.2	261.8
7750	160.3	108.6	0.569	88.6	12.55	356	44.2	264.1
7800	162.3	109.3	0.570	89.7	12.48	356	44.2	266.4
7850	163.8	109.6	0.567	90.2	12.50	357	44.3	267.9
7900	165.2	109.9	0.560	89.9	12.59	357	44.3	269.3
7950	166.7	110.1	0.551	89.1	12.78	359	44.3	271.2
8000	167.8	110.1	0.537	87.4	12.89	360	44.3	272.2
8050	168.6	110.0	0.528	86.4	12.98	361	44.3	272.7
8100	169.2	109.7	0.511	83.9	13.12	361	44.3	273.1
8150	169.4	109.2	0.502	82.6	13.31	362	44.3	273.4
8200	169.5	108.6	0.490	80.5	13.49	362	44.3	273.7
8250	169.4	107.9	0.486	79.9	13.64	363	44.3	273.9
8300	169.4	107.2	0.479	78.7	13.72	363	44.3	274.0
8350	169.0	106.3	0.480	78.6	13.76	364	44.3	273.9
8400	164.9	103.1	0.485	77.6	13.76	365	44.4	272.4
8450	152.3	94.7	0.520	76.7	13.56	366	44.4	269.3
8500	139.5	86.2	0.568	76.7	13.33	368	44.4	266.3

POLARIS AXYS HO 840 ENGINE JAWS PIPE AND STOCK MUFFLER

EngSpd	STPPwr	STPTRq	BSFA_B	FulA_B	LamAF1	STPCor	AirInT	Air_1c
RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	Factor	degF	CFM
6700	109.0	85.4	0.508	53.6	15.67	1.03	44.0	190.4
6750	109.8	85.4	0.528	56.1	15.51	1.03	44.0	193.5
6800	110.8	85.6	0.546	58.5	15.20	1.03	44.0	195.8

6850	111.8	85.7	0.552	59.7	14.96	1.03	44.0	197.2
6900	112.9	85.9	0.560	61.1	14.64	1.03	44.0	199.1
6950	114.1	86.2	0.563	62.1	14.30	1.03	44.1	201.3
7000	115.5	86.6	0.562	62.8	14.01	1.03	44.1	204.0
7050	116.9	87.1	0.558	63.1	13.91	1.03	44.1	206.1
7100	118.3	87.5	0.559	64.0	13.92	1.03	44.1	209.2
7150	119.4	87.7	0.569	65.7	13.95	1.03	44.1	211.8
7200	120.6	88.0	0.572	66.7	13.96	1.03	44.1	213.6
7250	121.8	88.3	0.575	67.8	13.95	1.03	44.1	215.9
7300	123.8	89.1	0.582	69.6	13.90	1.03	44.1	219.8
7350	129.8	92.8	0.586	73.6	13.48	1.03	44.1	229.9
7400	133.3	94.6	0.585	75.4	13.31	1.03	44.2	233.3
7450	137.8	97.1	0.579	77.2	13.14	1.03	44.2	238.9
7500	140.8	98.6	0.583	79.4	13.07	1.03	44.2	242.4
7550	144.2	100.3	0.585	81.6	12.99	1.03	44.2	247.0
7600	147.0	101.6	0.594	84.4	12.89	1.03	44.2	250.5
7650	149.2	102.4	0.592	85.4	12.81	1.03	44.2	252.9
7700	151.8	103.5	0.590	86.6	12.66	1.03	44.2	256.2
7750	154.2	104.5	0.579	86.4	12.55	1.03	44.2	258.9
7800	156.6	105.4	0.565	85.5	12.52	1.03	44.2	261.3
7850	159.1	106.4	0.552	85.0	12.62	1.03	44.3	263.5
7900	161.3	107.2	0.538	84.0	12.79	1.03	44.3	265.4
7950	163.4	107.9	0.530	83.7	13.00	1.03	44.3	267.0
8000	165.5	108.6	0.512	82.0	13.22	1.03	44.3	268.7
8050	167.1	109.0	0.504	81.5	13.37	1.03	44.3	270.0
8100	168.8	109.4	0.491	80.1	13.48	1.03	44.3	271.3
8150	170.1	109.6	0.486	80.0	13.53	1.03	44.3	272.3
8200	171.4	109.8	0.473	78.5	13.59	1.03	44.3	273.2
8250	172.7	110.0	0.465	77.7	13.66	1.03	44.4	274.2
8300	173.8	110.0	0.457	76.9	13.72	1.03	44.4	274.9
8350	174.8	109.9	0.458	77.3	13.73	1.03	44.4	275.4
8400	175.2	109.6	0.458	77.5	13.68	1.03	44.4	275.7
8450	175.1	108.8	0.462	78.2	13.56	1.03	44.4	276.0
8500	174.4	107.8	0.467	78.8	13.39	1.03	44.4	276.1
8550	173.5	106.6	0.478	80.1	13.21	1.03	44.4	276.1
8600	171.6	104.8	0.489	81.1	13.03	1.03	44.4	276.0
8650	169.5	102.9	0.504	82.6	12.90	1.03	44.5	275.8
8700	165.6	100.0	0.528	84.5	12.78	1.03	44.5	275.3
8750	160.2	96.2	0.551	85.3	12.65	1.03	44.6	274.4

Polaris Axys Terra Alps 840 stroker TQ and HP

Blue 840 stock pipe, Black 840 Jaws pipe, Red 800 stocker from Shootout

