

2012 Arctic Cat ProCross 800 with D&D trailporting and complete D&D exhaust sytem

Here is the ProCross 800 that D&D entered in the Trail Mod class last month during the 22nd AmSnow/ DTR Adirondack Shootout.

This pump gas trail sled has D&D's trailporting, Boyesen Rad valves, a two degree advance key, full D&D exhaust including Y pipe, tuned single pipe, and lightweight but quiet muffler. A Boondocker was used to add the proper amount of fuel flow. Dale Roes told me they originally tried a slightly higher compression head, but when they added the Rad valves the airflow increased enough to make the net effective compression ratio (actual cc of trapped air compressed into the fixed cc of each dome, as indicated by the Volumetric Efficiency %) too high for pump gas creating excessive torque and light deto that required extra fuel to eliminate the deto—offsetting most of the gain from the higher airflow. But by going back to a stock head, the extra fuel could be removed and more HP could be made. Making max power on pump gas requires balancing all components that affect airflow and fuel flow and peak cylinder pressure, and this combo appears to be an excellent mix of those components. Dale's plan was to create two maps—one for casual running on low octane gas and another for max power on pump gas.

Here's the ultraconservative fat and happy map that still made 20hp more than the stocker we tested for the Shootout.

EngSpd	STPPwr	STPTRq	BSFA_B	FulA_B	AFRAB	VolEff	Air_1c	FulPrA
RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	%	CFM	psig
6600	116.6	92.8	0.625	71.3	13.16	110.4	205.1	44.2
6700	117.5	92.1	0.615	70.6	13.49	110.4	208.1	44.2
6800	118.8	91.8	0.629	73.1	13.34	111.3	213.1	44.1
6900	122.1	92.9	0.641	76.5	13.19	113.5	220.5	44.0
7000	126.2	94.7	0.645	79.6	13.14	116.0	228.5	44.0
7100	129.3	95.6	0.642	81.2	13.17	116.9	233.6	43.9
7200	131.6	96.0	0.655	84.2	12.95	117.6	238.4	43.9
7300	136.5	98.2	0.680	90.7	12.52	120.8	248.3	43.8
7400	144.5	102.6	0.670	94.7	12.33	122.5	255.2	43.8
7500	149.6	104.8	0.657	96.0	12.40	123.3	260.3	43.7
7600	155.3	107.3	0.645	97.8	12.44	124.4	266.2	43.7
7700	160.0	109.2	0.639	100.0	12.35	124.7	270.3	43.7
7800	165.1	111.2	0.627	101.2	12.41	125.2	274.8	43.7
7900	169.2	112.5	0.621	102.7	12.36	124.9	277.7	43.6
8000	172.6	113.3	0.617	104.1	12.31	124.4	280.2	43.6
8100	175.0	113.5	0.630	107.7	11.97	123.7	282.2	43.5
8200	170.9	109.4	0.641	107.1	12.08	122.6	283.1	43.5
8300	142.8	90.4	0.747	104.1	12.07	117.7	275.0	43.6

Here's Dale's "hotrod map" which was knock-free on the 93 octane gas we were using. This is the way it was run on pump gas at the Shootout—a huge 25hp advantage over the stocker! Note that the hotter pipe temp caused peak HP RPM to climb. This was the tune they ran at the Shootout, where this sled ran a whopping

10mph faster than the stocker in 1000 ft! That’s not a “drive-by”, it’s a “fly-by”!
Also note that Dale added enough extra midrange fuel to ensure that midrange torque was not increased—excessively high torque at low revs is most likely to create knock, and we can easily use fuel tuning to take care of that. This tune was absolutely knock-free during this 14 second dyno test as shown by the Arctic Cat EFI diagnostic as well as the copper tube deto sensor.

EngSpd	STPPwr	STPTRq	BSFA_B	FulA_B	AFRAB	Air_1c	FulPrA
RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	CFM	Psig
6600	116.6	92.8	0.581	66.1	14.19	205.5	44.1
6700	117.3	92.0	0.572	65.4	14.40	206.2	44.1
6800	118.7	91.6	0.600	69.5	13.82	210.3	43.9
6900	121.4	92.4	0.638	75.6	13.14	217.6	43.9
7000	125.2	93.9	0.666	81.3	12.71	226.5	44.0
7100	128.2	94.8	0.690	86.2	12.36	233.5	43.9
7200	130.7	95.3	0.727	92.6	11.77	239.0	43.7
7300	135.6	97.5	0.757	100.0	11.36	248.9	43.6
7400	144.2	102.3	0.741	104.2	11.21	256.2	43.5
7500	149.1	104.4	0.726	105.5	11.30	261.5	43.5
7600	153.5	106.1	0.706	105.7	11.49	266.3	43.6
7700	160.3	109.3	0.678	106.0	11.61	269.9	43.6
7800	164.8	110.9	0.646	103.8	12.05	274.3	43.6
7900	170.7	113.5	0.602	100.2	12.64	277.6	43.7
8000	174.0	114.2	0.575	97.5	13.12	280.6	43.7
8100	176.6	114.5	0.577	99.3	12.99	283.0	43.7
8200	179.9	115.2	0.564	99.0	13.15	285.4	43.7
8300	181.1	114.6	0.552	97.4	13.01	287.3	43.7
8400	179.0	111.9	0.547	95.5	13.00	288.3	43.8
8500	151.6	93.7	0.629	92.8	12.99	280.8	43.8



2012 ProX800 w/ D&D trailport and exhaust

Red stock, Blue D&D sled w/ trail map, Green D&D sled w/ lakerace map

