2010 Arctic Cat F800

Here is our first production 2010 F8, brought to DTR by Dale and Josh Roes from D&D, on their way to the Novi, MI sled show.

Our plan was to get a good baseline, from cool engine to smoking hot engine. Then we planned to test the F8 with leaned out fuel flow w/ the new Power Commander V with Autotune, then w/ D&D Ypipe w/ stock pipe, and finally the D&D single.

I had a window of time from 7am to 9am to do this. Sean Ray had long ago scheduled 9am to do more Polaris SnoX mod testing for Hentges Racing, so we ran out of time before we got to the PCV, Ypipe and tuned pipe. But, were able to establish this excellent baseline test data on the new, out-of-the-crate engine. The new F8 is currently stored in the DTR warehouse. Next week, as time permits, we'll put the F8 back on the dyno with the D&D Ypipe and single pipe and post those results.

Here is our production F8 with fuel flow, as expected, about 10% higher than our preproduction F8 tested here last February. I have included a graph showing a comparison of the output of this engine with varying coolant/ pipe temps. As always, cool coolant temp (but not cold, especially since your 2010 ECU will tell the dealer how many revs were pulled at very cold coolant temps) is best. We made 164 HP on that cool engine dyno test, even with slightly richer A/F ratio as shown on the following graph. But once we got the engine heat soaked it maintained 163 HP and showed no sign of diminishing, even on the 89 octane fuel we had in the tank. Reverse cooling, and two plugs per cylinder (with less time from spark ignition to TDC to consume the contents of the combustion chamber, and thus less time to heat the combustion chamber surfaces) surely minimize knock that is sensed by the ECU, which will reduce HP to protect itself. During all of this testing there was zero knock at peak torque/ peak HP RPM and all was well.

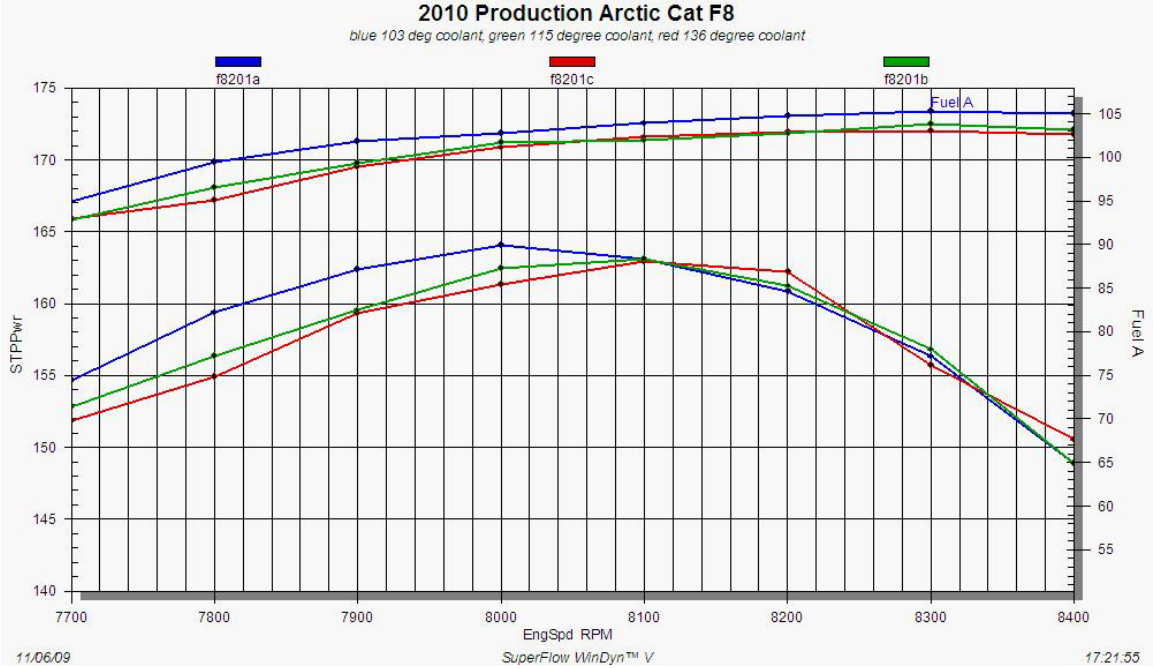
Arctic Cat engineers have offered that the only change in mechanical specs from preproduction to production is a quieter muffler, which possibly added some HP at the same time. With these modern two-stroke engines, louder does not necessarily = higher power. More often, needlessly louder mufflers reduce backpressure that the tuned pipe needs to create the optimal supercharging effect as the piston closes the exhaust port.

Here is our 2010 F8, totally heat soaked engine and pipe—coolant temp was between 115 and 136 degrees F and pipe center section temp was 1100 degrees F. Note that there is about 3/4 point difference between the mechanical A/F ratio (A/F A) and the Innovate wide band reading (LAMAF1). So 11/1 is expected at WOT, and this should give us plenty of extra fuel should the D&D Ypipe and/ or single pipe flow more air. Or perhaps there's more HP to be had by leaning out mixture with Boondocker or Power Commander PCV. We should find out next week.

EngSpd RPM	STPTrq Clb-ft	STPPwr CHp	BSFC A lb/hph	Fuel A lb/hr	AirTmp degF	A/F A Ratio	Air 2 scfm	LAMAF1 Ratio
5700	84.4	91.6	0.59	53.3	40	13.32	155	14.8
5800	84.5	93.4	0.58	53.7	40	13.40	157	15.0

5900	86.1	96.7	0.57	55.2	39	13.38	161	15.2
6000	86.0	98.2	0.57	55.7	39	13.44	163	15.2
6100	87.9	102.1	0.56	57.3	39	13.47	169	15.2
6200	90.0	106.3	0.55	58.5	38	13.71	175	15.4
6300	90.0	107.9	0.55	59.0	38	13.76	177	15.5
6400	91.0	110.9	0.54	60.0	39	13.85	181	15.7
6500	91.9	113.7	0.55	62.1	39	13.65	185	15.8
6600	91.8	115.3	0.56	64.8	39	13.32	188	15.4
6700	91.9	117.2	0.57	66.5	40	13.20	192	15.0
6800	90.6	117.3	0.58	67.8	39	13.13	194	14.7
6900	90.6	119.0	0.57	67.7	39	13.28	196	14.6
7000	93.3	124.4	0.59	73.3	39	12.91	207	14.1
7100	93.2	126.0	0.60	74.6	40	12.72	207	13.9
7200	94.0	128.9	0.59	76.0	40	12.79	212	13.7
7300	93.6	130.1	0.60	77.7	40	12.67	215	13.6
7400	94.2	132.7	0.60	79.5	39	12.65	220	13.4
7500	94.0	134.2	0.60	79.6	39	12.69	221	13.4
7600	97.8	141.6	0.59	83.6	40	12.51	228	13.4
7700	103.9	152.3	0.61	92.9	40	11.69	237	12.8
7800	104.8	155.6	0.62	95.8	39	11.49	240	12.4
7900	106.1	159.6	0.63	99.1	40	11.15	241	12.0
8000	106.4	162.1	0.63	101.4	40	11.01	244	11.8
8100	105.8	163.1	0.63	102.1	40	10.95	244	11.5
8200	103.7	161.9	0.64	102.8	40	10.83	243	11.4
8300	98.9	156.4	0.66	103.4	39	10.73	242	11.3
8400	93.7	149.9	0.69	102.9	39	10.66	240	11.2

Here's a graph of three back-to-back dyno tests:
103 degree F ending coolant temp, 1010 degree F pipe temp
115 degree F ending coolant temp, 1094 degree F pipe temp
136 degree F ending coolant temp, 1101 degree F pipe temp


2010 Production Arctic Cat F8
blue 103 deg coolant, green 115 degree coolant, red 136 degree coolant
f8201a
f8201c
f8201b
Fuel A
STPPwr
Fuel A
EngSpd RPM
175
170
165
160
155
150
145
140
105
100
95
90
85
80
75
70
65
60
55
7700
7800
7900
8000
8100
8200
8300
8400
11/06/09
SuperFlow WinDyn™ V
17:21:55