

2009 Arctic Cat SnoPro 600

Local snowX racer Larry Wierzba and tuner Jeff Kirshmeyer brought this stock 600 race sled to test and tune.

The SnoPro 600 engine is similar physically to a carbureted F6. Port timing is more radical than a F6, and exhaust is tuned for higher rpm operation. Compression ratio is higher requiring 100 octane fuel. To reduce reciprocating weight, wrist pins are smaller diameter than the F6/7 engines. Carbs fit into an open airbox which feeds cold outside air into the front of the box through screened openings. Carbs' float bowls are also fashionably vented into the airbox, ensuring constant A/F ratio even if slight inlet restriction from flying snow should occur during a race. The airbox design precluded the use of the dyno mechanical airflow meter, so airflow CFM and mechanical A/F ratio readings are not shown.

Larry and Jeff were using a combination of 93 octane pump gas and 110 leaded race gas to create about 100 octane gas. On the day we tuned this engine, our Kestral 4250 racing weather tracker recorded a density altitude of 70 feet below sea level.

Since SnowX race engines are subjected to short bursts full throttle operation, we usually tune them like 1/4 mile drag sleds—max HP for 20 seconds at WOT. Here is a compilation of the two hour dyno tune, including three dyno tests showing first the effect of jetting for maximum power fuel flow, then adjusting the timing switch for max power timing.

The LM-1 wideband O2 sensor was fed by a tube inserted into the muffler outlet, and was probably ingesting some outside air either from a leaking exhaust donut or from reversion (air being aspirated by negative pressure waves from the exhaust outlet). So A/F ratio was, at peak about one point leaner than actual but can be used here for reference.

Compared to the SkiDoo and Polaris SnowX 600 stock racers posted here on 6/10/08, the Arctic Cat 600 appears to have a HP edge.

340/350 main jets, timing set at +2

EngSpd	STPTRq	STPPwr	Fuel B	BSFC B	LAMAF1	TsTim2	AirTmp	BaroP
RPM	Clb-ft	CHp	lb/hr	lb/hph	Ratio	second	degF	in/Hg
5900	57.2	64.2	42.8	0.684	17.5	0	48	29.08
6000	57.2	65.3	42.7	0.671	17.6	0.2	48	29.08
6100	60.4	70.1	44.5	0.652	17.6	1.0	48	29.08
6200	65.1	76.8	45.0	0.600	16.8	2.1	47	29.08
6300	66.1	79.3	45.3	0.586	16.6	2.6	47	29.08
6400	67.4	82.2	47.2	0.588	16.3	3.3	46	29.09
6500	69.0	85.4	48.6	0.583	16.1	3.9	47	29.08
6600	70.8	89.0	50.5	0.582	16.1	4.5	48	29.08
6700	72.0	91.9	52.3	0.584	16.0	5.1	48	29.09
6800	72.9	94.4	53.1	0.577	15.9	5.8	48	29.09

6900	74.7	98.1	55.9	0.584	15.8	6.4	48	29.09
7000	77.6	103.5	59.5	0.590	15.5	7.4	48	29.09
7100	78.8	106.5	60.3	0.580	15.3	7.8	47	29.09
7200	79.1	108.4	61.1	0.577	15.1	8.6	46	29.09
7300	80.5	111.9	62.7	0.574	14.9	9.2	47	29.09
7400	81.0	114.1	64.0	0.576	14.7	9.8	49	29.09
7500	81.2	115.9	66.6	0.590	14.3	11.0	48	29.08
7600	80.4	116.4	67.3	0.594	14.1	11.6	49	29.08
7700	80.6	118.2	67.8	0.589	14.1	11.9	49	29.08
7800	82.3	122.2	68.0	0.572	14.1	12.2	49	29.08
7900	85.2	128.1	72.0	0.577	14.1	13.4	48	29.08
8000	86.2	131.3	73.5	0.574	13.9	14.4	48	29.08
8100	86.2	132.9	76.0	0.587	13.9	15.0	49	29.08
8200	86.0	134.2	77.4	0.592	13.7	15.7	49	29.08
8300	84.4	133.3	76.2	0.587	13.6	16.6	48	29.08
8400	82.8	132.5	77.0	0.597	13.6	17.1	48	29.08
8500	80.7	130.6	77.2	0.608	13.6	18.0	49	29.08
8600	78.0	127.7	76.0	0.612	13.6	19.1	49	29.08

320/330 main jets, timing set at +2

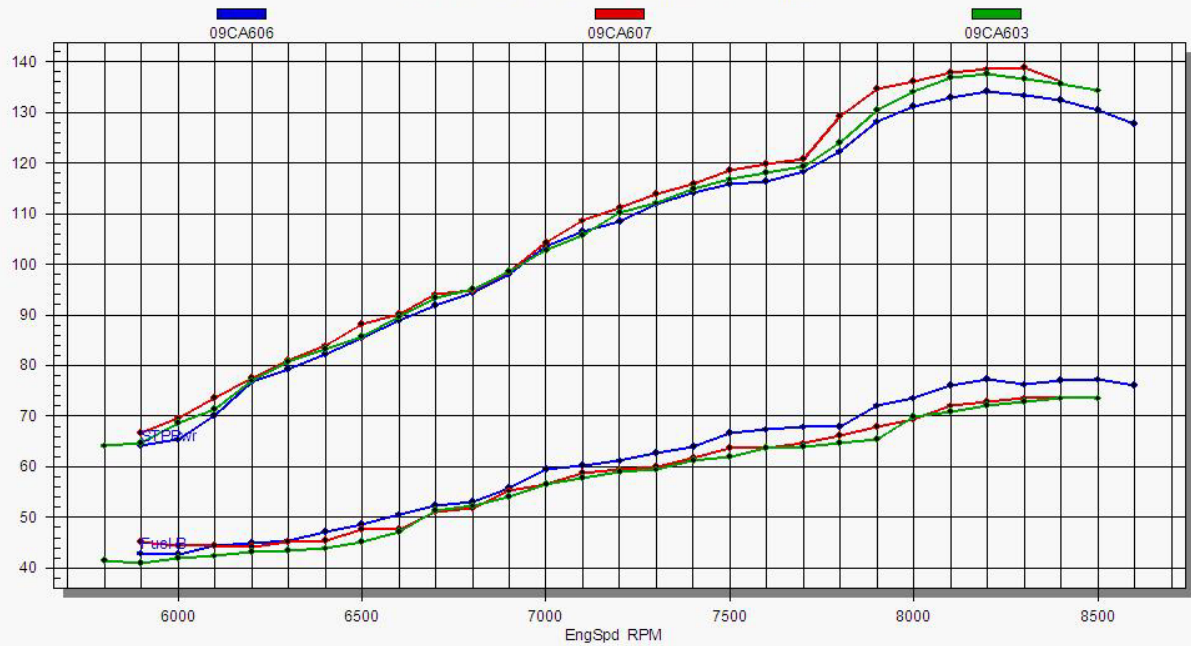
EngSpd	STPTrq	STPPwr	Fuel B	BSFC B	LAMAF1	TsTim2	AirTmp	BaroP
RPM	Clb-ft	CHp	lb/hr	lb/hph	Ratio	Second	degF	in/Hg
5800	58.1	64.1	41.5	0.665	18.5	0	49	29.08
5900	57.5	64.6	41.0	0.652	18.6	0.2	49	29.09
6000	60.0	68.6	41.9	0.627	18.8	0.9	48	29.08
6100	61.5	71.4	42.3	0.608	18.6	1.7	48	29.08
6200	65.2	76.9	43.1	0.575	18.0	2.5	48	29.08
6300	67.3	80.7	43.4	0.552	17.6	3.3	48	29.09
6400	68.4	83.3	43.8	0.539	17.3	3.8	47	29.08
6500	69.2	85.6	45.1	0.540	17.2	4.2	47	29.08
6600	71.2	89.5	47.2	0.540	17.0	5.1	47	29.08
6700	73.2	93.4	51.4	0.565	16.8	5.9	49	29.08
6800	73.4	95.1	52.2	0.564	16.7	6.3	49	29.09
6900	75.0	98.5	54.0	0.562	16.5	7.1	48	29.09
7000	77.1	102.8	56.6	0.565	16.4	7.6	48	29.09
7100	78.2	105.6	57.7	0.560	16.2	8.2	48	29.09
7200	80.4	110.2	59.0	0.548	15.9	9.0	47	29.09
7300	80.6	112.0	59.4	0.544	15.8	9.6	48	29.09
7400	81.5	114.9	61.3	0.547	15.5	10.3	48	29.09
7500	81.8	116.7	62.0	0.544	15.2	11.0	47	29.09
7600	81.7	118.2	63.8	0.553	15.0	11.8	46	29.09
7700	81.5	119.4	64.0	0.548	14.9	12.0	46	29.09
7800	83.5	124.0	64.7	0.535	14.9	12.5	47	29.09
7900	86.8	130.5	65.5	0.514	14.9	13.6	47	29.09
8000	88.0	134.0	70.0	0.535	14.8	14.3	47	29.09
8100	88.7	136.8	70.9	0.531	14.5	15.1	48	29.09
8200	88.1	137.6	72.2	0.538	14.4	15.8	48	29.09
8300	86.5	136.7	72.9	0.547	14.3	16.8	48	29.09
8400	84.8	135.7	73.5	0.556	14.2	17.6	48	29.09
8500	83.0	134.3	73.5	0.561	14.2	18.2	48	29.09

320/330 main jets, timing set at +3

EngSpd	STPTrq	STPPwr	Fuel B	BSFC B	LAMAF1	TsTim2	AirTmp	BaroP
RPM	C/b-ft	CHp	lb/hr	lb/hph	Ratio	second	DeqF	in/Hq
5900	59.3	66.6	45.1	0.695	18.7	0	48	29.09
6000	60.8	69.5	44.5	0.657	18.8	0.7	48	29.09
6100	63.3	73.5	44.5	0.621	18.6	1.3	48	29.09
6200	65.7	77.5	44.2	0.585	18.0	2.2	48	29.09
6300	67.6	81.1	45.1	0.571	17.7	2.8	48	29.09
6400	68.8	83.9	45.5	0.556	17.5	3.1	48	29.09
6500	71.2	88.1	47.6	0.553	17.2	4.3	47	29.09
6600	71.7	90.1	47.7	0.542	17.1	4.5	47	29.09
6700	73.7	94.0	51.1	0.557	17.0	5.1	47	29.09
6800	73.3	94.8	51.9	0.561	16.8	5.8	47	29.09
6900	75.1	98.7	55.2	0.573	16.6	6.6	47	29.09
7000	78.2	104.2	56.5	0.556	16.4	7.4	47	29.09
7100	80.3	108.6	58.8	0.556	16.2	8.2	48	29.09
7200	81.1	111.2	59.4	0.548	16.0	8.6	48	29.09
7300	81.9	113.9	60.0	0.540	15.8	9.5	48	29.09
7400	82.3	115.9	61.7	0.545	15.6	10.0	47	29.09
7500	83.1	118.6	63.7	0.550	15.2	11.0	47	29.09
7600	82.9	119.9	63.8	0.545	15.1	11.6	47	29.09
7700	82.4	120.8	64.6	0.548	15.0	11.8	47	29.09
7800	87.1	129.3	66.1	0.524	15.0	12.6	47	29.09
7900	89.5	134.7	68.0	0.517	14.8	13.6	47	29.09
8000	89.4	136.2	69.4	0.522	14.7	14.0	47	29.09
8100	89.4	137.9	72.0	0.535	14.5	14.9	47	29.09
8200	88.7	138.5	72.9	0.539	14.4	15.6	47	29.09
8300	87.9	138.9	73.5	0.543	14.4	16.3	48	29.09
8400	85.1	136.2	73.7	0.555	14.3	17.2	48	29.09

2009 Arctic Cat SnoPro 600 max HP tuneup at -70' density altitude

blue 340/350 timing 2, green 320/330 timing 2, red 320/330 timing 3



04/28/09

SuperFlow WinDyn™ V

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