2018.5 SkiDoo Etec MXZX with new 600R engine Jim Czekala

Tom Ferry of Arctic Adventures [Arctic Cat and Ski Doo] of Rosendale, N.Y. brought this zero mile 2018.5 SkiDoo MXZX with the new 600R engine with 91 octane non ethanol fuel to DTR to check engine performance compared to the 2018 Etec 600. The 600R engine is structured with 850-like electronically operated exhaust valves. It's said to have 600 snowcross one piece cast port race engine cylinders with lower compression pump gas compression ratio. The exhaust system in now fully insulated like the 850.

We had planned to dyno test it in breakin mode, then advance the timing to simulate what we might expect out of breakin but the BUDS II would not yet "permit" access to timing to the new 600R ECU. So we'll have to wait for this sled's new owner to rack up enough miles to take it out of breakin mode, then dyno test it again. Then, we'll collect and report other meaningful data including airflow and fuel flow.

We created overlay plot graphs comparing HP and A/F ratio of a zero mile 2018 Etec 600 (with 91.8 octane 5% ethanol fuel) with no timing added (122.2 HP) and with two degrees of timing added (124.8 HP), to the new 600R in breakin mode only with no timing added (126.6 HP). But the graphs are important in show the greatly improved midrange TQ and HP of the new 600R. Note that adding two degrees of timing to the 600 leaned out the mixture some. Why? As we home in on optimal timing on fixed fuel flow open loop EFI engines, we'll often see airflow CFM increase, leaning out A/F ratio! That's why when tuning EFI race engines we like to first tune fuel flow slightly richer than optimal, then add timing. When we find max power timing only then will we lean out mixture to max HP.

Tom Ferry has heard from contacts at BRP that it should make 130 HP after breakin, and that surely seems possible. Note the difference in A/F ratio curves—the 600R is much richer than the 600 on top end. Will that lean out some after breakin?

Etec 600R zero mile in breakin mode

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	LamAF1 Ratio	AirInT degF	Baro_P InHga	Vap_P InHg	DenAlt Feet	STPCor Factor
6450	80.7	65.7	16.12	25.1	28.84	0.07	-1155	1.004
6500	81.2	65.6	16.11	25.1	28.84	0.07	-1150	1.004
6550	81.7	65.5	16.06	25.2	28.84	0.07	-1148	1.005
6600	82.6	65.7	15.95	25.2	28.85	0.07	-1148	1.004
6650	83.9	66.3	15.86	25.2	28.85	0.07	-1148	1.004
6700	85.4	66.9	15.76	25.2	28.85	0.07	-1146	1.005
6750	86.6	67.4	15.66	25.2	28.85	0.07	-1145	1.005
6800	88.2	68.1	15.42	25.2	28.85	0.07	-1143	1.005
6850	90.3	69.2	15.04	25.3	28.84	0.07	-1140	1.005
6900	91.9	70.0	14.82	25.3	28.84	0.07	-1138	1.005

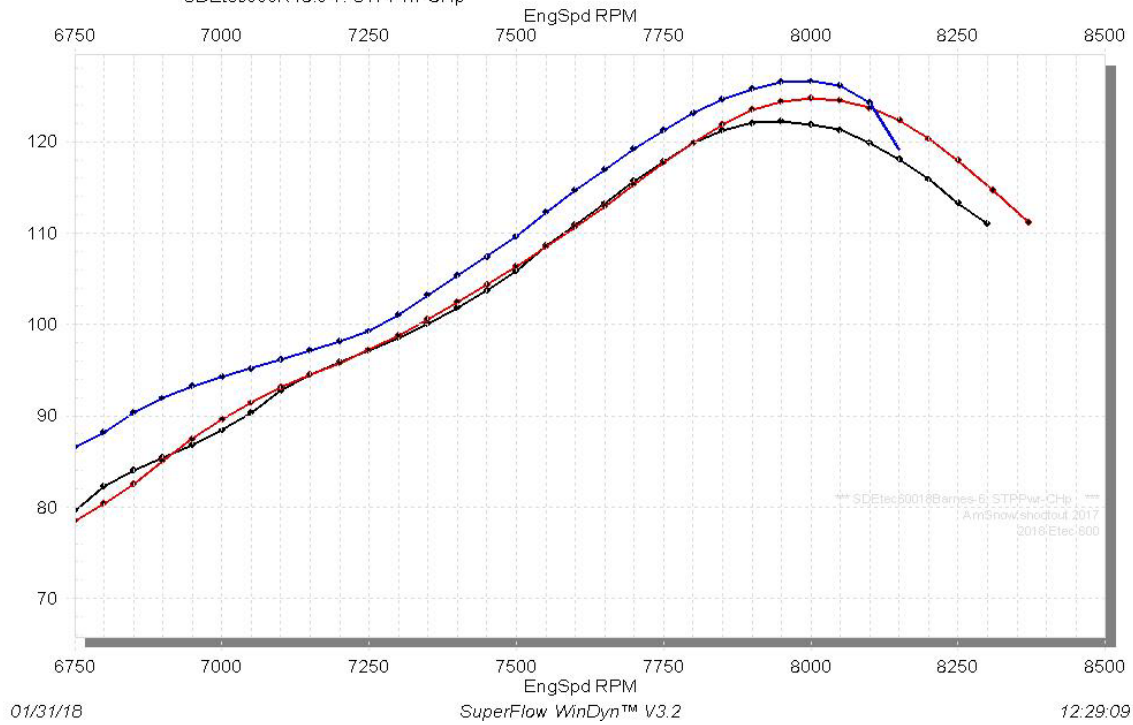|							
6950	93.2	70.4	14.64	25.3	28.85	0.08	-1138	1.005
7000	94.3	70.8	14.41	25.3	28.85	0.08	-1137	1.005
7050	95.2	70.9	14.15	25.3	28.85	0.08	-1137	1.005
7100	96.2	71.1	13.97	25.3	28.85	0.08	-1136	1.005
7150	97.1	71.4	13.87	25.3	28.85	0.08	-1135	1.005
7200	98.1	71.6	13.82	25.3	28.85	0.08	-1135	1.005
7250	99.3	71.9	13.80	25.3	28.85	0.08	-1135	1.005
7300	101.1	72.7	13.78	25.3	28.85	0.08	-1134	1.005
7350	103.2	73.8	13.76	25.4	28.85	0.08	-1133	1.005
7400	105.4	74.8	13.74	25.4	28.85	0.08	-1132	1.005
7450	107.4	75.7	13.69	25.4	28.85	0.08	-1131	1.005
7500	109.6	76.8	13.60	25.4	28.85	0.08	-1130	1.005
7550	112.3	78.1	13.44	25.4	28.84	0.08	-1129	1.005
7600	114.7	79.2	13.33	25.4	28.84	0.08	-1129	1.005
7650	117.0	80.3	13.25	25.4	28.84	0.08	-1129	1.005
7700	119.2	81.3	13.16	25.4	28.84	0.08	-1128	1.005
7750	121.3	82.2	13.04	25.4	28.84	0.08	-1125	1.005
7800	123.2	82.9	12.92	25.4	28.84	0.08	-1124	1.005
7850	124.7	83.4	12.85	25.4	28.84	0.08	-1125	1.005
7900	125.8	83.6	12.85	25.4	28.84	0.08	-1127	1.005
7950	126.5	83.6	12.88	25.4	28.84	0.08	-1127	1.005
8000	126.6	83.1	12.90	25.4	28.84	0.08	-1128	1.005
8050	126.2	82.3	12.86	25.4	28.84	0.08	-1128	1.005
8100	124.3	80.6	12.74	25.4	28.84	0.08	-1126	1.005
8150	119.2	76.8	12.56	25.4	28.85	0.08	-1127	1.005

Zero mile Etec 600 HP vs Zero mile Etec 600R

Black 600 breakin mode, Red 600 breakin mode +2 degrees, Blue 600R breakin mode

SDEtec60018Barnes-6: STPPwr-CHp   SDEtec60018Barnes-10: STPPwr-CHp

SDEtec600R18.5-7: STPPwr-CHp

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Zero mile Etec 600 A/F vs Zero mile Etec 600R A/F

Black 600 breakin mode, Red 600 breakin mode +2 degrees, Blue Etec 600R breakin mode

SDEtec60018Barnes-6: LamAF1-Ratio   SDEtec60018Barnes-10: LamAF1-Ratio

SDEtec600R18.5-7: LamAF1-Ratio

EngSpd RPM

EngSpd RPM

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