SkiDoo MXZ Turbo 850 Competition

This is HotRod Sled Shop's new turbo sled that's been run for 100 miles on Billy Howards' "Hillbilly Highway" proving grounds in Coudersport, PA. The BUDS, which we used to monitor the engine indicated that there was 59 hours remaining on breakin mode. Billy has his own MXZ Turbo 850 Comp sled, and as he recently passed full breakin mode he noted zero change in engine RPM or sled MPH on his test track. So we might surmise that "breakin mode" might consist mostly of increased oil delivery rate.

During our 58 10 second WOT dyno tests we used nearly a tankful of the SkiDoo branded water/ methanol mixture. Water/ methanol. injection (often a 50/50 mix) takes advantage of some added oxygen released by the methanol and the "heat of vaporization" which is actually the cooling effect that results when a liquid evaporates. As the water/ methanol evaporates inside the engine, the initial compressed charge temperature is reduced, as is peak combustion gas temperature. Gas expansion in each cylinder creates the pressure that forces each piston down its cylinder bore is the result of what engineering types refer to as "Delta T", which is the increase in the trapped gas temperature from the point of ignition to max temperature after TDC on the power stroke. Water/ methanol evaporation results in much lower initial temperature during compression/ ignition and most importantly much lower peak temperature. Excessive combustion gas temperature (approaching the temperature of an oxyacetylene torch!) and inadequate octane can cause the creation of active radicals in the combustion chamber residual end gases that can explode/ detonate during the combustion gas pressure/ temperature rise shortly after the next spark ignition which can wreck engine parts (see Kevin Cameron's TCD articles in this website explaining detonation). Reducing peak combustion gas temperature with water/ methanol evaporation can be just as effective as raising octane in preventing detonation. But as long as the Delta T of the combustion chamber gases greater than stock, and there are more gas molecules to expand (the result of added boost pressure) then HP will be greater even with much lower and safer peak combustion gas temperature.

"Incorrect", slightly optimistic correction factor on all factory turbo sleds?
The SkiDoo turbo ECU's boost control is said to be altitude compensating, maintaining constant absolute pressure (14.7 PSI barometric pressure plus @2.5 PSI boost pressure =17.2 PSI absolute pressure)—meaning that for every 1000 ft increase in altitude the ECU adds something like ½ PSI of boost just to compensate from the drop in barometric pressure to maintain sea level actual HP regardless of altitude. And since DTR is situated on a hill above Batavia NY at @1000' altitude, perhaps this boost level shown is ½ PSI higher than it would be at, say, Jaws' dyno which is much closer to sea level along the St. Lawrence Seaway. So today, with cold 27F intake air temps at 1000 ft altitude our stock boost made 188 actual uncorrected HP and 188 STP corrected (Standard Temperature and Pressure—the HP that the dyno calculates that an engine would make at 60 degrees sea level 29.92 in hg dry air) HP. The 27F intake air temp was better than STP, which was offset by the 29.06 in hg baro during the test, which was lower than STP which happened to offset each other for a 1.000 correction factor. But if we took this sled to a dyno in mile-high Denver, CO the baro pressure might be 24.4 IN HG or 12 PSI. So the

Turbo 850 Comp ECU should make @5.2 PSI boost which = 17.2 PSI absolute pressure. So on a properly calibrated engine dyno in Denver in 27F air, the stock Turbo 850 Comp should make the same 188 observed HP. But now the STP correction factor would be 17% higher than here, indicating 220 STP HP. If our ECU boost rise based upon actually atmosphere is actually a target 17.2 PSI absolute, then this particular Turbo 850 Comp dyno tested at sea level should make 180 STP HP (correcting down because the intake air temp is at 27F) because the correction factor would be about 4% less than it is here at 1000'. Got it? And remember—this partially correct STP correction factor is true of all the modern altitude compensating turbo sleds, so anyone can do their own math.

Air/Fuel ratio in modern two stroke engines—a simplistic, at least partially accurate explanation from a so-called dyno tuner who, in the quest for maximum HP has surely detonated and seized more pistons than any other human in over 37 years. One DTR member was wondering about the lean-appearing wideband measured Air/ Fuel ratio in these new NA and turbocharged twostroke engines. A/F is the pounds per hour of air compared to pounds per hour of fuel consumed. Old school tuners of race engines who are used to making max HP at 12.5 or 13/1 are sometimes horrified at the lean appearing 14/1+ A/F mixtures shown in our ETEC data. The difference is related to how the fuel enters the engine. A/F ratio, measured either by mechanically measuring the actual flow of air and fuel into the engine, or with a wideband O2 sensor somewhere in the exhaust stream. But neither of those measurements can tell us exactly what the actual "net" A/F ratio is, as the mixture burns the combustion chambers.

Carbureted or early EFI two stroke sled engines need properly sized high velocity carbs or throttle bodies, highly volatile (volatility is the "anxiousness" of any fuel to become burnable vapor) high RVP fuel, and lots of engine heat to create an optimally homogenized mixture or air and fuel vapor that finally gets trapped in the combustion chamber just as the exhaust port gets closed, effectively by a combo of the rising piston and the returning sound wave that's shoving air/ fuel mixture back into the cylinder.

If a mythical engine had optimal everything—intake air velocity, fuel volatility and heat—with 100% of the unburnable fuel droplets converted to burnable invisible vapor by the time the mixture gets trapped, then 100% of the fuel would combine with 100% of the oxygen in the air at a ratio of about 14.7/1. So in this mythical perfect engine with perfect combustion chamber cooling and perfect octane we should make max theoretical HP at a measured 14.7/1. But in the real world, high performance engines often have higher flowing CFM but lower velocity intakes, less than optimal low RVP fuel, and cooling systems that fail to remove just enough combustion chamber heat to prevent detonation even with the highest octane fuel. So inevitably, we must have some "extra" unvaporized fuel droplets absorbing heat (the "heat of vaporization" exactly like the water/ methanol injection functions) and taking up space in the combustion chambers to keep things happy, staving off deto. My old pal Greg Santry calls those final unvaporized droplets the "tails" or "tail ends"—the opposite of what Kevin Cameron calls the "front ends" like butane and isopentane (which boils at 80F) which are the first to become vaporized in the intake ports and crankcase, begin the fire which can quickly heat up and vaporize more of the fuel. (*Low RVP low volatility fuel requires more volume, and*

importantly more time in the initial combustion chamber fire to become vapor—requiring more advanced ignition timing which causes more heat loss into engine parts resulting in less heat available to expand gases and create HP. That's surely why Vance & Hines is said to have requested Sunoco create the higher RVP high octane Cyclone 17 blend for their higher revving four cylinder PS bikes). But most of those unvaporized "tail ends" finally do become vapor late in the combustion cycle in the fire of the exhaust exiting the engine, mixed in with actual combustion chamber exhaust and sort of fools the O2 sensor (and us) into thinking that the A/F ratio is "richer" than what is actually happening in the combustion chambers. So running stale fuel from sealed pails or drums (yes that happens too often) might result in leaner than optimal combustion chamber conditions, loss of HP or even detonation even with safe looking A/F ratio. Always test your fuel's volatility!

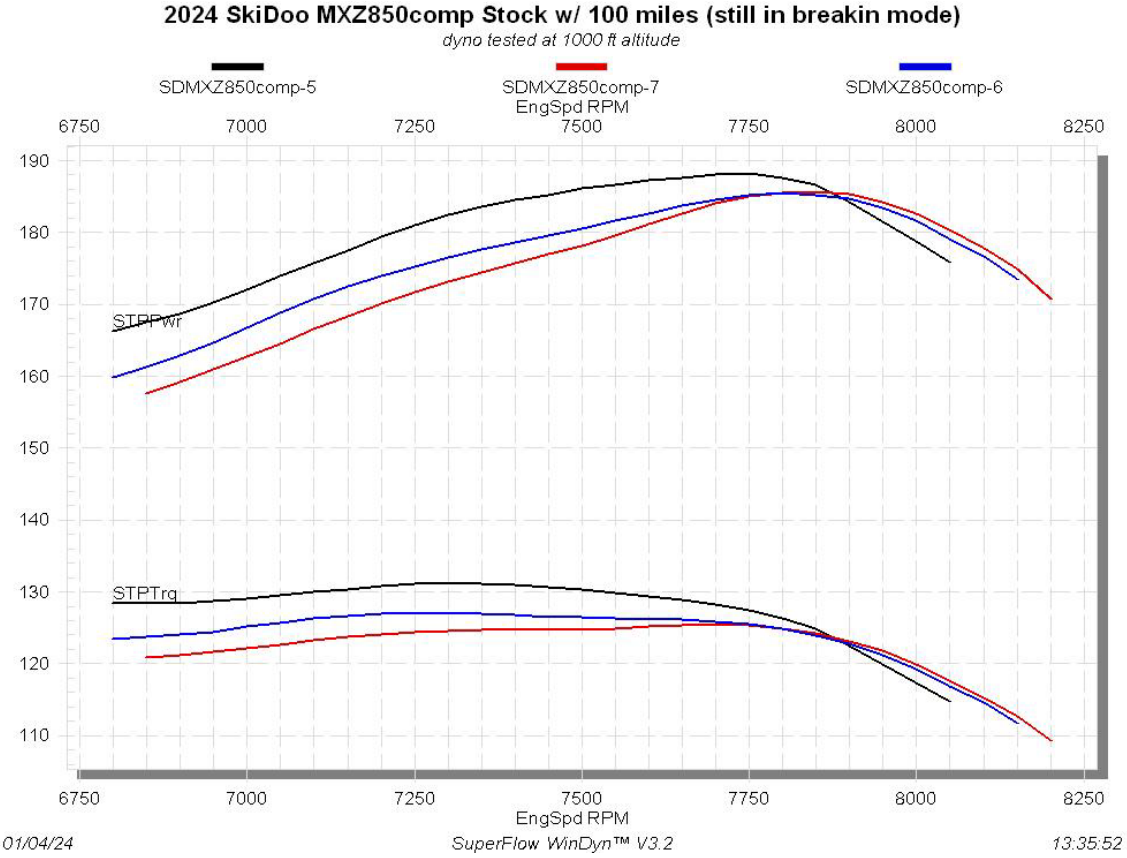
Being different from engines with fuel entering at the carbs or throttle bodies, the ETEC engine fools us with leaner-appearing A/F ratio than what's really going on in the combustion chambers. Because if, say, half of the fuel consumed is injected into the combustion chambers late in the compression stroke by the ETEC direct injection, then the short circuited air/ fuel mixture (mixture that has entered the exhaust pipe, but fails to get packed back into the combustion chambers by the returning sound wave and escapes out the exhaust) has much less fuel in it—what fuel is mixed in has been provided mostly by the throttle body injectors). So it's likely that a 14/1 reading at WOT is some combo of perhaps 12/1 trapped and making HP in the combustion chambers and, maybe 16/1 in the short-circuited mixture as both combine helter skelter then pass by the confused O2 sensor. This may be why the Jaws exhaust makes way more HP than the stock exhaust even with no added fuel with nearly identical indicated A/F ratio. It must be just packing more of the 16/1 A/F ratio short circuited mixture back into the engine, creating that added HP while leaning the combustion chamber out to a still-safe but powerful 12.5/1 or thereabouts!

The SkiDoo turbo ECU measures exhaust pressure in the tuned pipe, which typically is some % higher than intake pressure under load. The Jaws pipe requires moving that pressure sensor to the airbox, which we did at the conclusion of our HRSS stock exhaust reflash testing. After moving the sensor we ran three sweep tests with the stock exhaust still in place, and boost pressure dropped by 1/2psi and HP was a bit lower. But when we used Branko's HRSS tunes with the stock pipe, moving the sensor *added* slight boost and HP while extending revs some. Very interesting, but moving the sensor results in reduced boost and HP with stock ECU, but adds boost and HP with HRSS flashes. So all reflashes are shown with the pressure sensor fitted to the intake.

Here is the test data—back to back ten second sweep tests along with data from the best test (gonzo HP tunes were kept more reasonable at twenty seconds at WOT). All pump gas data was created using 91.0 octane 3.8% ethanol fuel—five gallons that was purchased from a single hose pump set at 93 octane (beware the hose and internal pump dispensing manifold that's likely filled with 87!). ***When we used to gas up our turbo Evo Harley and Buell demo bikes back in the day, we would ride around***

town to find a single hose pump that had the high buck price per gallon showing from the prior sale—then we would all buy from that pump. Octane is always your friend.

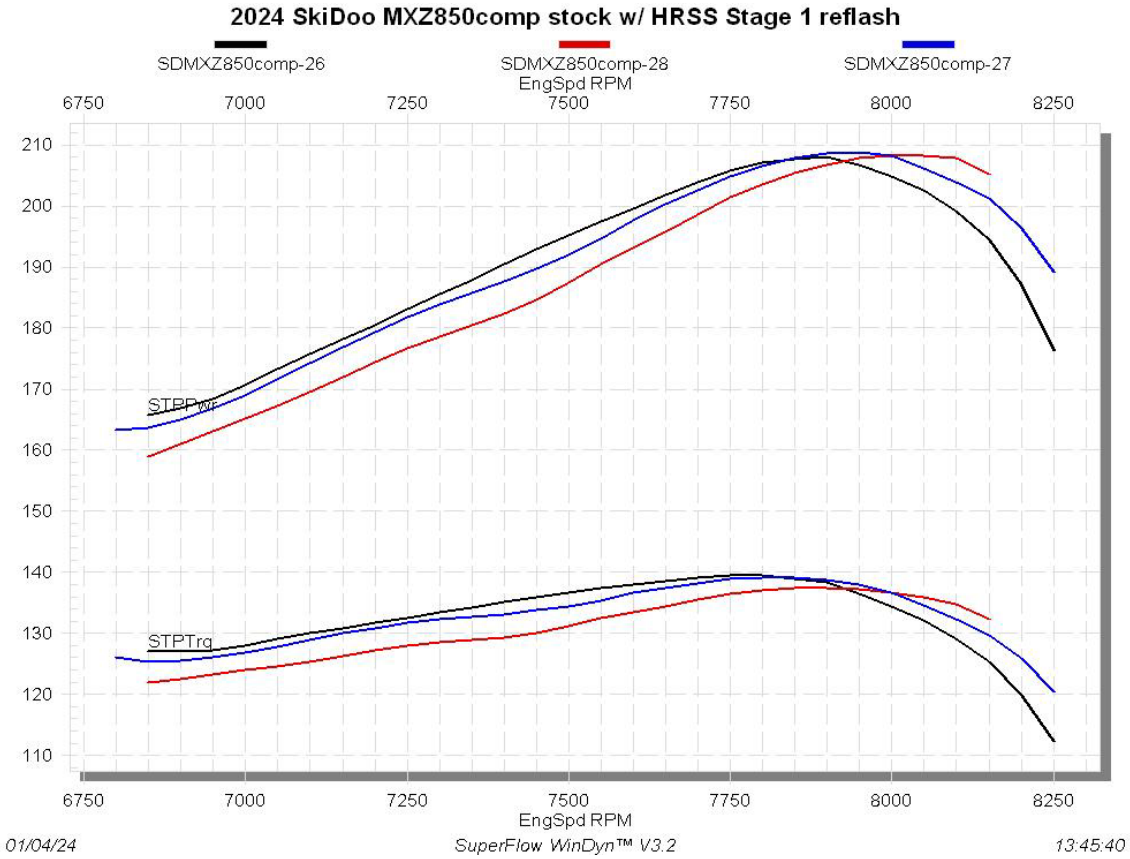
ALL STOCK



SDMXZ850comp-5 All stock test one

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6800	166.2	128.4	27.5	29.06	67.8	14.63	3.2	1.000
6850	167.5	128.4	27.5	29.06	67.9	14.59	3.2	1.000
6900	168.8	128.5	27.5	29.06	67.9	14.55	3.2	1.000
6950	170.3	128.7	27.5	29.06	67.9	14.54	3.2	1.000
7000	172.1	129.1	27.5	29.06	67.9	14.53	3.1	1.000
7050	173.9	129.5	27.5	29.06	68.0	14.52	3.1	1.000
7100	175.7	130.0	27.5	29.06	68.0	14.49	3.1	1.000
7150	177.5	130.4	27.5	29.06	68.0	14.44	3.1	1.000
7200	179.3	130.8	27.5	29.06	68.0	14.38	3.1	1.000
7250	181.0	131.1	27.5	29.06	68.1	14.33	3.1	1.000
7300	182.5	131.3	27.5	29.06	68.1	14.31	3.1	1.000
7350	183.6	131.2	27.5	29.06	68.1	14.30	3.1	1.000
7400	184.6	131.0	27.5	29.06	68.1	14.30	3.1	1.000
7450	185.2	130.6	27.5	29.06	68.1	14.32	3.0	1.000
7500	186.1	130.3	27.5	29.06	68.2	14.34	3.0	1.000
7550	186.7	129.9	27.5	29.06	68.2	14.35	3.0	1.000
7600	187.3	129.4	27.5	29.06	68.2	14.37	2.9	1.000

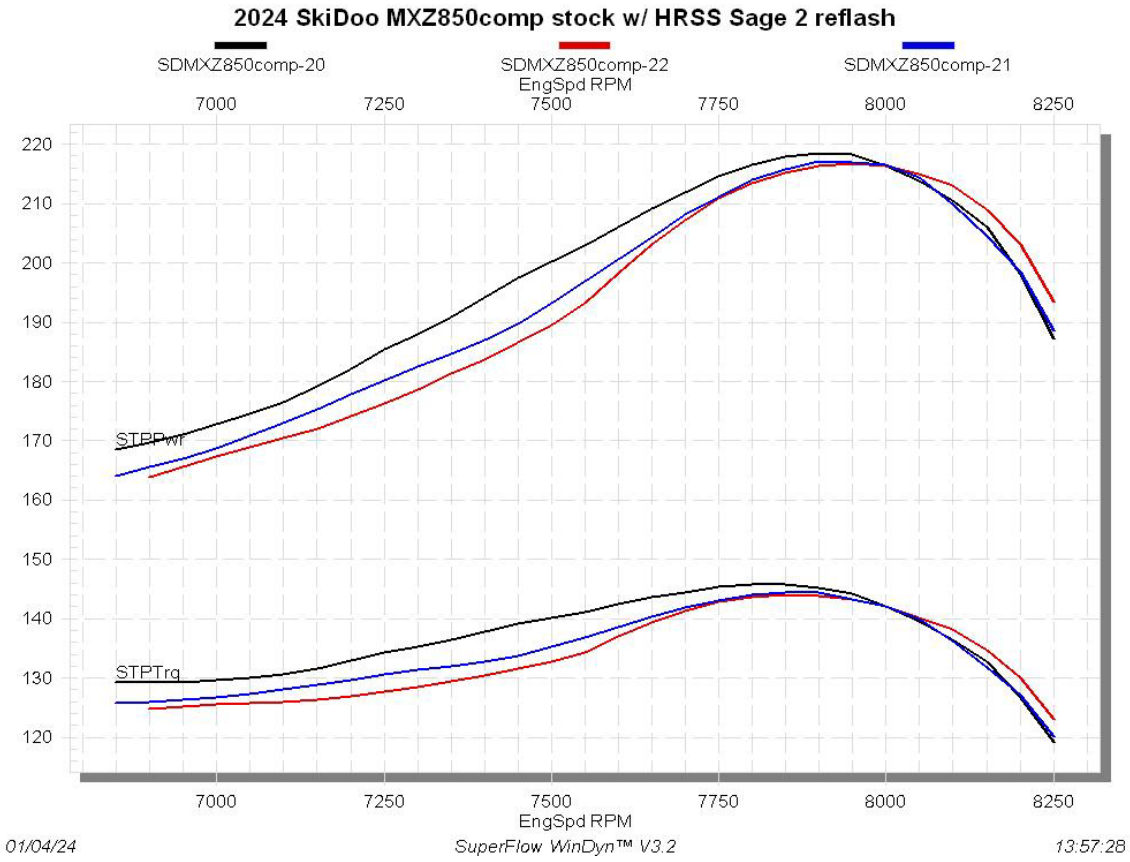
7650	187.7	128.8	27.5	29.06	68.2	14.37	2.9	1.000
7700	188.1	128.3	27.4	29.06	68.2	14.38	2.9	1.000
7750	188.2	127.5	27.4	29.06	68.3	14.39	2.8	1.000
7800	187.6	126.3	27.4	29.06	68.3	14.40	2.8	1.000
7850	186.7	124.9	27.4	29.06	68.3	14.41	2.7	1.000
7900	184.2	122.5	27.4	29.06	68.3	14.42	2.6	1.000
7950	181.5	119.9	27.4	29.06	68.3	14.45	2.6	1.000
8000	178.8	117.4	27.4	29.06	68.3	14.47	2.7	1.000
8050	176.0	114.8	27.4	29.06	68.4	14.49	2.8	1.000



SDMXZ850comp-27 stock exhaust HRSS Stage 1 reflash test two

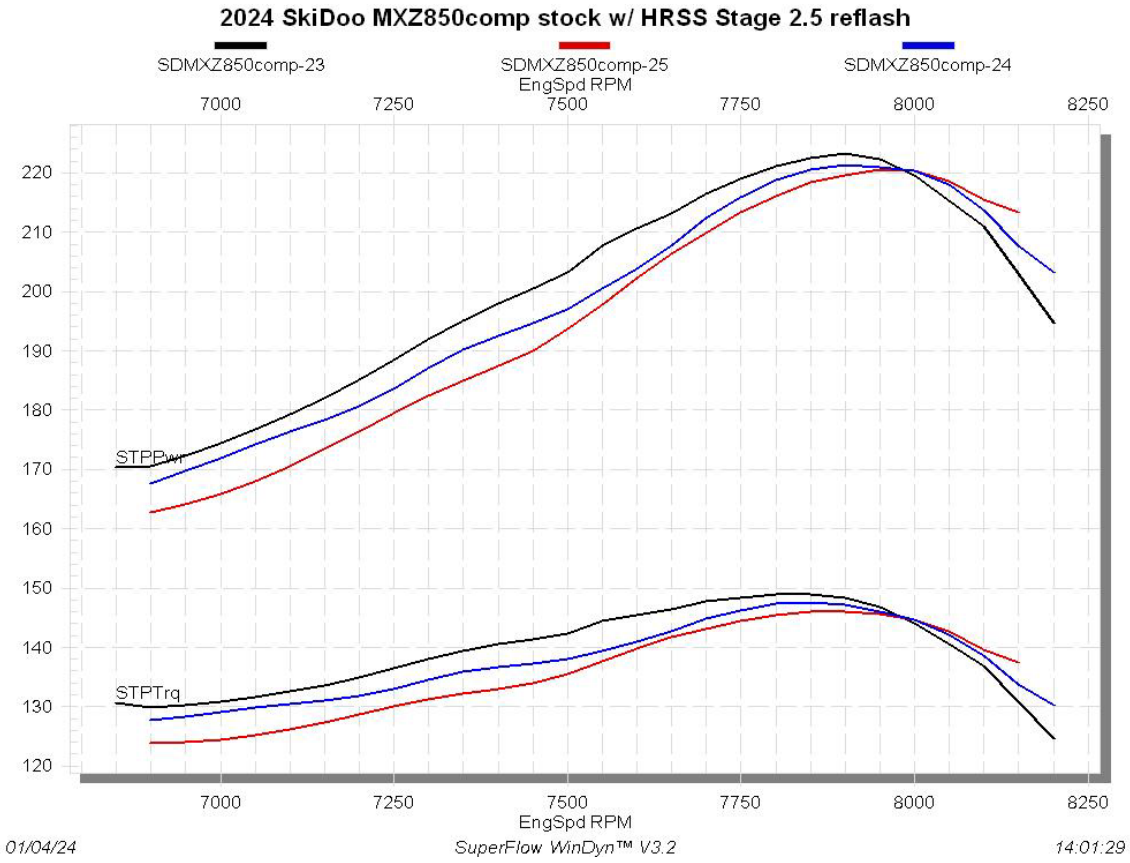
EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6800	163.4	126.2	27.3	29.07	72.6	14.82	3.4	1.000
6850	163.6	125.4	27.3	29.07	72.6	14.71	3.5	1.000
6900	165.0	125.6	27.3	29.07	72.6	14.67	3.5	1.000
6950	166.8	126.1	27.3	29.07	72.6	14.66	3.6	1.000
7000	169.0	126.8	27.3	29.07	72.6	14.65	3.6	1.000
7050	171.7	127.9	27.3	29.07	72.6	14.64	3.7	1.000
7100	174.3	128.9	27.3	29.07	72.6	14.61	3.7	1.000
7150	176.9	130.0	27.3	29.07	72.6	14.58	3.8	1.000
7200	179.4	130.9	27.3	29.07	72.6	14.54	3.9	1.000

7250	181.8	131.7	27.3	29.07	72.6	14.49	3.9	1.000
7300	183.8	132.2	27.3	29.07	72.6	14.45	3.9	1.000
7350	185.8	132.7	27.3	29.07	72.6	14.43	4.0	1.000
7400	187.6	133.1	27.3	29.07	72.6	14.42	4.0	1.000
7450	189.7	133.7	27.3	29.07	72.6	14.41	4.1	1.000
7500	192.0	134.5	27.3	29.07	72.6	14.41	4.2	1.000
7550	194.7	135.4	27.3	29.07	72.6	14.41	4.2	1.000
7600	197.6	136.6	27.3	29.07	72.6	14.41	4.3	1.000
7650	200.3	137.5	27.3	29.07	72.6	14.41	4.3	1.000
7700	202.6	138.2	27.3	29.07	72.6	14.40	4.3	1.000
7750	204.9	138.8	27.3	29.07	72.6	14.38	4.4	1.000
7800	206.6	139.1	27.3	29.07	72.6	14.36	4.4	1.000
7850	207.8	139.1	27.3	29.07	72.6	14.34	4.4	1.000
7900	208.6	138.7	27.4	29.07	72.6	14.34	4.4	1.000
7950	208.7	137.9	27.4	29.07	72.6	14.35	4.3	1.000
8000	208.2	136.7	27.4	29.07	72.6	14.36	4.3	1.000
8050	206.2	134.5	27.4	29.07	72.5	14.38	4.4	1.000
8100	203.9	132.2	27.4	29.07	72.5	14.39	4.4	1.000
8150	201.3	129.7	27.4	29.07	72.5	14.39	4.4	1.000
8200	196.4	125.8	27.4	29.07	72.5	14.38	4.4	1.000
8250	189.2	120.5	27.4	29.07	72.5	14.37	4.4	1.000



SDMXZ850comp-20 stock exhaust with HRSS Stage 2 Reflash test one

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6850	168.4	129.2	27.5	29.07	64.3	15.08	3.4	1.000
6900	169.7	129.1	27.5	29.07	64.3	15.03	3.4	1.000
6950	171.1	129.3	27.5	29.07	64.3	15	3.5	1.000
7000	172.7	129.6	27.5	29.07	64.3	14.97	3.5	1.000
7050	174.5	130.0	27.5	29.07	64.3	14.93	3.6	1.000
7100	176.6	130.6	27.5	29.07	64.3	14.88	3.7	1.000
7150	179.2	131.7	27.5	29.07	64.3	14.79	3.8	1.000
7200	182.2	132.9	27.5	29.07	64.3	14.68	4.0	1.000
7250	185.3	134.3	27.5	29.07	64.3	14.61	4.1	1.000
7300	188.0	135.2	27.5	29.07	64.3	14.58	4.2	1.000
7350	190.9	136.4	27.5	29.07	64.3	14.55	4.4	1.000
7400	194.2	137.8	27.5	29.07	64.4	14.55	4.6	1.000
7450	197.4	139.2	27.4	29.07	64.4	14.56	4.7	1.000
7500	200.2	140.2	27.4	29.07	64.4	14.56	4.8	1.000
7550	202.9	141.2	27.4	29.07	64.4	14.56	4.9	1.000
7600	206.1	142.4	27.4	29.07	64.4	14.53	5.0	1.000
7650	209.1	143.6	27.4	29.07	64.4	14.48	5.1	1.000
7700	211.8	144.5	27.4	29.07	64.4	14.43	5.2	1.000
7750	214.5	145.4	27.4	29.07	64.4	14.35	5.4	1.000
7800	216.6	145.8	27.4	29.07	64.4	14.28	5.4	1.000
7850	218.0	145.8	27.4	29.07	64.4	14.23	5.5	1.000
7900	218.4	145.2	27.3	29.07	64.4	14.22	5.5	1.000
7950	218.2	144.2	27.3	29.07	64.5	14.23	5.5	1.000
8000	216.3	142.0	27.3	29.07	64.5	14.25	5.5	1.000
8050	213.9	139.5	27.3	29.07	64.5	14.26	5.5	1.000
8100	210.5	136.5	27.3	29.07	64.5	14.27	5.5	1.000
8150	206.1	132.8	27.3	29.07	64.5	14.27	5.4	1.000
8200	198.0	126.8	27.3	29.07	64.5	14.25	5.3	1.000
8250	187.1	119.1	27.3	29.07	64.5	14.23	5.3	1.000

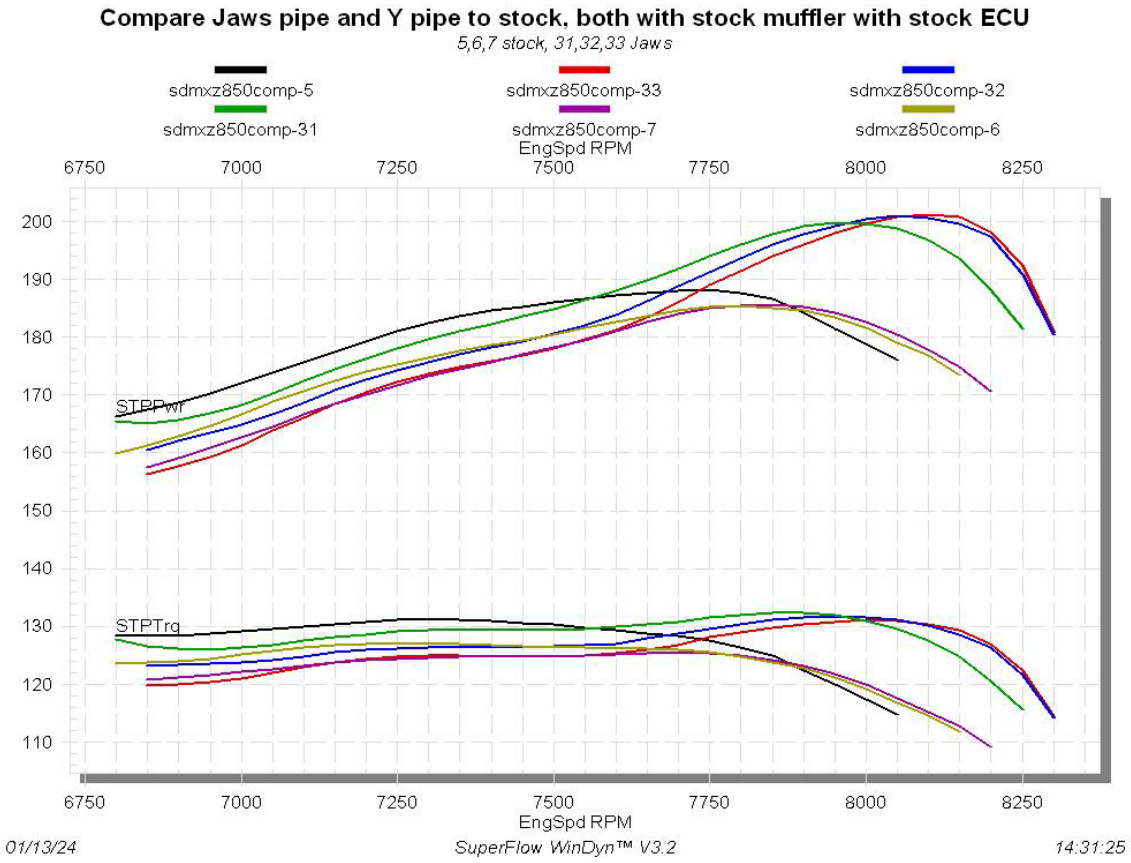


SDMXZ850comp-23 stock exhaust w/ HRSS Stage 2.5 reflash test one

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6850	170.4	130.6	27.5	29.07	69.8	15.84	3.3	1.000
6900	170.5	129.8	27.5	29.07	69.8	15.55	3.3	1.000
6950	172.4	130.3	27.5	29.07	69.8	15.43	3.4	1.000
7000	174.4	130.9	27.5	29.07	69.8	15.36	3.5	1.000
7050	176.7	131.7	27.5	29.07	69.8	15.27	3.6	1.000
7100	179.2	132.6	27.5	29.07	69.8	15.17	3.7	1.000
7150	182.0	133.7	27.5	29.07	69.8	15.06	3.8	1.000
7200	185.1	135.0	27.5	29.07	69.8	14.93	4.0	1.000
7250	188.4	136.5	27.6	29.07	69.8	14.82	4.1	1.000
7300	192.0	138.1	27.6	29.07	69.8	14.73	4.3	1.000
7350	195.1	139.4	27.6	29.07	69.8	14.69	4.4	1.000
7400	197.9	140.5	27.6	29.07	69.8	14.68	4.6	1.000
7450	200.5	141.4	27.6	29.07	69.8	14.67	4.8	1.000
7500	203.2	142.3	27.6	29.07	69.8	14.66	5.0	1.000
7550	207.7	144.5	27.6	29.07	69.8	14.61	5.4	1.000
7600	210.6	145.5	27.6	29.07	69.8	14.58	5.7	1.000
7650	213.2	146.4	27.6	29.07	69.8	14.54	5.8	1.000
7700	216.5	147.7	27.6	29.07	69.8	14.45	6.0	1.000
7750	219.0	148.4	27.6	29.07	69.8	14.38	6.1	1.000
7800	221.2	149.0	27.6	29.07	69.8	14.28	6.1	1.000

7850	222.5	148.9	27.6	29.07	69.8	14.21	6.2	1.000
7900	223.2	148.4	27.6	29.07	69.8	14.19	6.2	1.000
7950	222.3	146.9	27.6	29.07	69.8	14.19	6.2	1.000
8000	219.5	144.1	27.6	29.07	69.8	14.20	6.2	1.000
8050	215.3	140.5	27.6	29.07	69.8	14.23	6.1	1.000
8100	211.0	136.8	27.6	29.07	69.8	14.26	5.9	1.000
8150	203.1	130.9	27.6	29.07	69.8	14.30	5.7	1.000
8200	194.6	124.6	27.7	29.07	69.8	14.34	5.7	1.000

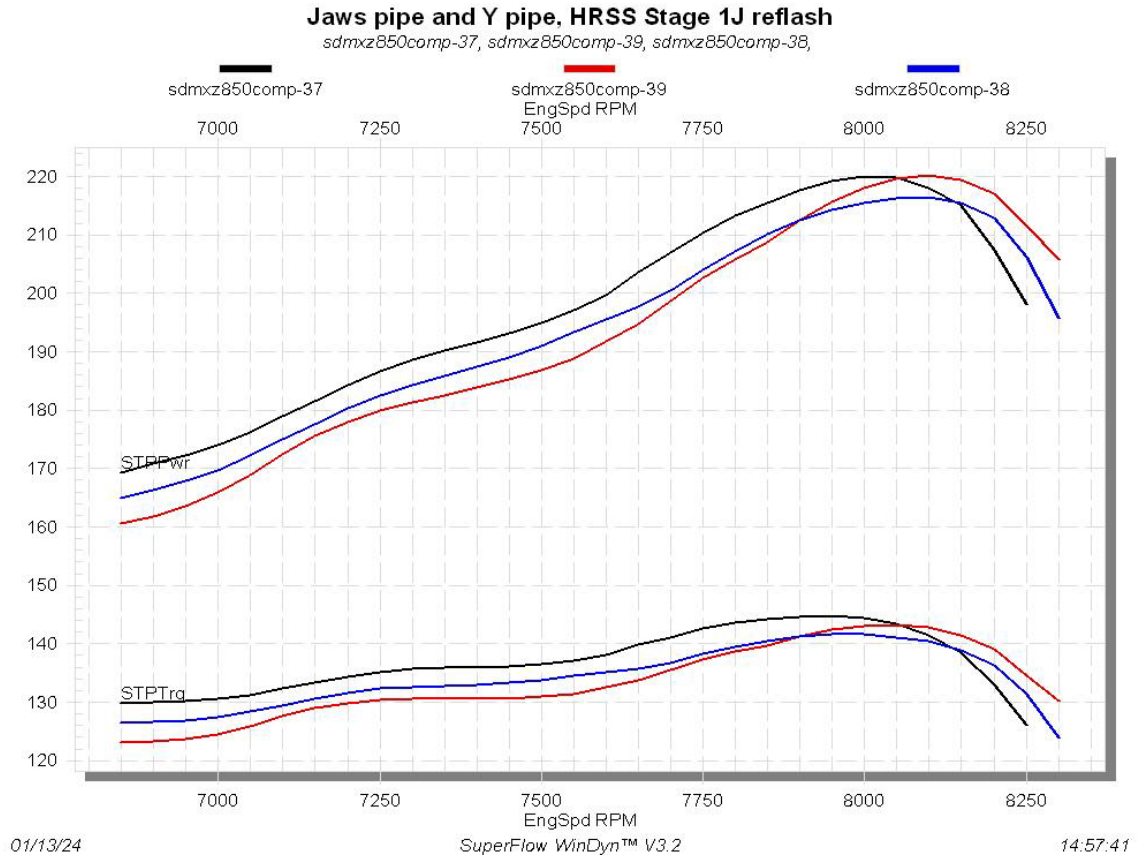
Next we installed the Jaws pipe and Y pipe with stock muffler. This first graph is BBB tests of the stock exhaust with Jaws exhaust—stock muffler and stock ECU (still in so-called breakin mode). The hottest Jaws exhaust gave us solid 15 HP increase compared to a hottest stock pipe! I believe that eclipses the previous record for a single pipe power increase—the 14HP Aaen Quiet Can single on our old Yamaha Phazer tested in one of our early "Pipe Shootouts" in early scanned DT issues on this website. With the Jaws exhaust, as the HP exceeded 220 HRSS owner Branko opted to add race fuel to have 100 octane (like Av Gas might be) for stage 2J and 3J and have 116 octane for Stage 4J. This is playing it safe, for sure. One might be able to run the higher stages on pump gas, but asking the ECU's deto protection to keep you running at high HP levels on pump gas is inviting expensive trouble. Scrapyards across North America are littered with ruined four stroke aluminum blocks and heads left there by snowmobilers who had hoped their deto protection would let them run their overboosted Yamahas and Cats at "recommended" high boost levels on mystery gas from the pump. I have gotten many samples of pump gas to test with my Zeltex 101C octane tester from people who have destroyed engines while running high boost on pump gas. In most cases, 93 has been close to 93, but sometimes you get hosed at the high test pump and wind up with 87 or worse. Av Gas or Race fuel is way cheaper than engine replacement. It's possible that the factory methanol injection might help enough to run high boost levels on pump gas, but that must be examined by measuring and possibly increasing the fluid injection rates on the dyno. That would be interesting to do. For now, it's wise to play it safe.



SDMXZ850comp-33 Jaws pipe and Ypipe and stock ECU test three

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6850	156.3	119.8	27.7	29.11	62.9	14.94	2.6	0.999
6900	157.6	120.0	27.7	29.11	63.0	14.90	2.6	0.999
6950	159.2	120.3	27.7	29.11	63.0	14.86	2.6	0.999
7000	161.3	121.0	27.7	29.11	63.0	14.80	2.7	0.999
7050	163.9	122.1	27.7	29.11	63.0	14.73	2.7	0.999
7100	166.1	122.9	27.7	29.11	63.0	14.68	2.7	0.999
7150	168.5	123.8	27.7	29.11	63.0	14.64	2.8	0.999
7200	170.6	124.4	27.7	29.11	63.0	14.59	2.7	0.999
7250	172.2	124.7	27.7	29.11	63.0	14.55	2.7	0.999
7300	173.6	124.9	27.7	29.11	63.0	14.51	2.8	0.999
7350	174.8	124.9	27.7	29.11	63.1	14.46	2.8	0.999
7400	175.8	124.8	27.7	29.11	63.1	14.42	2.8	0.999
7450	176.9	124.7	27.7	29.11	63.1	14.39	2.8	0.999
7500	178.1	124.8	27.7	29.11	63.1	14.37	2.8	0.999
7550	179.6	124.9	27.7	29.11	63.1	14.33	2.9	0.999
7600	181.3	125.3	27.7	29.11	63.1	14.31	2.8	0.999
7650	183.4	125.9	27.7	29.11	63.1	14.29	2.8	0.999
7700	186.0	126.9	27.7	29.11	63.1	14.27	2.8	0.999
7750	189.1	128.1	27.7	29.11	63.1	14.24	2.7	0.999
7800	191.5	128.9	27.7	29.11	63.1	14.22	2.6	0.999

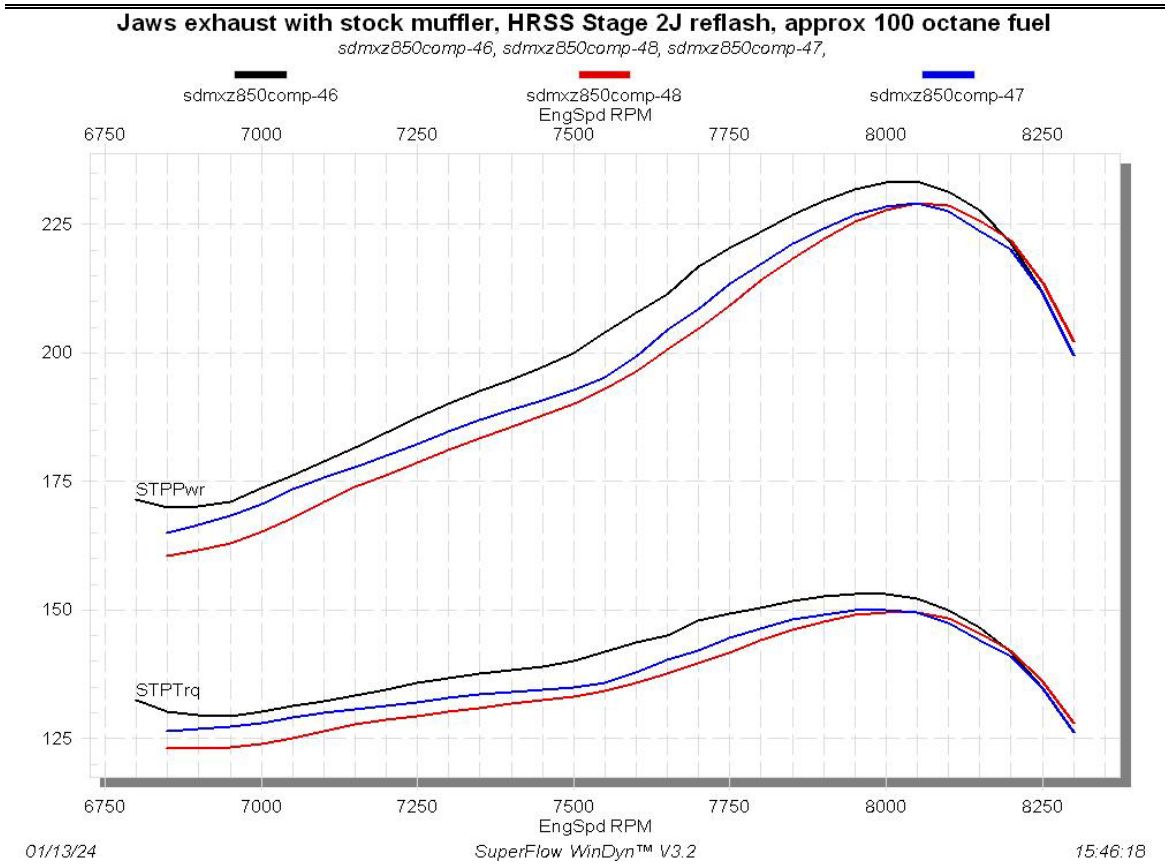
7850	193.9	129.7	27.7	29.11	63.2	14.20	2.6	0.999
7900	196.1	130.4	27.7	29.11	63.2	14.18	2.6	0.999
7950	198.0	130.8	27.7	29.11	63.2	14.16	2.6	0.999
8000	199.7	131.1	27.7	29.11	63.2	14.13	2.6	0.999
8050	200.8	131.0	27.7	29.11	63.2	14.11	2.6	0.999
8100	201.2	130.5	27.7	29.11	63.2	14.09	2.6	0.999
8150	200.8	129.4	27.7	29.11	63.2	14.07	2.7	0.999
8200	198.3	127.0	27.7	29.11	63.2	14.06	2.7	0.999
8250	192.3	122.4	27.7	29.11	63.3	14.06	2.8	0.999
8300	180.9	114.5	27.7	29.11	63.3	14.08	2.8	0.999



SDMXZ850comp-39 Jaws Exhaust, stock muffler, HRSS Stage 1J reflash test three

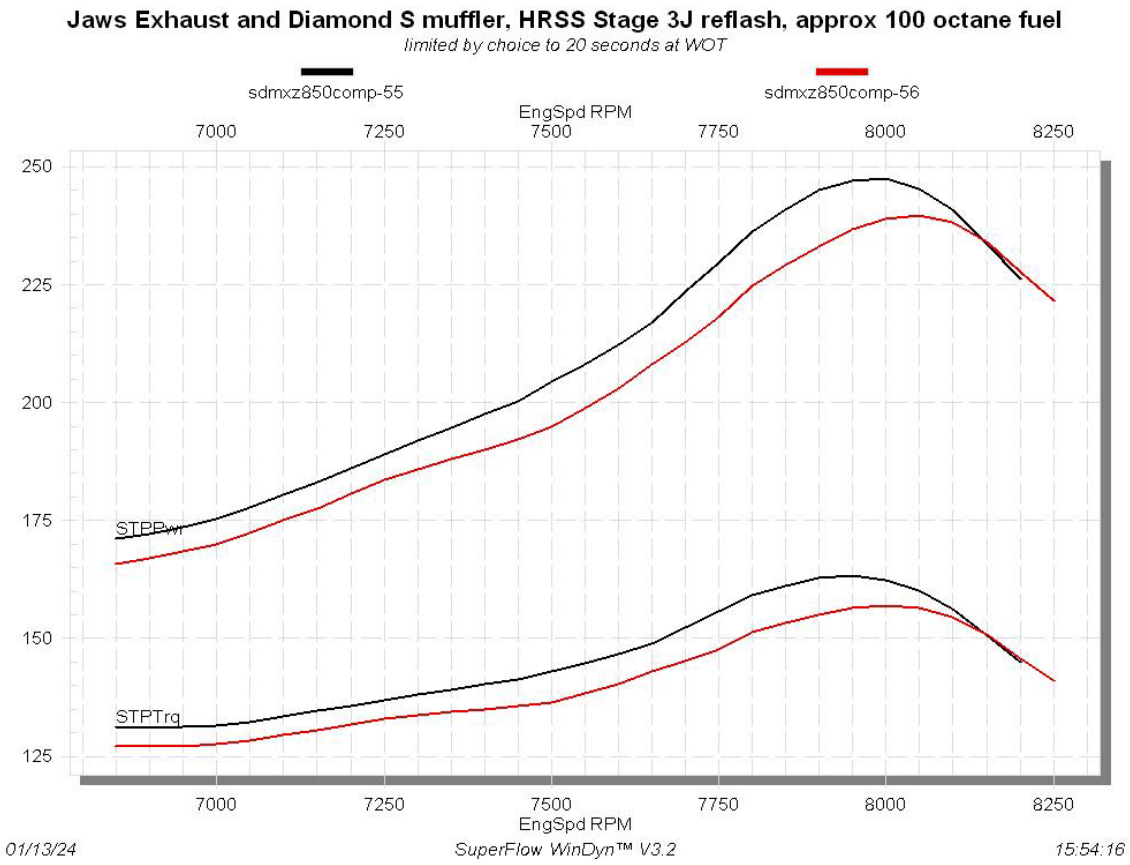
EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6850	160.5	123.1	28.9	29.08	62.2	14.60	3.3	1.001
6900	161.8	123.2	29.0	29.08	62.2	14.57	3.4	1.001
6950	163.6	123.6	29.0	29.08	62.2	14.54	3.5	1.001
7000	166.0	124.5	29.0	29.08	62.2	14.51	3.6	1.001
7050	168.9	125.8	29.0	29.08	62.2	14.47	3.8	1.001
7100	172.5	127.6	29.0	29.08	62.2	14.43	3.9	1.001
7150	175.5	128.9	29.0	29.08	62.2	14.39	3.9	1.001
7200	178.0	129.8	29.0	29.08	62.2	14.35	3.9	1.001

7250	179.9	130.3	29.0	29.08	62.2	14.32	3.9	1.001
7300	181.4	130.5	29.1	29.08	62.2	14.28	4.0	1.001
7350	182.6	130.5	29.1	29.08	62.2	14.24	4.1	1.001
7400	183.9	130.5	29.1	29.08	62.2	14.21	4.1	1.001
7450	185.3	130.7	29.1	29.08	62.2	14.19	4.1	1.001
7500	186.9	130.9	29.1	29.08	62.2	14.18	4.2	1.001
7550	188.9	131.4	29.1	29.08	62.2	14.16	4.2	1.001
7600	191.8	132.5	29.1	29.08	62.2	14.13	4.3	1.001
7650	194.7	133.7	29.2	29.08	62.2	14.10	4.3	1.001
7700	198.7	135.5	29.2	29.08	62.2	14.05	4.4	1.001
7750	202.7	137.4	29.2	29.08	62.2	14.00	4.5	1.001
7800	205.9	138.6	29.2	29.08	62.2	13.95	4.6	1.001
7850	208.8	139.7	29.2	29.08	62.2	13.91	4.6	1.001
7900	212.5	141.2	29.3	29.08	62.2	13.84	4.8	1.001
7950	215.6	142.5	29.3	29.08	62.2	13.78	4.9	1.001
8000	218.0	143.1	29.3	29.08	62.2	13.74	4.9	1.001
8050	219.5	143.2	29.3	29.08	62.2	13.71	4.9	1.001
8100	220.1	142.7	29.3	29.08	62.2	13.69	4.8	1.001
8150	219.4	141.4	29.4	29.08	62.2	13.68	4.7	1.001
8200	217.1	139.1	29.4	29.08	62.2	13.69	4.6	1.001
8250	211.5	134.6	29.5	29.08	62.2	13.72	4.6	1.002
8300	205.7	130.2	29.5	29.08	62.2	13.76	4.6	1.002



SDMXZ850comp-46 Jaws exhaust stock muffler, HRSS Stage 2J w/ approx 100 octane fuel test one

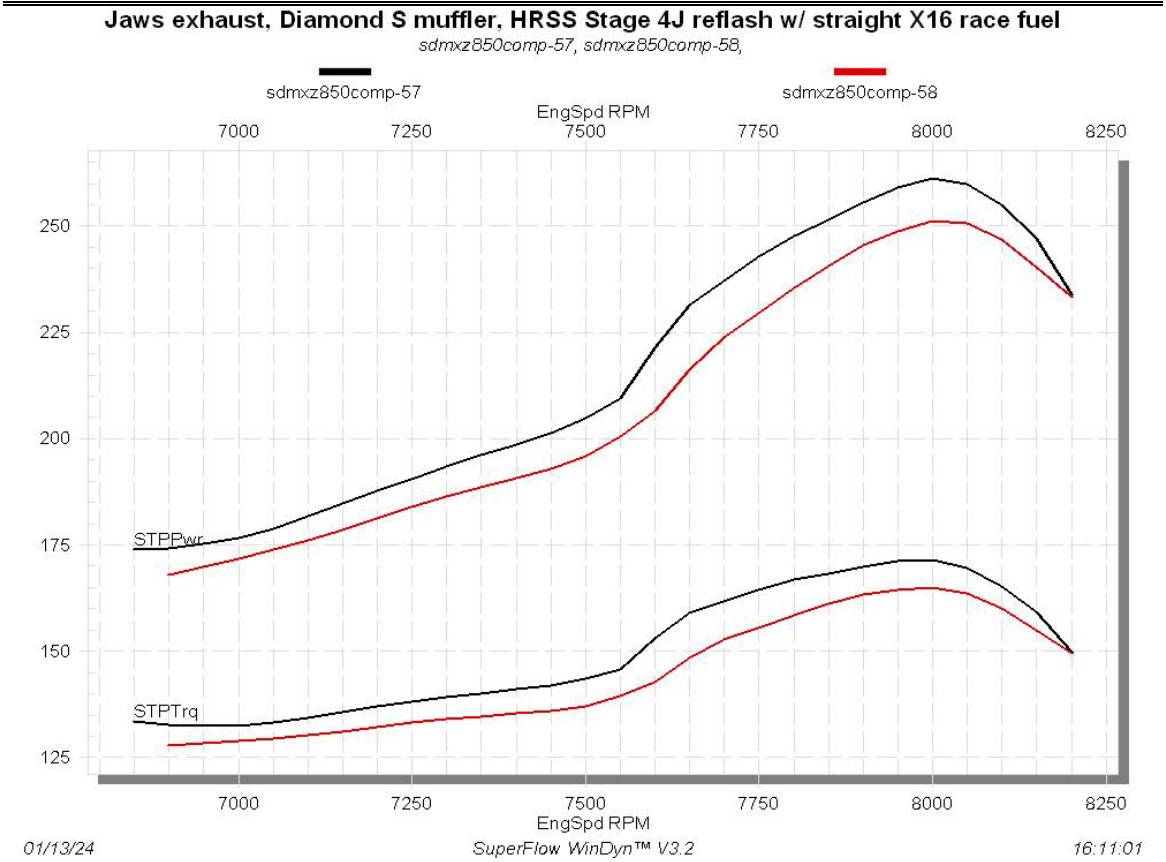
EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6800	171.5	132.5	27.9	29.1	62.0	15.39	3.2	0.999
6850	169.8	130.2	27.9	29.1	62.0	15.11	3.1	0.999
6900	170.2	129.6	27.9	29.1	62.0	15.02	3.1	0.999
6950	171.1	129.3	27.9	29.1	62.0	14.94	3.3	0.999
7000	173.7	130.3	27.9	29.1	62.0	14.92	3.5	0.999
7050	176.3	131.3	27.9	29.1	62.0	14.89	3.5	0.999
7100	178.8	132.3	27.9	29.1	62.0	14.82	3.6	0.999
7150	181.5	133.3	27.9	29.1	62.0	14.71	3.7	0.999
7200	184.4	134.5	27.9	29.1	62.0	14.58	3.8	0.999
7250	187.4	135.8	27.9	29.1	62.0	14.48	3.9	0.999
7300	190.0	136.7	27.9	29.1	62.0	14.44	4.1	0.999
7350	192.5	137.5	27.9	29.1	62.0	14.43	4.3	0.999
7400	194.8	138.3	27.9	29.1	62.0	14.41	4.5	0.999
7450	197.2	139.0	27.9	29.1	62.0	14.40	4.6	0.999
7500	200.1	140.1	27.9	29.1	62.0	14.38	4.8	0.999
7550	204.0	141.9	27.9	29.1	62.0	14.35	5.0	0.999
7600	207.9	143.7	27.9	29.1	62.0	14.30	5.1	0.999
7650	211.4	145.1	27.9	29.1	62.0	14.27	5.2	0.999
7700	216.7	147.8	27.9	29.1	62.0	14.18	5.3	0.999
7750	220.4	149.4	27.9	29.1	62.0	14.12	5.3	0.999
7800	223.5	150.5	27.9	29.1	61.9	14.08	5.4	0.999
7850	226.8	151.7	27.9	29.1	61.9	14.06	5.4	0.999
7900	229.5	152.6	27.9	29.1	61.9	14.06	5.4	0.999
7950	231.7	153.1	27.9	29.1	61.9	14.10	5.4	0.999
8000	233.0	153.0	27.9	29.1	61.9	14.14	5.3	0.999
8050	233.3	152.2	27.9	29.1	61.9	14.18	5.2	0.999
8100	231.4	150.0	27.9	29.1	61.9	14.22	5.0	0.999
8150	227.7	146.7	27.9	29.1	61.9	14.25	4.8	0.999
8200	221.4	141.8	27.9	29.1	61.9	14.27	4.6	0.999
8250	211.6	134.7	27.9	29.1	61.9	14.29	4.4	0.999



SDMXZ850comp-55 Jaws exh Diamond S muffler, HRSS Stage 3J reflash w/ approx 100 octane fuel test one

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6850	171.1	131.2	27.4	29.12	61.3	15.04	3.1	0.998
6900	172.2	131.1	27.4	29.12	61.3	14.92	3.1	0.998
6950	173.5	131.1	27.4	29.12	61.3	14.83	3.2	0.998
7000	175.4	131.6	27.4	29.12	61.3	14.73	3.3	0.998
7050	177.6	132.3	27.4	29.12	61.3	14.65	3.4	0.998
7100	180.5	133.5	27.4	29.12	61.3	14.55	3.4	0.998
7150	183.2	134.6	27.4	29.12	61.3	14.47	3.5	0.998
7200	186.1	135.7	27.4	29.12	61.3	14.39	3.7	0.998
7250	189.0	136.9	27.4	29.12	61.3	14.33	3.8	0.998
7300	192.0	138.1	27.4	29.12	61.3	14.30	4.1	0.998
7350	194.7	139.1	27.4	29.12	61.3	14.29	4.3	0.998
7400	197.6	140.2	27.4	29.12	61.3	14.28	4.6	0.998
7450	200.3	141.2	27.4	29.12	61.3	14.28	4.8	0.998
7500	204.3	143.1	27.4	29.12	61.3	14.25	5.2	0.998
7550	208.0	144.7	27.4	29.12	61.3	14.20	5.4	0.998
7600	212.2	146.6	27.4	29.12	61.3	14.14	5.6	0.998
7650	216.9	148.9	27.5	29.12	61.3	14.06	5.8	0.998
7700	223.4	152.4	27.5	29.12	61.3	13.94	6.0	0.998
7750	229.7	155.7	27.5	29.12	61.3	13.84	6.2	0.998

7800	236.2	159.1	27.5	29.12	61.3	13.76	6.4	0.998
7850	241.0	161.2	27.5	29.12	61.3	13.74	6.4	0.998
7900	245.0	162.9	27.5	29.12	61.3	13.76	6.4	0.998
7950	247.1	163.2	27.5	29.12	61.3	13.79	6.4	0.998
8000	247.4	162.4	27.5	29.12	61.3	13.86	6.2	0.998
8050	245.3	160.1	27.5	29.12	61.3	13.94	6.0	0.998
8100	241.0	156.2	27.5	29.12	61.3	14.02	5.7	0.998
8150	233.6	150.5	27.5	29.12	61.3	14.11	5.3	0.998
8200	226.3	144.9	27.5	29.12	61.3	14.17	5.2	0.998



SDMXZ850comp-57 Jaws exh Diamond S muffler, HRSS Stage 4J reflash w/ VP X16 fuel test one

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	AirInT degF	Baro_P InHg	Humidy %	AFRWB1 Ratio	BoostP psig	STPCor Factor
6850	174.0	133.4	26.9	29.12	64.2	15.21	3.3	0.997
6900	174.3	132.6	26.9	29.12	64.2	14.86	3.2	0.997
6950	175.3	132.4	26.9	29.12	64.2	14.79	3.3	0.997
7000	176.5	132.4	26.9	29.12	64.2	14.69	3.4	0.997
7050	178.8	133.2	26.9	29.12	64.2	14.58	3.6	0.997
7100	181.7	134.4	27.0	29.12	64.2	14.50	3.7	0.997
7150	184.7	135.7	27.0	29.12	64.2	14.44	3.7	0.997
7200	187.7	136.9	27.0	29.12	64.2	14.38	3.8	0.997
7250	190.5	138.0	27.0	29.12	64.2	14.33	3.9	0.997

7300	193.4	139.2	27.0	29.12	64.2	14.30	4.1	0.997
7350	196.1	140.1	27.0	29.12	64.2	14.27	4.5	0.997
7400	198.7	141.0	27.0	29.12	64.2	14.24	4.8	0.997
7450	201.3	141.9	27.0	29.12	64.2	14.21	5.0	0.997
7500	204.9	143.5	27.0	29.12	64.2	14.14	5.5	0.997
7550	209.5	145.7	27.0	29.12	64.3	14.04	5.9	0.997
7600	221.5	153.1	27.0	29.12	64.3	13.79	6.8	0.997
7650	231.5	158.9	27.0	29.12	64.3	13.66	7.2	0.997
7700	237.2	161.8	27.0	29.12	64.3	13.62	7.3	0.997
7750	242.7	164.5	27.0	29.12	64.3	13.57	7.5	0.997
7800	247.7	166.8	27.0	29.12	64.3	13.50	7.7	0.997
7850	251.5	168.3	27.0	29.12	64.3	13.43	7.8	0.997
7900	255.7	170.0	27.0	29.12	64.3	13.36	8.0	0.997
7950	259.1	171.2	27.0	29.12	64.3	13.36	8.0	0.997
8000	261.1	171.4	27.0	29.12	64.3	13.45	7.8	0.997
8050	259.9	169.6	26.9	29.12	64.3	13.62	7.3	0.997
8100	255.0	165.3	26.9	29.12	64.3	13.80	6.7	0.997
8150	247.0	159.2	26.9	29.12	64.3	13.96	6.2	0.997
8200	234.0	149.9	27.0	29.12	64.3	14.12	5.8	0.997