

Ski Doo Mach Z comparison of 06 and 07 WOT fuel maps

Jimmy Cooper brought his laptop computer with SkiDoo authorized ECU reprogramming software to tweak on Ray Stevens' stock 05 Mach Z with 4000 miles on it.

Jim has a long enough umbilical cord to watch/ reprogram the engine while the sled sits on the dyno, while he does his magic from the control room—monitoring engine coolant temp and signs of light or heavy engine knock.

Our plan was to baseline Ray's Mach Z with 06 programming, install the 07 program then compare fuel flow/ HP throughout the HP band. Then we were planning to dyno the stocker with Bikeman mod stock pipe and the same DynoPort single pipe and can muffler he ran so well with on his stock Mach Z in the Adirondack Shootout in Dec.

Amazingly, after establishing Ray's 06 baseline at about 178 Jimmy installed what he thought was the 07 map—he interestingly had three to choose from.

First run with the newly downloaded 07 map (picked from the top of the file) showed an incredible five plus HP increase with 10 lb/hr decrease in fuel flow! Further investigation from phone contacts revealed that this was the “high altitude” MZ stock 07 map!?!? A different map for different altitudes? We thought that EFI should keep an engine happy from sea level to 15,000 ft and from -40F to +90F. But apparently there is some “range limit” that necessitates what we saw on the dyno.

Next he figured out what the true sea level map was, downloaded that (takes about 10 minutes) and the engine repeated the 06 fuel and HP curves within ½%.

Then Jimmy figured out that the third 07 map was for medium altitude—maybe 6000ish ft?. Interestingly, this map had Exhaust valves held closed longer than the other three maps, indicating the possibility of better low end throttle response and acceleration. Note that on this test, the low end HP is much greater, fuel flow is lower initially (leading to hotter pipe as valves open and slightly surging the dyno. But top end fuel flow and HP are identical to the “high altitude” map.

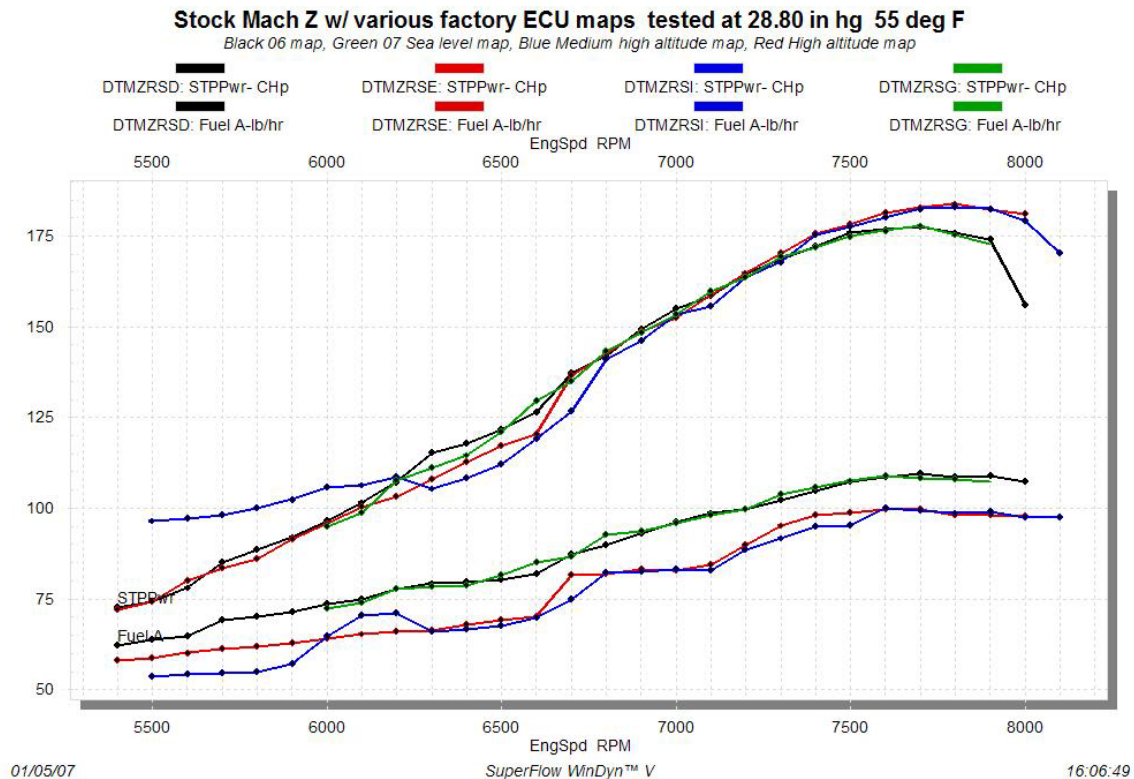
All of these dyno runs with 180 plus HP are 15-18 seconds WOT on pump gas water temp from 120-130 degrees F and Jimmy's deto meter on his laptop only twitched slightly a few times.

So Ray is opting to leave the “mid altitude” program in his sled and go ride it, know that running up north for miles WOT on “piston alley” road on 85 octane gas is no longer an option.

With the lean “mid altitude” map and screaming hot pipe, the stock pipe in this case exceeded the HP of either the Dynoport single and can or Bikeman mod single. This reminded me of how well the stock pipe performed on the RKTek 827 when the engine

was leaned to max pipe temperature. I'm assuming the aftermarket singles will perform better when compared against more conservatively fueled Mach Zs (like most are).

It will be interesting to see if all SkiDoo dealers have the capability of or willingness to install these higher performing maps for Mach Z hotrod owners. If not, Jim Cooper surely knows how.



Here's the actual dyno numbers for technoids' perusal. I've opted to not include 06 map because it was virtually identical to the sea level 07 map. Also listed is the time at WOT on each run. This time does not take into consideration the two or so seconds the engine loads at full throttle, stabilizing before each run.

Also note that the mid-high altitude data still is 10 lb/hr richer than the drag map we got for our Adirondack Shootout in 05.

07 sea level								
EngSpd RPM	STPTrq Clb-ft	STPPwr CHp	Fuel A lb/hr	BSFC lb/hph	AirTmp degF	Air1+2 scfm	TsTim2 second	A/FA-B Ratio
6000	83.1	94.8	72.3	0.819	59	174	0	11.02
6100	84.9	98.6	73.9	0.804	59	178	0.4	11.05
6200	91.3	107.7	77.8	0.774	59	190	1.5	11.17
6300	92.7	111.1	78.3	0.755	58	194	1.9	11.33
6400	94.1	114.5	78.8	0.737	58	196	2.2	11.38
6500	97.7	120.9	81.7	0.724	58	200	2.5	11.22
6600	103.1	129.6	85.1	0.703	59	206	3.8	11.09

6700	105.9	135.1	86.7	0.688	59	210	4.2	11.11
6800	110.7	143.3	92.7	0.692	58	217	5.1	10.72
6900	112.9	148.4	93.6	0.675	58	220	5.9	10.76
7000	115.2	153.5	96.1	0.669	58	223	6.5	10.62
7100	118.3	159.9	98.2	0.657	58	226	7.4	10.52
7200	119.4	163.7	99.8	0.654	60	227	7.9	10.43
7300	121.8	169.3	103.7	0.656	59	232	8.7	10.25
7400	122.1	171.9	105.8	0.659	59	233	9.4	10.09
7500	122.4	174.9	107.5	0.659	59	235	10.1	10.01
7600	121.9	176.4	108.8	0.661	59	237	10.8	9.96
7700	121.3	177.8	108.2	0.653	59	238	11.4	10.05
7800	118.1	175.2	107.9	0.661	58	238	12.5	10.11
7900	114.8	172.7	107.3	0.666	58	239	12.9	10.19

07 High
altitude

EngSpd	STPTrq	STPPwr	Fuel A	BSFC	AirTmp	Air1+2	TsTim2	A/FA-B
RPM	Clb-ft	CHp	lb/hr	lb/hph	degF	scfm	second	Ratio
5400	70.1	72.1	58.1	0.864	58	148	0	11.72
5500	71.1	74.4	58.6	0.847	59	150	0.5	11.69
5600	75.1	80.1	60.1	0.805	57	156	1.3	11.9
5700	76.9	83.5	61.2	0.785	57	161	2.3	12.02
5800	77.9	86.1	61.9	0.772	58	162	2.6	12.09
5900	81.4	91.4	62.8	0.737	58	170	3.3	12.38
6000	83.8	95.7	64.1	0.717	59	175	4.1	12.51
6100	86.5	100.4	65.2	0.696	59	181	4.8	12.72
6200	87.4	103.2	66.1	0.687	59	185	5.3	12.78
6300	90.1	108.1	66.4	0.659	58	192	5.9	13.22
6400	92.5	112.7	68.1	0.647	58	196	6.4	13.21
6500	94.6	117.1	69.1	0.632	58	199	6.5	13.18
6600	95.9	120.5	70.1	0.623	58	201	6.6	13.12
6700	107.1	136.6	81.6	0.641	59	212	8.6	11.89
6800	110.1	142.6	81.8	0.615	60	215	9.2	12.05
6900	113.2	148.7	83.1	0.598	59	220	9.9	12.11
7000	114.3	152.3	82.7	0.582	59	221	10.4	12.22
7100	117.5	158.8	84.5	0.571	59	224	11.3	12.16
7200	120.1	164.7	89.8	0.583	58	227	11.8	11.57
7300	122.5	170.2	95.1	0.597	57	230	12.4	11.08
7400	124.6	175.6	98.1	0.597	58	234	13.2	10.92
7500	124.9	178.3	98.7	0.592	58	235	13.8	10.89
7600	125.3	181.3	99.7	0.588	58	237	14.6	10.88
7700	124.7	182.8	99.7	0.584	58	239	15.3	10.97
7800	123.7	183.8	98.2	0.571	58	240	15.9	11.23
7900	121.2	182.3	98.5	0.576	58	240	17.2	11.23
8000	118.9	181.1	97.7	0.578	58	240	17.4	11.26

07 med
altitude

EngSpd	STPTrq	STPPwr	Fuel A	BSFC	AirTmp	Air1+2	TsTim2	A/FA-B
RPM	Clb-ft	CHp	lb/hr	lb/hph	degF	scfm	second	Ratio
5500	92.1	96.4	53.7	0.596	57	158	0	13.46

5600	91.2	97.3	54.3	0.597	57	159	0.5	13.41
5700	90.5	98.2	54.5	0.594	58	160	1.1	13.48
5800	90.5	99.9	54.8	0.587	58	162	1.8	13.58
5900	91.1	102.4	57.1	0.596	58	164	2.3	13.21
6000	92.5	105.7	64.7	0.656	59	167	3.2	11.79
6100	91.5	106.2	70.4	0.711	59	169	3.8	10.97
6200	91.9	108.5	71.1	0.702	59	171	4.2	11.05
6300	87.8	105.3	66.1	0.673	58	186	5.3	12.87
6400	89.1	108.4	66.6	0.658	58	188	5.4	12.95
6500	90.6	112.1	67.6	0.646	58	192	5.6	13.11
6600	94.8	119.1	69.9	0.629	59	196	5.8	12.86
6700	99.3	126.6	74.8	0.633	58	202	6.2	12.39
6800	108.9	141.1	82.1	0.622	57	214	7.8	11.91
6900	111.2	146.1	82.4	0.603	57	217	8.7	12.07
7000	115.2	153.5	83.2	0.579	57	221	9.6	12.17
7100	115.2	155.8	82.9	0.569	57	223	9.9	12.29
7200	119.4	163.6	88.5	0.578	57	226	10.6	11.71
7300	120.8	167.9	91.6	0.583	57	228	11.4	11.38
7400	124.4	175.3	94.9	0.579	57	231	12.2	11.14
7500	124.3	177.5	95.3	0.574	57	233	12.6	11.17
7600	124.4	180.1	99.9	0.594	57	236	13.5	10.81
7700	124.5	182.5	99.4	0.583	58	237	14.2	10.91
7800	123.2	183.1	98.6	0.577	58	238	15.2	11.06
7900	121.3	182.5	99.2	0.582	58	239	15.8	11.03
8000	117.5	179.1	97.4	0.583	58	240	16.5	11.29
8100	110.3	170.2	97.5	0.614	58	239	17.2	11.22