

Art Andre's MPI SC'd Apex with upgraded fuel pump and Boondocker controller

In Art's dyno evaluation shown earlier on DTR, the stock Apex fuel pump was inadequate to deal with 240 plus HP—fuel pressure dropped at high revs as injectors strained to supply fuel to Art's high boost 240 HP SC engine. Plus the MPI supplied controller was vague at best. Since I've had such good results dyno tuning 100's of two-stroke NA EFIs with Boondocker controllers, and since the Boondocker guys were here with a turbo Apex that worked dandily, I suggested to Art he try a Boost referenced Boondocker for the SC Apex.

Art went home to New Jersey, did his internet homework and came up with a replacement in-tank EFI pump that had much higher capacity. He also purchased a boost-referenced Boondocker Apex controller from Boondocker. Art asked for some beginning baseline numbers and the Boondocker tech wisely suggested "all zeros" meaning Art needed to figure it out on the DTR dyno. Baseline numbers from the Boondocker turbo kits are probably useless for SC since the turbo makes full boost at low RPMs and the SC boost rises with engine speed.

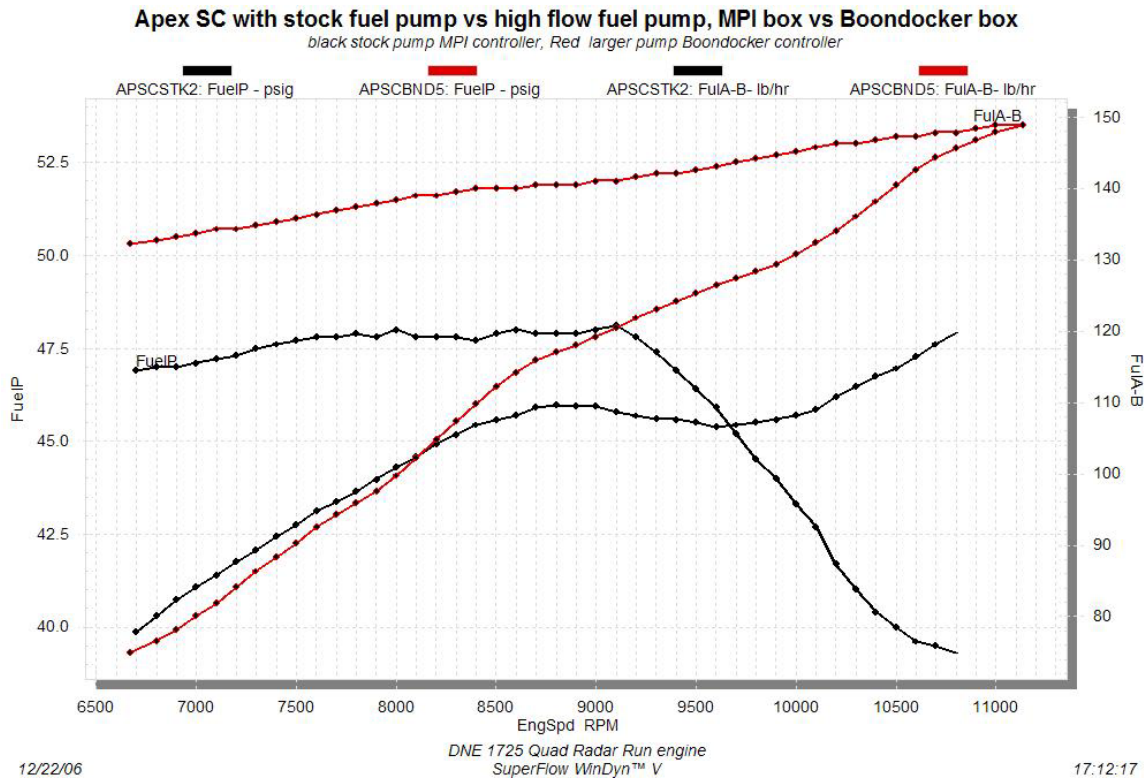
So after spending another six hours on the dyno with the higher flowing fuel pump and Boondocker here is Art's numbers, now safely fat at high revs—BSFC at .60 is ultra safe on boosted four-strokes. This dyno run is 15 seconds on mostly pump gas (we ran out of Art's 50/50 mix after spending hours doing successful part throttle and midrange mapping on the Boondocker).

But from the control console Art should be fine at all throttle positions/ boost/ RPM. The fact that the Boondocker is RPM and boost referenced allowed us to tune dandily from idle to rev limiter.

With this tuneup, we are down maybe four HP to 240 HP but way safer A/F ratio and BSFC compared to our earlier, wickedly lean test data. Note that Art's fuel pressure rises with RPM instead of dropping into the basement like the stock pump did.

EngSpd	STPTRq	STPPwr	FulA-B	LAMAF1	BSFA-B	Air1+2	FuelP	A/FA-B
RPM	C/b-ft	CHp	lb/hr	Ratio	lb/hph	scfm	psig	Ratio
6667	100.3	127.4	74.9	13.3	0.61	153	50.3	9.36
6800	102.1	132.1	76.6	13.6	0.59	158	50.4	9.45
6900	103.1	135.3	78.2	13.7	0.59	162	50.5	9.49
7000	103.3	137.6	80.1	13.8	0.59	165	50.6	9.44
7100	104.3	141.1	81.9	13.8	0.59	169	50.7	9.47
7200	105.2	144.2	84.1	13.9	0.59	174	50.7	9.45
7300	106.4	147.9	86.3	13.9	0.59	178	50.8	9.46
7400	106.8	150.5	88.3	13.9	0.59	182	50.9	9.45
7500	107.1	152.8	90.3	13.9	0.61	186	51.1	9.42
7600	107.4	155.4	92.5	13.9	0.61	190	51.1	9.41
7700	108.1	158.4	94.3	13.9	0.61	194	51.2	9.43
7800	108.8	161.6	95.9	13.9	0.61	199	51.3	9.52
7900	108.8	163.7	97.5	13.9	0.61	203	51.4	9.54

8000	109.2	166.4	99.7	13.9	0.61	208	51.5	9.54
8100	109.2	168.4	102.2	13.9	0.61	212	51.6	9.48
8200	109.2	170.5	104.8	13.9	0.62	216	51.6	9.42
8300	109.2	172.6	107.3	13.9	0.63	220	51.7	9.38
8400	109.7	175.5	109.8	13.9	0.63	225	51.8	9.38
8500	110.2	178.4	112.2	13.9	0.64	230	51.8	9.41
8600	111.1	181.8	114.2	13.9	0.63	235	51.8	9.44
8700	111.9	185.4	115.9	13.9	0.63	240	51.9	9.47
8800	113.3	189.8	117.1	13.9	0.62	244	51.9	9.55
8900	114.3	193.7	118.1	13.9	0.62	249	51.9	9.66
9000	115.1	197.2	119.2	13.9	0.61	254	52.1	9.77
9100	115.4	200.1	120.4	13.9	0.61	259	52.1	9.86
9200	115.9	203.1	121.8	13.9	0.61	264	52.1	9.91
9300	116.3	205.9	123.1	13.9	0.61	267	52.2	9.94
9400	116.9	209.2	124.1	14.1	0.61	271	52.2	10.02
9500	117.1	211.8	125.3	14.1	0.61	275	52.3	10.07
9600	117.5	214.8	126.4	14.1	0.61	280	52.4	10.15
9700	118.2	218.3	127.3	14.1	0.59	285	52.5	10.25
9800	119.1	222.1	128.3	14.1	0.59	290	52.6	10.34
9900	119.5	225.3	129.3	14.1	0.58	294	52.7	10.41
10000	119.7	227.9	130.7	14.1	0.58	299	52.8	10.47
10100	119.4	229.6	132.3	14.1	0.58	303	52.9	10.51
10200	118.9	230.9	134.1	14.1	0.59	307	53.1	10.51
10300	118.5	232.3	136.1	14.1	0.59	311	53.1	10.46
10400	118.4	234.4	138.1	14.1	0.61	315	53.1	10.43
10500	118.3	236.4	140.4	14.1	0.61	318	53.2	10.38
10600	118.4	239.1	142.6	14.1	0.61	323	53.2	10.36
10700	117.9	240.2	144.3	14.1	0.61	327	53.3	10.37
10800	117.1	240.8	145.6	14.1	0.61	333	53.3	10.46
10900	115.7	240.1	146.7	14.1	0.62	337	53.4	10.53
11000	114.5	239.9	147.8	14.1	0.62	342	53.5	10.58
11133	113.1	239.6	148.8	14.1	0.63	345	53.5	10.61



Also note that Art's LM1 wideband A/F numbers at full throttle are useless. Maybe we wrecked his O2 sensor with lead, but it seems to work well at part throttle with light load, poking around to achieve good and safe cruising A/F ratio, matching mechanical meters nicely, but when we pour the coals to it and get it hot it seems to flatline. I trust the mechanical meters at WOT.

So far Art has probably \$3000 invested in missing work, dyno tuning, modifying fuel pump, acquiring Boondocker and coming back for final dyno tuning. His map numbers may be a valuable commodity to sea level SC Apex owners who desire to upgrade to Art's fuel system, or to Mountain riders who desire the fine tuning capabilities of the Boondocker.

I'm going to suggest to Art that he share his fuel pump configuration and the Boondocker base map/ boost map numbers for \$200 to Apex SC owners who like the numbers posted here. I will gladly be the middleman, call me at 585-993-2777. This is fun stuff, and if we can help Art Andre defray his investment in making his SC Apex sea level safe everyone should be happy. Then if a group of, say ten or twenty guys are using Art's baseline they can communicate with me and one another to help each other achieve good trail manners, and good reliable performance on the mountains or lakes.

