2017 Polaris Axys 800 pipe update…new questions and some answers

It required 40+ full throttle dyno sweep tests to bring this brand new 800 engine's HP up from the low 140's to the low 150 HP level which is typical after good breakin. Note that even though we surely had the engine perfectly broken in, the ECU was still in breakin mode. All testing on this day was done with non-ethanol 91 octane fuel with the ECU set in non-ethanol mode. We also had some single pipes to test—Jaws, SPI, BMP, and SSI. Canadian Polaris madmen Brad "Brock" Ratch and Rich Lys were the key wrenchers/ spring pullers.

During all testing, we monitored the engine with Digital Wrench. Once the engine was up to proper HP level, we would do series' of three back to back sweep tests beginning test one at @90F coolant and 850F pipe temp, and the third hot test ending at 120F+ coolant and 1100F+ pipe temp. The ECU retards ignition timing at low pipe temp. Remember—retarded timing results in less time for A/F mixture burning in the combustion chambers which = less expanding gas volume there to force pistons down in the bores (creating torque).

Retarding the timing causes more A/F mixture to burn out in the pipe which raises the pipe gas temperature, which expands gas volume and increases backpressure to optimal (to optimize the supercharging effect of the returning sound wave), and in some cases, *higher than optimal backpressure* which can reduce airflow and increase the likelihood of detonation. When we see pipes lose HP as pipe temperature climbs, that often indicates that the pipe is tighter than optimal on long stretches of WOT operation, where average pipe pressure might exceed four PSI (typical best torque pressure). But pipes that build best HP on the first or second sweep test then lose HP might be best for trail riders who prefer quick HP rise, and don't drone on at WOT for miles.

For some reason it appeared that ignition timing monitored by DW was dropping to single digits as revs approached 8500 and beyond—even with EGT at 1100+, whereas it seems that 2015 and 16 Axys 800s maintained double-digit timing all the way to 8700. Is that the result of 2017 ECU breakin mode, or the 2017 timing calibration? One well-connected DTR member suggests that high RPM timing will be *back to double digits when breakin mode is gone.* Let's hope! That severe retard in the "breakin" timing curve was fine at high revs with the stock pipe, but seemed to result in less than optimal performance with the higher revving aftermarket pipes. Could that be some prank by the crafty Polaris calibration engineers tasked with keeping power levels/ warranty costs low by the evil penny pinching MBA bean counters at Polaris? I wish I could put some "tongue in cheek" emoji right here.

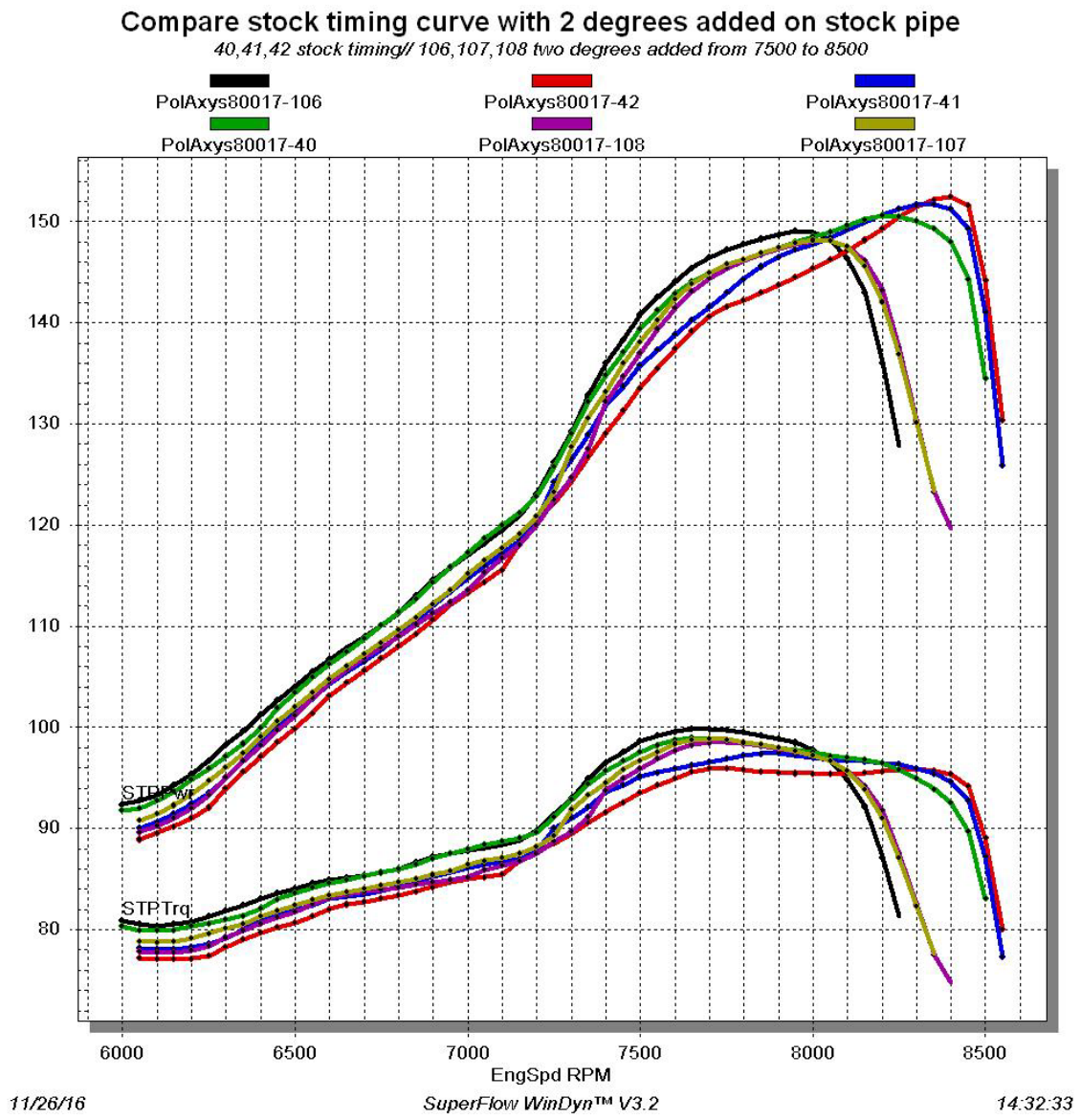
We really didn't notice this timing until we had already tested BMP, SSI and SPI pipes. Earlier this season a DTR tuning customer came with a 2017 Axys and a Jaws single pipe and it only made a couple of extra HP over stock—way less than what we had seen on earlier stock and modified Axys engines, and that info made its way to the internet. Greg Balchin at Jaws takes this seriously, got the pipe back and on a 2016 Axys on his dyno was made to work dandily. Greg came to DTR on this day to retest that same new pipe

here. But when we installed that same pipe on this engine, power was low—and then Greg commented on the odd, single digit timing at higher revs where his pipe is happiest. So we added two degrees of timing from 7500 to 8500 and the Jaws pipe came alive! Is the 2017 breakin timing curve retarded at high revs, or is the 2017 broken in timing curve retarded at high RPM after breakin? And "breakin mode" fueling is adequate for all these aftermarket pipes, but will fuel flow lean out to inadequacy after breakin? Does every higher revving aftermarket "piped" 2017 Axys 800 need a Dynojet PCV with timing control to optimize performance? Since engineering info is difficult to obtain from Polaris, we must wait until we get broken in higher mileage units for tuning/ testing.

So here we will show every pipe with stock ECU, breakin mode fuel and timing, and since the stock ECU gave us adequate fuel for every pipe in breakin mode, the second set of dyno tests is with stock fuel and 2 degrees added timing from 7500-8500. The only exception was the SPI pipe was only tested with stock timing—since it's physical shape and HP output/ power curve is so identical to the stock pipe, which was happiest with stock timing. Also the SPI pipe came with a Y pipe and muffler that were not tested. The original SPI single pipe was fitted with an internal stinger, but the one tested today was the final version with no internal stinger. Recently we tried to tune one of the original SPI pipes with internal stinger on a 2017 Axys and we had to map the PCV heavily with fuel and/ or retard timing to keep it from detonating and thus there was no HP gain. That pipe was returned to SPI, and this one is final production.

The new SSI polished stainless steel single pipe is a work of art—three-dimensional stampings mean that there are only circumferential tig welds connecting the two stamping halves—no cutting, twisting, and rewelding! The double benefit of this is that internal weld slag and rust both seem to inhibit sound wave strength and horsepower. Internal corrosion is surely an issue considering that most sledders use synthetic oil (poor corrosion inhibitor) and water is a byproduct of combustion. Before off season storge, sleds should always be fogged with petroleum oil not only to protect engine components, but also to prevent flaking, HP robbing corrosion inside the exhaust.

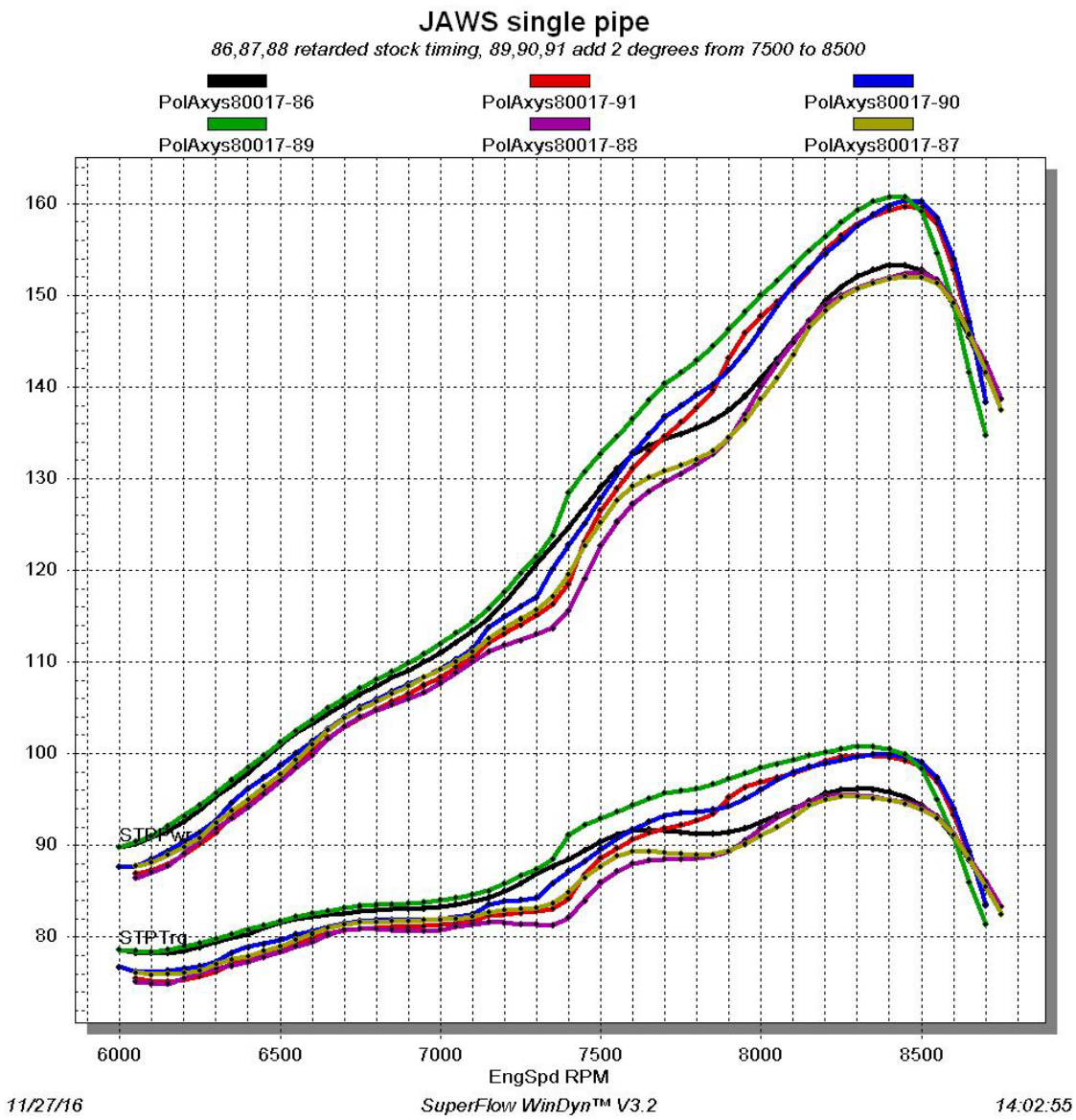
Interpolating the sets of tests stock timing vs added flat timing, it's obvious that being able to create one's own timing curve—advancing in the midrange and peak HP RPM, then retarding after the hp peak RPM can be advantageous! A broader HP curve with better overrev HP is a good thing.



Test 42, stock exhaust, stock timing best HP on repeat test 3

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LamAF1 Ratio	LM1Air SCFM	Air_1c CFM	DenAlt Feet
6050	88.9	77.2	0.545	45.4	15.3	159.0	170.0	1978
6100	89.6	77.1	0.559	47.0	15.2	164.0	172.1	1979
6150	90.2	77.0	0.568	48.0	15.3	168.0	173.4	1979
6200	91.0	77.1	0.562	47.9	15.3	168.0	174.5	1979
6250	92.1	77.4	0.555	47.9	15.3	168.0	175.5	1979
6300	93.9	78.3	0.553	48.7	15.1	169.0	177.0	1978
6350	95.6	79.0	0.558	50.0	14.9	171.0	177.8	1978
6400	97.1	79.7	0.557	50.7	14.8	172.0	178.6	1978
6450	98.6	80.2	0.548	50.7	14.6	170.0	179.5	1979
6500	99.9	80.7	0.539	50.4	14.6	169.0	180.4	1979

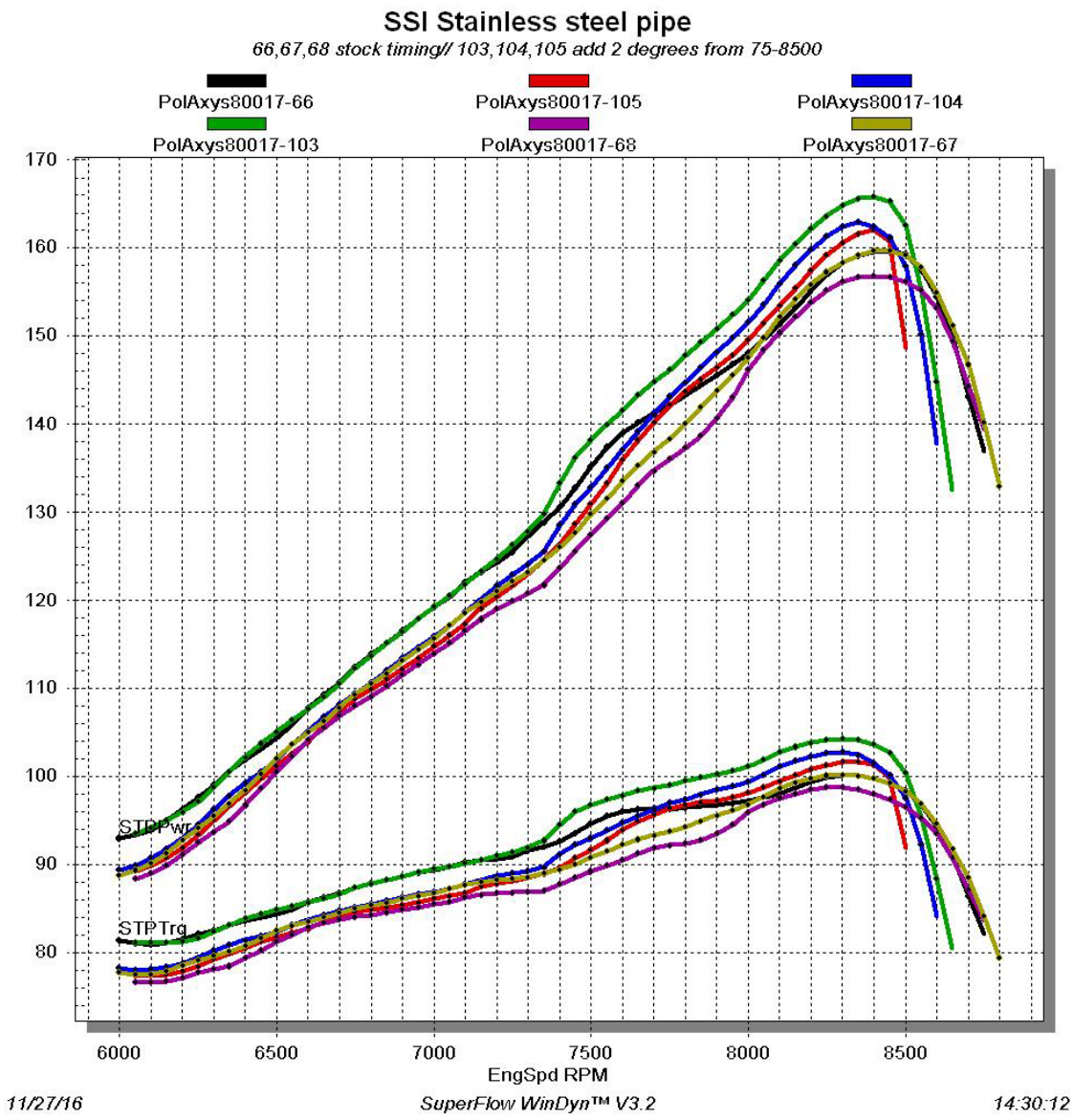
6550	101.4	81.3	0.529	50.3	14.7	170.0	181.4	1979
6600	103.1	82.0	0.517	50.0	14.9	170.0	182.6	1981
6650	104.4	82.5	0.521	51.0	14.9	175.0	183.6	1981
6700	105.6	82.8	0.528	52.2	14.9	178.0	184.6	1981
6750	106.8	83.1	0.548	54.9	14.7	185.0	186.1	1982
6800	108.0	83.4	0.556	56.3	14.4	186.0	187.7	1982
6850	109.3	83.8	0.560	57.4	14.2	186.0	189.2	1982
6900	110.7	84.2	0.559	57.9	14.0	185.0	191.1	1983
6950	112.1	84.7	0.549	57.6	13.8	183.0	193.4	1983
7000	113.3	85.0	0.546	58.0	13.8	184.0	195.2	1984
7050	114.4	85.2	0.548	58.7	13.8	186.0	196.9	1984
7100	115.6	85.5	0.557	60.4	13.8	191.0	199.0	1985
7150	118.2	86.8	0.591	65.5	13.4	202.0	205.5	1985
7200	120.5	87.9	0.595	67.2	13.1	202.0	208.8	1985
7250	122.2	88.5	0.593	67.9	12.9	201.0	211.0	1985
7300	124.3	89.5	0.600	69.9	12.7	204.0	214.4	1985
7350	126.8	90.6	0.598	71.1	12.7	208.0	218.5	1987
7400	129.1	91.6	0.597	72.2	12.8	212.0	221.5	1988
7450	131.4	92.6	0.592	72.9	12.8	215.0	224.4	1988
7500	133.6	93.5	0.590	73.8	12.8	218.0	227.1	1988
7550	135.5	94.3	0.590	75.0	12.8	220.0	229.5	1989
7600	137.4	95.0	0.591	76.2	12.7	223.0	232.0	1989
7650	139.2	95.6	0.597	77.9	12.6	226.0	234.4	1989
7700	140.6	95.9	0.601	79.3	12.5	227.0	237.2	1990
7750	141.6	96.0	0.600	79.6	12.4	226.0	238.8	1990
7800	142.2	95.8	0.604	80.5	12.3	227.0	240.7	1991
7850	142.9	95.6	0.604	80.9	12.3	228.0	242.5	1991
7900	143.7	95.5	0.607	81.8	12.2	230.0	244.3	1992
7950	144.5	95.5	0.607	82.1	12.3	231.0	246.5	1993
8000	145.3	95.4	0.596	81.2	12.3	229.0	248.7	1994
8050	146.2	95.4	0.583	79.8	12.4	227.0	250.2	1994
8100	147.1	95.4	0.564	77.8	12.6	225.0	251.7	1995
8150	148.2	95.5	0.548	76.1	12.9	224.0	252.7	1995
8200	149.3	95.6	0.529	73.9	13.2	223.0	253.7	1995
8250	150.5	95.8	0.512	72.1	13.5	223.0	254.4	1996
8300	151.5	95.9	0.496	70.4	13.7	221.0	254.9	1997
8350	152.2	95.7	0.481	68.6	13.8	218.0	255.2	1998
8400	152.5	95.3	0.477	68.1	14.0	218.0	255.2	1999
8450	151.6	94.2	0.481	68.2	14.0	220.0	254.8	2000
8500	144.2	89.1	0.519	70.0	13.8	221.0	252.8	2001
8550	130.3	80.1	0.590	71.9	13.3	219.0	248.5	2002



Jaws single pipe with 2 degrees added to 2017 prebreakin mode from 75-8500 test 1

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LamAF1 Ratio	LM1Air SCFM	Air_1c CFM	AirInT degF
6000	89.8	78.6	0.578	48.9	14.8	165.0	170.2	60.8
6050	90.4	78.4	0.568	48.3	14.8	163.0	170.4	60.8
6100	91.0	78.4	0.553	47.4	15.0	162.0	170.8	60.9
6150	92.1	78.6	0.557	48.3	15.1	167.0	171.2	60.9
6200	93.2	79.0	0.560	49.1	15.3	171.0	171.6	60.9
6250	94.4	79.3	0.566	50.3	15.2	175.0	172.1	60.9
6300	95.7	79.8	0.558	50.3	15.1	173.0	172.7	60.9
6350	97.1	80.3	0.550	50.2	14.7	169.0	173.3	60.9
6400	98.5	80.8	0.543	50.3	14.4	166.0	174.0	60.9
6450	99.8	81.3	0.538	50.5	14.3	165.0	174.6	60.9
6500	101.2	81.8	0.536	51.1	14.3	166.0	175.3	60.9

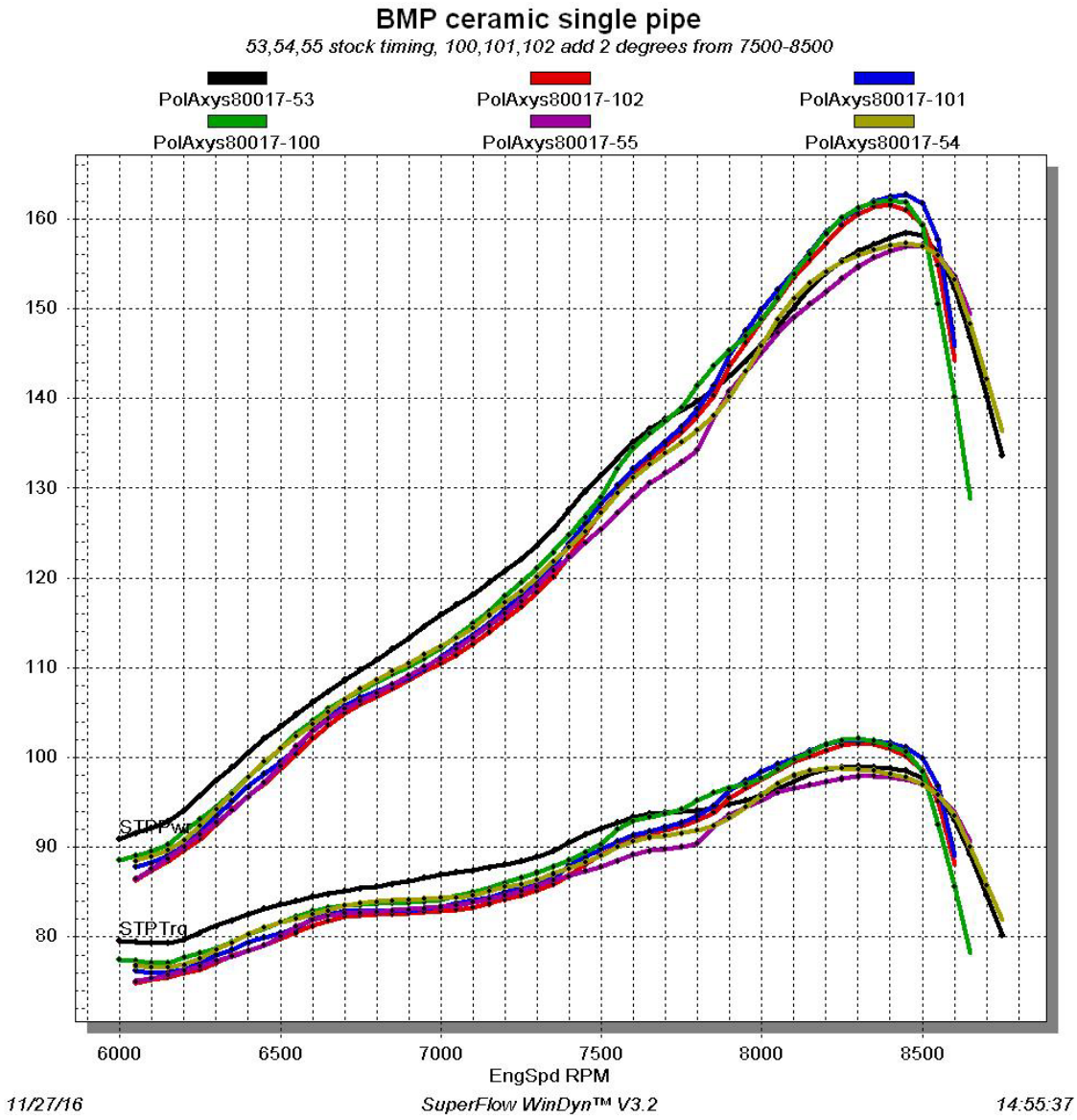
6550	102.5	82.2	0.523	50.5	14.3	165.0	176.2	60.9
6600	103.7	82.5	0.522	51.0	14.4	167.0	176.9	60.9
6650	104.9	82.9	0.525	51.8	14.4	171.0	177.9	60.9
6700	106.1	83.1	0.542	54.1	14.4	177.0	179.0	60.9
6750	107.1	83.4	0.549	55.3	14.2	179.0	180.4	60.9
6800	108.1	83.5	0.549	55.9	14.0	178.0	181.4	60.9
6850	109.0	83.6	0.548	56.2	13.7	176.0	182.7	60.9
6900	109.9	83.6	0.548	56.6	13.5	175.0	184.5	60.9
6950	110.9	83.8	0.546	57.0	13.4	175.0	186.3	60.9
7000	112.0	84.0	0.541	57.0	13.4	175.0	188.2	60.9
7050	113.1	84.3	0.552	58.7	13.4	180.0	190.3	60.9
7100	114.3	84.6	0.568	61.1	13.4	187.0	192.5	60.9
7150	115.8	85.0	0.593	64.6	13.4	197.0	195.0	60.9
7200	117.6	85.8	0.620	68.7	13.1	206.0	198.5	60.9
7250	119.6	86.7	0.634	71.4	12.8	209.0	201.5	60.9
7300	121.5	87.4	0.637	72.8	12.6	209.0	203.7	60.9
7350	123.8	88.4	0.632	73.6	12.3	208.0	206.7	60.9
7400	128.4	91.1	0.616	74.4	12.2	207.0	213.2	60.9
7450	130.8	92.2	0.611	75.2	12.2	210.0	215.5	60.9
7500	132.7	92.9	0.609	76.1	12.2	212.0	217.7	60.9
7550	134.6	93.6	0.615	77.9	12.2	217.0	220.5	60.9
7600	136.5	94.3	0.620	79.6	12.2	222.0	223.6	60.9
7650	138.6	95.1	0.619	80.7	12.2	225.0	226.9	60.9
7700	140.3	95.7	0.616	81.4	12.1	225.0	229.7	60.9
7750	141.6	96.0	0.610	81.2	12.0	224.0	231.6	60.9
7800	142.9	96.2	0.601	80.8	12.1	222.0	233.9	60.9
7850	144.4	96.6	0.591	80.3	12.2	224.0	236.7	60.9
7900	146.3	97.2	0.578	79.5	12.4	225.0	239.3	60.9
7950	148.2	97.9	0.569	79.4	12.5	228.0	241.2	60.9
8000	150.0	98.5	0.552	78.0	12.7	226.0	243.5	60.9
8050	151.6	98.9	0.541	77.1	12.8	226.0	244.8	60.9
8100	153.2	99.3	0.525	75.7	13.0	224.0	246.3	60.9
8150	154.9	99.8	0.512	74.5	13.1	224.0	247.6	60.9
8200	156.4	100.2	0.506	74.5	13.3	226.0	248.3	60.9
8250	157.9	100.5	0.496	73.8	13.4	226.0	248.9	60.9
8300	159.3	100.8	0.484	72.5	13.6	225.0	249.3	60.9
8350	160.2	100.8	0.474	71.5	13.7	224.0	249.5	61.0
8400	160.8	100.5	0.459	69.5	13.8	219.0	249.4	61.0
8450	160.7	99.9	0.459	69.4	13.8	219.0	249.1	61.0
8500	159.1	98.3	0.466	69.8	13.8	220.0	248.5	61.0
8550	154.5	94.9	0.486	70.6	13.4	215.0	247.3	61.0
8600	148.8	90.9	0.516	72.2	12.9	213.0	246.1	61.0
8650	141.6	86.0	0.564	75.0	12.5	214.0	244.6	61.0
8700	134.8	81.3	0.604	76.4	12.2	212.0	241.9	61.0



SSI stainless single pipe, 2 degrees added from 7500-8500, test 1

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LamAF1 Ratio	LM1Air SCFM	Air_1c CFM	FulPrA psig
6050	93.5	81.2	0.560	49.8	14.5	162.0	172.5	63.9
6100	94.2	81.1	0.541	48.5	14.5	158.0	172.8	64.0
6150	95.1	81.2	0.534	48.3	14.7	159.0	173.1	64.0
6200	96.0	81.3	0.531	48.4	14.8	162.0	173.6	64.0
6250	97.2	81.7	0.534	49.3	15.0	166.0	174.2	64.0
6300	98.8	82.4	0.530	49.8	15.0	168.0	175.0	63.9
6350	100.6	83.2	0.531	50.8	14.8	169.0	175.7	63.9
6400	102.2	83.9	0.531	51.6	14.6	169.0	176.4	63.9
6450	103.7	84.5	0.526	51.9	14.4	169.0	177.2	63.8
6500	105.1	84.9	0.515	51.5	14.4	167.0	178.1	63.9

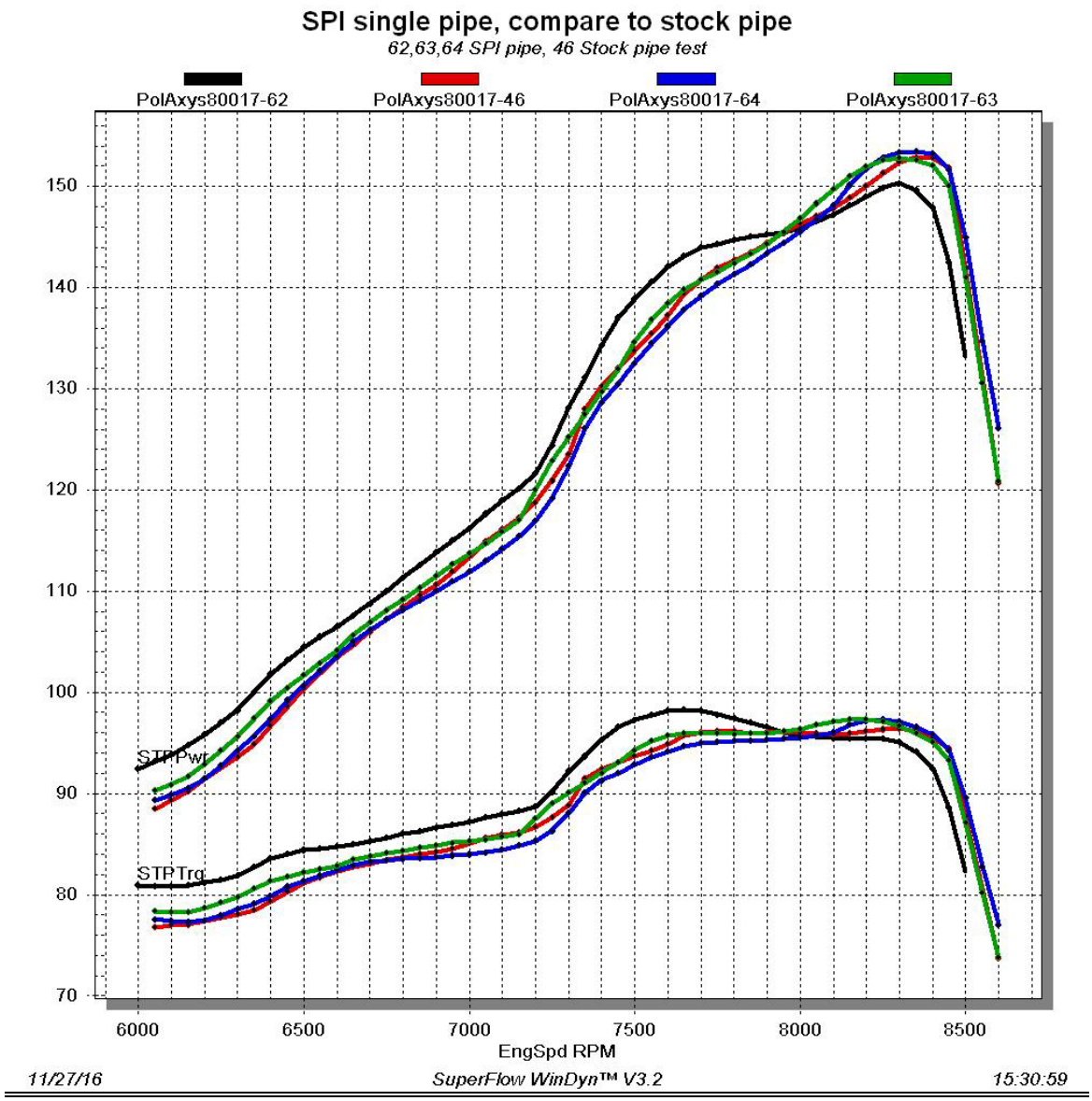
6550	106.4	85.3	0.505	51.1	14.4	166.0	178.9	63.8
6600	107.7	85.7	0.502	51.4	14.4	167.0	179.8	63.8
6650	109.1	86.1	0.502	52.1	14.5	169.0	181.0	63.8
6700	110.6	86.7	0.512	53.9	14.4	174.0	182.3	63.7
6750	112.3	87.4	0.517	55.2	14.2	176.0	184.1	63.6
6800	113.7	87.9	0.523	56.6	14.0	178.0	185.4	63.6
6850	115.2	88.3	0.523	57.2	13.9	179.0	186.8	63.6
6900	116.5	88.6	0.525	58.1	13.8	181.0	188.2	63.6
6950	118.0	89.1	0.516	57.9	13.8	180.0	190.5	63.6
7000	119.3	89.5	0.518	58.8	13.9	183.0	192.2	63.6
7050	120.6	89.8	0.525	60.2	13.9	188.0	193.9	63.5
7100	121.8	90.1	0.547	63.4	13.9	198.0	196.3	63.4
7150	123.3	90.5	0.584	68.4	13.7	211.0	200.2	63.1
7200	124.8	91.0	0.605	71.7	13.5	218.0	203.5	62.9
7250	126.3	91.5	0.613	73.6	13.2	218.0	206.6	62.9
7300	127.9	92.0	0.614	74.6	12.9	217.0	209.7	62.9
7350	129.8	92.7	0.615	75.9	12.8	218.0	213.1	62.9
7400	133.3	94.6	0.605	76.7	12.7	219.0	218.7	62.9
7450	136.2	96.0	0.592	76.7	12.7	220.0	222.2	62.8
7500	138.2	96.8	0.587	77.2	12.7	221.0	224.4	62.8
7550	140.0	97.4	0.592	78.8	12.7	226.0	226.6	62.7
7600	141.6	97.8	0.600	80.8	12.7	230.0	228.9	62.7
7650	143.3	98.4	0.616	84.0	12.5	236.0	231.6	62.6
7700	144.8	98.8	0.618	85.1	12.4	237.0	233.6	62.6
7750	146.2	99.1	0.616	85.6	12.3	237.0	235.5	62.6
7800	147.8	99.5	0.607	85.3	12.2	235.0	238.1	62.6
7850	149.4	99.9	0.596	84.7	12.3	234.0	240.3	62.7
7900	150.8	100.3	0.590	84.5	12.3	235.0	242.0	62.7
7950	152.4	100.7	0.577	83.6	12.4	233.0	243.6	62.7
8000	154.1	101.2	0.568	83.3	12.5	234.0	245.0	62.8
8050	156.3	102.0	0.553	82.1	12.6	233.0	246.7	62.8
8100	158.6	102.8	0.537	80.9	12.8	233.0	248.1	62.8
8150	160.4	103.4	0.524	80.0	12.9	232.0	248.9	62.8
8200	162.1	103.9	0.508	78.3	13.1	230.0	249.8	62.9
8250	163.6	104.2	0.499	77.6	13.3	232.0	250.7	63.0
8300	164.9	104.3	0.495	77.5	13.5	235.0	251.3	63.0
8350	165.6	104.2	0.486	76.6	13.6	234.0	251.5	63.1
8400	165.9	103.7	0.480	75.7	13.7	234.0	251.4	63.1
8450	165.3	102.7	0.484	76.0	13.8	236.0	251.1	63.1
8500	162.6	100.4	0.503	77.7	13.7	240.0	249.9	63.0
8550	155.2	95.4	0.533	78.5	13.1	232.0	247.7	62.8
8600	144.8	88.4	0.568	78.1	12.7	224.0	245.4	62.8
8650	132.6	80.5	0.595	74.8	12.4	209.0	237.9	63.0



BMP single pipe, 2 deg added to 2017 prebreakin mode from 75-8500, test 2 (101)

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LamAF1 Ratio	LM1Air SCFM	Air_1c CFM	STPCor Factor
6050	87.8	76.2	0.560	46.3	14.4	152.0	164.6	1.053
6100	88.2	76.0	0.562	46.7	14.4	153.0	166.3	1.053
6150	89.1	76.1	0.562	47.2	14.5	156.0	167.8	1.053
6200	90.2	76.4	0.559	47.5	14.6	158.0	168.7	1.053
6250	91.7	77.0	0.560	48.4	14.6	161.0	169.8	1.053
6300	93.5	77.9	0.558	49.1	14.5	162.0	170.9	1.053
6350	95.0	78.6	0.556	49.8	14.3	162.0	171.6	1.053
6400	96.7	79.4	0.538	49.0	14.1	157.0	172.5	1.053
6450	98.2	80.0	0.529	49.0	14.1	157.0	173.3	1.053
6500	99.5	80.4	0.515	48.3	14.1	154.0	174.0	1.053

6550	101.0	81.0	0.496	47.2	14.1	152.0	174.9	1.053
6600	103.1	82.1	0.492	47.8	14.4	156.0	176.6	1.053
6650	104.5	82.6	0.505	49.8	14.4	163.0	177.4	1.053
6700	105.7	82.9	0.529	52.7	14.3	172.0	178.5	1.053
6750	106.6	83.0	0.554	55.7	14.0	177.0	180.0	1.053
6800	107.4	82.9	0.570	57.7	13.8	180.0	181.1	1.053
6850	108.1	82.9	0.575	58.6	13.5	180.0	182.4	1.053
6900	108.9	82.9	0.581	59.6	13.4	182.0	183.8	1.053
6950	110.0	83.1	0.579	60.0	13.3	182.0	185.9	1.053
7000	111.2	83.4	0.578	60.6	13.3	183.0	187.6	1.053
7050	112.4	83.8	0.572	60.7	13.3	184.0	189.4	1.053
7100	113.6	84.1	0.577	61.8	13.3	187.0	191.3	1.053
7150	114.9	84.4	0.595	64.4	13.3	194.0	193.9	1.053
7200	116.6	85.0	0.620	68.2	13.0	202.0	197.8	1.053
7250	118.0	85.5	0.634	70.5	12.8	205.0	200.5	1.053
7300	119.4	85.9	0.636	71.5	12.5	204.0	203.0	1.053
7350	121.0	86.5	0.640	73.1	12.3	205.0	205.7	1.053
7400	123.8	87.9	0.647	75.5	12.2	209.0	210.8	1.053
7450	126.0	88.9	0.641	76.1	12.2	211.0	213.3	1.053
7500	128.3	89.8	0.638	77.1	12.2	214.0	216.0	1.053
7550	130.3	90.6	0.634	77.8	12.2	215.0	218.6	1.053
7600	132.1	91.3	0.638	79.5	12.1	220.0	221.2	1.053
7650	133.7	91.8	0.638	80.3	12.1	221.0	223.3	1.053
7700	135.2	92.2	0.637	81.2	12.0	223.0	225.1	1.053
7750	136.9	92.7	0.627	80.8	12.0	221.0	227.6	1.053
7800	138.8	93.5	0.616	80.6	12.0	220.0	230.6	1.053
7850	141.4	94.6	0.601	80.1	12.0	219.0	233.5	1.053
7900	144.8	96.3	0.577	78.7	12.2	219.0	237.0	1.053
7950	147.5	97.5	0.558	77.5	12.3	218.0	239.3	1.053
8000	149.9	98.4	0.546	77.2	12.5	219.0	241.5	1.053
8050	152.1	99.2	0.532	76.3	12.6	219.0	243.5	1.053
8100	154.0	99.9	0.523	76.0	12.8	221.0	244.9	1.053
8150	156.3	100.8	0.506	74.5	13.0	221.0	246.5	1.053
8200	158.5	101.5	0.491	73.3	13.3	221.0	247.7	1.053
8250	160.0	101.8	0.482	72.7	13.4	221.0	248.2	1.053
8300	161.2	102.0	0.469	71.2	13.5	218.0	248.5	1.053
8350	162.0	101.9	0.459	70.0	13.6	216.0	248.7	1.053
8400	162.5	101.6	0.444	68.0	13.7	213.0	248.8	1.053
8450	162.8	101.2	0.440	67.5	13.8	213.0	248.5	1.053
8500	161.7	99.9	0.448	68.3	13.8	214.0	247.7	1.053
8550	157.7	96.8	0.469	69.7	13.4	212.0	246.1	1.053
8600	145.9	89.1	0.526	72.2	12.8	210.0	243.2	1.054



SPI single pipe, stock timing, test 3

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LamAF1 Ratio	LM1Air SCFM	Air_1c CFM	FuelA lbs/hr
6050	89.3	77.6	0.565	47.2	15.0	162.0	172.6	256.6
6100	89.9	77.4	0.569	47.8	15.0	164.0	173.4	257.0
6150	90.5	77.3	0.570	48.3	15.1	168.0	174.3	256.6
6200	91.4	77.5	0.568	48.6	15.3	170.0	174.9	256.4
6250	92.7	77.9	0.562	48.8	15.4	172.0	175.7	256.0
6300	94.2	78.6	0.557	49.1	15.2	171.0	176.5	256.1
6350	95.7	79.1	0.547	48.9	14.9	168.0	177.3	256.3
6400	97.3	79.9	0.537	48.9	14.7	164.0	178.3	256.3
6450	99.2	80.8	0.529	49.1	14.4	163.0	179.5	256.4
6500	100.7	81.3	0.524	49.3	14.4	163.0	180.2	256.0
6550	102.1	81.9	0.523	50.0	14.4	166.0	181.0	256.1

6600	103.6	82.4	0.516	50.0	14.5	166.0	182.0	255.8
6650	105.0	82.9	0.521	51.1	14.5	170.0	182.9	256.0
6700	106.2	83.2	0.524	52.0	14.5	173.0	183.7	256.0
6750	107.2	83.4	0.540	54.2	14.3	177.0	184.8	256.2
6800	108.1	83.5	0.546	55.2	14.0	178.0	185.9	256.3
6850	109.0	83.6	0.553	56.4	13.7	178.0	187.3	255.9
6900	110.0	83.7	0.551	56.7	13.6	177.0	188.9	256.0
6950	110.9	83.8	0.546	56.7	13.5	176.0	190.4	256.0
7000	111.9	84.0	0.549	57.5	13.5	178.0	192.0	256.4
7050	113.0	84.2	0.548	57.9	13.5	179.0	194.2	256.5
7100	114.2	84.5	0.563	60.1	13.5	187.0	196.5	256.4
7150	115.5	84.8	0.574	62.0	13.5	192.0	198.5	256.2
7200	116.9	85.3	0.590	64.5	13.4	199.0	200.8	256.0
7250	119.1	86.3	0.618	68.8	13.2	208.0	204.6	256.3
7300	122.4	88.0	0.624	71.4	12.8	209.0	209.1	256.2
7350	126.1	90.1	0.614	72.4	12.5	208.0	213.6	256.2
7400	128.6	91.3	0.611	73.5	12.5	210.0	216.5	256.1
7450	130.5	92.0	0.602	73.5	12.5	210.0	218.6	255.7
7500	132.5	92.8	0.606	75.1	12.5	215.0	221.6	255.6
7550	134.5	93.6	0.607	76.3	12.4	218.0	224.7	255.5
7600	136.2	94.1	0.611	77.8	12.4	221.0	226.9	255.8
7650	137.8	94.6	0.614	79.1	12.3	223.0	230.3	255.6
7700	139.2	94.9	0.613	79.8	12.2	223.0	232.9	255.6
7750	140.3	95.1	0.612	80.3	12.1	223.0	235.4	255.5
7800	141.3	95.2	0.608	80.4	12.1	223.0	237.6	255.2
7850	142.3	95.2	0.603	80.2	12.1	223.0	239.7	254.9
7900	143.4	95.3	0.600	80.4	12.2	225.0	241.9	254.8
7950	144.4	95.4	0.591	79.8	12.2	224.0	243.6	254.6
8000	145.5	95.5	0.584	79.4	12.3	224.0	245.1	254.9
8050	146.8	95.8	0.568	77.8	12.5	223.0	246.9	254.9
8100	148.2	96.1	0.547	75.7	12.8	222.0	248.7	254.8
8150	150.2	96.8	0.520	73.0	13.1	220.0	250.5	254.6
8200	151.7	97.2	0.505	71.6	13.3	218.0	251.3	254.8
8250	152.9	97.3	0.501	71.6	13.3	219.0	251.9	255.4
8300	153.4	97.1	0.491	70.4	13.5	217.0	252.4	255.3
8350	153.5	96.5	0.484	69.4	13.6	217.0	252.6	255.2
8400	153.2	95.8	0.486	69.6	13.7	219.0	252.4	255.1
8450	151.7	94.3	0.495	70.2	13.8	222.0	251.7	255.0
8500	145.0	89.6	0.530	71.7	13.4	220.0	249.3	254.4
8550	134.8	82.8	0.586	73.6	12.8	217.0	246.7	254.9
8600	126.1	77.0	0.656	77.0	12.5	220.0	244.8	255.5