

2021 Polaris 850 Patriot single pipe comparison

This new 850 Matrix has enough hard miles on it to have broken in the engine properly, and have the ECU out of “breakin mode”. The sled’s owner had a Straightline (SPI) single pipe with him and we had the BMP 850 pipe on our pipe rack. Both companies sell the single tuned pipes separately, and offer optional Y pipes that may add some airflow and HP. Today we tested all the tuned pipes with the stock 850 Y pipe and stock ECU. Pump gas was tested at 93.2 R+M/2 octane with 4.4% ethanol. We first did two back to back sweep tests to heat soak the engine, then did two back to back tests on each pipe to make sure we found optimal pipe temperature. Note that on each of the second tests the ECU delivered added fuel flow as the pipes reached maximum temperature, reducing HP some.

Note that while all three pipes made virtually identical peak HP, the SPI and BMP pipes made more midrange torque and HP than did the stock pipe. That was noted by the sled owner, who reported the SPI pipe felt stronger than stock coming out of the corners but didn’t add anything on top end. Conversely, the stock pipe then had better overrev HP and top end. Note also that the SPI pipe which has a long internal stinger created two audible clicks of midrange deto on test two causing slight enrichment of fuel flow as shown in the data.

Polaris 850 stock pipe, test 1

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LM1AF1 Ratio	LM1Air SCFM	FulPrA psig	ServoV %
6730	116.0	90.5	0.601	68.9	13.95	207.5	64.4	63.4
6790	116.8	90.4	0.595	68.6	13.97	207.1	64.4	62.7
6850	117.6	90.2	0.589	68.4	13.98	206.5	64.4	62.0
6900	118.4	90.1	0.585	68.3	14.00	206.7	64.4	61.5
6950	119.3	90.2	0.584	68.8	14.02	208.4	64.4	61.1
7000	120.5	90.4	0.588	70.0	14.04	212.2	64.3	60.7
7050	122.1	91.0	0.595	71.8	14.04	217.7	64.2	60.5
7100	124.1	91.8	0.607	74.4	13.98	224.8	64.0	60.3
7150	126.5	93.0	0.619	77.4	13.88	232.0	63.9	60.3
7200	129.2	94.2	0.629	80.3	13.74	238.2	63.8	60.2
7250	132.1	95.7	0.636	82.9	13.57	243.1	63.7	60.1
7300	135.0	97.1	0.639	85.2	13.40	246.6	63.7	60.0
7350	137.7	98.4	0.638	86.7	13.28	248.8	63.7	59.8
7400	140.4	99.7	0.635	88.0	13.21	251.0	63.7	59.7
7450	143.2	101.0	0.630	89.1	13.18	253.7	63.7	59.5
7500	146.0	102.2	0.623	89.9	13.20	256.2	63.7	59.3
7550	148.8	103.5	0.615	90.4	13.24	258.6	63.7	59.0
7600	151.4	104.6	0.607	90.7	13.30	260.6	63.7	58.8
7650	154.0	105.7	0.597	90.9	13.35	262.1	63.7	58.6
7700	156.5	106.7	0.587	90.7	13.41	262.7	63.7	58.3
7750	158.8	107.6	0.576	90.4	13.46	262.8	63.7	58.0
7800	161.0	108.4	0.567	90.1	13.51	262.9	63.7	57.7

7850	163.0	109.1	0.559	90.0	13.56	263.6	63.7	57.3
7900	164.9	109.6	0.554	90.2	13.61	265.3	63.7	56.9
7950	166.4	109.9	0.552	90.8	13.64	267.4	63.7	56.3
8000	167.5	110.0	0.553	91.5	13.65	269.9	63.7	55.8
8050	168.5	109.9	0.556	92.5	13.62	272.1	63.6	55.1
8100	169.1	109.6	0.558	93.2	13.56	272.9	63.6	54.3
8150	169.3	109.1	0.558	93.2	13.47	271.4	63.6	53.5
8200	169.1	108.3	0.555	92.7	13.38	268.0	63.6	52.5
8250	168.8	107.5	0.550	91.6	13.31	263.5	63.6	51.4
8300	168.3	106.5	0.543	90.3	13.28	259.0	63.7	50.3
8350	167.7	105.5	0.537	89.0	13.30	255.7	63.7	49.0
8400	167.2	104.5	0.532	87.8	13.37	253.6	63.8	47.4
8450	166.5	103.5	0.528	86.7	13.46	252.3	63.8	45.7
8500	165.3	102.1	0.526	85.8	13.57	251.5	63.9	43.6
8550	162.8	100.0	0.528	84.9	13.67	250.7	63.9	40.9
8610	158.6	96.8	0.534	83.7	13.78	249.1	63.9	37.1
8670	154.2	93.4	0.542	82.4	13.88	247.1	64.0	33.3

Polaris 850 stock pipe, test 2

EngSpd	STPPwr	STPTRq	BSFA_B	FulA_B	LM1AF1	LM1Air	FulPrA	DenAlt
RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	SCFM	psig	Feet
6780	114.7	88.8	0.622	70.3	13.76	209.1	64.4	-229
6840	115.4	88.6	0.612	69.7	13.78	207.4	64.4	-228
6900	116.2	88.5	0.605	69.4	13.79	206.9	64.4	-227
6950	117.0	88.4	0.602	69.5	13.81	207.6	64.4	-227
7000	118.0	88.5	0.605	70.5	13.82	210.5	64.3	-226
7050	119.3	88.8	0.616	72.5	13.81	216.5	64.2	-226
7100	120.8	89.4	0.632	75.3	13.74	223.8	64.1	-226
7150	122.7	90.1	0.646	78.2	13.64	230.6	64.0	-225
7200	124.6	90.9	0.659	81.0	13.50	236.4	63.9	-225
7250	126.9	91.9	0.665	83.3	13.32	239.7	63.8	-225
7300	129.7	93.3	0.662	84.7	13.15	240.7	63.7	-224
7350	132.4	94.6	0.657	85.8	13.02	241.5	63.7	-224
7400	135.1	95.9	0.651	86.8	12.92	242.6	63.6	-223
7450	137.9	97.2	0.644	87.6	12.87	243.8	63.6	-223
7500	140.8	98.6	0.635	88.3	12.87	245.5	63.6	-223
7550	143.6	99.9	0.627	88.8	12.91	247.9	63.6	-222
7600	146.4	101.2	0.618	89.3	12.96	250.3	63.6	-223
7650	149.2	102.4	0.610	89.8	13.02	252.7	63.6	-222
7700	152.2	103.8	0.602	90.3	13.07	255.3	63.6	-222
7750	154.8	104.9	0.595	90.9	13.11	257.7	63.6	-221
7800	157.1	105.8	0.589	91.4	13.13	259.4	63.5	-222
7850	159.2	106.5	0.585	91.9	13.15	261.2	63.5	-221
7900	160.9	107.0	0.583	92.5	13.16	263.2	63.5	-220
7950	162.6	107.4	0.582	93.3	13.16	265.3	63.5	-219
8000	163.9	107.6	0.583	94.3	13.14	268.0	63.5	-218

8050	165.0	107.6	0.587	95.5	13.11	270.6	63.5	-218
8100	165.7	107.4	0.590	96.5	13.05	272.2	63.5	-218
8150	165.9	106.9	0.592	96.9	12.98	272.0	63.5	-217
8200	165.8	106.2	0.594	97.1	12.90	270.8	63.5	-217
8250	165.4	105.3	0.593	96.7	12.84	268.5	63.5	-216
8300	164.8	104.3	0.590	95.9	12.81	265.5	63.5	-214
8350	164.3	103.3	0.584	94.7	12.82	262.4	63.6	-214
8400	163.9	102.5	0.578	93.4	12.88	260.2	63.7	-213
8450	163.5	101.7	0.571	92.1	12.98	258.4	63.7	-213
8500	163.0	100.7	0.563	90.5	13.10	256.5	63.8	-212
8550	161.6	99.3	0.557	88.8	13.24	254.3	63.9	-212
8610	159.0	97.0	0.552	86.5	13.42	251.0	63.9	-211
8670	156.2	94.6	0.547	84.2	13.60	247.5	64.0	-210

Polaris 850 Straightline pipe, test 1

EngSpd	STPPwr	STPTrq	BSFA_B	FulA_B	LM1AF1	LM1Air	FulPrA	FuelA
RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	SCFM	psig	lbs/hr
6730	118.4	92.4	0.587	68.3	14.64	216.4	64.4	225.3
6790	119.5	92.4	0.600	70.5	14.61	223.0	64.3	225.7
6850	121.0	92.8	0.608	72.4	14.58	228.2	64.2	226.0
6900	122.7	93.4	0.611	73.8	14.53	232.0	64.1	226.3
6950	124.8	94.3	0.613	75.3	14.48	235.9	64.0	226.5
7000	127.2	95.4	0.613	76.7	14.43	239.3	64.0	226.7
7050	130.0	96.8	0.609	77.9	14.36	242.1	63.9	226.8
7100	132.8	98.2	0.607	79.3	14.31	245.6	63.9	227.0
7150	135.7	99.7	0.607	81.0	14.26	249.8	63.8	227.3
7200	139.0	101.4	0.607	83.0	14.19	254.8	63.7	227.7
7250	142.4	103.2	0.607	85.0	14.12	259.6	63.7	228.1
7300	145.5	104.7	0.606	86.8	14.04	263.6	63.6	228.4
7350	148.4	106.1	0.605	88.3	13.97	266.8	63.6	228.6
7400	151.1	107.2	0.602	89.5	13.89	268.8	63.6	228.7
7450	153.3	108.1	0.597	90.1	13.81	269.1	63.6	228.6
7500	155.6	109.0	0.590	90.4	13.75	268.7	63.6	228.4
7550	157.9	109.8	0.583	90.6	13.69	268.2	63.6	228.1
7600	160.2	110.7	0.575	90.7	13.65	267.8	63.6	227.8
7650	162.4	111.5	0.569	90.9	13.61	267.6	63.5	227.7
7700	164.1	111.9	0.564	91.1	13.59	267.6	63.5	227.6
7750	165.5	112.2	0.561	91.3	13.56	267.7	63.5	227.6
7800	166.6	112.2	0.558	91.5	13.53	267.7	63.6	227.7
7850	167.6	112.1	0.557	91.8	13.51	268.2	63.6	228.0
7900	168.3	111.9	0.557	92.2	13.50	269.1	63.6	228.3
7950	168.7	111.5	0.557	92.5	13.51	270.2	63.6	228.5
8000	169.1	111.0	0.558	92.8	13.52	271.4	63.4	228.7
8050	168.9	110.2	0.559	92.9	13.55	272.1	63.0	228.7
8100	167.5	108.6	0.561	92.4	13.57	271.2	62.8	228.4
8160	164.6	105.9	0.564	91.2	13.60	268.4	62.5	227.5

8220 161.6 103.2 0.567 90.1 13.63 265.5 62.1 226.8

Polaris 850 Straightline pipe, test 2

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LM1AF1 Ratio	LM1Air SCFM	FulPrA psig	FuelB lbs/hr
6780	122.3	94.7	0.568	68.3	13.90	205.6	64.3	159.9
6840	123.3	94.7	0.573	69.4	13.94	209.6	64.3	158.9
6900	124.4	94.7	0.576	70.3	13.99	213.2	64.3	158.0
6950	125.4	94.8	0.577	71.2	14.04	216.4	64.3	157.2
7000	126.6	95.0	0.580	72.1	14.08	220.1	64.2	156.2
7050	127.9	95.3	0.585	73.5	14.12	224.8	64.1	154.8
7100	129.5	95.8	0.592	75.3	14.13	230.5	64.0	153.1
7150	131.4	96.5	0.602	77.7	14.08	237.1	63.9	150.8
7200	133.4	97.3	0.614	80.4	13.99	243.8	63.8	148.3
7250	135.7	98.3	0.624	83.2	13.87	250.0	63.7	145.8
7300	138.2	99.4	0.633	85.9	13.72	255.3	63.6	143.5
7350	141.0	100.8	0.636	88.1	13.56	258.8	63.6	141.5
7400	143.7	102.0	0.635	89.7	13.44	261.3	63.6	139.9
7450	146.4	103.2	0.634	91.1	13.35	263.6	63.5	138.5
7500	149.2	104.5	0.631	92.5	13.27	266.1	63.5	137.2
7550	151.8	105.6	0.628	93.7	13.21	268.2	63.4	135.9
7600	154.1	106.5	0.625	94.7	13.15	269.9	63.4	134.8
7650	156.3	107.3	0.622	95.4	13.09	270.7	63.4	134.0
7700	158.3	108.0	0.616	95.7	13.03	270.2	63.4	133.4
7750	160.2	108.6	0.608	95.7	12.97	268.9	63.4	133.2
7800	161.7	108.9	0.600	95.4	12.94	267.5	63.4	133.3
7850	163.1	109.1	0.594	95.1	12.95	266.7	63.4	133.4
7900	164.2	109.1	0.588	94.9	12.97	266.7	63.4	133.5
7950	164.8	108.9	0.587	95.0	13.00	267.8	63.4	133.5
8000	165.1	108.4	0.589	95.5	13.03	269.8	63.4	133.1
8050	164.9	107.6	0.595	96.4	13.03	272.2	63.4	132.5
8100	163.4	105.9	0.608	97.6	12.98	274.6	63.4	131.8
8160	160.2	103.1	0.633	99.5	12.86	277.4	63.3	130.7
8220	156.9	100.2	0.659	101.6	12.74	280.4	63.2	129.6

Polaris 850 BMP pipe, test 1

EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	BSFA_B lb/hph	FulA_B lbs/hr	LM1AF1 Ratio	LM1Air SCFM	FulPrA psig	STPCor Factor
6730	114.9	89.7	0.605	68.3	13.83	204.4	64.5	1.016
6790	116.1	89.8	0.618	70.5	13.80	210.5	64.4	1.016
6850	117.5	90.1	0.631	72.8	13.77	217.0	64.3	1.016
6900	119.1	90.7	0.638	74.6	13.73	221.8	64.2	1.016
6950	121.0	91.5	0.641	76.2	13.69	225.8	64.1	1.016
7000	123.2	92.4	0.643	77.7	13.64	229.6	64.1	1.016
7050	125.5	93.5	0.643	79.3	13.60	233.3	64.0	1.016

7100	127.7	94.5	0.644	80.8	13.57	237.2	64.0	1.016
7150	130.4	95.8	0.644	82.4	13.54	241.5	63.9	1.016
7200	133.2	97.1	0.641	83.8	13.52	245.4	63.9	1.016
7250	135.9	98.4	0.638	85.2	13.50	248.9	63.9	1.016
7300	138.8	99.8	0.634	86.3	13.48	252.0	63.8	1.016
7350	141.7	101.3	0.627	87.2	13.46	254.1	63.8	1.016
7400	144.2	102.3	0.620	87.8	13.43	255.2	63.7	1.016
7450	146.6	103.4	0.615	88.6	13.40	256.9	63.7	1.016
7500	149.1	104.4	0.611	89.4	13.37	258.8	63.6	1.016
7550	151.6	105.5	0.605	90.2	13.34	260.3	63.6	1.016
7600	154.1	106.5	0.600	90.7	13.32	261.7	63.7	1.016
7650	156.6	107.5	0.592	91.1	13.31	262.6	63.7	1.016
7700	158.8	108.3	0.584	91.1	13.31	262.7	63.7	1.016
7750	161.0	109.1	0.575	90.9	13.32	262.0	63.7	1.016
7800	163.0	109.7	0.565	90.4	13.33	261.1	63.8	1.016
7850	164.9	110.3	0.555	89.9	13.35	259.8	63.8	1.016
7900	166.4	110.7	0.546	89.3	13.37	258.5	63.8	1.016
7950	167.9	110.9	0.538	88.7	13.39	257.1	63.8	1.016
8000	168.8	110.8	0.532	88.3	13.42	256.4	63.8	1.016
8050	169.3	110.4	0.531	88.2	13.44	256.8	63.8	1.016
8100	169.2	109.7	0.532	88.4	13.45	257.6	63.8	1.016
8150	168.4	108.5	0.536	88.7	13.45	258.3	63.7	1.016
8200	166.8	106.9	0.544	89.2	13.43	259.3	63.7	1.016
8250	164.6	104.8	0.555	89.7	13.40	260.2	63.7	1.016
8300	161.4	102.1	0.567	89.8	13.36	259.8	63.7	1.016
8360	156.6	98.4	0.584	89.8	13.32	259.0	63.7	1.016
8420	151.7	94.6	0.605	90.1	13.27	258.8	63.8	1.016

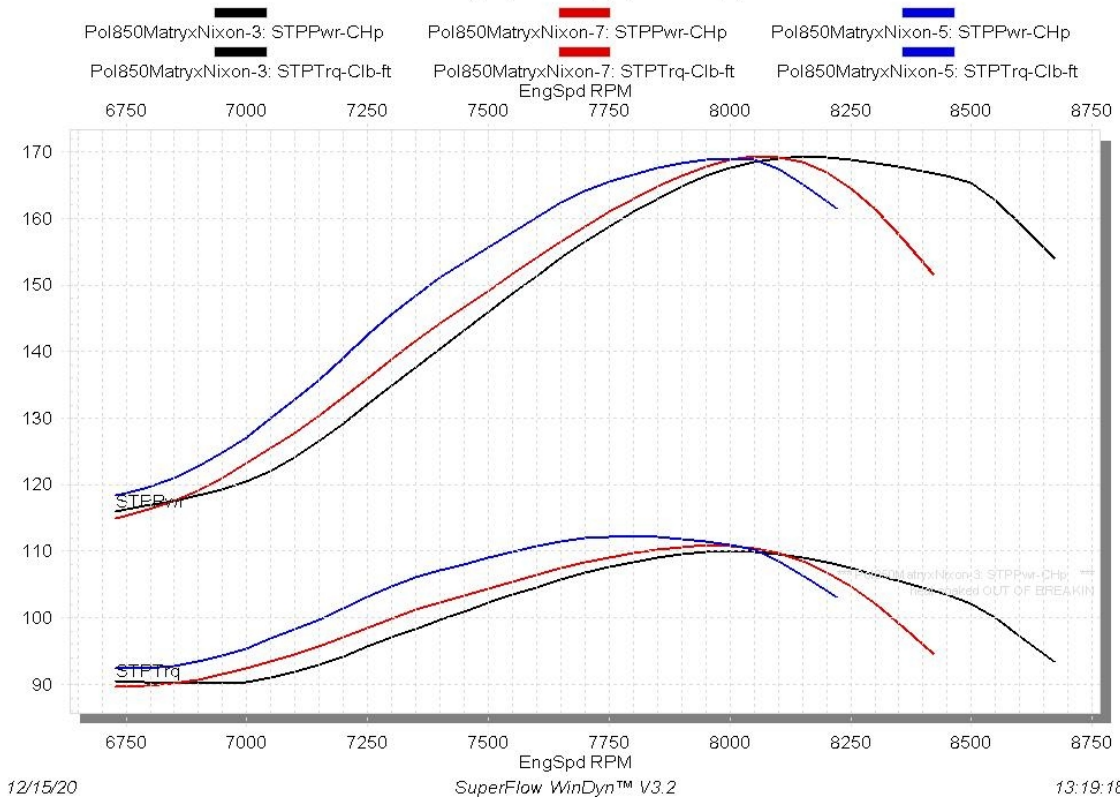
Polaris 850 BMP pipe, test 2

EngSpd	STPPwr	STPTRq	BSFA_B	FulA_B	LM1AF1	LM1Air	FulPrA	AirInT
RPM	CHp	Clb-ft	lb/hph	lbs/hr	Ratio	SCFM	psig	degF
6730	115.4	90.0	0.620	70.3	13.60	207.1	64.4	42.6
6790	116.0	89.8	0.614	70.0	13.62	206.4	64.4	42.6
6850	116.7	89.5	0.609	69.8	13.64	206.4	64.3	42.6
6900	117.5	89.5	0.606	69.9	13.66	207.0	64.3	42.6
6950	118.5	89.5	0.605	70.3	13.69	208.7	64.3	42.6
7000	119.7	89.8	0.607	71.3	13.73	212.2	64.2	42.6
7050	121.2	90.3	0.616	73.3	13.75	218.4	64.1	42.6
7100	123.0	91.0	0.628	75.8	13.76	226.1	64.0	42.6
7150	125.0	91.8	0.643	78.9	13.71	234.5	63.9	42.6
7200	127.4	92.9	0.657	82.1	13.60	241.9	63.8	42.6
7250	129.8	94.1	0.666	84.9	13.46	247.5	63.7	42.6
7300	132.3	95.2	0.669	86.9	13.30	250.6	63.6	42.6
7350	134.8	96.3	0.667	88.3	13.15	251.7	63.6	42.6
7400	137.2	97.4	0.661	89.0	13.04	251.5	63.6	42.6
7450	139.6	98.4	0.653	89.5	12.97	251.5	63.6	42.6

7500	142.1	99.5	0.643	89.7	12.94	251.7	63.6	42.6
7550	144.8	100.7	0.633	89.9	12.94	252.2	63.6	42.6
7600	147.6	102.0	0.621	90.0	12.96	252.7	63.6	42.6
7650	150.3	103.2	0.610	90.0	12.99	253.2	63.6	42.6
7700	152.9	104.3	0.599	89.9	13.02	253.8	63.6	42.6
7750	155.4	105.3	0.589	89.8	13.06	254.3	63.6	42.6
7800	157.7	106.2	0.579	89.6	13.10	254.4	63.6	42.6
7850	159.8	106.9	0.570	89.5	13.13	254.7	63.6	42.6
7900	161.9	107.7	0.564	89.6	13.17	255.8	63.7	42.6
7950	163.7	108.2	0.559	89.9	13.20	257.3	63.7	42.6
8000	165.1	108.4	0.558	90.5	13.21	258.9	63.6	42.6
8050	166.0	108.3	0.561	91.4	13.18	261.1	63.6	42.7
8100	166.3	107.8	0.567	92.6	13.11	263.1	63.5	42.7
8150	165.9	106.9	0.574	93.5	13.02	263.8	63.5	42.7
8200	165.1	105.7	0.580	94.0	12.93	263.2	63.5	42.7
8250	163.7	104.2	0.584	93.9	12.84	261.3	63.5	42.7
8300	162.1	102.6	0.585	93.1	12.80	258.2	63.6	42.7
8350	160.3	100.8	0.583	91.7	12.81	254.7	63.6	42.7
8400	158.2	98.9	0.581	90.2	12.88	251.8	63.7	42.7
8460	155.4	96.5	0.579	88.2	13.04	249.3	63.8	42.7
8520	152.4	94.0	0.576	86.2	13.20	246.6	63.8	42.7

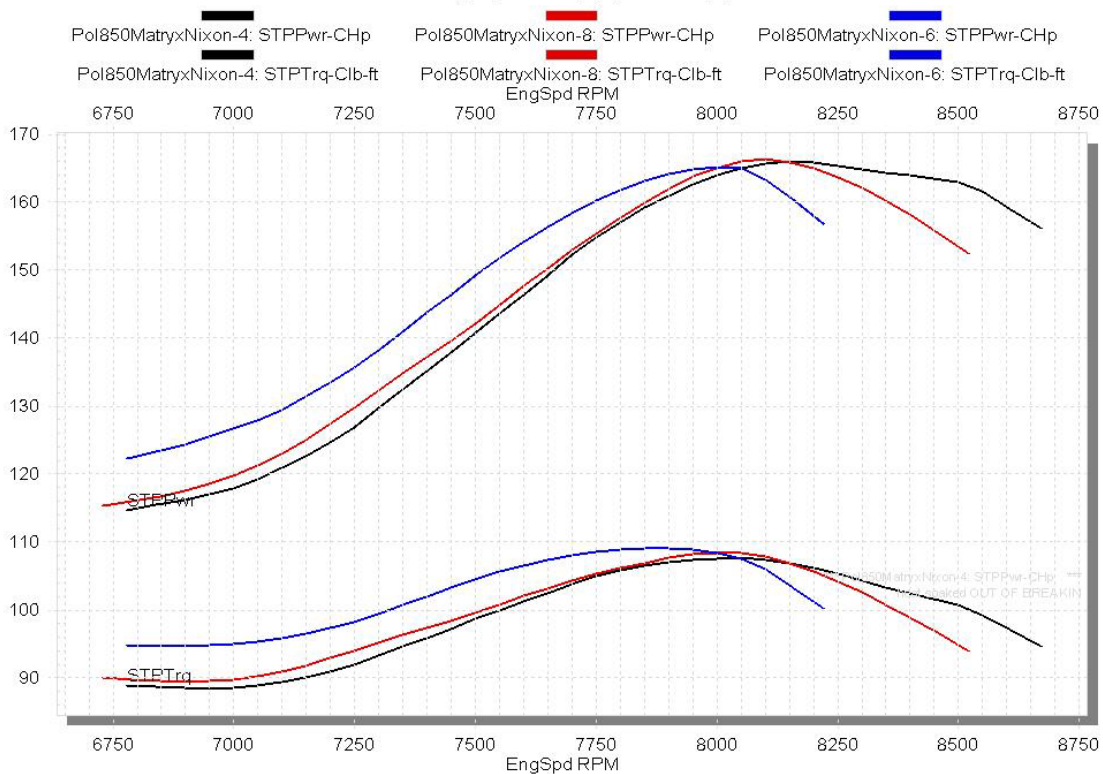
2021 Polaris 850 Patriot after breakin miles, Test 1 of each pipe

Black stock pipe, Blue SPI pipe, Red BMP pipe



2021 Polaris 850 Patriot after breakin miles, Test 2 of each pipe

Black stock pipe, Blue SPI pipe, Red BMP pipe



12/15/20

SuperFlow WinDyn™ V3.2

13:25:54



