

2005 Arctic Cat F7 EFI, our first production sample??!!!

Here's our first real '05 F7 but I'm cringing about the unbelievable HP, resulting from the unbelievably low fuel flow! This is even better than our bragged-about and fantastic dyno tuned '03 and '04 F7 EFI's. Remember we dyno tuned the '04 F7 stocker for last year's AmSnow shootout? I believe it was 128 HP, typical in the state of tune that gave us 10-1 A/F ratio and .800 BSFC. Then earlier this year we tested an '05 ECU on an early sled and saw 105 lb/hr. How could this new '05 F7 have 20 HP more? Assuming engine/ compression/ pipe etc is identical, we're looking at optimal fuel flow and ignition timing. For sure this PARTICULAR F7 is nicely lean, the way we like it here. This one out of the crate gave us less than 100 lb/hr fuel flow. Perfect for 147 HP. One hour earlier, we dyno tuned an '03 ECU ported sled that flowed 110+ lb/ hr, same air temp, same baro. But, whether this is the standard '05 F7 or if it's an anomaly, here is our first complete 2005 F7 EFI:

05F7Jk1

bone stock 2005 F7 EFI, this particular sample

EngSpd RPM	STPTrq Clb-ft	STPPwr CHp	Fuel A lb/hr	FUEL-P psig	Air1+2 scfm	A/F Ratio	BSFC lb/hph	AirTmp degF
5900	69.7	78.3	52.8	42.4	164.2	14.23	0.679	44
6000	70.6	80.6	53.5	42.5	164.6	14.08	0.669	45
6100	72.5	84.2	53.2	42.5	166.1	14.28	0.637	45
6200	74.5	88.1	54.5	42.5	168.1	14.12	0.625	45
6300	76.6	91.9	55.2	42.4	172.5	14.31	0.606	45
6400	77.3	94.1	54.9	42.5	174.7	14.57	0.587	44
6500	80.2	99.2	56.8	42.4	180.3	14.53	0.577	44
6600	81.7	102.6	57.7	42.6	185.3	14.71	0.566	44
6700	83.2	106.1	59.7	42.4	191.9	14.71	0.567	45
6800	83.7	108.4	61.2	42.3	194.6	14.56	0.571	45
6900	87.1	114.3	62.9	42.4	201.2	14.64	0.555	45
7000	88.8	118.4	67.1	42.2	208.3	14.21	0.571	45
7100	91.3	123.5	70.2	42.1	215.3	14.04	0.574	46
7200	90.8	124.5	71.6	42.1	217.7	13.92	0.581	46
7300	91.8	127.5	71.3	42.1	221.3	14.21	0.564	46
7400	97.3	137.1	87.9	41.5	237.3	12.36	0.647	45
7500	99.3	141.8	96.8	41.5	246.4	11.65	0.688	45
7600	99.1	143.4	98.1	41.5	251.2	11.72	0.691	45
7700	98.8	144.8	100.1	41.2	253.9	11.62	0.696	45
7800	98.8	146.7	99.4	41.4	257.3	11.85	0.683	45
7900	97.8	147.1	98.9	41.4	261.4	12.11	0.678	45
8000	95.6	145.6	97.2	41.7	265.4	12.51	0.674	46
8100	85.5	131.9	95.3	41.7	269.8	12.96	0.731	46

Next we installed Kaz' Speedwerx single pipe, ceramic coated, using the stock muffler (dB was as quiet as stock). This added several lb/ft of midrange torque and three HP on top.

05F7JK3

Stock 05 F7 as above with speedWerx single pipe, stock muffler

EngSpd RPM	STPTrq Clb-ft	STPPwr CHp	Fuel A lb/hr	FUEL-P psig	Air1+2 scfm	A/F Ratio	BSFC lb/hph	AirTmp degF
5900	71.7	80.5	53.2	42.5	165.3	14.22	0.666	45
6000	72.1	82.3	52.9	42.5	164.8	14.26	0.648	44
6100	73.8	85.8	54.4	42.4	166.9	14.04	0.639	44
6200	77.6	91.7	53.8	42.4	169.7	14.44	0.592	45
6300	76.9	92.3	53.7	42.5	171.1	14.58	0.587	45
6400	77.7	94.7	55.7	42.5	173.8	14.28	0.594	46
6500	81.4	100.7	56.2	42.4	177.1	14.42	0.563	46
6600	84.3	105.9	58.9	42.3	183.2	14.24	0.561	46
6700	86.4	110.2	62.1	42.2	194.2	14.31	0.567	44
6800	87.1	112.8	64.1	42.2	200.3	14.31	0.572	44
6900	87.7	115.2	64.7	42.2	202.9	14.36	0.565	44
7000	89.5	119.3	66.2	42.2	208.7	14.43	0.559	44
7100	90.9	122.9	68.2	42.1	212.3	14.25	0.559	44
7200	92.8	127.2	70.6	42.1	217.6	14.11	0.559	44
7300	93.5	129.9	71.1	42.1	220.3	14.18	0.551	44
7400	102.4	144.3	89.6	41.4	240.5	12.29	0.625	44
7500	102.9	147.1	98.3	41.5	247.4	11.52	0.674	45
7600	102.1	147.8	98.7	41.4	248.8	11.54	0.673	45
7700	100.6	147.5	99.7	41.4	251.4	11.54	0.681	45
7800	100.7	149.6	99.8	41.4	255.4	11.71	0.673	45
7900	99.9	150.3	99.1	41.4	258.4	11.94	0.665	45
8000	97.2	148.1	98.7	41.2	265.1	12.31	0.672	45
8100	88.1	135.8	93.5	41.5	270.8	13.26	0.694	45

Even though my recommendation to Kaz was "leave it alone" greedy Kaz decided to drop fuel pressure with the D&D pac needle valve. Note that rail fuel pressure stock was 41.5 on our previous runs. Kaz tweaked his top end fuel pressure down to 39 psi on our dyno gauge.

05F7JK5

stock 2005 F7, speedwerx single. Drop top end fuel pressure to 39 psi.

EngSpd RPM	STPTrq Clb-ft	STPPwr CHp	Fuel A lb/hr	FUEL-P psig	Air1+2 scfm	A/F Ratio	BSFC lb/hph	AirTmp degF
6000	72.5	82.8	53.1	41.6	165.1	14.22	0.647	46
6100	73.1	84.8	52.8	41.6	165.6	14.36	0.629	46
6200	75.1	88.6	53.3	41.6	166.7	14.32	0.608	46
6300	77.1	92.4	53.2	41.5	169.9	14.62	0.581	46
6400	77.7	94.6	53.8	41.5	173.7	14.78	0.574	46
6500	78.5	97.1	55.1	41.5	174.8	14.52	0.573	46

6600	81.1	101.9	56.2	41.4	178.2	14.51	0.557	46
6700	83.5	106.5	58.1	41.3	184.3	14.52	0.551	46
6800	85.7	111.1	61.8	41.1	198.7	14.72	0.563	47
6900	86.8	114.1	64.1	41.1	201.5	14.39	0.568	47
7000	90.4	120.5	65.9	41.1	207.3	14.41	0.553	47
7100	90.1	121.8	66.4	40.9	208.4	14.37	0.551	47
7200	92.5	126.8	70.2	40.8	214.7	14.01	0.561	47
7300	92.7	128.8	70.5	40.8	217.4	14.12	0.553	47
7400	93.9	132.3	72.4	40.6	220.2	13.92	0.553	47
7500	101.6	145.1	91.1	39.5	242.4	12.18	0.635	47
7600	102.5	148.3	94.2	39.3	247.9	12.05	0.642	47
7700	101.6	148.9	95.9	39.3	249.7	11.92	0.651	47
7800	100.7	149.5	95.7	39.2	253.5	12.13	0.646	46
7900	100.1	150.4	96.7	39.1	258.9	12.26	0.649	46
8000	98.5	150.1	96.1	39.2	262.1	12.48	0.647	46

We tweaked fuel pressure down, a few tenths of a PSI at a time, and we peaked, max HP at 37.5 PSI. Less PSI on this engine = danger and less HP. This would be Kaz' drag spec, maybe safe for ¼ mile blasts on 93 octane.

05F7JK7

stock 2005 F7 EFI, Speedwerx single, stock muffler, drop top end fuel pressure to max HP 37.5 psi

EngSpd	STPTrq	STPPwr	Fuel A	FUEL-P	Air1+2	A/F	BSFC	AirTmp
RPM	Clb-ft	CHp	lb/hr	psig	scfm	Ratio	lb/hph	degF
6000	73.2	83.7	52.9	40.9	166.9	14.44	0.638	45
6100	74.1	86.1	53.3	40.9	168.1	14.44	0.625	45
6200	76.8	90.7	52.8	40.9	169.4	14.69	0.587	44
6300	78.6	94.3	54.3	40.8	172.8	14.57	0.581	44
6400	78.3	95.4	53.5	40.8	176.8	15.13	0.565	44
6500	78.3	96.9	53.9	40.2	178.3	15.14	0.561	44
6600	79.9	100.4	54.6	40.5	180.4	15.12	0.548	44
6700	82.8	105.6	55.8	40.5	183.7	15.07	0.533	44
6800	87.1	112.6	60.5	40.2	201.5	15.25	0.542	44
6900	86.4	113.5	61.2	40.2	203.8	15.24	0.544	44
7000	87.1	116.1	61.8	40.2	206.9	15.32	0.536	43
7100	91.6	123.9	65.4	40.1	213.3	14.93	0.532	44
7200	92.5	126.8	67.3	39.8	217.7	14.81	0.535	44
7300	92.7	128.9	67.3	39.8	218.8	14.88	0.526	44
7400	93.8	132.2	68.8	39.7	222.2	14.78	0.525	44
7500	102.9	146.9	86.1	38.1	246.1	13.09	0.591	44
7600	102.4	148.2	89.2	37.9	249.2	12.79	0.606	43
7700	102.4	150.1	93.7	37.6	252.5	12.34	0.629	44
7800	102.2	151.8	92.9	37.5	255.8	12.61	0.617	44
7900	101.6	152.8	94.1	37.4	257.7	12.55	0.621	44
8000	100.2	152.6	93.5	37.6	265.8	13.01	0.617	43

8100	98.4	151.7	91.2	37.7	270.3	13.57	0.605	43
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EPILOGUE

Can this '05 F7 EFI be typical? All Cat people hope so, but we'll surely do many others to verify this. What if we hadn't dyno'd Kaz' F7 before the Adirondack Shootout? Last year's F7 made 128, and this one without an offset timing key could easily have been 143-144 HP. If Kaz' sled were this year's Shootout entrant, there surely would have been howls of protest from the other camps. Thank you Kaz for saving us from that. As Bender Racing owner Terry Paine, who has a SuperFlow dyno calibrated exactly like mine says, "it is what it is".