

## EVEN MORE AXYS 800 HO TEST DATA

Dave M. has 1500 trail miles on his Axys 800 HO, all with Polaris VES oil, all with bone stock clutching. He's complained all season about poor acceleration and top speed—he's had trouble keeping up with his friend's well-clutched Polaris 600, which is probably around 120 HP, so Dave was *sure* his engine was in that HP range. And after noting all the Internet chatter, and seeing the wide variation in HP with our own Axys testing, he was certain that his engine was under-performing. So it cost him an hour and a half of dyno time and \$200 to find out that he was wrong—his engine is performing fine, but his clutch setup needed attending to! This was just a quick hookup to the dyno—pop the clutch off, connect the crank taper to the rubber dampened dyno driveshaft, and just use the wide band procto-tube inserted in the muffler outlet to get us Innovate A/F ratio. No fuel lines to mess with, and no airflow measuring, no need to unfasten body panels and pod, all saves us time. Then we would just fire the engine, warm it up to about 80F coolant temp and do a series of back-to-back WOT acceleration tests to see the HP output, and see what RPM the peak HP occurs at with both warm and very hot pipe temp. If the HP was low, then we would use the Digital Wrench to look for trouble codes, check valves, etc. But there was no need to do that today. Power was excellent—peaking at 155 HP @8250 on run #4. And even with six back-to-back runs totaling about *one minute* at WOT the HP dropped hard after 8300.

Dave had noted that his tach was buzzing up to about 8400 on acceleration. So it's easy to see from his dyno graph why he was having difficulty running with that pesky 600—while trail riding, pipe temperature is typically pretty cool. So when you first whack the throttle with temperature in the 500 F range, peak HP might occur at 7800 and if it overrevs to 8400 there might only be 110-120 HP there. I would estimate that on the first dyno test on Dave's engine (black line), the pipe temp would have been @750 F at the end of the test, and peak HP occurred at @ 8100 but dropped hard after that. Then, by test six (red line) the pipe temp would have been in the 1100 F range and HP peaking at 8300 then dropping hard after that. We should also note that Dave was using 91.6 octane non-ethanol fuel, with ECU set appropriately. And it's likely that if he had 10% ethanol fuel with non-ethanol setting, he might have matched Heath's Axys HP! Also note that the pipe really was happiest at 1000 F +. We made just over 150 HP on the first test, and then the second (gold) test was around 152 HP. Then, it made 154-155 on subsequent tests and tailed off to 153 as coolant temp climbed to @180 F. It would be interesting to try restricting the muffler inlet like we do with late model Arctic Cat 800s, to try to optimize backpressure with a warm pipe.

So with the following HP data/ graph in hand, Dave was off to his Polaris dealer JanCen Automotive in Buffalo NY where clutch guru Rick Janis would fix him up. Then he plans to go riding with his Polaris 600 riding pal one more time. Here's Dave's best test, peaking at 155.0 at 8250:

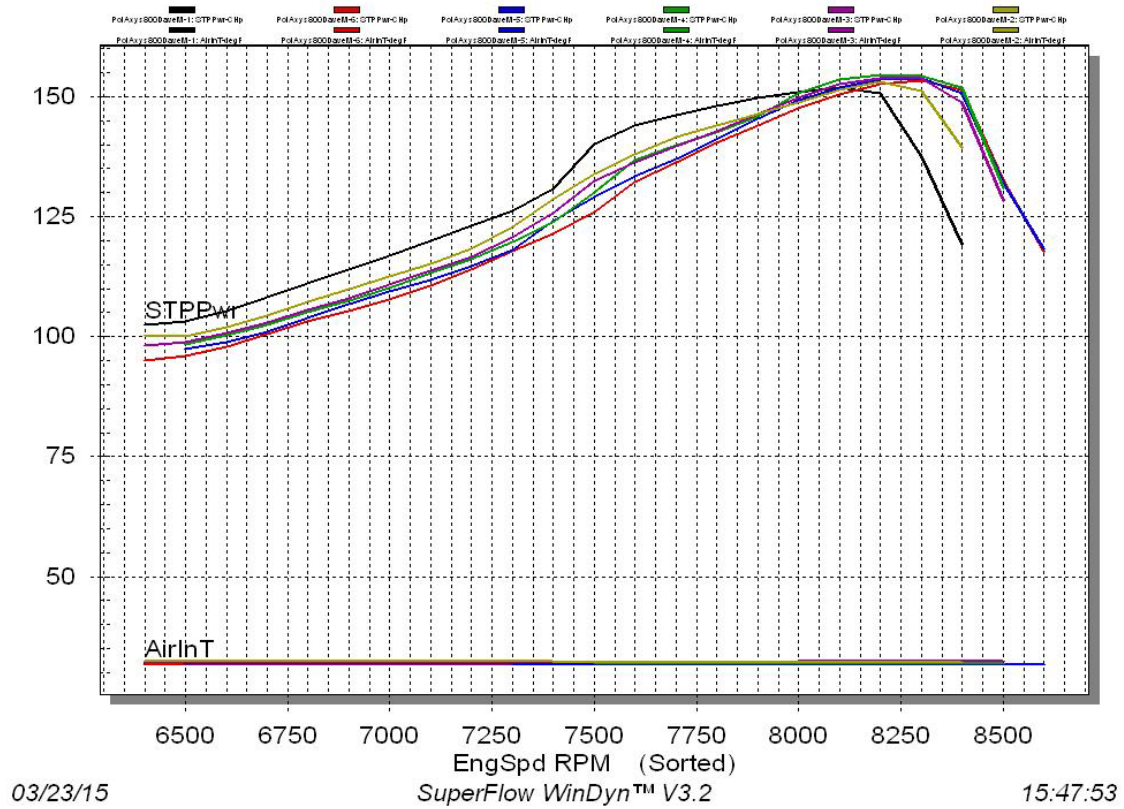
EngSpd RPM	STPPwr CHp	STPTrq Clb-ft	LamAF1 Ratio	AirInT degF	DenAlt Feet	Baro_P InHga	STPCor Factor
6500	98.4	79.5	14.69	32.2	-924	29.08	1.002
6600	100.4	79.9	14.60	32.2	-921	29.08	1.003
6700	102.6	80.4	14.46	32.2	-921	29.08	1.003
6800	105.1	81.1	14.35	32.2	-922	29.08	1.003
6900	107.5	81.8	14.26	32.2	-922	29.08	1.003
7000	110.2	82.7	14.18	32.2	-922	29.08	1.003
7100	113.2	83.7	14.16	32.2	-922	29.08	1.003
7200	116.2	84.8	14.14	32.2	-923	29.08	1.003
7300	119.7	86.1	14.07	32.1	-925	29.08	1.002
7400	123.8	87.9	13.92	32.1	-928	29.08	1.002
7500	130.2	91.2	13.58	32.1	-931	29.08	1.002
7600	136.8	94.5	13.17	32.0	-936	29.08	1.002
7700	139.9	95.4	12.93	32.0	-939	29.08	1.002
7800	142.6	96.0	12.79	32.0	-940	29.08	1.002
7900	145.9	97.0	12.61	31.9	-942	29.08	1.002
8000	150.7	98.9	12.51	31.9	-945	29.08	1.002
8100	153.5	99.5	12.60	31.9	-948	29.08	1.002
8200	154.5	99.0	12.71	31.9	-950	29.08	1.002
8300	154.3	97.6	12.87	31.9	-950	29.08	1.002
8400	152.0	95.0	13.03	31.9	-948	29.08	1.002
8500	130.9	80.9	13.26	32.0	-940	29.08	1.002

Now we added Dave's best test #4 to the other five Axy's'. I wish we had done leak down tests on all six, but it would appear that proper breakin and pipe temperature are critical. The three real good engines (blue, black, green) are all running Polaris VES synthetic oil. The Precision engine (green) only has the 320 grit rehone and 50 hard test miles on new rings—which may be nearly as good as the 70+ dyno tests we did on Heath's (blue) to make his powerful. But the least powerful was the Shootout sled (red), which had zero miles in rich breakin mode (rich A/F ratio and low pipe temp). According to Bill Lutz of Fun Unlimited, the fellow who bought the Shootout sled reports that the miles on his sled have resulted in revs climbing gradually from 8000 to 8200, indicating a HP improvement. Brock's engine (gold) seemed to have fairly high fuel flow, which may have prevented us from getting his pipe temp hot as the others. Plus, his 2200 miles were all with Legend mineral oil, which may have had some unintended effect on the engine. Then Todd's engine (purple) had lean enough fuel flow and hot pipe, but that Walmart oil may have been the reason for the low HP.

Brock is planning to come back one more time—perhaps with rehone, new rings and VES oil for breakin on the dyno like we did with Heath's.

Even more to come!

# Six back to back tests on Dave M's 800 HO



# Six Different 2015 800 HO engines

add one more--BLACK is Dave M's 1500 miler on VES oil

