

## F500 SCCA class

August 8, 2010

Rotax 493 Dyno tests comparing to Rotax 600cc model 593 engine with same exhaust and carbs.

Testing done at WIENANDT Performance Technology, Fond du Lac, WI.

Present for the test was

Mike Wienandt, owner of WPT and dyno operator. SCCA member

Jon Wienandt, dyno technician

Mark Vollbrecht, F-500 owner and SCCA member who arranged the tests.

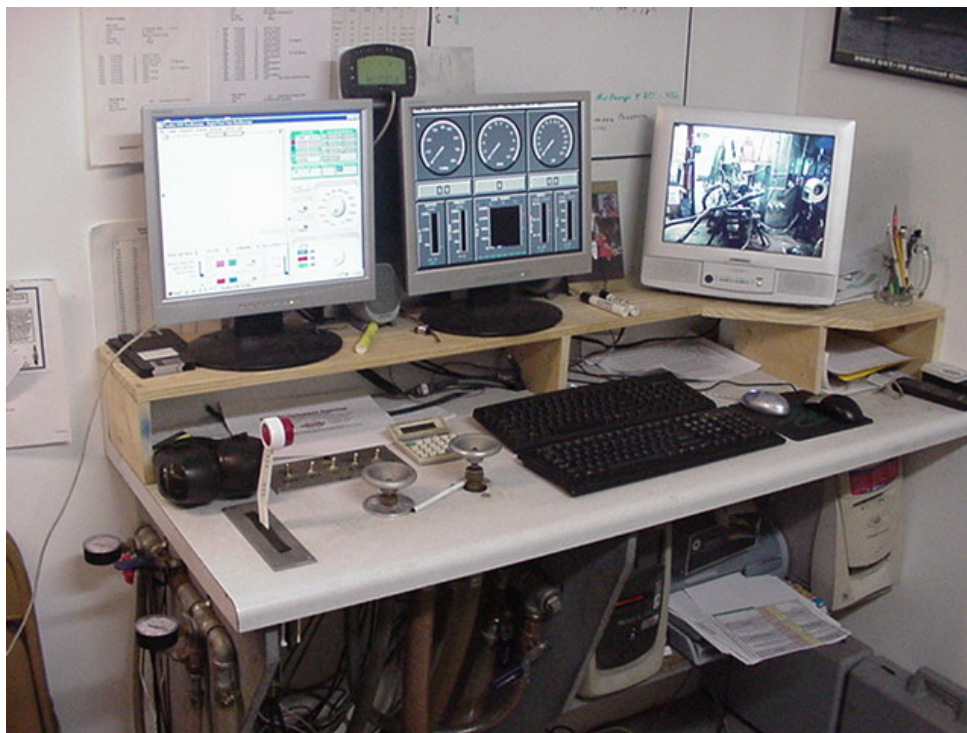
Darrel Greening, F-500 owner/driver SCCA member (observer)

Justin Gaver, SCCA member driver (observer)

Ryan Damm, Mech. Engineer (observer)

Funding for this work was provided by member contributions from:

Charlie Schlismann, Wayne Dixon, Jeff Jorgenson, Ted Simmons, William Sneal, Thomas Buchman, Donald Reding JR., Chris Eckles, and Jack Walbran



493 Rotax engine was low mileage F500 . Prepared with fresh hone and new rings.  
 Engine was documented as to all specifications.

593 Rotax was stock with fitted new .010 OEM pistons.  
 Engine was documented as to all specifications.

<b>Rotax 500 493</b>			
	atdc	duration	mm
Ex main	84.5	191	34.9
Aug Ex	91.0	178	38.9
F Transfer	116.5	127	52.2
R Transfer	116.5	127	52.2
Boost	116.25	127.5	51.5
Head MSV		46.1	

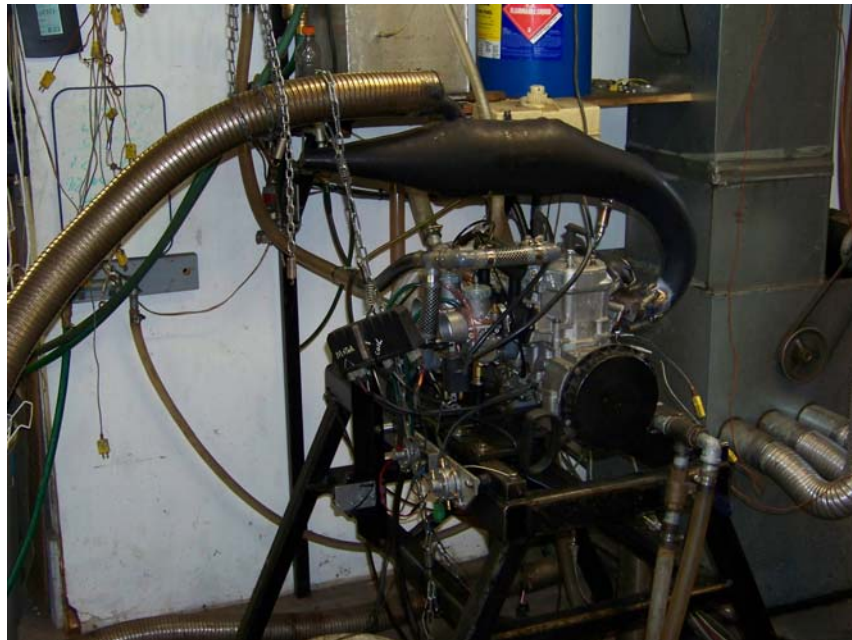
<b>Rotax 600 593</b>			
	atdc	duration	mm
Ex main	85.5	189	34.7
Aug Ex	93.5	173	39.3
F Transfer	120.2	120.2	52.7
R Transfer	120.2	120.2	52.7
Boost	118.2	123.4	51.7
Head MSV		32.08	

Both engines ran with 38mm round slide Mikuni carbs.  
 Testing of the 600 was also done with 34mm round Mikuni carbs.

Spark plugs were monitored and jetting was adjusted to balance EGT of each cylinder for each setup, to achieve about .58 BSFC @ peak torque for each engine and pipe.

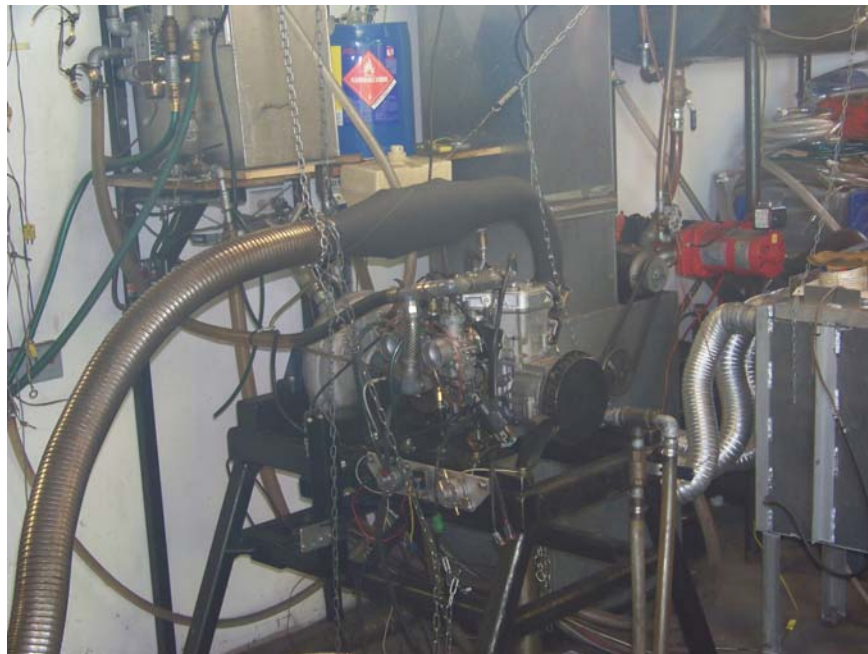
Pipes used were a 2008 WPT pipe using the stock OEM Y pipe, a 2010 WPT pipe using a modified OEM Y pipe and a HRP Copy pipe and Y pipe sold by Leon Mitchell.  
 These are the most popular pipes in the market place.

All tests were same day, same machine, with stable weather.



End conclusions:

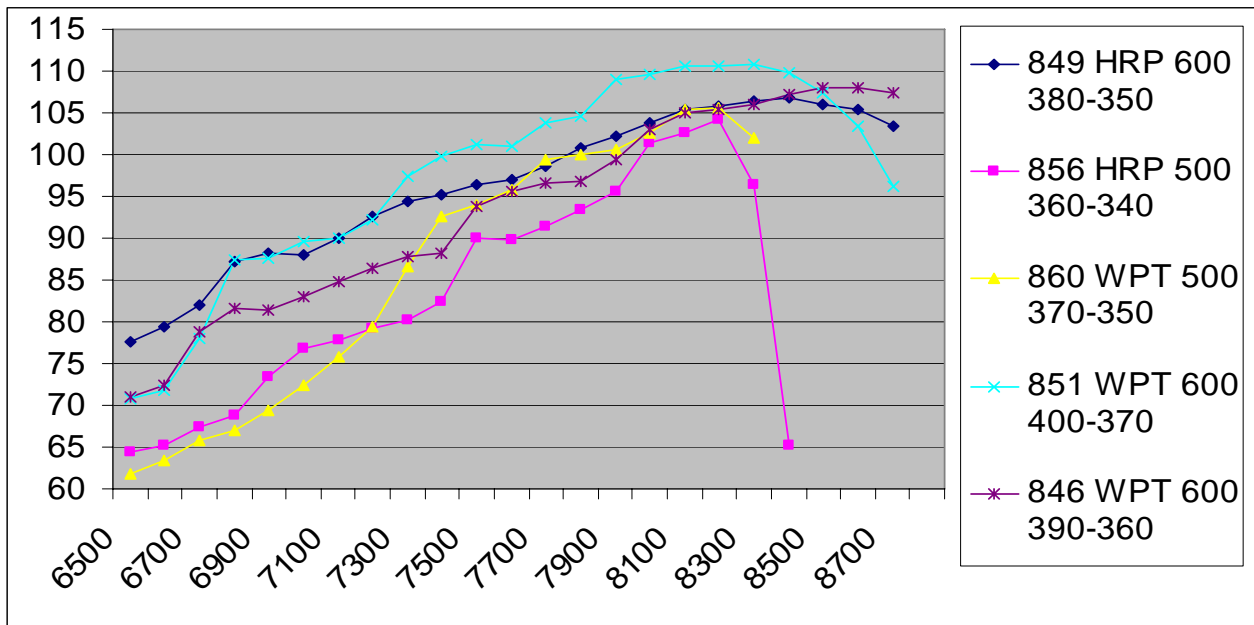
The 600 Rotax is a stronger powerplant than the 500. The graphs will show results. The 600 engine is a more conservative design, and because of that will be more durable. The head is less sensitive to fuels than the 500 but should still use a gas **designed** for two stroke application, not four stroke fuels as they cause the engine to run hotter. The power-band is stronger producing wider working range making clutching less challenging. The 600 engine was made in much higher volume for more years and there is no shortage of supply.



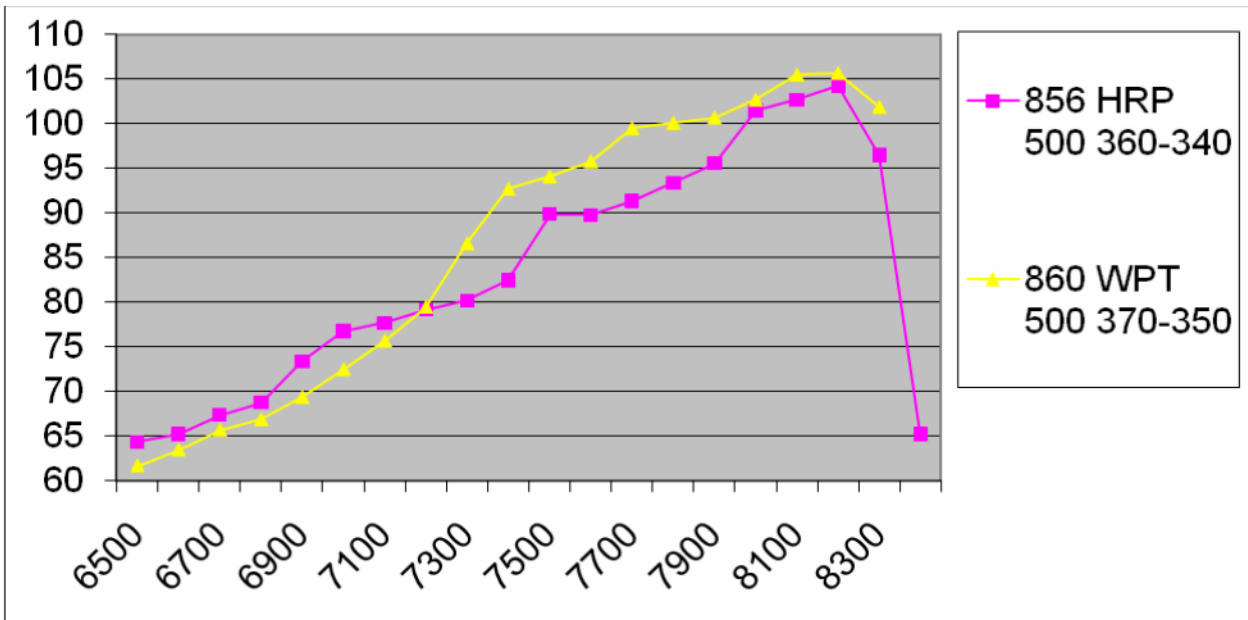
We ran 34mm carbs to try to take power away, and that failed. The increased velocity made the engine powerband even better and it carbureted even better. Being that the engine is reed valve, with the smaller carbs, the reeds are just open longer. This would not have been the case if it was a piston port or rotary valve intake. A smaller yet restrictor could be explored but the design could be complex to make the slide carb work. I do have experience in this design work.

International National Snowmobile Racing (ISR) allows in every stock class, by-passing the oil injection pump and permits pre-mix oil and fuel to be used in every racing category. I strongly recommend adding oil to gas to aid in durability because of the higher operating temps of a summer race track with an engine cooling system designed for winter application.

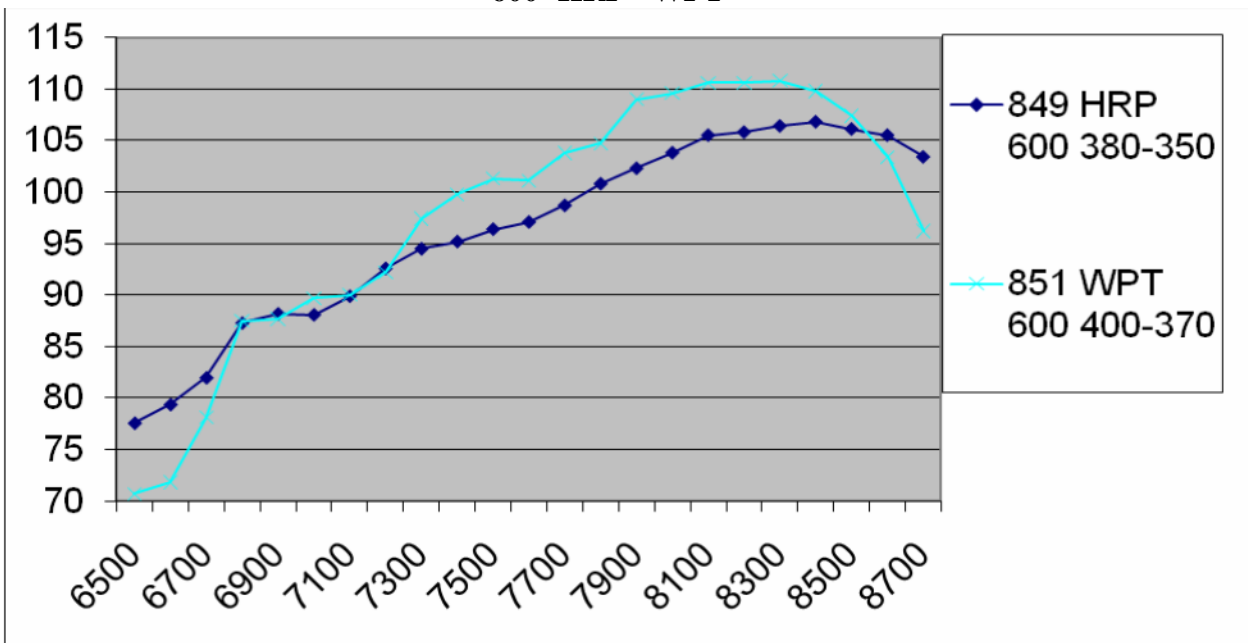
RPM	856	860	851	849	846
	HRP 500	WPT 500	WPT 600	HRP 600	WPT 600
	360-340	370-350	400-370	380-350	390-360
					Old wpt pipe
6500	64.4	61.7	70.7	77.6	71
6600	65.3	63.5	71.8	79.4	72.5
6700	67.4	65.7	78.1	82.0	78.8
6800	68.8	66.9	87.5	87.3	81.6
6900	73.4	69.4	87.7	88.2	81.5
7000	76.8	72.5	89.7	88.1	83.0
7100	77.7	75.7	90.0	89.9	84.8
7200	79.2	79.5	92.2	92.6	86.4
7300	80.2	86.6	97.4	94.5	87.8
7400	82.5	92.7	99.8	95.2	88.3
7500	89.9	94.1	101.3	96.4	93.8
7600	89.8	95.8	101.1	97.1	95.7
7700	91.4	99.5	103.8	98.7	96.6
7800	93.4	100.1	104.7	100.8	96.8
7900	95.6	100.7	109.0	102.3	99.5
8000	101.5	102.7	109.6	103.8	103.0
8100	102.7	105.5	110.6	105.5	104.9
8200	104.3	105.7	110.6	105.8	105.4
8300	96.5	101.9	110.8	106.4	106.1
8400	65.3		109.8	106.8	107.3
8500			107.4	106.1	107.9
8600			103.4	105.5	108.0
8700			96.2	103.4	107.4



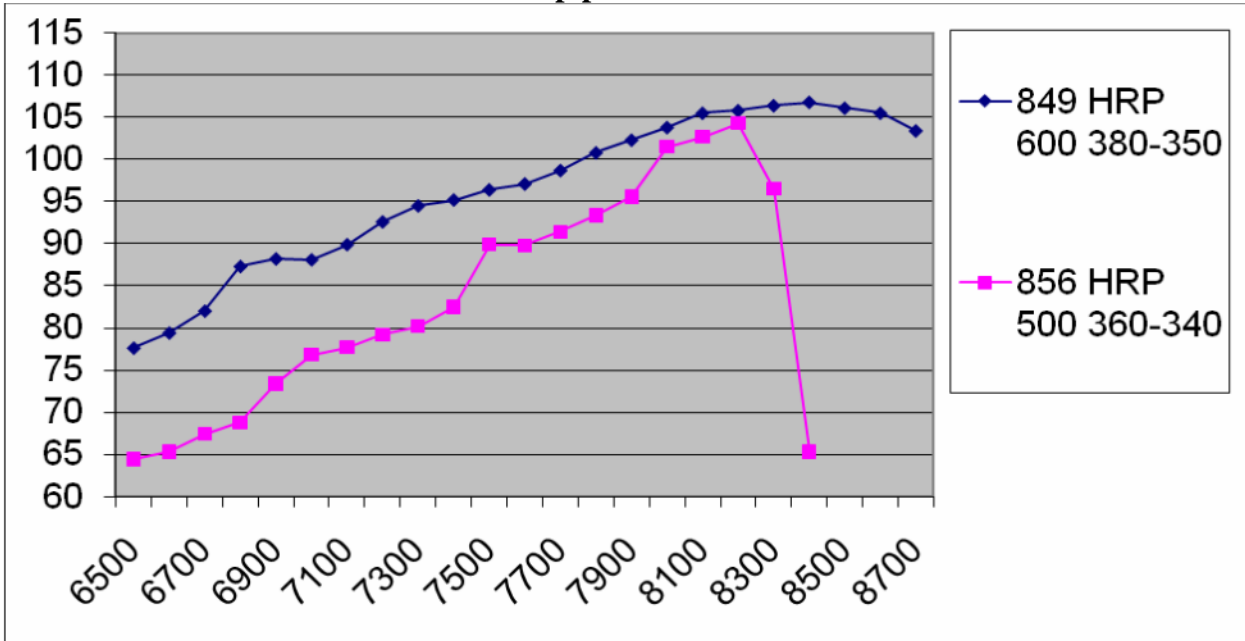
500 HRP - WPT



600- HRP - WPT



HRP pipe 500- 600



WPT pipe 500-600

