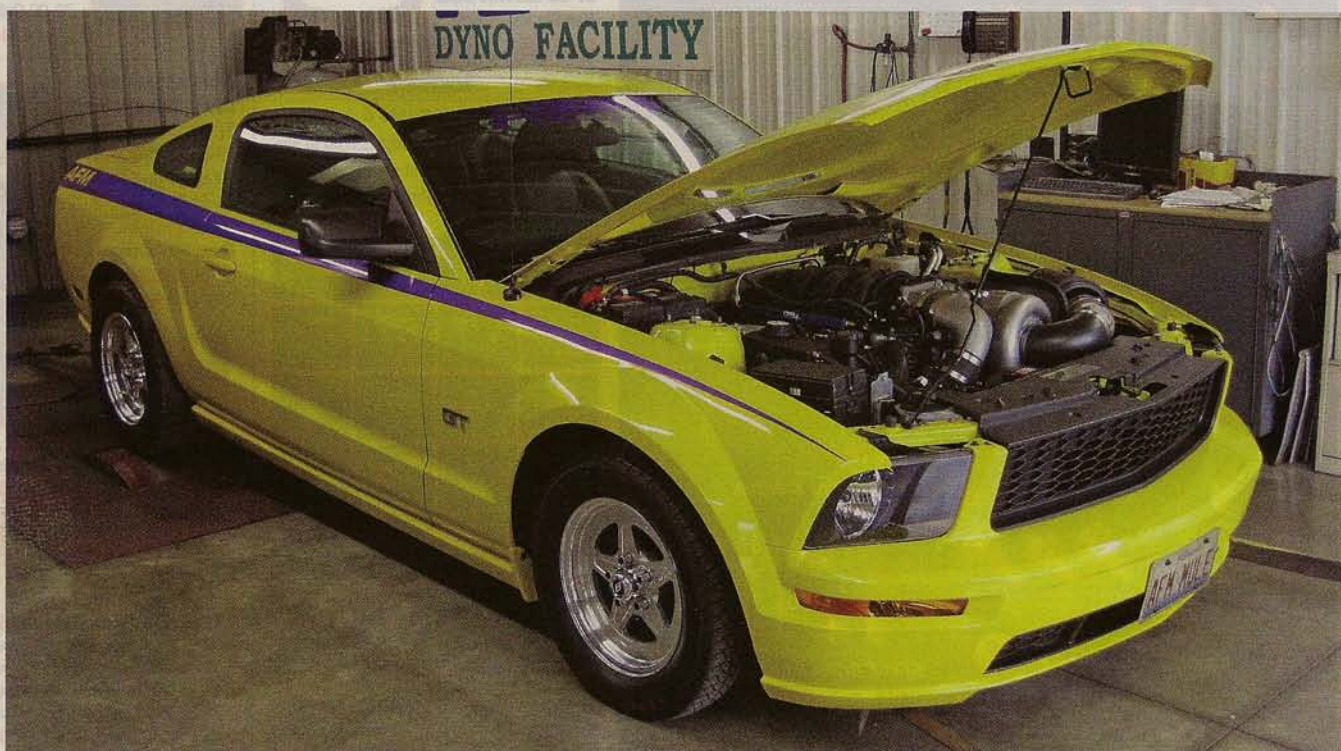


Centrifugal Horse

BOOSTING AN S197 WITH INTERCOOLED CENTRIFUGAL BLOWERS FROM VORTECH YIELDS IMPRESSIVE RESULTS



As you can imagine, we get constant queries about testing this, or doing a story on that. It's something we've covered many times before, but every so often we are introduced to a path not taken.

Such was the case when Rick Anderson at Anderson Ford Motorsport gave us a call about Vortech's air-to-air intercooler. He asked if we had ever tested a centrifugal blower configured with one of these charge coolers. We had not. Rick explained that the results, especially the air-charge

▲ Through various combinations Anderson Ford Motorsport's mule test car, an '05 Mustang GT, has spun the rollers of the AFM Dynojet 746 times. That's a lot of testing! To hold up to the boosted D.S.S. engine combo on the dyno, street, and dragstrip the engine is backed by an AFM Stage V clutch (PN AF-11.0-S5-26-S197; \$795), an AFM aluminum flywheel (PN AF-SLFW46-8; \$329), and a ProMotion Transmission (PN 05-09 3650 26-spline; \$1,650). So far the combo's been bulletproof while handling multiple 6,500-rpm, 20-plus-psi dyno pulls.

temps from this setup were impressive. Sounded like a good story to us.

Making it even more compelling is that even as positive-displacement blowers and turbos have grown in popularity, Rick has steadfastly maintained that a properly tuned centrifugal will deliver a better

performance at the dragstrip. "Centrifugals are linear," he explained. "You can put the power to the ground with a centrifugal. They are more tractable because as tire speed goes up horsepower goes up, so they don't fight the chassis."

With that in mind, we wanted to see

By **Steve Turner**
Photos courtesy of **Anderson Ford Motorsport**

Horse Sense: Anderson Ford Motorsport is best known for its Power Pipe inlet tubes, which started out as a way to reduce restriction and increase boost on centrifugally supercharged 5.0s. These days, AFM offers Power Pipes for all manner of supercharged and naturally aspirated applications.

just how this intercooled combo responded to a variety of superchargers and boost levels to truly max out its potential on 93-octane pump gas. So we asked Rick if he'd be willing to run the AFM in-house mule, an '05 Mustang GT, with all the streetable Vortech blowers, so you could see how the power builds differently with each blower. Always game for some testing,

Rick gladly agreed to strapping on Vortech's Si-, T-, JT-, and YSi-Trim superchargers to his boost-ready combo

That combo has already seen innumerable dyno pulls, and is proven ready to withstand the 20-plus pounds of boost it would see in our testing. Providing a rock-solid foundation to Rick's GT is a 4.6 Three-Valve Super Modular

Aluminum block (PN SM46 ALUMINUM 3V; \$4,999.95) from D.S.S. Competition Engines. It features D.S.S. Extreme X Forged Pistons, plasma-moly rings, tri-metal bearings, a KPC forged crankshaft, D.S.S. 4340 H-beam forged connecting rods, a D.S.S. Main Support, and a D.S.S. Level 10 CNC-prepped block. All told, the Super Mod short-block is far better suited to big

ON THE DYNO

We don't see as many centrifugal blowers on Mustangs as we did in the Fox days, but with numbers like these, it's a surprise. Rick tuned each combo for maximum performance on 93-octane pump gas, and to show he was really trying, he ran them all past the recommended supercharger redline. Rick isn't scared.

The dyno numbers are obviously listed, but even more interesting were the air-charge temperatures entering the engine. Starting with the Si-Trim fitted with a 2.7-inch pulley, Rick fired up the mule in a 71-degree dyno room. The results were 20 pounds of boost and a 90-degree air-charge temperature (19-degree increase). The T-Trim (PN 4FU218-110TSQ; \$3,348), wearing the same 2.7-inch pulley, spun 22 pounds off boost. The air going into the engine was 88 degrees, while ambient air in the dyno room was 70 degrees (18-degree difference).

Both the JT- and YSi-Trim wore a smaller 2.5-inch pulley. The JT-Trim (PN 05-06 V-4FU218-180JT;

\$5,664) cranked out 24.5 pounds of boost with a 90-degree air-charge temperature, while ambient air in the dyno room was 72 degrees (18-degree increase). Moving to the headlining YSi-Trim (PN 05-06 V-4FU218-180; \$5,664), boost jumped to 25.5 pounds with an 86-degree air-charge temperature, while ambient air in the dyno room was 71 degrees (15-degree increase).

"What was interesting with the

Vortech superchargers is as the blowers got bigger and the boost increased, the intake charged actual went down compared to the temp of the dyno room," Rick said. "I believe this is because of the Vortech impeller design."

It's certainly hard to argue with the results. When we left, Rick was still trying to turn up the wick with more boost and more fuel to support it.



RPM	SI-TRIM		T-TRIM		SI-TRIM VS. T-TRIM		JT-TRIM	
	POWER	TORQUE	POWER	TORQUE	POWER	TORQUE	POWER	TORQUE
2,500	152.89	321.19	150.36	315.86	-2.53	-5.33	157.03	329.89
3,000	202.00	353.64	205.58	359.90	3.58	6.26	208.52	365.05
3,500	287.88	431.95	284.30	426.58	-3.58	-5.37	300.43	450.80
4,000	372.17	488.65	367.97	483.11	-4.20	-5.54	391.01	513.38
4,500	457.33	533.77	460.97	538.02	3.64	4.25	488.76	570.43
5,000	526.13	552.68	534.03	560.95	7.90	8.27	566.50	595.07
5,500	560.07	534.83	566.74	541.19	6.67	6.36	603.08	575.89
6,000	575.18	503.49	586.72	513.59	11.54	10.10	628.00	549.72
6,500	549.85	444.30	584.07	471.94	34.22	27.64	606.57	490.15
6,750	n/a	n/a	568.83	449.28	n/a	n/a	578.87	457.82

RPM	T-TRIM VS. JT-TRIM		YSI-TRIM		JT-TRIM VS. YSI-TRIM	
	POWER	TORQUE	POWER	TORQUE	POWER	TORQUE
2,500	6.67	14.03	153.43	322.32	-3.60	-7.57
3,000	2.94	5.15	207.16	362.66	-1.36	-2.39
3,500	16.13	24.22	291.78	437.81	-8.65	-12.99
4,000	23.04	30.27	378.65	497.13	-12.36	-16.25
4,500	27.79	32.41	473.92	553.13	-14.84	-17.30
5,000	32.47	34.12	562.45	590.82	-4.05	-4.25
5,500	36.34	34.70	597.90	570.96	-5.18	-4.93
6,000	41.28	36.13	637.00	557.61	9.00	7.89
6,500	22.50	18.21	616.36	498.05	9.79	7.90
6,750	10.04	8.54	589.76	466.25	10.89	8.43

S-5795; \$369.99), and Shelby GT500 fuel pumps and 60 lb/hr injectors feed the fire with 93-octane fuel from the local gas pump.

All told, this combo easily supported over 600 horsepower, which is impressive from a stock-displacement, stock-cammed Three-Valve 4.6 engine. To see how Rick got her past 600 and keep the discharge temperatures shockingly low, keep reading. We think you'll be impressed with the results.

SOURCES 5.0



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▲ AFM's Cool Kit, feeding the various blowers in our test, offers an unrestricted inlet through an AFM Power Pipe, while the blower boosts through the Vortech intercooler, past a blow-through 85mm Abaco mass air meter. The blow-through arrangement allows for the most accurate mass-air measurement and great drivability with the side effect that Rick could read blower discharge temps right off the mass-air sensor. While you can't see it here, the setup is also configured with a Mondo bypass valve to handle the flow released by these big blowers when the throttle slams closed. Rick says this setup is really loud, so if you like that racy bypass valve sound, this deal is for you.



▲ We've covered the Vortech S197 installation in the past, and it's pretty straightforward, BUT time consuming. The big V provides detailed instructions, and if you aren't comfortable doing the work yourself, you can always turn to a trained professional. Once the kit is in place, it is quite easy to change out blower head units, as the Vortech design and mounting plate works across the entire line. All Rick had to do is loosen the belt, disconnect the oil feed and drain lines, and swap out the blowers on the mounting plate.

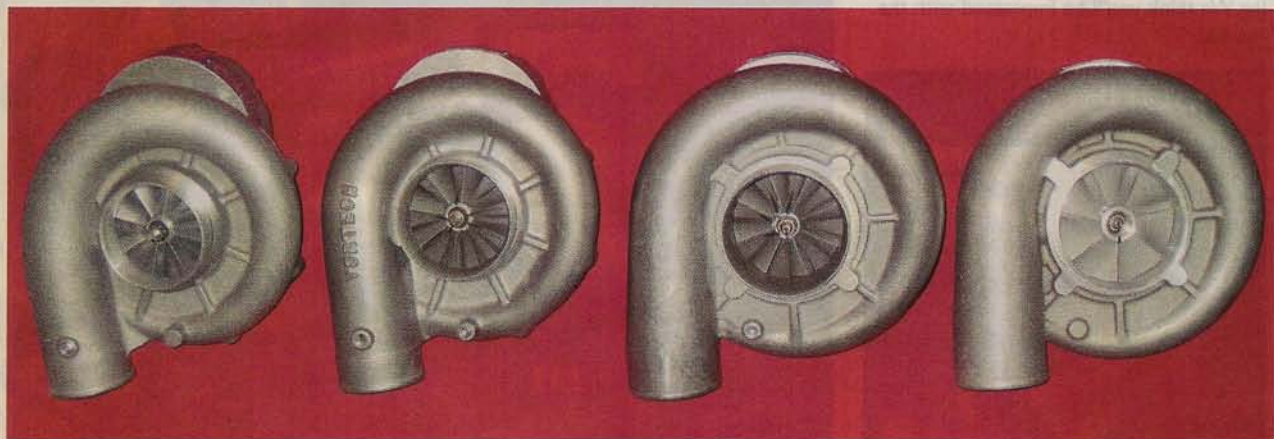
boost and big power than the fragile stock short-block.

Rick topped off the combo with a pair of AFM ported stock heads (\$1,200 plus cores), stock cams locked in the fully advanced position, a stock intake, and a stock throttle body. This stout but stock-appearing combo is fed by a Vortech Si-Trim tuner kit (PN 4FU218-110SQ;

\$3,063), which served as foundation for a variety of different head units. This was augmented by the AFM Cool Kit (PK-AAPP0506; \$2,295), which includes a Vortech air-to-air intercooler, Anderson Power Pipe (PN AF-0134c), DBX85 mass air meter (PN AB-DBX85), adapter harness (PN AB-P03) as well as the optional Vortech Mondo bypass valve

(PN V-8D103-001; \$277).

An Innovators West 10-percent Overdriven Damper (PN IW-804; \$425.00) maximizes the boost potential of the combo, while Kooks long-tube headers and X-pipe (PN KO-60210X; \$1,338.86) and Ford Racing mufflers (PN M-5230-5GT; \$489) release the fumes. Rick tuned it all up with a DiabloSport Predator (PN



▲ From left to right are Vortech's Si-, T-, JT-, and YSi-Trim superchargers. You can see as you move from blower to blower that the volute sizes and impeller designs change for a given performance level. Vortech rates the Si-Trim at a maximum output of 22 psi, 1,150 cfm, and 775 horsepower. The T-Trim maxes out at 26 psi, 1,200 cfm, and 825 hp. Stepping up to the JT yields maximums of 27 psi, 1,450 cfm, and 1,000 hp; while the YSi-Trim tops out at 30 psi, 1,600 cfm, and 1,200 horsepower. The Si-Trim features a 3.5-inch inlet and 2.75-inch outlet, while the T-Trim shares the same outlet size; its inlet is 3.75 inches. Both the JT- and YSi-Trim blowers feature 4-inch inlets and 3-inch outlets.

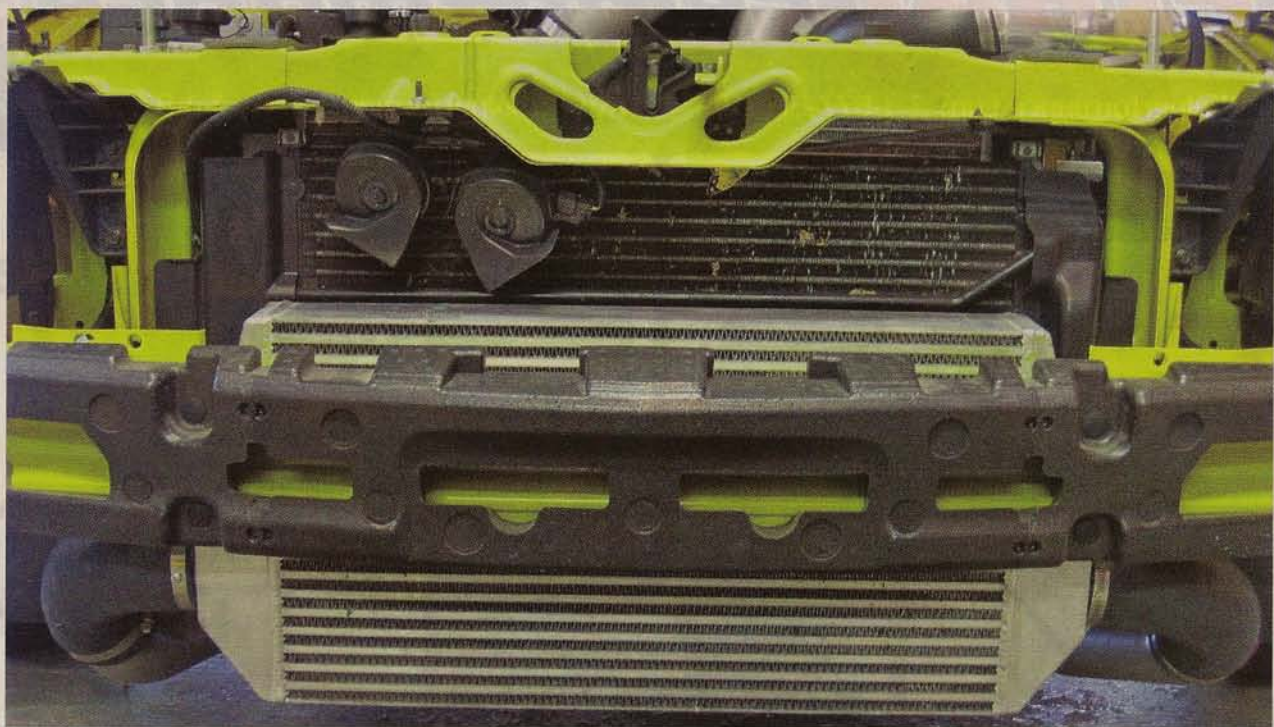


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▲ We are used to seeing triple-digit air-charge temperatures when we are dealing with force-induction applications. Not so with Vortech's air-to-air intercooler in place. This baby is really efficient at taking heat out of boost. It measures 24x13x3.5 inches and features 3-inch inlet and outlet tubes, and Vortech says it is capable of supporting up to 900 hp. In our testing this intercooler tamed the boost so that blower discharge temps were only 15-19 degrees higher than the ambient temperatures in the dyno room. That is crazy efficient on a stationary car. Imagine how well it does rolling down the road.

5.0

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1. Disconnect the Negative Battery Cable, remove the Serpentine Belt and remove the Air Filter Cover. (Clean that air filter, too!)



2. Gently remove the regulator plug from the Alternator, using a flat blade screwdriver, taking care not to break the clip.



3. Cut all three wires on the Power Output Plug - two #10 Black/Orange stripe wires and one #14 White/Black stripe wire.



4. Unbolt the Top Mounting Bolt (9/16") and the Bottom Mounting Bolt, the Bottom Mounting Bolt will be reused.



5. Wiggle the old unit front to back to loosen it and remove the Wire Loom Fastener. Remove the old Alternator from the car.



6. Crimp and Solder the new Terminals onto the 3 wires cut in Step 3. Seal the connections with the supplied Heat-Shrink Tubing.



7. Install the Alternator with the new Top Bolt and the old Bottom Bolt finger tight. Reinstall the Belt and tighten the bolts.



8. Connect both #10 Wires connect to the Stud on the Alternator with a 10mm nut. Clip the New Stator plug and the Regulator plug in place.

9. Reconnect the Battery Negative terminal. Start the Engine and check the output with a volt meter - You should be producing 12.5 Volts at Idle.

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