



Quick Six

FEWER CYLINDERS DOESN'T MEAN LESS POWER

text and photography by Ricardo Topete

Ford's latest rendition of the Mustang seems to be as popular today as when it was introduced to the public nearly two years ago. A well-balanced mix of power, agility, and sharp retro-styling has ensured its success. Even the "entry-level" V-6 Mustang performs quite admirably against other cars in its class.

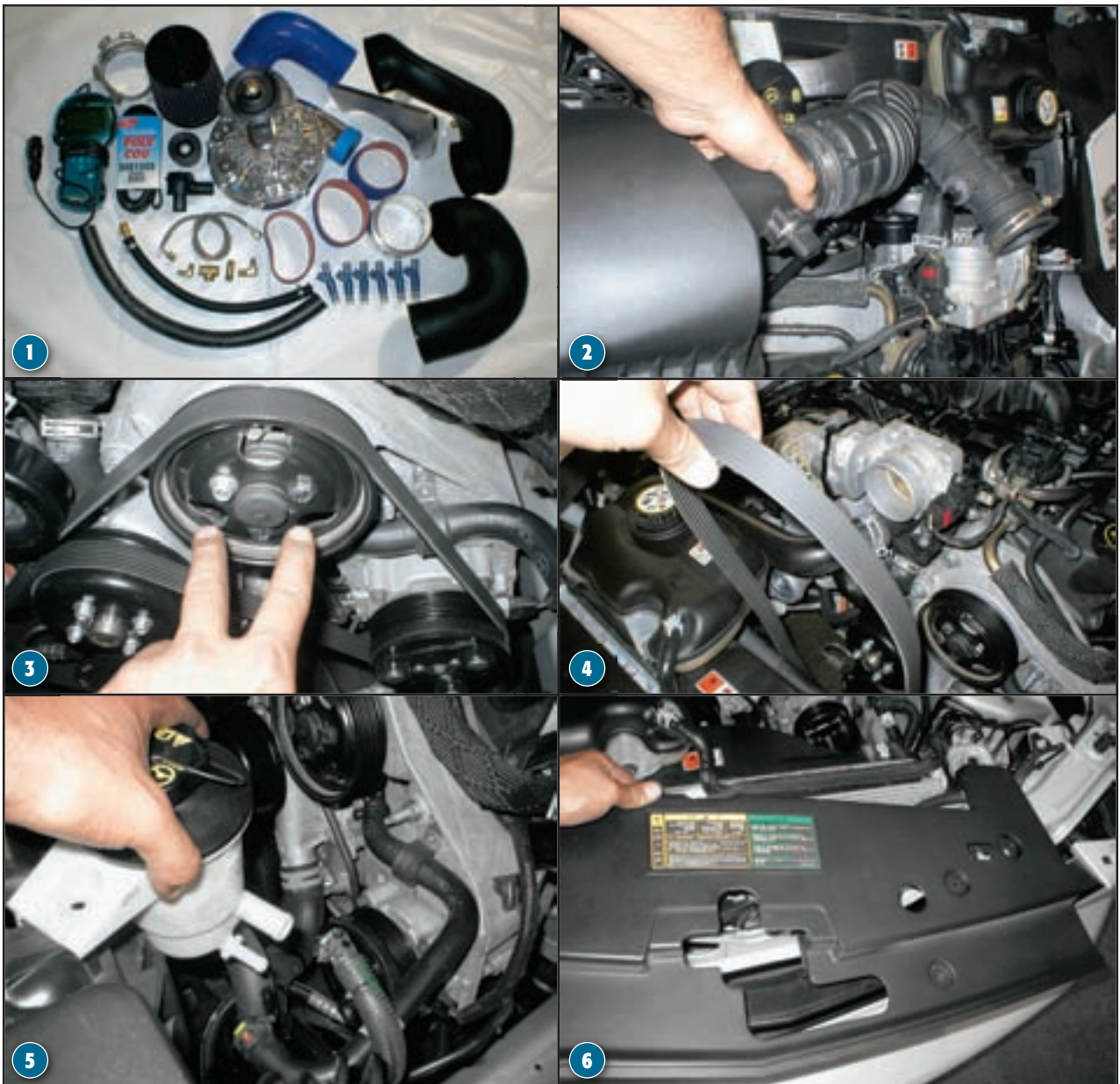
With athletic performance and fuel efficiency (EPA rated 19 city/25 hwy mpg) and lower insurance costs when compared to the Mustang GT, it is no mystery why the V-6 Mustang is a popular vehicle. Equipped with a 4.0 liter engine yielding 210 horsepower

and 240 lb-ft of torque (flywheel figures), this pony gallops well for most owners. However, most V-6 Mustang owners that read this publication are usually not content with stock performance. Survey the typical V-6 Mustang enthusiast and you'll find the

desire for more power at the top of their wish lists. If some is good, then more is better, right?

We at *Mustang Enthusiast* feel it our duty to inform you of new and effective ideas on how to build a better 'Stang. Because of that, we're taking an in-depth look at supercharging the '05-'06 V-6 Mustang. Superchargers have become an effective method of adding large doses of horsepower and torque to Mustangs. There are few other single upgrades that can match the performance gains offered by a supercharger, not to mention the wow-factor that a blower adds. When we got word that Vortech Engineering, a leader in superchargers, had developed a kit specifically for the new V-6 powered Mustang, we knew interesting things were in store for us.

Vortech has been building Mustang supercharger kits for decades, so they offer complete systems for most late-model Mustangs. Vortech provides everything necessary for a complete



installation, eliminating the guesswork and making this kit user-friendly. Some of the key components included with the Vortech kit for the '05-'06 V-6 Mustang are: the S-Trim supercharger (pumps out 8 psi boost at 6,000 rpm), the inlet and discharge tubing, a large 98 mm mass air flow housing, K&N air filter, bypass valve, larger 39 lb/hr fuel injectors, mounting brackets, serpentine belt, oil drain and oil feed lines, and a Diablosport Predator hand-held programmer to re-flash the stock computer.

The Predator provides a custom and safe Vortech-supercharged calibrated tune. Other cool features of the Predator are its ability to monitor live data (for example: read fuel pressure, coolant temperature, etc...) on virtually every

on-board sensor. It can also read and clear diagnostic trouble codes, otherwise known as "check-engine" lights. Best of all, the Predator allows for further tuning that may be required for vehicles that have other modifications, which means you will never have to purchase another tuner. The versatile Predator can easily adapt to your Mustang's on-going modifications.

Intangible features of the Vortech supercharger are a three year/36,000 mile warranty, smog-legal status, and of course the famous and melodious Vortech supercharger gear-whine that we all crave. Still not impressed? For you power-hungry types, Vortech has a 10 psi kit fitted with their unique air/water intercooler. Naturally, the

1 These are the components of the kit you get from Vortech. It can be installed in a couple of days by professionals and not something you want to try if you don't have the proper tools or experience.

2 Remove the intake from air filter housing up to throttle body.

3 Replace original bolts on power steering pulley with supplied low-profile bolts.

4 Relieve tension from belt tensioner and remove original belt.

5 Drain and remove the power steering reservoir.

6 Remove the plastic radiator cover.



intercooled version produces a higher level of performance. By now, most of you are figuring out how to sell your first-born child in order to purchase a Vortech supercharger kit. Such drastic measures are not required as Vortech's suggested retail price for the '05-'06 V-6 kit is \$3,295, while the charge cooled model carries an MSRP of \$4,295. Want some show along with the go? Vortech offers a polished finish on either kit for a couple hundred bucks more.

We teamed up with GTR High Performance in Rancho Cucamonga, California, to observe the installation of a Vortech supercharger system on Charles Abjornson's 2006 Mustang V-6. GTR has been serving the Mustang community since 1997. Using their in-house Dyno-Jet Chassis dynamometer, GTR performed

7 Attach the supplied hoses and mounting bracket to the power steering reservoir.

8 Relocate your power steering reservoir on the passenger side in order to make room for Vortech supercharger.

9 Temporarily remove the coil pack. This will allow access to the fuel rail.

10 Disconnect all fuel injector harnesses and unbolt fuel rail in order to remove fuel injectors.

11 At this point, you will be able to notice

dyno testing on Charles's V-6 before and after the install. The car was fitted with an automatic transmission, a set of JBA shorty headers, and a dual exhaust

the supplied fuel injector is much longer than the stock fuel injector.

12 Install new fuel injectors with supplied fuel rail spacers. Re-assemble fuel rails and coil pack.

13 Remove original hardware that secures power steering pump bracket and replace with new supplied hardware and spacers for Vortech.

14 This is an assembled shot of the Vortech supercharger with supplied mounting bracket and oil drain line.

system, but everything else was factory-stock. Once strapped to the rollers, the pre-supercharged Mustang laid down a peak of 173 hp at 4,900 rpm and 196 lb-ft



15 Install the Vortech assembly and secure it with the provided hardware.



16 Assemble the supplied discharge tube between the throttle body and Vortech supercharger.



17 Install the inlet tube to the supercharger using supplied hose clamps and silicone connectors.



18 Assemble the supplied mass air flow housing, K&N filter and remaining inlet ducting with supplied parts.



19 Assemble provided bypass valve as shown. Hoses may be trimmed for best fit.



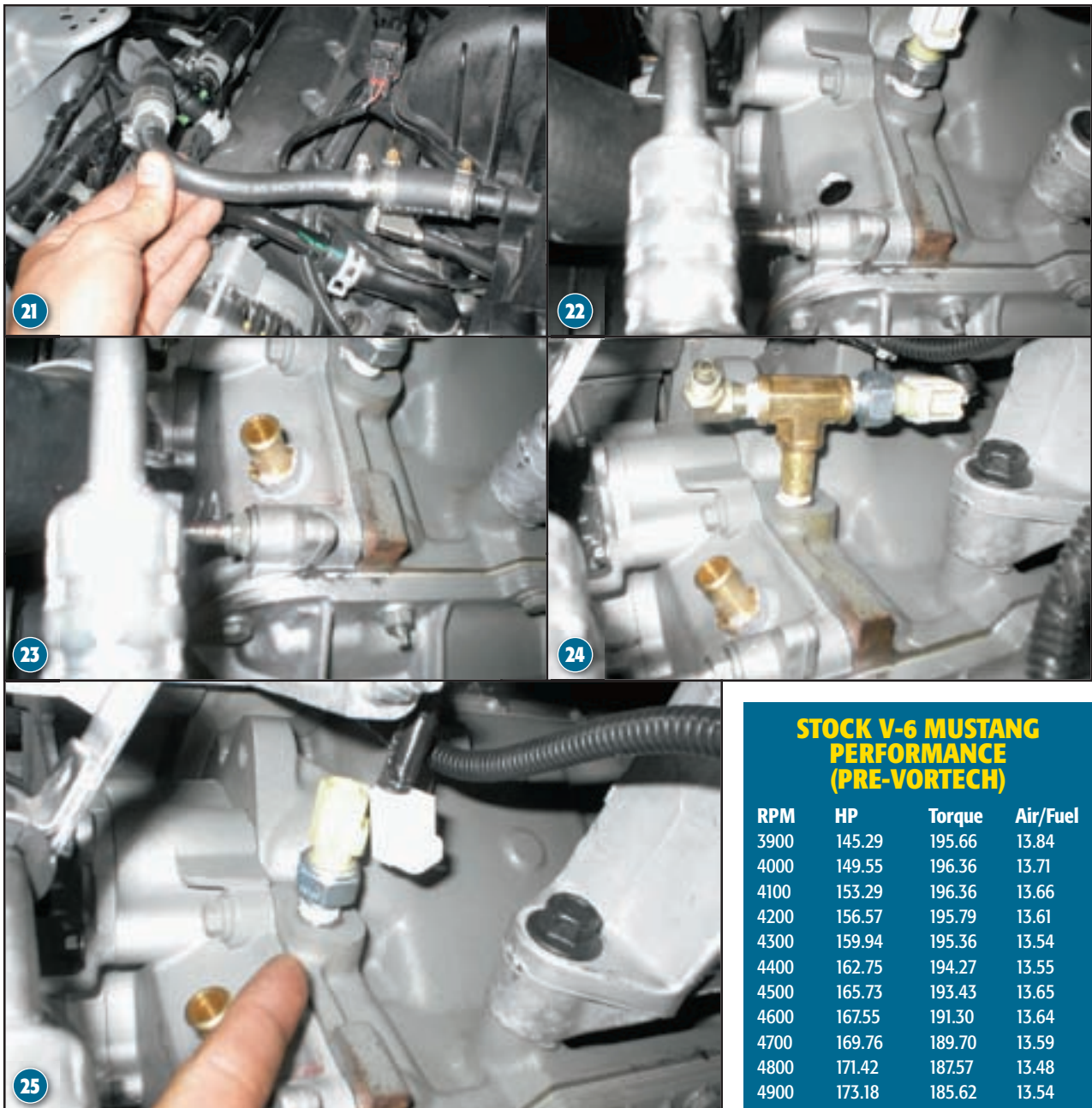
20 Install bypass valve. Connect it between discharge tube and inlet duct.

of torque at 4,100 rpm to the tires.

GTR made the project look simple, and for the mechanically-inclined with access to an assortment of tools, it is relatively straightforward. According to Vortech, installation time for the base, non-intercooled kit is 8-12 hours and 12-16 hours for the more complex intercooled system. A job of this magnitude is certainly not recommended for the inexperienced backyard mechanic. If you fall into this category, GTR High Performance, or any other qualified speed shop, can make short work of it for you.

Upon installation of the Vortech system, the crew at GTR anchored down the Mustang to the dyno for further testing. The mighty V-6 revved with authority; a sure-fire sign that more power was on tap. When the rollers stopped, the Vortech-assisted V-6 had spit out 248 hp at 5,700 rpm and 250 lb-ft of torque at 4,700 rpm. Notice that these results were achieved with only a modest 5 psi boost. Overall, peak gains of 75 hp and 54 lb-ft of torque were reached. Even more impressive were the gains across the entire rpm range (see the charts at the end for results). Mid-range power is significantly improved and it gives the spirited V-6 much needed punch. Consider the 63 lb-ft torque jump at 4,900 rpm with a mere 3.4 psi boost! The above results were achieved using the "default out-of-the box" tune, which yielded a conservative 12.2:1-12.4:1 air/fuel ratio.

A bit of dyno-tuning by GTR would undoubtedly result in higher power output. For this story, we were not



STOCK V-6 MUSTANG PERFORMANCE (PRE-VORTECH)

RPM	HP	Torque	Air/Fuel
3900	145.29	195.66	13.84
4000	149.55	196.36	13.71
4100	153.29	196.36	13.66
4200	156.57	195.79	13.61
4300	159.94	195.36	13.54
4400	162.75	194.27	13.55
4500	165.73	193.43	13.65
4600	167.55	191.30	13.64
4700	169.76	189.70	13.59
4800	171.42	187.57	13.48
4900	173.18	185.62	13.54

concerned with trying to achieve the highest possible gains for a couple of reasons. First, we used only commonly available 91 octane fuel, which dictates a conservative tune for maximum engine life-span. Second, we wanted to get an idea of what the average enthusiast can expect simply by bolting on the Vortech kit as it is offered. No custom tuning and no special horsepower tricks were employed. Again, there are even further gains possible with mere tuning utilizing the Predator supplied with the supercharger.

To put this in perspective, a factory-stock '05-'06 Mustang GT V-8 with manual transmission belts out around

260 horsepower and 280 lb-ft of torque to the tires. As you can see, this V-6 supercharged Mustang is not that far behind. Moreover, given the V-6 Mustang's slight weight advantage, it would make for a very interesting and close drag-race! Can you say "Sleeper?"

Raw data and numbers are nice; however, we don't drive dynos, so a test drive was needed to verify the findings. A quick spin (literally) around the block confirmed massive doses of new-found power. The Mustang pulls hard to redline in every gear with vigor. Gone is the soft bottom-end power that plagued the stock V-6. Driveability under all conditions is very civilized and

21 Assemble the supplied PCV valve between passenger valve cover and intake manifold.

22 Drill and tap a hole in oil pan in specified location.

23 Install the supplied fitting into the oil drain hole in oil pan and connect oil drain hose from supercharger.

24 Temporarily remove the factory oil pressure sending unit.

25 Install a supplied T-fitting where the oil pressure sending unit had been. Assemble the stock sending unit and fittings as shown. Install oil feed line to supercharger.



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26 Installation is complete. This is what an installed and finished Vortech supercharger kit should look like.

27 The job is done. Now, let's take it back to the dyno.

28 We have the figures from before. Let's

see what the difference will be.

29 The car has been secured. We'll start rolling.

30 Though you may not be able to tell, the car is moving and reaching into the higher rpm range. The end result showed power gains across the entire range.

SUPERCHARGED V-6 MUSTANG PERFORMANCE (POST-VORTECH)

RPM	HP	Torque	Air/Fuel	BOOST
2900	125.80	227.78	14.83	0.12
3000	130.82	229.01	14.67	0.04
3100	136.30	230.91	14.27	0.03
3200	141.76	232.67	13.79	0.10
3300	147.06	234.05	13.42	0.24
3400	151.76	234.43	13.11	0.41
3500	155.79	233.77	12.92	0.58
3600	161.57	235.72	12.74	0.76
3700	167.76	238.13	12.55	0.96
3800	173.34	239.58	12.43	1.09
3900	178.20	239.98	12.39	1.12
4000	183.84	241.38	12.34	1.11
4100	189.62	242.91	12.28	1.05
4200	194.85	243.65	12.27	1.32
4300	201.32	245.90	12.28	1.72
4400	206.99	247.08	12.28	1.85
4500	211.98	247.41	12.25	1.88
4600	218.09	249.00	12.24	2.40
4700	223.75	250.03	12.23	3.00
4800	226.98	248.36	12.25	3.32
4900	231.67	248.32	12.27	3.46
5000	234.02	245.82	12.30	3.24
5100	239.30	246.44	12.33	3.09
5200	242.42	244.85	12.36	3.11
5300	243.46	241.27	12.39	3.33
5400	245.47	238.75	12.41	3.76
5500	246.61	235.50	12.39	4.03
5600	247.44	232.08	12.35	4.24
5700	248.02	228.53	12.35	5.03
5800	246.44	223.16	12.34	5.39
5900	243.70	216.94	12.32	4.52

refined. No surging idle, no hesitation under initial throttle application, just pure performance. The characteristic Vortech supercharger gear whine is subtle enough that it never becomes obtrusive, yet prominent enough that it leaves no doubt that you have something special under the hood. Best of all, if you have the willpower to stay out of boost, mileage remains unaffected, which for many, is a key reason why a V-6 was purchased over a V-8. Interesting concept isn't it? Imagine having performance that will rival a V-8 out of a fuel efficient and insurance friendly V-6 Mustang. ■

SOURCES

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