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5.0 MUSTANG & SUPER FORDS

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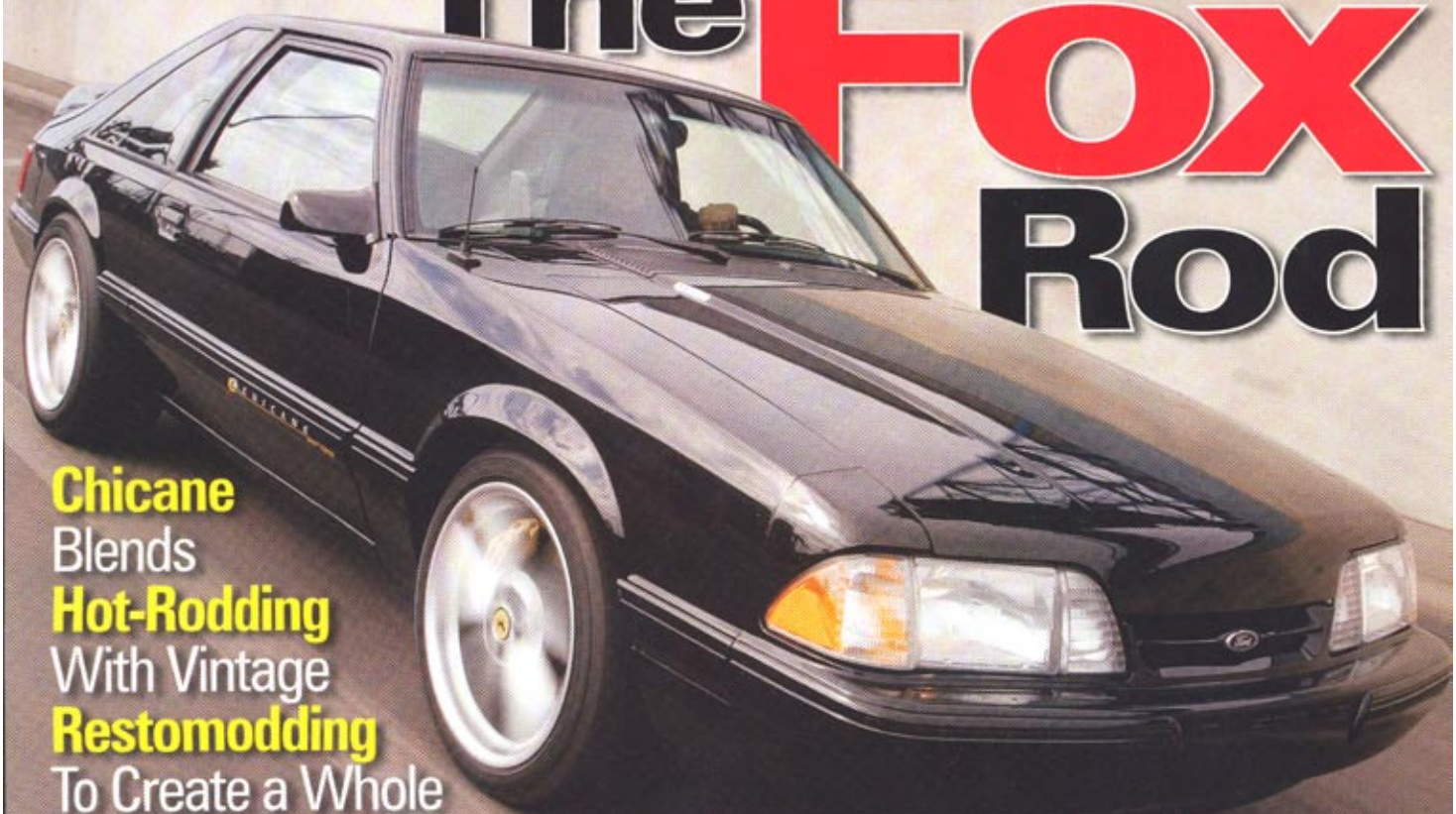

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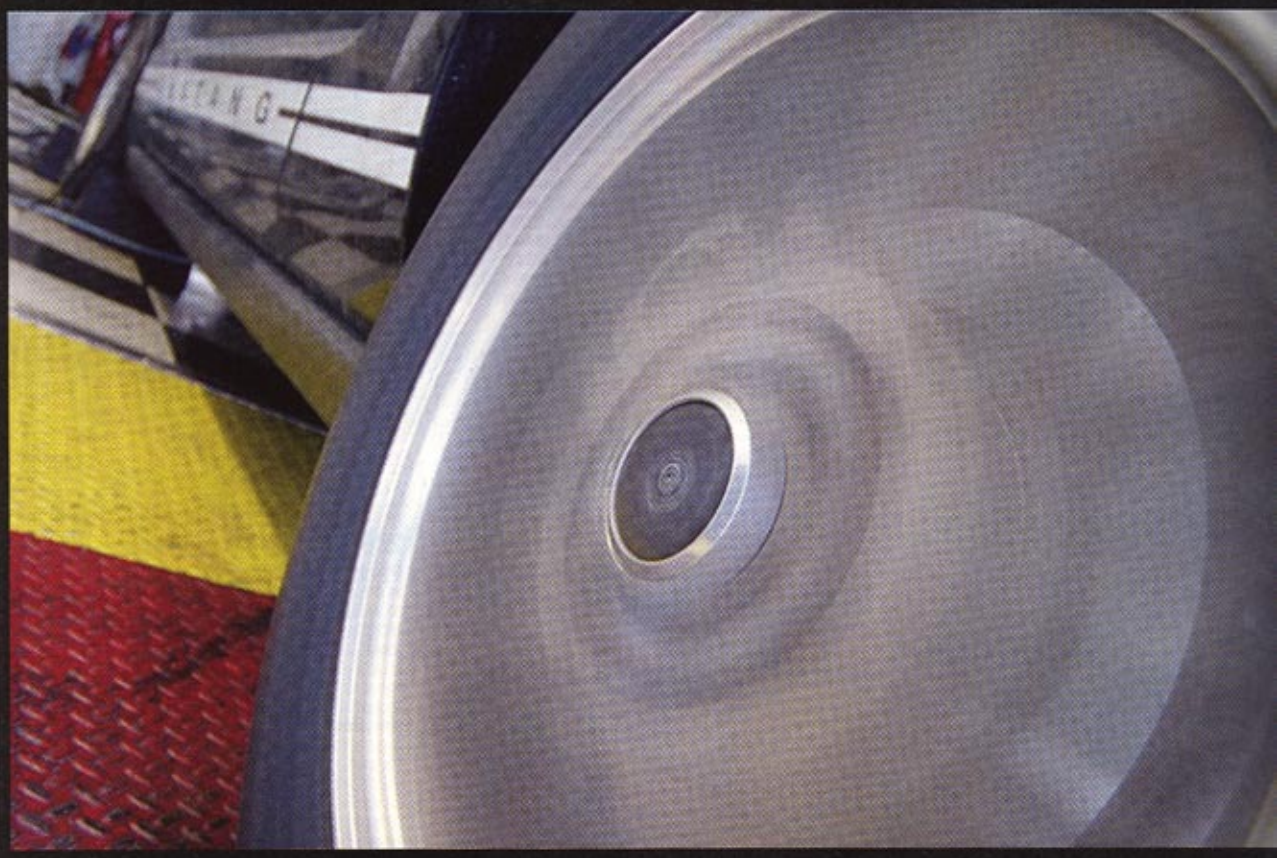


Six Toys

A FEW BOLT-ONS AND A QUICK FLASH MAKE SIX EXCITING IN THE NEW MUSTANG

If you've historically regarded a V-6 Mustang as nothing more than a sure cure for insomnia, you may want to recalibrate your mental processor when it comes to the '05's feisty 4.0 SOHC six-banger. While still playing second fiddle in the Mustang powertrain symphony, the current bent-six is worlds ahead of its pushrod predecessor in both power and personality. The consensus around here is that this year's V-6 'Stang would

▲ *Get used to the thought and sight of '05 V-6 Mustangs spinning their wheels—on both the chassis dyno and the pavement—especially after a few simple bolt-ons and an electronic tune-up. Older stock GTs beware: This V-6 is not an easy target.*

◀ *Our affordable laundry list of V-6 bolt-ons consisted of CARB-exempt, Cat4ward shorty headers and an Evol muffler from JBA, along with PHP's conical-filtered replacement for the factory airbox/inlet tube. JBA also sent along a set of stylish blue PowerCables for the V-6, but we ran out of time to install and test them.*

Text and Photos by **Dale Amy**

Horse Sense: Though the V-6 usually handily outsells the GT, Ford sources recently commented that for the '05 model year V-8s would account for nearly 70 percent of Mustang production.

▲ Jumping right in, we decided to install the headers and muffler first, see what they did on the dyno, then go back and finish with the new airbox, which Paul correctly surmised would necessitate a reflash to reestablish correct A/F ratios. This is the V-6's Y-pipe, which we didn't mess with for the exhaust modifications. JBA's instructions suggest removing it to install the headers, but PHP's Mike Sears proved it could be done with the Y-pipe still in place.

▲ In a refreshing change from typical Mustang V-8 header swaps, about the only work Mike had to do under the car was unbolt the Y-pipe from the factory manifolds and disconnect the quartet of oxygen sensors. Everything else could be achieved from up top. Obviously the line workers were in good spirits the day this ragtop was assembled—check out the smiley face drawn on the oil pan.

▲ We suggest starting with the driver side to get the toughest part out of the way first. Extra chores on this side include disconnecting the EGR tube (a 27mm or 1¹⁄₁₆-inch open-end is the tool of choice), removing the dipstick and its bracket, and unbolting the legs of the coil-pack bracket from the cylinder head on the side and the exhaust manifold on top. The header install moves the coil pack outboard by the thickness of the header flange, and little offset brackets are included to compensate at the coil-pack-to-intake mounting positions.

JBA Equipped - Fastest 4.6L 3v Mustang

Sutton High Performance - 2005 Mustang 4.6L - Vortech supercharger
Horsepower - 665rwhp • 1/4 Mile - 9.82 @ 136 mph

JBA Equipped - Falken Tire Drift Mustang

JBA Equipped - 192mph Top Speed

Vortech Superchargers - 2005 Mustang 4.6L 3v
Horsepower - 575 • Top speed - 192 mph

THE DYNO SPEAKS

RPM	Stock POWER	Stock TORQUE	JBA Headers and Muffler POWER	JBA Headers and Muffler TORQUE	Difference POWER	Difference TORQUE	Exhaust, Airbox, and Tune POWER	Exhaust, Airbox, and Tune TORQUE	Difference POWER	Difference TORQUE	Overall Difference Stock vs. Exhaust, Airbox, and Tune POWER	Overall Difference Stock vs. Exhaust, Airbox, and Tune TORQUE
3,300	116.5	185.4	121.3	193.0	4.8	7.6	133.2	212.0	**11.9**	**19.0**	16.7	**26.6**
3,400	121.9	188.2	130.0	200.7	8.1	12.5	137.3	**212.1**	7.3	11.4	15.4	23.9
3,500	126.2	**189.4**	136.4	204.7	10.2	15.3	140.9	211.4	4.5	6.7	14.7	22.0
3,600	130.0	189.6	140.9	**205.6**	10.9	16.0	144.4	210.7	3.5	5.1	14.4	21.1
3,700	133.3	189.3	144.6	205.2	11.3	15.9	148.3	210.5	3.7	5.3	15.0	21.2
3,800	136.6	188.7	148.0	204.6	11.4	15.9	152.2	210.3	4.2	5.7	15.6	21.6
3,900	139.6	188.1	151.3	203.8	11.7	15.7	155.8	209.8	4.5	6.0	16.2	21.7
4,000	142.6	187.2	154.4	202.8	11.8	15.6	159.2	209.0	4.8	6.2	16.6	21.8
4,100	145.2	186.1	157.4	201.7	12.2	15.6	162.5	208.2	5.1	6.5	17.3	22.1
4,200	147.6	184.6	160.4	200.6	12.8	16.0	165.7	207.2	5.3	6.6	18.1	22.6
4,300	150.0	183.2	163.2	199.3	13.2	**16.1**	168.5	205.8	5.3	6.5	18.5	22.6
4,400	152.4	181.9	165.7	197.8	13.3	15.9	171.1	204.3	5.4	6.5	18.7	22.4
4,500	154.6	180.4	168.1	196.2	13.5	15.8	173.4	202.4	5.3	6.2	18.8	22.0
4,600	156.7	178.9	170.1	194.2	13.4	15.3	175.4	200.2	5.3	6.0	18.7	21.3
4,700	158.5	177.2	171.8	191.9	13.3	14.7	177.0	197.8	5.2	5.9	18.5	20.6
4,800	160.1	175.2	173.3	189.6	13.2	14.4	178.8	195.6	5.5	6.0	18.7	20.4
4,900	161.3	172.9	174.9	187.5	13.6	14.6	180.3	193.3	5.4	5.8	19.0	20.4
5,000	162.2	170.4	175.9	184.8	13.7	14.4	181.0	190.2	5.1	5.4	18.8	19.8
5,100	163.7	168.6	176.2	181.4	12.5	12.8	181.4	186.8	5.2	5.4	17.7	18.2
5,200	166.8	168.5	176.5	178.3	9.7	9.8	183.3	185.1	6.8	6.8	16.5	16.6
5,300	170.3	168.7	178.4	176.8	8.1	8.1	187.4	185.7	9.0	8.9	17.1	17.0
5,400	**170.9**	166.2	182.3	177.3	11.4	11.1	**190.6**	185.4	8.3	8.1	19.7	19.2
5,500	168.8	161.2	**185.3**	177.0	16.5	15.8	189.4	180.9	4.1	3.9	**20.6**	19.7
5,600	167.1	156.7	184.1	172.7	**17.0**	16.0	185.5	174.0	1.4	1.3	18.4	17.3
5,700	165.8	152.8	180.0	165.8	14.2	13.0	183.0	168.6	3.0	2.8	17.2	15.8
5,800	164.3	148.8	178.3	161.4	14.0	12.6	181.1	164.0	2.8	2.6	16.8	15.2
5,900	163.3	145.4	176.9	157.4	13.6	12.0	178.0	158.4	1.1	1.0	14.7	13.0
6,000	159.8	139.9	172.2	150.8	12.4	10.9	174.9	153.1	2.7	2.3	15.1	13.2
6,100	158.2	136.2	172.6	148.6	14.4	12.4	171.7	147.8	-0.9	-0.8	13.5	11.6
6,200	154.0	130.5	166.0	140.7	12.0	10.2	167.6	142.0	1.6	1.3	13.6	11.5

The dyno duo—SCT's Chris Johnson and PHP's Paul Svinicki—confer in developing a calibration to take advantage of both the day's bolt-ons and the use of premium fuel. Both believe the V-6's factory calibration leaves less room for improvement than does the new GT's, especially in the area of electronic throttle control. Even so, the car responded to its reflash with more power and torque, and much improved shifting.

Paul and Chris were careful to monitor air/fuel ratios after each round of bolt-ons. While the headers and muffler did not appreciably alter WOT A/F, the new airbox did, meaning recalibration was, at that point, essential. Chris Johnson rolled into town that day with a beta-testing version of SCT's latest tuning software, called Advantage III, as well as a working prototype of the new Xcalibrator 2, which combines the flash-tuning capabilities of the previous Xcalibrator with the datalogging powers of the SCT Raptor. Production versions of the new Xcalibrator 2 are now available. Chris and Paul put his new toys to good effect.

On the tuning side, overall observations are that Ford left a lot less on the table with the factory '05 V-6 programming than it did with the Three-Valve V-8. While there are clearly power and response gains with a recalibration—especially one made to take advantage of premium fuel—the gains are not as dramatic as on the '05 GT. But because of the firm grip the Spanish Oak engine management has on all aspects of vehicle behavior, recalibration will become a practical necessity after any significant engine mods, and even on those as seemingly insignificant as swapping to a high-flow airbox.

As for our bolt-on modifications, we were all pretty surprised at the gains produced by the JBA headers and muffler, with point-to-point increases of as much as 17.0 rwhp at 5,700 rpm, and 16.1 lb-ft at 4,300. Even better, the gains were most apparent in the mid-rpm levels, meaning a nice bit of extra thrust is available in everyday driving situations. Adding the airbox and re-cal provided additional single-digit increases pretty much throughout the powerband, though the gains were again most obvious in the midrange. Overall point-to-point increases were as high as 20.6 rwhp at 5,500 revs, and 26.6 lb-ft down at 3,300 rpm. If you can't feel that type of power gain, maybe you should be driving a Yugo—so we'd have to say the 4.0 V-6 responds rather well to simple bolt-ons. Now bring on those power adders...

JBA Equipped - Foose Stallion

Foose Designs - 2006 Mustang 4.6L 3v
Limited Edition

JBA Equipped

Paul's High Performance
2005 Mustang 4.0L V6, 5 spd
with JBA Cat4ward® Headers,
JBA Exhaust and 75hp ZEX Nitrous Kit
279.3 hp and 361.2 lb ft
1/4 Mile - 12.80 @ 105.85 mph

JBA Equipped - CDC Glassback

Classic Design Concepts - 2006 Mustang 4.0L V6 - Glassback
JBA dual exhaust conversion with JBA Cat4ward® Headers

make a darn good daily driver right out of the box. And, as we were to discover in a recent outing to Paul's High Performance, it also responds well to physical and electronic tweaking.

The aftermarket is stepping up to the plate with some fairly serious power adders for this engine, but in the meantime Paul Svinicki decided to test fit some quick-breathing bolt-ons and also see what might be found via recalibration. Paul's relatively inexpensive shopping list

ROAD WORK

Dyno numbers are fine, but since most V-6 owners will use their Mustangs as daily commuters, how modifications translate to the seat of the jeans is even more important. With that in mind, I drove our subject black convertible in baseline form and again after modification. This was also the first '05 V-6 I had ever sampled. The ragtop was virtually new and utterly stock except for the swap of a 3.73 gearset in place of the factory 3.31s (a rear-gear swap on an automatic also necessitates a quick recalibration, since the Spanish Oak processor also oversees transmission shift characteristics and timing, and bases some of these calculations on the programmed axle ratio).

In baseline form, the ragtop surprised us with its frisky disposition, having electronic-throttle-control programming that felt much better and more linear than any of the '05 GTs I've driven. Some of this spirit no doubt resulted from the steeper gearset, but the extra ratio of the five-speed automatic also helps tremendously, making the self-shifting version worth serious consideration, especially if rush-hour traffic is a regular threat. Even the factory exhaust note is pleasantly sporting.

After a day of bolt-on mods and dyno testing, Chris Johnson finished up his calibration sitting in the copilot's seat as I pedaled the notably stronger V-6 around PHP's Jackson, Michigan, neighborhoods. The purpose of the joyride was to test and finalize auto-shift calibrations, the result of which was satisfyingly crisp gear changes without a hint of harshness. The intake and exhaust upgrades and reflash combined for some gratifying midrange punch, as if additional cubic inches had magically come onboard. We're not kidding when we say this thing felt every bit as strong and willing as a stock older GT—not bad for a car that weighs more and gets notably better gas mileage.

We liked the sound of the JBA header/muffler combo. With it the V-6 emitted a smooth, dare we say *Euro-sounding* note, deeper and more vocal than factory but never enough to attract unwanted attention even at WOT. It was just loud enough to drown out the sound of rubber chirping as the energized convertible hustled through the gears. Overall, we'd have to say our first round of '05 V-6 bolt-ons was a resounding success.

▲ *There's sufficient working room around the exhaust manifolds that all six of their fasteners can be easily accessed from up top. JBA's instructions say to remove all manifold studs, and use the kit's bolts and lock washers to secure the headers. Though new ones are in the kit, Mike chose to reuse the factory steel manifold gaskets.*

▲ *The 4.0-liter V6 manifolds don't look all that restrictive, resembling the swoopy 427 FE cast-iron manifolds of the '60s. Looks can be deceiving however, as the JBA Cat4wards, with their 1.5-inch mandrel-bent primaries and proper collector design, provided surprising boosts in both horsepower and torque.*

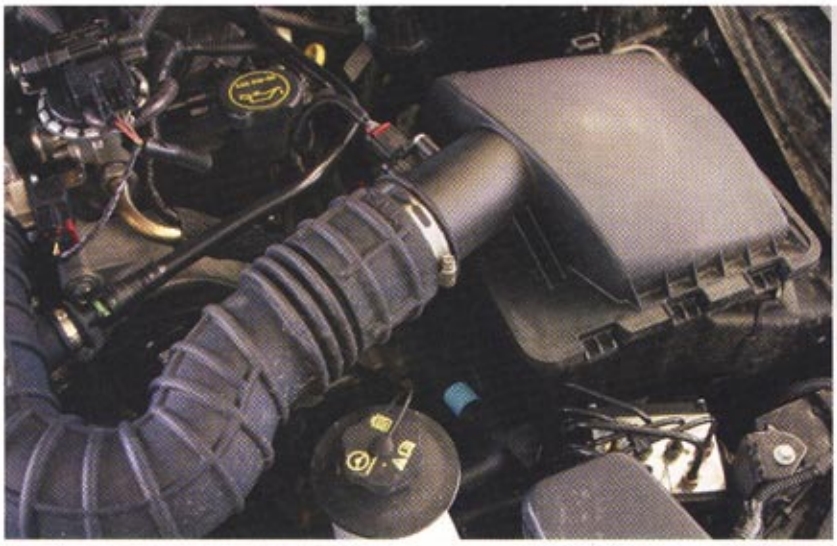
▶ *After the headers and muffler were bolted up, the car went on the Dynojet for some interim testing. Afterwards, it was time to plug in PHP's short-ram airbox replacement, made up of a generous conical filter and a powdercoated aluminum inlet/mass air tube.*

SCT'S LATEST TOY

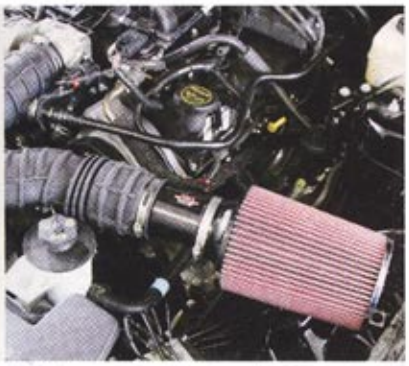
With all the major players in the market today when it comes to electronic tuning, to stand still is to be trampled. Not that long ago we expounded on the datalogging capabilities of SCT's Raptor, and we've watched the company's original Xcalibrator flash tuner—not that many months old itself—in use during many of our recent tuning/dyno tech trips.

Now the flash-tuning capabilities of the original Xcalibrator have been combined with the Raptor's datalogging skills in the new Xcalibrator 2. Like the original, the Xcalibrator 2 will hold up to three custom tunes along with your processor's stock calibration, yet is notably faster and has "updatable" firmware via USB connection, and will read and clear processor error codes. It'll flash and datalog any Ford OBD-II processor, has analog input to allow logging of, for instance, a wide-band oxygen sensor, and can even permit some incremental customer adjustments to a tune.

Competition is a great thing...



▲ The PHP setup simply replaces the factory hardware outboard of the flexible inlet tube. Removal starts with loosening the band clamp visible here, and disconnecting the mass air meter wiring harness.



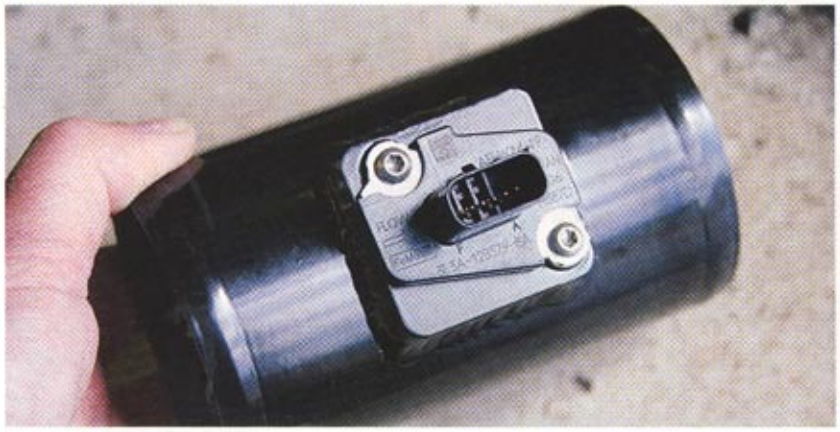
▲ At $159, PHP's air inlet is an affordable and easily installed way to let the 4.0 cammer six breathe a little deeper. But beware—the '05 Spanish Oak processor is a sensitive beast and must have its mass air curve, or transfer function, recalibrated to account for the improved airflow. Before recalibration, wide-open throttle air/fuel ratios had leaned out from a normal 13.1:1 to as high as 14.5:1 with the new filter setup. In other words, putting this or any other high-flow air-filter setup on a new V-6 Mustang might actually decrease WOT power unless accounted for in the processor calibration.

▲ At the outboard end, a single bolt secures the rectangular airbox to the inner fender. With this removed, the airbox/mass air assembly can be lifted out.

▲ Optionally, you can slice the stock airbox's rubber bushing and use the lower slim portion as an isolator when bolting the new filter assembly to the stock inner fender location. Don't try to use the bushing at full height, however, as the filter would mash up against the hood liner.

◀ The next step is to transfer the mass air electronic "wafer" out of the plastic factory inlet. Undoing two Torx T20 fasteners does the trick.

▼ When fitting the MAF wafer in the PHP inlet tube, be wary of the airflow-direction arrow visible here. Needless to say, if the MAF is installed backwards, good things won't result.



started with short-tube headers and a muffler from JBA, then continued with PHP's simple and affordable V-6 airbox, and finished up with a thorough reflash using a beta version of Superchips Custom Tuning's new Advantage III software teamed with a prototype of the company's latest Xcalibrator 2 tuner/logger.

By day's end, we had coaxed our subject '05 automatic ragtop's 4.0 V-6 output up to nearly 191 rear-wheel horsepower and 212 lb-ft of torque, making it a potential threat to many an unwary stock 5.0 or '96-'98 GT. Check out our driving and dyno sidebars for the happy story. **5.0**

SOURCES 5.0

JBA Headers
Dept. 5.0
7149 Mission Gorge Rd., Ste. D
San Diego, CA 92120
www.jbaheaders.com

Paul's High Performance
Dept. 5.0
3715 Commerce St.
Jackson, MI 49203
(517) 764-7661
www.paulshp.com

Superchips Custom Tuning
Dept. 5.0
134 Baywood Ave.
Longwood, FL 32750
(407) 774-2447
www.sctflash.com