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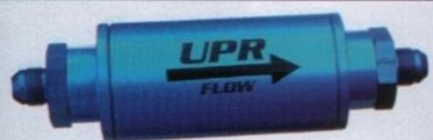
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DUMP THE SINGLE PUMP!

Unclog the arteries leading to your Three-Valve's heart with this simple prescription.

STORY AND PHOTOS BY BRAD BOWLING

You know that TV commercial where the guy is a picture of health but the voiceover informs us that his cholesterol is 270? No doubt the expensive miracle drug in the advertisement will cure all his problems, but what can be done about the 2005-'06 Mustang's circulation?

In stock form, Ford's new Three-Valve 4.6 provides a wonderful combination of smooth power and decent gas mileage, but the fuel system can't keep up with a supercharger installation or other power adders at high rpms. Running lean as an engine approaches redline is an invitation to disaster, as a local dentist discovered when he created a window in the side of his Windveil Blue coupe's supercharged V-8 block.

During the Mustang's autopsy Paul Conner and Kelby Harris, of Harris Racing in Concord, North Carolina, concluded the untimely powertrain demise was the result of terminal fuel starvation brought on by an insufficient flow rate. They offered to develop a cure, but first had to get the Mustang running again.

They installed a DSS short block with forged pistons and forged rods, then beefed up the rest of the drivetrain with a SPEC Stage 3 clutch and full Bassani exhaust system. The

stock exhaust manifolds are still in place for the moment, but will be replaced in the very near future once the planned power adder upgrade is completed. Harris Racing's rebuild of the car included the Vortech S-trim supercharger, 3.33" pulleys, intercooler and aftercooler, from which the guys expect to see around 15 pounds of reliable boost with a proper tune.

Ford's stock 24lb injectors had been discarded and replaced with the Vortech kit's 39-pounders during its initial installation but the block's destruction made it clear the bigger squirters alone did not provide enough juice to the cylinders. Harris upgraded to 60-pound units but found on the dyno a serious drop-off in fuel pressure and pump voltage when the engine reached 5,500 rpm.

Paul and Kelby designed a complete fuel system improvement kit for the new Mustang that solves the fuel starvation problem for any streetable, high-horsepower application. Every component and line from the in-tank fuel pump to the injectors gets replaced in a process that takes a skilled mechanic no more than about six hours, but we don't recommend it for novice wrench-turners or Mustangers who are short on patience or time.

The results of this kit speak for themselves. With the conversion in place, Dan DeSio ran the '05 on his mobile Dyno-Jet 224 and tuned the computer with an XCalibrator 2 flash tool. On 93-octane pump gas the 4.6-liter produced 525 rear-wheel horsepower. Paul predicts 570 is possible by switching to racing fuel. Rail pressure remained a steady 40 psi, which compares favorably to the stock system's drop to 10 psi.

In short, if your '05 Mustang is the guy with high cholesterol and clogged arteries, this fix will turn it into Lance Armstrong! Let's see how they did it.

SOURCEBOX

Harris Racing

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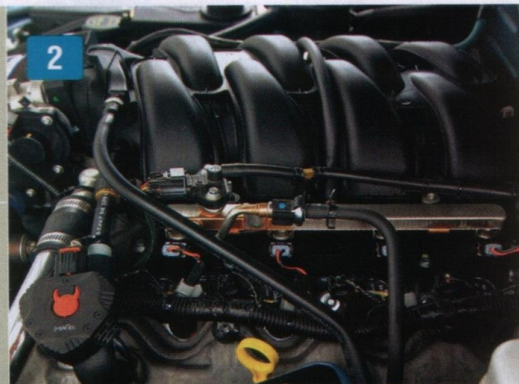
Pro-Dyno

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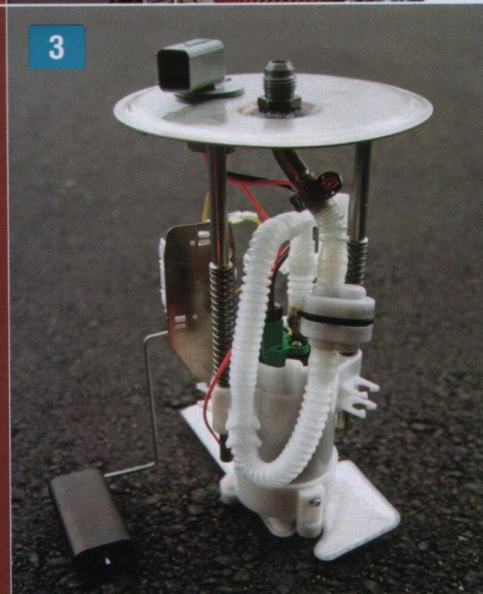
INSTALLATION



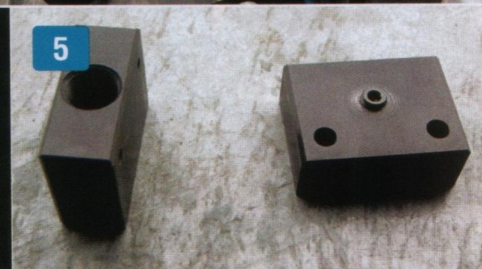
1. This '05 GT engine compartment has been enhanced with a Vortech S-trim supercharger sporting an intercooler and aftercooler, but dyno runs show fuel starvation at around 5,500 rpm.



2. Ford's stock fuel rails on the 4.6-liter Three-Valve engine look cheap and the inlet is restrictive. There's just no way to make 500-plus horsepower with these parts.

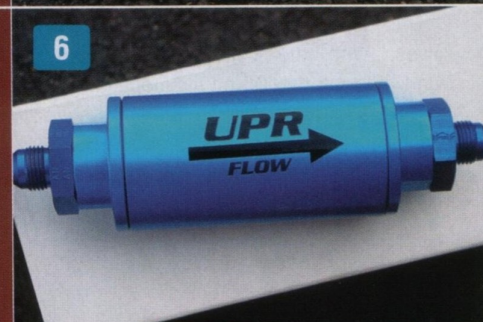


3. Every 2005-06 Mustang GT comes with a single fuel pump in the tank capable of flowing 255 liters every hour. That sounds like a lot of liquid, but the unit becomes overwhelmed at high rpm in a supercharged application. Under such conditions, pumps can burn out and fail. Our photo example is already wearing its new -6 AN threads on top.



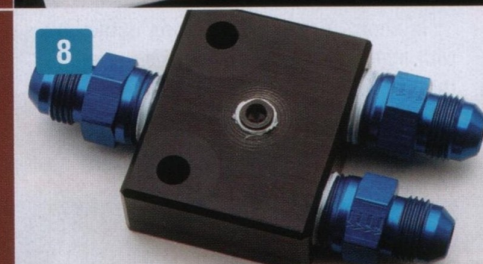
4. This flat filter at the base of the pump is actually the first line of defense against trash in the fuel line.

5. UPR makes these billet aluminum Y-blocks. The first will flow output from two pumps into one line at the back of the car, then split into two channels in the engine compartment to feed both rails.



6. UPR's 10-micron high-flow inline filter is a key component for this upgrade. It will neatly replace the stock Ford unit and features a replaceable element.

7. Harris Racing recommends replacing every inch of the fuel system for high-horsepower upgrades, and that includes the lines themselves.

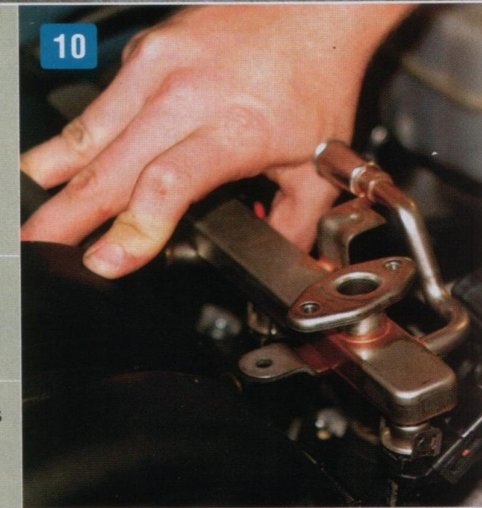


8. Here is one of the complete Y-block assemblies, ready to install. Paul has used Teflon tape to ensure leak-free results. Because the extra port is not necessary for this particular application, the threaded opening in the center of the block has been sealed with a provided plug and Teflon tape.



9. Paul uses a plastic Ford-specific tool to separate the GT's main fuel line from the driver-side rail after disconnecting the car's battery.

10. Remove a couple of clips, a wiring harness and some screws – it's that easy to take out the fuel rail and injectors.



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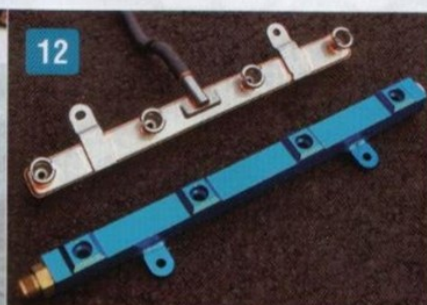
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INSTALLATION



11. It only takes a couple of minutes to get the stock rails and injectors out of the car. You can't see it, but Paul is smiling because he's just performed the easiest part of this upgrade.



12. Creative Performance Racing's fuel rails are anodized billet aluminum. Notice how substantial they appear when placed next to the stock parts.



13. These 60lb injectors should keep the blown 4.6 fed well above 5,000 rpm; stock units are 24-pounders. This kit came with wiring adaptor clips (shown) for a Ford application.



14. Paul applies a thin film of lube to the bottom of each injector. This keeps the O-ring seal from tearing itself up during installation.



15. The fuel rail pressure sensor (FRPS) will be relocated to the center of the new rail. Adjusting the wiring harness to reach it only required cutting, then re-taping, the protective wrap. There was no cutting or splicing of wires necessary.



16. Because he is performing the fuel system upgrade from scratch, Paul must cut and fit his lines after careful measuring. These braided lines will be used in the hot engine compartment.



17. After installation, a bracket will be made to mount the Y-block, but for now the three hoses keep it securely in place.

18



18. Here are the stock gas line and evaporative channel for the returnless fuel system. Paul removed the original gas line for this upgrade.

19



19. To access the fuel filter mounting location, it is necessary to temporarily remove a protective plastic panel. Although the UPR high-flow filter is larger than stock, clipping the plastic clamp allowed us to slide it in without much effort.

20



20. In many ways, the 2005 Mustang was designed for aftermarket tinkering. The bottom of the rear seat pops out without the need for tools, and the top of the double-hump gas tank is immediately accessible for the next steps of this project. No more pulling the gas tank to replace pumps!

21



21. On the driver's side of the transmission tunnel, prying off the rubber cap gives access to the top of the standard fuel pump.

22



22. Don't try to move this lock ring with your bare hands! A light mallet or hammer, a notched screwdriver and some finesse are required. Notice the non-threaded outlet on top of the factory pump; some welding will give us a much sturdier -6 AN connector once the unit is away from the car and has dried.

23. The pump does not want to come out smoothly. After disconnecting the in-tank hose that runs between the sending unit and pump, carefully twist and turn the carrier and pull gently.

24



24. Since this is the prototype for their kit, Paul ran a wire to the secondary pump through the tank. When refined, the kit will include a Ford pigtail harness that connects the two pumps together. In the meantime, a length of thin copper tubing is the easiest way to feed the wire from one opening to the other.

23



25



25. It's a very tight fit, but the new hardware that sits atop each pump is heavy-duty stuff.

26



26. This is the rear Y-block, temporarily held in place by the tension of the surrounding metal. The twin-plug side is facing the gas tank; the single opening points toward the front of the car. The Y-block will be secured by a custom bracket after the installation is complete.

27



27. The new fuel line is a neat package most people will never see. The composite hoses are good for up to 250 psi - about five times normal fuel line pressure.

28



28. If it's pretty, it must work better, right? In this case, that thinking is true. The billet fuel rails and braided lines really dress up the engine compartment, and the 4.6-liter V8 now boasts much improved circulation.