5 WAYS TO PROTECT YOUR MUSTANG

AMOS MUSTANG ENTHUSIAST

Mustang ENTHUSIAST

RUNS ON E85

SUPERCHARGED AND SAVING GAS

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FEATURES:

The Boss – Now and Then
Low Mile '85
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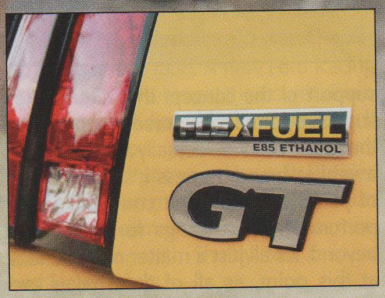
STEVE SHRADER'S SUPERCHARGED



text and photography by Brad Bowling

Welcome to the 21st Century, where terms such as "energy independence," "renewable resources," and "flexible fuel vehicle" are no longer buzzwords from the classified ad section of *Popular Science* magazine. Due to increasing unrest in the Middle East, a global warming problem that is melting polar ice caps and a little storm called Katrina, alternative fuels are no longer the exclusive domain of eccentric inventors and sandal-wearing granola eaters.

POny

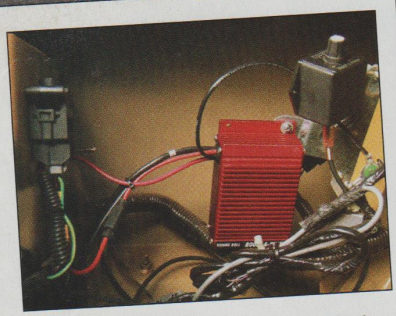
'99 GT RUNS ON ETHANOL!

There are even a few folks in the Mustang performance world who have started experimenting with different ways to power their ponies.

"When gas climbed to more than three dollars a gallon after the hurricane," Steve Shrader remembers, "I suddenly became very interested in fuels the U.S. could produce at home that wouldn't drain my wallet. I think a lot of Americans did."

Alternative fuel possibilities for today's passenger cars range from "ready" to "not quite there yet." For the owner of a diesel-powered Volkswagen or F-350 pickup, for instance, switching to soybean-derived biodiesel is as simple as finding a station that sells it. A little more work and money is required to switch to fuels that require expensive storage tanks, such as compressed natural gas. Converting to electricity is a massive task that involves hundreds of pounds of costly batteries. And while hydrogen works great for scientists with plenty of grant money, there is currently no real infrastructure for its distribution as an automobile fuel.

Steve, who is better known as "that guy who started the Yellow Mustang Registry Web site," heard about something called E85 through Mark Coley, who happens to be YMR's Web administrator. E85 is a blend of 15 percent gasoline and 85 percent ethanol, whose octane rating of



105 puts it in the same class as racing fuel, but at nearly half the cost per gallon. Ethanol is an alcohol-based product made by fermenting and distilling corn, barley, wheat or even agricultural waste. Think of it as fuel-grade moonshine.

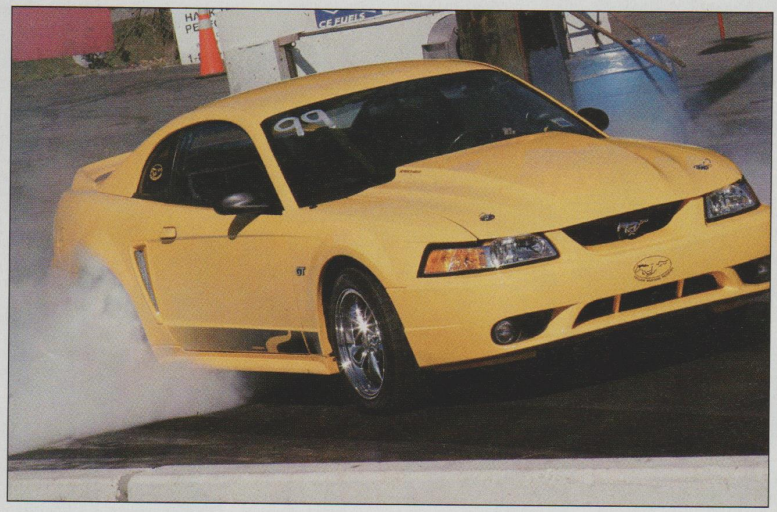
Because the Clean Air Act Amendments of 1990 mandated the sale of oxygenated gasolines in certain high-density population areas and ethanol meets the oxygenation requirements, many cars have been burning some amount of ethanol for years without their owners realizing it.

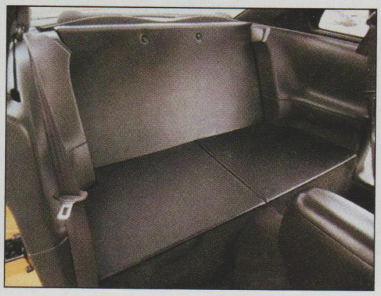
"It was vital that any new fuel be able to produce the kind of horsepower I was used to," Steve said. "I wasn't looking to go backward after everything I had done to my Mustang."

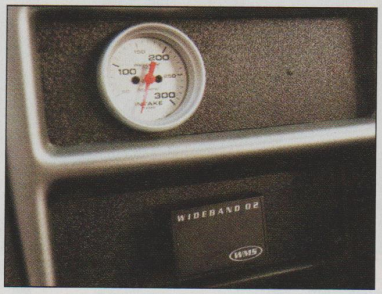
His '99 coupe was a rolling catalog of go-fast parts, so by "everything" Steve meant a Vortech SQ-trim centrifugal supercharger with 3.33-inch pulley and Vortech air-to-water intercooler, MRT exhaust system, Anderson Power Pipe, Pro-M 80mm MAF, '03 Cobra fuel pumps, Accufab 75mm throttle body, C&L intake plenum, Meziere electric water pump, and trunk-mounted Dyna-Batt battery. The rest of the powertrain was beefed up with a SPEC billet steel flywheel, Stage 2 clutch and pressure plate, Moser 31-spline drive axle, Ford Motorsport aluminum driveshaft,; and an '05 Mustang GT differential with 3.73:1 rear axle gears. Steve shifts Ford's stock T45 five-speed manual transmission with great confidence by way of a Pro-5.0 shifter and Steeda Tri-Ax handle.

The chassis has been improved with a Steeda strut brace and Maximum Motorsports' caster/camber adjustment plates. He beefed up the suspension with Tokico five-way adjustable Illumina shocks all around and Steeda Superlite springs. Rims are chrome Bullitts from Wheel Replicas – 17x8 in front and 17x10.5 in the rear. BFGoodrich radials sit at the four corners, with massive 315/35-17s in the rear. Upper and lower control arms from Steeda keep the tires in contact with the pavement under hard acceleration.

After the Mustang tapped a wall on the interstate during a rainstorm, Steve gave the '99 a Cobra-style facelift and Steeda R-model hood. Other eye-catching upgrades include a Mach 1 delete grille, WebElectric sequential taillights, and bumper inserts from SSinserts.com. Shiny







Readily Available

Although no one can say how ethanol will figure into America's plans for energy independence, the truth is that consumers today have much more access to it than ever before. There are currently more than 1,100 ethanol stations in 40 states, according to www.e85refueling.com.

Ethanol has long been promoted by agriculture lobbyists in Washington as one long-term answer to the country's fuel needs, which explains why it has been a popular additive to gasoline since the late '80s. American cars built after 1988 were designed to store and run on fuels with as much as 10 percent ethanol (also known as E10).

Many automakers are now offering flexible fuel vehicles (FFVs) at little to no extra cost. Ford, DaimlerChrysler, Isuzu, Mercedes, Mercury and Nissan are just a few of the companies currently selling trucks and sedans capable of processing any ethanol-enhanced gasoline from E10 to E85 with no input from the driver.

pieces under the R-model hood include MAC covers for the radiator, coolant reservoir and fuse box, plus some panels of ABS plastic the owner had custom made. Steve credits Turn 2 Collision and Dale Sciranko of Custom Performance with making the final product look as good as it runs.

The interior benefits from a Husky Liners brushed aluminum dash kit, MGW chrome interior accents, aluminum pedals, Auto Meter Lunar gauges, Raptor shift light, WMS Wideband Air/Fuel meter, and Corbeau Forza racing seats. Steve's company, Shrader Performance, supplied the rear seat delete kit, which is made of ABS plastic and has panels that lift for access to storage.

Once the decision was made to convert "Project Brightmare" to E85, Steve drained the tank of premium, filled up with the alternative fuel and trailered it to Dan DeSio and Rob Ranucci at Pro-Dyno for some computer calibration.

"I wanted to do this switchover with as few parts as possible," Steve recalls, "so we started with just the computer work."

Fuel flow was immediately determined to be inadequate for performance driving, due to E85's inherently fewer BTUs (British thermal units) per gallon. Gasoline ranges from 109,000 to 125,000 BTUs across the field of 86 to 94 octane, while E85 is rated at around 80,000 BTUs. This means that more E85 must be pumped into the engine to obtain the same results when compared to gasoline – about 20 to 40 percent more, depending on how much power is needed. (By comparison, wood alcohol – known popularly as methanol – has an octane rating of 100 but only produces 60,000 BTUs.)

"I was able to drive the car around town with no changes to the fuel system, but the engine would starve at around 4,500 rpm. We replaced the 42-pound injectors with 60-pound units, which helped a little, and then we increased the volume coming out of the Cobra fuel pump."

Steve talked to Kenne Bell's tech staff, which suggested adding a Boost-A-Pump. This innovative product was designed to electronically increase fuel output without removing the tank or adding an external pump. During full throttle, the Boost-A-Pump increases the in-tank pump's voltage from 12 to 17.5 volts.

The new injectors and Boost-A-Pump were the only new parts Steve needed to generate sufficient fuel flow for the E85. The fuel rail, lines and returnless system remain stock. There is enough petroleum-based gasoline in the E85 blend to lubricate the hoses and other parts that might otherwise be in danger of corrosion through exposure to pure ethanol. Because ethanol scrubs a fuel system clean of gasoline deposits, Steve replaced the Mustang's fuel filter before the conversion and again at 500 miles.

Once the Pro-Dyno team dialed in the new computer specs (which included advanced timing to take advantage of the high octane), the coupe registered 471 rwhp and 424 lb-ft of torque.

"We are still experimenting with the settings," Steve told us. "E85 burns cooler in the combustion chamber than gasoline, so there is probably some room to try spark plugs with different heat ranges."

Steve uses a handheld SCT XCalibrator2 to switch his computer settings between two different E85 tunes (one for winter blend, one for summer) and straight gasoline, making Brightmare a true "flex fuel" vehicle. After six months of hard driving entirely on E85, Steve has noticed no deterioration in the car's performance. He is so happy with the simple conversion that he created www.e85mustangs.com to encourage discussions among other Mustang fans that are curious about E85's performance potential.

Who knows what the future of alternative fuels might bring? In a few years all of our ponies may be eating corn!