SPECIAL PULL-OUT POSTER
CENTERFOLD INSIDE!

Canada $2.95 October 1987

HOT ROD

'87 MUSTANG BLASTS 12.90s!

1988 HI-PERF CAR PREVIEW

TOP SECRET!

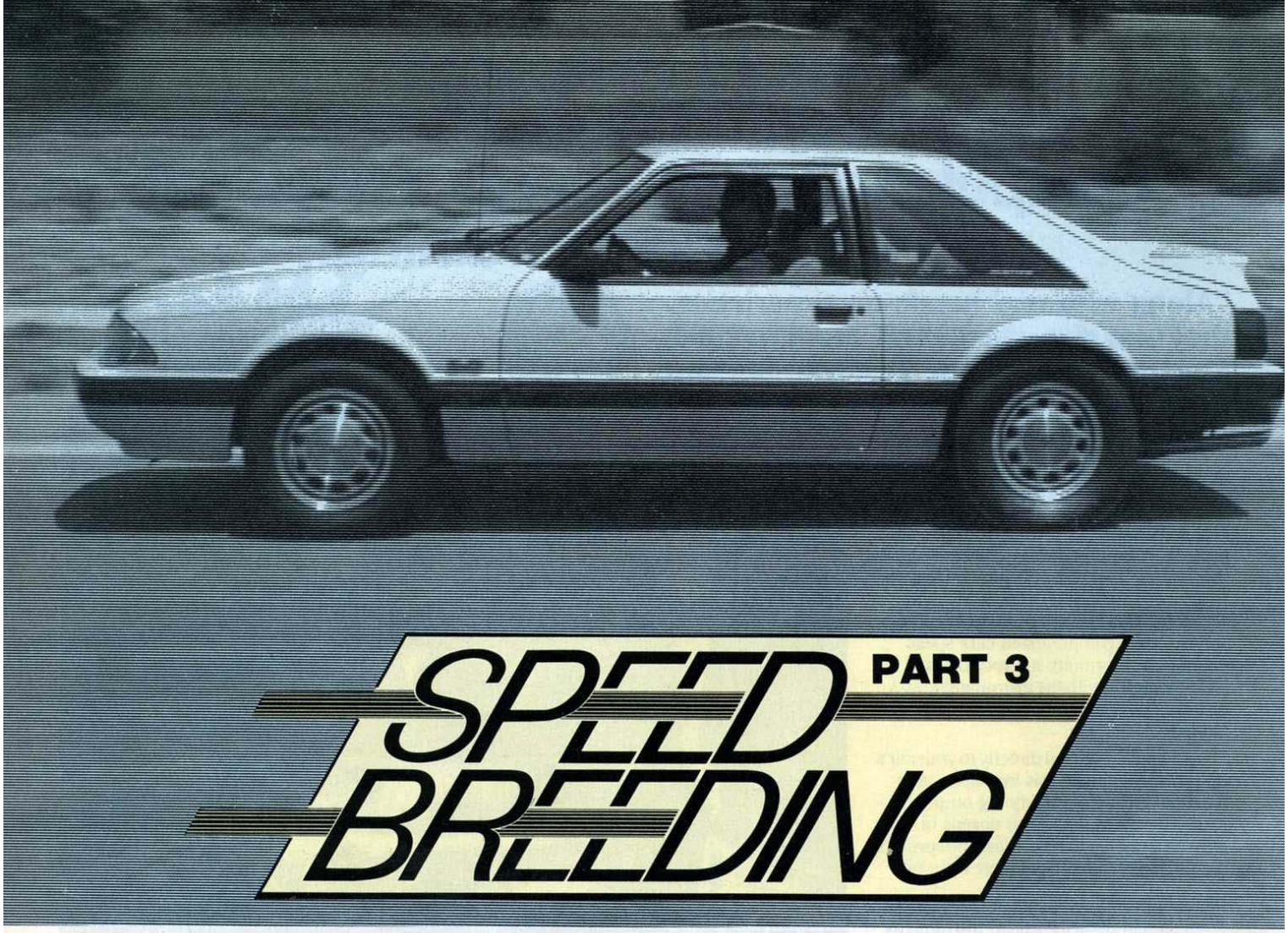
Pontiac Motorsports' Pro Fiero

16-Valve Super Duty Engine

V8 Fiero Bolt-in

PETERSEN PUBLISHING COMPANY

0 71486 02355 10



SPEED BREEDING PART 3

GETTING SERIOUS WITH A 12-SECOND MUSTANG

By Jeff Smith

There's something ominous about the Mustang as it sits sedately in the staging lanes, waiting for its run. From the exterior, it appears to be just another late-model Mustang. But then you notice the rather large Mickey Thompson slicks bulging inside the rear fenderwells. What does a smogger need with slicks? After all, you tell yourself, this is only an '87 Mustang. How quick can it be? Then the driver fires the motor. Again, nothing too impressive, although it does sound a bit louder than stock. The driver does a quick burnout and stages. Cresting the rpms, the Mustang launches *hard*, chirping the slicks through each gear. Then the track announcer calls out the time: "Right lane, 12.92 at 106.11 mph."

Welcome to the age of late-model supercars.

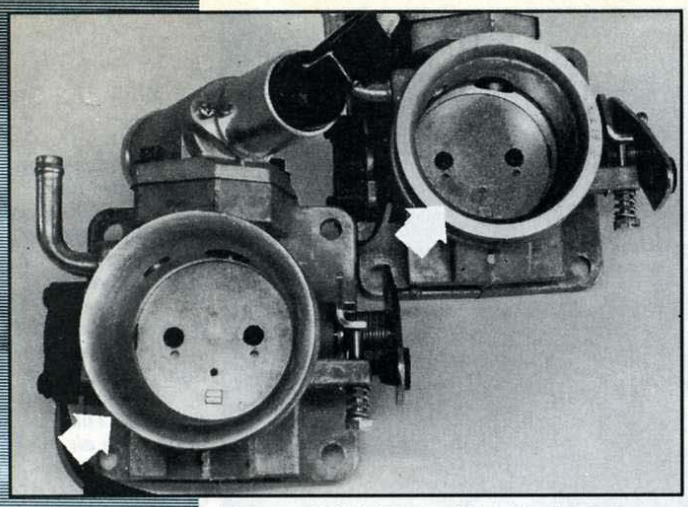
If you've been following our coverage of Chris Kaufmann's Speed Breeder Mustang, then you already know that last month we left off with the 1987 LX cranking out a solid 13.53 at 100.22 mph. Tire spin from the tremendous amount of bottom-end torque had required the use of a set of 26x8-inch Goodyear slicks in an attempt to hook the powerful pony to the pavement. Unfortunately, even these slicks weren't up to the task, since the Mustang was easily capable of spinning them through a good portion of first gear.

Back at Chris Kaufmann's shop, the KPI crew decided to kill some bottom-end torque by retarding the camshaft timing from 109 degrees (five degrees advanced) back to the original "straight up" position of 114 degrees. This accomplished two goals. Retarding the camshaft killed a portion of the bottom-end torque for a cleaner launch, and also improved the Mustang's top-end mph numbers. Returning to the dragstrip, the camshaft exercise netted a 13.46/102.15 gain from the previous 13.53/100.22.

Next, Chris' research revealed that 49-state Mustang computers have a slightly better spark curve than the computer for California cars. Swapping in the 49-state computer, combined with a brief cooling off period, netted another small gain, posting a 13.41/102.15-mph pass.

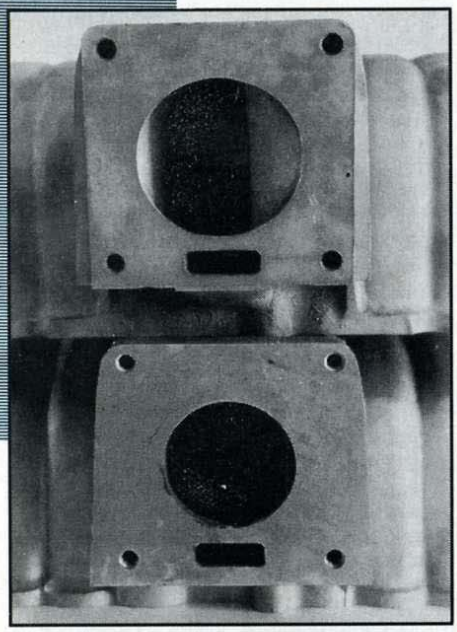
However, we were still plagued with tire spin off the starting line, which required a switch to a larger set of slicks. The next step up was a set of 28x9-inch Mickey Thompson slicks that are both 1-inch wider and 2 inches taller, which reduces the gear ratio slightly. Chris also experimented with a modified upper intake manifold, which he had cut apart, ported, and then welded back together. With the taller slicks, the Mustang managed a 13.29 at 102.02 mph. Bolting on the upper manifold (about a 35-minute chore at the track), the Mustang stepped up with a 13.22 at 102.93 mph.

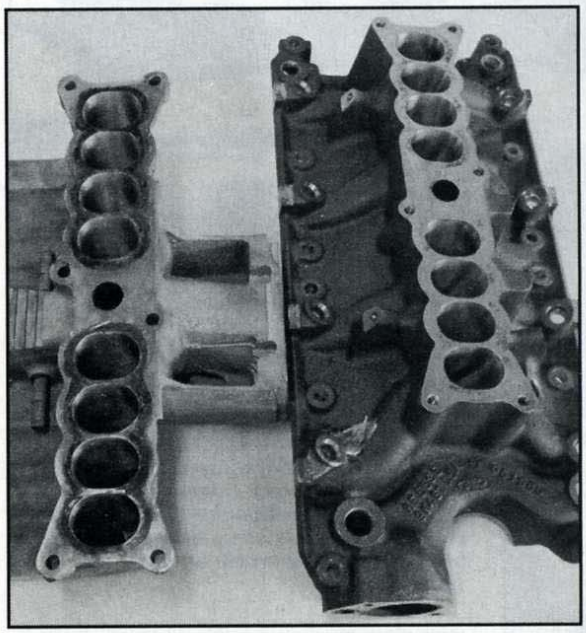
To this point, the modifications had included a 3.55 gear, tires, underdrive pulleys, a slightly larger camshaft, a set of tubular exhaust manifolds, a cross-over pipe, Flowmaster mufflers, and the upper intake manifold. In discussing the progress of this project with the engineers at SVO and the 5-liter engine development group at Ford, there was some disagreement over whether the intake manifold or the cylinder heads were the major breathing restrictions. In an effort to determine which component would be worth the most gain, Chris de-



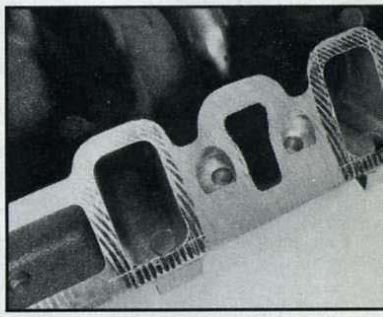
The stock '87 injected throttle body is not a restriction to total airflow, but Chris blends in the sharp edges (arrows) ***to reduce turbulence.***

FAST TIMES 1987 LX Mustang	
E.T./MPH	**CONFIGURATION**
14.54/96.56	Stock trim
14.19/96.87	M/T street tires
13.88/100.33	3.55 gears, KPI pulleys, K&N filter, slicks
13.53/100.22	Camshaft, headers, mufflers, slicks
13.41/102.15	Retarded cam, 49-state computer
13.29/102.02	Larger M/T slicks
13.22/102.93	Ported intake
12.92/106.11	Ported cylinder heads





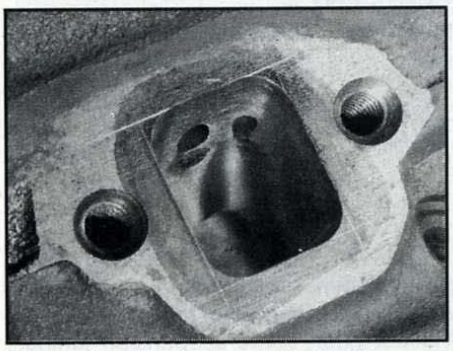
While both the 1986 and '87 Mustangs are port-injected, that's where the similarities end. As you can see, the air inlet area is substantially larger in the '87 intake manifold (top) ***as opposed to the '86 intake*** (bottom)***.***



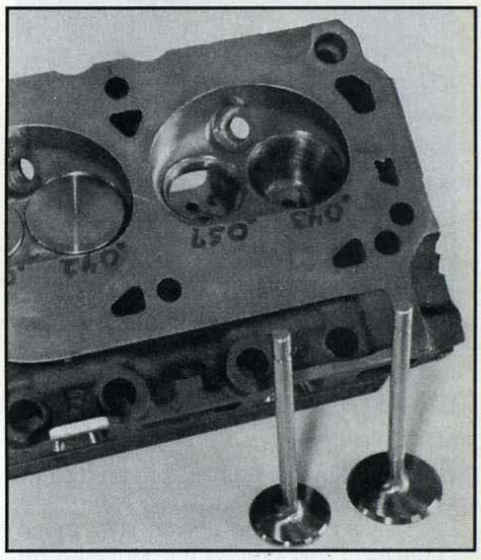
Chris opens up the ports in the lower half of the intake and actually cuts the upper manifold plenum apart to blend in the sharp radius turns. The stock manifold presents a tortuous path for airflow since the air must make two right hand turns before entering the cylinder head. Long runner length improves mid-range torque.

cided to port the '87 cylinder heads and fit them with larger valves. In addition, the ported intake would be included in order to take advantage of the additional breathing capability of the ported cylinder heads.

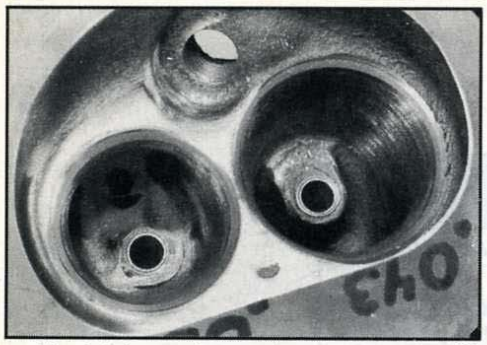
Outfitted with the massaged cylinder heads, Chris again returned to Carlsbad Raceway to evaluate the changes. Kaufmann's extensively rebopped cylinder heads proved their worth on the second pass when the Mustang cranked out a quicker 13.06/104.40-mph blast. Based on the early results of his testing, Chris decided a couple of driving changes also were necessary. Up until this time, Chris had stayed on the conservative side of the rpm curve, keeping the engine below 5200 rpm. With the improved cylinder heads and intake, Chris upped the shift



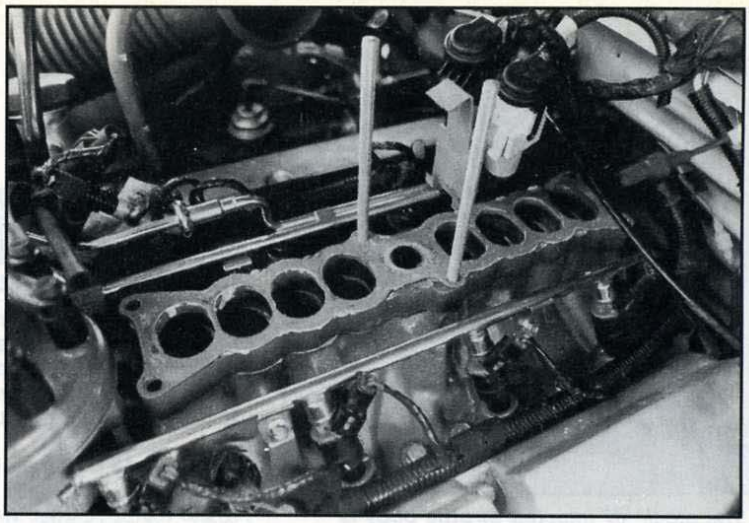
The major effort is expended in the exhaust ports. As with most Windsor small-block Ford engines, the exhaust ports need serious work in order to properly evacuate the cylinder. Chris has spent many hours with the flow bench to come up with his Stage III modifications for the stock '87 Ford heads.



The stock '87 cylinder heads come with 1.78/1.45-inch intake and exhaust valves. Chris installs larger 1.90/1.60-inch KPI stainless valves and performs chamber and port work to enhance flow and swirl.



The intake ports are also massaged, with careful attention paid to the radius into the intake valve. Rather than just blindly open up the intake ports, Chris has concentrated on improving the quality of the airflow.



KPI also designed this plastic heat shield, which is positioned between the upper and lower halves of the manifold, reducing the overall upper intake manifold temperature by as much as 40 degrees! This reduces the air inlet temperature, especially during extended running.

Removing the front sway bar and some non-essential engine compartment goodies improved the Mustang's starting-line prowess. There is some suspension tuning that might be worth an extra .10 second.

The larger M/T 28x9-inch slicks helped control the wheelspin, but were a tight fit in the stock wheelwells. The horizontal shock in the Quad Shock suspension had to be moved inboard slightly to clear the wider tires.

point to 6000 rpm and worked on a starting line technique that would make best use of his newfound power. With these changes, Chris cooled the Mustang off for the next blast and cranked out a blistering 12.92 at 106.11 that was to stand as best time. Imagine, 12-second e.t.'s with unleaded gas, catalytic converters, and mufflers!

PARTS LIST	
PART NO.	**COMPONENT/SOURCE**
3054	Slicks, 28x9, Mickey Thompson
8875-PP	Upper manifold, ported, KPI
8879-KP	Lower manifold, ported, KPI
3588	Throttle body, ported, KPI
4289-85	Cylinder heads, complete and ported, KPI

Even with this stout 12.92 run, Chris believes there are still some e.t. improvements to be gained with the LX Mustang. A stiffer gear, some suspension tuning, and a couple of other tricks are just some of Chris' ideas for the Mustang that could put the ponycar even deeper into the 12-second twilight zone.

Is this as far as you can go with an injected 5-speed Mustang? Have we reached the outer limits of this Ford's capabilities? Not a chance! Next month we'll take a look at turning Ford's strip star into an honest-to-g-pullin' corner turner with some tires, wheels, and chassis tuning tweaks that will turn this pony into a purebred corner performer. **HR**

FUEL FOR THOUGHT

In any engine, it is the combination of fuel and air that makes horsepower. In most engines, if you increase the amount of airflow, you can compensate with additional fuel to make more power. Unfortunately, with the new fuel-injected engines, you reach a point at which increasing the airflow only leans the engine out, because the computer is designed to limit total fuel flow to a pre-set, specified amount. When you first increase the airflow through a stock engine, horsepower increases are easy to obtain because the factory has pre-set the fuel delivery somewhat rich to prevent lean fuel mixtures from destroying the engine. Since no one has yet come up with a new PROM to reconfigure the fuel delivery, producing more than approximately 260 to 270 horsepower is, ironically, a function of the inability to accurately deliver the fuel to make more power.

This is not to say that the stock Ford 5-liter fuel-injectors aren't capable of producing more fuel flow. According to Ford engineers, the stock '87 injectors are capable of delivering sufficient fuel to make 300 horespower, given the proper commands from the computer. But until changes are made to the computer or to the fuel delivery system, our current high-12-second e.t.'s are the effective limit for the injected Mustang—based on limited fuel flow, rather than airflow.

SOURCES

Kaufmann Products
Dept. HR
12400 Benedict Ave.
Downey, CA 90242
(213) 803-5531

Mickey Thompson Tires
Dept. HR
P.O. Box 227
Cuyahoga Falls, OH 44222
(800) 222-9092