



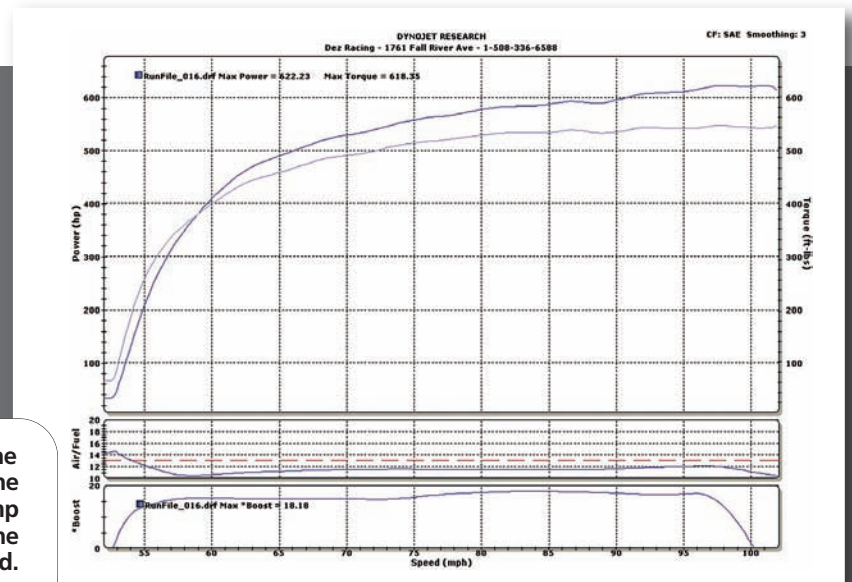
SHOCKING RESULTS

BY MICHAEL GALIMI
PHOTOS THE AUTHOR

Fixing Zombie Coupe's ignition problem with the Pro-M Racing Coil On Plug Ignition conversion

Last month our resident street/strip project car, dubbed Zombie Coupe, made it on to the DynoJet chassis dyno at Dez Racing and the results were a little lackluster. Zombie Coupe fell short of its goals because we lacked the proper ignition. Mike Dezotell of Dez Racing and your author knew the stock setup was doomed to fail, but our goal was simply to get the 1989 Mustang LX running. Dezotell predicted just 520 RWHP. He was virtually dead-on as Zombie Coupe stopped pulling at 5,100 RPM and produced 518 RWHP. We weren't discouraged because an ignition fix was already in the works before the car even cooled down.

Cutting right to it—the supercharged 363ci engine pushed out 622 RWHP on pump gas and 18 PSI of boost with the new ignition system installed.



Backing up just a moment, the details of our 363ci stroker motor are simple and easily replicable. A Coast High Performance short-block is based off a Dart Sportsman block that was filled with a Scat crankshaft and connecting rods, which have eight Probe pistons hanging off the rod ends. An ATI balancer keeps harmonics to a minimum. A Moroso oil pan finishes off the bottom-side, keeping it well-lubricated. Dezotell prescribed a nasty little hydraulic roller camshaft and Comp Cams cut it. Then we topped the short-block with a set of Edelbrock heads and Performer RPM II intake manifold. Boost is supplied by a ProCharger D-1SC blower, which includes an air-to-air intercooler. We turned to Pro-M Racing for engine management system, which is an easy plug-and-play setup right down to the tuning. The ECU self-tunes using the parameters inputted on setup and two wide-band O₂ sensors. It all rolls through a Dynamic Racing Mighty-Mite C₄ and TCT torque converter.

Back to the problem at hand—lack of a sufficient ignition spark. Pro-M Racing EFI has the solution in the form of a Coil On Plug ignition system. Each cylinder has its own Coil On Plug rather than one big coil for all eight cylinders. Pro-M Racing modifies the engine wiring harness to accept the eight individual coils. We made a call to Chris Richards at Pro-M Racing for the required ECU software upgrade in order for us to run this setup.

After the wiring harness was re-installed in the engine compartment, it came time to mount the coils. We've seen a lot of conversions where the coils are mounted on top of the valve covers and many factory systems go this route for

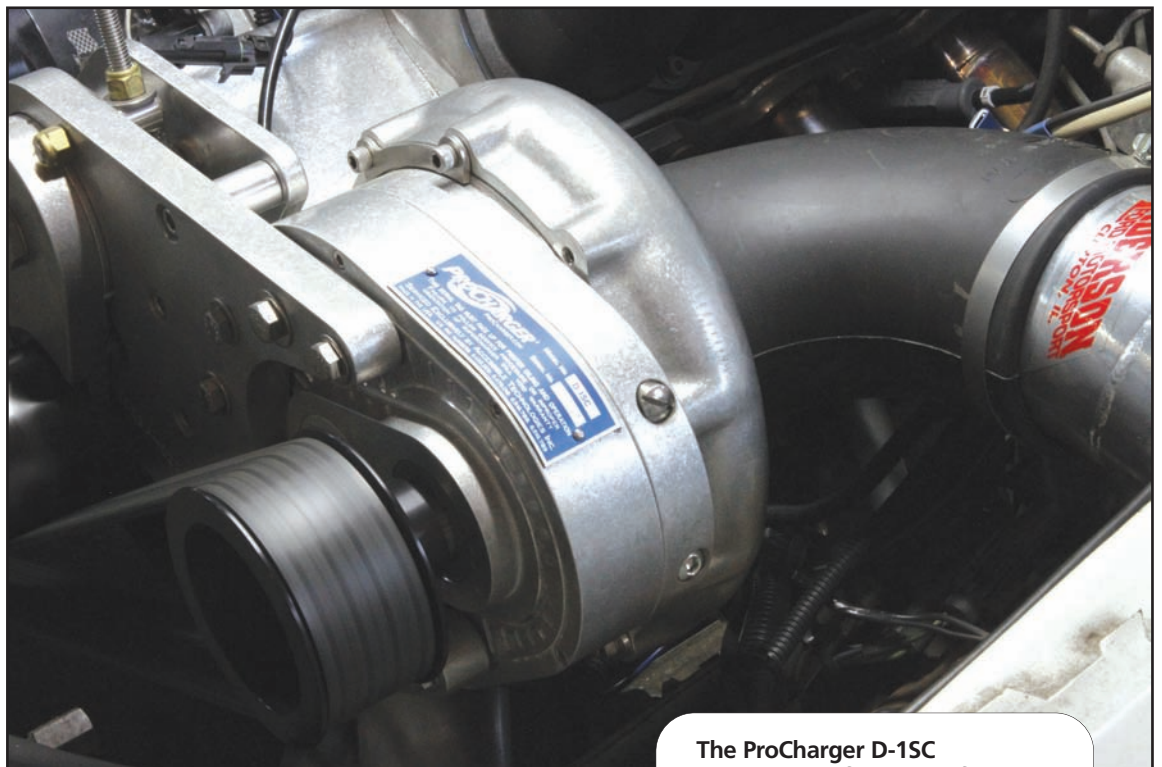


The Pro-M Racing C.O.P coils are compact and easy to mount in a variety of places. Each packs a serious punch for virtually any badass combination.

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Adding the Coil On Plug coils was easy; an upgraded wiring harness was added as well as some new software from Pro-M Racing. Dezotell dialed in 18-degrees of ignition to be safe due to the 93-octane pump gas.

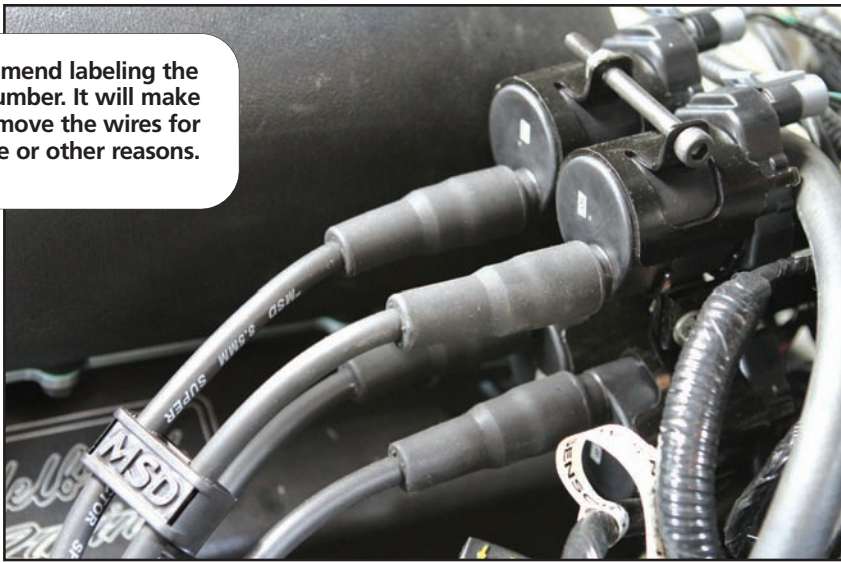


Doug Paradise of Dez Racing custom fit MSD 8.5mm spark plug wires from the firewall mounted coils to each spark plug.

The ProCharger D-1SC supercharger features a front-mounted air-to-air intercooler. Using a 3.40-inch upper and 7.65-inch lower as well as an Anderson Ford Motorsport PowerPipe, the centrifugal blower provided 18 PSI of boost to our stroker 302 engine.

Paradise and Dezotell recommend labeling the coil packs with the cylinder number. It will make life easier if you need to remove the wires for maintenance or other reasons.

Each coil in a Coil On Plug system will only have to charge and discharge one time for every two engine revolutions.



The Pro-M Racing C.O.P coils require the use of Accel P/N 170064 boots for the side of the spark plug wires.

space savings and simplicity. The problem with that setup is that we have some fancy Edelbrock Racing valve covers that aren't built for it. Doug Paradise of Dez Racing found an alternative mounting solution by building some L-shaped brackets that come off of the firewall and hang a set of four coils on each side of the manifold. He then took an MSD custom wire kit and cut each to length.

Why a Coil On Plug? Richards was hot on our case from the start about how great it works and he broke it down for us. Every ignition coil has an optimum charge and discharge time. The coil fires off its charge to a cylinder and then it needs to quickly recover (charge back up) so it can discharge into the next cylinder. As the engine speed increases, the less time the single coil of a typical ignition system has to recover for the next cylinder. At some point the coil will be firing off before it achieves an optimum charge, eventually the spark has trouble jumping the spark plug gap. According to Richards, most naturally-aspirated combinations don't run into trouble but it is very prevalent with turbocharged, supercharged, and nitrous-equipped engines.

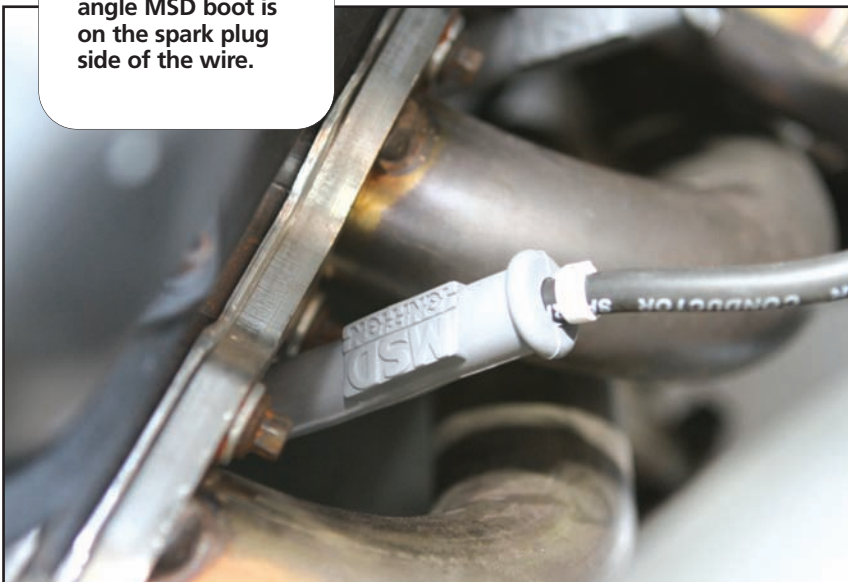
"You can solve the problem three ways, first is to close the gap on the spark plug. But that will only get you so far. Second is to add a CD [ed note: capacitive discharge] box, which puts more current to the primary side of the coil, increasing the output of the coil. While this increases the output, it also shortens the duration of the discharge. It works, but it's not a great method, and these CD boxes are unreliable at best," said Richards.

Richards went on to reveal the third solution as increasing the charge and discharge time of the coils using multiple coils. He said, "A single coil will have to charge and discharge four times per engine revolution. Each coil in a Coil On Plug system will only have to charge and discharge one time for every two engine revolutions." Adding the Coil On Plug system is only half the battle; the other is the software in the ECU to complement it. The factory 5.0L distributor is used as a cam and crank sensor to feed



Pro-M Racing provides a billet cap to top off the distributor. The distributor acts as a crank and cam sensor for the ECU.

The standard multi-angle MSD boot is on the spark plug side of the wire.



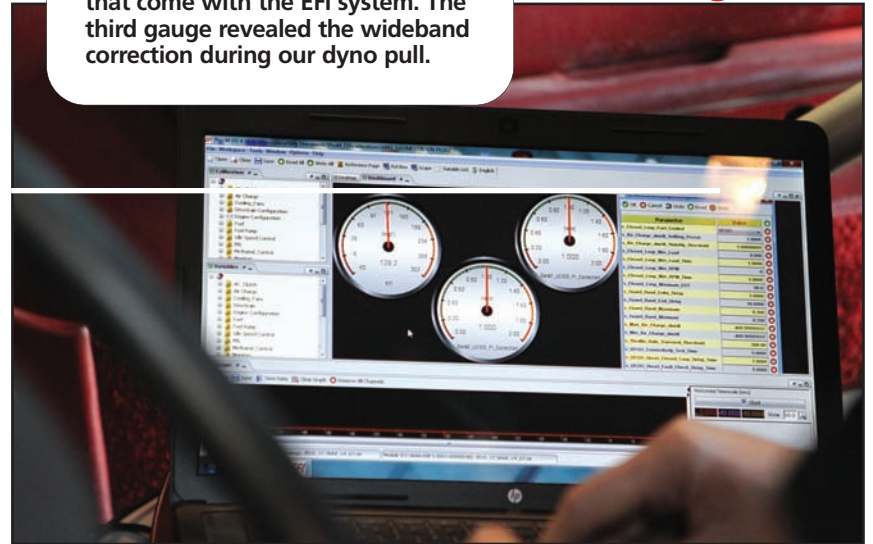
the intel to the ECU, so those engine packages that don't have a cam or crank sensor can utilize this technology. Pro-M Racing developed a software strategy that takes the previous eight ignition signals, averages those out, and the ECU determines when to fire the next coil. The result is a very powerful coil discharge, and equally important, a consistent ignition advance from cylinder to cylinder. According to Richards, if you were to take a typical ignition system and look at the spark advance with a timing light, the ignition timing for all eight cylinders will be off. The same would apply to a system with a CD box. The Pro-M Coil On Plug system solves this problem.

Armed with the new ignition system, Zombie Coupe fired up quickly with one twist of the key. Dezotell performed his typical routine of letting it idle to get some heat in the motor and then shifted the Dynamic Racing C4 through the gears at a consistent RPM to warm the driveline fluids. Then came the fun, Dezotell slipped the car into Third gear and went immediately to WOT. Zombie Coupe screamed, pulled on the dyno straps, and the motor was twisted as the ProCharger buzzed up to 18 PSI of boost. As soon as Dezotell felt it nose over, he yanked his foot out of the gas, and shut down the run. We scrambled to the computer screen—622 RWHP on the car's first full dyno pull! The torque reading was obscure and showed 618 RWTQ but Dezotell commented that it was a spike, so he scrolled through the graph and noted the real peak torque reading was 582 ft.-lbs. The dyno didn't record any RPM and therefore we were stuck with MPH as a reference. We made one more run on the dyno after a short cool down and backed up the 622/582 with 621 RWHP and 582 ft.-lbs of torque.

Two full dyno pulls and Zombie Coupe produced shocking results just by adding the Coil On Plug system. We didn't let the fact that the LX isn't quite strip-ready spoil our bench racing fun. According to Dezotell the car is capable of high-nine-second runs, if it hooks. And it was on pump gas to boot, which leads us to next month's test—methanol injection. We didn't mention it earlier, but Pro-M Racing also added a special meth plug-in on the wiring harness for the ECU and we have a Snow Performance meth kit ready to bolt in. Stayed tuned as we see how far we can push Zombie Coupe on pump gas. ■



Dezotell was navigating through the Pro-M Racing program to make sure all was good. As you can see there are a variety of gauges that can be configured on the laptop. Two of those gauges show the Innovate wide-band O₂ sensors that come with the EFI system. The third gauge revealed the wideband correction during our dyno pull.



All dyno testing was done with a huge fan positioned in front of Zombie Coupe.



Bench racing is always fun and chassis dyno results only encourage this behavior. We prefer to hit the drag strip and let the numbers do the talking but in the meantime, Dezotell says that the power Zombie Coupe produced should allow us to run high nines if it hooks. A set of Mickey Thompson 275/60-15 radials and UPR suspension should take care of the traction.

We were running low on fuel so a quick jump to the local gas station netted us five gallons of 93-octane fuel. Next month Zombie Coupe will continue to run on pump gas but a Snow Performance kit will spray some methanol into the intake tract for even more power.



SOURCES

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