

Here's a familiar sight—Rick Anderson's coupe on the Anderson Ford Motorsport Dynojet. He has owned this car for as long as we can remember. It was the basis for Rick's Clean Power package back in the day and has continued as his development mule and driver. Thus far, it's seen naturally aspirated, supercharged, and, now, nitrous power. It seems a turbo is all that's left to try on this trusty coupe.

# Plug and Spray

**Taking a high-rev 347 to the outer limits with electronically controlled dry nitrous from AFM and NOS**

Text by Steve Turner  
Photos courtesy of Anderson Ford Motorsport

Longtime readers may remember we covered Rick Anderson's pursuit of high-revving, naturally aspirated horsepower in our Oct. '02 issue ("Natural High," p. 55). Back then Rick had D.S.S. put together a

**Horse Sense:** Another reason Rick wanted to play with nitrous is it is much less demanding on a car's fuel system. Unlike blower cars, which must produce power to turn the blower and use fuel to cool the extra heat in the cylinders, nitrous cars get the extra power with no drag, and the nitrous cools the cylinder. This means street cars aren't forced to run huge fuel pumps, which may wear out quickly in street duty.



Seen here is the complete 360hp AFM/NOS kit, which features eight direct port nozzles; 150hp, 185hp, 200hp, 250hp, 360hp jets; two Super Pro shot solenoids; a bottle gauge; a bottle and bottle brackets; lines; hardware; and a throttle switch. This package retails for \$1,108 without the pictured PMS. If you don't have a PMS, you can add it. A kit completed as such will be \$1,805 for EEC IV (pushrod) cars and \$2,156 for EECV (modular) cars. AFM also offers single- and dual-nozzle systems for less. The single-nozzle is good for up to 200 hp and will set you back \$525 without a PMS. The dual-nozzle kit is good for up to 350 hp and runs \$635 without a PMS. Likewise, these systems don't come with fuel injectors or fuel pumps, but Rick will let you know what sizes you need to run a system on your particular car.



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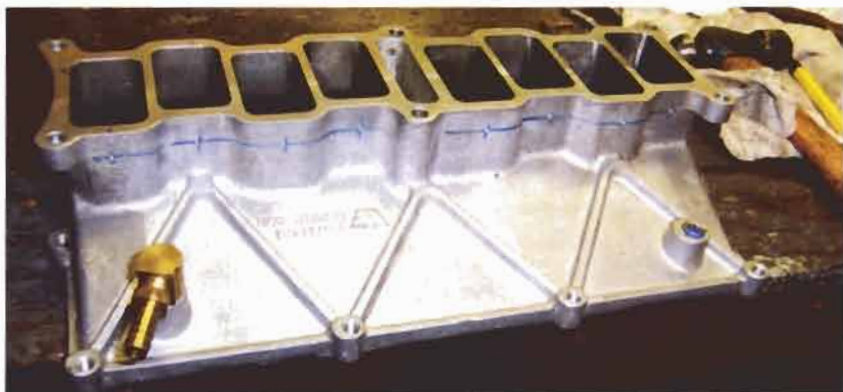
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## Plug and Spray

ready-to-rev 347 with lightweight parts inside a Ford Racing Performance Parts Sportsman block. The package worked well, churning out more than 450 hp and revving well past 8,000 rpm! Combining the torque of a 347 with the rev-happy nature of a 4.6 Cobra, this engine has long been on our list of engine combinations to put in a car.

Of course, too much is always just about right, so we also wondered how such a combination might accept a bit of nitrous. Well, it seems Rick has been wondering too, especially with all those NMRA Real Street and Renegade racers flying on the sauce. He also saw it as an opportunity to utilize the flexibility of his favored Programmable Management System. He reasoned that dry nitrous systems are great for the street because you needn't muss with extra fuel lines and



*Rick begins by removing the Vortech Mondo Box upper intake from his high-rev D.S.S. 347. He then measures the intake's short runners to see where he wants to insert the nozzles in the intake. He chooses to center them in the runners for equal nitrous distribution—obviously a strong suit of a direct-port system.*



*Here's the slightly scary part. Take it slow while drilling the holes, and make sure you stay on your mark. You don't want to have to drill twice! JB Weld is good, but it's not made for permanent intake repairs.*



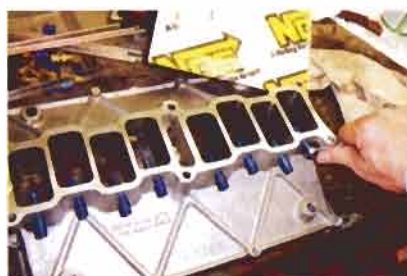
*Next up is tapping the holes to accept the nozzles. Take your time with this process. Make sure you thread the holes straight and true so the nitrous nozzles aren't cockeyed in the intake.*



such, and there's a reduced chance for intake backfires. All you'd need is an appropriately sized set of injectors and a PMS to tune it all up.

From that thought process, Rick decided to develop some nitrous packages built around the concept of dry nitrous controlled and tuned by the PMS. The kit installed and tested here is the heavy hammer—an NOS direct-port good for 750 hp at the rear wheels. There are also several smaller single- and dual-nozzle systems available. These kits are less expensive and easier to install, but they don't offer the ultimate power potential and even distribution of the direct-port system.

As it turns out, once you install the kit, the tuning is actually quite easy. Rick will help you choose the right injectors and give you a base tune-up for the PMS. From there, it's just big power at the touch of a button.



*After tapping the holes, simply wrench the nozzles into the manifold, using some liquid thread sealant to keep the leaks at bay. You'll want to orient the nozzles all to the same angle, which in this case is straight down into the lower manifold. As such, don't just screw them all in until they bottom out. They may not be lined up if you do that.*



*Next up is routing tubing from the individual nozzles to the distribution block at the solenoid. Rick wants to keep the tube lengths as equal as possible to further ensure equal distribution, so he tries them out like this before bending them. The tubes use compression fittings at each end, so don't overtighten them when you install them for real.*

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As you can see, Rick decided to install the solenoids right on the intake manifold by using longer bolts in two of the holes attaching the Mondo Box halves together. He then uses a tubing bender to neatly route the tubes from the solenoid to the distribution block.



Here's a look at the finished nozzle installation, with each nozzle centered neatly in the port and spraying down into the lower intake. Not only do direct-port systems make the most power and provide the most even distribution, but they also allow the additional flexibility of tuning individual cylinders to compensate for unequal airflow in a manifold.

## RICK ANDERSON'S COUPE

### ENGINE AND DRIVETRAIN

Block	FRPP Sportsman
Cylinder Heads	Trick Flow Twisted Wedge (AFM Stage V porting)
Intake Manifold	Vortech Mondo Box upper
Camshaft	AFM S25810
Power Adder	360hp AFM/NOS kit
Exhaust	Bassani 1 3/4-1 1/4-in stepped long-tube headers, Bassani 3-in X-pipe
Fuel Pump	Aeromotive A1000
Fuel Injectors	55-lb/hr injectors
Transmission	TTC-Tremec T5 (prepped by Pro Motion w/G-Force gearset)
Rearend	8.8 w/4.56 gears

### ELECTRONICS

Engine Management	EEC IV w/Programmable Management System
Ignition	Mallory Hy-Fire VIIS w/ProMaster coil
Gauges	Auto Meter

### SUSPENSION AND CHASSIS

Springs	FRPP drag
Struts/Shocks	AVO
Rear Suspension	HP Motorsports upper control arms, HPM Mega-Bite lower control arms, and HPM antiroll bar
Wheels	Weld Aluma Star
Tires	Akurer (front), Mickey Thompson (rear)
Brakes	Wilwood discs (front), stock rear



With the bottom of the upper intake still on the workbench, Rick begins wiring up the nitrous solenoids. He then transfers the intake to the car so he can properly measure the wiring to route into the car's interior. Rick sets up the nitrous system so the PMS' smart switch activates the nitrous solenoids, which in turn sends a signal back to the PMS to switch on the nitrous program (we'll get to that in a few captions).



In addition to the wiring, Rick routes the nitrous feed lines from the solenoids into the car's interior. He chose to feed them through this hole in the passenger-side inner fender, then back up through a hole he drilled in the floorboard under where the factory computer rests (be sure to move it first if you do the same). Rick installs this Y fitting between the solenoids and the bottle to divide the nitrous flow from the bottle feed line to the two solenoids. The Y also provides a perfect spot to mount the sending unit for the Auto Meter nitrous-pressure gauge Rick also installed.





Rick mounted the bottle behind the rear seat for easy access. "You never know when you might need to turn it on," he explains. He also installed an optional NOS bottle heater. This heater is designed to keep the bottle temperature at 85 degrees, which Rick says equates to 900 psi of bottle pressure on his gauge.



Speaking of the gauge, here it's mounted alongside water-temp and oil-pressure gauges in a gauge pod, which replaces the factory A/C vents. Unlike our Florida street cars, Illinois street cars apparently don't place much importance on climate control.



Naturally, Rick's coupe was already equipped with a PMS, but it's not difficult to install one should you need to. Once it and the nitrous are up and running, the only thing left to do is input your tune-up. As far as the nitrous is concerned, that simply means subtracting a fixed amount of timing and adding a fixed amount of fuel under the nitrous menu. In preparation for installing this kit on his 347, Rick increased the injector size from 42 lb/hr to 55 lb/hr. Instead of recalibrating his mass air meter, he used the PMS' Global Fuel control to reduce the injector output during normal operation. But, when the nitrous kicks, he still has the fuel flow capability to supply the nitrous. For more on the PMS, check out our story in the June '04 issue ("Piggyback Stride," p. 105). **5.0**

## On the Dyno

RPM	Baseline		150hp Nitrous		250hp Nitrous	
	POWER	TORQUE	POWER	TORQUE	POWER	TORQUE
3,500	196.27	294.40	225.59	338.49	217.34	335.72
3,700	244.80	347.50	243.60	345.80	232.50	339.22
3,900	252.78	340.42	250.68	337.61	245.21	338.91
4,100	264.35	338.62	332.63	425.67	285.72	156.07
4,300	302.26	369.18	398.82	487.16	296.90	380.23
4,500	323.29	377.32	440.20	513.74	489.45	584.12
4,700	339.00	378.82	464.08	518.61	508.37	580.37
4,900	353.75	379.17	493.23	528.66	558.48	611.02
5,100	372.95	384.07	526.76	<b>542.46</b>	587.91	617.57
5,300	399.85	396.23	544.57	539.67	625.33	<b>631.61</b>
5,500	420.19	<b>401.25</b>	556.35	531.31	637.73	620.24
5,700	434.29	400.17	568.72	524.06	652.51	612.01
5,900	444.35	395.56	580.49	516.79	679.21	578.90
6,100	453.95	390.85	559.53	481.78	630.84	552.25
6,300	461.41	384.67	566.17	471.90	646.05	547.16
6,500	469.27	379.19	581.35	469.74	677.11	555.70
6,700	470.75	369.03	582.56	456.66	681.93	542.70
6,900	473.07	360.09	<b>610.09</b>	464.37	<b>688.71</b>	531.96
7,100	<b>473.46</b>	350.24	595.71	440.70	682.09	511.79

It's hard to argue with the results of nitrous. Popping in the 150hp pills added 136.63 hp and 141.21 lb-ft of torque to the rear wheels, while stepping up to the 250hp shot added another 78.62 hp and 89.15 lb-ft to the peaks. That's a total of 215.25 hp and 230.36 lb-ft added to the peak output of Rick's already impressive 347. Of course, Rick cautions that it's the average increases—not the peaks—that really get the car down the track. Those gains are obvious in the graphs we're presenting. Each nitrous pull picks the entire curve up a significant notch. Rick has been tempted to pop in the 350hp jets, but he's fearful his Sportsman block and lightweight internals might not be up to the task of 700-plus-horsepower at the wheels. Just remember, you can't put one of these systems on a stock engine and expect to hit it with a 350 shot and have it live.

