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TRACK, STREET, & DYNO

BY KJ JONES

Nitrogen Assisted Nitrous Oxide

You've heard us mention the Performance Racing Industry trade show on various occasions in the past. We've explained how the show is the premier event for manufacturers to display and debut the latest, greatest, hard-core racing equipment.

Naturally, seeing and learning about new products designed to improve a Mustang's performance is our primary mission while we walk the rows of booths at PRI. While there's a huge amount of products to see, we try to give you an overview of the 'Stang-related highlights each year in our annual report on the show ("Hardcore Gear," May '07, p. 131). Each year, the show brings us a few standout parts that *5.0&SF* editors make note of and consider for Tech Inspection or other tech-related articles.

"NANO makes nitrous shots consistent during the course of several runs, keeping bottle pressure steady for however long a nitrous solenoid is open and juice is being sucked down. Maintaining continuous and consistent pressure also promotes using the entire contents of the nitrous bottle, so an empty bottle is truly an empty bottle."

One of the new companies on hand at the '06 PRI show was Nitrogen Assisted Nitrous Oxide of Lawrence, Kansas. NANO debuted its latest in nitrous-oxide technology at last year's show. The company came out with a unique support system for nitrous injection that's centered on a nitrogen charge; it overcomes variations in bottle temperature and pressure. A nitrous system's performance is all about bottle temperature and nitrous pressure. Inconsistency in either area radically affects the performance of a nitrous system.

Company co-owner, Tom Darnell Jr., gave us an overview of how this system



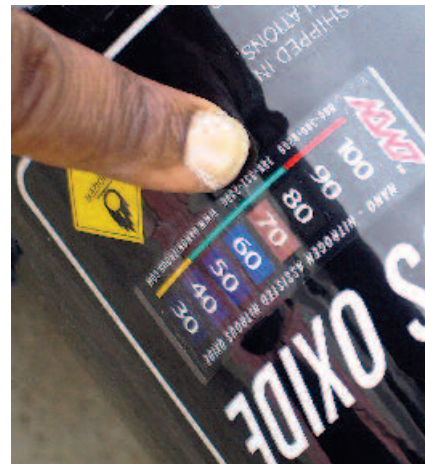
▲ We installed the Nitrous Pressure Compensator (left) and the 117ci, high-pressure NANO bottle from NANO's Competition Kit (\$689) on one of the higher-end, street-driven, street-raced nitrous 'Stangs. The NANO bottle is equivalent to a standard 10-pound nitrous bottle. This tank-and-sidecar setup looks similar to something that shoots George Jetson into the next galaxy, let alone get a 'Stang from one side of the dragstrip to the other with consistency when nitrous oxide is the power adder being employed.



▲ The kit includes this modified NOS SuperHiFlo valve, capable of providing a sustained flow of 0.43 pounds of liquid nitrous oxide per second. Also included is a liquid-filled pressure gauge, 12 inches of steel-braided line that links the compensator and NANO bottle, and an anti-reversion check valve (to the left of the gauge). The check valve comes into play when the line connecting the compensation tank and NANO bottle is disconnected for refilling nitrous or nitrogen. It prevents nitrous from escaping through the port for the bottle-to-compensator link.



▲ The Nitrous Pressure Compensator features an On/Off knob and this 6,000 psi pressure gauge. The cylinder should be filled with high-pressure nitrogen or air to 4,500 psi. We had to have pressure in our compensator bumped up a bit before testing the system, and a local paintball shop took care of it for us. SCUBA shops, fire equipment refill stores, and local fire departments are also possible refill sources.



▲ We think this bottle-mounted temperature gauge is a cool feature. The gauge measures ambient temperature, and it features a color-coded temperature scale that can be used as a reference for determining the best conditions for spraying nitrous with NANO's support. Per NANO, the 50- to 80-degree range (shown in green) is fine.



▲ The Competition Kit is installed in a matter of minutes, as the Nitrous Pressure Compensator and NANO bottle replace the 'Stang's existing nitrous bottle and don't require any modifications or adjustments whatsoever. Powerhouse's adjustable AN wrench and 3/8- and 1/2-inch combination wrenches are tools we use to complete the job.

works. A nitrous bottle typically loses pressure near the end of a quarter-mile run, and also as the amount of nitrous inside the bottle decreases. A system may be filled for a 200 shot of nitrous, but the shot's potency is decreased as the run progresses and bottle pressure drops.



▲ We decided to bypass the dyno and go for a real-world street test of NANO's performance. We hit it hard, making four 200hp (nitrous jetting), four-gear passes using a full nitrous bottle warmed by an electric bottle warmer. We then made four additional passes with NANO's equipment in its place. Using a nitrous gauge to monitor pressure, by the time we made our third pass without NANO, we saw a distinct drop in bottle pressure and slight engine sputtering when nitrous was activated—despite having warmed the bot-

"...without NANO, we saw a distinct drop in bottle pressure and slight engine sputtering when nitrous was activated—despite having warmed the bottle"

tle to 1,050 psi prior to each run. The problem persisted on the final hit. On the other hand, NANO proved to be all that it's said to be. After boosting pressure in the compensator (we used nitrogen) and establishing 1,050 psi at the liquid-filled gauge on NANO's bottle and our in-car gauge, we made another four full-tilt laps and saw no waver in pressure. The Mustang's hopped-up Two-Valve never missed a beat, and the car may have moved a bit faster with consistent nitrous pressure and full shots of 200 horses.



While heat is used as a method of increasing pressure, maintaining a consistent pressure level and nitrous hit is difficult each time the bottle cools or uses a few pounds of nitrous per run. It's rare to use all the nitrous inside a bottle, and when it's low, it's all but impossible to raise pressure to the 950 to 1,050 psi necessary for an optimum shot simply by trying to warm it.

Through as much as 5,000 psi of forced nitrogen pressure, NANO makes nitrous shots consistent during the course of several runs by keeping bottle pressure steady for however long a nitrous solenoid is open and

◀ Tom Darnell Jr. says the NANO system isn't designed to increase or change the desired horsepower level, per se. There really isn't a need to tune or change jetting when NANO is used. Instead, the NANO unit uses the pressure of nitrogen (or high-pressure air) to maintain constant nitrous pressure inside the bottle when the trigger is pulled. It promotes a full-horsepower shot of nitrous throughout a run, as opposed to a shot starting at X amount of horsepower but is decreased to a lower amount of power as the run progresses and nitrous is consumed.

"On the other hand, NANO proved to be all that it's said to be...saw no waver in pressure."

juice is being sucked down. Maintaining continuous and consistent pressure also promotes using the entire contents of the nitrous bottle, so an empty bottle is truly an empty bottle.

The '01 GT test mule we're using is motivated by a D.S.S. 4.6 with Patriot heads, Comp camshafts, and other assorted go-fast goodies, with one of the more important accessories for this test being a Nitrous Express Shark S.H.O. wet system.

We plumbed an Auto Meter pressure gauge into the 'Stang's nitrous feed line and made a total of eight full-bore passes on one of our local test streets to see if there was any discernable difference in pressure or performance. Four of the runs used the pre-existing NX bottle and bottle warmer, while the other four used the NANO Nitrous Pressure Compensator bottle. Pressure for each run was 1,050 psi and both bottles were full when our tests began.

Check out the photos and captions for

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