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Aluminum Driveshafts for Early Models
347 Small-Block Stroker Buildup, Part Three

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Suddenly, It's 1966 Again —

BUT BETTER!

BY STEVE LANCASTER
PHOTOGRAPHY BY THE AUTHOR

One of the most sought after Mustangs ever produced would unquestionably be the 1965 and 1966 Shelby GT350s, and one of the rarest and most valuable speed options available for them was the Paxton centrifugal supercharger kit. Coined the Cobra Supercharger option, the Paxton compressor carried a $670 list price in 1966, and could easily boost the Shelby-modified K-code small-blocks powering these rare fastbacks by close to 100 horsepower.

To better understand the dramatic power increase and what it means in the real world, consider this. To achieve the same 100 horsepower gain in 1966, a K-code 289 small-block Ford would need to be fitted with a tricked-out carburetor, high rise aluminum intake manifold, heavily ported cast iron cylinder heads, a very rowdy camshaft, and free-flowing exhaust system. The funding expended to acquire all these hard parts easily eclipses a Paxton's price tag, not to mention the man hours necessary to install and tune such a combination. When viewed in this light, the Paxton option is a very viable alternative.

The original Paxton Supercharger kits consisted of the company's SN-60 planetary ball-drive compressor housing pullied to produce approximately 5 pounds of boost, a specially machined sealed carburetor enclosure, custom air filter element, supercharger mounting brackets and pulleys, and a larger mechanical fuel pump. The compressor was a three-piece unit that utilized a unique internal step-up drive with a 4:1 ratio, which allowed the impeller to reach speeds as high as 30,000 rpm, while the housing was fitted with its own self-contained oiling system to keep the ball bearing surfaces lubricated.

Though a well-designed system, in itself, the early Paxton Supercharger systems still had room for improvement. The internal step-up ball-drive design limited the amount of total boost that could be run safely, and exceeding those limits, more often than not, caused the steel balls to slip and skid, galling the supercharger's internal race.

TECH

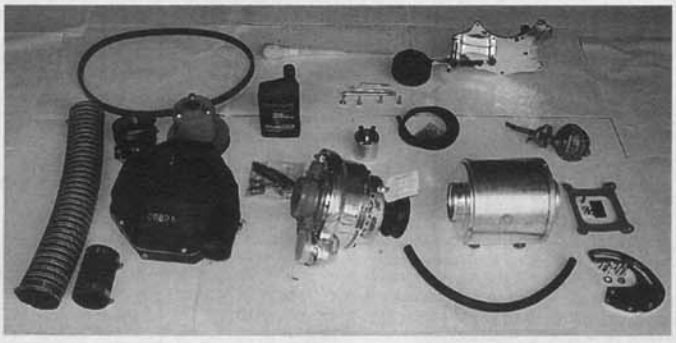
Paxton's new Novi G.S.S. Supercharger Kit for 1965-70 289/302-equipped Mustangs has bridged this gap with its upgraded design. The compressor housing now consists of a two-piece unit, and a one-piece solid impeller shaft has replaced the previous straight cut version. The ball bearings themselves are now located inside the housing, and the casting lends increased support to the ball-drive unit for added longevity.

"It's the same basic concept that has been in use for over 20 years," said Paxton Products' Bob Wyman. "Though we have been constantly upgrading and improving the design."

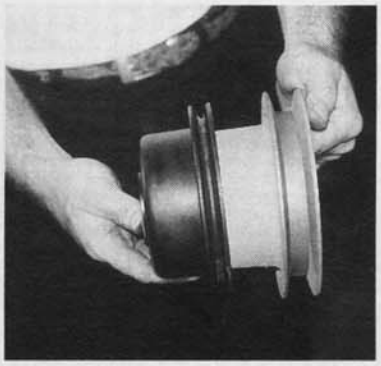
The Novi G.S.S., part number 1000300, is shipped with a 5-pound. pulley in place on its one-piece impeller shaft, good enough to produce 850 cfm-worth of airflow on a stock or mildly

modified K-code 289. Should one desire more power than the standard 5-pound. Novi provides, Paxton offers a special modified impeller that can channel upwards of 1,100 cfm of airflow at slightly over 7 psi. The Novi G.S.S. kit also incorporates its predecessor's cast aluminum one-piece mounting bracket and cast crank pulley. In addition, oiling and lubrication concerns have been addressed with the company's synthetic Paxta-Trac fluid.

After reviewing the new Novi G.S.S.'s strong suits, we were just itching to witness its performance on an early Mustang first hand. To that end, it was off to Huntington Beach's Wheeler's Speed Shop, where Rich Fabbri's 1966 Mustang fastback was about to make the transformation from natural aspiration to forced induction. The fastback sports a Wheeler-built 289-cubic-inch small-block topped off with reworked factory cylinder heads, a mild Competition Cams hydraulic camshaft, and Hedman headers. Before the installation began, however, Wheeler's Speed Shop's Glenn Gruettke motored the fastback over to nearby Jones Electronic Technologies for a quick session on the rollers of their Dynojet chassis dyno to establish a baseline. The healthy 289 small-block responded with a 318 horsepower pull in naturally aspirated form, but that reading was just an appetizer when compared to the things to come! When the dust had finally settled, the Paxton-huffed Mustang had registered 447 horsepower at the rear wheels with just 6 pounds of boost pressurizing the intake manifold. That's an astounding 129 horsepower increase at the rear wheels with no adverse effects on the fastback's streetability, whatsoever.

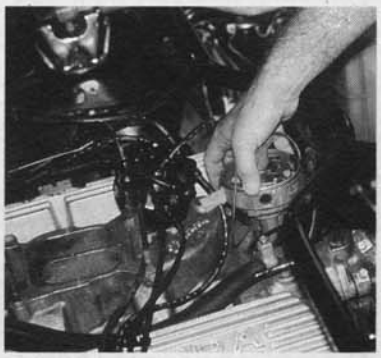


The Paxton Supercharger Kit was a rare option on Shelby Mustangs, beginning in 1966. These kits are still available today, and now consist of Paxton's updated Novi G.S.S compressor housing, custom air filter element, supercharger mounting bracket, pulley assembly, larger capacity fuel pump, supercharger drive belt, and all necessary nuts, bolts, and hoses, making installation a snap.



Next, Glenn unbolted the Mustang's factory crankshaft pulley, which will be combined with the Paxton-supplied crankshaft pulley to drive the supercharger.

The Wheeler Speed Shop-built 289 small-block nestled between the framerails of Rich Fabbri's '66 Mustang fastback generated 318 horsepower on Jones Electronic Technologies' chassis dyno in normally aspirated form. How much power can it generate when its cylinders are pressurized with 6 to 7 pounds of boost from the Paxton Novi G.S.S. centrifugal supercharger? Keep reading to find out.



Though not necessary to install the supercharger, Glenn chose to remove the factory distributor, providing him with more working room under the hood.

Fuel enrichment would be a major concern when under boost, so the Mustang's Carter mechanical fuel pump was replaced with a new version. The new Carter pump, on the left, which is supplied in all of Paxton's kits, utilizes a vacuum fitting located on the top of the pump body to sense supercharger boost, then spikes the fuel pressure to stave off detonation.

Once the battery has been disconnected, the radiator overflow and windshield wiper reservoir can be removed along with the Mustang's 700-cfm Holley carburetor.

If the ignition coil is bolted to the intake manifold from the factory, it must be relocated to clear the Paxton's intake ducting.

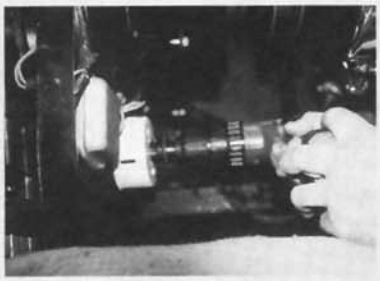
The high-volume fuel pump is bolted in place using the 7/16-inch Grade-8 bolts supplied in the kit.

The supercharger mounting bracket is next. Remove the two cap screws from the water pump...

...then bolt the bracket to the engine with the bolts provided in the kit. Note: For installation on early 1964 engines with staggered height bosses, 1/16-inch washers will be needed to compensate for the short boss.

Next, Glenn bolted the Paxton Novi G.S.S. supercharger housing into place.

From there, it was on to mounting the Paxton's special air filter element, which is encased in a custom aluminum housing. But first, the factory voltage regulator must be relocated 4.5-inches above its original position on the front support.



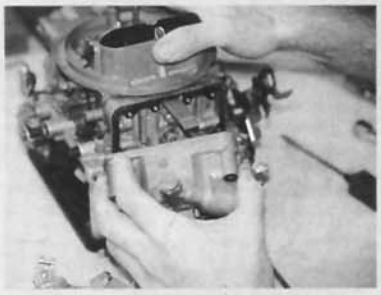
An opening in the core support would be necessary to supply the supercharged 289 motor with ample amounts of fresh airflow. Gruettke used a hole saw to cut the prerequisite 4-inch hole needed for the Paxton's fresh air inlet.

A trial fitting of the air cleaner screen revealed some slight interference with the freshly relocated voltage regulator. The problem was easily remedied by rotating the voltage regulator 90 degrees.

The air filter element was then installed. The rear of the element should slant upward slightly, then two 5/16-inch mounting holes were drilled into the left front fender to secure the air filter base.

With the inlet system in place, Glenn moved back to the Mustang's Edelbrock intake manifold, where he installed the lower half of the Paxton carburetor enclosure with the extra long studs supplied in the kit.

Meanwhile, it was back over to JET, where technician Sean Murphy began the fuel delivery system modifications by thoroughly degreasing the carburetor.

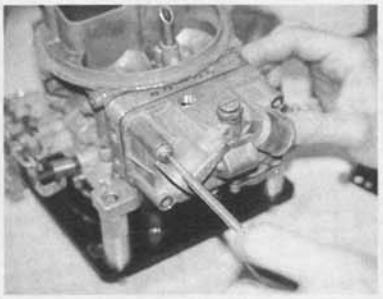


Next, it was over to the workbench, where the Holley's float bowls were removed.

The factory Holley floats are not up to the increased fuel pressures associated with forced induction applications, production pieces will collapse under that pressure. So...

...Sean replaced them with Holley's solid float bowls, part number 1163000.

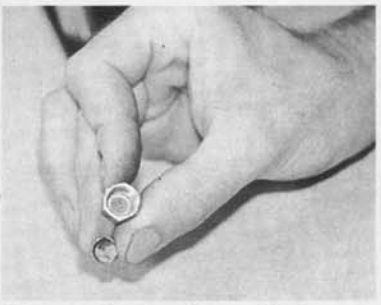
Though not necessary on Fabbri's Mustang, some blown steeds will need some additional modifications. Sean drilled a 1/16-inch hole in each float bowl, which was then tapped with a 1/8-18 NPT fitting. Four additional 1/16-inch holes are drilled in the carburetor's base plate, then they are connected with the supercharger kit's hardware.



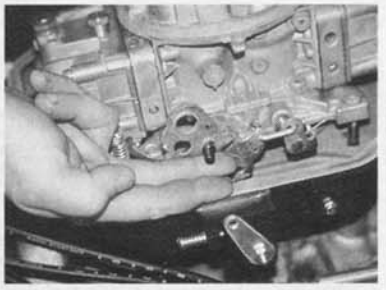
Sean preset the float level even with the float level bolt, then reinstalled the fuel bowls.

From there, it was back over to Wheeler's, where Gruettke placed the carburetor inside its new home.

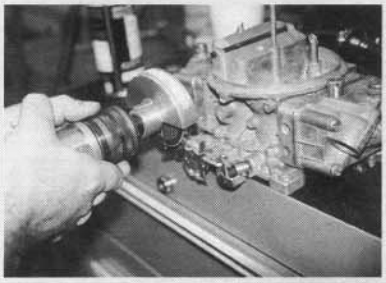
Next, Sean replaced the Holley's primary jets with .067 versions, while the stock secondaries gave way to .089 jets. Paxton recommends starting with these jet settings, then fine tuning the combination to each application. Remember, changes in altitude, camshaft profile, free breathing cylinder heads, and other intake and exhaust modifications can require different jet sizing to optimize the combination.

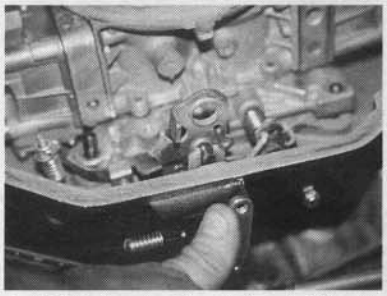


Before completing the carburetor modifications, Murphy installed this block off piece into the cam plate's hot air tube. Carbureted applications that see positive manifold pressure (i.e. supercharging and/or turbocharging) require the fitting to be blocked off.

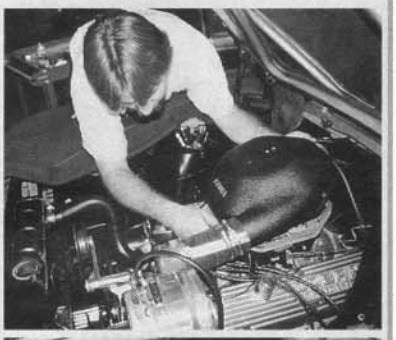


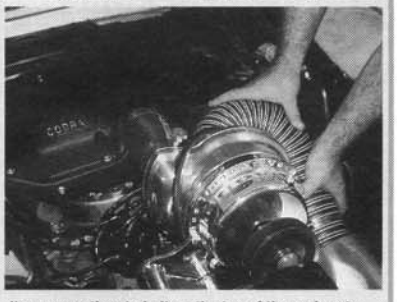
Another minor snag was encountered when Glenn attempted to connect the carburetor's throttle stud to the bonnet's linkage. The inner lip of the bonnet was interfering with the stud when the throttle was opened.



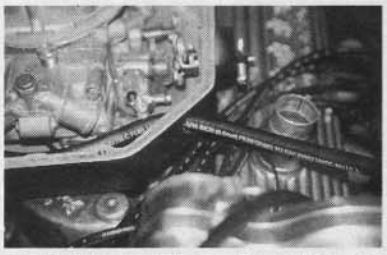


A cutoff wheel was used to sever the end of the throttle stud, allowing it to clear the inner edge of the carburetor bonnet without further hang-ups.



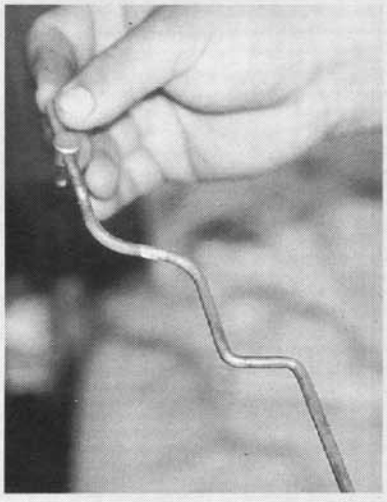


It was now time to bolt on the top of the carburetor bonnet and connect the Paxton's air inlet hoses.

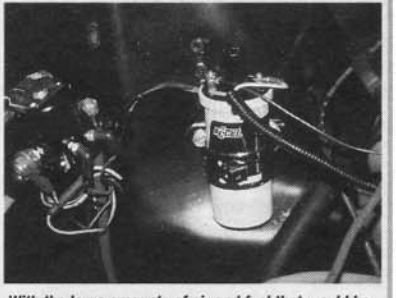


Next, Gruettke connected a new piece of 5/16-inch fuel line from the carburetor and out through the hole in the side of the bonnet.

The final steps before fire up were to reinstall the distributor and attach the vacuum/boost line from the supercharger housing to the boost-sensitive Carter fuel pump. Garcia also bent a custom fuel line from the pump to the carburetor to clear the supercharger housing's large inlet.



Wheeler technician John Garcia custom bent the throttle linkage to clear the Paxton's carburetor enclosure.



With the large amounts of air and fuel that would be force-fed into the 289's combustion chambers, Glenn decided to add a high output ignition system. The ACCEL coil, which now resides on the passenger side inner fender well, fits the bill nicely.

SUDDENLY, IT'S 1966 AGAIN

It's now time to add the lubricating oil to the supercharger housing. Glenn added the recommended 8 to 10 ounces of Paxta-Trac synthetic fluid to the blower, insuring proper lubrication. Paxton recommends that fluid levels be checked at regular intervals, as well.

Finally, the supercharger belt is installed, Garcia then set the timing at 8 degrees initial advance while Gruettke checked for any vacuum or fuel leaks.

After a quick (mighty quick, from our vantage point in the copilot's seat!) test drive around the block, the Mustang was put on the dyno rollers at JET once again. With the Paxton generating 6-pounds of manifold pressure, the Mustang registered 447 horsepower at the rear wheels. That's a whopping 129 horsepower increase at the rear wheels! Not bad at all for an afternoon's worth of labor.

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