



# Taken By Force

FORCED AIR PERFORMANCE  
BRINGS ANOTHER SUPER-  
CHARGER OPTION TO THE  
MUSTANG WORLD

In today's performance world, a Mustang owner has a wealth of performance upgrade options from which to choose. When it comes to power adders, nitrous, superchargers, and turbos are all on the menu. To further complicate things, there are centrifugal superchargers and positive-displacement blowers that offer rpm-swelling power or instant boost, respectively.

If you're a fan of belt-driven power adders, there's another new option coming to light. The Rotrex blower is a centrifugal supercharger that basically uses the intake side of a turbo to produce boost and is turned by a unique traction-drive system. The traction-drive planetary is based on the same theory employed in an automatic transmission.

The Rotrex traction drive setup ranges from 13:1 on its smaller units to 7.5:1 on its largest unit. This produces im-

pel speeds of more than 200,000 rpm, while the largest unit still spins at 90,000 rpm. Since the supercharger spins so fast, the unit can be much smaller than other centrifugal superchargers and still produce the same amount of boost. The planetary/traction system requires less horsepower to turn than a conventional centrifugal blower and much less than the Roots-style/twin-screw blowers.

The technology behind the Rotrex blower has been around for years. Forced Air Performance is a new Danish company that has produced superchargers for several OEMs, including the Koenigsegg CCXR, dubbed the fastest production car in the world. Forced Air Performance is a spin-off from the parent company Mountain Performance. MPI produces supercharger kits for snowmobiles and side-by-sides.

"We've had great success with our



▲ Beginning with a stock '07 Mustang GT equipped with 3d Carbon exterior modifications, Forced Air Performance R&D technician Abe Carter begins removal of the air intake pipe and airbox. The front bumper is also removed, which makes the car much easier to work on and allows us to mount the intercooler.

kits using the Rotrex blower on off-road applications," says Forced Air Performance CEO Mac Randolph. "We chose the Mustang for our first automotive kit

Text and Photos by Stephen Clark

**Horse Sense:** Unfortunately, we can't always do these stories on our own cars, but



because almost every supercharger manufacturer makes a kit for this vehicle, and we want to show off our technology. This will be an excellent opportunity to expand our business into the musclecar market."

After hearing about the Forced Air Performance kit, we were immediately curious as to how it would fit on the car, the type of performance that the Rotrex supercharger could produce, and above all, the driveability. We took a trip to the Forced Air Performance facility in Draper, Utah, to witness the installation of the company's kit on an '07 Mustang GT.



▲ With the airbox removed, there's plenty of space to mount the supercharger.



▲ The first stage of the installation is to mount the heat exchanger and oil cooler assembly, but before installing this all-aluminum unit, the factory power-steering cooler had to be removed and replaced with this included compact cooler.



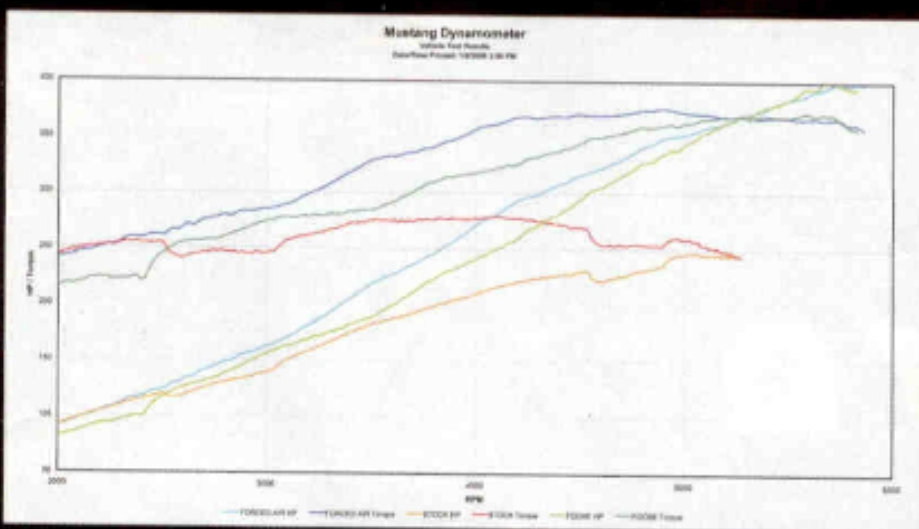
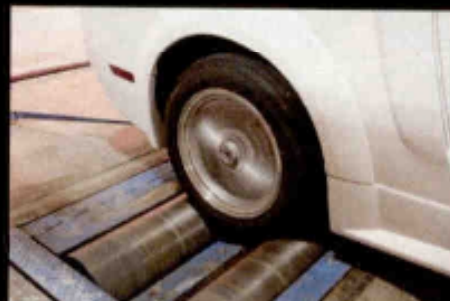
▲ The kit comes with a preassembled heat exchanger and oil cooler assembly. It's temporarily mounted

## ON THE DYNO

RPM	BASELINE		FAP ROTREX		DIFFERENCE	
	POWER	TORQUE	POWER	TORQUE	POWER	TORQUE
2,250	108	253	108	253	0	0
2,500	120	253	125	262	5	9
2,750	130	248	146	278	16	30
3,000	141	246	163	285	22	39
3,250	163	264	188	303	25	39
3,500	183	275	219	329	36	54
3,750	197	276	243	340	46	64
4,000	211	<b>277</b>	274	360	63	83
4,250	223	276	299	369	76	93
4,500	231	270	317	370	86	100
4,750	230	254	337	<b>373</b>	107	119
5,000	241	253	354	372	113	119
5,250	<b>243</b>	243	370	370	<b>127</b>	<b>127</b>
5,500	N/A	N/A	386	369	N/A	N/A
5,750	N/A	N/A	402	367	N/A	N/A
6,000	N/A	N/A	<b>404</b>	354	N/A	N/A

With the Forced Air Performance kit installed, we took the car to Gillett Diesel to test the horsepower and torque output on the MD-250 dyno. All dyno testing was performed at 5,000 feet above sea level, so the horsepower numbers are about 20 percent lower than what we would've seen if this testing were done at sea level. All the horsepower and torque numbers are actual and not corrected for altitude. For the sake of comparison, we also brought along a stock '08 Mustang GT and an '07 Foose Stallion Mustang that has a competitor's 12-psi centrifugal supercharger kit.

On the dyno, the Forced Air Performance Mustang produced 401 hp at 5,750 rpm and 377 lb-ft at 4,800 rpm. We made four back-to-back runs to prove the kit's consistency and immunity to heat soak. The first run was 399.5 hp and the fourth run was 401 hp. While the stock Mustang was nearly this repeatable, the other supercharger kit lost almost 10 hp per run for a combined decrease of 35 hp between the first and fourth runs.



THE TECHNOLOGY BEHIND THE ROTREX BLOWER HAS BEEN AROUND FOR YEARS. **FORCED AIR PERFORMANCE IS A NEW DANISH COMPANY THAT HAS PRODUCED**





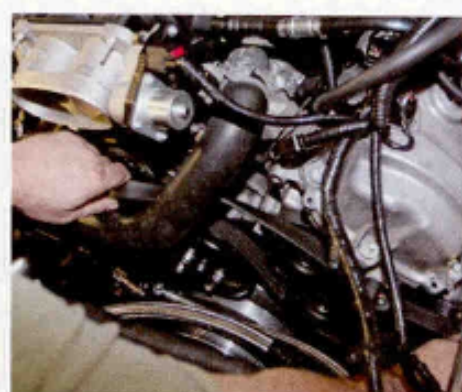
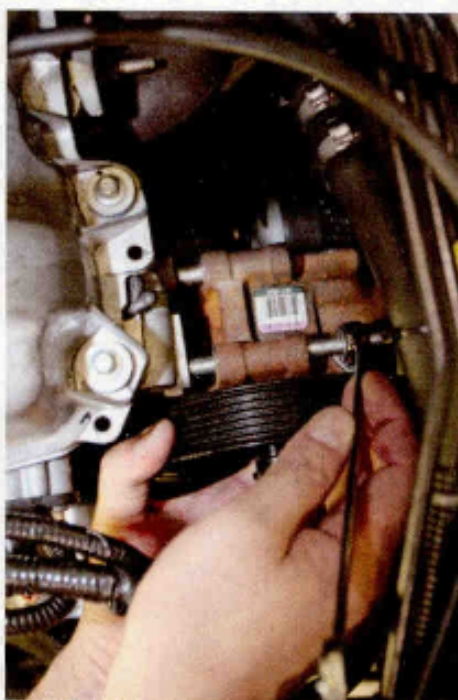
▲ Abe drills two holes on each side of the car.



▲ With the holes drilled and lined up correctly, the radiator/cooler is bolted into place.



▲ Abe moves back under the hood to remove the factory serpentine belt and harmonic damper. A new two-piece billet damper is installed so that a second belt can drive the supercharger.

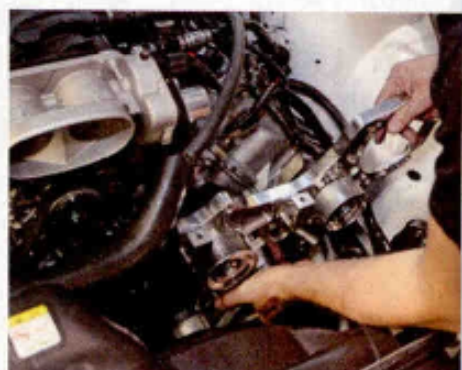


▲ Abe rotates the belt tensioner so there is enough slack for another technician to mount the stock serpentine back on the power-steering-pump pulley.



▲ Two billet stand-offs are installed onto two factory pulleys. This allows the main billet blower/pulley bracket to be mounted.

▲ An aluminum bracket to support the main billet blower/pulley bracket needs to be mounted behind the factory power-steering pump. Abe removes the pump and replaces a small factory spacer with the new bracket behind the pump using the stock bolts.



▲ With two of the four stand-offs mounted on the pulleys, Abe can now install the main bracket. It's one of the key components in the kit because it provides a rigid base for the supercharger to mount. The bracket is precision machined from 6061 T6 aluminum, and it's pocketed for lighter weight and rigidity.

## ROAD TEST

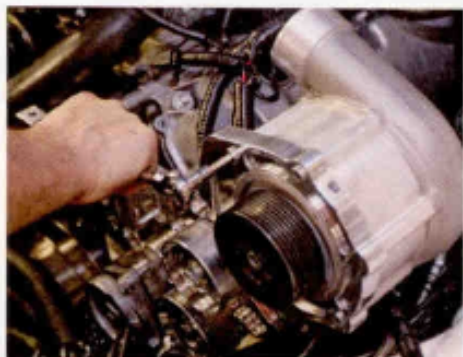
**E**ven being a mile high, we couldn't knock the wind out of this Pony. With 400 rwhp, the Mustang was fast on the road with incredible low-end pull. Compared to the other centrifugal blowers on the market, the Rotrex blower is smaller and spins much quicker (around 90,000 rpm), therefore it makes the car responsive but still gives good top-end pull. In comparative terms, the Rotrex produces a Roots-style/twin-screw bottom end while still yielding turbo/conventional centrifugal charger top end.







▲ The Rotrex blower is now ready for mounting onto the bracket. The kit uses a centrifugal C38-81 blower that can produce more than 15 psi, but the supplied pulley setup will yield a streetable 10 psi.



▲ Abe torques the four bolts holding the blower to the bracket and installs the oil line.



▲ Mounting the belt to the supercharger belt system requires a second set of hands. Abe takes the tension out of the belt using a 1/2-inch ratchet on the tensioner, meanwhile Forced Air Performance CEO Mac Randolph routes the belt onto the pulleys and blower.



▲ With the pulley and blower installation finished, Abe begins installing the air-to-water intercooler. Forced Air Performance opted for an air-to-water intercooler system. It's more efficient than an air-to-air intercooler on this particular car because of the number of bends required to make the air-to-air intercooler fit. The air-to-water is also much easier to install and doesn't require modification or cutting



▲ The air-to-water intercooler is mounted onto the billet blower/pulley bracket.



▲ Abe connects the braided steel lines with -12 fittings, which are used to connect the air-to-water intercooler to the radiator or heat exchanger behind the bumper. It's a closed system, so it doesn't use any coolant from the stock engine or radiator.



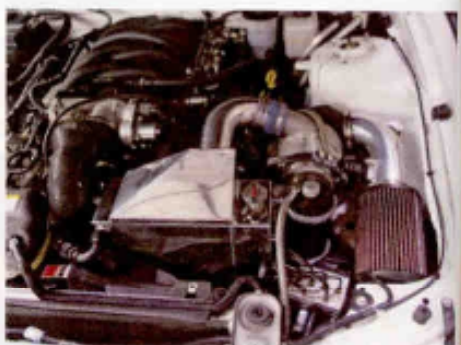
▲ Abe installs the custom-built silicon hose that connects the air-to-water intercooler to the OEM throttle body.



▲ The Rotrex blower uses a self-contained oil system, so a new reservoir is mounted onto the intercooler. This reservoir will contain the specially formulated oil that the traction-drive system inside



▲ Abe installs the filter, intake pipe, and intake elbow onto the blower. The kit uses an AirRaid cotton-gauze filter and draws air from the stock location behind the driver-side headlight.



▲ Once all the connections and bolts are torqued and checked, the front bumper can be reinstalled. When the supercharger is installed, the only thing left to do is install the fuel map to the stock ECU. This is a simple procedure that involves plugging in the OBD II downloader that comes with the kit, then uploading the correct fuel maps for the supercharger to the OEM computer.

5.0

## SOURCES 5.0

### 3D Carbon

Dept. 5.0  
845 W. 16th St.  
Newport Beach, CA 92663  
(866) 332-2726  
[www.3dcarbon.com](http://www.3dcarbon.com)

### Forced Air Performance

Dept. 5.0  
12379 S. 265 W., Unit B  
Draper, UT 84020  
(888) 649-4609  
[www.forcedairperformance.com](http://www.forcedairperformance.com)

### Gillett Diesel Service

Dept. 5.0  
14812 S. Heritagecrest Way  
Bluffdale, UT 84065  
(800) 638-4679  
[www.gillettdiesel.com](http://www.gillettdiesel.com)