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Tennis Phenomenon
Andrea Jaeger

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Supercharging For Economy

An old idea whose time has come—again.

Remember the last picture of a dragster you saw: front quarters high off the ground, wheels pawing the air like an enraged animal, smoke pouring from enormous rear tires distorted by the awesome power coursing through them from engine to asphalt?

Focus in on the engine. There, on top, between those two neat rows of flame-spewing exhaust stacks, sits a large, finned aluminum, barrel-like box. It's called a "supercharger" (or "blower"), and it's been the darling of the drag-race and street-rod crowd since the flathead Ford was the end-all engine. It creates great boosts of extra horsepower by pumping pressurized air into the cylinders, to be burned along with proportionate amounts of fuel.

The idea of supercharging for more power dates back to the dawn of automotive time, and as early as 1909 certain American racing cars were employing the concept. Soon after came the exhaust-driven supercharger, or "turbocharger," and by World War I both systems were widely used on combat aircraft to compensate for the rarefied air at high altitudes. From the 1920s on, supercharging, in one form or another, has been a familiar element in high-powered racing cars and boats, piston-engine aircraft, long-haul diesel trucks and other vehicles where an extra power boost is needed or desired. This concept has also been used in exotic street machines from the classic Blower Bentleys of the '20s to the Turbo Porsches of the '70s.

In recent years, the engine-driven supercharger has been all but forgotten for street use in the wake of the turbocharger's growing popularity as a device for making small, fuel-efficient engines perform like larger ones on demand. This year, Buick,

Chevrolet, Pontiac, Saab, Volvo, Porsche, Audi, Mercedes and Peugeot are offering factory turbocharging on certain models, and a variety of aftermarket suppliers are selling turbo kits for installation in just about anything.

But there are those who believe that engine-driven superchargers may well displace turbochargers as the small-engine power boosters of the 1980s. At the forefront of recent supercharger research is Southfield, Michigan's Bendix Corporation, al-

‘An automaker must keep a certain feeling in his cars, balancing fuel economy with proper acceleration and enjoyment.’

ready well-known as a leading manufacturer of air filters and spark plugs; brake, steering and fuel injection componentry; and truck air compressors.

Bendix began work on modern, compact, lightweight superchargers in 1976, and was building prototype units by the following year. In 1979, Bendix set up a formal project center to speed development and help sell the idea to carmakers. Last fall, the company invited a group of auto writers to check out six supercharged test cars; each one of us came away thoroughly impressed.

A 1979 Dodge Omni 024, for example, accelerated from zero to 60 mph

in 9.5 seconds with the supercharger, compared to 13 seconds without. Largely because its axle ratio had been lowered to 2.99:1 from the production 3.37:1, its city fuel economy was up 4 miles per gallon (to 28), and its highway mileage jumped 2 mpg to 38. A four-cylinder Mercury Capri did zero to 60 in 11.1 seconds, with increases of 2.1 and 2.7 mpg in city and highway economy, respectively. A VW Scirocco zipped from zero to 60 in 8.9 seconds, with no effect on city economy and only a slight (0.7 mpg) drop in highway mileage to a still-impressive 42.9. And a Plymouth Horizon TC-3 equipped with a VW 1.5-liter diesel engine improved its zero-to-60 performance by a full 10 seconds—from 27 down to 17—while its average fuel economy was measured at 42.1 mpg. And in no case did the supercharger adversely affect an engine's emissions cleanliness.

A 1977 General Motors study showed that a car's zero-to-60 performance must be about 15 seconds or better for customer acceptance, yet cars in general have grown progressively more sluggish as their makers strive to squeeze out every last drop of fuel economy. The point of supercharging, says Bendix, is to restore that lost performance while tuning and gearing everything else for maximum mileage. "People buy cars, not just fuel mileage numbers," emphasizes William C. Eddy, managing director of the Bendix supercharger engineering and marketing program. "An automaker must keep a certain feeling in his cars, balancing fuel economy with proper acceleration and a certain enjoyment."

When properly engineered, supercharging enjoys some clear advantages over turbocharging. Only 12 to 15 inches long and about 7.6 inches

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DRIVING

in diameter, the compressor fits nearly anywhere there's room alongside the engine, where it can be driven by an accessory belt like a standard alternator or air conditioning compressor. It requires less under-hood plumbing, no modifications to the intake or exhaust manifolds and none of the heat shielding necessitated by exhaust-driven turbochargers. It reacts immediately on demand and works best at low engine speeds, in contrast to the turbo's traditional power "lag" (while the turbine builds up to speed) and high-rpm performance. It is also, says Bendix, less expensive (perhaps four to five hundred dollars

An engine-driven supercharger, says Bendix, is less expensive and lighter in weight than the typical turbocharging system.

at retail, to hazard a guess) and lighter in weight than the typical turbocharging system.

But because production facilities have yet to be put into place (that depends on firm orders), it would be 1983 at the earliest before Bendix systems are likely to appear on even small numbers of production cars. Some import makers, however, (most notably Italy's Fiat) are known to be working on superchargers of their own and may beat Bendix to market.

Whoever gets there first, it appears that supercharging is an old idea whose new time has come. But this time around, automakers will be supercharging for economy instead of brute performance . . . or some happy compromise in-between. ■

Detroit-based auto writer Gary Witzenburg contributes a monthly column to United Mainliner.

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