

PES Supercharged Audi A4

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Photos by Henry Z. DeKuyper



Of all the aftermarket performance-enhancing products *European Car* experienced in 2002, we chose Performance Engineered Systems' supercharger kit for 30-valve Audi and Volkswagen V6s to receive one of our Select Gear awards (*ec*, 12/02). This is the car that impressed us.

If you want to combine 295 bhp with O.E. levels of niceness and seamless operation,

this is a great way to do it. PES' first objective in engineering this supercharger system was to preserve the integrity of the vehicle: A customer

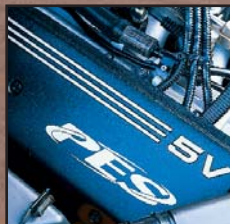
est quarter mile for the least amount of money spent, the customer would have bought a Camaro.

The PES supercharg-

ers-type supercharger, which is highly efficient at moderate pressure ratios and has proven its reliability as original equipment on

originally wanted to invert the compressor to allow longer intake runners, but the power steering pump and pulley prevented it. Even now, they are relocated downward to clear the compressor housing. An intercooler isn't required with an Eaton supercharger at the boost pressures seen in PES' Audi system, nor is there space for one.

Integrating the manifold and compressor made it logical to put



has already paid a premium for an Audi and expects perfection. If the goal was the quick-

er kit replaces the factory manifold with a proprietary cast manifold and an Eaton M62

models from Mercedes-Benz, Jaguar and Aston Martin. An O.E. gasket is used. PES states it

the throttle upstream of the compressor, which is the best location anyhow. Noise is virtually eliminated at light throttle settings, response is smoother and only about 1/4 hp is needed to drive the compressor with the throttle closed. The Eaton's built-in bypass valve allows the air to go straight into the engine rather than going through the rotors. Boost pressure is typically around 5.5 psi and can rise to 7- to 9 psi at the 30-valve engine's 7000-rpm redline, but these figures depend somewhat on how freely the exhaust flows.

Perfect driveability is achieved by keeping the factory engine management happy, not by tricking it. PES adds larger injectors to go with a remapped ECU. Take everything you've heard about the difficulty of tuning Audi's turbo

cars and multiply it a few times to put boost on a non-boosted car. More than 1,000 hours of tuning and road testing were required, but PES got it dialed in. Internal fuel and timing trim corrections are held to a few percent.

Another element of a seamless experience is a truly bolt-on installation, with no guesswork and everything in the box. The manifold and inlet pipe are shipped assembled to the supercharger, so it is ready to mount. The PES system will work with factory or aftermarket intake and exhaust systems, though improvements are recommended for maximum power. PES' A4 demonstrator uses the stock airbox, providing the ultimate in noise containment, and a complete Supersprint Magnum exhaust system. Ignition coils

remain in their original location atop the manifold/supercharger assembly, and the factory plastic cylinder head covers are maintained.

PES provides the installation manual on CD. PES' own technician can install the kit in 6 hours, but a first-timer is better off reserving 12. PES has found the Ross-Tech VAG-COM diagnostic connector and software (also a *European Car Select Gear* item in 2002) to be indispensable, allowing PES to diagnose installation mistakes by phone or e-mail from thousands of miles away. No stock parts are modified with the PES supercharger installation, so a car can be completely returned to original condition.

PES' specialty is turbo supercharger and turbo upgrade kits, but it also markets a full line of tuning accessories. This



A4 is outfitted with KW Suspension's Variant 2 coil-over system and PES' own 8x18-in. Grand Prix wheels with 225/40ZR18 Pirelli P Zero Rosso tires. PES sells Brembo brake upgrades. True to PES' engineering objective of maintaining the integrity of the original vehicle, appearance enhancements remain subtle, with Oettinger front and rear spoilers and Sparco pedal covers.

An Audi must run and drive perfectly, and PES' demonstrator A4 does just that. It also made a ton of power, with excellent throttle response and no lag. Around town, it was quiet. The supercharger was audible only with the throttle open, at which point people will know there's something under the hood anyway. And even then, it didn't

howl the way some installations do. It was almost like driving a stock-engined A4 with a tuned chassis, only there was more power. Ultimately, this system asks questions a chipped S4 may have a hard time answering.

At this time, PES' supercharger kit works only with 2.8L, 30-valve engines. PES has been working to develop the kit for the 3.0L; the manifold fits and PES tells us this A4 will soon be replaced by a new one, which will become its 3.0L tuning mule. In the meantime, the company has kept busy developing its other tuning product lines and building 600+bhp Porsche Turbos, which is not at all a bad way to while away the hours in a day. Readers will be the first to hear about it when we drive one. ❧



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