PAUL PIOLA TAKES A COMPREHENSIVE LOOK AT ENGINE TUNING OPTIONS FOR THE 2.7 LITER V6 TWIN-TURBO IN THE B5 AUDI S4.

When Audi released the S4 in late '99, everybody went nuts. At that time, no other V6 in the States had a twin-turbo engine this side of the $120k Porsche Turbo, never mind all-wheel drive.

The 2.7 liter started with 250hp and 250 lb/ft at the flywheel, good for a 14sec quarter at nearly 100mph. With four doors and room for five, this ultimate hauler continued its reign until '02.

In this article, we're using 200hp at the wheels (whp) as our baseline, indicating 20% drivetrain losses. But gains vary from car to car. To calculate engine hp, divide whp by 0.8.

Also note, installation costs aren't included but should be considered since a turbo upgrade can take several hours once the engine is removed.

Furthermore, importers of European products like RS4 turbo kits are at the mercy of fluctuating exchange rates, so prices can vary.

$0-1000
As always, a decent intake system gives the best bang for your buck.

AWE Tuning's S-flow Intake uses an ITG filter that sits in the factory airbox, intended for light mods with stock turbos. For $80, you can expect an 8whp gain with a 205whp peak.

AWE sells its billet Drive Train Stabilizer (DTS) for $349.

Neuspeed cat-back exhaust
Since many S4s rack up the miles, AWE sells factory K94 engine mounts for $130 each – something to think about when upgrading to K04 turbos.

AWE also sells $160 Bailey Motorsport diverter valves in either polished or black. While replacing a faulty DV, the Bailey valve revealed the old unit lost 8% horsepower during AWE's dyno tests. They also sell Samco hose kits for $445, replacing all boost hoses on high mileage engines.

GIAC offers software for stock turbos at $595, netting 50-60whp at peak, with 80-90whp in conjunction with a good exhaust. The $795 stage 3 “minus” software for K04 turbos uses a 5bar Bosch fuel pressure regulator (FPR) and stock injectors. AWE, evoms and Torque Factory are GIAC distributors.

Matrix Engineering has a 25-row Mocal oil cooler kit and thermostatic adapter for $497. It fits either stock, RS4 or AWE side-mount intercoolers, plus front-mount intercoolers (FMIC) with custom brackets. Customers saw 30-40° drop in oil temps on track.
$1000-2000

Matrix Engineering offers S4 cams, which retail at $1099 and work with factory valve springs and retainers. Two different cam profiles are available, but a $900 core charge is extra.

At over 5000rpm, AWE has reportedly seen a 10° drop on intake temps over RS4 units, and 50° over the heat-soaked stock parts. At 20psi boost, the units saw a 1psi pressure drop versus up to 2.5psi for the stock cores. Testing was done on AWE's dyno using a K04-equipped S4, which jumped from 324whp to 344whp.

AWE is proud of its $1396 dual side-mount intercooler (SMIC) upgrade. The cores are 65% larger than stock and 57% bigger than RS4.

The AWE tubular exhaust manifolds cost $2885. The header flanges are fly-cut and come Swain Tech coated. They give a peak 10whp gain at high rpm and over 20 lb/ft down low over stock. You can earn a $200 discount when it's ordered with AWE's K04 upgrade.

If you want to build your own S4 heads, Matrix Engineering offers Supertech intake and exhaust valves, stiffer springs, titanium retainers, locaters, and solid lifters for $2457.
For the S4 that just blew its turbos, factory K04s is the way to go for both price and power. Any GIAC dealer can sell you the stage 3 "minus" software, aimed at people who can't afford a full stage 3 kit yet. All you need is a Bosch Sbar FPR and the turbos, which you can get from companies like AWE, Torque Factory and Evolution Motorsports. It works with the stock intake, injectors and exhaust. The setup will run about $3800 and will work on Tiptronic cars. Expect around 290whp.

$4000-5000

Give AWE $5250 and you get a RSK04 turbo upgrade, turbo inlet piping and installation hardware to the downpipes. This kit also includes AWE's optional fuel system with balanced Bosch injectors, spark plugs, GIAC software, AWE MAF housing with adapter, silicone hoses and all hardware. For '01-02 models, the Bosch MAF must be converted to a Hitachi unit, adding $300. AWE reports it doesn't use OE RS4 injectors because the spray pattern doesn't suit US-spec S4s. AWE also claims its downpipe ($1595) and cut-back system ($995) are needed to run this kit. The firm further recommends its Intercooler upgrade ($1366), Samco hoses ($400), DTG bar ($349), RS4 engine mounts ($260) and RS4 clutch kit ($495). Tiptronic S4s need a level 10 transmission upgrade to run this kit.
$8000-10000

$10000-12000

Rich and Shameless
If your S4 is bone stock, you can double your power with AWE while maintaining good spooling. You need their RSK04 turbo kit with stainless and coated tubular manifolds and fueling system, plus the side-mount intercooler kit ($1595), downpipes ($1595) and cat-back ($995), bringing the total to $9258 ($10345 for '00 models converted to Hitachi MAF). Additionally, you'll need the RS4 clutch ($485) and a turbo-back system ($2590) to fully benefit, for a grand total of $12331. AWE has seen 3800whp and 370 lb/ft on 93-octane, and 416whp and 428 lb/ft using 103. Thanks to the exhaust manifolds and GIAC tuning, 20psi is reached by 3000rpm.

Contact

Although primarily AWE dealers, Wicked Motorsports offers its "stupid-power" package. It includes a built motor to reach 800whp on race fuel with a custom GT2871 turbo kit, Innovate Systems headers and downpipes, built 2.6 liter O-ringed motor using JE Pistons, Cunningham rods, nitrided crank, main and head studs, a worked head with oversized valves and custom cams, RS4 gaskets, Aeromotive fuel pump, fuel rail and 65 lb/hr injectors, RS4 intake manifold, Evolution Racewerks 4" side-mount intercoolers and Clutch Masters clutch and flywheel. The system is controlled by 034 Motorsports engine management. This setup will run over $26000, but don't forget 45-plus hours of labor. 