

Modified cars: **EIP Stage 1 turbocharged R32**



# Bolt-on *boost*

**Simon Griffith's EIP turbo'd R32  
boasts well over 400 bhp, from  
a bolt-on conversion...**





**Most 23-year-olds would be content with a tuned and styled Mk 2 GTI, but Simon Griffiths, a plant fitter and Taekwondo instructor from South Wales, obviously sets his sights at a much higher level. Not content with an average hot hatch, he bought his R32, in December 2004, for £21,000 from Cardiff Volkswagen.**

Factory-equipped with black leather and Satnav, and with 10,000 miles already on the clock, it was well run-in, but after driving it for only a few weeks Simon found that it wasn't as quick as he expected a 240 bhp 3.2-litre V6 to be. As we've noted before, some of the early cars suffered from a software fault and were below par on performance and economy. Although an official software upgrade was soon released, in the meantime many owners turned to the aftermarket tuning industry for their salvation.

### 'IT WASN'T AS QUICK AS HE EXPECTED A 240 BHP 3.2-LITRE V6 TO BE...'

Simon took the R32 to AmD Technik, one of the first tuning companies to develop an ECU upgrade, pushing the power up to over 260 bhp. The engine also ran much more cleanly and smoothly as a result, but it still wasn't enough. Indeed, it was at this point that Simon first set off on the trail of pressurised induction systems, the only real way to get a substantial power increase from the narrow-angle V6 engine without extensive re-engineering and machining. AmD had been testing the VF Engineering supercharger kit from the USA, but at that stage didn't think it was quite ready for market. It has since carried out a lot of work devising an improved tensioning system for the all-important belt drive, which will soon be available.

So, instead, Simon spent some time researching the other options, with an evening on the internet throwing up leads on two companies in the USA which had developed turbo kits for the R32. Generally considered superior to supercharging, in that it doesn't sap power from the engine to drive the compressor, the turbo option for the R32 certainly offered greater returns, promising over 400 bhp in its basic

configuration compared with around 320 for the contemporary supercharger kits.

The decision was soon made when Simon realised that the EIP Stage 1 turbo conversion could be fitted without extensive work to the engine. Literally a bolt-on job, without taking the head off to install a spacer plate to reduce the compression, and retaining the standard inlet manifold, it was not only easier to fit but was also cheaper than the higher-tech competition.

After reading further, about the promise of over 400 bhp from the T4 Turbonetics turbocharger with stainless steel manifold, Turbosmart wastegate, Spearco front-mounted intercooler, and easy seven-hour installation, a click on the contacts panel referred Simon to two companies in the UK which were suppliers of EIP components, although neither – at that stage – had actually installed the turbo kit. Deciding instead to go it alone, Simon contacted the next nearest installer – VR6 Specialists in the Netherlands. Not only was Ronald Logmans at VR6 Specialists extremely helpful, but he had only just ordered a kit from EIP at the time and was happy to make it available.

The only issue was that all the EIP conversions up to that point had been carried out on American and European left-hand-drive models. Simon was going to be the first to deal with the difficult installation issues raised by the right-hand-drive steering rack.



By the time the kit arrived, in late November 2005, the car had already been off the road for nearly a month, up on ramps in Simon's garage, and – working from pictures posted on the 'net – he'd removed the exhaust system, subframe and front bumper in readiness for the conversion.

Designed for DIY installation, EIP provides a DVD showing the basic procedures for fitting the Stage 1 kit, such as modifying the manifold to fit the two oxygen sensors into the separate banks, a task requiring accurate measuring, cutting and TIG-welding. Apart from that, the only other major modification which has to be made is to remove the sump and drill a hole in the side for the oil return pipe from the turbo.

With the front bumper off, a small lip has to be cut off the front of the radiator to allow the front-mounted intercooler

to sit flush against it. A highly efficient bar and plate design, flowing from end to end, this sits very neatly behind the central air intake in the R32's standard front bumper. Carefully tailored, the combination of aluminium and silicone pipes which connect it to the turbo were all found to fit almost perfectly, in some cases missing vital parts like the crank pulley by only a few millimetres.

Predictably, the same couldn't be said for the downpipe from the turbo. The right-hand-drive rack was right in the way. No longer a DIY proposition, Simon rang around and was put in contact with Pro-Speed Exhausts, a company in Cardiff which was willing to fabricate a suitable piece of pipework. With the front subframe and suspension put back on the car, it was trailered down to Pro-Speed's premises in Cardiff Road, where Charlie Newton worked all day



and well into the evening reshaping the pipe to fit. Tacked together in place on the car, the plan had been to remove it for the final fabrication, but such was the resultant shape that it couldn't be extracted and the final welding had to be performed in situ, after a total of 16 hours hard work.

The rest of the exhaust system was straightforward. The EIP Stage 1 conversion includes a full 3-inch diameter stainless-steel competition exhaust and high-flow cats, as well as a choice of atmospheric or recirculating dump valves, although Simon preferred to fabricate his own flange to mount a Forge Motorsport dump valve.

Meanwhile, the original ECU was sent off to VR6 Specialists, so that it could be reprogrammed to suit European applications. Often overlooked is that software from companies in the US is specifically written to suit American driving styles, ambient conditions and petrol grades. Installed and tested on Ronald's own car, the results were described as 'awesome' – the perfect present, as it arrived back here in the UK on Christmas Eve. Ronald talked Simon through the procedure of fitting it and letting it learn the engine's new characteristics, and after a few days of steady driving and setting up the APEXi AVC-R boost controller, it was ready for its first full-blooded road test. In Simon's own words: 'I pushed the pedal to the floor and all hell was let loose. The car

took off with a deep growl from the open wastegate and it just kept pulling and pulling. I love it. It's the best thing I have ever driven!

A first test run on the Dastek four-wheel-drive rolling-road at Westec Performance netted a peak power figure of 385 bhp, using only 0.4 bar as shown on the VDO boost gauge mounted in the column pod. Despite the standard compression ratio, the stage 1 conversion is capable of boosting to 0.6 bar (nearly 9 psi), so there was clearly more to come. The ECU was sent back to the Netherlands for some more tweaks, and Simon was confident of achieving over 400 bhp. A few more modifications were made, installing a three-way switch in the dash to control the cooling fans, and a 70°C thermostat was fitted only a few minutes prior to the second test session, which we witnessed at Westec.

A bitterly cold and frosty morning in early February provided perfect conditions for the rolling-road test, and this time the engine temperature stayed much cooler. Previously, it had heated up to 112°C by the last run, but now, with the manual fan switch and cooler thermostat, it stayed at 90°C. On the best of four runs, it recorded 418 bhp at 6712 rpm at the flywheel and 330 lb.ft. torque at 3000 rpm, impressive figures for a conversion which is essentially a straightforward bolt-on.

Seeing Simon's enthusiasm for the car at first hand, it seems unlikely that it

will remain at Stage 1 for long, though. EIP also offers a Competition series upgrade which uses a ceramic ball bearing turbo, to provide faster spool-up, and an improved intercooler which can flow twice as much air as the standard component, a combination which can add another 20 bhp. Simon is also looking at fitting a competition clutch to keep control of all that torque.

There's also a Stage 2 conversion, which requires installation of a low-compression head gasket but which can allow the boost and power to be cranked up still further, and Stage 3 which requires an engine rebuild with forged alloy low-compression pistons and 4340 chrome moly conrods, along with an integrated engine management and fuel system upgrade to produce over 500 bhp.

Stage 4 adds a Turbonetics T04 turbo, a high-flow cylinder head, larger fuel injectors, 1:1 fuel pressure regulator and a bigger fuel pump, along with an Electromotive engine management system, to produce

582 bhp and 529 lb.ft torque. Needless to say, it also needs an uprated transmission mount, racing clutch and flywheel, and a Haldex controller to manage this much power!

In the meantime, the official right-hand-drive version of the Stage 1 kit will soon be commercially available here in the UK. Grant Westgate of Westec Performance will shortly be fitting one to his own R32 and Westec is now an official importer for EIP Performance products, with a whole range of products listed on its website. We suspect that the Dastek four-wheel-drive rolling-road which dominates the Westec workshop will prove to be a useful investment! 



**'THE CAR TOOK OFF WITH A DEEP GROWL FROM THE OPEN WASTEGATE AND IT JUST KEPT PULLING AND PULLING. I LOVE IT. IT'S THE BEST THING I HAVE EVER DRIVEN!'**



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