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VAGTECH'S TURBO R32

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Turbo R32!

VAGtech's HPA turbo conversion has transformed the R32 into a sensational supercar

WHEN THE R32 was introduced to the UK early in 2003, it was an instant hit with performance VW enthusiasts looking for something really special. Here at last was a Mk 4 Golf which not only performed and handled like a true hot hatch, but also looked just right. Many preferred the muscular but mature styling of the R32 to the bold, brash overt image of rivals like the Subaru Impreza or the super subtlety of the Audi S3. In the R32 they now had the silky smooth performance of a tuned V6 allied to four-wheel drive, with uncompromisingly sporting handling and all the practicality of the five-seater hatchback.

Among the ranks of those who were instantly smitten by the R32 was Jon Watts of Milton Keynes. Although he'd spent much of his working life as an IT consultant, designing and troubleshooting computer systems for the big banks, Jon had always been a dedicated car enthusiast, with a string of high-performance cars – mostly BMW or Volkswagen – to his name, and the R32 was a natural aspiration.

His involvement in performance VWs dates back to the time when the gearbox of his Mk 2 GTI 8V developed a fault and he visited Clive Race at German Recycled in nearby Hockliffe for a replacement. The possibilities posed by a breaker's yard full of engines and gearboxes proved too much and before long the Mk 2 was also lined up for a G60 engine transplant. Although successful, this was soon superseded by a VR6 swap, along with just about every other high-tech conversion possible, including a Mk 3 dash swap and ABS upgrade.

It wasn't long before friends and acquaintances were calling upon his growing expertise and as well as developing his mechanical skills, he found he was increasingly putting his computer experience to good use, becoming involved in some fairly sophisticated conversions, even transplanting a tuned 20VT engine into a Golf Rallye. The seeds had been sowed for a future venture...

But it was at GTI International in 2004 that the real inspiration came. By this time, he had left the stresses of his high-

powered job in London behind and was keeping his options open. He'd also invested some of his hard-earned cash in the R32 he'd lusted after since he'd first seen it tested on BBC's Top Gear. Wayside VW at St. Albans had an order cancelled for a brand-new Deep blue pearl R32 and Jon was around at just the right time to pick it up at a good price. It didn't take long, though, before he wanted to improve its performance and visited AmD Technik at Bicester for its Stage 2 re-chip and Milltek exhaust, pushing the power up from 240 to 270 bhp. It was to be only the start of a conversion process which was to see the R32 transformed into a true supercar.

Jon had been watching the quarter-mile Sprint when the KW Suspensions-sponsored twin-HGP turbo'd R32 ran its 11.26 ET, with a 0-60 time of just 2.98 seconds. It was a sight, he recalls, that truly changed his life: 'It was just awesome, and I realised right then and there that I had to do something similar...' By this time he had already decided on his future direction in life and had

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invested his savings in starting VAGtech, an independent VW tuning company based in a well-equipped workshop unit in the sleepy village of Soulbury, only about 10 miles from Volkswagen HQ at Milton Keynes.

Before taking the performance of the R32 any further, Jon turned his attention to the suspension and brakes. If it was good enough for the twin-turbo R32 then it was good enough for him and so he installed a KW Variant 1 height-adjustable coil-over suspension kit. As well as allowing the ride height to be set at the perfect level, it also improved the handling and, surprisingly, the ride comfort of the R32. The standard Aristo multi-spoke alloys were also fitted with a set of 225/40 ZR18 Yokohama Paradas, to provide a further improvement in roadholding.

A Forge Motorsport poly bush conversion for the 'dogbone' engine mount also improved the driveability, reducing the tendency of the heavy engine block to rock back and forth when accelerating or cornering hard.

An improvement in braking power was also on the agenda, especially after reading a feature in *Volkswagen Driver* which compared a Brembo-braked GT TDI with a tuned R32. We'd commented that the Brembo brakes felt rock hard, while the standard R32 stoppers, although powerful, were perhaps rather too progressive. It only served to reiterate his own dissatisfaction with the standard set-

up and it wasn't long before an ECS Stage 5 308 mm big-brake conversion was installed, the full fitting procedure covered in the May 2005 issue of *Volkswagen Driver*. Since then, Jon has also installed the matching ECS 308 mm rear disc conversion, producing a well-balanced braking system that is well up to the job of hauling the R32 down from high speed.

Meanwhile, the main task of providing the R32 with a substantial power boost was being thoroughly researched. Jon had read about the supercharger conversions already on the market, producing about 320 bhp, but was convinced that turbocharging was the way to go. While

the belt-driven supercharger saps some power from the engine, the exhaust driven turbo only adds to the performance. But, at that time, only two companies – both based in North America – were marketing turbo kits for the R32, EIP Tuning in America and HPA Motorsport in Canada.

It didn't take long to realise that HPA were using components from HGP in Germany, whose twin-turbo'd R32 had been such an inspiration, and an order was soon placed for the HPA FT400 single turbo conversion, claimed to be capable of boosting the R32 to 400 bhp. HPA also produces two other configurations of turbo kit, the basic FT360 which uses a non-intercooled direct-to-manifold turbo system to produce 360 bhp, and a twin-intercooled FT450 kit which edges the peak power up to 450 bhp.

There was only one reservation; the kits – designed primarily for the German and American markets – were only suited for left-hand-drive cars. No-one could guarantee that it would fit a right-hand-drive car, but Jon bit the bullet and ordered the kit anyway, determined to carry out any further conversion work necessary to make it fit. After a long wait, the kit arrived in April this year and the R32 was wheeled into the workshop.

It's important to appreciate that this is not just a bolt-on conversion. The cylinder head has to be removed to allow a head spacer plate to be installed, to reduce the compression ratio from the standard



11.3:1 to 8.5:1. Without it, the 0.9 bar (13 psi) boost from the HGP Garrett R30 ball-bearing turbo would literally blast the engine apart. Removing and reassembling the complex 24-valve cylinder head on the R32 isn't a job for the faint-hearted, especially the precision task of re-setting the variable valve timing, and Jon is grateful for the help of

Greig Brookes, an experienced technician at Wayside VW who has since come to work at VagTech.

It's also necessary to take off the sump, to install an oil return pipe, and tap into the water circuit for a feed to the water-cooled turbo. The major task, though, was modifying the 70 mm diameter down-pipe to prevent interference with the bodywork around the steering column, and after a lot of trial and error VAGtech

has perfected a technique for cutting and rotating the pipework by just the right amount to provide the necessary clearance.

The kit also involves installing new high-flow fuel injectors and plumbing in the piping for a side-mounted intercooler which is situated in the left-hand front wheelarch, receiving airflow through the bumper grille panel. It also uses the larger diameter air mass meter (MAF) housing from an Audi S4, with the R32 sensor, relocating the air temperature sensor to the inlet manifold. →



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'PRESS THE PEDAL FLAT TO THE FLOOR, THOUGH, AND ALL HELL BREAKS LOOSE AS THE FULL 400 BHP CATAPULTS THE CAR FORWARD...'

All in all, the conversion took somewhat longer than the standard 10 hours advised by the suppliers, but – now that the right-hand-drive manifold modifications have been perfected – any future conversions will be much more manageable. And there are sure to be lots of interested customers, not only from the ranks of R32 owners but also 3.2 V6 TT quattro pilots, once the full potential of the conversion is demonstrated.


It had only done a few thousand miles when we drove the car for our photoshoot, but its performance is absolutely phenomenal. Due for its first public outing on the quarter-mile drag strip at the GTI Festival at Santa Pod, just after our deadline for this issue, the 400 bhp VagTech R32 is bound to impress. It will also be seen in action on the circuit at our track day at Castle Combe on July 23, and VAGtech also has plans to take part in the Tuner Grand Prix at Donington in September.

In the meantime, although the car hasn't been committed to the rolling road, initial road tests, two-up and with a full tank of fuel on board, have recorded acceleration times of 4.5 seconds for 0-60 and a quarter-mile time of dead-on 13 seconds, using a G-Timer vehicle performance computer. That's performance on a par with a Porsche 911 GT3!

But perhaps even more impressive than its blinding outright performance is its tractability at low speeds. With not a hint of off-boost temperamental or turbo lag, the car will trickle along at almost walking pace, smooth and relaxed, but tickle the throttle and it oozes forward with perfect progression. No lurching or shunting, just seamless linear acceleration. Press the pedal flat to the floor, though, and all hell breaks loose as the full 400 bhp catapults the car forward. You need to shift through the gears very rapidly to keep the rev counter from burying itself deep in the red, and the speedo just keeps on climbing. With the speed limiter disarmed as part of the ECU reprogramming necessary to suit the turbo conversion, the car now has a theoretical top speed of over 170 mph, but its real forté is its mid-range acceleration. Regardless of which gear you are in, the massive torque (HPA claim 380 lb.ft) just squirts the car forward at whim, and almost any overtaking opportunity becomes a mere formality.

Not only is the conversion capable of producing supercar performance, but it remains civilised and tractable enough for everyday road use. Far from straining at the leash and needing to be reined in all the time, the smooth and progressive power delivery is perfect for road use.

You'd soon lose your licence if you employed the full power output on a regular basis, but this is one of those high-performance conversions which makes every journey an effortless breeze and endows the driver with the confidence that he has nothing to prove, such is its superiority.

Bear in mind, too, that this is not the ultimate capability of the R32. There is still the HPA twin intercooler conversion, capable of pushing the power output up to 450 bhp... 



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