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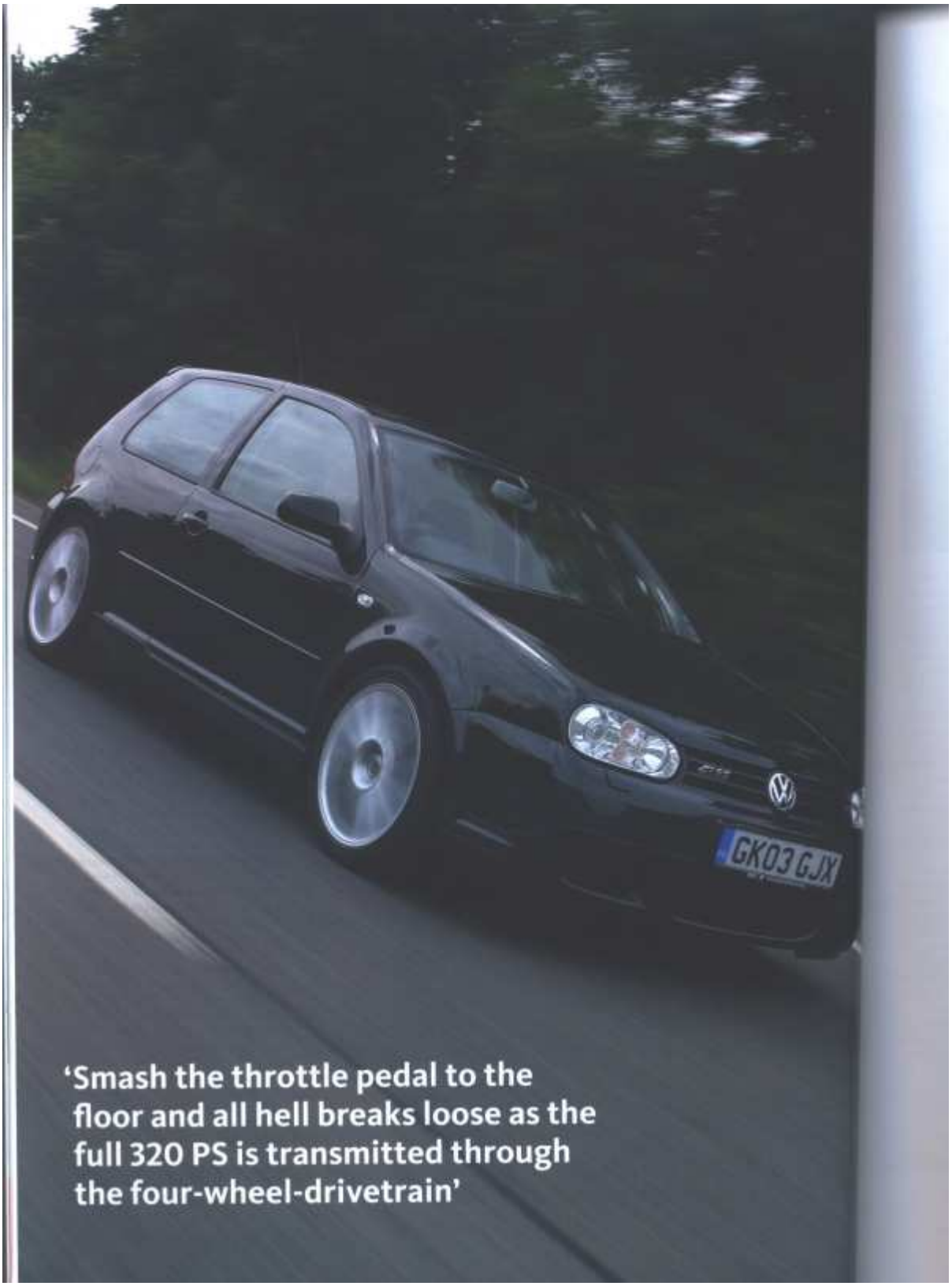
GK03 GJX
'Smash the throttle pedal to the floor and all hell breaks loose as the full 320 PS is transmitted through the four-wheel-drivetrain'

# Storm force!

## The Scotts Mototune R32 now benefits from forced-feeding, with its Vortech supercharger pumping the power up to 320 PS!

THIS IS NOT the first time we've featured this very car, but there have been major developments since we first road-tested it in the September 2003 issue of *Volkswagen Driver*. At that time, Scotts Mototune were one of the first to re-chip the R32, using a conversion from the German specialist SKN, along with a Milltek exhaust system. Pushing the power up from 241 to 260 PS, it was not only measurably faster, but also smoother and more responsive. The standard Volkswagen UK press car we were road-testing at the same time felt almost lame in comparison!

Now, Scotts Mototune has taken another step forward, and the car now benefits from a supercharger kit developed by VF Engineering of Anaheim, California, and marketed in the UK by NS Racing. Using the well-proven Vortech V1-SC unit, the 3.2 V6 now produces over 320 PS and is capable of knocking nearly 2 seconds off the 0-80 mph time, compared with the standard car, providing massive mid-range torque for almost instantaneous overtaking.

But why a supercharger kit? Pressurised induction has long been a favourite method of extracting major power increases, literally force-feeding the engine with fuel-air mixture. An exhaust-driven turbocharger offers the maximum gains, because engine power isn't wasted, as it is with the belt-driven supercharger unit, but it also incurs difficulties routeing hot exhaust pipes within increasingly space-restricted engine bays. There is also the progression problem resulting from lag at lower engine speeds; use a turbo unit large enough to make substantial power at high rpm and response at lower speeds suffers as it takes longer to spool up. Not so with the engine-driven supercharger, which provides an almost linear increase in power, in direct proportion to engine rpm. Although ultimate peak power outputs are not always as impressive, the characteristics of the supercharged engine are generally much better suited to road use, and there are far fewer problems with thermal insulation and overheating.

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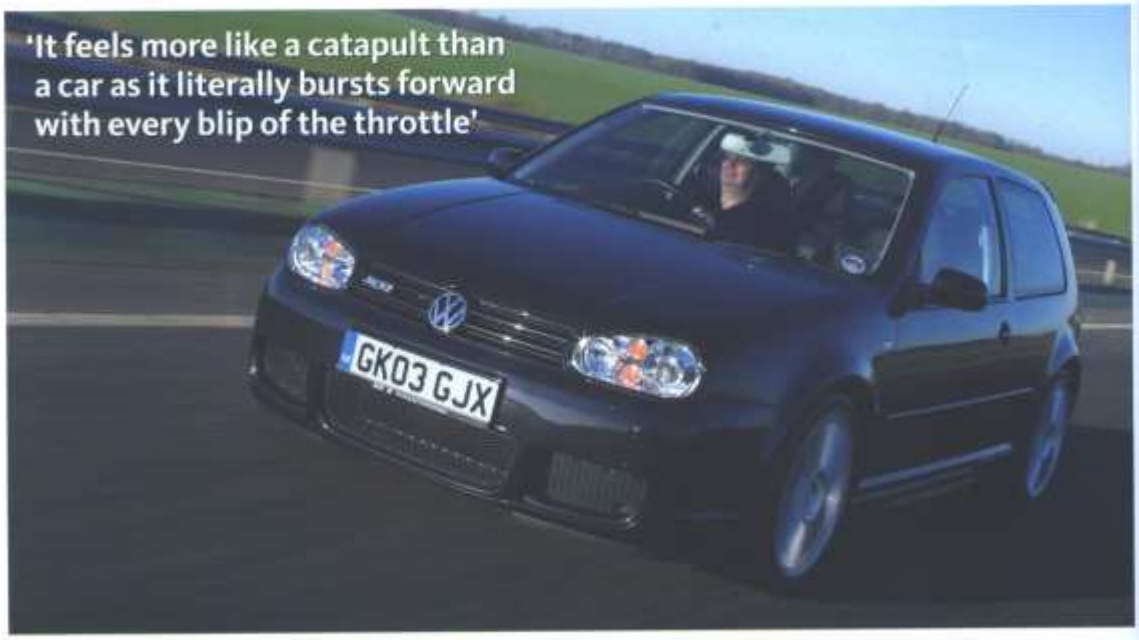
In the case of the VF-Engineering conversion, the compact Vortech compressor unit sits neatly in the space normally occupied by the washer bottle at the front left-hand side of the engine bay. A very short unit, with substantial bearings and a short driveshaft, it suffers much less from the belt tensioning problems experienced with other supercharger conversions.

The current stage 1 conversion is very neat, the induction piping routed around the front of the engine, behind the radiator. It then snakes around the right-





hand side of the block, to the throttle housing mounted between the block and the bulkhead. Although this routeing incurs a greater length of pipework than the traditional 'clockwise' system, it has two advantages. Quite apart from avoiding the hot-spots above the standard exhaust system behind the engine, it also leaves the way clear for the soon to be released stage 2 conversion. This will include a front-mounted high-flow air-to-air intercooler. Used in conjunction with high-capacity injectors, it will allow the use of higher boost pressures, up from 5.0 psi to 7.5 psi, for even greater power increases.

It looks superb, not only expertly engineered for a neat installation, but also beautifully finished. The supercharger unit can even be specified in a choice of plain satin aluminium finish, or highly polished, and the ceramic aluminium-coated pipework is perfectly formed and highly polished.

It performs beautifully too. Flick the ignition key and blip the throttle and the 3.2 V6 snarls into life before settling down to its usual slightly gruff idle. But in addition to the usual six-cylinder engine note there is the unmistakeable supercharger whine and induction hiss as the pressurised airflow is squirted through the pipework to the throttle body. Mounted on the dashboard, just below the lip of the instrument binnacle, a small digital boost gauge flickers frantically as its red figures register the boost level, up to the maximum 5.0 psi.

With its low first gear, the R32 needs treating with respect at the best of times, if you are to avoid bouncing off the rev-limiter almost as soon as you engage the clutch. But while it's obvious that the supercharged engine is capable of far more ferocious aceleration that the standard car, it can also be driven smoothly and steadily. In fact, once accustomed to the clutch and throttle response, we found that it would cruise very comfortably in traffic, without snatching and surging. Just like the standard car, it remains extremely tractable and can be trickled along at very low speeds without drama, even pulling cleanly from less than 10 mph in sixth gear!

Smash the throttle pedal to the floor, though, and all hell breaks loose as the full 320 PS is transmitted through the four-wheel-drivetrain. With no wheelspin or clutch slip to soften the blow, it feels more like a catapult than a car as it literally bursts forward with every blip of the throttle. The only difficulty, certainly in the lower gears, is keeping it from colliding with the rev-limiter as the engine revs with such little inhibition. Fortunately, the six-speed gearbox shifts smoothly and quickly and some deft work on the clutch and gearlever will enable you to chase the rev counter all the way up to sixth gear and a cruising speed deep into three-figure territory. With the speed-limiter removed as part of the SKN software modification, Scotts Mototune claims a potential top speed well in excess of 170 mph!

More important in the real world is how quickly it accelerates up to speeds below the legal limit. Despite the inhibiting effect of the short gearing, the 0-60 time is cut by nearly a second compared with the standard R32, and it is nearly two seconds faster to 80; indeed it was 1.3 seconds faster than the re-chipped car. In fact, this is the fastest accelerating road car we've ever tested for *Volkswagen Driver*.

Its torque and flexibility are also reflected in the in-gear times. While we had difficulty improving on these with the car with the 260 PS conversion, the

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GOLF

# Modified cars: **Supercharged R32**


supercharged R32 comes into its own in the mid-range, with the benchmark 50 to 70 mph achieved 1.2 seconds faster in fourth gear and 1.3 seconds faster in fifth.

Without the benefit of our usual extensive road-test regime on this occasion, we were unable to record any meaningful fuel consumption figures. It is perfectly feasible, though, that – driven carefully – the optimised and enhanced supercharged car could match the standard example for fuel economy. When we tested Abt Sportsline's supercharged V6 4Motion in November 2001, we actually improved marginally on the figure for the standard car. For the record, the Scotts car is significantly faster than the Abt V6, despite the R32's extra weight of trim and equipment. The only consideration is that the supercharged car must use high-octane fuel, 98 RON Optimax the preferred diet, because of the combination of high boost levels and increase in effective compression ratio.

Despite its substantially improved power output and performance potential, Scotts Mototune has made no other modifications to the car since we last drove it. The standard suspension, brakes and wheel/tyre combination are all quite capable of coping with the extra performance, although we've always felt that the R32 would feel much more better with a brake upgrade. The long pedal travel and soft response of the standard brakes lend themselves to easy modulation in traffic conditions, but aren't inspiring when driving fast. For track-day use, certainly, it would benefit greatly from a rigid monoblock multi-piston calliper design and high-temperature pads, giving a rock-hard pedal with no fade at all.

Only a masochist will want to use a stiffer or lower suspension set-up on the R32 for road use, although increasing the diameter of the anti-roll bars might eliminate the hint of body roll when switching quickly from lock to lock. The brand-new standard Michelin Pilots on the Scotts car had hardly been roughened by the road when we first drove it, feeling distinctly 'green' and slippery, but now bedded-in after a few thousand miles they were much more inspiring. But, even with the benefit of the Haldex unit and ESP/ASR traction control, we suspect that the full 320 PS will need to be used with some caution on a wet road.

The supercharger conversion has certainly added a substantial boost to the performance of the R32. At nearly £5,000, including labour charges for the 8-10 hours needed for fitting, it is not an inexpensive conversion, but it raises the performance into another league. In fact, this very car was being offered for sale shortly after we tested it. At an asking price of £24,750 – just £2,155 more than the standard car, and with the options of black leather, sunroof, cruise-control and aftermarket Smartnav system, it will almost certainly have been snapped up in no time. The good news is that Scotts Mototune can readily arrange a replica!

**PERFORMANCE COMPARISONS**

| | Scotts Mototune Golf R32 – S'charged | Scotts Mototune Golf R32 | Golf R32 | Golf V6 4Motion | Abt Golf V6 4Motion – S'charged |
|---|---|---|---|---|---|
| Displacement, cc | 3189 | 3189 | 3189 | 2792 | 2792 |
| Power output, PS/kW | 320/235 | 263/193 | 241/177 | 204/150 | 280/205 |
| @ rpm | 6250 | 6800 | 6250 | 6200 | 6750 |
| Maximum torque, lb.ft/Nm | 287/390 | 262/354 | 236/320 | 200/270 | 244/330 |
| @ rpm | 2750 | 2600 | 2800-3200 | 3200 | 4800 |
| Maximum speed, mph | 170+ | 170 | 153 | 146 | 158 |
| 0–50mph, sec | 4.5 | 4.8 | 5.1 | 5.2 | 4.8 |
| 0–60mph, sec | 6.0 | 6.4 | 6.9 | 7.0 | 6.4 |
| 0–70mph, sec | 7.7 | 8.0 | 8.9 | 9.5 | 8.3 |
| 0–80mph, sec | 9.5 | 10.0 | 11.3 | 11.8 | 11.2 |
| 30–50mph (third gear), sec | 3.0 | 3.2 | 3.5 | 3.6 | – |
| 30–50mph (fourth gear), sec | 4.2 | 4.4 | 4.6 | 4.7 | – |
| 50–70mph (third gear), sec | 3.2 | 3.7 | 3.7 | 3.8 | – |
| 50–70mph (fourth gear), sec | 3.6 | 4.0 | 4.0 | 4.7 | – |
| 50–70mph (fifth gear), sec | 4.6 | 6.1 | 5.9 | 5.9 | – |
| 50–70mph (sixth gear), sec | – | – | 8.4 | – | – |
| Overall fuel consumption, mpg / l/100km | – | 24.7/11.4 | 24.1/11.7 | 22.7/12.4 | 22.9/12.3 |
| Unladen weight, lb | 3256 | 3256 | 3256 | 3089 | 3089 |
| Power/weight ratio, PS/ton | 213 | 181 | 165 | 148 | 202 |
| Test publication date | March '04 | September '03 | September '03 | September '00 | November '01 |


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