



At the top of the rev
range it's brutal

DEVELOPMENTAL

A SUPERCHARGED 2.0L FSI 20V MK2 RALLYE? BUT WHY CHUCK THE TURBO AWAY IN THE FIRST PLACE? ANDY SAHOTA CAN THINK OF 400 REASONS...

Word up: James Wallace Happy snapper: Dan Pullen



THEGOLF.CO.UK 53 AND THERE'S MORE!

UK RALLYE

DEVELOPMENTAL

IT'S A TOUGH QUESTION, but one that's definitely worth asking: How do you maintain the four-cylinder, forced-induction character of the Rallye without altering the driving characteristics of VW's homologation special, or resorting to a turbo transplant? It's a sad fact, but for all you forced-induction devotees the original G-lader 'charger has never really cut the mustard in terms of developing enough power to make the most of that Syncro all-wheel-drive system. All too often it's been found wanting in the reliability stakes, too. And given that the Rallye is hardly visually discrete, thanks to those agreeably flared metal haunches and hostile, squinty-eyed front end, it really is a car that needs a good slab of power to go with the looks.

So, as 30-year-old Andy Sahota settles down to another brew, surrounded by weapons-grade VR6 and 1.8T-powered VWs in the Aldermaston workshop of forced induction specialists Storm Developments, he starts to tell us just how Storm went about it, and in the process made the Porsche-baiter now shown here.

In actual fact this car came from Belgium, and when Andy picked it up it was already a heavily tweaked specimen, motivated by a race-spec 2.0-litre G60 engine from the renowned Dutch G-lader specialists JD Engineering. Thanks to an overbore, JD pistons, 65mm supercharger pulley, a custom re-map and a Supersprint exhaust system the car was already knocking on for 250bhp. But that wasn't enough...

New clear power

From the outset the plan was always to craft a somewhat special demo vehicle from this particular car. But with numerous other personal projects on the go – not to mention plenty of engine transplants being undertaken for paying customers – the Rallye sat in the corner of the workshop gathering dust until one annoyingly persistent customer by the name of Martin Hackett convinced Andy that the G60 engine would suit his *GOLF+* featured Mk2 16v (Feb '06 issue).

The Rallye then sat engineless for a while until a 2.0-litre T-FSI lump from a written-off Audi A3 Sportback popped up in the classifieds. Andy snapped it up and set about bolting it into the Rallye engine bay using the original 02a gearbox, and a custom driver's side engine mount. But there were still some clearance issues as the original K03 turbo was interfering with the 4WD transfer box at the base of the engine bay, while the space-age Stratified Fuel injection and Ignition system didn't want to play ball using aftermarket engine management. You see, VW/Audi's latest FSI technology aims fuel directly into the combustion chamber, accurately controlling the mixture of fuel and air for better economy with the greatest possible power and torque, while still complying



This is something different



Those power-crazed loons



with current world emissions legislation.

However, to achieve this VW sacrificed four of the 20 valves originally used in the 1.8T cylinder head to make room for the injectors in the latest 2.0-litre FSI power plant, and as Andy said: "After examining the 16v cylinder head we realised that the FSI technology would compromise power; we weren't really searching for economy anyway, and although Motec now makes an ECU that can deal with the stratified element of the combustion process, there had to be a more logical way to get serious power out of the Rallye."

At around the same time, experiments with Storm's R32-engined Mk2 and also its Mk2 2.9-litre VR6 demo cars netted impressive

power gains using a range of superchargers from Danish company Rotrex. With confirmed power figures of 490bhp and 370bhp respectively on Dave Walker's Emerald rolling road, thinking caps were donned and Andy decided that a Rotrex set-up might just work on a four-cylinder lump.

Nice Cupra T

So the Rallye swiftly became home to an AYP (Seat Ibiza Cupra) 1.8L 20-valve engine. Using a normally aspirated 20v exhaust manifold, selling the original KKK turbo and replacing it with the hybrid Rotrex/Storm C30/94 supercharger that was producing around 2bar of boost, alongside a fully

mappable Emerald M3DK engine management system, resulted not only in a super-neat install, but also 359bhp from an otherwise internally stock 1.8T. Pretty impressive, eh?

Admittedly, an aftermarket turbo set-up might develop the same sort of power, but it's the linear and controllable way in which this particular engine delivers its power that really matters, not forgetting the easily accessible torque throughout the rev range. Nevertheless the power-crazed loons from Aldermaston still weren't satisfied.

"Realising the limitations of the 1.8 bottom end and the extra stress that the 2.0-litre FSI engine is designed to cope with, we decided to mate the small port AYP 20v head to it using



GET THE LOOK



"You know you've got 400bhp when your extendable aerial extends itself as you accelerate," Andy laughed. The point is: don't buy a crap aerial, get a 2.0 20v supercharged engine instead!



OWNER PROFILE

NAME:

Andy Sahota

FROM:

Basingstoke, UK

FAVE MOD ON CAR:

The FSI bottom end – first in the world!

DREAM CAR:

Mk2 G60 Edition 1 with 600bhp R32 engine... Watch this space!

TOP CHOONZ:

Razorlight - Razorlight

RAZORLIGHT

In the Morning



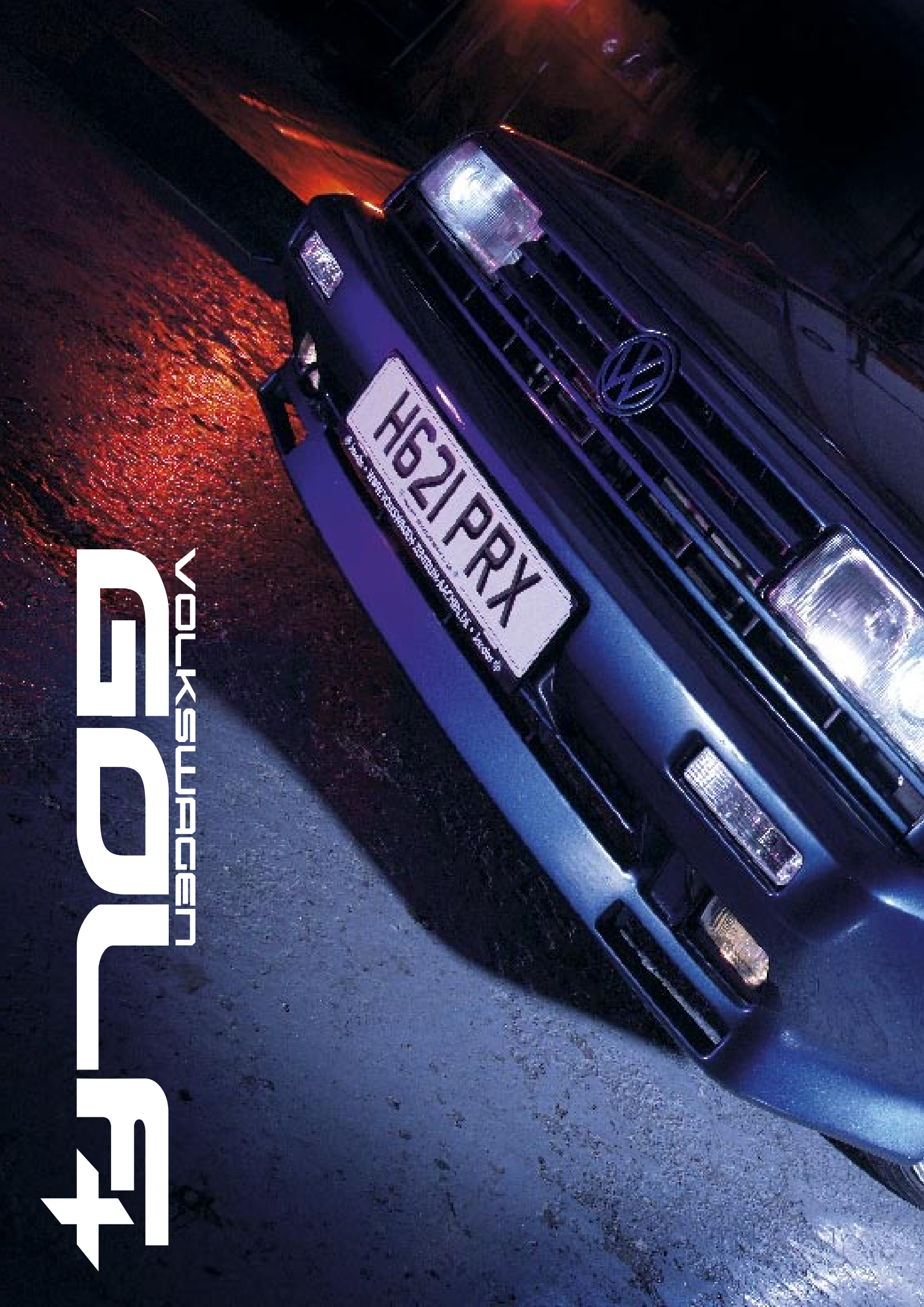
- we love it



Left: Fully re-trimmed leather Recaros. **Right:** Triple-chromed 17in BBS split rims keep it off the deck

Results are just insane





FOR

VOLKSWAGEN





It's such a neat 'charger install, sitting beneath the air filter, that we had to take it out to get a good look – Jimbo gets ready to make some precision adjustments



Was 359bhp, now up to 400bhp

a combination of plates, head bolts and a spot of specialist welding here and there." The results are nothing short of insane. Having experienced both the 1.8 and 2.0 incarnations from the passenger seat it's very difficult to summarise the experience, but suffice to say this car felt rapid with 359bhp, now with an estimated 400bhp courtesy of 440cc 'green top' injectors, a Walbro Mitsi Evo external fuel pump and an even smaller supercharger pulley; it feels brutal, particularly at the top end.

The key to such power is the sophisticated 10:1 planetary gearbox of the Rotrex blower that allows the impellers to spin at turbo speeds of around 120,000rpm. In conjunction with a Nissan Sunny front-mount intercooler – that doesn't have to deal with charge temps anywhere near those of a turbo set-up – a Pipewerx 2.5-inch Rallye exhaust system and Aquamist inlet manifold methanol/water injection, the whole package is sensory overload. As air is drawn through that huge JR induction filter, onlookers are left in no doubt that this car

maintains the original Golf

Rallye character, without the limitations of the G-lader supercharger.

All this and we haven't even told you about the fully re-trimmed leather

Recaros, lightened G60 flywheel, Hi Spec 310mm four-pot front brakes, or even the BMW-fitment, 5x120 PCD, triple-chromed 8.5- and 9.5x17-inch BBS RS split rims, sheltered by ever so slightly flared metal wheel arches. And what about the totally smoothed and flushed boot, the removed side rubbing strips, or indeed the de-locked and de-handled doors. There's also the HID Xenon headlamps, uprated Passat driveshafts, and supremely comfortable yet razor-sharp-feel KW Variant 3 coilovers.

Ultimately, though, it's the jet fighter sound effects that will sway you, while the very fact there is an alternative out there to the huge turbo brigade is refreshing. If nothing else you've got to admire these guys for trying something different. After all, in a world of mediocrity standing out from the crowd is the most difficult challenge.

Whether you can track down a 2.0T FSI bottom end is another matter, but as Mk5s, Audi A3s, Skodas and SEATs are now packing them, it surely won't be long until they start appearing. Last we heard VW Racing had a cooked engine in need of big end bearings from its Mk5 GTI race car.

Hmmm... Now there's a thought.

THE COOLEST

Has to be the hybrid engine, the first of its kind anywhere in the world (unless you know different?) The Rotrex 'charger is even used by the Koenigsegg CCX supercar. Developmental?

THE KNOWLEDGE

ENGINE:

1984cc (BPY) Audi A3 T-FSI bottom end, 10.3:1 comp ratio, JR induction filter, hybrid Storm / Rotrex C30/94 supercharger running 2bar pulley; independent charger oil feed, standard 20VT small-port cylinder head, custom head gasket and bolts, 440cc 'green top' injectors, Walbro external fuel pump, Aquamist methanol and water inlet manifold spray, Nissan Sunny GTI-R FM intercooler, 20v normally aspirated exhaust manifold, Emerald M3DK fully mappable ECU, four-pin coilpacks, Pipewerx 2.5in Rallye exhaust system, lightened G60 flywheel, Syncro four-wheel-drive system, 02a 5-speed gearbox/ 400bhp, 280lb/ft torque

CHASSIS:

KW Variant III adjustable coilover suspension, 310mm Hi Spec front brake discs with four-piston calipers. WHEELS: 8.5in and 9.5x17in triple-chromed 5x120 BBS three-piece split rims with custom Storm adaptors and 195/40 and 215/35 ContiSport Contact 2 tyres

STYLING:

Pearl Blue blended front splitter, de-locked and de-handled all over; side strips removed, HID Xenon light conversion, de-badged and flushed tailgate, wiper removed, rear numberplate relocated INTERIOR: Full black Nappa leather Recaros, MOMO wheel



The badge on the engine cover says it all – supercharged 2.0FSI. Yeah!