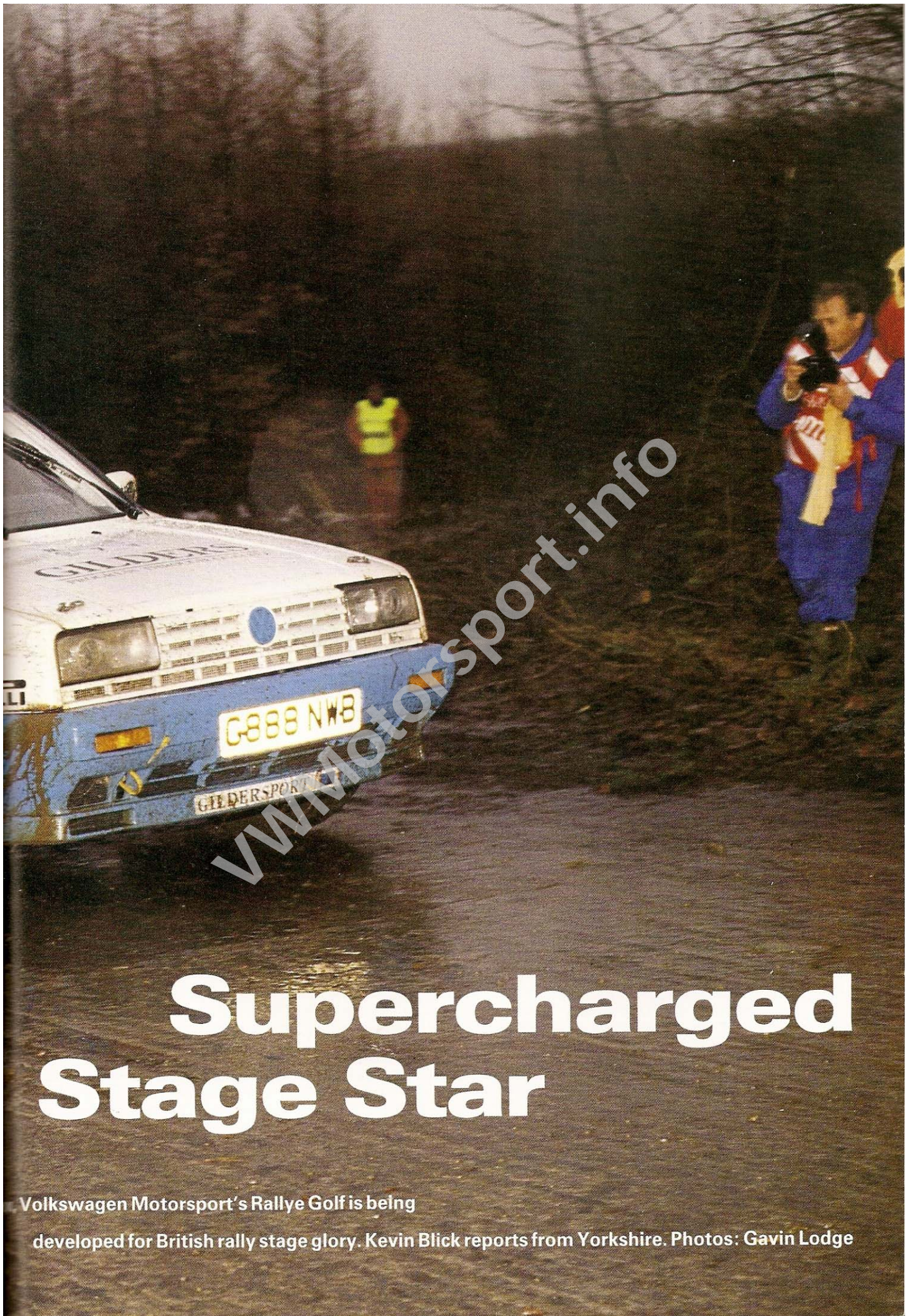




Supercharger on its engine and six-speeds in



Supercharged Stage Star

Volkswagen Motorsport's Rallye Golf is being

developed for British rally stage glory. Kevin Blick reports from Yorkshire. Photos: Gavin Lodge



On the familiar golfball-style gearknob someone had drawn an extra line and the number '6'. A prank? No, this really is a six-speed gearbox, a very special gearbox for a very special Golf. You won't find another example like it in Britain.

This is the Volkswagen Motorsport works Group A Rallye Golf G60 which will be making a serious challenge for honours in this year's British Open Rally Championship.

The Golf is not new to international rallying and indeed has collected its fair share of class wins – including a World Championship – over the years. However, a change in the sport's regulations to a more production-based formula inspired Volkswagen to lift its sights and aim for outright success.

Hence the introduction of the Rallye Golf G60 two years ago, as a car which would form the basis of a major international rally effort. The Rallye Golf has all the right ingredients to become a star on today's rally circus; most notably the viscous coupling-based, Syncro permanent four-wheel drive system and G-Lader supercharged engine, also fitted to the 140mph Corrado G60.

While Volkswagen Motorsport in Hannover has concentrated on developing the Rallye Golf for the World Rally Cham-

pionship, the UK Volkswagen Motorsport operation at Milton Keynes has put its weight behind making the car a winner in British events. In overall charge of the project is Nigel Walker, Volkswagen Brand Promotion Manager. The brains and brawn to develop and run the car has been supplied by a small team headed by former British national rally champion Alistair Sutherland under the auspices of one of Yorkshire's largest Volkswagen dealers, Gilders, and with one of Britain's top rally drivers, Mark Lovell behind the wheel.

"Volkswagen Motorsport gave us the go-ahead for the project in February last year and the car made its debut in April," explained Sutherland.

"Since then we have been developing it more or less constantly. The Motorsport division at the factory did their best to help but they were also busy, developing and improving their own works rally cars.

"So we designed and developed most of the special components for suspension, brakes and so on and brought in a specialist tuning company to develop our own competition version of the G60 engine."

In January this year, however, the UK Volkswagen Motorsport rally team – now running out of a new Gilders dealership near Selby, where Sutherland's operation has been reformed as Gildersport – did take delivery of a very important item from



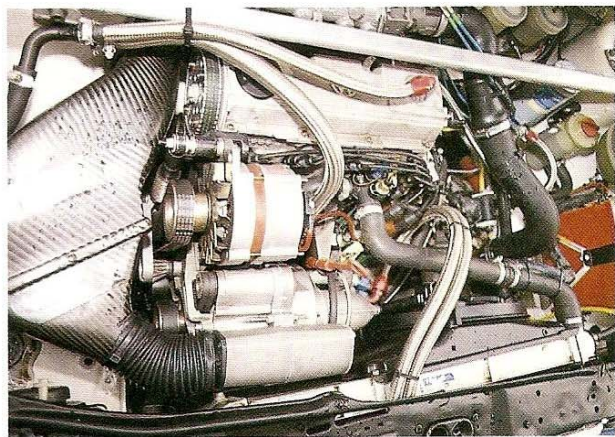
the factory; that six-speed gearbox.

In fact, it is not just a gearbox but a whole transmission package, including a stronger viscous coupling in the 4wd system, bigger driveshafts, stronger propshaft and new limited slip differentials for the front and rear. It's a box of bits which costs almost as much as a standard Golf road car, but it marks a giant leap forward in the Rallye Golf's quest for competitiveness.

You may wonder how a six-speed gearbox can be allowed in what is intended to be a production car based formula. The answer lies in the labyrinthine regulations which govern international motorsport. To go rallying a manufacturer must build 5000 identical examples of his chosen car, such as the Rallye Golf G60, in a year. But that is just the start. Rallying is then divided into two categories, Group N and Group A. Group N is for what are basically showroom standard versions of those 5000-off models; the bare minimum of alteration is permitted. The front line formula is Group A and many more changes are allowed.

The interior can be stripped out for lightness, the suspension heavily modified provided its basic pick-up points remain the same, the bodyshell seam welded to increase its strength, brakes can be beefed up, gear ratios altered and, most important of all, the engine can be tuned.

Opening pages: Golf was a front runner on Talkland Rally until engine mount broke. Clockwise, from left: Six-speed knob tops complex linkage; driver Mark Lovell, with supercharger ace Power; cockpit, engineered for action; G60 engine gives 240-250bhp, with more to come



On top of this, the manufacturer is allowed to register—homologate—special rally-orientated components such as, for example, a different steering rack, different suspension components and, needless to say, a special gearbox. Finally, as a safety consideration, cars have to run at specified minimum weights which depend on their engine capacity.

This last rule is of particular advantage to the Rallye Golf, which creeps into a lower capacity class than its principal rivals and so can run with less weight (the sport's governing body calculates the effective capacity of super- and turbocharged en-

gines as being 1.7 times their actual capacity, so the Rallye Golf, with an actual capacity of 1763cc, is rated at 2997.1cc). All of which might seem to be giving teams a free hand in what they do but in fact the rules are tightly drawn.

"The guiding principle is that if the rules don't specifically say that you can do something, then you have to assume that you cannot," explained Sutherland.

Even so, there is considerable room for experimentation, all part of the intensive test and development programme established by the team in a build-up to the Welsh International Rally in May. "We're



liaising closely with the Hannover team and testing new components – like the six-speed gearbox, for instance – almost to destruction prior to the Welsh,” says Volkswagen Motorsport’s Nigel Walker.

“Yes, it’s an expensive business, probably about the same as running a Formula 3 racing team, but we feel that rally enthusiasts – who include a lot of our Golf GTi customers – expect Volkswagen to field a competitive car.

“I think the returns are even better than from Formula 3 because of this and also because what we learn can be put to use on road cars.”

Indeed, Gilders hopes to capitalise on its

involvement with the Volkswagen Motorsport Team by marketing Volkswagen-approved modified road cars using the engine tuning expertise it has picked up through its work on the supercharged G60 rally unit.

The G60 engine is potentially both the advantage and disadvantage of the car. Development of the engine has been done by David Power of supercharging specialists, Power Engineering. He explained: “A supercharged unit is quite unlike a turbocharged engine where power tends to come in with a bit of a delay and then a great big thump. Rather it’s immediate, lower down and across a broader rev range

– all ideal characteristics for rallying.”

That is the advantage; the potential disadvantage compared with a turbo engine, with which you can almost ‘dial in’ the required power, is achieving a competitive level of horsepower. The standard car has 160bhp and Power has now got that up to around 240-250bhp, but to be on the pace of the front runners another 40-50bhp is needed. He believes it can be found, but each extra horsepower is harder and more expensive to achieve.

The first step in finding more power was to make the supercharger spin faster to push more air into the engine. The standard G-lader unit runs to a maximum of

about 10,500 rpm: in the current engine it is spinning at a remarkable 17,000 revs, by a combination of altered drive gearing and a higher engine rev limit. Consequently, boost pressure has gone up from 0.65 to 1.5 bar. "To go much further we shall have to design our own electronic engine management programme," went on Power "and that is a big step." It's a step which won't be taken until a new car is built up nearer the middle of the season. First priority is for Mark Lovell and the team to familiarise themselves with the new six-speed transmission.

In truth, you wouldn't need that drawn on number to guess that this was something quite different from the standard Golf five-speeder.

Below the golfball a stout cast alloy stick extends down to a linkage of astonishing complexity, which includes a spring-loaded reverse gear gate that makes the transition to going backwards very definitely a two-handed affair. The 'box itself is actually a non-synchromesh unit with straight cut gears – called a 'dog-box' in the business, after the engineering description of the design of the gears themselves. With no synchromesh, it's actually very quick and extremely positive in action under a knowing hand.

Golfball gearknob met the knowing hand that will work it through the coming season on the battered concrete runway of a bleak, cold former airfield just three days before the first event of the season, the Talkland International in Yorkshire. Mark Lovell had not sat in the car since the last event of the previous year. He was impressed with the changes: "The dog-box is terrific. In rally cars like the Golf you have to left-foot brake to keep the car balanced when cornering, so your left foot isn't always available to use on the clutch.

"You can go up through this 'box without having to use the clutch; you just bang the gears in. Likewise, on the way down you just give the throttle a quick blip while braking and the gear slots straight in. The shift is very fast, too."

Four-wheel drive is essential to be competitive in loose surface rallies, but the Golf's system differs significantly from those of its rivals. Where they all use a central differential to split and apportion engine output front and rear, the Syncro system relies on a viscous coupling which progressively locks to engage rear wheel drive as it detects a difference in speeds between front and rear axles, an indication of wheel spin. It's a simple system which is ideal on the road but has needed slight modification for special stage rallying.

"Last year we found the car was rather nervous," explained Lovell. "It would start going through a corner in one way and then, as the extra drive took up, it would change its handling characteristics."

The new transmission incorporates a stronger coupling, which locks up more quickly. "It's a great improvement; the car feels better balanced and it has a lot

of grip – you can really feel the four-wheel drive working."

Lovell is one of Britain's most accomplished drivers. Still only 30, he has won numerous titles, including both the British National and Open series in 1986, the Dutch Championship in '88 and the Irish in '87 and '88. He has been a works driver for Ford and also driven for Citroen and Toyota. This season, as well as campaigning the Rallye Golf in rounds of the British Open – which include the classic Welsh, Scottish and Manx Internationals – with co-driver Richard Stamp, he will drive a four-wheel drive Mazda in selected Malaysian rallies when his Volkswagen commitments allow.

His verdict on the Rallye Golf was frank: "It has a lot of potential: the handling is good, the brakes are terrific and the gearbox will make a big difference – but it does need that extra horsepower.

"I'm convinced, though, that given reliability it's more than capable of winning international rallies."

Sutherland is confident the Volkswagen Motorsport team can make the breakthrough: "It's a tough job developing a competition car like this. Manufacturers spend millions on a new production model, then we have to make it go faster, stop better and go round corners quicker at a fraction of the cost," he smiled.

As if to emphasise the point, the test session came to a premature close. Lovell had spotted that the new 'box was jumping out of third gear on right hand turns. Rather than risk its only new six-speed gearbox, the team packed up and headed for home. It was Wednesday afternoon: to make the start of the Talkland Rally, by Friday night the car would have to be stripped down, the gearbox dismantled, the problem traced and cured and the car reassembled and tested. In rallying, that's just part of the routine. □

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Left: Mark Lovell, former British National and Open Rally Champion, tests Rallye Golf with new six-speed gearbox for first time. Below: Group A rally car keeps standard Rallye Golf bodywork

