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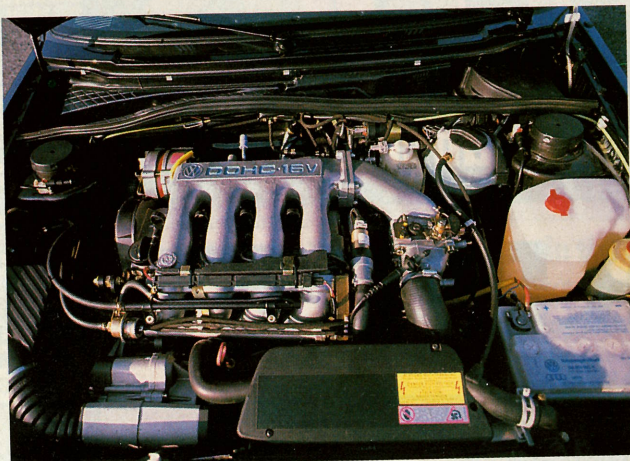
How Japan intends to stop Lancia



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**A SUPERCHARGED GOLF,
TURBOCHARGED RENAULT AND
EMOTIONALLY CHARGED LOTUS**



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Golf G60 Limited (right) is a sophisticated fast road machine which should be winning rallies – if the plans of VW Motorsport boss Klaus-Peter Rosorius (below, centre) progress positively



THE CONTENDER

Since Kenneth Eriksson became Group A World Champion rally driver, the competition in that rally category has escalated, as has the technology of the cars contesting it.

Kenneth was champion in 1986, in a VW Golf GTi – a normally-aspirated two-wheel drive car. The current 16-valve variety proved its reliability by taking Stig Blomqvist to a fine third on this year's Safari Rally – the 2wd works car's last ever event. But the car has hardly a hope in Hades of beating today's top turbo four-wheel drive Group A rally cars.

The competition arm of the Wolfsburg giant, Volkswagen Motorsport, is well aware of this. It also realises that the stages of the World Rally Championship are the best arena in which to publicise VW cars. As the saying goes, any publicity is good publicity, but VW Motorsport has also to prove its philosophy to the Wolfsburg bosses. And to do that it has to win.

VW Motorsport runs as a quasi-autonomous operation, with its own budgets, but as a function of Volkswagen's public relations area. Motorsport's boss Klaus-Peter Rosorius doesn't think that's such a bad idea: "We are here to help sell the cars, in other words to show people how good VW cars are in competition. Our responsibility is for motorsport worldwide – to see what's happening in the regulations; homologation; which cars are good in which kind of motorsport. It's a good way to show everybody how reliable and powerful the cars are.

"The VW policy is to show people standard cars – there are three world championships, and at that high level this is only possible in the World Rally Championship – it's very popular, at a high level, and we have a good car for this kind of competition."

The fact that VW Motorsport does seem to have a car in the Golf Rallye which could prove to be competitive in WRC terms is something of a triumph in itself. The learning curve about the benefits of being involved in world rallying is somewhat gradual for the board of directors of this volume production "people's car" manufacturer. VW Motorsport's Rally Manager, Andy Hansch: "We've done quite well with our small Group A cars in rally sport, and this has helped the marketing people to learn to use the successes. In former times they were not interested."

It's still not all plain sailing though: homologation of the Golf Rallye, to be built in the VW plant in Brussels, keeps being put back. Rosorius: "I remember some months ago we were fighting for production of the Golf Rallye, and the Board of Directors made the decision; 'No, first we need more Passats, people are waiting for them, that's more

Technology has taken today's Group A rally cars a long way from those which were winning when the VW Golf GTi was champion. The Golf Rallye looks set to redress the balance

**Report: Martin Sharp
Photography: Norman Hodson**

important'.

"VW doesn't make motorsport its main priority as in some other companies... making 5000 cars just for the homologation. It's different in our company, we make cars for people to sell, they must be good standard cars."

But things are looking up: "This is the first time in this company that people have consulted me about a production car's specification; 'We are going to build a 4wd G-charged Golf, what needs to be changed for you to be able to rally it?' The first point was that the capacity was for sure a little bit too high, which meant that with the 1.7 equivalence ratio we would have been more than 3-litres and into the next weight class, so I asked for a little bit less."

The decision to produce the Golf Rallye was made some time ago, and cars are being produced now, with homologation into Group A expected by the end of this year, either this month or December – as a four-cylinder, eight-valve, G-charged, 4wd fast road blaster.

But, with a 16-valve cylinder head now in production on a normally-aspirated version of the self-same cylinder block, to homologate the Golf Rallye with eight valves in order to take on the world's best Group A rally cars – each with four-valves-per-cylinder – must be somewhat shortsighted, surely? Klaus-Peter Rosorius: "Today I'm not really sure why it was impossible to build this car with 16-valves. At the moment I must say I hope that it will be the next step, and maybe it will be possible, I hope that we will be successful in rallying (with the eight-valve car) so that people in the company will be happy. If we get good publicity maybe that will help us a little bit to make a decision in the future to build 5000 cars with 16-valves and a G60 supercharger."

To prove that the engineering is hardly a problem, VW Motorsport itself is "hand-building" 70 "Limited Edition" five-door road-going Golf Rallyes, each with a G-charger forcing its charge through 16 valves. The standard eight-valve Golf Rallye produces 160bhp, but just swapping its cylinder head for a 16-valve and fiddling with its brain

releases an extra 50bhp, and VW Motorsport's Hansch explained that 215/220bhp is very easy to obtain, even while retaining the catalytic converter. ...

If you think you might like one of these Limited Edition Golf Rallyes, you can't have one. They're already all sold – at DM68,500 apiece, that's a cool £22,833. But you can get an idea of what it's like from the accompanying panel on the next page.

Having achieved sign-off approval for 5000 Golf Rallyes, albeit eight-valve versions, and finally battled towards a sort of acceptable likely homologation date, another hurdle appeared to VW Motorsport's progress with its programme. This time it was from outside the company. FISA's restrictor ruling for 1990 forced induction Group A rally engines threatened any vestige of competitive output from VW's G-charged engine. But after investigation FISA finally relented and allowed VW to run its G60 supercharger unrestricted in its Group A rally car in 1990.

Klaus-Peter Rosorius: "It was a hard fight for us, because it was not so easy for us to explain to FISA that turbochargers and superchargers are completely different. I don't think FISA's turbocharger restriction will make any difference to the turbo engine builder, but with our G60 system it would have made such a difference that we would have had to have stopped our activities with the car – we would have had no chance to have had more than maybe 230bhp."

VW convinced FISA to relax its restrictor ruling for the supercharged Golf engine after inviting FISA technical people to see the results of comparative tests which had been undertaken at the Hanover Technical Institute. Andy Hansch: "The scientists there measured air flow speed and air volume through a turbocharger and compared them to our system. Their diagrams showed that a turbo is able to flow air at sonic speed, very fast... I think they found that just a 30mm intake orifice is enough to flow the air required to produce 400bhp! A turbo runs at 150,000/200,000rpm, and our rally supercharger runs at 14,000rpm only, therefore we cannot have the same volume of air in the engine."

VW Motorsport's eight-valve supercharged rally engine seems to deliver compatible qualities of urge to it's 4wd chassis. Early tests of the rally car in Greece with less than the currently available power have been encouraging. Hansch: "We had 250bhp and were as fast as the existing Lancia and Toyota Group A cars on the stages. I don't know what it is, but our car must have some other qualities, maybe its handling is good or it's easy to drive... we don't need to pass the 300bhp limit to be as ►

THE CONTENDER

◀ fast on the stages as the other competitors.

"The target is the new Lancia with the 16-valve engine, and I think if we were to build a 16-valve Golf Rallye in Group A trim it would be quite likely to be competitive with a 16-valve Integrale."

The Group A Golf Rallye's G-charger is geared-up to spin at a maximum of 14,000rpm – the standard car's runs at 11,000; 18,000 could be possible, but then there's a danger of the comparatively big supercharger unit blowing to pieces. Tests with variable speed drives have not shown any significant advantages. Andy Hansch: "With the G-lader we can only get boost of one bar above atmospheric pressure, but for sure there are some tricks we can use. We have a very good intercooler – a real big one. I think it's the biggest in the competition, it uses up all the front of the car."

As Mitsubishi Ralliart Europe is well aware from its experience in developing the Galant, a generous intercooler size makes cooling the drive train a critical science. To this end, VW Motorsport has tested its Group A Golf Rallye several times in Greece, and in Kenya. These tests were also to assess transmission endurance, to try to break bits.

Andy Hansch: "The car currently weighs less than 1100kg. I don't know how close we will be able to get to the 1020kg class weight limit – in the past most of our parts were very close to standard parts. But that's changing – we're using some expensive high tech materials. We must do that to get down to the weight. This will be the first time we will use titanium for example – but I shall also try to have the same things working just as well, but slightly heavier, for the privateers, so they can choose between a titanium and carbon-fibre propshaft for DM20,000 or a steel one at DM8000."

The Group A Golf Rallye front and rear suspension arrangements are quite close to those of VW Motorsport's previous 2wd car, but with different settings and 25mm more wheel travel, at 200mm.

The team has established a gravel suspension setting which it considers to be pretty close to final, but the tarmac setting is still some way off. The 4wd car has bigger brakes than the previous 2wd car and will run on 16in wheels on tarmac with a maximum of 7½in wide tyres to take it to the class width limit, while on gravel it will roll on 15in diameter rubber, either 6 or 7in wide.

VW Motorsport relies to a somewhat unusual extent on the engineering expertise in VW Wolfsburg's Research and Development establishment. Engines are entirely a Wolfsburg responsibility, and a mainstream engineer is allocated to Motorsport for on-ent assistance.

The fruits of some of these developments are now beginning to be seen in the metal, and during CCC's visit a car was under preparation for testing. Hansch: "A lot of the things which we started to get together at the beginning of this year will be ready, new bodies and new test cars. The engine power is increased. Then we will go out and test to try and break it again!"

The last Greece tested Golf Rallye, one that which was professed to be on the pace of the Group A Celica GT-Four and Delta Integrale, was not to this later specification:

"It was too heavy, built from a standard body, and just fitted with a special suspension, engine and transmission."

Speaking of transmission, VW will be homologating a six-speed gearbox for its rally car which requires just an extra compartment to its casing to accommodate the sixth ratio. The standard Syncro 4wd system accommodates an over-run facility in its viscous coupling arrangement to optimise braking stability and enable the use of anti-lock braking.

The VC assembly is located on the rear axle end of the propshaft and the rally car's casing is in the same place and looks similar to that of the road car. Inside, of course, there is no over-run arrangement, and the VC is set rather differently. Andy Hansch: "I think the VC is locked almost all the time, when the rally car is going the VC is not working a lot."

The Group A car runs with mechanical limited slip differentials in its front and rear axles, but with a difference up front which "makes the car easier to drive. When you lift the throttle, drive is disconnected to the front axle, which makes it feel like a rear-wheel drive car, so you can use the handbrake... it makes it easier in tight cornering. I haven't seen the arrangement in other cars, so it must be something different. I think it's more interesting if we say it's brand new, top secret, otherwise the car is too simple..."

CHAMPAGNE CHARLIE

Park a standard Golf Rallye next to a road-going Delta Integrale and the Lancia looks pretty. That old Italian five-door is attractive. Maybe it's the association with all those rally-winning Group A cars, but the 4wd turbocharged Italian stallion must have breakfasted on amphetamine krispies.

The VW, in comparison, looks like it had rather too much beer, sausages and sauerkraut after the match the night before. The less kind could say the car *looks* like a semi-digested mixture of beer, sausages and sauerkraut. It's got a bodykit, you see. There are vulgar bodykits and less vulgar bodykits. The Golf Rallye's is less vulgar, but still doesn't do the car any favours.

Add a Golf G60 Limited to this exclusive parking lot and you're talking taste which does not need any mayonnaise to take it away. It's only available in its very dark grey hue. But then it's not really available anyway, because all 70 that VW Motorsport is going to build have already been sold.

There'll be one a week popping out of Hanover, each equipped with its exclusive plaque. But more importantly, it will have subtly adjusted styling of its five-door Golf bodyside and 16 valves in its cylinder head.

The ordinary Golf Rallye has styling that is not subtle, and eight valves.

The Golf G60 Limited is exclusive, handmade and all that, old chap. It's nearly 23 grand. It's also very quick.

CCC was one of the fortunate few to have a quick whizz in one. First impressions were that it felt a bit soft at the back and lurched a bit. But things changed when we started to grab it by the scruff of its neck.

As ace photographer Hodson supported himself in the right-hand passenger seat he

maybe we'll paint it black and then it will become our black box!"

Andy Hansch enjoys a joke, but does concede that this diff disconnects drive to the front axle on throttle lift "something like" variably on a mechanical basis.

With the Group A Golf Rallye specification sorted, and the car homologated, VW Motorsport intends entering a few "test rallies" next spring, and it will only be after the results of those are known that the decision will be made whether or not to contest a World Rally Championship with the car.

Klaus-Peter Rosorius: "But it will only be possible to do the whole WRC in 1991, next year it will be impossible."

"And when we are successful, I think for sure that it must be possible for us to convince people in VW that we need the 16-valve engine. When the people are happy it's very easy to explain: 'Now we need a car with 5000 units and a 16-valve engine'. But first we must be successful with this car, that's very important."

If it's the case that an over-heavy early specification eight-valve Group A Rallye can be on the 1989 top pace over the rough roads of Greece with just 250bhp, there's hope yet that VW Motorsport will get the 16-valve engine it deserves. And that what promises to be an exciting World Rally Championship will be even more so. ■

blurted: "Grunt that is – you wouldn't get that on a turbo." Damn right, this supercharged, 4wd, 16-valve, 1.8-litre machine had just stormed out of an uphill right hairpin at Integrale-esque velocity. From 3000rpm in third gear. . . .

Impressed? We were. This car has pervasive mid-range urge. And it's a Golf – a modern design bodyside that doesn't rattle nor flap its door tops at speed.

But surely that viscous coupling sitting on the back of the rear-drive propshaft like a neat wasp's nest must be the reason why gear changes sometimes balk and super-swift cog slots are out of the question. That must pose problems for the rally team – titanium and carbon-fibre propshaft indeed The Limited is available left-hand drive only – and inside it is nearly impossible to properly heel and toe into second for a hairpin because of the centre console.

On the way back, the Limited still lurched. But then that's in comparison to the road-going version of today's World Rally Champion. Out of the showroom that Lancia feels like it's set up as a Group N rally car. The Golf G60 Limited feels like it's set up as a fast road car.

The Golf G60 Limited could, nay should, be winning rallies. The Delta Integrale is. And the road car's a lot cheaper. You can't get a Limited, but if you could it's a far better car than the Lancia to drive over long distances.

As road cars, if the Golf Rallye has overloaded on bangers and supped a stein over the nine, and the Delta Integrale still craves those amphetamine krispies, in comparison, the Golf G60 Limited is Champagne Charlie. ■