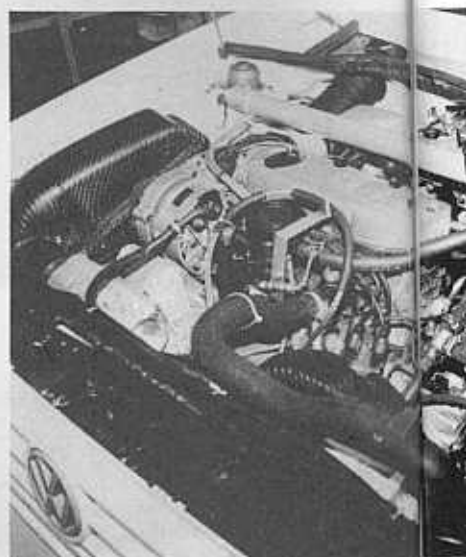


## VW enter the Four-wheel Drive Era



Left: 6th on the Costa Smeralda were Weber/Feltz in the Rallye G60, on its debut rally. Below: The GpA Rallye G60 at VW Motorsport in Hanover. Above: The GpA engine; 290bhp from 1764cc. Right: G60 GpA; front transmission assembly (MARTIN HOLMES)

"Everything takes so long!" VW Motorsport Director Klaus-Peter Rosorius exclaimed. Discovering for the first time the problems now facing rally car manufacturers in the age of four-wheel drive and forced induction systems, Rosorius is trying to adjust the pace of development at a large motor manufacturer to the special pressures from sport.

"The Rally Golf was homologated on 1 December last year, though we had begun our testing earlier in 1989, using on a matter of principle as many parts of standard specification as we could. We made our first event in actual competition at the European Championship Costa Smeralda Rally when we had a good run, but we want to test the whole car again before we make our World Championship debut at the Acropolis in June."

Rosorius' ambition is to settle the specification of the rally car as soon as possible, so that the various national importers for countries like Britain, Belgium, Australia and Spain can have their cars. "Then we can make our plans for the second half of the year in the World Championship. We would like to do four or five such events this year, then the whole Championship in 1991." Only one car is entered on the Acropolis, but a second driver will be required for the other events. "This programme is important. We need to show ourselves and people at the parent factory at Wolfsburg that the car is competitive."

Erwin Weber's sixth place in Sardinia was encouraging. "The

handling wasn't completely right, the weight particularly as we carried the special testing computer system was too high, although we only expect to be able to get a few more horsepower in future."

VW Motorsport is discovering there is a whole new world in the special stages of the 90s. Even over the last two or three years since the team was regularly active in WCR events, attitudes and budgets have completely changed. "These days you need to take many more tyres; this means bigger service vans and more mechanics. Though we have never and will never be able to match the size of, say, Lancia and Toyota, even we must increase the size of our operation a lot."

Nowadays helicopters and 'planes are usually necessary. For every task you need a specialist. "The orders from the VW Board of Directors are clear, we must prove the car with smaller budgets. If we can do that, we expect to have bigger support from them in the future."

The limiting factor with the Rallye Golf is the power. The G60 compressor offers excellent torque characteristics, but Rosorius imagines it is impossible to exceed the magic 300bhp level with the 1760cc 8-valve engine. FISA acknowledged VW's inherent power deficit when they excused them from the normally mandatory 40mm restrictor rule, which is presumably a permanent arrangement, until such time as the engine becomes more



powerful than anticipated!

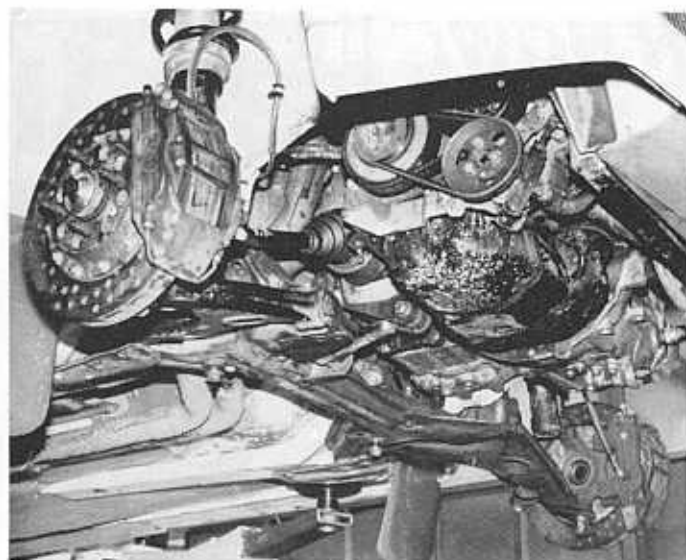
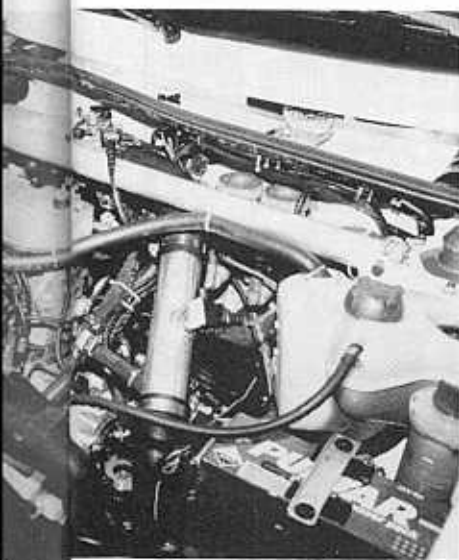
"We are happy with the G60, but it is not for high power. With our size of available engines, you need a turbocharger to get up to the 350bhp level. The standard car compressor works at about 10,000rpm; we are going up to around 14,000, that's all. This gives about 280bhp at the moment. I think we can get up to 290/295 eventually." Wolfsburg develops the engine, Lehmann in Lichtenstein assemble the competition units.

Andreas Hansch, VW Motorsport Rally manager, is clear about the effect the engine has on his work. "The most important thing we have discovered is how important it is to transport our own fuel, wherever we go. It is really stupid but we need to do it for competition. Just a few years ago, everyone was able to buy their fuel at the local service station. Any engine which

demands a high compression engine is the same. We lose 10-15% power if we use pump fuel. It's crazy. One of our rival teams in taking 28,000 litres to Corsica for testing, practice and the event.

Say we normally pay 1DM15 at the pump; we are having to start our negotiations for fuel at 10DM. . . This has been perhaps the biggest change in recent rally life. In general the scale of operations is greater. More service points, more people around the cars. And of course, the compressor means we use more fuel. Obviously, this depends on what you use the fuel for: some people inject more fuel into the engines to reduce the temperatures. We have a sixty-five rather than fifty fuel tank: we use 50% more fuel on the special stages than we did in the normally aspirated car, but now we have more service points."

Four-wheel drive makes



things more complicated. It also means that the original development work is much more important. For the mechanics four-wheel drive makes no difference; for the engineers it is another dimension. "Obviously we have learned from the experience of other teams, because so many suppliers are common to other teams, but still we are behind the others."

The competition Rallye Golf uses a standard transmission system with viscous coupling, central differentials. This is set so that power goes initially to the front axle. "It is therefore mainly a front-wheel drive car. Only when the front wheels are turning faster than the rear will the rear-drive take effect. In competition on gravel the speed of the front and the rear is nearly always different, that means the v/c is blocked nearly all the time. For asphalt we modify the elasticity of the v/c. We think it is the suspension which will need more development for asphalt than the transmission."

The transmission is almost standard. Six-speed internals have been fitted using only a small extension to the standard housing. The front and rear differential are both pre-loaded limited-slips with plates, which should prevent the car being stuck (as happened to Bjorn Waldegard on the Safari) when a driveshaft is broken. Testing showed up various problems with the suspension. "Mainly this was a matter of dimension and quality of the components, not the initial design." New for VW is computer datalog equipment. "We have a VW-made computer system, monitoring thirty-two channels. Whenever we have had, for example, transmission problems, the computers have shown whether the

circumstances have been normal or not.

The compressor brings new temperature situations and the team has found the air moves in unexpected directions under the bonnet - often leaving the engine compartment through the front! Bigger fans have been fitted to help direct the air efficiently. No wind tunnel work has been carried out. Wheels and tyres are similar to before. Maximum rim size is 7.5in; 15in diameter wheels for gravel (where the best effect for the side walls is important) and 16 or 17in for asphalt.

"You don't need such wide tyres on four-wheel drive. We will use in Greece the same size Pirellis as Toyota used last year." The area under the wheel arches is the same as the old two-wheel drive cars. The VW compressor still attracts FISA's 1.7 engine size coefficient; the 1764cc engine therefore enables the car to fit inside the 3-litre category. This offers the 1020kg weight limit but also means the wheels must be one inch narrower than the top rally cars of today. "We cannot have wider wheels, anyway; they would not fit."

The competition life of the Rallye Golf is not defined; much of this depends on FISA planning. There is the possibility of increasing the power a certain degree with a 16-valve cylinder head. "But we want to prove the 8-valve car in competition first. We are in no position to ask too much too soon."

The VW legend continues. The Rallye Golf looks like being the Rally car for the people in the '90s, at least that is the aim of VW Motorsport. "This is under general discussion. At the moment we have the situation where the front-wheel drive Golf GTI is African rally

down to that level. A titanium propshaft, which will save less than 10kg, would increase the price by maybe 20,000DM." The Audi 90 quattro is probably the four wheel drive Group A car currently closest to the pocket of private drivers, but its normally aspirated engine gives only some 70% of the power of the Rallye Golf. There are special opportunities open to VW.

"We have seen before that a good performance by our team has encouraged privateers. In 1980 Eklund came fifth at Monte Carlo. That year there were only a handful of Golfs on the event. The next year VW was the most represented make on the event. We are interested in Group N, but the development work is secondary to Group A for us. We imagine a Group N Rallye Golf will always suffer a power deficit against the turbocharged cars from rival companies, which can substantially increase their power in competition. A full Group N VW would only reach about 200bhp. Rival turbocharged Group N cars start at 200/220 and can go beyond 300 with the necessary tuning on the boost. In the old days VW provided the formula of performance at the right price and this attracted the privateers. We are not intending to build a car so perfect nobody can afford to buy it!

"The Rallye Golf is the People's car of rally sport."

- By Martin Holmes

Champion but there is no current VW promotion in Africa. We know, however, that the car should be competitive, within its limits, in the World Championship, and this will be attractive for national activities.

"We have not yet costed the price of a fully prepared Rallye Golf for a customer, we imagine it will be around 300,000DM, maybe twice the price of the two-wheel drive car. (This is probably half that of a Subaru Legacy and 35% less than a Lancia Intergale.) This depends very much of the final specification. We need not be far above the minimum class weight of 1020kg, but the total price for the car depends very much on the value of getter right

VW Motorsport, Hanover. Managers Andy Hansch (left) and Klaus-Peter Rosorius.

(MARTIN HOLMES)

