



The Hot Seat

Commencing motorsports activities in 1970, when 27 Spanish national Formula 1430 racecars were powered by Seat engines, the seed of the Seat Sport operation was germinated the following year. The first official Seat team appeared in 1972 and, by the end of that year, Seat works driver Salvador Cañellas's efforts were to net the team the national rally championship.

Now part of the Volkswagen/Audi/Skoda VAG operation, Seat road cars are based on VAG floorpans. Its current works rally car is a 2-litre, front-drive Ibiza, prepared to the Variant Option Kit Car regulations. The production

Ibiza road car is based on the VW Polo platform, but this, and the car's general layout, are the only similarities to the small VW.

The first Ibiza rally car appeared in 1995, this a 1.8-litre, 16-valve Group A car whose most notable successes that year were first and second places in the 2-litre class on the Acropolis. Seat Sport introduced a 2-litre Kit Car version of the original Group A car last year, which represented the Spanish manufacturer's then biggest motorsports campaign.

Seat made an all-out bid for the FIA World 2-litre Rally Championship, which went down to the wire at the UK's RAC Rally, locked in championship battle with Skoda Motorsport on this

final round. Despite Stig Blomqvist's magnificent and giant-killing third overall in his Skoda Felicia Kit Car, the retirement of the other two works Skodas meant that the World Championship went to Seat. 'Almost by default' might seem something of a glib statement, but this comparatively small rally team enjoys average budgets and has been gaining experience about its Ibiza Kit Car by event, amassing knowledge in the process.

The 1996 World 2-Litre Champion manufacturer is campaigning Ibiza Kit Cars in this year's World Rally Championship. Seat contested the first four rounds using developed versions of the originally evolved car. A

homologation birthday on 1 April 1997 then enabled the Spanish team to revise the Ibiza Kit Car's specification in time for the Rallye Cataluña-Costa Brava. In common with some competitors, this 'second evolution' Ibiza Kit Car is titled Evo 2. It is a significantly revised machine – sufficiently so for regular 1997 Seat Sport works driver Oriol Gomez to describe the latest Kit Car as, "A completely different car."

Under president Vicente Aguilera, Seat Sport is managed by Jaime Puig. On the arrival of Benoit Bagur from Citroën Sport, towards the end of last year, Puig's 35-strong team (not including rally car crews) began its main thrust at developing the Evo 2

Ibiza Kit Car.

The 1996 Catalonia Rally was held in November, and Bagur began developing the chassis of the 1996-specification 'Evo 1' Ibiza Kit Car after that rally. Most of the improvements were provided by anti-roll bar revisions, and damper and spring evolutions. These were seen on the 1996 RAC Rally and, by the Monte Carlo Rally this year, further refinement had been detailed into the 'old' Kit Car's suspension, although the drawn specifications of very few parts had changed.

Bagur and his engineering team began the design and construction of the new car on 1 January, before this year's Monte. The resulting Evo 2 Ibiza Kit Car is so revised that similarity to the old car remains in just its six-speed, sequential-shift transmission. Knowledge gained from experience of the World 2-Litre Championship-winning 'Evo 1' car on events – plus significant potential performance improvements from other 'second evolutions' of competitor Kit Cars – indicated that a major redesign was necessary. A stiffer bodyshell was a priority, as were suspension revisions.

A completely revised caged bodyshell design was modelled by Seat Sport, and this is now constructed by Matter France. At the time of writing, torsional testing is planned for the assembly, there having been no time available to complete this before the car was

entered for its first event – the 1997 Catalonia Rally (brought forward to April this year).

However, Bagur reported that the new Evo 2 shell, is very much more stiff "in principle" than its predecessor.

It had been identified that the Evo 1 suspension was not ideally adapted to the tyres, or indeed to a front-drive rally car. Accordingly, the Evo 2 redesign was aimed at redressing this, plus significantly improving suspension serviceability – making the tasks of changing geometries and anti-roll bar types much more simple (and in some cases, possible). Bagur freely admitted that, after one rally, both front and rear axle components of the Evo 1 car were "Ready for the dustbin."

Clearly, a more sturdy, serviceable and optimised chassis was also a primary objective. Design work for the new car was undertaken by Seat Sport. While at Citroën Sport, Benoit Bagur had specialised in engine development, but he is a time-served motorsports engineer, having spent 13 years in the field on both rally car chassis and engine development: "What interests me is the car from the front bumpers to the rear bumpers. I've never been concerned solely with just the engine or just the chassis; it's all the car," explained Seat Sport's chief engineer.

Racecar caught up with Bagur during workshop preparation for the 1997 Catalonia Rally, the Evo

2 car's debut event. Build of this first car had been completed just three days previously. Two half-days of testing had precluded any real performance comparisons with the earlier car, and Bagur joked that the Seat Sport team was incorporating modern production techniques in its rally car build, using the 'Just In Time' method.

The car's Hewland gearbox and final drive are the remaining main assemblies common to both Evo 1 and 2 Ibiza Kit cars. A carbon twin-disc AP Racing clutch was fitted for Spain, but a change to a triple-disc is planned. For Catalonia, the team employed a mechanical plate-type Hewland limited-slip differential, arranged to produce more 'free' characteristics on coast, although the unit is never completely open. A viscous coupling is also an option.

Prepared by Henri Mader in Switzerland, the Evo 2 has a long-stroke (84.0x89.5mm), 1994cc,

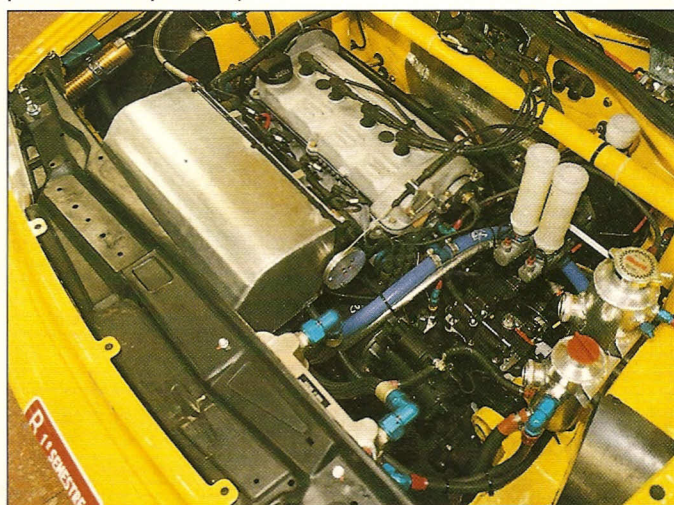
16-valve, four-cylinder engine which officially produces 260bhp at 8400rpm. This is a further 10bhp than its 'first evolution' predecessor. The maximum torque output remains the same as before, but modifications to the Magneti Marelli management have significantly improved the power curve. Gear ratios to suit this curve had not been developed in time for Catalonia, although this work was programmed to be included before the Rally of Argentina.

Despite its dual gravel/asphalt requirement, inspection of this new car highlights some clever current thinking in its design, particularly in the suspension area. The new design results in completely different geometry in all areas. All suspension components, hubs, uprights and arms are unique to the new car. A totally new tubular subframe at the front supports uprights designed and manufactured by Seat Sport, machined from solid alloy. Further evidence of clear thinking in the front suspension design is in the relocation of the anti-roll bar to a position approximately halfway up the height of the front MacPherson struts, rigidly located in mounts fixed to the inner wing. Adjustable cast-aluminium alloy blades connect the bar to the suspension points. Ohlins components provide the front damper internals, and remote adjustable reservoirs are fitted. The springs are manufac-



The Mader-prepared, long-stroke, 1994cc, 16-valve Seat twin-cam engine produces 260bhp at 8400rpm.

1997 Seat works driver Oriol Gomez demonstrates the Evo 2 Ibiza Kit Car's unusual, vertically mounted handbrake.



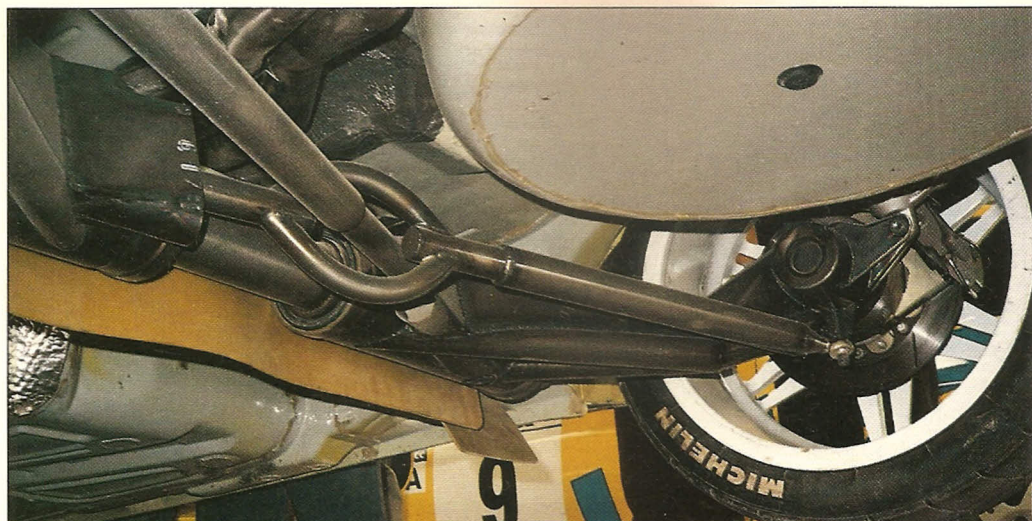
SHORT TAKE

►tured by Eibach.

"There are four wheels on a car, so you've got to use all four," reasoned Seat Sport's engineer, and his newly homologated rear axle (right) illustrates that he has pondered this fact. The original Evo 1 car's rear arrangement was essentially a reinforced standard rear beam. In respecting the FIA's mounting point radius tolerance of 25mm, the new assembly comprises independent diagonal trailing arms to each rear wheel hub, following the lead initially shown by the rear suspension homologated by Gordon Spooner Engineering for the Ford Escort Kit Car.

The independence of these rear arms is maintained by a twin-tube 'eye' welded into the left-to-right wheel rear arm at the arms' crossover point, and through which the right-to-left rear arm passes. It is an attractive and neat solution, and indeed, a similar arrangement is to be evaluated in the rear of the Ford Kit Car. Remote-reservoir Ohlins dampers are also used in the rear of the Seat.

Road wheels of 18in diameter replace the 17in versions of the earlier car in tarmac specification, enabling larger-diameter AP Racing front brake discs to be fitted. The Seat has servo-assisted brakes – unusual in a rally car. Bagur explained that the use of power-assisted brakes is a means to arrive at his objective: "The drivers need a good pedal, and the cars need good brakes. The servo is a solution to arrive at that, but there are others." Water cooling for the brakes was part of the



The innovative design of the newly homologated rear suspension 'beam' in the latest Evo 2 Ibiza has sent engineers of other Kit Cars directly to their drawing boards.

engineering design at the conception stage of the Evo 2 car. This was not considered necessary for Catalonia, but all parts were available to fit the system at that time.

To say that Seat Sport had bad luck on its home rally is an understatement. All three works Ibiza Kit Cars retired, Oriol Gomez's Evo 2 with transmission problems in the fifth stage, Bruno Thiry's Evo 2-engined Evo 1 car with a 'window' in his engine's cylinder block, and Harri Rovannerä out of time after an 'off' on gravel thrown up by the front-runners.

It should be borne in mind, however, that the Evo 2 car was just three days old, with two half-day tests under its wheels. Indeed, this new rally project effectively entered its first major tarmac test when Gomez powered the Evo 2 Ibiza off the line and onto La Trona, the first special stage of the 1997 Catalonia Rally. For the 1997 season, Seat Sport plans to build a further four Evo 2 Ibiza Kit Cars.

Missing the Tour of Corsica, at which a thrilling battle between the tarmac racing Renault and Peugeot Kit Cars is guaranteed, Seat's next World Championship round was planned at press-time to be the Rally of Argentina – an all-gravel event.

As the specifications of natu-

rally aspirated 2-litre two-wheel-drive Kit Cars become increasingly sophisticated, it is evident that this very first version of Seat Sport's second evolution Kit Car represents a thoroughly engineered, up-to-the-mark base design from which to engineer competitiveness.

SEAT IBIZA KIT CAR : COMPETING ON WEIGHT

ALTHOUGH significantly stiffer than its first incarnation, the new bodyshell of the Ibiza Kit Car 'Evo 2', which is built by Matter France, is also a major contributor to a reduction of approximately 30kg (66lb) in the total vehicle weight, relative to the Evo 1 version in tarmac trim. This is an important benefit.

Seat Sport is contesting the World Rally Championship, which comprises both asphalt and gravel rallies. The basic design of its latest Kit Car must therefore account for both surface types. By budget definition, it must be more of a compromise than a design specifically for a national championship, because teams which only build cars for national championships generally need to cater for predominantly either tarmac or gravel.

Seat Sport's chief engineer, Benoit Bagur explained: "All our studies were done so that all parts would be compatible with both gravel and tarmac. At the level of the suspension, the shell, everything is previewed as for the gravel and for the asphalt. So, we have parts which are too heavy for the asphalt – there are things one is obliged to do which are not sympathetic."

The Seat, therefore, can never be as light in weight as a car developed for, say, the all-tar-

mac, multi-practised national French Rally Championship. The performance of one such car, the Peugeot 306 Maxi Kit Car, was embarrassingly superior even to that of the turbocharged, four-wheel-drive, factory team World Rally Cars on the tarmac stages of Catalonia.

The weight factor was confirmed at pre-event scrutineering. The minimum weight for the 2-litre category is 960kg (and for the WRC cars, 1230kg). Oriol Gomez's Evo 2 Seat Kit Car weighed-in at 1008kg, Bruno Thiry's Evo 1 Seat (fitted with an Evo 2 engine) at 1027kg, and Harry Rovannerä's Evo 1 was the heaviest Seat at 1034kg. By comparison, the super-quick 'second evolution' Peugeot Kit Cars were the only class competitors under the tonne at 993kg and 983kg for the 306 Maxis of François Delecour and Gilles Panizzi respectively.

At the weight check before the final service park in Lloret de Mar, a ground-breaking drive by Panizzi had put his 306 Maxi third overall in the general classification. His naturally aspirated, two-wheel-drive Peugeot weighed-in at just 973kg (as a rule of thumb, teams estimate the weight of individual wheel/tyre assemblies at 16.5-17kg).

