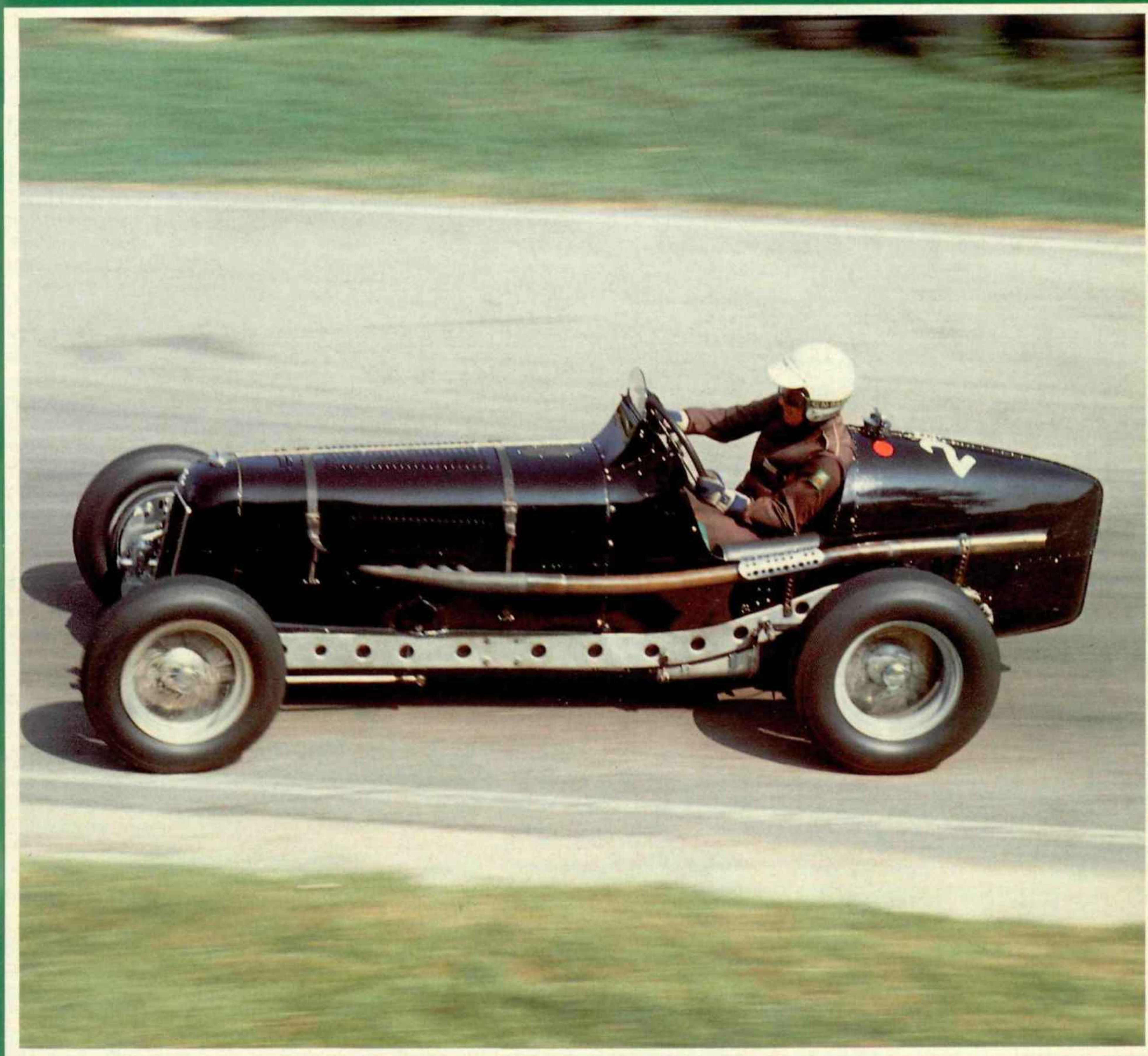


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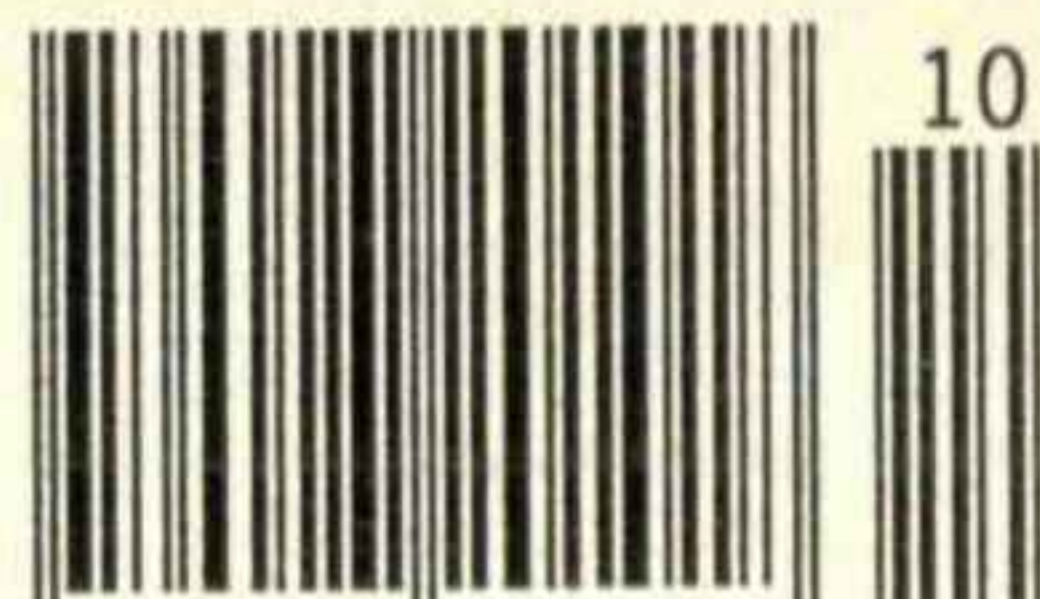


VSCC: Cadwell Park finale

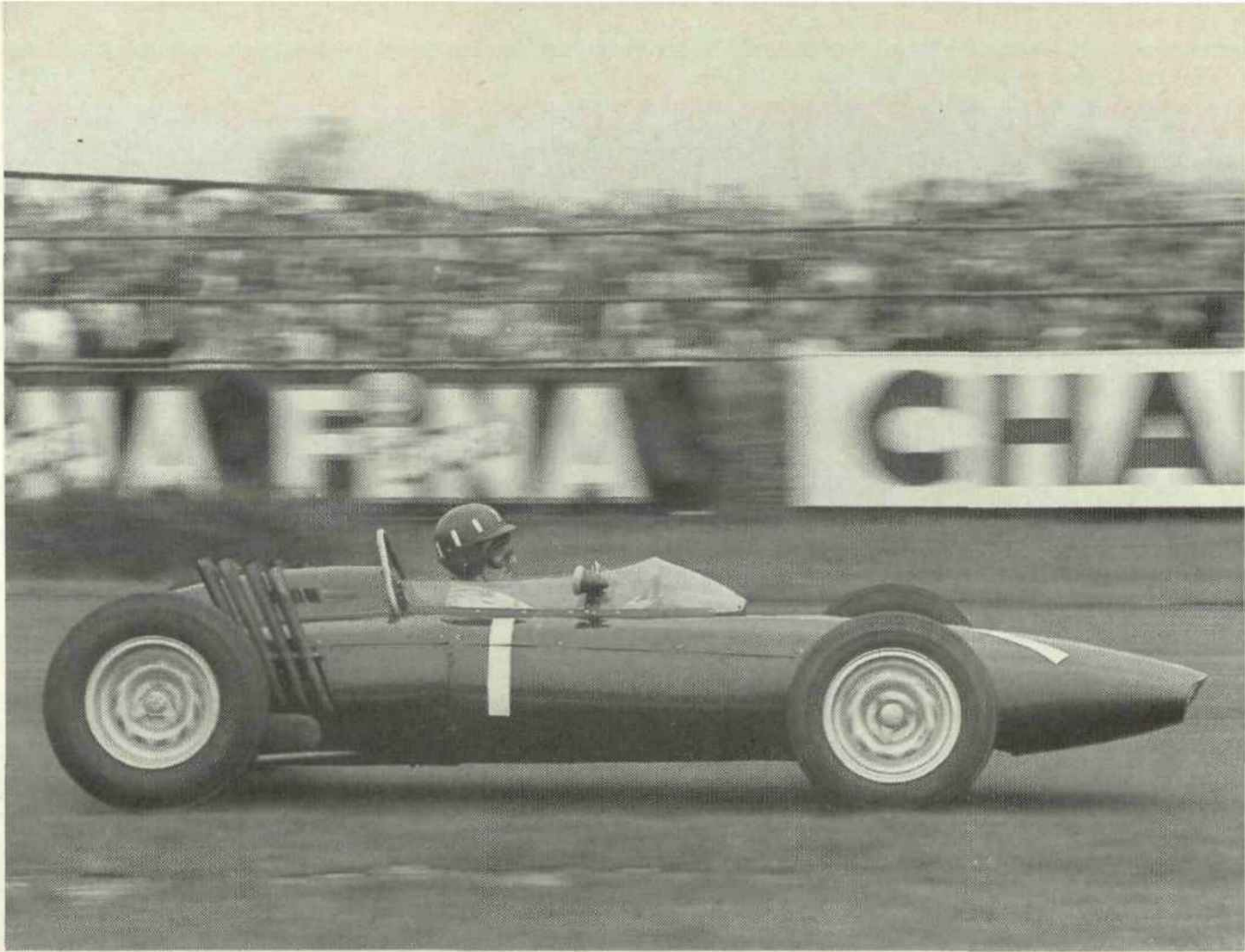
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INCORPORATING SPEED AND THE BROOKLANDS GAZETTE

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FRONT COVER: Anthony Mayman, the winner of this year's MOTOR SPORT Brooklands Memorial Trophy contest, driving the ex-Raymond Mays ERA R4D in full throttle slide at Cadwell Park.

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MATTERS OF MOMENT

What will happen next?

The crisis in the Middle East has begun with the equivalent of the 'phoney war' period of 1939, when German bombers droned over London but no bombs fell and we shed leaflets over Berlin. But pessimists have predicted that the Third World War will emanate in the Middle East. So we must hope and pray for a peaceful solution.

Wars, the Suez Crisis, even a tanker drivers' strike, have resulted in petrol shortages. In WW2 petrol was severely rationed, although farmers and journalists were treated leniently; so leniently that the writer ended the war with a huge wad of unused coupons for his 12/50 Alvis, having been unable to afford all the allowable fuel. For most car owners, only brief outings were possible, if at all; one has to hope that there will be no return to this frustrating situation. Meanwhile, less traffic congestion caused by the record high petrol prices is apt to be tempered by cars driven abnormally slowly to conserve the precious fluid.

The Oil Companies have again been treating their customers shabbily. Almost from the start of the Gulf Crisis petrol prices rose, exceeding the previous £2 gallon, since when they have fluctuated by some 24p a month, with dishonest prices apparently being displayed at some pumps. Apart from which, confusion and anxiety continues, over some engines boiling on 4 star and others thought likely to suffer damage if run on 4 star instead of on the now unavailable 2 star. The former trouble was seemingly due to a change in fuel volatility, unsuited to hot weather, and never mind the customer! Further confusion exists through vehicle owners being encouraged to burn unleaded fuel — its cheaper anyway — only to be warned that the consequence may be damage to some engines, in which valves

and valve seats were designed for leaded fuel.

This is droll. Because when Rodwell Banks delivered his learned paper on Tetraethyl Lead in Fuel before the R-Ae-S in 1934 he was careful to stress that if such an additive were used he would expect steps to be taken to reduce exhaust valve temperature and for valves and seats to be made of austenitic steels, and stellite. The exact opposite surely, of what drivers using unleaded fuel are now troubled about? The oil folk have certainly got their customers in a twist! Yet Air Commodore Banks, CB, OBE, whose ethyl-lead moved 1930's octane ratings of 65 to 70 (or 76 for the 1930s aviation fuel) up to ratings of 90 to 92, knew what he was talking about. His research into anti-knock fuel enabled Rolls-Royce to get 1900hp from their Schneider Trophy engine that had previously peaked at 900hp, and we all know what that led to

At best, we must see the enormous build-up of American and other military hardware in the Gulf as safeguarding the world's supply of oil. It could spare us roads flocked (blocked?) by 2cv Citroëns and similar "thriflers". (Nothing against the excellent 2cv as such — it gives 29 bhp from 603cc, whereas before WW2 many thrifty drivers put up over the years with an average of 13½ bhp from the A7's 747½cc a sound, if low key, advance).

Should faraway sources of petrol dry up, a perhaps too idealistic solution for us might be to start producing benzole from British coal, blended with that North Sea oil we are told we are so very fortunate to have. Even Rodwell Banks knew that the more lead you add to petrol the less the anti-knock effect; whereas with benzole the result is just the opposite. Alas, seldom do ideals work out in practice. **WB**

“Old Number One” – The Inside Story from Ed Hubbard

The cover of MOTOR SPORT's September issue promised: 'Old Number One': The fact of the matter. But this was not delivered.

Indeed, how could it have been? Since the author of the piece 'Saga of a Speed Six Bentley' William Boddy was not present in Court to hear all the facts.

He omitted key points in the argument over whether or not 'Old Number One' Bentley chassis number LB 2332, registration MT 3464 was the car that won Le Mans in 1929 and 1930.

With the advantage of being present at the negotiations over the sale of 'Old Number One' to Middlebridge Scimitar Ltd, then attending every day of the subsequent 12-day trial – as Plaintiff, witness and fascinated observer – I would like to draw attention to some of the key facts.

In broad terms, the case came to Court because I sought specific performance of a contract, in which the Defendants had agreed to purchase “the Bentley known as

'Old Number One'” from me.

The Defence counter-argued that I – the Plaintiff – did not have the car referred to in the agreement, though they accepted it was the car that crashed in the 1932 Brooklands 500 Miles Race.

That argument failed, and Mr Justice Otton found for the Plaintiff, giving his reasons in great detail.

There is no disputing the early history and remarkable racing record of the Bentley chassis number LB 2332, known as 'Old Number One'.

Hand in hand with this, beginning with its extraordinarily eventful and successful 1929 season, the car evolved continuously throughout its racing career. Even at the end of that first season, the car was extensively rebuilt. Michael Hay, the expert historian of vintage Bentleys, gave evidence for three days during the hearing.

Hay's statements were based on his access to all of Bentley Motors' service records – including Nobby Clark's strip-

down reports and race records – and previously unpublished facts he had researched from the Bentley Drivers' Club archives.

He told the Court that the chassis, front axle, gearbox, differential – and, quite possibly, the steering column and engine crankcase – were replaced before the car raced at Le Mans in 1930.

He went on to detail the changes that were made in 1931, 1932 and 1933.

After examining the car, he concluded that – through its continuous history – it is the direct descendant of 'Old Number One', the Speed Six that won Le Mans in 1929 and 1930. Furthermore, he declared there is no other car that can claim to be 'Old Number One'.

In his subsequent Judgement, Mr Justice Otton commented: “No-one has suggested that the car that won the 1930 Le Mans was a new car – merely that it was a modification of the 1929 car. The modifications were justified by the

OCTOBER FIXTURES

C—Closed. CI—Closed Invitational. R—Restricted. N—National. INT—International

Date	Organiser	Venue	Event	Type
Sep 22	HSCC	Silverstone Circuit, Northants	Race Meeting	R
Sep 22/23	BRSCC	Snetterton, Norwich, Norfolk	Race Meeting	N
Sep 23	BARC	Thruxton, Andover, Hampshire	Race Meeting	INT
Sep 23	BRSCC	Silverstone Circuit, Northants	Race Meeting	NR
Sep 23	BRSCC	Brands Hatch, Dartford, Kent	Race Meeting	N
Sep 23	Automobile Club du Portugal	Estoril, Portugal	Portuguese Grand Prix	INT
Sep 23	ASACO des 24 Heures du Mans	Le Mans, France	International F3000 Championship	INT
Sep 29	500 MRC	Kirkistown, Cloughey, Belfast	Race Meeting	N
Sep 29/30	Brands Hatch Leisure RC	Brands Hatch, Dartford, Kent	Race Meeting	INT
Sep 30	BHLRC	Cadwell Park, Louth, Lincolnshire	Race Meeting	NR
Sep 30	BARC	Mallory Park, Kirby Mallory, Leics	Race Meeting	NR
Sep 28-30	Cyprus Automobile Association	Cyprus	Cyprus Rally	INT
Sep 30	Cirjesa	Jerez, Spain	Spanish Grand Prix	INT
Sep 29-30	ASA Dijon-Prenois	Dijon, France	International Historic	INT
Oct 6	Brands Hatch Leisure RC	Oulton Park, Tarporley, Cheshire	Race Meeting	NR
Oct 6-7	BRDC	Silverstone Circuit, Northants	Race Meeting	IR
Oct 7	BARC	Brands Hatch, Dartford, Kent	Race Meeting	NR
Oct 7	BHLRC	Cadwell Park, Louth, Lincs	Race Meeting	NR
Oct 7	VSCC	Weston-Super-Mare, Avon	Sprint	
Oct 13-14	VSCC	The Welsh Trial, Wales	Trial	
Oct 13	BARC NW	Oulton Park, Tarporley, Cheshire	Race Meeting	NR
Oct 13-14	Brand Hatch Leisure RC	Brands Hatch, Dartford, Kent	F3 Championship	N
Oct 14	BARC	Thruxton, Andover, Hants	Race Meeting	NR
Oct 14	BARC	Pembrey, Llanelli, Dyfed	Race Meeting	NR
Oct 14	A C San Remo	San Remo, Italy	San Remo Rally (WRC)	INT
Oct 20	Hagley & District Light CC Ltd	Arrow Mill Hotel, nr. Alcester, Warks	Ken Wharton Mem. Autotests	
Oct 21	Suzuka Motorsport Club	Suzuka, Japan	Japanese Grand Prix	INT
Oct 21	Brands Hatch Leisure RC	Snetterton, Norwich, Norfolk	Race Meeting	C
Oct 21	VSCC	Eastern Rally	Rally	R
Oct 26-28	BRSCC	Brands Hatch, Dartford, Kent	Race Meeting	INT
Nov 4	VCC	Hyde Park Corner, London	London-Brighton Run	
Nov 4	Confederation of Aus. Motor Sport	Adelaide, Australia	Australian Grand Prix	INT
Nov 10	VSCC	The Lakeland Trial	Trial	R

Before going to a particular race meeting, we strongly advise you to check with the circuit concerned that the scheduled meeting is taking place.

demands of speed and victory."

The Judge also declared: "Mr Hubbard has restored it to a perfect condition and has spent extensive time researching its provenance, including contacting Mr Hassan to obtain drawings and other details from him.

"Mr Hassan approves of the restoration and was proud to be recently driven in the car around Monthéry."

Between its appearance in the 500 Miles Race at Brooklands in October, 1931, and the British Empire Trophy there at Easter, 1932, Walter Hassan rebuilt the car for Woolf Barnato. The engine was not changed at this juncture. Barnato, by then a director of Rolls-Royce, thought the car too slow in the British Empire Trophy. So he instructed Hassan to replace the 6½-litre engine with an 8-litre for the 500 Miles Race in 1932.

Like so many others, the 'Saga of a Speed Six Bentley' article alludes to Hassan rebuilding the car with a 4-litre Bentley chassis in 1932.

In fact, the chassis was a hybrid because Barnato wanted to retain the race-proven D-type gearbox in preference to the considerably heavier and untried F-type fitted to production 4 and 8-litre Bentleys.

So tubular cross members, associated with the F-type gearbox, were rejected in favour of 6½-litre pattern cross members.

Both gearbox and cross members came from the 'Old Number One' 1930 chassis, as did the steering column, drop arm, radiator, bulkhead, handbrake and wings.

Mr Boddy mentions none of this. Instead he highlights Hassan's reference to building a "new" car for Barnato in his book *Climax in Coventry* that narrates the broad sweep of Hassan's brilliant career and not the specifics of 'Old Number One'.

In reality, 'Old Number One' in 1932 was no more a new car than it had been in 1930 – and no more a new car than Campbell's Sunbeam Tiger or Seaman's Delage.

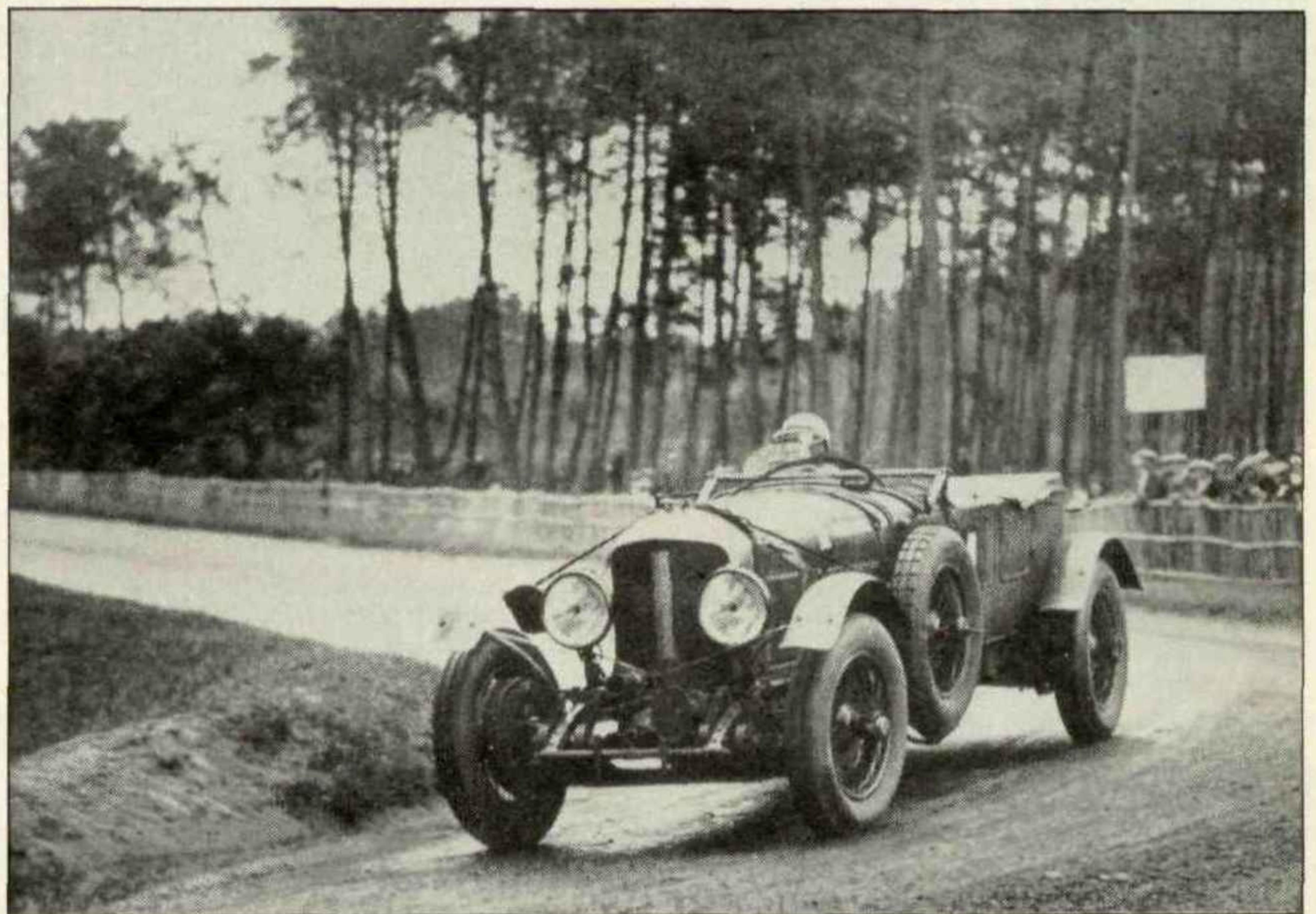
Barnato's view on the matter was described in Court by his daughter, Diana Barnato Walker. She said her father was very fond of the car that sped him to victory in 1929 and 1930. "He treated it rather like a dog. He would pat it as he went by and say 'Hello Old Number One'."

She recalled the car in its 1931 form, she was present at Brooklands when Clive Dunfee was killed while driving it in 1932, and she remembered it later with a fixed-head coupé body.

Mrs Barnato Walker stated that, because of its history, her father was even more attached to the car after the crash.

This is reflected in the fact that the chassis number LB 2332 was stamped on the front cross member and the registration MT 3464 was retained. Additionally, as Walter Hassan stated, the car carried the Speed Six radiator, upon which were engraved the 'Old Number One' record of successes.

The original registration document records the change of engine, but the



Old Number One at Le Mans in 1929.

chassis and registration numbers are unaltered.

Similarly, the Bentley Motors service records for the car are continuous from 1929 until World War II.

"The original log book was produced to me", said Mr Justice Otton in his judgement. "It shows various changes in colour of the car. So far as registration of the car is concerned, the history of this vehicle is continuous." The Judge also found: "The new parts that were incorporated in this car were part of its development."

In his pursuit of the argument that 'Old Number One' ceased to exist when Hassan rebuilt it in 1932, Mr Boddy omitted references to:

A contemporary report in *The Times*, detailing the full racing history of 'Old Number One', and *The Motor* (September 21, 1932) account of the Brooklands 500 Miles Race, in which Clive Dunfee was killed.

The magazine reported: "He was driving 'Old Number One', a Bentley with a famous record, which had been fitted, for this race, with an 8-litre engine instead of the original 6½-litre power unit."

Mr Justice Otton's Judgement stated: "This comment carries considerable weight. If the continuity had been broken, the car would not have been described in this way."

In his fine book, *The History of Brooklands Motor Course* published in 1957, Mr Boddy himself records: "the famous Number One Speed Six Bentley, now with a brand new 8-litre engine installed in a 4-litre chassis frame, with the outriggered springs."

And, in his judgement, Mr Justice Otton said: "I believe that the body of opinion which regarded the car as destroyed is wholly incorrect. I am satisfied that the car, which was the subject matter of the sale, is the Bentley known as 'Old Number One' and can properly be referred to as

'Old Number One'...I consider there is no break in its racing continuity."

Yet Mr Boddy's 1990 stance is: "I cannot see how two cars, one created in 1929, the second in 1932, can merge into one historic entity 58 years later." One wonders what prompted Mr Boddy's spectacular apparent change of heart over the car's continuous history evolving from the 1929 Le Mans winner.

This is perhaps doubly ironic since, during the recent Court hearing, considerable time was spent matching 'Old Number One' as it now exists to categories detailed in Denis Jenkinson's *Directory of Historic Racing Cars*.

"Applying his (Jenkinson's) definitions, the car cannot be called original," said Mr Justice Otton. "Degrees of originality have no meaning in the context of this car. It could only be called original if it remained in its 1929 Le Mans form."

The Judge went on: "In 1930, 1931 and 1932, it was rebuilt from component parts. It remained a living entity. Not even the Defendants say it is a reconstruction. The Defendants have not attempted to stigmatise the car."

MT 3464 can properly be described as authentic. It had a chequered career and never disappeared from view. The entity has always existed in some form or another.

It has been restored to its 1932 form. In many respects, this car seems a better example of authenticity than that cited by Mr Jenkinson.

Any new parts were assimilated into the whole. On the authenticity of the car, Mr Justice Otton further concluded: "There is no other Bentley which could legitimately lay claim to be 'Old Number One'. The expression 'Old Number One' is the famous name in history which is justly applied to the car which raced between 1929 and 1932" EH



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GOODYEAR

Racing in the Grand Manner



The Spa-Francorchamps circuit is one of the most picturesque on the Grand Prix scene and is also a favourite with the drivers.

Francorchamps, August 26th

After the Mickey Mouse Formula One affair called the Hungarian Grand Prix, it was refreshing to be at Le Grand Prix de Belgique on the *Circuit Nationale de Francorchamps* in south-east Belgium in the foothills of the Haute Fagne bordering with the Ardennes. It is always the scene for a real Grand Prix in every sense of the words.

When Ayrton Senna takes pole position, leads the race from start to finish, to win at a new record speed, there are those members of the British press who yawn and say: "Not much of a race". I am happy to say I am not one of those and I get enormous satisfaction out of watching an artist of high speed driving doing a fine job of work; the fact that there are few drivers who can challenge Ayrton Senna, and few cars that can match the McLaren-Honda V10 is unfortunate from the racing point of view, but does not detract from the joy of watching a master driver in real action. It is probably not very spectacular on the television screen or if you are standing in the pit lane, but standing at the bottom of the hill from La Source hairpin down to the Eau Rouge bridge watching the approach at 170 mph, the flick of left lock and right lock as the car tackles the steep *Raidillon* climbing up to the sky, is to see something special; and that is only one small part of the spectacular Francorchamps circuit, there are many more in the 6.940 kilometers (4.312 miles) that make up the lap.

The painfully anti-Senna magazine *Autosport* excelled itself in its report of the race, quoting in a headline "Senna dodges the wreckage to win Belgian GP". They were referring to accidents that caused the race to be stopped twice with red flags. The truth of the matter was that Senna did not dodge any wreckage at all, and did not even see any, because it all happened way behind him. A lot of the tail-enders towards the back of the grid did indeed 'dodge the wreckage' but not Senna.

Apart from Senna's natural aptitude to be the fastest in qualifying, on the simple premise that if pole position is there for the taking, why not take it, it also means there is less chance of getting involved in other drivers' accidents away from the start.

The Francorchamps circuit is one of those made up from public roads closed for the occasion of the Grand Prix, but in no way is it a temporary affair. Everything is permanent and to the highest standards of Formula One requirements and you can drive round the circuit before it all begins to happen and again after it's all over, so that it is a circuit where you can virtually 'live' with a driver as you watch him circulating, especially if you've had the opportunity to listen to a top driver describing a lap of the circuit. Even the man on the back of the grid can bring it all alive for you. For me the visit to Francorchamps is one of the highlights of the Grand Prix season.

There are no opportunities for anyone to do any testing before the event, so that it is the same for everyone when practice

begins on Friday morning, though naturally drivers and teams that have raced in previous years and collated and analysed all their previous data correctly have an obvious advantage. Both Honda and Renault were fielding 'improved' versions of their V10 engines, though not a lot was given away, but power and sustained torque were the obvious requirements, probably with higher rpm. Renault described their engine as 'Evolution 2' of the RS2 and mentioned that enhanced performance was coming from new connecting rod and camshaft development, which could suggest carbonfibre composite strengthening and lightening of the con-rods as Mercedes-Benz are using in their sports car V8 racing engines. Honda merely described their engines as 'Version 5' particularly suited to the requirements of the Belgian circuit, which means more power at the top end and higher rpm. It was noticeable that the Honda engines were using plastic intake trumpets in place of the regular highly polished aluminium ones, and they were still of staggeringly large diameter for a 10 cylinder engine. The Honda engineers and mechanics make it quite clear that they do not want anyone looking down the inlet trumpets and as soon as the airbox is removed plastic covers are put over the inlets. Until now the RA100E Honda engine has been using butterfly throttle valves, whereas most other engines use sliding plate throttle valves, but this time it looked as though the Japanese engine was using a sophisticated sliding plate system.

First day's practice saw perfect weather conditions, perhaps a little too perfect for racing engines and a bit too hot, but nonetheless the scene was set for a hard-fought McLaren v Ferrari battle, with Benetton and Williams not far behind and Leyton House well up for a nice change. Down at the back there were some changes in as much as the Onyx-Monteverdi team had withdrawn and this allowed the two Ligiers to move up from the early morning pre-qualifying into the real thing, and gave hope to two different rabbits; in this case the AGS cars of Tarquini and Dalmas. The Friday order at the front was Berger, Prost, Senna, Mansell, Piquet, Boutsen as good a bunch of high-speed runners as anyone could wish for.

On Saturday it was still fine but a little cooler and everyone went faster, even the non-qualifiers. Senna and Berger ruled the day with the McLaren number one driver half a second quicker than his teammate, at an average of over 140 mph, and this on a circuit with a 55 mph hairpin bend in it. The McLaren drivers were the only ones to break 1 min 51 sec but behind them there was a very active mixture with Prost (Ferrari) and Boutsen (Williams) in the 1 min 51 sec bracket, and then five drivers in 1 min 52 sec bracket in the order Mansell (Ferrari), Nannini (Benetton), Patrese (Williams), Piquet (Benetton) and Alesi (Tyrrell), the last named being the 1990 phenomena that we are getting very used to with the very slippery Tyrrell 019 and the Brian Hart-tuned 90 degree V8 Cosworth DFR that seemingly powered The Ark.

At the top of the long hill from the Raidillon to Les Combes the McLaren-Hondas were fastest at 195.65 mph (Senna) and 194.74 mph (Berger) with Prost (193.90 mph) and Mansell following at 192.23 mph. Not a lot of difference, but a worthwhile amount, and behind Mansell came Alesi and Nakajima with the Tyrrells and their Cosworth DFRs at just over 190



Senna equalled Clark's and Lauda's number of Grand Prix wins with his victory at Spa.

mph. Slowest was the Osella of Grouillard at 178.53 mph a difference that was really visible.

Just after half way through Saturday qualifying there was a tense moment as Piquet's Benetton spun coming out of the last corner and hit the end of the pit guard-rails; the driver was alright, but everything had to be stopped while wreckage was gathered up. The top runners were finding that the Goodyear qualifying tyres were marginal for one complete lap at maximum effort, the very fast downhill corners playing havoc with the front tyres particularly. For a really fast lap the drivers had to strike a balance between going very fast on the first half lap and losing a certain amount of adhesion on the second part, or going not so fast on the first part and giving it all on the second part, or yet again they could strike a compromise all the way round, but none of it was easy and the hard-chargers at the front of the grid were having to work really

hard. Piquet was taking a gamble on giving it his all at the end of the lap, but the tyres had gone over their peak and he lost it on the final corner.

A break in the middle of the qualifying hour often puts a damper on things when they restart and somehow the frenetic tempo is lost, but this time it did not happen and the battle for grid positions continued to the bitter end, and it was Senna's advantage to be on pole position.

On Saturday night the rains came and Sunday morning saw heavy mists all over the hills, but gradually the sun burned its way through, but not to any great extent, so the circuit was dry and grey for most of the time, which was ideal for racing. Sunshine is great stuff for spectators, but not necessarily for drivers, tyres and engines.

In the drivers briefing before the race the Director of the event made it quite clear that if there was any sort of accident at the start, going into the first hairpin, he was not going to stop the race, always providing there was no personal injury. In spite of his warning there was an accident at the start, in fact there were three, but Senna, Berger, Prost and Boutsen were long gone. Imagine their surprise when red flags came out before the end of the opening lap and the race was stopped. Suzuki (Lola-Lamborghini), Piquet (Benetton) and Mansell (Ferrari) had had a shunting match, the Brummie being totally innocent but the Ferrari was badly bent. In the general dodging about, Donnelly and Warwick collided, wrecking the Ulsterman's car and giving Warwick a punctured right-rear tyre, and nothing to do with the accident, Larini's Ligier broke a final drive. Nobody was hurt in this low-speed *caramboulage*, but Warwick was driving slowly round on a flat tyre, and two more cars had spun off at the ess-bend at Les Combes, so the Race Director had little option but to stop the race.

Twenty-five minutes later all was ready



No matter how he tried, Prost was unable to match Senna's pace round the circuit.

for another start, Mansell was in the spare Ferrari, which did not suit him as it was set up for Prost, Larini was in the spare Ligier, Warwick took the spare Lotus and Donnelly was hoping to take Warwick's car after it had been repaired. Suzuki was out of the race as he had crashed his race car in the morning warm up and was in the spare car at the first start anyway, so that was that.

At the restart Boutsen made a real flyer and got ahead of Prost and dived in between the McLarens, Senna once again leading. Down to Eau Rouge and up the hill they all went with Boutsen determined to do his utmost to hang on to Senna. He was still there at the end of the opening lap, followed by Berger, Nannini, Prost, Mansell, Patrese and Alesi and we had an interesting situation on our hands.

As the tail enders breasted the top of the Raidillon Paolo Barilla let his Minardi slip from his grasp and had a monumental high-speed spin into the unforgiving guardrails, wiping off most of the appendages from the car. At first sight it looked very bad, and doctors and service vehicles were soon on the spot. As this was just over the brow the Race Director once again was forced to call for red flags and the race was stopped. Once more the leaders stopped at the grid at the end of the lap, and once more Senna did not 'dodge the wreckage' he did not even see it, so that one wonders where the *Autosport* headline writer was. Thanks to modern carbonfibre composite construction Barilla was extracted from the Minardi monocoque virtually unhurt but he could take no further part in the Belgian Grand Prix, which was now about to make a third start.

For the third time Senna led the field round on the parade lap, now reduced to 23 cars. Suzuki and Barilla were non-starters and Donnelly was going to start from the pit lane in Warwick's repaired car. The initial start had been given at 2pm and this third and final one was given at 2.56pm, the 'almighty' television being in something of a turmoil running nearly an hour late, but the Belgian Grand Prix and the well-being of the drivers are much more important than time schedules and money.

This time all went well and as the last car went by the pit exit Donnelly joined in, so we had 24 cars in the race. The two McLarens made no mistakes and led from Prost, Boutsen and Patrese, with Nannini, Piquet (in the spare Benetton), Mansell, Alesi, Capelli and Bernard. Mansell was right off the pace, the spare Ferrari being down on power and feeling 'undriveable' according to the driver later, even though Prost had set it up for his own emergency use.

Naturally everyone had been a bit anxious about their clutches with three starts in succession, but all was well and it was now a question of keeping an eye on the tyres. Most teams had decided to leave the decision to the driver on whether to try and go through non-stop or make a stop for new tyres, for nobody was going to know better than the driver about the tyre wear as



Not only did Gugelmin remain unlapped, he also picked up a championship point for sixth place.

it developed. The normal course of events meant that lap times were about 5 seconds up on qualifying laps, but the pace was still fast and the dry conditions encouraged some pretty frantic racing. The opening laps saw Senna setting the pace, going fast enough but not overfast so that tyre wear became a problem, but it did not take many laps to see that Berger was trying a bit too hard holding on to second place, but he was forced to do so as he had Prost, Boutsen, Patrese, Nannini and Piquet close up behind and none of them were dragging their feet. After a brief gap came Alesi in the Tyrrell 019 with Mansell seemingly unable to keep up and being threatened by Capelli, Bernard, Gugelmin and Modena. In the first Lotus-Lamborghini was Derek Warwick, his teammate Donnelly still making up ground from his pit-lane start, and Warwick's performance (or to be precise, the Lotus 102's performance) would have looked alright if Eric Bernard in the Lamborghini-powered Lola hadn't been a long way ahead already!

By 10 laps Senna was away on his own and already had the tail-enders in sight, coming up to lap them. He really was in a class of his own regardless of what the anti-Senna press may say or write.

Although Berger held second place, his tyres were losing their efficiency and Prost was getting a little angry at being held up, but more angry that it was letting Senna get away. On lap 14 the Ferrari thrust past the McLaren and took second place, but there was little hope of matching Senna's pace, or improving on it. Already some cars had disappeared, Nakajima with his Tyrrell's engine reluctant to run properly, and Patrese with his Williams gearbox stuck in third gear. On lap 19 Mansell was into the pits to give up as he considered the spare Ferrari hopeless, and almost immediately afterwards Boutsen was out when a driveshaft joint broke, so the demanding Francorchamps circuit was taking its toll of the weak. At the end of lap 18 Berger was in for new tyres and three laps later Senna decided new tyres were necessary. We now saw the most remarkable thing of the whole race.

Senna and Prost had done lap 20 at almost identical times, 1.58.8 for Senna, 1.58.7 for Prost. On lap 21 their times were 1.59.3 and 2.00.5, respectively. On lap 22 Senna did 2.03.6 as he slowed for the pit lane, and Prost recorded 2.00.0 exactly, as he followed the McLaren into the pits,

having closed right up at this point. The McLaren pit stop was first class, while the Ferrari stop was 4 seconds slower, but all the while Senna was conscious that Nannini was gaining ground rapidly while he and Prost were in the pits, and the Benetton looked as though it was going to go through non-stop.

As the McLaren was dropped down off the jacks Senna caught a glimpse of green between the pit lane guard-rails, which was all he needed, for it had to be the Benetton. After the race Senna admitted that he gave it all he had got to get down the pit lane and round the right hand hairpin to rejoin the track. He knew he had to cover that distance in less time than Nannini was going to spend braking down from 150mph for the 55mph La Source hairpin which was that much further down the road than the pit lane hairpin, which he was going to negotiate from a standing start.

If you believe some of the anti-Honda-McLaren writings you would wonder why he was bothered, for they tell us that the Senna/McLaren supremacy is purely a matter of Honda horsepower and McLaren top speed, so therefore Senna should be able to waft past the Benetton with ease. If you talk intelligently to Senna he will explain that he knew exactly how fast the Benetton could go, how well Nannini is driving, and that he did not consider spending one or two laps finding a way by were justified; not if he could win the race down to the hairpins. All thoughts of Prost and his tyre stop were irrelevant and he got out of his hairpin and down the hill to Eau Rouge ahead of Nannini who was full tilt down the hill from La Source hairpin. It wasn't over for Senna, because even though the tyres are heated before being put on the car, they need at least half a lap to get up to full working temperature, and the Benetton was hard up behind the McLaren as they went over the top of the Raidillon, Prost in the Ferrari was now third.

Senna's first flying lap after his pit stop was in 1.57.5, his fastest in the race so far, and Nannini could not match that, nor could he match the next five that Senna did. 1.56.9; 1.56.1; 1.56.1; 1.55.9; 1.55.9. He then did 1.56.6 as he lapped Alboreto, and 1.57.0 as he caught and lapped Caffi and then he was back into laps at 1.55.7 to 1.55.1 for six laps and it was really all over. Meanwhile, Prost had been doing heroic things with the Ferrari, virtually matching Senna lap for lap, but always about 1 second slower. For consistency and precision drivers of the calibre of Senna and Prost make you shake your head in disbelief when you get a chance to study the Longines Olivetti race lap time sheets afterwards. Bearing in mind they are averaging around 134/135 mph on such a challenging circuit with its high-speed corners, uphill and downhill and maximum braking for a hairpin once a lap, to see electronically timed laps with only hundredths of a second variation makes you blink. Senna did two consecutive laps of 1.55.143 and 1.55.132, while Prost did 1.56.162 and



Nannini's gamble on winning the race by not calling in for fresh rubber did not work out.

1.56.115. Eventually Prost got in one lap at 1.55.087 to claim fastest race lap, but by this time Senna had eased off his pace as the end was in sight.

These two perfectionists gave an exhibition of Grand Prix driving at its best, apart from a slight aberration by Prost when he couldn't find a way past Alboreto's Arrows and Caffi's Arrows. Senna had lapped both of them with little trouble, his depth perception and high-speed judgement always having been that much sharper than that of Prost.

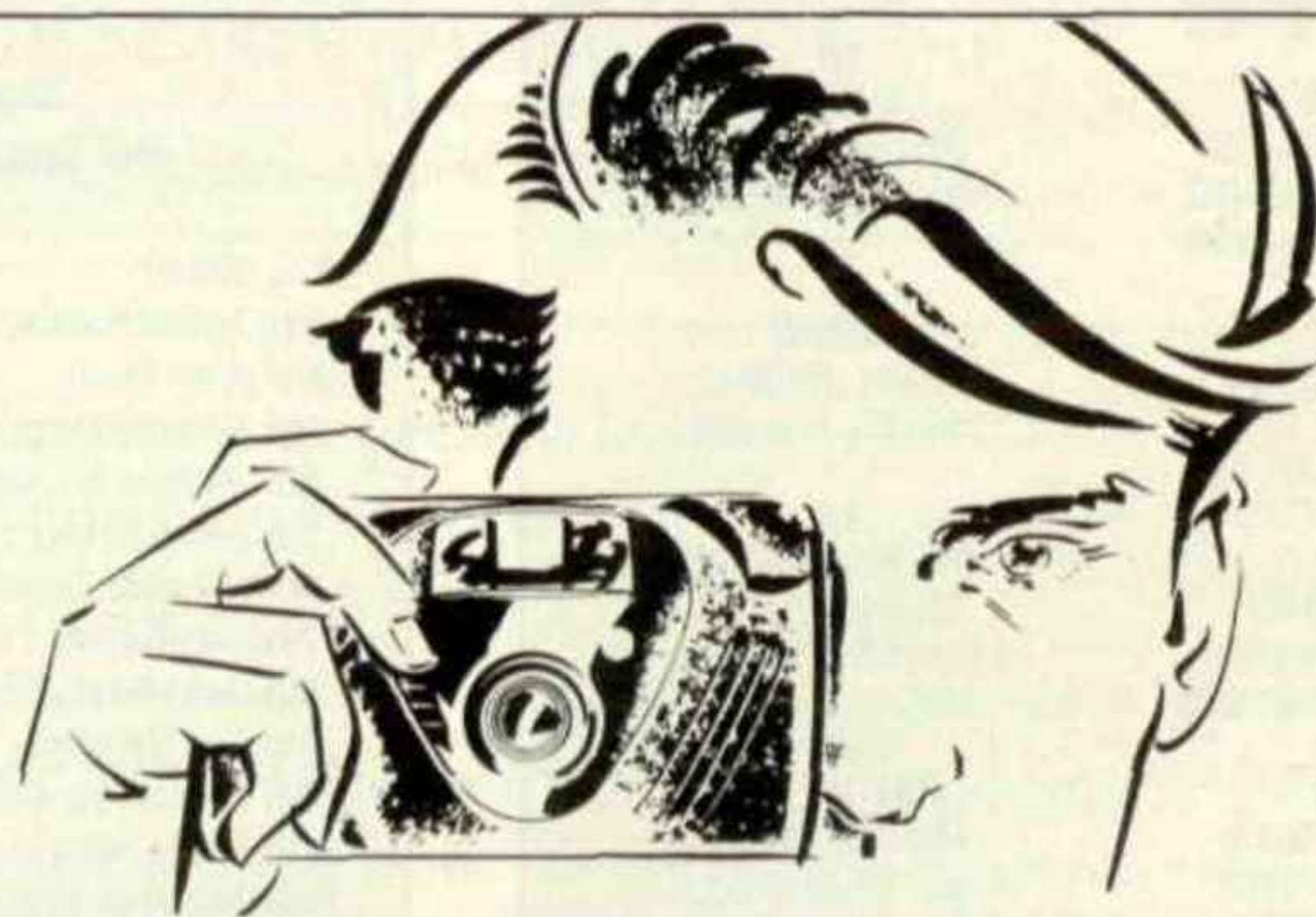
Nannini was valiantly holding on to a precarious third place, for his tyres were now very worn, and Berger was pressuring him, desperately needing third place to justify keeping his job at McLaren. Nannini was not going to help, and why should he? So it got a bit rough and ragged between the two of them until the Benetton lost rear tyre adhesion at the top of the Raidillon. While the Italian gathered it all up the Austrian whipped by into third place, with three laps to go.

Almost overlooked was Piquet's drive into fifth place and Gugelmin's arrival in sixth place, both still on the same lap as the leader, which is something worthwhile on the Francorchamps circuit. The second Leyton House car was seventh, both Gugelmin and Capelli running through non-stop, their Judd V8 engines never missing a beat, even

though Capelli's broke an exhaust pipe towards the end of the race.

It had been Grand Prix racing in the Grand Manner, apart from the starting troubles, but the nicest thing of all was that one did not spend the whole time listening to drivers complaining about the circuit. They all seemed to love it and their general opinion is 'this is what Grand Prix racing is all about'. 80,000 spectators travelled from all parts of Europe (if licence plates are anything to go by) for this true Grand Prix, and though these words are being read long after it is all over, it is a pleasure to put it on record.

DSJ



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STARTING GRID



28 BERGER McLaren MP4/5B 1 min 50.948 secs	27 SENNA McLaren MP4/5B 1 min 50.365 secs
5 BOUTSEN Williams FW13B 1 min 51.902 secs	1 PROST Ferrari F1/90 1 min 51.043 secs
19 NANNINI Benetton B190 1 min 52.648 secs	2 MANSELL Ferrari F1/90 1 min 52.267 secs
20 PIQUET Benetton B190 1 min 52.853 secs	6 PATRESE Williams FW13B 1 min 52.703 secs
3 NAKAJIMA Tyrrell 019 1 min 53.468 secs	4 ALESI Tyrrell 019 1 min 52.885 secs
16 CAPELLI Leyton House CG901 1 min 53.783 secs	30 SUZUKI* Lola L90 1 min 53.523 secs
15 GUGELMIN Leyton House CG901 1 min 54.120 secs	8 MODENA Brabham BT59 1 min 58.916 secs
23 MARTINI Minardi M190 1 min 54.312 secs	29 BERNARD Lola L90 1 min 54.251 secs
11 WARWICK Lotus 102 1 min 55.068 secs	21 PIRRO Dallara BMS 190 1 min 54.595 secs
22 DE CESARIS Dallara BMS 190 1 min 55.261 secs	10 CAFFI Arrows A11B 1 min 55.199 secs
12 DONNELLY Lotus 102 1 min 55.304 secs	25 LARINI Ligier JS33B 1 min 55.278 secs
7 BRABHAM Brabham BT59 1 min 56.668 secs	14 GROUILLARD Osella FA1M 1 min 55.334 secs
9 ALBORETO Arrows A11B 1 min 56.055 secs	24 BARILLA* Minardi M190 1 min 55.859 secs

*30 A. Suzuki eliminated at first start by accident.
*24 P. Barilla eliminated after second start by accident.
Only 24 cars took third and final start.

DRIVERS

CONSTRUCTORS

Ayrton Senna.....63	McLaren-Honda.....96
Alain Prost.....50	Ferrari.....63
Gerhard Berger.....33	Williams-Renault.....42
Thierry Boutsen.....27	Benetton-Cosworth.....40
Nelson Piquet.....24	Tyrrell-Cosworth.....14
Alessandro Nannini.....16	Leyton House-Judd.....7
Riccardo Patrese.....15	Larrousse-Lamborghini.....6
Jean Alesi.....13	Lotus-Lamborghini.....3
Nigel Mansell.....13	Arrows-Cosworth.....2
Ivan Capelli.....6	Brabham-Judd.....2
Eric Bernard.....5	
Derek Warwick.....3	
Alessandro Caffi.....2	
Stefano Modena.....2	
Satoru Nakajima.....1	
Aguri Suzuki.....1	
Mauricio Gugelmin.....1	

LAP TIMES

No	Driver	Car	Tyres	Pre-qualifying	Friday Qualifying	Saturday Qualifying	Best Race Lap (on lap)
1	Alain Prost	Ferrari F1/90	G		1m 51.841s	1m 51.043s	1m 55.087s (38)
2	Nigel Mansell	Ferrari F1/90	G		1m 52.601s	1m 52.267s	1m 59.767s (15)
3	Satoru Nakajima	Tyrrell 019	P		1m 55.798s	1m 53.468s	2m 14.599s (1)
4	Jean Alesi	Tyrrell 019	P		1m 54.116s	1m 52.885s	1m 58.531s (39)
5	Thierry Boutsen	Williams FW13B	G		1m 54.024s	1m 51.902s	1m 58.199s (20)
6	Riccardo Patrese	Williams FW13B	G		1m 54.260s	1m 52.703s	1m 58.666s (9)
7	David Brabham	Brabham BT59	P		1m 58.034s	1m 55.668s	2m 01.959s (34)
8	Stefano Modena	Brabham BT59	P		1m 57.014s	1m 53.919s	1m 59.415s (39)
9	Michele Alboreto	Arrows A11B	G		1m 57.255s	1m 56.055s	2m 00.671s (24)
10	Alessandro Caffi	Arrows A11B	G		1m 56.562s	1m 55.199s	2m 00.610s (35)
11	Derek Warwick	Lotus 102	G		1m 56.246s	1m 55.068s	1m 59.081s (41)
12	Martin Donnelly	Lotus 102	G		1m 56.666s	1m 55.304s	1m 58.330s (29)
14	Olivier Grouillard	Osella FA1M	P	1m 57.941s	1m 57.770s	1m 55.334s	2m 00.886s (35)
15	Mauricio Gugelmin	Leyton House CG901	G		1m 54.497s	1m 54.120s	1m 58.163s (28)
16	Ivan Capelli	Leyton House CG901	G		1m 55.012s	1m 53.783s	1m 58.351s (40)
17	Gabriele Tarquini	AGS JH25	G		1m 59.910s	1m 58.293s	1m 57.566s
18	Yannick Dalmas	AGS JH25	G		1m 58.339s	1m 58.995s	1m 57.704s
19	Alessandro Nannini	Benetton B190	G		1m 55.800s	1m 52.648s	1m 55.650s (40)
20	Nelson Piquet	Benetton B190	G		1m 53.689s	1m 52.853s	1m 57.036s (40)
21	Emanuele Pirro	Dallara BMS 190	P		1m 56.239s	1m 54.595s	2m 03.152s (3)
22	Andrea de Cesaris	Dallara BMS 190	P		1m 56.923s	1m 55.261s	2m 02.225s (9)
23	Pierluigi Martini	Minardi M190	P		1m 56.074s	1m 54.312s	2m 00.157s (34)
24	Paolo Barilla	Minardi M190	P		1m 57.221s	1m 55.859s	DNS
25	Nicola Larini	Ligier JS 33B	G		1m 57.471s	1m 55.278s	1m 59.956s (38)
26	Philippe Alliot	Ligier JS 33B	G		1m 57.571s	1m 56.118s	
27	Ayrton Senna	McLaren MP4/5B	G		1m 52.278s	1m 50.365s	1m 55.132s (36)
28	Gerhard Berger	McLaren MP4/5B	G		1m 51.211s	1m 50.948s	1m 55.531s (41)
29	Eric Bernard	Larrousse-Lola 90	G		1m 56.213s	1m 54.251s	1m 56.531s (36)
30	Aguri Suzuki	Larrousse-Lola 90	G		1m 55.294s	1m 53.523s	DNS
31	Bertrand Gachot	Coloni-C3B	G		1m 59.130s	no time	1m 58.520s
33	Roberto Moreno	EuroBrun 189B	P		2m 00.270s		
34	Claudio Langes	EuroBrun 189B	P		2m 01.405s		
35		Monteverdi (Onyx)	G				Team withdrawn from the World Championship
36		Monteverdi (Onyx)	G				Team withdrawn from the World Championship
39	Bruno Giacomelli	Life RE F1/90	G		2m 19.445s		

RESULTS

Belgian Grand Prix, Francorchamps, August 26
44 laps of 6.94 km circuit (305.360 km; 189.741 miles)

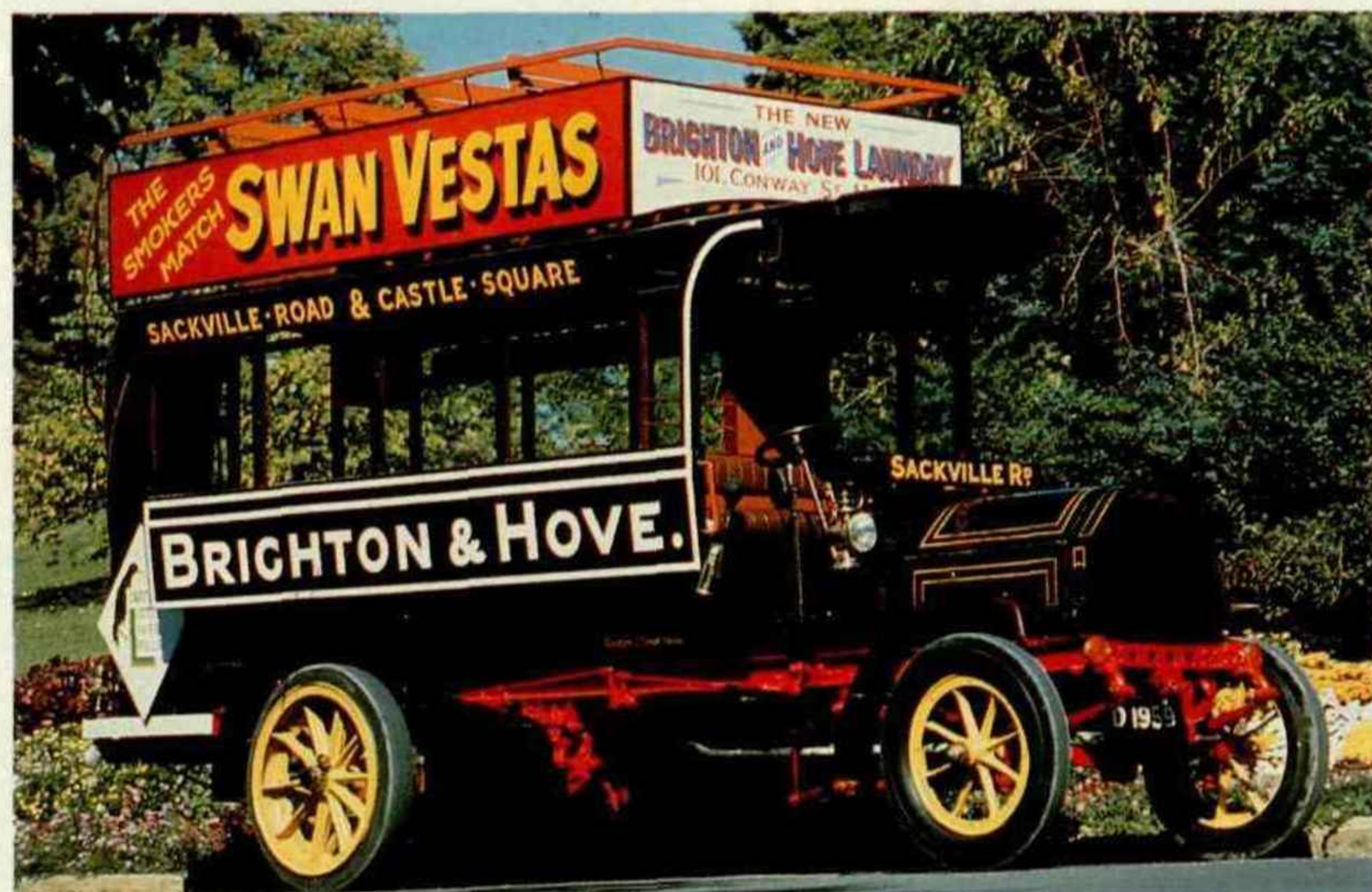
Pos.	Driver	Nat.	Car/Engine	Time
1st	Ayrton Senna	(BRA)	McLaren MP4/5B-Honda V10	1h 26m 31.997s
2nd	Alain Prost	(F)	Ferrari F1/90-Ferrari V12	1h 26m 35.547s
3rd	Gerhard Berger	(AUT)	McLaren MP4/5B-Honda V10	1h 27m 00.459s
4th	Alessandro Nannini	(I)	Benetton B190-Cosworth V8 EXP	1h 27m 21.334s
5th	Nelson Piquet	(BRA)	Benetton B190-Cosworth V8 EXP	1h 28m 01.647s
6th	Mauricio Gugelmin	(BRA)	Leyton House CG901-Judd V8	1h 28m 20.848s
7th	Ivan Capelli	(I)	Leyton House CG901-Judd V8	1 lap behind
8th	Jean Alesi	(F)	Tyrrell 019-Cosworth V8 DFR	1 lap behind
9th	Eric Bernard	(F)	Lola L90-Lamborghini V12	1 lap behind
10th	Alessandro Caffi	(I)	Arrows A11B-Cosworth V8 DFR	1 lap behind
11th	Derek Warwick	(GB)	Lotus 102-Lamborghini V12	1 lap behind
12th	Martin Donnelly	(GB)	Lotus 102-Lamborghini V12	1 lap behind
13th	Michele Alboreto	(I)	Arrows A11B-Cosworth V8 DFR	1 lap behind
14th	Nicola Larini	(I)	Ligier JS33B-Cosworth V8 DFR	2 laps behind
15th	Pierluigi Martini	(I)	Minardi M190-Cosworth V8 DFR	2 laps behind
16th	Olivier Grouillard	(F)	Osella FA1M-Cosworth V8 DFR	2 laps behind
17th	Stefano Modena	(I)	Brabham BT59-Judd V8	retired on lap 40
18th	David Brabham	(AUS)	Brabham BT59-Judd V8	retired on lap 37
19th	Andrea de Cesaris	(I)	Dallara BMS 190-Cosworth V8 DFR	retired on lap 28
20th	Thierry Boutsen	(B)	Williams FW13B-Renault V10	retired on lap 22
21st	Nigel Mansell	(GB)	Ferrari F1/90-Ferrari V12	retired on lap 20
22nd	Riccardo Patrese	(I)	Williams FW13B-Renault V10	retired on lap 19
23rd	Emanuele Pirro	(I)	Dallara BMS190-Cosworth V8 DFR	retired on lap 6
24th	Satoru Nakajima	(J)	Tyrrell 019-Cosworth V8 DFR	retired on lap 5
25th	Paolo Barilla	(I)	Minardi M190-Cosworth V8 DFR	did not start
26th	Aguri Suzuki	(J)	Lola L90-Lamborghini V12	did not start

Fastest Lap: Alain Prost (Ferrari F1/90) 1 min 55.097 secs on lap 38, 217.088 kph (134.892 mph)

Winner's Average Speed: 211.729 kph (131.562 mph). Conditions: Warm

DNQ	Philippe Alliot	(F)	Ligier JS33B-Cosworth V8 DFR	1m 56.118s
DNQ	Gabriele Tarquini	(I)	AGS JH25-Cosworth V8 DFR	1m 57.566s
DNQ	Yannick Dalmas	(F)	AGS JH25-Cosworth V8 DFR	1m 57.704s
DNQ	Bertrand Gachot	(L)	Coloni C3B-Cosworth V8 DFR	1m 58.520s
DNPQ	Roberto Moreno	(BRA)	EuroBrun ER189B-Judd V8	2m 00.270s
DNPQ	Claudio Langes	(I)	EuroBrun ER189B-Judd V8	2m 01.405s
DNPQ	Bruno Giacomelli	(I)	Life 12 cylinder	2m 19.445s

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Senna Again



Not only did Ayrton Senna achieve his first Italian Grand Prix victory, he set the fastest qualifying times in both sessions as well as the fastest lap of the race.

Monza, September 9th

With the 1990 season moving into its closing stages, it is becoming more and more clear that the only team seriously to challenge the McLaren-Honda domination is the Ferrari team. Equally the only driver seriously to challenge Ayrton Senna is Alain Prost, so that Senna-McLaren and Prost-Ferrari are the two yardsticks by which all others are judged and quite simply, no-one really matches up to them consistently. It is as if we are putting on a stage production, with two stars, a strong chorus, and a flexible back-drop. Senna and Prost are the stars, Boutsen, Patrese, Nannini, Piquet, Mansell, Berger are the strong chorus, with Alesi the joker in the pack, and the rest from Warwick, Gugelmin and Capelli down to Langes and Giacomelli are the moving back-drop. With the cars it is very similar, McLaren-Honda and Ferrari are the stars, Williams-Renault, Benetton-Cosworth, Lola-Lamborghini, Leyton-House-Judd are the chorus and the rest are the moving back-drop.

The Italian Grand Prix was no exception to this idea, and while Ferrari were able to challenge the number two McLaren-Honda they could not touch the number

one. Any team of any substance had done a lot of pre-race testing, courtesy of Goodyear or Pirelli, so that there was not a lot to be learnt. With conditions seldom being consistent, when official practice started it was a case of applying the data collected previously to the conditions of Friday morning and as the day got warmer and the pace got faster, applying detail changes to match the situation. When you realise that everything on a modern Formula One car is adjustable to a very fine limit, and that each component has to be compatible with all the other components, from tyres to ignition timing it is not surprising that some teams get in a muddle and progress backwards. It is all very well data-logging everything about the entire car, but if you don't know how to analyse it and extract it correctly you would probably be better off without any knowledge. How often has one heard a team member say, "We went the wrong way with our adjustments," as if it is something creditable. What is really meant is "we lost our way", which is inexcusable.

It is not difficult to see which teams know what they are doing, providing there is a good driver in the car, which is why the front-running teams are always up at the

front. Friday morning was no exception and for a long time Jean Alesi was heading the times with his Tyrrell 019, its Brian Hart built Cosworth DFR pushing the slim Tyrrell through the air virtually as quick as the Honda, Ferrari and Renault powered cars. Monza being virtually flat there was no great advantage to the extra "grunt" of the more powerful engines. Just when it looked as if Alesi was going to head the morning testing times at 1 min 24.1 sec, Senna went out with the McLaren-Honda in "high-speed" trim, having been doing "race-trim" experiments and testing, and put in one fast lap to keep everything in perspective. His time was 1.23.6 sec! Not everything was plain sailing, for afterwards Mansell's Ferrari and Donnelly's Lotus arrived back at the pits on the end of tow-ropes.

From 1pm until 2pm the serious business of qualifying began, watched by a surprisingly large crowd who had the benefit of huge Star Vision screens at strategic points around the circuit which relayed TV pictures and times as they were happening, so that everyone could "live" with each driver on a fast qualifying lap. In the pits the Olivetti/Longines VDUs provided continuous data in figures to enable anyone to follow a driver's progress, while

Honda, Ferrari, Renault and Ford engineers were following the progress of their engines through the telemetry fitted to the cars sending information back to their control centres. At times you wonder if anyone is actually watching the driver at work!

Qualifying was a clear tight battle between McLaren and Ferrari, or Honda and Fiat, with Senna and Berger versus Prost and Mansell. The quick morning lap by Senna showed that times in the 1 min 23 sec bracket were going to be called for, which was a world apart from most of the other runners, especially those at the back of the grid who were doing their best to record 1 min 28 secs, which looked like the cut-off point for the four drivers who were going to get left out. Senna went out quite early and set a benchmark of 1.23.704 and ten minutes later Berger upped this to 1.23.430. Mansell could only (only?) manage 1.23.892 and Prost a "slow" 1.24.806. However, the Frenchman then went for his second run and scored 1.23.497 which spurred Berger on to greater things and he recorded 1.23.239. Mansell replied with a lap at 1.23.141 and temporary pole position, amid shrieks of delight from the partisan crowd. Meanwhile Senna was waiting and watching, and when they had all done he went out and recorded 1 min 22.972! The looks on faces all along the pit lane, and the shaking of heads, were saying "How does he do it?" Senna knows how he does it, of that there is no doubt at all. It was interesting that the speed-trap over the finish line had Senna's McLaren at 195.76 mph, slower than Berger, Prost, Mansell and Alesi, the number two McLaren recording 198.10 mph. More significant were the speeds through the "trap" out of the Curva Grande because there Senna was fastest.

Nobody else got below 1 min 24 sec and there was exactly six seconds difference between Senna's fastest lap and that of the car in 30th position, the Coloni-Cosworth DFR of Gachot. It may be depressing for the majority of the entry, but this is Grand Prix racing, not an old ladies-teaparty or a sporting club affair.

While Friday had gone very much as anticipated, especially for the McLaren-Honda team, Saturday morning saw a complete reversal and while it would be untrue to say the red and white pits were in a panic, there was some pretty intense work going on and nobody had time for conversation. The morning test sessions which well organised teams use for deciding on a race set-up, checking fuel consumption, tyre wear, handling with full and near-empty fuel tank, all related to the track conditions, with a modicum of inspiration thrown in to allow for afternoon rise in the temperature, saw the Honda team in trouble. Senna had barely set off from the pits when his engine telemetry told the Honda engineers that all was not well. He was instantly back in the pits and as the impending trouble was not of a simple nature the decision was

taken to change the engine.

By pre-arranged planning the spare McLaren was for the priority use of Berger for this meeting, only available to Senna in emergency, so it was prepared for the Austrian's size and driving style. Before Senna could use it many things had to be changed, so while one group of McLaren and Honda mechanics were taking the engine out of Senna's car another group were altering the spare car. Meanwhile practice was continuing unabated and Berger was fending off competition from the Williams-Renaults, the Benetton and others, while Prost and Mansell were quietly getting on with race preparation. By the time Senna got out in the spare car time was running out and he only managed a total of eight laps, during which there was not much opportunity to make any real decisions about race set-up. During the morning most people had done more than 20 laps, and some nearer 30 laps in their search for optimum settings for race conditions.

As always the final qualifying hour began at 1pm on Saturday afternoon in fine and warm conditions, with a crowd of 40,000 having flooded into the Autodromo from early morning. Senna's race-car was still being finished off and the Brazilian was standing quietly at the back of the workshop totally calm and composed, and in the meantime Berger went out on the track quite early "to hold the fort", which he did valiantly. He recorded a 1.23.025 which kept him in second place behind Senna's Friday time and when Prost and Mansell went out for their first runs and recorded 1.23.475 and 1.23.720 respectively, things were looking good for the McLaren team. Just before the Ferraris went out Senna's car was finished and he did one quiet warming-lap and returned to the pits for minor adjustments.

Prost then pulled out all the stops and at his brilliant best did a lap in 1.22.935 to claim pole position by mere hundredths of a second, but pole position nonetheless. The noise from the crowd nearly drowned the passing cars. Senna now went out for another "test" lap, returning to the pits without completing a flying timed lap, and sat waiting, confident that now all was well. Berger went out for his second

attempt and did an heroic 1.22.936, just one-thousandth of a second slower than Prost. (If you pause to contemplate the accuracy of the Longines/Olivetti timing system, you take away all the excitement.)

Senna was now in third place, with his Friday time of 1.22.972 and with less than four minutes left before the session ended McLaren number 27 trickled quietly down the pit lane and cut onto the track. As he went through to start his flying lap the chequered flag was being unfurled to mark the end of qualifying. Next time Senna went across the timing strip the digital timer stopped at 1 min 22.333 sec and an air of total incredulity wafted up and down the pit lane. Mere seconds after he had crossed the line the chequered flag came out to denote the end of qualifying. Not only had Senna snatched pole position back with seconds to spare, he had done so by nearly half a second, and with only one flying lap for the whole session. But what a lap! Within the vast crowd of spectators there were a lot of Brazilians, and they had formed a solid united section in the grandstand opposite the McLaren pits, and they took great delight in letting the world know where they were.

Personally I could have packed my bag there and then and returned home for anything else was going to be an anticlimax and a mere formality, but enthusiasm for racing still makes me stay until the last racing engine is switched off and the car packed away, to race another day.

Sunday was another fine day and from early morning the crowds poured into the circuit, for though McLaren-Honda had beaten Ferrari in the free-for-all of one lap qualifying sprints, they had yet to win the race and Prost had shown that he was not going to give in. In the McLaren team there had been long hours of decision-making in consultation with Honda and Goodyear, to decide on the detail settings of Senna's car for race conditions. They had much testing data at their command and Senna and his engineers had done a lot of deep thinking and decision-making to set the car up, with only the early morning half-hour "warm-up" period to cross-check their decisions. Yet again, Prost and Senna, Ferrari and McLaren, Fiat and Honda, were in a class of their own, with



Nakajima scored another point while Warwick earned everyone's admiration by taking to the tracks again immediately after his fearful accident.



The Williams twins had a low key weekend, put in the shade by Alesi and the Tyrrell in qualifying.

mere hundredths of a second between them at the end of "warm up" so clearly the McLaren decision-making was not far out.

The start of the 53 lap race was scheduled for 3pm, by which time the Autodromo had at least 100,000 people packed into it and the sun was shining and all was set for a good race. The 26 starters gradually took up their positions on the starting grid, as shown in the accompanying table, and the four non-qualifiers, Tarquini (AGS), Barilla (Minardi), Brabham (Brabham) and Gachot (Coloni) could only watch and hope that their turn would come in due course.

The two McLarens were one behind the other on the left of the grid, and the two Ferraris were one behind the other on the right of the grid, with Alesi, in fifth place, behind the McLarens. That fact in itself was an embarrassment to the Williams-Renault team, the Benetton-works Cosworth team, the Leyton House-works Judd team and the four Lamborghini powered cars, two Lotus and two Lola. Away from the start, after the parade lap, it was even more embarrassing for Alesi went off the line like a rocket and was in behind the two McLarens almost before Prost or Mansell saw him. At the end of the opening lap it was Senna, Berger, Alesi, Prost, Mansell and just as we were wondering if we had been "seeing things" there was excitement down at the exit of the last corner leading onto the start/finish straight. Derek Warwick lost control of his Lotus, hit the outside barriers and rolled over and over, bits of the car flying off as it went, dissipating the kinetic energy. After a long time sliding along the track upside down the monocoque chassis came to rest in the middle of the track and Warwick scrambled quickly out, totally unhurt. Red flags stopped the race and there was a twenty minute delay while order was restored. Which time Warwick ran back to the pits and took over the spare Lotus-Lamborghini, taking it all in his stride as "part of motor racing" and passing a medical check by Professor Watkins with no problems.

At the re-start Prost kept a wary eye on Alesi and beat him into the first chicane, so it was McLaren, McLaren, Ferrari, Tyrrell with Senna in the lead again. Half way round that opening lap Alesi outbraked Prost into a chicane and snatched third place. The sheer audacity of the young Frenchman astounded everyone, most of all Alain Prost, who afterwards said he had

never seen anyone brake so late and get away with it!

Senna was setting the pace from the front, with Berger following dutifully, but the blue and white Tyrrell number 4 was hanging on; not just for the opening lap, but throughout lap 2 and it was still there on lap 3 and lap 4. It could not in all truth go on like this. As the leaders braked into the first chicane on lap 3 the Tyrrell overdid it and got sideways on and then spun off the track into the loose run-off area, stopping within inches of the barriers, and that was that. Alesi had gone out in a blaze of glory, and while some of his critics derided him as a "hot-head" there were those who appreciated the many good things about this quiet young Frenchman.

Once the excitement of the opening phase had died down Senna gradually dominated the scene, running the race at his own pace and pulling away little by little. At 10 laps Prost was beginning to press Berger and at that point Senna could see the tail-enders ahead of him. He then "pushed" hard for a few laps, to open out a gap between himself and Berger and Prost, in readiness for lapping the slower cars, at the time deciding just where he was going to pass them, without losing time. His mental processes for doing this while racing at 145 mph average speed are remarkable.

Up to this point in the race the fastest lap had been kicked around by Senna, Berger, Alesi, Prost, Nannini and Mansell in the general free-for-all while the race was settling down. But that now stopped and Senna made fastest lap on laps 14, 16, 19, 25 and 27, going faster and faster all the time. He was lapping the likes of Alliot, Larini, Modena, Grouillard, de Cesaris and Alboreto losing virtually no time at all. Behind him Berger and Prost were into the "traffic", but Berger was not over-confident of his brakes and Prost took advantage and got by into second place, but Senna was long gone.

Mansell in the second Ferrari was not in the picture, having trouble with a slow-closing throttle mechanism, which at times he had to help by hooking his foot under the pedal, so he had little option other than to run a dispirited 4th. By this time both Lotus 102 cars had disappeared, Donnelly in a cloud of smoke from the engine and Warwick with clutch failure, while Martini, Bernard and Pirro had retired with mechanical failures, and Boutsen soon joined them.

Senna now ran the race as he liked, and there was nothing Prost or the Ferrari could do about it; between them they traded fastest laps, but as soon as Prost put in a new one Senna counteracted it with a faster one. However, Prost was not giving up and the two of them kept at it right to the end the gap varying from 12 seconds to 5 seconds, but at no time was Senna troubled; he was in complete control of the race "from the front" and six seconds separated the McLaren and the Ferrari at the end of the race. The rest simply could not match the pace set by the "giants" of Formula One, whether we look upon them as Senna/Prost, McLaren/Ferrari or Honda/Fiat, the result is the same.

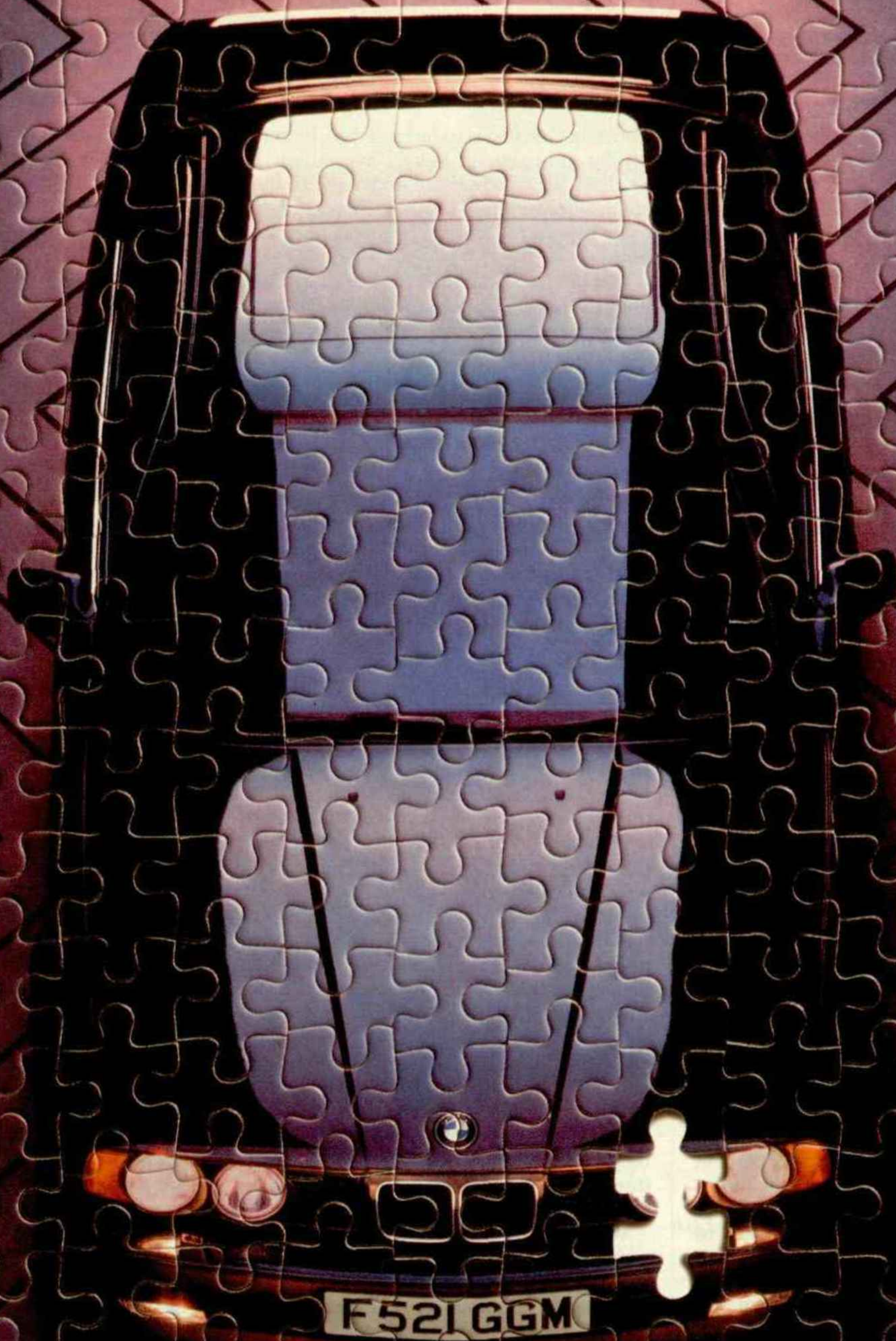
The Benetton-Cosworth team were right out of the picture, in 7th and 8th places through no real fault of their own, for Nannini came in for a new set of tyres and had to stop his engine due to the clutch not freeing properly, and in the middle of the activity Piquet arrived unexpectedly with a deflated tyre. In the confusion both stops were so long that when they rejoined the race there was no hope of getting back up into the first six. This confusion let Nakajima take 6th place, the Japanese Tyrrell driver having driven a very good race and justifiably gaining himself another whole Championship point. Watching the Japanese Footwork owned Arrows team finishing 2 laps behind (Caffi) and 3 laps behind (Alboreto), using similar obsolete Cosworth DFR engines to the Tyrrell team, it causes some puzzlement over 1991. They are due to have the new Porsche-designed Formula One engine, which has simply got to be a competitor to the Honda, Ferrari, and Renault engines.

The 95,000 Ferrari fans (there must have been 5000 Ayrton Senna fans at the race) went home fairly subdued, having arrived hoping to see a Ferrari win, or at least a Ferrari leading at sometime. But they were not totally disappointed because Ferrari had achieved an honourable second place, which no other team could claim.

The Italian Grand Prix gave Senna his first win at Monza, his 26th Grand Prix victory, his 49th pole position and he set a new lap record and a new race record for the present-day circuit and led from start to finish. Not a bad weekend's work in spite of a certain amount of trouble. DSJ

Monza Aftermath

The Monza paddock, during the Italian Grand Prix, was a sea of people telling lies, or at best being sparing with the truth; team managers, driver agents, lawyers, team owners, sponsors, trade representatives, team "spokesmen", public relations people, they all seemed to be at it, saying which drivers they had signed up for next year; which engine manufacturer they were doing a deal with for 1991; who had contracts and who didn't and on and on it went. If one had listened to it all one might have missed the Grand Prix itself, but



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THE ULTIMATE DRIVING MACHINE
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luckily all the rumour-mongering and loose talk takes place in the paddock, and not in the pits. In the pits there are racing engines running and even if someone is telling you a lie you can't hear it. I have always said that if you start up a Cosworth V8 the bullshit stops; if you start up a Honda or Ferrari it doesn't even get started.

What was obvious was that a Formula One contract is about as binding as a perished rubber band, and a driver's signature is nothing more than an autograph, to be stuck in an album alongside his photograph. In the end most deals in Formula One are resolved by money changing hands, sometimes "up front", other times behind the back (or the motorhome!). Out of all the ifs and buts and promises, two things seem pretty definite and they are that Senna will still drive for McLaren-Honda next year, and Alain Prost will continue to drive for Ferrari, so that the keen rivalry that has developed this year will continue and we should see some more good battles.

In the midst of all the rumours the FISA President announced some proposals for next year, that have to be formerly ratified at the Paris Congress on October 8, that were popular or un-popular depending on where you were standing and who you were. The introduction of the 3½-litre Formula last year, and the end of 1½-litre turbocharged engines, was intended to curb the speeds of Formula One cars, but it has failed in that objective though it has proved to be a good Formula as far as racing is concerned. Engine, chassis and tyre engineers never stop development and high G-forces are being generated so that once again the medical profession are getting a little concerned about the effects on drivers. In the aircraft world, these problems were solved by the introduction of G-suits for pilots, but nobody wants to take that step in motor racing, so before things get too extreme some new rules are proposed for 1991 to reduce G-forces when cornering.

As from the Gran Premio di San Marino at Imola next year the present stipulation of a flat bottom to the cars between the wheel centre-lines is being extended to run from the front edge of the complete front wheel, which means the foremost part of the front tyres, to the rearmost part of the bodywork: bodywork being defined as any part of the car that is licked by the airstream, so that means the rear aerofoil, its sideplates, or any covering over the transmission or the exhaust system. This will rule out the Tyrrell 019 as it is today, the McLaren, the Ferrari, the Williams and the Lotus and the Leyton House, with their air-tunnels at the back or their skirts under the front aerofoils, as well as most of the other cars.

In addition the front and rear aerofoils (or wings as they are loosely described) are going to be reduced in maximum size, the details yet to be decided. The minimum weight is to be increased from 500 kgs to 540 kgs, and in 1992 new minimum dimensions for cockpits are to be introduced to make the cockpits less glove-like in their fit to the drivers, especially those tall or bulky ones. The definitions and specification of

Formula One fuel is to be reviewed, as some of the concoctions being brewed up by Shell, AGIP and ELF are beginning to emit some "interesting" smells, far removed from the petrol we get from the roadside pumps.

Circuits are continually under scrutiny and the Hungaroring at Budapest is to undergo modifications to permit more opportunities for overtaking, while the start area and entry into La Source hairpin at Francorchamps is to be widened. Other circuits used for championship events are to be scrutinized closely, but hopefully not Monte Carlo, for that could prove embarrassing. The new circuit north of Barcelona is now complete and moves are afoot to transfer the Spanish Grand Prix from Jerez, north to Barcelona. All things point to the French Grand Prix being moved from the Paul Ricard circuit to the rebuilt Magny Cours circuit in the middle of France.

We cannot say we haven't been given warning, short though it may be.

Among the supporting activities to the Italian Grand Prix there was a demonstration by a collection of recent, but obsolete, Formula One cars, all beautifully turned out and a credit to their owners. It was something of a cultural and engineering shock to see a Lotus 72 in John Player black and gold, for it looked an aerodynamic mess, yet when it was the current state-of-the-art Formula One car I thought it was the most beautiful thing I had seen. The flat-12 Ferrari that looked like a grass-cutter when it was new, still looks like a grass-cutter, and there were one or two Cosworth powered cars that looked awful twenty years ago, and still look awful. That little demonstration made me appreciate just how smooth and sleek today's cars are, even those using Cosworth engines that look as though they were taken out of a Lotus 49, let alone a Lotus 72.

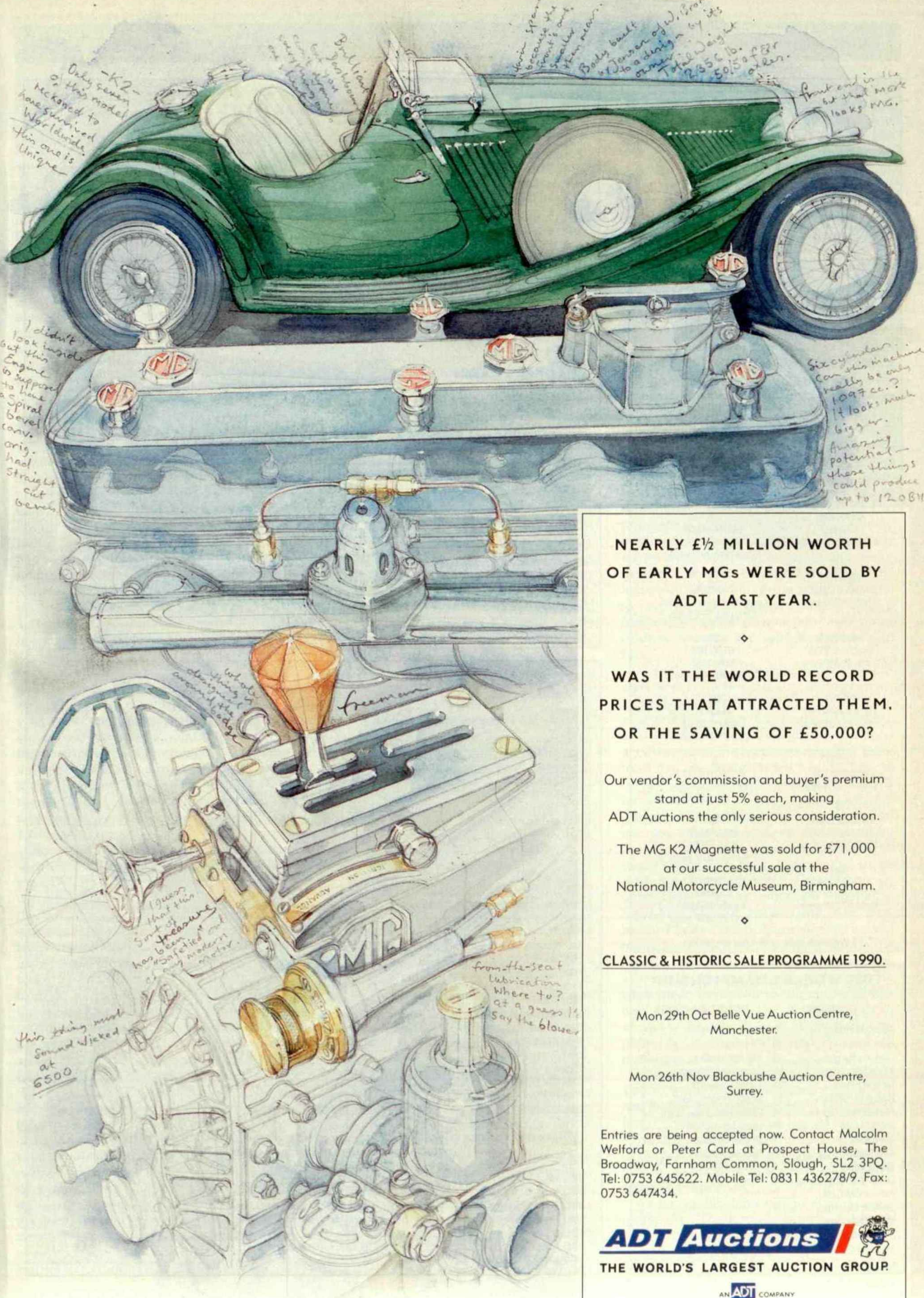
While on the subject of Lotus, anyone watching the television broadcast will have seen Derek Warwick's accident coming out of the Curva Parabolica, and no doubt the BBC will show us it *ad nauseum* to introduce all future Grand Prix TV broadcasts. After the race Warwick explained his thoughts while sliding along upside down. With a clear, untroubled mind, he prepared himself for a quick exit when it came to rest, just in case the remains of the car caught fire, so he made ready to undo his six-point seat harness and prepare his muscular system to extract his body as quickly as possible. But much more important were his thoughts about what to do after he was out of the wreckage. He was more or less aware of where the car was sliding, and where it was going to come to rest, so he told himself not to run blindly from the car, because there were still eight or ten cars behind him, passing the wreckage. He took careful stock of the situation before crossing to the inside of the track, and running back to the pits. As he said, "It would have been bloody daft to get run over, after surviving a shunt like that". A good solid lad, with both his feet firmly on the ground, is our Hampshire Hog.

After the race the Olivetti/Longines

people came up with some interesting statistics culled from their computer timing system. The total number of racing laps of all the 1990 Grand Prix events, up to and including the Italian Grand Prix is 784. The driver who has completed most laps in total is Berger, with 747 laps completed. Senna is next with 720 laps and Piquet is third with 682, followed by Patrese with 650, Mansell with 645, Prost 644, Nannini 604, Bernard 603 and so on, down the whole list of starters. The most incredible statistic is the number of laps that each driver has been in the lead. Top of the list is Senna with 423 laps, and the next best is Boutsen with 91, followed by Berger with 68 and Prost with 65. Poor old Piquet has never led for a single lap all season and nor have most of the other drivers, but Capelli has a score of 45, Alesi 34, Mansell 27, Nannini 19, and Patrese 12. If I refer to Ayrton Senna as being a pace-setter, you can now appreciate what I mean. Of the total of 784 laps in the season so far, he has led for 423; it speaks for itself doesn't it.

As darkness began to close in over the Monza paddock most of the teams and trade people had finished loading their 38 tonne articulated trailers and had hitched up their tractor units. To leave the paddock to join the internal road system it was necessary to take a tight 90 degree turn to the right out of the gate. Watching these professional drivers at work was as fascinating as watching racing drivers at work. They were all good, though some were better than others, as they lined up their Volvos, Renaults, Fords, IVECOs, Mann, Mercedes-Benz and Scania units and long trailers to take the tight turn between the wire netting fences. Some had to make a reverse at mid-point, others went round in one sweep; some had to watch their rear wheels and the closeness to the gate posts, and some were marginal on the clearance of their front bumpers with the fence on the other side of the road, but as I said, they were all very competent. Three drivers stood out head and shoulders above the rest, as they left the paddock in line-ahead formation, and these were the Pirelli men. The three big yellow and red articulated lorries swept out of the gate without so much as a moment's hesitation, judging the exit to a nicety as they turned in one smooth sweep. Regrettably, none of the three drivers looked out of his cab, a quick glance in the mirror was all that was necessary to confirm that their angle of approach had been spot on, and the width and turning judgement had been perfection. No doubt they had spent many years on Pirelli delivery runs all over Italy before joining the racing department, and were used to mountain hairpins and tight gateways. It was a joy to watch.

As I walked to my car, to start on my 2 mile drive back to my hotel I thought about some of those lorry drivers who were setting off on a 1200 mile drive or more, through the night while I was sleeping off the excitement of the day. DSJ



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I didn't
look inside
but this
engine
is supposed
to have
a spiral
bevel
conv.
orig.
had
straight
cut
bevel

Six cylinder
Can this machine
really be only
1097 cc.?
It looks much
bigger.
Amazing
potential -
these things
could produce
up to 120 BHP.

What
thing is
designing
around the
badge

I guess
that this
is a
"safely" out
of any
modern
motor.

This thing must
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at
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STARTING GRID

27 SENNA McLaren MP4/5B 1 min 22.533 secs	1 PROST Ferrari F1/90 1 min 22.935 secs
28 BERGER McLaren MP4/5B 1 min 22.936 secs	2 MANSSELL Ferrari F1/90 1 min 23.141 secs
4 ALESI Tyrrell 019 1 min 23.526 secs	5 BOUTSEN Williams FW13B 1 min 23.984 secs
6 PATRESE Williams FW13B 1 min 24.253 secs	19 NANNINI Benetton B190 1 min 24.583 secs
20 PIQUET Benetton B190 1 min 24.699 secs	15 GUGELMIN Leyton House CG901 1 min 25.556 secs
12 DONNELLY Lotus 102 1 min 25.629 secs	11 WARWICK* Lotus 102 1 min 25.677 secs
29 BERNARD Lola L90 1 min 25.927 secs	3 NAKAJIMA Tyrrell 019 1 min 26.081 secs
23 MARTINI Minardi M190 1 min 26.330 secs	16 CAPELLI Leyton House CG901 1 min 26.712 secs
8 MODENA Brabham BT59 1 min 26.950 secs	30 SUZUKI Lola L90 1 min 26.962 secs
21 PIRRO Dallara BMS 190 1 min 26.964 secs	26 ALLIOT Ligier JS33B 1 min 27.043 secs
10 CAFFI Arrows A11B 1 min 27.410 secs	9 ALBORETO Arrows A11B 1 min 27.448 secs
14 GROUILLARD Osella FA1M 1 min 27.541 secs	18 DALMAS AGS JH25 1 min 27.673 secs
22 DE CESARIS Dallara BMS 190 1 min 27.749 secs	25 LARINI Ligier JS33B 1 min 27.937 secs

* 11 Warwick took spare car for restart.

1990 WORLD CHAMPIONSHIP

DRIVERS	POINTS	CONSTRUCTORS	POINTS
Ayrton Senna	72	McLaren-Honda	109
Alain Prost	56	Ferrari	72
Gerhard Berger	37	Williams-Renault	44
Thierry Boutsen	27	Benetton-Cosworth	40
Nelson Piquet	24	Tyrrell-Cosworth	15
Riccardo Patrese	17	Leyton House-Judd	7
Alessandro Nannini	16	Larrousse-Lamborghini	6
Nigel Mansell	16	Lotus-Lamborghini	3
Jean Alesi	13	Arrows-Cosworth	2
Ivan Capelli	6	Brabham-Judd	2
Eric Bernard	5		
Derek Warwick	3		
Alessandro Caffi	2		
Stefano Modena	2		
Satoru Nakajima	2		
Aguri Suzuki	1		
Mauricio Gugelmin	1		

LAP TIMES

No	Driver	Car	Tyres	Pre-qualifying	Friday Qualifying	Saturday Qualifying	Best Race Lap (on lap)
1	Alain Prost	Ferrari F1/90	G	1m 23.497s	1m 22.935s	1m 26.376s (42)	
2	Nigel Mansell	Ferrari F1/90	G	1m 23.141s	1m 23.730s	1m 27.776s (37)	
3	Satoru Nakajima	Tyrrell 019	P	1m 26.449s	1m 26.081s	1m 28.777s (46)	
4	Jean Alesi	Tyrrell 019	P	1m 24.159s	1m 23.526s	1m 29.386s (4)	
5	Thierry Boutsen	Williams FW13B	G	1m 24.042s	1m 23.984s	1m 28.672s (18)	
6	Riccardo Patrese	Williams FW13B	G	1m 24.253s	1m 24.555s	1m 28.608s (40)	
7	David Brabham	Brabham BT59	P	1m 28.382s	1m 30.446s		
8	Stefano Modena	Brabham BT59	P	1m 26.950s	1m 27.997s	1m 32.025s (9)	
9	Michele Alboreto	Arrows A11B	G	1m 27.784s	1m 27.448s	1m 30.348s (38)	
10	Alessandro Caffi	Arrows A11B	G	1m 27.828s	1m 27.410s	1m 29.820s (47)	
11	Derek Warwick	Lotus 102	G	1m 25.728s	1m 25.677s	1m 30.521s (11)	
12	Martin Donnelly	Lotus 102	G	1m 26.110s	1m 25.629s	1m 29.876s (8)	
14	Olivier Grouillard	Osella FA1M	P	1m 26.947s	1m 27.541s	1m 31.523s (27)	
15	Mauricio Gugelmin	Leyton House CG901	G	1m 26.170s	1m 25.556s	1m 29.298s (20)	
16	Ivan Capelli	Leyton House CG901	G	1m 26.712s	1m 26.735s	1m 29.112s (36)	
17	Gabriele Tarquini	AGS JH25	G	1m 27.773s	1m 28.107s		
18	Yannick Dalmas	AGS JH25	G	1m 28.132s	1m 28.564s	1m 29.868s (44)	
19	Alessandro Nannini	Benetton B190	G	1m 25.567s	1m 24.583s	1m 28.483s (12)	
20	Nelson Piquet	Benetton B190	G	1m 24.699s	1m 24.987s	1m 27.882s (45)	
21	Emanuele Pirro	Dallara BMS 190	P	1m 27.790s	1m 26.964s	1m 31.668s (12)	
22	Andrea de Cesaris	Dallara BMS 190	P	1m 27.772s	1m 27.749s	1m 29.750s (43)	
23	Pierluigi Martini	Minardi M190	P	1m 26.330s	1m 26.516s	1m 31.740s (7)	
24	Paolo Barilla	Minardi M190	P	1m 28.258s	1m 28.521s		
25	Nicola Larini	Ligier JS 33B	G	1m 28.626s	1m 27.937s	1m 30.640s (36)	
26	Philippe Alliot	Ligier JS 33B	G	1m 27.153s	1m 27.043s	1m 32.881s (12)	
27	Ayrton Senna	McLaren MP4/5B	G	1m 22.972s	1m 22.533s	1m 26.254s (46)	
28	Gerhard Berger	McLaren MP4/5B	G	1m 23.239s	1m 22.936s	1m 26.650s (46)	
29	Eric Bernard	Larrousse-Lola 90	G	1m 25.927s	1m 26.154s	1m 29.949s (10)	
30	Aguri Suzuki	Larrousse-Lola 90	G	1m 27.074s	1m 26.962s	1m 29.138s (38)	
31	Bertrand Gachot	Coloni-C3B	G	1m 27.594s	1m 28.952s	1m 30.140	
33	Roberto Moreno	EuroBrun 189B	P	1m 28.703s			
34	Claudio Langes	EuroBrun 189B	P	1m 35.061s			
39	Bruno Giacomelli	Life RE F1/90	G	1m 55.244s			

RESULTS

Italian Grand Prix, Monza, September 9th
53 laps of 5.80 km circuit (307.400 km; 191.009 miles)

Pos.	Driver	Nat.	Car/Engine	Time
1st	Ayrton Senna	(BRA)	McLaren MP4/5B-Honda V10	1h 17m 57.878s
2nd	Alain Prost	(F)	Ferrari F1/90-Ferrari V12	1h 18m 03.932s
3rd	Gerhard Berger	(AUT)	McLaren MP4/5B-Honda V10	1h 18m 05.282s
4th	Nigel Mansell	(GB)	Ferrari F1/90-Ferrari V12	1h 18m 54.097s
5th	Riccardo Patrese	(I)	Williams FW13B-Renault V10	1h 19m 23.152s
6th	Satoru Nakajima	(J)	Tyrrell 019-Cosworth V8 DFR	1 lap behind
7th	Nelson Piquet	(BRA)	Benetton B190-Cosworth V8 EXP	1 lap behind
8th	Alessandro Nannini	(I)	Benetton B190-Cosworth V8 EXP	1 lap behind
9th	Alessandro Caffi	(I)	Arrows A11B-Cosworth V8 DFR	2 laps behind
10th	Andrea de Cesaris	(I)	Dallara BMS 190-Cosworth V8 DFR	2 laps behind
11th	Nicola Larini	(I)	Ligier JS33B-Cosworth V8 DFR	2 laps behind
12th	Michele Alboreto	(I)	Arrows A11B-Cosworth V8 DFR	retired on lap 51
13th	Philippe Alliot	(F)	Ligier JS33B-Cosworth V8 DFR	3 laps behind
14th	Yannick Dalmas	(F)	AGS JH25-Cosworth V8 DFR	8 laps behind
15th	Ivan Capelli	(I)	Leyton House CG901-Judd V8	retired on lap 37
16th	Aguri Suzuki	(J)	Lola L90-Lamborghini V12	retired on lap 37
17th	Olivier Grouillard	(F)	Osella FA1M-Cosworth V8 DFR	retired on lap 28
18th	Mauricio Gugelmin	(BRA)	Leyton House CG901-Judd V8	retired on lap 25
19th	Stefano Modena	(I)	Brabham BT59-Judd V8	retired on lap 22
20th	Thierry Boutsen	(B)	Williams FW13B-Renault V10	retired on lap 19
21st	Derek Warwick	(GB)	Lotus 102-Lamborghini V12	retired on lap 16
22nd	Emanuele Pirro	(I)	Dallara BMS 190-Cosworth V8 DFR	retired on lap 15
23rd	Martin Donnelly	(6B)	Lotus 102-Lamborghini V12	retired on lap 14
24th	Eric Bernard	(F)	Lola L90-Lamborghini V12	retired on lap 11
25th	Pierluigi Martini	(I)	Minardi M190-Cosworth V8 DFR	retired on lap 8
26th	Jean Alesi	(F)	Tyrrell 019-Cosworth V8 DFR	retired on lap 5

Fastest Lap: Ayrton Senna (McLaren MP4/5B) 1 min 26.254 secs on lap 46, 242.076 kph (150.419 mph)
Winner's Average Speed: 236.569 kph (146.997 mph). Conditions: Warm and Dry.

DNQ	Gabriele Tarquini	(I)	AGS JH25-Cosworth V8 DFR	1m 28.107s
DNQ	Paolo Barilla	(I)	Minardi M190-Cosworth V8 DFR	1m 28.258s
DNQ	David Brabham	(AUS)	Brabham BT59-Judd V8	1m 28.382s
DNQ	Bertrand Gachot	(L)	Coloni C3B-Cosworth V8 DFR	1m 28.952s
DNPQ	Roberto Moreno	(BRA)	EuroBrun ER189B-Judd V8	1m 28.703s
DNPQ	Claudio Langes	(I)	EuroBrun ER189B-Judd V8	1m 35.061s
DNPQ	Bruno Giacomelli	(I)	Life 12 cylinder	1m 55.244s

Old Circuits

Dear Reader

Racing circuits come and go, some I am sad at the passing, others I am joyful, but they all leave behind memories, both good and bad. Either way they leave behind them a fascinating aura and if it is a circuit that I knew in its heyday, it is rather sad to revisit the scene today if it is one of dereliction. On the other hand some old circuits had to be abandoned to make way for new roads or building projects and every trace of racing has gone, but if one knew it when it was active it can be interesting to trace what is left.

Other circuits have been modified or rebuilt and are still active but in a different form, but the classic example being the *Circuit Nationale de Francorchamps* which I visited recently. The circuit in use today uses some of the old circuit and is magnificent and a drive round it makes me whistle through my teeth and murmur "oooh!" or "aaargh!" However, I still drive round the old circuit that went right down to the outskirts of Stavelot, though the Malmedy corner has long since disappeared under a new road complex. When I first went to the Belgian circuit in 1948 it used to run right down to a tight hairpin on the edge of Stavelot but a little while later a new full-throttle banked curve was built across the fields, eliminating the hairpin. Both roads are still there, so depending how old your memory is a visit to Francorchamps holds much in store. Even though I stop at the top of the Burnenville slopes and look across the valley to the Masta straight and marvel at the memories of the 1950s and 1960s, I then do a lap of the new circuit and remind myself that there is nothing wrong with the 1990s.

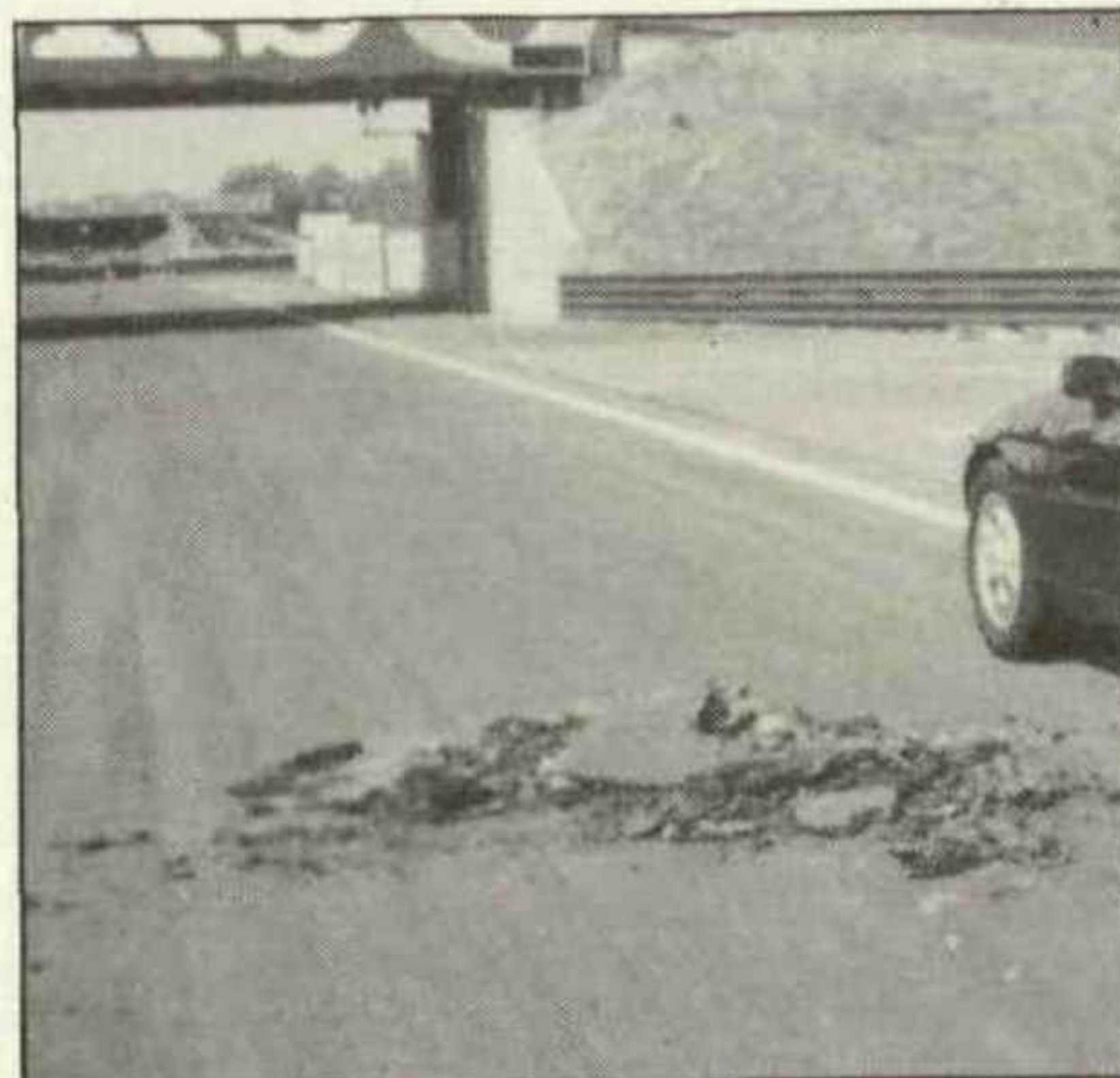
Some circuits that have been altered or shortened effect me totally differently. The Paul Ricard circuit in the south of France was virtually cut in half a few years ago, the western end being abandoned, and when I visit the French Grand Prix there is no desire whatsoever to explore the disused end. In Germany a "New" Nürburgring was built, completely divorced from the mighty Nürburgring of old and if I am in the Eifel Mountains I cannot resist paying the toll and taking a drive round the real Nürburgring, leaving the place without so much as a glance at the "Neue Nürburgring".

In Belgium a circuit was built at Nivelles, south of Bruxelles, and I heard a Firestone Tyre Company executive describe it as "a fantastic modern facility". I was wondering what it was, because it certainly wasn't my idea of a Formula One circuit, let alone a Grand Prix circuit. I can drive past Nivelles with no desire to turn in the gate, just as I can drive past the Zolder circuit in the north of Belgium. There have been so many circuits in Belgium, some restricted to motorcycle racing and places

like Mettet, Chimay, Gedinne or Floreffe make me indulge in the luxury of an extensive detour just to relive old times, for they were good circuits when we raced on them, and are still good; these being on public roads.

In France there are also old circuits in profusion, most of them still worth a visit for the memories they retain and I am sure there are few readers who pass through Reims without making a detour round the Reims-Geux circuit, where racing used to take place "In the Grand Manner". A reader was recently down in the South West of France, visiting Albi, where the old road circuit has long been superseded by a small autodrome, and he sent me a photograph of the abandoned race control tower that still stands on the site of the pits area which has long since disappeared beneath a tennis club. The caretaker of the club was most helpful and showed him where the circuit used to run and reminisced about Fangio and Farina, but not about DSJ when he struck his head on the straw bales while leaning out of a racing sidecar in 1952!

The control tower still carries the ironic inscription *CIRCUIT Du VITESSE PERMANENT — AUTOMOBILE e MOTORCYCLISTE*. Sad.



Tom Walkinshaw did it....!

At home our "Circuit Permanent de Silverstone" is undergoing an enormous face-lift and on August 1st last I was up in Buckinghamshire watching Tom Walkinshaw at the controls of a "digger" making a really serious great hole in the Silverstone track's pristine surface, just about where the Formula One cars are beginning to brake for the Bridge Turn at the end of the Grand Prix circuit lap. As the great spike was hammered into the tarmac I realised that the BRDC and Silverstone Circuits were serious about their proposed plans to make Silverstone much more interesting for drivers and spectators alike, without losing the high-speed cornering atmosphere of the circuit. All the modifications may reduce the lap speed from 160 mph to 145 mph, but I feel cer-

tain it will not be "slow" as some people are suggesting. My feeling is that the New Silverstone relative to the old one will be akin to the New Francorchamps circuit to the old one.

Another disused circuit which keeps cropping up, especially with members of the British armed forces in Germany, is the egg-shaped flat oval round the small town of Wegberg, not far from the Dutch/German border. This was known as the Grenzlandring (Frontier-country-circuit) and was virtually a flat-out blind round a sort of ring-road round the town, with a lap speed approaching 130 mph for Formula Two cars in the early 1950s.

When you look at a map of Europe there are racing circuits or hillclimb venues dotted about everywhere that recall those far off days when a town council could close some local roads to allow the local clubs to organise a race meeting. Most of them began to die out in the 1950s, especially after the 1955 Le Mans catastrophe, and again after the 1957 Mille Miglia hullabaloo. The growing pace of motor racing throughout the world and the increase in population and public mobility gradually hounded motor racing off the public roads on to more and more permanent autodromes, as the photograph from Albi instanced. More and more people wanted to race so that permanent circuits were a financially viable proposition and autodromes became the accepted places to race.

In Switzerland there were public road circuits all over the tiny country, at Porrentruy, Schaffhausen, Zurich, Berne, Geneva, Lausanne, Erlen, Olten, Locarno and Lugano, all of which ended in 1955 after the Le Mans accident when the Swiss government put a total ban on racing. Anyone on holiday in Switzerland, or merely passing through, is almost certain to pass over hallowed ground where racing cars once ran. If you are crossing the Alps by the mountain passes, rather than travelling through the tunnels, you can almost guarantee to be driving on the roads where Grand Prix cars once took part in mountain hillclimbs. Susa-Mont Cenis; Aosta-Gran San Bernardo; Monte Ceneri; Klausen; Stelvio; and many more were used regularly during the months of June, July and August when they were clear of snow. People used to ask me what these European mountain hillclimbs were like and the easiest way to sum them up was to describe them as 10 years of competing at Shelsley Walsh and Prescott all put together in one go and non-stop!

When the ADAC used to hold their classic 1000 kilometre race for sports cars on the real Nürburgring I used to warn newcomers from England that one lap of the Nürburgring was about equal to a whole season of English club racing, and the race was 44 laps of the 'Ring!' It did tend to give them a sense of proportion.

As my reader who visited Albi recently remarked, "There must be enough history of bygone racing circuits and hillclimbs to compile a Travellers Guide Book to Europe".

DSJ



Ayrton Senna's analytical ability is possessed by very few other drivers in Formula One.

Ayrton Senna – An appreciation

It was during the 1984 season that my friend and colleague Alan Henry introduced me to a newcomer to Formula 1. He was from Brazil and had won a Formula 3 championship and was now in Formula One with the Toleman team. His name was Ayrton Senna da Silva, though for racing purposes he was using the abbreviated name Ayrton Senna. In conversation we told this newcomer that we had a general parameter for drivers who we considered good Grand Prix drivers, and it was quite simple. With a look of keen intensity he enquired what it was,

and we said, "You have to win at least 10% of all your races". We explained that we did not expect a newcomer to win a Grand Prix in his first ten races, nor did we really expect him to win two races by the time he had competed in twenty events, but by the time he had done thirty events he should have won three. He looked at us very thoughtfully and you read in his deep brown eyes that he was summing it all up before saying "Yes".

By the end of that season he had finished second to Alain Prost at Monaco and third behind Prost and Lauda in the Portu-

guese Grand Prix at Estoril. He was driving for the Toleman team in their TG183B powered by a Hart turbocharged 4-cylinder engine. Prost and Lauda were in the all-conquering Porsche turbocharged V6-powered McLarens. In conversation with Brian Hart he gave his honest opinion that this lad Senna was something out of the ordinary and should go a long way.

In those days turbocharging was still a bit primitive and if you let the engine rpm drop too low the turbocharger lost speed and instantly lost boost pressure. It then took time for the exhaust gases to get the turbocharger spinning up to high revs again and bring the boost pressure up again. The excuse of "turbo lag" was given by anyone who could not cope with the situation, as though it was part of the business of driving a Formula One car. My reaction at the time was that some of the drivers should try racing a highly tuned 2-stroke motorcycle, or a single-cylinder Norton with a big megaphone, then they might learn something about engines. Brian Hart said that one of the first things that Senna asked him and the Toleman engineer Rory Byrne, was whether it would be alright to take slow corners and hairpin bends free-wheeling with the clutch pedal depressed. He explained that if he did that he could keep the engine running at high rpm and thus keep the turbo boost up. Once round the hairpin he could then drop the clutch at near maximum rpm and full boost, thus being completely untroubled by "turbo lag". When I heard this my reaction was "that's exactly what Gilles Villeneuve used to do with the early turbocharged Ferrari". I will always remember the bright-eyed little Canadian grinning when someone asked him about "turbo lag" on the Ferrari. He replied "if you keep the engine rpm around 12,000 there is no turbo lag". It was only after the enquirer had gone away, not really understanding the answer that Villeneuve had given him, that I got the little Canadian to enlarge on what he had said. He explained that he went into corners with the clutch pedal depressed with his left foot and doing a "heel and toe" with his right foot on the brake pedal and the throttle pedal. He did admit that it called for a lot of judgement and dexterity for you had to judge your braking without the full advantage of the engine on the over-run, you had to judge your free-wheeling speed to a nicety, and above all you had to be very precise in judging when you took your left foot off the clutch pedal, because the car really took off in a big way.

In 1985 Senna joined Team Lotus when they were running the Lotus 97T with turbocharged Renault power and he retired from his first race with this front-running team due to an electrical fault. He had been fourth fastest in qualifying, a mere three tenths of a second slower than his team-mate Elio de Angelis. He was running a pretty secure third behind Alain Prost (McLaren-Porsche) and Michele Alboreto (Ferrari) when his ignition system went wrong.

One for the open road



Opened by the late Hon. Patrick Lindsay, The Anthony Durose Collection was established at Hatfield House ten years ago.

Over the past decade, the museum has built up an extensive collection of historic motor vehicles representative of the development of the light car during the pre- and post-war years, such as the 1953 Jowett "Jupiter" Sports illustrated here which is one of the highlights of the sale.

The A. Durose Collection

13th OCTOBER 1990

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SOTHEBY'S
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It was in the rain sodden Portuguese GP in 1985 that Senna displayed all his natural talents to claim his first Formula One victory.

The next race was the Portuguese Grand Prix on the interesting little circuit at Estoril. Senna was on pole position and in pouring rain he led the race from start to finish. It really appeared as simple as that, but to anyone watching out on the circuit it was a virtuoso display of a natural talent that was clearly going to go a long way. I had flown out to Lisbon for the event, and not being in a hurry to return home I took a day's holiday in the sun to dry out from the soaking of race day. My return flight to London was late in the afternoon on Tuesday and there did not seem to be any familiar motor racing faces on the plane, everyone having returned on Sunday night or during the day on Monday. Imagine my surprise when I looked over the mop of black hair of the young man sitting in front of me and noticed he was reading a motor racing magazine. It was even more of a surprise when he got up to get something from the luggage rack and I saw it was Ayrton Senna. For the next two hours we had a most interesting conversation, completely uninterrupted because the rest of the passengers were holiday makers who probably had no idea who had won the Portuguese Grand Prix the previous Sunday.

He explained that he had taken a brief holiday after the race as Portugal was the only European country on the racing calendar where his native language was spoken, so he could feel relaxed and "at home". We talked about the race and I explained where I had been watching, just after a flat-out downhill right-hand swerve behind the pits and he said, "Where I had a *beeg* moment?" I had watched enthralled as he went off on the grass with all four wheels on the left of the circuit, missed hitting the Armco by mere inches, speared back across the track at 45-degrees, caught the car in the middle of the track and accelerated down the hill as if nothing had happened. He said, "After the race everyone said I had good car control; but

that is *bullsheet*, I had no control. When all four wheels broke free on the water that was running across the track I was completely out of control. It was luck that I did not hit the barrier and that the car came back onto the road. In racing you need some luck". I suggested that it was not luck that he regained control as the car reached the middle of the road, that was skill and judgement. He may have been out of control a moment before that, but he hadn't given up and the moment he felt the tyres gripping again he was in full control. "Of course," he replied, "You must never give up".

As he sat down to read his magazine again I thought, "This is a very intelligent and introspective young man". Then he was standing up again and saying, "You have seen all the great drivers for many years, what are the requirements, in your view, that are needed to make a good Grand Prix driver?" I replied, "Firstly, good drivers are not made, they are born. You must have superb eyesight, a first-class central nervous system to analyse the information fed to it by the eyes, and a good effector-system to make use of the analysis. Add to that simple and obvious things like good judgement, good anticipation, a good sense of balance and the ability to supplement everything with experience, and you can't go wrong." His eyes looked down the length of the aeroplane as he took this in, and then sat down to analyse himself.

Soon he was up again, this time asking about the drivers of the day. "I have been reading some racing statistics about drivers," he said, "and some drivers have competed in more than one hundred races, yet they have only won one, why is that?" I knew who he was referring to, but I did not mention any names and replied, "If you look closely you will find that they did not win that race, they finished first, thanks to the default of others." He thought for a moment and then said, "Ah!

Yes. But don't they want to win any more races?" he asked, to which there was no real reply. "You have just won your first Grand Prix. It won't be the last, will it?" Instantly the reply came clear and firm, "No, of course not."

We talked about the philosophy of racing and the racing driver and all his questions were very thought-provoking, and when we parted company at London Airport I went on my way very impressed by the brain that was behind those brown eyes that are so deep.

Since then I have been lucky to meet Ayrton Senna on a number of occasions when he has been away from the hurly-burly of the pits or paddock, away from the world of the Press and Public Relations, or sponsors or team management, and he has had time to stop and talk motor racing and the art of high-speed driving. I get enormous pleasure from listening to him, he is so intelligently analytical, but he needs the stimulus of an intelligent question or observation. He lives in an unreal world, for motor racing and Formula One in particular is totally unreal, but necessary if you have the passion for high-speed driving, racing and competition. You need to appreciate this and keep a sense of proportion. He said once, "Some drivers think the real world is Formula One, but they are wrong, you know. The real world is being at home and waking up in the morning to meet your family and your friends."

It is now five and a half seasons since Ayrton Senna won his first Grand Prix, and he has now won 26 Grand Prix races, many of them like his first one, leading from start to finish. He has a total of over 100 races to his credit. When Alan Henry and I put forward our parameter of 1 in 10 back in 1984, he did not think we were being unreasonable! Winning 26 Grand Prix races is not any sort of a record, but it does deserve a little appreciation. DSJ



Mercedes left the best of the opposition standing with yet another 1-2 success.

Home Rule for Mercedes

Continuing what now looks like a repeat whitewash of the World Sports Prototype Championship, the Sauber Mercedes team notched up another 1-2 success at the Nürburgring in August. The Silk Cut Jaguars were fast and reliable, finishing in third and fourth places one lap behind, and Mark Blundell was "best of the rest" in a solo drive taking his Nissan to fifth place, three laps in arrears.

It wasn't that the opposition was disgraced in any way. Last year the Jaguar XJR11 turbos were new and frail; now they're two seconds faster and virtually as reliable as their German rivals. The trouble is that, while Jaguar, Nissan, Toyota and the Porsche teams were wrapped up with Le Mans, Peter Sauber put the Mercedes through a further development programme which found the C11s another gear.

"Although they had zero opposition last year, they didn't get complacent," said Martin Brundle admiringly of the Swiss-German team. Today's Jaguars might beat the Mercedes C9s from time to time but the C11 is something else, superior to the opposition in almost every department: chassis, handling, fuel economy, and especially power and torque from the stock-block, 5-litre V8 engine.

The Nürburgring. It may be the *neue* version: wide, safe and modern in every way, but it's still fast (Schlesser's pole position average was 126.46 mph), challenging in parts and tricky enough to cause the odd scare. Michael Schumacher, Mercedes' 21 year old 'L driver', impressed his elders no end when he claimed a temporary pole position on Friday afternoon, but then erred when he lost control of the C11 towards the end of Saturday's qualifying session, on a damp

road, and thumped the carbon chassis hard enough to put it out of commission for the race. Schlesser was another to frighten himself more than somewhat with a huge, 120 mph spin at the Veedol chicane during qualifying, but in the end it was the two silver cars that lined up on the front row with Schlesser/Baldi on pole at 1 min 20.344 sec, and Mass/Schumacher alongside.

Since the disappointment at Dijon Tom Walkinshaw's team had carried out an in-depth investigation and revised the suspension settings to what they called the 'Portland' set-up, a compliment to Tony Dowe's IMSA team which has come up with a package that the drivers like.

The two cars could hardly have been

closer in qualifying: Brundle was third quickest overall at 1 min 22.780 sec in an XJR11 equipped with carbon brake discs, Lammers at 1 min 22.783 sec in a similar car with steel discs, 2.4 seconds faster than last year.

They qualified on the second row and in an ideal world the scale of TWR's progress should have turned the Jaguars into race winners, but Mercedes have moved not only the posts, but the whole pitch as well! Schlesser had smashed Baldi's qualifying record by 2.8 seconds, and the gap between the two teams remained as wide as ever.

Huge progress has been made by the factory-assisted Joest Porsches too, but they started from too far back to be anything but also-rans. Hans Stuck's Supercup 'pole' record was 1 min 25.5 sec and laps in the 23s would have been unthinkable for the ageing 962Cs, but in qualifying Jonathan Palmer was timed at 1 min 23.664 sec and Frank Jelinski at 1 min 23.845 sec. Michelin supply a good qualifying tyre but in race conditions the Joest runners were, as usual, sadly handicapped by a lack of rear grip once the tyres had covered half a dozen laps.

The neat two-by-two Mercedes, Jaguar, Joest Porsche grid formation was broken by Geoff Lees in Toyota Team Tom's Taka Q 90CV which was seventh fastest, heading the two Nissans of Mark Blundell, and Kenny Acheson with Gianfranco Brancatelli.

An amazing oversight by Nissan's management left Julian Bailey unqualified, since he'd driven in the two morning practice sessions but not in an afternoon one. You could say that team manager Dave Price took his eye off the ball on Saturday, waiting for the drizzle to clear for a chance to run the T-car with the 1000 bhp Le Mans qualifying engine. It would have been pole position or bust, but the car didn't leave the garage all afternoon and neither did Bailey. Another man who



Oscar Larrauri and Harold Huysman claimed unofficial 'best customer' award for their eighth place in the Brun Porsche 962C.

would make a solo run in the race, to 11th place, was 1987 sports car champion Raul Boesel, listed to drive Jochen Dauer's TicTac sponsored BFG Porsche. Car owner Dauer was clearly unwell and decided even before practice that he wouldn't take part.

Finances are tightening on the smaller teams. Tim Lee-Davey's various driver arrangements fell through and he took his two Porsches home on Friday night, needing to settle a bill to get one released from the bailiffs; Hugh Chamberlain and Dave Prewitt ran one Spice apiece and so, even, did the Spice 'works' team with a 90C Cosworth DFZ for Cor Euser and Costas Los.

It wouldn't be a bad idea if FISA put all the fines into a kitty for the benefit of the World Championship, though the authority will think of a thousand reasons not to do so. Jean-Louis Ricci, still smarting from his \$50,000 fine at Le Mans, announced his retirement and his Joest Porsche did not start; Otto Rensing was fined \$5000 for late payment of his Superlicence fee, and Giovanni Lavaggi \$2000 for being late at scrutineering; that wasn't surprising since he hadn't raised enough sponsorship to pay for his drive in Lee-Davey's Porsche, and had little prospect of taking part in the event. There is no hearing and no appeal, according to FISA's standard procedure. Such fines might be a little more acceptable if FISA were dealing with highly paid drivers and well sponsored teams, but some of the victims are down to their last set of overalls.

Jan Lammers was surprisingly happy when his JaguarSport engine broke five laps into the Sunday morning warm-up session, obviously preferring this to an early retirement in the race, and the TWR mechanics did a fine job in changing the engine in 140 minutes, about half the standard time for the job (complex electronics in the Group C cars prevent the really fast engine changes usual in Formula 1).

Once the race was under way the Mercedes 'Silver Arrows' were clearly unbeatable. Brundle made a scorching start from the second row, reckoning that he and Schlessler anticipated the green light at the same moment, and managed to hold off Mass' car for three laps. The German's overtaking, on the pit straight, looked absurdly easy and showed just what the Silk Cut drivers have to put up with.

Schlessler went away from Brundle at two seconds per lap, establishing a new Group C record at 1 min 26.092 sec as early as lap six, and for a while Mass pulled away at one second per lap, though the gap steadied, then closed up again as Mass coped with his front tyres overheating. He stopped 10 laps before schedule to hand over to Schumacher, and Goodyear's harder, 430 compound tyres were fitted like those on Schlessler's car. The stop was a short one, the car taking 67 litres of fuel in as many seconds, and when the lead car stopped for Baldi to hop in, it took on 86 litres of fuel. The 'deficit' of 19 seconds worked in Schumacher's favour, of course, and flattered what was in



The Jaguar of Brundle and Ferté did well to finish third, but simply couldn't match the pace of the Mercedes.

any case an outstandingly good drive for one so inexperienced.

With a lighter tank, Schumacher was able to catch and pass Baldi, something the Italian hadn't expected at all. Although Baldi had the same compound of tyres as Schlessler, and Schumacher of course, he experienced a bad understeering problem that put a second or two onto his lap times. Since he's known to be one of the fastest drivers of all there was clearly something wrong, and Goodyear's engineers discovered later that Baldi's front tyres were like new; they'd never got to their working temperature.

All that was a bit academic for the pursuers, of course. Schlessler made short work of Mass in the final shift to earn a 22 second margin at the flag, and the Jaguars finished almost level, one lap behind, with Lammers rather piqued at being told to 'hold position' in the closing stages. Brundle thought he was short of fuel, although that was a telemetry fault, and after a tangle with Walter Brun's Porsche his XJR's handling went off, so Lammers was quite justified in thinking that he could have gone a little faster to finish third.

Blundell's solo drive earned him fifth place, virtually faultless save for a first chicane spin, but Brancatelli soldiered on for too long with a softening tyre and lost three laps having the wheel changed when the cover blew out. Luck ran out again for the Toyotas, Johnny Dumfries and Roberto

Ravaglia retiring at half distance with an electrical failure, Lees and Hitoshi Ogawa when they ran out of fuel seven laps from the end.

Jonathan Palmer was the first to retire from the race when water leaked from his Porsche's 3.2-litre engine and it seized after 15 laps; a pity because he was going really well in sixth place, keeping Lammers' Jaguar in sight. His demise, and Mass' early stop, put Euser's Spice up into fifth place for a while, but co-driver Los made an extra pit stop due to a problem with the nose panel, and they dropped to seventh place in the results.

The best placing for Porsche was sixth, Bob Wollek and Frank Jelinski taking the last championship point for Reinhold Joest's team. It was a pity that a misfire slowed Richard Lloyd's car, driven by Manuel Reuter and Steven Andskar, and that a suspension breakage should lead to retirement, because it had a factory-supplied 3.2-litre engine installed and was among the quickest of the Porsche customer cars throughout qualifying. The unofficial 'best Porsche customer' award went to Oscar Larrauri and Harald Huysman driving the Brun Motorsport 962C in Hydro Aluminium colours, in eighth place.

This might have been the least exciting WSPC race of the year, but it was a splendid advertising promotion for Mercedes-Benz, and hundreds of their dealer guests.

MLC

Shoot for the Stars



The Jaguar team were out of luck at Donington when both cars were disqualified for fuel infringements.

I drove my heart out for 300 miles. I took no prisoners on the track, and then I got disqualified on a detail like that. I am totally overwhelmed". Martin Brundle was dejected and angry the day after the Donington round of the World Sports-Prototype Championship, his solo drive to third place in the Silk Cut Jaguar XJR-11 expunged from the records by the FISA stewards. The offence was to overshoot the 246 litre fuel allocation by 0.8 litres, Jan Lammers and Andy Wallace were disqualified from eighth place for a similar discrepancy, 1.0 litre over the top.

Team Sauber Mercedes, of course, won the race with their fifth 1-2 result of the season and went away with the main prize, the Team's Championship. Jean-Louis Schlesser and Mauro Baldi, who won the race outright, drew close to sharing the driver's championship, and Jochen Mass shared the second placed car with Heinz-Harald Frentzen, the young German F3000 driver competing with Mercedes for the first time.

Mercedes, in fact, looked vulnerable at times. The winning car was puffing oily smoke from its left-side exhaust as early as

the tenth lap, and this condition worsened steadily. Oil was leaking from the V8 engine onto the turbocharger, and got so bad that Baldi had to make an emergency stop half an hour from the finish to take on five litres of Castrol, in addition to the six litres taken at the second fuel stop.

The risk of engine failure was high, but the risk of a fire was greater still, because on Saturday Frentzen had stopped with just such an oil leak, and with the plug leads melting in flames. Had the race lasted many more laps Schlesser and Baldi might not have collected any points at all, and Mass would have been the clear leader of the world championship thanking his lucky stars that Frentzen's unforced spin at the Old Hairpin had missed the wall, missed the gravel trap and done no damage to the car!

The Tom's Toyotas ran out of fuel even sooner than usual, and the Porsches didn't get a look-in so the main challengers to Mercedes were Jaguar and Nissan, with Spice Engineering coming into the reckoning as the track would favour the nimble Cosworth DFZ-powered cars.

There was never any doubt that the

Mercedes would be quickest in qualifying, only about where they'd leave the GpC qualifying record, established by Baldi last year at 1m 19.1s in the Sauber Mercedes C9. Typically Schlesser and Baldi have been knocking two seconds off last year's records (one second due to the C11, one to the Goodyear tyres), and Baldi, whose turn it was, answered the question with an astonishing 1m 16.952s.

"I 'ad to do it, the computer said we could do a 16.8, and I didn't want to get the blame" said the Italian driver, who has shared the burden of this year's programme with Schlesser better than anyone expected. Jochen Mass was the only other to go under last year's pole, at 1m 18.157s. That, though, was in the number 2 T-car, since the intended race car had melted its ignition.

British fans were treated, for the last time, to the thundering sound of Mercedes' mighty twin-turbo V8, which adopts a lighter, more urgent tone during qualifying when an extra 500rpm is demanded; to the flat tones of the Jaguar-Sport V6, and the racier sounds of the race-designed Toyota and Nissan V8s.

Tickets were offered at Formula 1 tariffs, unfortunately, absurdly priced at £20 to get in on race day (£15 if booked in advance) and another £20 to sit in a grandstand, and it was certainly optimistic to guess at a crowd figure of 15,000. A pity, because the Mercedes are magnificent to watch, even if their performances are predictable, and the race for third place is usually excellent.

Geoff Lees won the race for third place on the grid, reminding us that the Toyota 90C-V is a very good car for qualifying even though the race consumption needs further attention, and Brundle was fourth quickest in the Silk Cut Jaguar. "I can't get any more out of it" he exclaimed forcefully after recording 1m 19.863s. "I've done a 19.5, a 19.6 and a 19.7, that's it. I've driven it smoothly, banged it over the kerbs, the times are just the same".

Kenny Acheson, who hasn't had a particularly smooth run in the Nissan this year, was full of smiles after qualifying fifth fastest, just ahead of team-mate Bailey. "We tried about four different chips, and renewed a turbo pipe because the boost was fluctuating, and eventually it came right" sighed the Ulsterman.

Apart from Jan Lammers, who wasn't quite satisfied with his Jaguar's handling, no-one else got below the 1m 20s mark, though the works-assisted Joest Racing Porsches handled by Jonathan Palmer and Bob Wollek were low in the 80 second bracket. A minor technical breakthrough was marked by the fact that they were equipped with Salisbury limited slip differentials, breaking the habit of a lifetime by the Porsche factory which has long preferred solid, 100 per cent locked differentials. The Spices were 12th and 13th on the grid, outgunned by the high-boost turbo cars but seemingly in with a chance for the race.



The Sauber Mercedes steamroller continued and for the second year clinched the Teams' Championship at Donington.

Race for Third

Jochen Mass' intended race car, with a fresh engine installed, would start on the button when the time came to race, so after a few moments of hesitation he climbed into the spare T-car which was nearly as good but, obviously, not his first choice.

And in this car Mass made a customary poor start, while Bailey made a storming take-off from the third row and slipped his Nissan between the two silver cars before Redgate Corner. Brundle and Lees were in threatening positions, and these five quickly broke clear of Lammers, Wollek, Palmer and Acheson.

To make up for the German slip-up, Bailey was allowed to go onto the attack at Donington; if a caution was operated he'd get back onto the fuel allowance, and if not he'd have to slow down at the end. The Londoner made the most of being off the leash and kept well up to Baldi, who must have been wondering why the Nissan wouldn't go away. On lap nine the Italian made his big effort, lowering the circuit's sports car record by a second, and only then did he shake the Nissan off.

Mass, meanwhile, was getting comfortable in the second Mercedes and found a way past Bailey, who was happy enough to stay third and keep Brundle's Jaguar behind. Just as Lees expected, the Taka Q Toyota dropped back as though he'd hit the brakes, as soon as he checked the fuel consumption readout.

Motor racing is a contact sport at a track like Donington. Hugh Chamberlain's two Spices were in the wars from the beginning, as Otto Altenbach used Robbie Stirling's rear wheel as a brake at the hairpin on the opening lap, and Beppe Gabbiani rather needlessly took Will Hoy off the road the second time around. A little later Wollek and Dumfries collided heavily at the Melbourne hairpin, and the Scottish earl went to the Toyota pit with bits missing from both sides of the nose panel, the result of a sandwiching operation.

The two Joest Porsches lost rear tyre grip after six laps and began their graceful

decline, enabling the forceful Larrauri to lead the Porsche race in tenth place. Up ahead, Harvey and van der Poelle were making good progress in the Spices, sixth and eighth after 15 laps.

Even at this early stage there were puffs of smoke from the left-hand exhaust on the leading Mercedes, more noticeable when the car was cornering to the right. As yet Baldi hadn't noticed anything amiss, but the atmosphere was unusually tense in Peter Sauber's pit.

A good charge by Brundle took him past Bailey's Nissan, into third place, and Harvey's Spice became the next image in Bailey's mirrors. Behind them, Lammers was having a fearsome job holding off van der Poelle, the Dutchman's XJR oversteering as it never did in qualifying. Almost inevitably the two cars clashed, the Belgian dropping back straight away with a missing wheel spat affecting the delicate handling.

Front tabs were removed from Lammers' car during the first stop, making life a little easier for co-driver Andy Wallace, and at the second stop the rear wing was cranked up a few degrees. Basically, though, a mechanical imbalance had got into the car, just as it did at Dijon, although Brundle's was perfect all afternoon. Kenny Acheson wasn't too happy when Giovanni Lavaggi crossed his path in Tim Lee-Davey's Porsche at the hairpin, forcing a stop to fit a new nose panel on the Nissan.

So tough is the track that several Porsche runners, Larrauri, Schneider and Pareja among them, had to have new front brake pads fitted at the first stops. Brakes dissipate energy, of course, and there were few drivers not much concerned about their fuel consumption figures.

Even Mass admitted to being concerned about the consumption, a rare statement for a Mercedes driver to make. Brundle just about caught him by the time the first fuel stops were due, and stayed in the seat to enjoy a nine second lead over Frentzen. "I was pretty ruthless with backmarkers, but we had to keep maximum pressure on the Mercedes team", said the English driver. "It was the only chance we had".

It took young Heinz-Harald ten laps to catch Brundle, and for two more they had a ferocious duel which left the young German with mauve paint on the door the first time he tried to pass! Once past he was able to pull away with some ease, but nearly threw it away with an unforced spin at the Old Hairpin. Walkinshaw's crew whooped as their TV monitor showed the silver car spinning gracefully across the manicured grass, missing a gravel bed by the width of a wheel. Frentzen got it back though, dropping 13 seconds on the lap but still getting back to speed before Brundle appeared. Then, the race was as good as decided.

Sixty laps, half distance, and Schlessler led Frentzen by 58 seconds, Brundle by 67 seconds. Euser, Blundell and Brancatelli were one lap behind, and two laps down were John Watson in Lees' Toyota, Wallace's Jaguar, Huysman's Porsche, Giacomelli's Spice, then more Porsches handled by Jelinski, Michael Bartels (co-driving Palmer in the Joest entry), Steven Andskar (RLR) and Walter Brun.

Six litres of oil, no less, went into the leading Mercedes at the second pit stop. The leak was getting worse, no doubt, but there was no time to carry out repairs. That particular Mercedes engine was expendable. Lap times weren't affected, and Baldi was able to extend his lead over Mass in the final stint. Just as well, since he had to make an unscheduled stop for another five litres when the pressure gauge started fluctuating.

Rival teams were willing the lead Mercedes on! If it failed most of them would have to do another lap, and towards the end Bailey's Nissan was very marginal as were most of the Porsches. As it was, Bailey toured slowly around his final lap and dropped two places to Euser and Acheson, and suffered the indignity of being hit by Lavaggi, the same driver who had nearly taken Acheson out earlier.

Baldi took the flag safely, lifted off the throttle, and his Mercedes was almost lost from view as more smoke erupted from the engine bay. It's very doubtful that the C11 would have lasted more than a handful of laps, but no-one from Mercedes would admit that. Wollek stopped over the line, out of fuel, and the unfortunate Larrauri urged his Brun Porsche a kilometre from the Melbourne hairpin on the starter, losing his eighth place then being excluded because his last lap took too long.

After the prizegiving, the rumours had Spice protested both Jaguars for taking on too much fuel? Would Brundle's car be excluded for having an external battery start in the pits? Big problems in the scrutineering bay, a long wait for the final results. Then, when the paltry crowd had drifted home, came the news that both Jaguars were out. The fact that several litres were taken from their tanks afterwards was of no consequence, and the entire weekend was wasted for the 'home team'. "All that for nothing," said Brundle the next day. "I can't wait for next year, when we'll have real racing again". So say all, in Group C racing. MLC

WORLD SPORTS-PROTOTYPE CHAMPIONSHIP

Round 6, Nürburgring 480 km, August 19

QUALIFYING TIMES

Schlesser/Baldi	Mercedes	1m 20.344s
Mass/Schumacher	Mercedes	1m 21.013s
Brundle/Ferté	Jaguar	1m 22.780s
Lammers/Wallace	Jaguar	1m 22.783s
Palmer/Stuck	Porsche	1m 23.664s
Wollek/Jelinski	Porsche	1m 23.845s
Lees/Ogawa	Toyota	1m 24.998s
Blundell	Nissan	1m 25.428s
Acheson/Brancatelli	Nissan	1m 25.554s
Schneider/Van der Merwe	Porsche	1m 25.793s
Huysman/Larrauri	Porsche	1m 25.930s
Reuter/Andskar	Porsche	1m 26.023s
Dumfries/Ravaglia	Toyota	1m 26.529s
Los/Euser	Spice	1m 26.683s
Fabre/Robert	Cougar	1m 27.005s
Reid/Elgh	Porsche	1m 27.300s
Rensing/Santal	Porsche	1m 27.443s
Pareja/Brun	Porsche	1m 27.647s
Lässig/Altenbach	Porsche	1m 27.887s
Grohs/Oppermann	Porsche	1m 27.936s
Winter/Dickens	Porsche	1m 27.975s
Boesel	Porsche	1m 28.426s
Konrad/Toivonen	Porsche	1m 30.419s
Almeras/Almeras	Porsche	1m 31.710s
Adams/Hausmann	Spice	1m 31.794s
Trollé/Thuner	Cougar	1m 32.017s
Salamin/Cohen-Olivar	Porsche	1m 32.226s
Hausmann/Piper	Spice	1m 33.027s
Randaccio/Barberio	Spice	1m 33.122s
Migault/Wettling	ALD	1m 35.668s
Euser	Spice	1m 35.732s
Trombetti/Brand	Alba	1m 38.205s
Gabbiani/Jones	Spice	1m 40.266s
Ricci	Porsche	1m 48.286s

RACE RESULTS

1st	J-L. Schlesser/M. Baldi	5.0t Mercedes C11	2h 39m 15.913s
2nd	J. Mass/M. Schumacher	5.0t Mercedes C11	2h 39m 38.475s
3rd	M. Brundle/A. Ferté	3.5t Jaguar XJR-11	105 laps
4th	J. Lammers/A. Wallace	3.5t Jaguar XJR-11	105 laps
5th	M. Blundell	3.5t Nissan R90C	103 laps
6th	B. Wollek/F. Jelinski	3.2t Porsche 962	103 laps
7th	C. Los/C. Euser	3.5 Spice-Cosworth SE90C	102 laps
8th	H. Huysman/O. Larrauri	3.2t Porsche 962	102 laps
9th	K. Acheson/G. Brancatelli	3.5t Nissan R90C	102 laps
10th	P. Fabre/L. Robert	3.0t Cougar-Porsche C24S	101 laps
11th	R. Boesel	3.2t Porsche 962	101 laps
12th	J. Winter/S. Dickens	3.0t Porsche 962	100 laps
13th	O. Rensing/B. Santal	3.0t Porsche 962	100 laps
14th	F. Konrad/H. Toivonen	3.0t Porsche 962	100 laps
15th	M. Trollé/B. Thuner	3.0t Cougar-Porsche C24S	99 laps
16th	J. Lässig/O. Altenbach	3.0t Porsche 962	99 laps
17th	H. Grohs/J. Oppermann	3.2 Porsche 962	98 laps
18th	B. Schneider/S. Van der Merwe	3.2t Porsche 962	98 laps
19th	J. Almeras/J-M. Almeras	3.0t Porsche 962	97 laps
20th	A. Salamin/M. Cohen-Olivar	3.0t Porsche 962	96 laps
21st	F. Migault/F. Wettling	3.3 ALD-Cosworth 289	86 laps
R	G. Lees/H. Ogawa	3.6t Toyota 90C-V	out of fuel
R	J. Pareja/W. Brun	3.0t Porsche 962	gearbox
R	A. Reid/E. Elgh	3.2t Porsche 962	suspension
R	M. Reuter/S. Andskar	3.2t Porsche 962	rear suspension
R	N. Adams/C. Hausmann	3.5 Spice-Cosworth SE89C	electrics
R	J. Dumfries/R. Ravaglia	3.6t Toyota 90C-V	spark box
R	R. Randaccio/P. Barberio	3.5 Spice-Cosworth SE89C	bodywork
R	J. Palmer	3.2t Porsche 962	engine
DNS	C. Hausmann/R. Piper	3.5 Spice-Cosworth SE89C	
DNQ	G. Trombetti/M. Brand	4.5 Alba-Buick CSA1	
DNQ	B. Gabbiani/R. Jones	3.5 Spice-Cosworth SE89C	

WORLD SPORTS-PROTOTYPE CHAMPIONSHIP

Round 7, Donington 480 km, September 2

QUALIFYING TIMES

Schlesser/Baldi	Mercedes	1m 16.952s
Mass/Frentzen	Mercedes	1m 18.157s
Lees/Watson	Toyota	1m 19.432s
Brundle/Ferté	Jaguar	1m 19.563s
Acheson/Brancatelli	Nissan	1m 19.709s
Bailey/Blundell	Nissan	1m 19.832s
Lammers/Wallace	Jaguar	1m 19.840s
Palmer/Bartels	Porsche	1m 20.021s
Wollek/Jelinski	Porsche	1m 20.282s
Dumfries/Ravaglia	Toyota	1m 20.545s
Huysman/Larrauri	Porsche	1m 20.783s
Giacomelli/Van de Poele	Spice	1m 21.192s
Harvey/Euser	Spice	1m 21.526s
Schneider/Van der Merwe	Porsche	1m 22.296s
Fabre	Cougar	1m 22.470s
Olofsson/Reid	Porsche	1m 22.738s
Grohs/Altenbach	Porsche	1m 22.839s
Winter/Pescarolo	Porsche	1m 23.140s
Pareja/Brun	Porsche	1m 23.395s
Santal	Porsche	1m 23.820s
Reuter/Andskar	Porsche	1m 24.068s
Konrad/Toivonen	Porsche	1m 24.686s
Trollé	Cougar	1m 24.997s
Grohs/Altenbach	Porsche	1m 25.060s
Adams/Hoy	Spice	1m 25.278s
Nurminen/Gabbiani	Spice	1m 25.611s
Stirling/Thuner	Spice	1m 25.922s
Randaccio/"Stingbrace"	Spice	1m 26.114s
Musetti/Lavaggi	Porsche	1m 26.205s
Piper/Youles	Spice	1m 26.434s
Salamin/Cohen-Olivar	Porsche	1m 27.808s
Migault/Wettling	ALD	1m 32.250s

RACE RESULTS

1st	J-L. Schlesser/M. Baldi	5.0t Mercedes C11	2h 53m 40.919s
2nd	J. Mass/H-H. Frentzen	5.0t Mercedes C11	2h 55m 03.134s
3rd	T. Harvey/C. Euser	3.5 Spice-Cosworth SE90C	118 laps
4th	K. Acheson/G. Brancatelli	3.5t Nissan R90C	117 laps
5th	B. Giacomelli/E. Van de Poele	3.5 Spice-Cosworth SE90C	117 laps
6th	J. Bailey/M. Blundell	3.5t Nissan R90C	117 laps
7th	B. Wollek/F. Jelinski	3.2t Porsche 962	116 laps
8th	A. Olofsson/A. Reid	3.2t Porsche 962	116 laps
9th	B. Schneider/S. Van de Merwe	3.2t Porsche 962	115 laps
10th	J. Palmer/H. Bartels	3.2t Porsche 962	115 laps
11th	M. Reuter/S. Andskar	3.2t Porsche 962	114 laps
12th	J. Pareja/W. Brun	3.0t Porsche 962	113 laps
13th	H. Grohs/O. Altenbach	3.2t Porsche 962	113 laps
14th	J. Winter/H. Pescarolo	3.0t Porsche 962	113 laps
15th	B. Santal	3.0t Porsche 962	113 laps
16th	F. Konrad/H. Toivonen	3.0t Porsche 962	112 laps
17th	V. Musetti/G. Lavaggi	3.0t Porsche 962	111 laps
18th	R. Stirling/B. Thuner	3.5 Spice-Cosworth SE89C	108 laps
19th	A. Salamin/M. Cohen-Olivar	3.0t Porsche 962	107 laps
20th	F. Migault/F. Wettling	3.3 ALD-Cosworth 289	97 laps
DSQ	Brundle/Ferté	3.5t Jaguar XJR-11	
DSQ	Lammers/Wallace	3.5t Jaguar XJR-11	
R	H. Huysman/O. Larrauri	3.2t Porsche 962	out of fuel
R	G. Lees/J. Watson	3.6t Toyota 90C-V	out of fuel
R	J. Dumfries/R. Ravaglia	3.6t Toyota 90C-V	out of fuel
R	M. Trollé/P. Fabre	3.0t Cougar-Porsche C24S	low oil pressure
R	R. Randaccio/"Stingbrace"	3.5 Spice-Cosworth SE89C	electrics
R	R. Piper/Youles	3.5 Spice-Cosworth SE89C	low fuel pressure
R	J. Nurminen/B. Gabbiani	3.5 Spice-Cosworth SE89C	off the road
R	W. Hoy/N. Adams	3.5 Spice-Cosworth SE89C	accident damage
R	O. Altenbach/H. Grohs	3.0t Porsche 962	accident damage

Drivers' Championship: 1, Schlesser and Baldi 45; 3, Mass 39; 4, Wendlinger, Lammers and Wallace 21; 7, Brundle 19; 8, Schumacher 12; 9, Ferté 10; 10, Bailey 9.
Teams' Championship: 1, Sauber-Mercedes 54; 2, Jaguar 26; 3, Nissan Motorsport 17.

Controversy in East Midlands

Smoke pours from the vast, fat power station towers on the horizon between Nottingham and Derby, and although the gathering gloom concealed the fact at Donington Park, a smoke cloud of equal proportions rose above Tom Walkinshaw's motorhome. The Silk Cut Jaguars had been excluded from the results of the seventh round of the World Sports-Prototype Championship, on a track that might fairly be described as 'home' (it's nearer than Silverstone to Coventry), and all but a few spectators had gone home believing in Martin Brundle's inspired drive to third place.

Was it an act of vengeance? Did the stewards judge harshly to make up for the exclusion of Jochen Mass' Mercedes at Silverstone? Almost certainly not. We have already expressed our own views about FISA's zealous use of an over-large rule book, but this was no vendetta. To over-fuel one car could be a sheer accident, but to over-fuel another immediately afterwards is sheer carelessness.

In a typically robust statement, Walkinshaw blamed the throng of photographers and film crew around the pits, but these are the people that all the manufacturers and sponsors most want to greet, in the interests of popularising the rather sickly Group C World Championship.

As Martin Brundle said next day, if the team had short-changed him of 0.8 litres, and he'd run out on the last lap, there'd have been hell to pay; last year Jean-Louis Schlesser nearly lost his World Champion title just because his Mercedes was short-changed at the last stop at Spa. Truly, the line between right and wrong is very thin, but it has a very sharp edge.

Once an offence is established the stewards have to inflict the punishment, just as if the police chose to prosecute a motorist for doing 71 mph on a motorway, and the case was proved, the magistrates would have to penalise. Spice team manager Jeff Hazell was quite within his rights to go to the stewards, though he didn't have to protest Jaguar because the matter was already in hand.

Hazell points out: "Recently the IMSA organisation fined a competitor \$2000 for having an oversize fuel tank, I asked, what's the fine for going 20 litres oversize, because we'll pay!" It's all to do with gaining an unfair advantage, deliberate or not doesn't matter, and Oscar Larrauri, who covered the last kilometre on his Porsche's starter motor, would have had a strong grievance if Jaguar had 'got away with it'.

It was surely distressing for Walkinshaw, and the whole team, to face two disqualifications, but it was pointless to blame the media. The pit-lane at Le Mans is always ten times more crowded, and well-drilled

refuellers shouldn't make mistakes like that.

Having covered the point, though, we can ruminate on the absurdity of the fuel consumption formula, which thankfully will reach its conclusion in Mexico on October 7 (except for those teams which must continue with turbocharged engines in the short-term, though not contenders for the podiums).

There are several ways of restricting the performances of different engines: by limiting the engine size, the engine speed, the consumption of fuel, or the consumption of air. Back in 1981, when fuel was in a 'precious' phase, it seemed such a good idea to introduce a formula by which manufacturers could come up with any type or size of engine, so long as it didn't use more than 60 litres of fuel per 100 kilometres.

The drivers hated it, of course, none more vociferously than Derek Bell at Silverstone in May 1982. Perforce they learned new driving techniques, and some circuits are easier on fuel than others, but even now competitors tend to run short, or worse, run out of fuel on the last lap, and this means nothing but disappointment for all concerned.

FISA missed a golden opportunity to ration the air in 1984/5 when a *rapprochement* was reached with the IMSA organisation. The love affair was short-lived and afterwards the air-restrictor idea went with the bathwater down the plug-hole. The IMSA drivers lived happily ever after, and the FISA drivers continued to struggle with the fuel gauge.

Next year it will all be different. New cars will come from Mercedes, Jaguar, Peugeot, Spice-Lamborghini, Brun-Judd (or Neotech), March and Lola, and later from Toyota, Nissan and Alfa Romeo. There will be no limit on power or consumption but, unless FISA acts quickly, there will be controversy about 'mad chemists' as Cosworth's chief engine designer Geoff Goddard calls them, creating new brews of steroid fuel that can pump the power up by an extra 50-60 horsepower. Formula 1 doesn't need these alchemists, Group C needs them even less.

Spice's V12 sighted

The wraps came off the first of next year's challengers at Donington, the Chrysler-Lamborghini-powered Spice SE91C. The beautifully crafted little 3½-litre, V12 engine, so small that it makes a DFZ look like something out of a MAN truck, was designed by Mauro Forghieri but it was his partner, Daniele Audetto, who attended the launch. With him was Heini Mader, the famed Swiss tuner, who will look after the V12s during the test programme, having

prepared two different specifications.

The lower powered has around 600 bhp with massive low-down torque, the other some 625 bhp produced higher up the range suitable, no doubt, for tracks like Monza and Spa. "It just shows how small we'll have to make our next car," observed Spice Engineering director Ray Bellm, peering down into the engine bay. There might be one proviso, though, Bellm himself is over six-foot tall and built like a rugby forward, and no doubt he'll be wanting to test the car himself!

Credit Due

Back in March a Swede called Per Arwidsson, unknown to most people in Group C racing, named a Scotsman, Anthony Reid, to share the driving of his new Porsche 962C with Anders Olofsson, of whom we had all heard. The car would be owned and sponsored by Arwidsson's company, Convector, in estate and not in heating as many supposed.

Reid's light burned only briefly back in 1985 when he was Maurizio Sandro Sala's team-mate in the short-lived Madgwick Racing Reynard-Saab. After that he became resigned to a living just above the level of clubbies, earning his crust by instructing at the Jim Russell Racing Schools.

Team manager Bo Strandell somehow remembered Reid's name and put it on his shortlist, along with those of Harri Toivonen and Bengt Tragardh, but Reid had to beat those drivers in tests at Monza to secure the drive.

Even then it was difficult to make a name, the Porsche being only one of those hopelessly outclassed this season, but Reid's third place at Le Mans, in the Alpha Racing entry with Tiff Needell and David Sears, made everyone note his name carefully.

Most of the Porsche teams have special chassis nowadays, honeycombs or composites, and the top ones have 3.2-litre engines as well. A 'straight from the box' factory built 962, with a normal customer 3-litre engine, is hardly rated a mention . . . except at Donington, where Reid was the fastest Porsche driver on race day! He made the eighth quickest time of the race, at 1m 25.128s, and was three-tenths faster than Oscar Larrauri's honeycomb chassis, 3.2-litre Brun Porsche, four-tenths faster than Jonathan Palmer's 3.2-litre 'works' Porsche, and 1.2 secs faster than Bob Wollek's ditto.

"Tyres" they'll all say, it's all to do with the tyres. Of course, Reid was running his boring Porsche on unfashionable Dunlops, not the made-to-measure Michelins, Good-years or Yokohamas. We think Bo Strandell and Anthony Reid should take a bow. MLC



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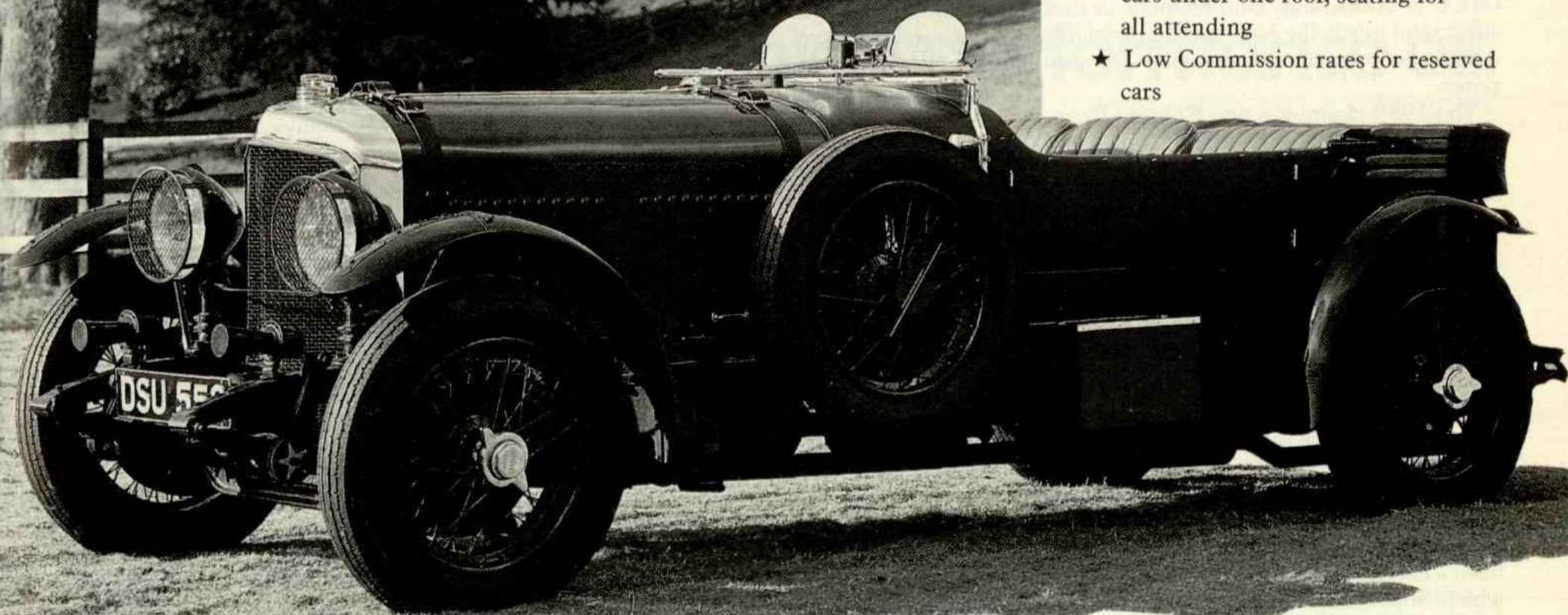


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An Englishman Abroad

When the 1990 racing season comes to an end, most people will have something to reflect on. A championship win, a dreadful year or maybe the hope of better things. Whether he wins the German Touring Car Championship title or not, Steve Soper can at least be certain of one thing. He knows that his name is always going to be one of those on the list of every leading Gp A touring car manufacturer in the world. Not that there are many left that he hasn't driven for. In the last 12 seasons, Soper has brought victories across the globe to both Ford and BMW, the leading names in European Gp A circles since 1986. With one hand on the German crown, and the full backing of BMW right behind him, there's every indication that his reign at the top is set to continue for a great deal longer.

"You simply cannot guarantee that you're going to go to one of those races and come out a winner. It really is that competitive," explains Soper of the German Touring Car Championship.

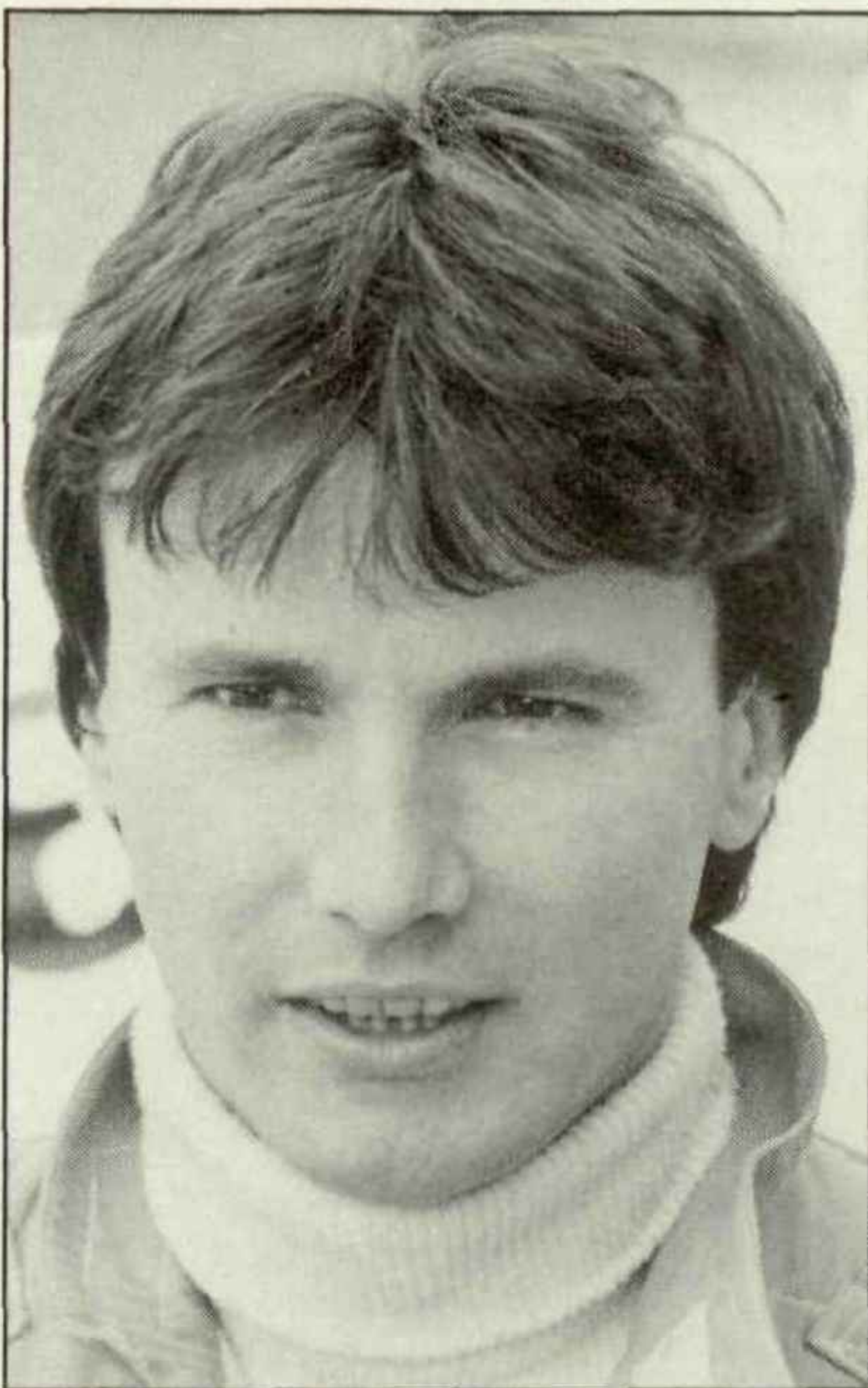
Since the abolition of a pan-European Gp A series, it is the German championship which has flown the standard for touring car racing. With the weight of Ford, Mercedes, Audi, BMW and Opel behind it, and an agreement to work together for the common good of the championship, the GTCC is flourishing. One element in that successful mix is the high quality of drivers who have been tempted to the German series.

The 1989 champion was Roberto Ravaglia, the Italian who can lay claim to the title of sole World Touring Car Champion as well as two European crowns. Yet he has no doubt that winning the German title meant more to him than any other.

"The driving standard is very, very high. It certainly isn't easy to drive a modern Gp A car, they're very different to the days of road cars with a little bit of work on them. The M3 I drive is a very sophisticated car with adjustable wings at the front and back, cockpit adjustable anti-roll bars, helper springs, dampers, ride heights and over 50 different set-ups plus telemetry read-outs. It's a real racing car," notes Soper.

It takes a skilled driver to obtain the best from a car as technically advanced as those which Soper and his contemporaries now handle. For the past 12 seasons though, the Briton has worked with the leading names in European Gp A racing, starting from humble beginnings in the club racing scene in the UK. Success in Minis was soon followed by a works-assisted effort with Fiat, driving an X1/9 for Radbourne of Wimbledon and then other championship crowns for Ford Fiesta success.

However, it was victory in the Austin Rover Metro Challenge which was the first positive step on the road to the success of today. That championship win resulted in a



Steve Soper's - Britain's man in the German Touring Car Championship.

season of British Touring Car racing, handling a Tom Walkinshaw-prepared Rover Vitesse. By the end of 1983, Soper's name was established as a man of the future in Gp A, although legal wrangles over the eligibility of the TWR car's engine spoil the championship win he had achieved.

Months and then years of legal wrangles followed until that series win was finally taken away, but by then the Soper name had been established. What had been important about 1983 was not so much the success, but the manner in which it was achieved.

At that early period, the Rover was in the initial stages of its development as a Gp A car. The opposition was led by none other than Hans Stuck, a name already revered in touring car circles, and whose handling of the potent BMW 635CSi left many in his tracks. That number did not include Soper. The pair fought out a number of fine duels during the season, none better than a televised scrap at Donington which the Austin Rover man won fair and square.

Those performances not only increased Walkinshaw's interest in his young driver, but also attracted the attentions of Dieter Stappert, then at BMW. For the first time, the leading names in European motor sport were taking notice of Soper. However, he stayed with Walkinshaw, progressing through a couple of lean seasons in the European Touring Car Championship but learning the new circuits and proving his pace. It was soon clear that he was becoming just one member of a squad which was well established in success and

had Walkinshaw and his co-driver Win Percy as the figureheads. Keen for achievement in his own right, Soper began to look further afield.

Finally, for 1986, the opportunity came. BMW had again loomed large in his decision-making but eventually his name went onto a Ford contract. For the first season the XR4Ti was to be used but for 1987, the potent Sierra RS Cosworth was in the offing. A further sweetener in his verdict was the choice of Ruedi Eggenberger as the man to prepare the cars, the Swiss already having managed to turn the Volvo 240 Turbo into a race winner.

The first year was hit and miss, with some success. For 1987 though, the Cosworth programme began in earnest as Soper and his team-mates regularly racked up the points for the Texaco-sponsored cars. As an indication of his abilities, Soper tracked F1 guest driver Thierry Boutsen for lap after lap at the Spa 24 Hour race before passing him to pull clear.

The arrival of Ford's RS500 Evolution design further extended the Cosworth's advantage at the front of the field but, as was the way of the WTCC points system, the BMW M3s of a capacity class lower were busy scoring equal points for their successes. The title went to BMW at the last race although the Fords secured the manufacturers' title as some compensation.

The story was repeated in 1988, albeit at an ETCC level as Soper's once-real championship hopes finally dimmed with a head gasket failure at Zolder. The championship, a former shadow of its once-great self, was binned at the season's close. Both Ford and BMW looked towards Germany, with its burgeoning national championship, and all the leading drivers followed suit.

The German handicapping system, enabling all cars to race as one class irrespective of engine capacity, worked far better for the nimble M3 than it did the powerful Cosworth. When the opportunity was offered on this occasion, Soper chose to move, joining the Zakspeed BMW team.

1989 was his first year and there were race wins but the championship slipped away. For 1990 though, BMW was committed to the Briton and a new team awaited Bigazzi. It could have been seen as a risk to join a team which had little experience of the German series. Soper had calculated the risk.

"I'd seen how Bigazzi was the only team regularly to beat Schnitzer (BMW's WTCC, ETCC and GTCC winning team) in the Italian championship. They knew how to run M3s well and had Yokohamas a modern GpA car can produce."

However, it is still clear that Soper is extremely happy in what he does, and he'll keep racing for as long as he stays competitive. After that? The options are varied but it seems unlikely that he would ever be away from racing. "How about running a team? That would be quite nice. I like the sound of that." GD



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First non-Nordic driver to win



Carlos Sainz consolidated his lead in the World Championship with his fine win in Finland, and brought Toyota closer to Lancia in the makes' series.

When the Safari Rally achieved world recognition and began to attract drivers from all over the globe, the visitors, even the most experienced and battle-hardened professionals found it very difficult indeed to beat the local crews. A special skill was required to do well on this event, and East African residents were so accustomed to local conditions and "reading the signs" that it was not until twenty years after the event began as part of the coronation celebrations in 1953 that the myth of overseas drivers being unable to beat the locals was finally broken. There was great revelry in 1972 when Mikkola and Palm drove their Ford Escort triumphantly into Dar-es-Salaam, a victory celebrated as much by the locals as by the overseas visitors.

The very same mystique has surrounded the 1000 Lakes Rally, and it has always been said that, whilst it is difficult to beat Finnish drivers anywhere in the world, to

beat them in Finland is virtually impossible. Swedes have nevertheless done it occasionally, notably Erik Carlsson, Stig Blomqvist and Mikael Ericsson, but no-one else.

Now, even that time-honoured theory has been laid to rest and, just as the East Africans did, the Finns have welcomed it as much as anyone. At the end of August, Spanish pair Carlos Sainz and Luis Moya became the first from outside the Nordic region to win this furiously fast and highly competitive event over the incomparably undulating roads through the forests of central Finland. Some have said that they are the first non-Scandinavians to win, but that is wrong because Finland is not one of the Scandinavian group of countries.

The two Spaniards have demonstrated remarkable talent in the short time that they have been driving for Toyota Team Europe, whilst team director Ove Andersson showed his shrewdness by

spotting it before anyone else (just as he did with Kankkunen) and signing Sainz as a contracted driver. That kind of perception is now more than likely to be rewarded, for Sainz has leapt to a commanding lead in the World Rally Championship points table and has elevated his team to a position in the makes' series well within striking distance of Lancia.

Rallying has been popular in Spain for many years, and there are plenty of good events to attract professionals and amateurs alike, but the country has never produced a driver of the calibre of Sainz. Many have mistaken his quiet, unassuming and not at all demonstrative manner for cold reservation, but this is far from true. He is passionately devoted to mastering whatever endeavour faces him, but is invariably a thorough gentleman. Co-driver Moya is equally dedicated to the sport but is somewhat more ebullient than his partner. Nevertheless, they comp-

lement each other perfectly and it is always a pleasure to be in their company.

When Group B cars were ruled out and Peugeot left the fray with its 205 Turbo 16, only Lancia was ready with a Group A car capable of winning. The Italian team made full use of that advantage and immediately took over from Peugeot as rallying's dominant make. Other manufacturers began the lengthy job of developing Group A cars, but it was Toyota which first began to chip away at Lancia's domination and to show that, in a straight fight, the Turin cars were not invincible.

Others followed, notably the Japanese teams with competition bases in Europe, and it did not take many stages of the 1000 Lakes Rally (we prefer the original, full title, Rally of the Thousand Lakes) to show that the winner could come from any one of a number of teams, Lancia, Toyota, Subaru, Mitsubishi and Mazda. Ford was also there with new Sierra Cosworth 4x4s, but they suffered problems almost from the start and were never in a potentially winning position. As it happened, Lancia, Subaru and Mazda also had setbacks, and it was left to Toyota and Mitsubishi to provide as thrilling a close finish as the sport has ever seen, Ari Vatanen just 19 seconds behind Sainz when they climbed the final ramp.

The entry list this year was chock-full of talent, representing all the regular teams. In addition, Ford, Subaru and Mazda brought their new machinery to provide a most impressive line-up indeed.

Lancia's team consisted of three cars for Juha Kankkunen, Didier Auriol and Alessandro Fiorio, the latter being entered by the Jolly Club rather than Martini-Lancia. Other Group A Lancias were driven privately by Per Eklund and Sebastian Lindholm, whilst Group N versions were driven by Jorge Recalde and Ernesto Soto from Argentina and Gustavo Trelles from Uruguay.

Toyota brought two cars, one for Sainz and the other for Mikael Ericsson who last year won the event in a Mitsubishi which he drove on that one occasion during a period of unsatisfactory semi-contract to Lancia. The two drivers who provided Mitsubishi with victories in 1989 (the other was Pentti Airikkala) did so on single-event contracts and both are now driving for other teams.

Mitsubishi, represented by UK-based Ralliart, brought two Galant VR-4s for Ari Vatanen and Kenneth Eriksson, whilst the leading Mitsubishi driver in the Group N category was undoubtedly Tommi Mäkinen who finished sixth in New Zealand this year. Experienced co-driver Seppo Harjanne continues to ride beside him. Another Group N Galant, entered by Mitsubishi Finland, was driven by Lasse Lampi who has done much of the test and development driving for Ralliart.

Mazda brought two 323 GT-Xs for Timo Salonen and Hannu Mikkola, the latter now reunited with his former co-driver Arne Hertz. Subaru, having taken the 6-speed Legacy to Greece at the beginning

of June, was making its second foray of the year from Prodrive in England and brought one car for Markku Alén.

Ford, having spent a long period combining the rwd Sierra Cosworth and the 4wd Sierra into a competitive, ratified rally machine, brought three such cars for Malcolm Wilson, Pentti Airikkala and Franco Cunico, all in Q8 colours, plus a Group N version entered jointly by Ford and Mike Little Preparations for Gwyndaf Evans, the Dinas Mawddwy driver who was actually making his first trip overseas.

Audis continue to be rallied even though the factory ceased its own participation years ago, and there were several in the 1000 Lakes entry list, notably the 200 Quattro of Risto Buri and the 90 Quattros of Esa Saarenpää and Stig-Olof Walfridsson. Paola de Martini brought her 90 Quattro from Italy and finished 32nd, winning the ladies' trophy after Finland's Minna Sillankorva, who had been much faster, stopped when a split driveshaft gaiter sent grease over hot engine parts, causing a fire which destroyed wiring, pipework and drive belts.

There was a team of three works Lada Samara 21083s driven by Priit Kasak, Vjatsheslav Shtikov and the lady driver Galina Grohovsaja, whilst a fourth Soviet driver, Nikolai Bolshikh, drove a BMW M3. Skoda Favorits were driven by Pavel Sibera and Kalevi Aho, whilst Wartburg had not abandoned its regular annual pilgrimage to Finland; there were two 1.3-litre cars driven by Klaus-Dieter

Krügel and Jens Voigt. There were no Trabants this year, however.

Always based at Jyväskylä in the centre of the country, the 1000 Lakes has mostly been a three day affair from Friday to Sunday. However, FISA's insistence on long rest periods has meant that the organisers are hard pressed to fit a reasonable number of special stages into the available daylight hours. Last year, the finish was not until Sunday evening, but this encroached upon traditional after-rally activities, so this year the event began on the Thursday with a five hour leg containing just enough stage miles to allow them to restart on the Friday in classification order rather than numerical.

There were three night stops dividing the four legs, all of them at Jyväskylä, where the well-appointed but very expensive Sandpiper Hotel in the suburb of Laajavuori has for many years been the only establishment able to provide all the headquarters facilities and a generous parking area; a far cry from the city centre jeweller's workshop which served as the rally office in the 'Sixties. The route formed an overlapping cloverleaf which rendered service planning a straightforward job.

Practice, although now insisted upon by FISA, even for the Lombard RAC Rally, has always been a delicate knife-edge from which some events have toppled. It is one thing to have convoys of cars passing through an area for a day, or even four days, but to have regular visiting traffic for



For once the Lancias were not in the running for victory, although they remained a threat.

something approaching a month, sometimes at speeds not exactly within the tourist category, can be very daunting indeed for country dwellers and workers or even holidaymakers. The demise of the famed Alpine Rally was brought about as much by the extent of practising as by the inconvenience of road closures during the event itself.

'Practice makes it safer' is a remark we've heard many times. Arguably, it is true, because the possession of accurate pace notes means that a crew knows what lies around the next bend, or over the next brow, before getting there. On the other hand, 'Practice makes it faster' may be a better way of phrasing it, and it cannot be denied that unexpected dislodged boulders, wandering animals or flooded hollows present greater hazards with pace notes than without, simply because the speeds are greater.

Pace notes are at their best value when they have been refined at rally speeds. They are necessarily made at low speed but, during the process of checking and rechecking, speed is gradually increased so that drivers become confident that what they have recorded is correct for high speed travel. Unchecked notes are always risky, although better than no notes at all, especially in Finland where there are so many completely blind crests which cannot be taken at high speed without knowledge of what lies on the other side.

In Finland, as in many other countries, practice can only be carried out within declared speed limits, much lower than required to check notes properly. But unlike some other organisers, the Finns enforce the rule strictly, often in co-operation with the police, and there are several groups of speed-check teams moving around from stage to stage throughout the practice period.

Some drivers are used to this and accept it, simply because any serious mishap during practice would jeopardise the entire rally and put its future at risk. However, other drivers complain bitterly, asking how can they be expected to drive at their best during the rally if they are unable to practise properly. This is quite unfair, of course, for every competitor is subject to the same rules. There are, of course, ways of bending them, and it was not just for company that many drivers practised in pairs, their cars linked by radio!

Late August is not regarded as summertime in Finland. The nights have become longer and darker, the brilliant sunshine is often dulled by cloud, and most summer cottage dwellers have returned to their urban apartments. But at least the swarms of mosquitoes, more than we have ever seen in Africa, have almost vanished and the lakes are still warm enough for invigorating after-sauna swims, both of which are appreciated by service crews and the many thousands of spectators who throng the forests at rally time.

The practice period was predominantly fine and dry, and it was not until a day or

two before the start that the cloud thickened and more serious rain began to fall. However, it was mostly fine for the rally itself, although a little rain here and there did make some of the stages very slippery indeed.

Sainz looked a bit lopsided as he walked to his car for the start. He wore racing footwear on his right foot and a plimsole on his left which had been badly wrenched in an accident during practice. However, the attention of the Toyota doctor, firm strapping, and careful repositioning of the clutch pedal soon had the Spanish driver declaring he was ready for the action.

The first stage was just over a mile and a half long, starting and finishing on tarmac roads in the city and using some dirt roads in the central park in the middle. Usually, these short openers are treated with tolerance and caution rather than determination and enthusiasm. Total penalties on most rallies are such that short spectator stages contribute very little indeed to a winner's advantage. Indeed, where the stage route is marked out artificially, as they often are in such cases, it is possible to throw away everything in an unnecessary quest for a few unimportant seconds. 'You can win nothing, but lose everything' is one lucid way of putting it.



The Mazda challenge never really materialised.

But in the 1000 Lakes things are rather different. The total stage distance is only about 330 miles, speeds are higher than in most events and winning penalty totals are around the four or five hours mark rather than the six, seven or eight common in other rounds of the World Championship. When you add to this the number of very closely matched drivers in similarly performing cars, you will see that odd seconds can be far more important than they are elsewhere. Consequently, everyone was trying hard even on that first stage. Even the tyre warmers were out, and drivers were being very thoughtful indeed over their choice of compounds. 'There can be no tactics in Jyväskylä', we've often heard said. 'You have to attack right from the start.'

That attack was almost the undoing of Auriol, Sainz' nearest rival in the championship. He slid off and hit a tree, causing so much body damage on the left side that mechanics later had to rip off panels and replace and patch them as the rally progressed. Later, team-mate Fiorio dented a door and Salonen hit a stone and bent a

track control arm.

Alén complained that his brake pedal was far too hard and lacking in all pressure sensitivity, a problem which persisted for much of the event despite constant fettling and the replacement of various components.

For Ford there was a much more serious problem when Airikkala stopped on the fourth stage, his Sierra Cosworth having lost all drive. There was no chance of getting him going again, but when the car was recovered mechanics worked late into the night to find the cause of the fault so that they could take steps to avoid any recurrence on their other cars. It turned out that it was in the Ford's new 7-speed gearbox which had also given some trouble during testing.

On the opening stage, six different makes of car made the six best times, and even at the end of the first day there was the same number of makes in the top ten. In the lead was Kankkunen, just two seconds ahead of Sainz, and they were followed by Ericsson, Vatanen, Salonen, Alén, Eriksson, Mikkola, Wilson and Auriol, one minute separating the first and the tenth.

Rain was falling when the second leg started, but this did not daunt Kankkunen who was then in stages around his home which he knew like the back of his hand. His short-cutting lines through and across corners were quite amazing, bringing remarks of astonishment from drivers who followed. However, his advantage, and his lead, were soon lost when he had to endure a decidedly uncomfortable ride through the final part of stage ten by travelling outside the car rather than in it. His throttle cable had broken and, rather than rig up the customary length of wire (perhaps he had none) he decided to hand the wheel over to co-driver Piironen whilst he wedged himself under the bonnet, back braced against the windscreen (which cracked!) and feet against the suspension top mounts. He lowered the bonnet to his chest and, with just head and shoulders visible over the top, hand-throttled the car to the end of the stage.

The cable was soon replaced at service, but more than five minutes had been lost on the stage, and with them all chances of victory. Later there was talk that the stewards were considering whether Kankkunen should be disqualified for completing a special stage whilst not wearing his seat belts. Fortunately, common sense prevailed and he was allowed to carry on. This is the sort of thing in which many people have indulged over the years, and stems from determination to keep going, not deliberate flaunting of the rules. Indeed, we recall doing the same some years ago, wedged into the front compartment of a works Imp, directing an extinguisher at a front tyre lest it should catch fire from friction against severely bent bodywork. The driver? Colin Malkin!

Alén continued to complain of insensitive brakes, despite such frequent



The two Mitsubishi's finished close together in second and third places after a tremendous battle with the Toyota.

replacement of components that the whole system must have been replaced several times over during the course of the event. There was talk that the transmission may have been responsible, so this also came in for attention and replacements but still the tall Finn was unhappy and he was certainly not performing as well as he might.

Just before the short mid-day stop, the Ford people discovered that they had their second gearbox failure when Wilson radioed that he had stopped in stage 13 with no drive. This time, however, there was a chance that a new gearbox could be got to him in time, and the stops were pulled out to do this and carry out a roadside replacement. No effort was spared, and when the last bolt was tightened, Wilson roared off to complete the stage and drive on to the rest stop where he arrived in a most urgent fashion, horn blaring, barely a minute short of his maximum permitted lateness.

That afternoon, Wilson had terrible trouble clawing his way through much slower back-markers, so a request was put in that, at the restart on the third leg the next morning, he should be allowed to start at the end of the seeded drivers. He was hopelessly down in the field, last-but-one of the 143 still running, but there is no testing like competition itself, and both Wilson and his team wanted to go on, if only for that very reason. But this would be a productive exercise only if he could be repositioned in the running order and be able to drive at competitive speed without the hindrance of slower cars ahead of him. The request was refused, so Wilson withdrew from the rally and did not restart the following morning.

Ford's misfortune didn't stop there. On the very first stage of the third leg, the remaining Group A Sierra Cosworth was lost when Cunico rolled. He was unable to continue, losing some five minutes, but the frame and roll-cage damage discovered at service was so great that it was considered unsafe to carry on. This left Ford with just the Group N car of Evans, second in the category to Mäkinen whose knowledge of the stages was superior. But, two stages later, he also rolled, although he was able to continue, albeit well out of the running. Mäkinen, certainly the star of Group N, is no relation of the famous Timo who was also in Jyväskylä with a replica works Mini-Cooper S with which he won the 1000 Lakes Veteran Rally a few days before the start of the main event.

The first few stages of Saturday were

damp, the others dry, and on the way down to Tampere Sainz and Vatanen were playing a very tense cat and mouse. Both spun on stage 23, the fourth of the day, but Sainz gained the advantage because his engine did not stall whilst Vatanen's did.

Ericsson had been making good times in third place, staying about a minute behind his leading team-mate, but on stage 22 he collected a puncture, went off, hit a stone and rolled. He was unable to continue, and thus handed third place to his near-namesake Eriksson. The latter had earlier hit a bridge in his Mitsubishi, but nevertheless stayed ahead of Alén who broke a drive shaft and lost all his brakes when the hydraulic pipe also broke.

In the Mazda camp there was consternation when Salonen needed two transmission changes in quick succession. It seems that the violent strain of standing starts from the line were stripping teeth in the centre differential, so the only solution thereafter was to make more prudent departures when the start flag was raised.

Team-mate Mikkola had no such transmission problem, but he left the fray on the second stage of the day when the low oil pressure warning light came on and the engine very quickly died. Attempts to restart it failed, so the car was out. Meanwhile, Auriol had ditched his Lancia, causing such severe damage that he, too, went no further than his next service point. This allowed Fiorio up to sixth place, but this was short-lived because a few stages later his gearbox jammed and he was out. That evening back at Jyväskylä, Kankkunen's gearbox was changed as a precaution.

Eklund's private Lancia also had its gearbox fail, but the Swede survived this and managed to crawl out of the stage in second gear, only to be stopped by tur-

bocharger failure soon after.

By the end of the leg, Sainz, by inching gradually but relentlessly forward, had extended his lead over Vatanen to 48 seconds, but this was still not enough for real comfort and there was no doubt that the final leg would produce a renewed duel between them. Well behind, Eriksson had a 50-second lead over Alén, who was followed by Kankkunen and Salonen.

The final day, again dry, began by Vatanen taking nine seconds from Sainz. Was this a sign that Finnish determination was at the end of its fuse and about to explode into a rocketing sprint to the finish line? When the margin fell by six more seconds, then by another ten, it certainly seemed like it. Or had Sainz eased off imperceptibly, caring more about staying ahead and taking no risks than the extent of his lead?

The two duellists held position for a while, making equal times on three stages, so that before the final stage the difference was 25 seconds. The tension was incredible, although there was hardly any outward sign of nervousness. Perhaps it was the silence that gave the game away. Normally there is considerable chatter at service points, but before that last stage there was very little talking going on at the Toyota and Mitsubishi camps.

Whether one had already slowed down or the other speeded up will never really be clear, but on the final stage Sainz was content to give away another six seconds, thus finishing 19 seconds ahead of his rival. It had been one of the most exciting, edgy fights that we can recall. Sainz and Moya received tumultuous applause at the finish ramp, their many Spanish supporters erupting into almost uncontrollable emotion when the pair climbed on the bonnet of their Toyota. The Finnish crowd were just as delighted, responding enthusiastically to this first win in Finland by a pair from outside the Nordic region. Vatanen's reception was equally animated, everyone recognising that his drive had been just as remarkable. What an end to a superb contest!

There is no doubt that the 1000 Lakes is the fastest, most fiercely competitive dirt road rally in the world, and it says much for the slickness of the organisers that they are able to run it safely and without a single hitch. GP

Rally of the 1000 Lakes, August 23-26

Round 7 World Championship for Makes, Round 8 World Championship for Drivers

1. Carlos Sainz/Luis Moya (Toyota Celica GT4)	4h 40m 55s
2. Ari Vatanen/Bruno Berglund (Mitsubishi Galant VR-4)	4h 41m 14s
3. Kenneth Erikson/Staffan Parmander (Mitsubishi Galant VR-4)	4h 45m 53s
4. Markku Alén/Iika Klivimäki (Subaru Legacy RS)	4h 46m 47s
5. Juha Kankunen/Juha Piironen (Lancia Delta Integrale)	4h 47m 10s
6. Timo Salonen/Voitto Silander (Mazda 323GT-X)	4h 49m 02s
7. Lasse Lampi/Pentti Kuukula (Mitsubishi Galant VR-4)	4h 50m 14s
8. Sebastian Lindholm/Timo Hantunen (Lancia Delta Integrale)	4h 50m 51s
9. Esa Sarenpää/Olli Mannisto (Audi 90 Quattro)	5h 04m 26s
10. Risto Buri/Jyrki Stenroos (Audi 200 Quattro)	5h 05m 06s

WRC standing - Drivers: 1, C. Sainz 115; 2, D. Auriol 67; 3, M. Biasion 64; 4, J. Kankunen 50; 5, M. Ericsson 26; 6, B. Waldegård and D. Cerrato 20.

- Makes: 1. Lancia 124; 2. Toyota 111; 3. Subaru 31; 4. Mitsubishi 27; 5. Audi and Renault 24.

My experience of the most recent Mercedes weapon in the evolution homologation warfare against BMW, a 2463cc shorter stroke version of the Cosworth 190E power unit and radical aerodynamics, packaged under the unbecoming Evolution II label was as concentrated as the BMW assessment was extended (MOTOR SPORT, Sept. 1990, pp976,977). This was understandable as only six of 500 Evolution II Mercedes 190E come to Britain, their £55,200 cost met by private owners and the Patrick Museum Collection.

On arrival in the blazing sunshine of race week Goodwood, a cheerful Kenny Acheson (Sauber Mercedes team member in their 1989 World Champion season) quipped, "Who is the first victim?" Since he was walking purposefully toward a metallic rendition of the latest in Evolution 190E models, I fell in step quickly and learned that it was also to be Acheson's first outing in such a saloon, although he has raced the M3 in Japan. To act as the homologation base to face the 2.5 BMW M3 Sport Evolution in the German touring car championship, the second generation Evolution Mercedes carries extensive modifications beyond the familiar 2.5/16, an example of which was available in automatic form for comparison purposes. The second Evolution model carries modified panels to effect just about every competitive facet of its aerodynamic performance. The result is ugly, but it is necessary. Although it does not look to be the case, Mercedes have been more subtle than BMW, and those swollen side panels and comprehensive rear wing set are part of a plan that sees the upper half of the rear glass covered by dark plastics to direct airflow down to the rear wing. The effect is to block out following cars in motorway conditions, but Acheson was completely at home with such a set up as — like the majority of racing drivers outside the saloon car set — he relies on exterior mirrors only. Such detail work, including a reshaped front bumper keeps drag factor low (0.31Cd) whilst using generous 8.25 x 17 inch Speedline wheels and (for Goodwood) Goodyear Eagle 245/40 ZR tyres.

The engine changes centre on the quest for high rpm, shortening the standard 2.5-litre stroke from 87.25mm to 82.8mm and enlarging the bore to 97.3mm from the production 95.5mm. All major reciprocating components have been revised or replaced, compression now 10.5:1 in association with new inlet camshaft profiles, revised intake and exhaust systems. The latter emerging as a rather startling perforated oval of the kind that you might associate more with dirt track bikes than a Mercedes.

The engine work yields a gain in road car rpm from 7000 to 7700; maximum power is now recorded at 235 bhp on 7200 rpm instead of the usual 194 bhp at 1000 rpm less on the £32,940 Mercedes 2.5/16. That represents a bhp per litre figure of 95.4 bhp per litre, a fine normally



Serious Sports Saloon **Track impressions:** **Mercedes 190E 2.5 Evolution II**

aspirated figure whilst retaining road car flexibility and catalytic convertor exhaust emission standards. The racing variant would achieve over 340 bhp and reach the 9000 rpm marked at the end of the scale on the road car. Peak torque is maintained at 180 lb ft between 5000 and 6000 rpm, whilst the unmodified 2.5/16 yields 173 lb ft at 4500 rpm. An Evolution II, despite its screaming sporting messages is easy to drive, with a generous power spread that is easily accessible, particularly around a fast 2.42 miles like that of Goodwood.

Mercedes engineering pride will not allow them to turn out a traditional British "homologation special" that is full of groans, rattles and reverberations and served by a restive chassis. Thus the car tested came with a steel catalytic convertor, leather seats, electric memory adjustment of the front seats, electric tilt-and-slide sunroof, central locking and so on. The BMW M3 Evolution road car that sits outside my house as this is written pleasantly surprised by sporting air conditioning. Thus the Germans have gone about as far from those early British specials — such as the Mini Cooper S, and Lotus Cortina — as possible.

Former triple Formula Ford Championship winner Acheson took the largish leather rim wheel first, and confirmed that his winning record outside Grands Prix is the result of a smooth style that "takes the least out of me. I am not particularly strong for endurance racing and so I always let the car tell me where it wants to

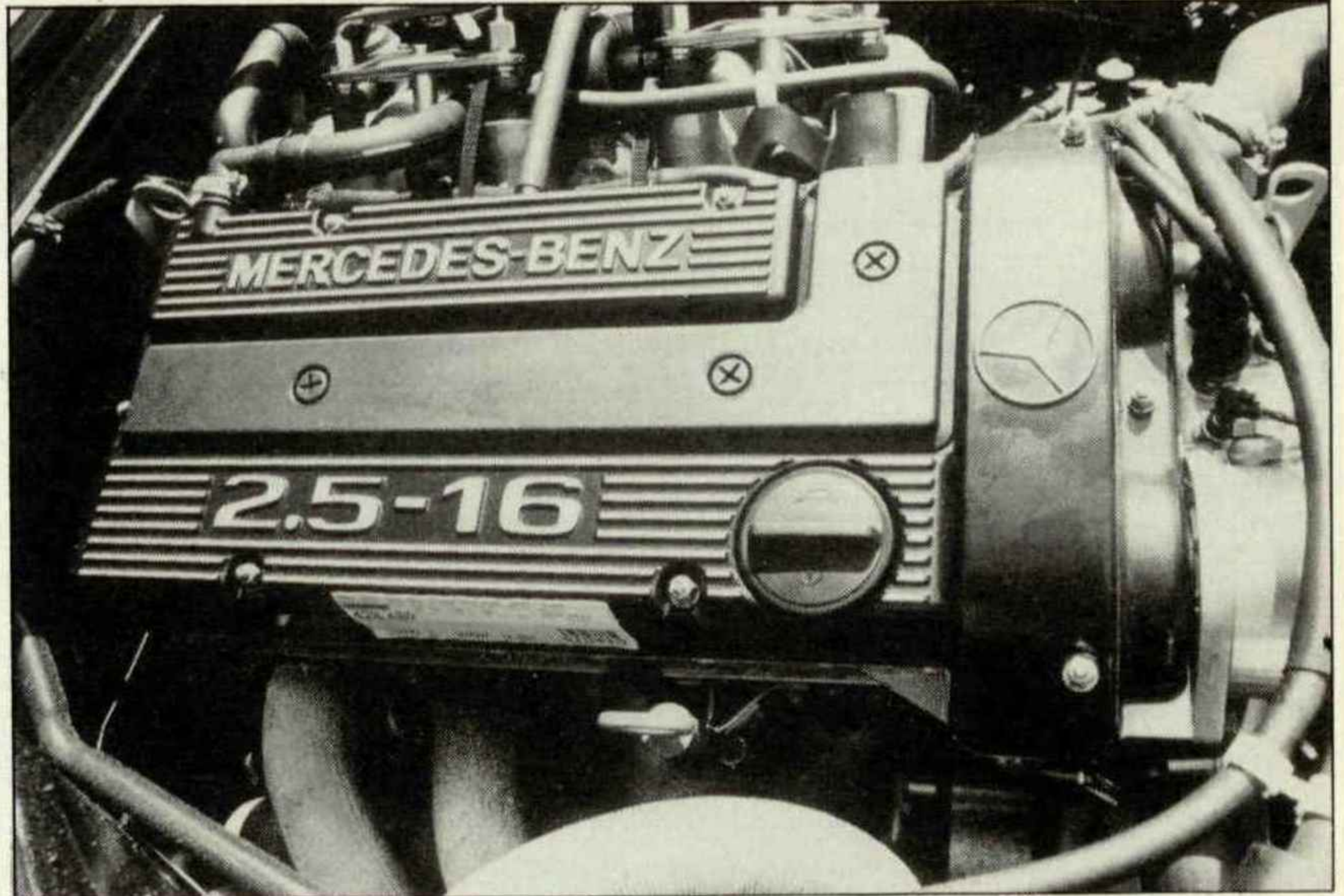
go." This technique of running slightly wide at an initial apex to provide a smooth arc and exit to a second apex is particularly effective at Goodwood. This meant that the Mercedes was not always turned in from the coned positions marked by Peter Gethin at the home of his extremely successful road and circuit driving courses, but both men (the Monza Grand Prix winner in a superbly refrigerated and chauffeured 500 SL) were pleasantly informative.

Neither had the arrogant "this is the only way, my way" that customers often have to suffer from instructors of lesser pedigree. Driving road cars at race circuits makes it very difficult to draw relevant impressions for the potential road customer, but there are some strong memories that are worth recalling. Kenneth Acheson confirmed that he was pleased with the handling of the car, "much more precise than I expected of a road car." This reflects engineering changes that include a 45mm drop (1.77 inches) in ride height, tauter damping, "reinforced" front and rear axle hub carriers and wheel bearings. I was unofficially told that the five link system at the rear now had rose joint solid mounts incorporated and it is worth noting, that as for the Evolution 2.5 M3, front and rear spoiler adjustments can be made that will significantly change characteristics. So will the facility to adjust ride height back up to the standard level to cope with realities of street life.

For myself I liked the way that the

Mercedes turned into corners with the assurance of generous grip and positive feedbacks, but I was not so thrilled with the behaviour of the automatic limited slip differential. I would prefer to be able to switch this electro-mechanical device off for circuit and similar work, finding that its action promotes a restless "wriggle," particularly at speeds beyond the overall UK limit, or in really tight and slow corners. It is not dangerous, and the extra traction is welcome in reducing wheelspin to negligible proportions, yet it demands the allowance of a little more run-off space than is strictly necessary. Recirculating ball power steering is geared at three turns lock to lock and is sensitively rapid enough to adjust cornering angles even when the Evolution II is on the edge of adhesion at 100 mph, and the same facility (at lower speeds) is evident in the well balanced production 2.5/16. The engine was a delight, especially by 2.5-litre four cylinder standards. It revved exceptionally well between 4000 and 7000 rpm, urging the bulk of 2948 lb kerb weight to 110 mph with suave speed. Manners that belie its 155 mph claimed maximum and the ability to encompass 0-62 mph in 7.1 seconds. The gearbox, with the traditional competition isolation of first, wanted care initially, but can supply rapid fire ratio exchanges.

Braking was fully up to the weight and speeds Mercedes must tackle in a road car. A



The 235 bhp power-plant.

quartet of pistons are used in substantial front calipers, clamping 300mm/11.8 inch ventilated fronts. These backed by ABS only when really necessary, and 278mm/10.9 in rears that have two piston callipers.

I feel that an Evolution II Mercedes 190E is a supreme example of making the homolo-

gation special a bearable everyday companion. My personal preference is for the racier, rougher and simpler Evolution 2.5 BMW at £34,700. You gain over £20,700 in small change between BMW and Mercedes Evolution II, or £22,260 between the Evolution 190E and a 2.5/16. JW

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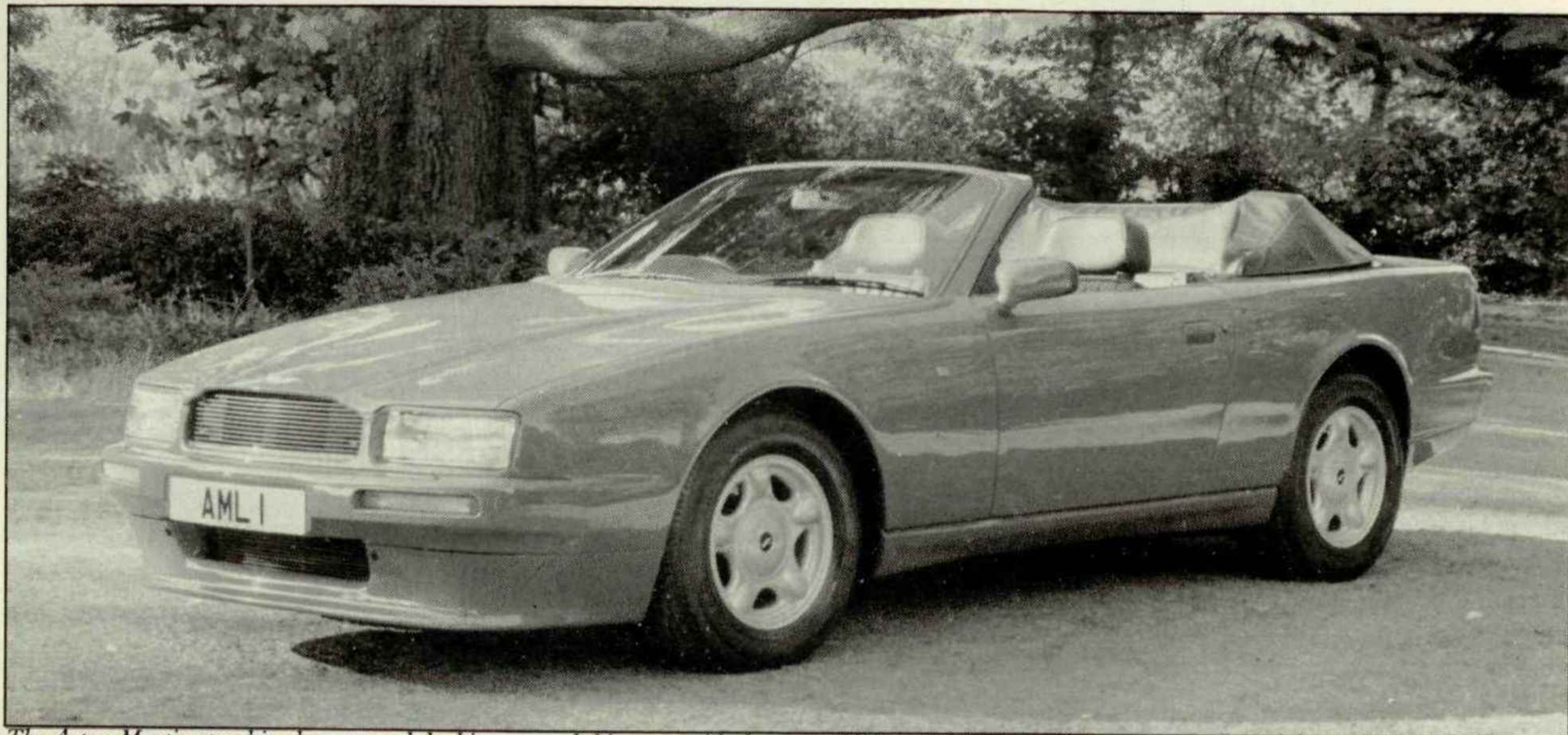
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The Aston Martin stand is always worth looking at, and this year, with the new addition of the Virage Volante, it was the honeypot of the show.

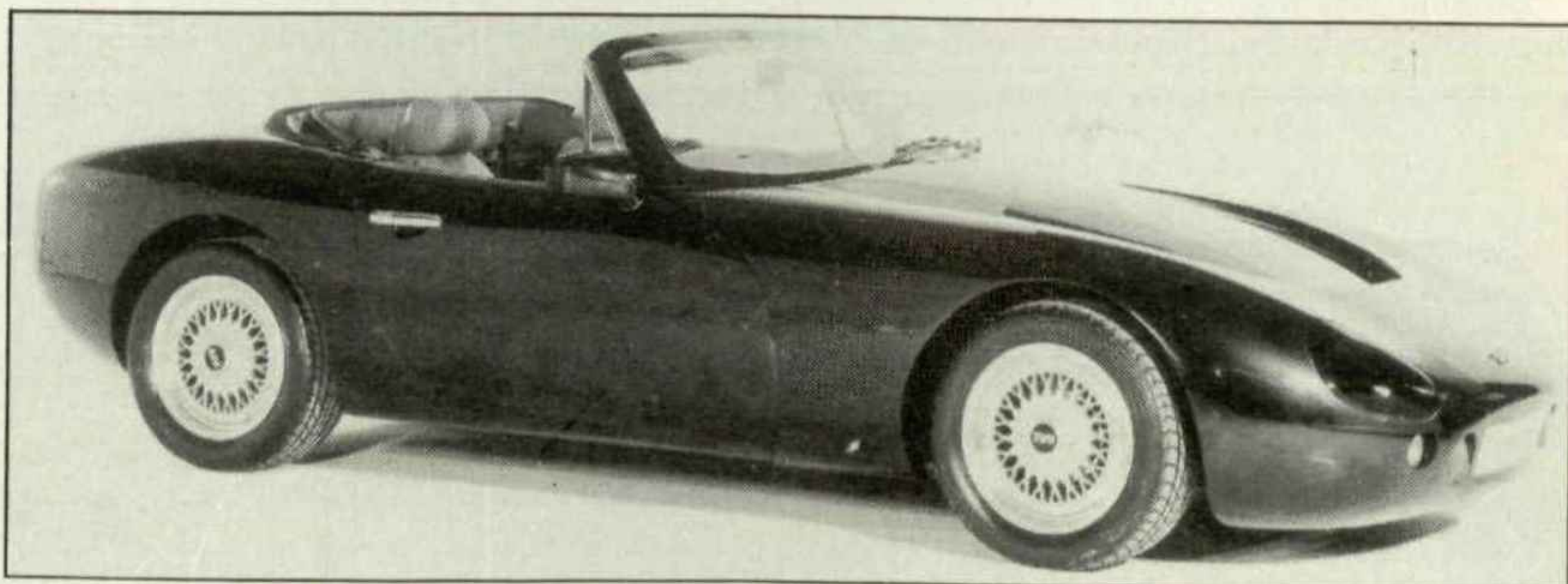
The Show Must Go On

Just as we closed for press, the 1990 Motor Show was opening its doors to the general public. There was an opportunity, though, to go to Birmingham on press day to see what was new.

Most of the stands were impressive, but that of Ford in particular was massive, the total investment running into hundreds of thousands if not the million pound mark, but it was an important Show for the multinational manufacturer since it was the occasion for the European debut of the new Escort/Orion range. Since the former has been a best seller in Britain for years, Ford had necessarily pulled all the stops out.

Proudly on display on the slightly less vast Rover stand was their latest model range, and although pride of place went to the new 216 GTi 16V, the new flagship of the 200 series, the real 'star' was the Mini Cooper. Who would have thought that a derivation of a model first introduced thirty years ago from a major manufacturer would still hold its own with the latest products?

Vauxhall announced a new-look Nova and a new 2.6-litre 'Dual Ram' engine for the Carlton and Senator while Jaguar had the 3.2-litre version of the XJ6 which replaces the 2.9. BMW meanwhile used the occasion to launch the 850i in Britain, while round the corner were Alpina, at the Show for the first time, with their own version of the model alongside the incredible B10 Bi-Turbo. Other new flagships included Mitsubishi's HSX 3000GT, developed from the HSR II concept car which was also on show, the Alfa Romeo 164QV, Vauxhall's controversial Lotus Carlton, the Citroën XM V6 24 Valve, the Peugeot 605 SVE24, the Saab Carlsson installed with a 2.3 turbocharged engine



Alongside Aston Martin, but by no means in their shade, were TVR with the lovely Griffith.

and the world debut of the Volvo 960/940. Despite this fine bunch of cars, though, it was the Aston Martin Virage Volante, the Lamborghini Diablo, the Honda NSX and the 320 bhp, four-wheel drive Citroën ZX Rally Raid challenger which undoubtedly stole the limelight.

Such is the importance of the British market to the VAG Group that the Show was used as the occasion for the world launch of the Volkswagen Polo as well as of the Audi Coupé S2, while making its British debut was the Audi 80 16V. Fiat showed the new Tempra saloon, Nissan the new Primera while Renault introduced the Clio, even though it is still more than six months away before its official UK launch, the 140 bhp Renault 19 16V and one of the most exclusive cars at the Show, the GTA Le Mans, the sales of which are limited to just 35 in the UK.

Hyundai introduced the hideously named Scoupe, their new coupé, Lada the Samara Cabrio, Skoda a prototype Favorit Roadster and world premier of the Favorit Estate and Proton their second generation range of models.

New models from the specialist sports car manufacturers included the beautiful TVR Griffith and a prototype of their forthcoming Speed Eight, a 2-litre Marcos, a convertible Ginetta G32 and the new G33. Of the four-wheel drive manufacturers, Mercedes-Benz unveiled their new Gelandewagen, Land Rover their new five-door Discovery, Daihatsu their new Fourtrak EL Special and from Turbo Technics the debut of a turbocharged 3.9-litre Range Rover. Of a different nature altogether on the Toyota stand, there was the new eight-seater multi-purpose vehicle Previa which was making its European debut. Of a similar nature, but as yet just a concept vehicle, was the Mazda Gissya, the Japanese company's interpretation of a family vehicle in the 21st century.

These were just some of the examples on display, but it was simply impossible to do justice to the four car halls, let alone discover the other four in use in just one day. The economy may be depressed, the motor industry may be in a slough, but that would never be guessed from the bravado displayed at the Show. WPK



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A Touch of Class

The new B12 Coupé, capable of 175mph, which will be making its world debut at the Birmingham Motor Show. The building in the background is the new extension.

One of the most pleasurable aspects of working for MOTOR SPORT is the opportunity of meeting top people in top places, part of the attraction of which is the continual hope that some of the stardust will sprinkle itself upon oneself.

In many cases the subject turns out to be an average human who is doing something that he is good at which a) makes him a lot of money or b) makes him the focus of media interest. It is not usual for that person to be otherwise a cut above the average man in the street.

In Herr Burkard Bovensiepen, boss and founder of the Alpina Burkard Bovensiepen GmbH + Co in Germany, we have an exception to that rule. If ever there was a man whose product was a reflection of himself, then it has to be the products which are produced in a leafy village in Bavaria.

Looks are deceptive. It is hardly imaginable that such a quiet, sleepy place such as Buchloe, half an hour's drive from Munich, is the centre of so much activity, a deception which continues even when entering the premises.

Instead of the high tech razmatazz which is usually associated with BMWs, one of the yuppy status symbols of the Eighties, one is met by a few low slung buildings and just a few staff busying themselves on cars. It is in complete contrast to BMW Motorsport's own activities as well as to some of the larger tuning establishments in Britain.

There are the departments one would expect to find in any serious automotive company, but everything is scaled down. At the moment there are two engine test benches, although there are plans for a third to be built and there are the usual engine, machine room and spares departments. At the moment, though, Herr Bovensiepen has had to recognise the need for at least a modest expansion, so the company is enduring a certain amount of upheaval as each department in turn is temporarily relocated. At the time of our visit in August, the company had just seen completed the construction of a new building on the site. Although this has enlarged the present area by 20%, the extra space will not necessarily translate into one fifth more increase in cars produced due to the complexity of the machines they now assemble which thus require extra time.

Under German law, a manufacturer must keep spares in stock for ten years once a model has gone out of production, and naturally Alpina comply with this. In one vast 2000 square metre warehouse, there is row upon row of parts, each carefully labelled and stored, but this warehouse is nothing like as interesting as the one next door. Known to only a few outside Germany, Alpina Burkard Bovensiepen GmbH is also a wine merchant, dealing in wines of the *premier cru*. A look around that warehouse was even more fascinating for somebody like me with only a limited knowledge of wine.

The obsession of being the best stems from Herr Bovensiepen's own ideals, although the emphasis with regard to the cars has changed over recent years.

In the early years, in the mid-Sixties when he had borrowed the Alpina name from his father's defunct typewriter business to use on his own engine tuning company, Bovensiepen was far more concerned with extracting greater horsepower from engines than he was with refinement and luxury. Obviously there was pride in a job well done, but the greater importance was to see just how far a standard engine could be abused in the search for more power.

It was the company's good fortune that it decided to specialise in BMWs, a marque which has since seen a steadfast rise in sales and prestige after a period of near bankruptcy in the Fifties. As BMW began to supply their own 'hot' versions of their models, though, those from Alpina subtly began to change. Out and out performance gradually slipped from being the ultimate goal, and instead became just part of the overall package. So comprehensive was the development of the

base model, though, and so great the modifications made, that in due course Alpina was granted the status of being a marque in its own right as granted by VDA, the West German equivalent of the Society of Motor Manufacturers and Traders.

It may be a marque, but the Alpina symbol still remains highly rare, and to the uninitiated, it still remains a BMW at heart. Both facets, however, are attractive to Alpina's customers: on the one hand they are buying a proven product, and one that is already a status symbol, while on the other he will have one of just 600 hand-made examples, 150 of which will have been made that year in Nottingham. The British connection may be a surprise to some, but its operation, through the Frank Sytner dealership, is one that has been successfully developed since 1982.

It had become clear by the early Eighties that Alpina had reached a plateau as far production was concerned — albeit the 200 cars then produced was less than half the number produced last year — and yet there was still a demand to be fulfilled for right-hand drive from Britain alone — one that could not be ignored. It was BMW (GB) which saw Alpina through the next phase of its life.

Although not in a position to handle the business themselves on an operational level, they realised the kudos that the Alpina BMWs could bring to the entire BMW range if imported into the country.

They would do for the BMW range what Austin Rover's marketing men hoped the Vanden Plas version would do for the Allegro range, except that in the Bavarian case, the execution of the job was a lot more professional.

It was at this stage that Frank Sytner was brought into the frame. Not only was he well known for his racing exploits, his dealership was centrally located in the country and he was ebullient enough to do something with the golden opportunity handed to him.

Being the bullish sort of man he is, Sytner immediately calculated that he could sell between 60 and 80 cars a year, but it was a figure that Alpina could not supply. Thus began the arrangement whereby Sytner assembled the components manufactured out of BMW parts by Alpina — a type of lateral franchising. Over the ensuing years the two companies worked hand-in-hand so that by the end of this year, a full 25% of the total Alpina output will have been assembled in Nottingham.

Britain is not the only market, however. The land of the rising sun in one short year is already bigger than Britain in terms of turnover while Switzerland and France are important, but remain relatively small.

The Japanese connection came about through the commercial activities of the son of the German ambassador to Japan who began by importing specialist racing

components from Europe, such as a range of products from Automotive Products, Mahle pistons and Alpina parts. It was only when he became a fully fledged BMW dealer in 1989, though, that Alpina noticed a dramatic upturn in its fortunes with an order from him for 100 of the top of the



Frank Sytner (left) and Burkard Bovenspien.

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The new B10 Bi-Turbo which will only be produced in left-hand drive form.

range models.

Like Britain, Japan is right-hand drive, but so keen were the customers to acquire them that even in left-hand drive form the cars were quite acceptable.

Questioned about the USA, Herr Bovensiepen again came back to the issue of quality not quantity. He is simply not interested in producing an ever-increasing number of cars to satisfy insatiable demands. For him, like a good wine, each and every car has to be individually tested and flavoured. The more that are manufactured, the greater the fall in quality.

At present there are nine different Alpina models: the B3 2.7-litre saloon, touring and convertibles, which is based on the 325i, and is confusingly called the C2 2.7 in Britain; the B6 3.5 which is also based on the 325i, but develops 254 bhp, 50 bhp more than the B3; the B6 3.5S, with the same horsepower figures but based on the M3; the B10 3.5 based on the 535i; the new B10 Bi-Turbo, also based on the 535i, but which develops 360 bhp; the B11 3.5, based on the 735i developing 254 bhp, and the B12 5.0 and B12 Coupé, based on the 750i and 850i respectively, both developing 350 bhp. Finally there is Alpina's version of the Z1.

The 'B' tag is one that has stuck to the Alpina model, although that was not the original intention. The early models with the 4-cylinder engines were the 'A' series, while the 6-cylinder engines greater than 2.5 litres became the 'B' series. The C series comprised of the baby sixes and from a logical point of view, the 12-cylinder models should have been prefixed by the letter 'D'. It was felt, though, that the 'D' series sounded cheap whereas the B12 somehow didn't, so it has transpired that the 'B' prefix has come to mean the same thing to Alpina as the 'M' prefix does to

BMW Motorsport.

Without exception, these models have been extensively developed with almost as much lead time-in time as that of BMW themselves. For instance, on one of the two test beds, we saw the new 4-valve 2.5-litre engine being put through its paces. Already bored out to 2.8-litres, this is an engine destined to power the Alpina version of the new 3 series due for next year and yet it is one not yet officially announced.

The 450 cars that Alpina expect to have manufactured by the end of this year include 180 B10 Bi-Turbos, 100 B10s, the same car but with the normally aspirated engine, 100 B12s, 44 Z1-based Roadsters and the remainder 3 series cabriolets, touring and four-wheel drive models, the low numbers reflecting the declining sales of the 3 series prior to the launch of the new model at the beginning of next year as well as the emphasis the company is putting on the new Bi-Turbo model.

A chance to drive the Bi-Turbo in the most deplorable

of conditions showed just what a good car this is, but its wet weather performance was but one asset.

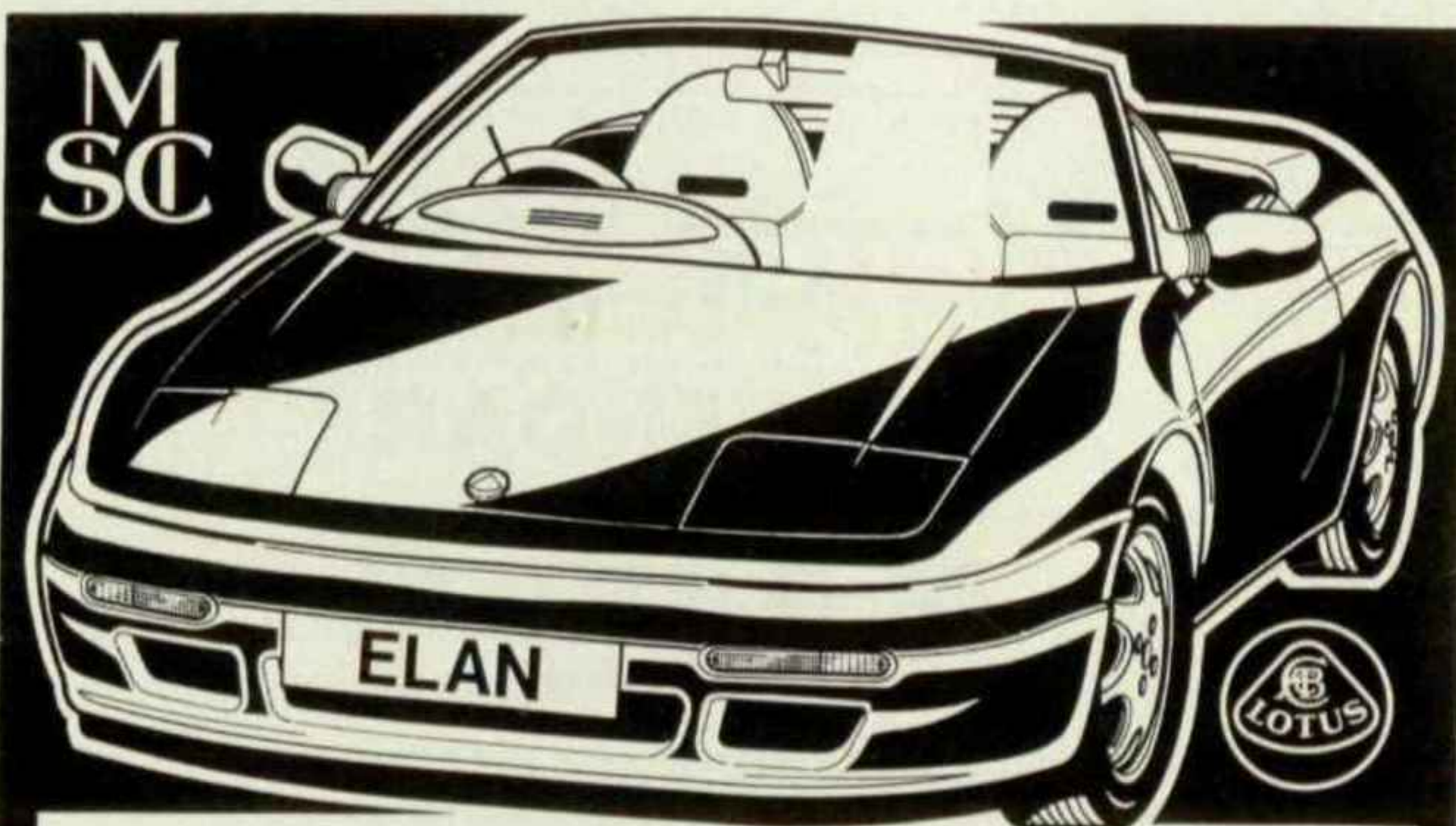
As soon as you open the door and are confronted by the plush interior of polished wood and attractive Alpina upholstery, you know you are in a different territory from the usual 5 series BMW. The luxurious and well appointed car obscures the fact that it is in fact capable of more than 180mph, a bullet in any language.

The 360bhp which Herr Bovensiepen's men have managed to extract from the 3430cc engine are mainly from the use of a couple of Garrett T25 turbochargers which are regulated by a Bosch system. Naturally, the extensive modifications made to the engine have all played their part, but any car weighing 1695kg which can accelerate to 62mph in 5.6 seconds, and yet be driven at 30mph in fifth gear while doing a mere 1000rpm, has to be taken seriously.

In conditions which were akin to driving through a car wash, the car displayed exemplary manners and never stepped out of line once, while the heating and ventilation systems worked quietly and efficiently to keep the car's environment acceptable.

At the end of the journey, one could be only but impressed, for Alpina has produced a fine car even if it will cost £57,250 in England. More's the pity, then, that it will be produced only in left-hand drive form.

WPK



- LOTUS ESPRIT TURBO SE 1990 (H). Only 500 miles, full Raven hide, air conditioning, glass sun roof, Blaupunkt stereo, finished in Special Metallic Pearlescent POA
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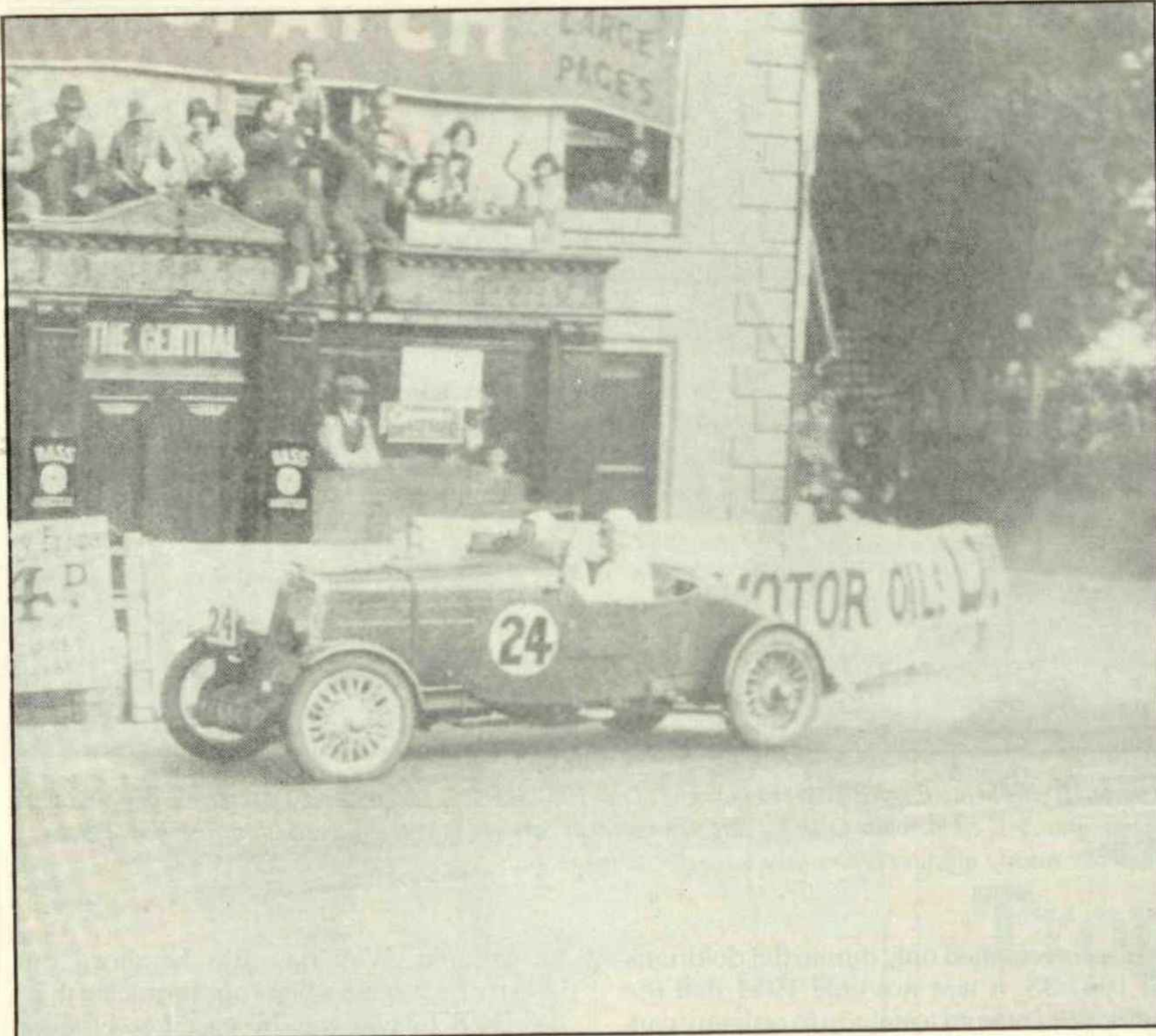
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In the 1928 Ulster TT handicap race, the winner was Kaye Don's supercharged Lee Francis.

Unfair Advantage

Keith Duckworth, the supreme British racing-engine designer, is known to have had an aversion to supercharging and turbocharging. Graham Robson has made this clear in his fascinating book *Cosworth*, which *MOTOR SPORT* reviewed recently. Duckworth made this quite clear soon after the appearance of the first turbocharged F1 car, the Renault V6 RS01 of 1977. Although there were to be Cosworth turbocharged engines, at that time Keith Duckworth saw the turbocharger as different even from a supercharger as a means of taking an unfair advantage in racing. He saw the turbo as a gas turbine sharing its combustion chamber with a piston engine, which is the equivalent of having a two-engined F1 car, which the rules expressly forbid. There may have been mild commercial undertones in this but no-one would question Duckworth's technical arguments.

The supercharger, he said, was rather different, as although it affected the weight of charge into the cylinder, at the expense of driving the blower or compressor, only the piston stroke did the expansion work. Be that as it may, both supercharger and turbocharger are a means of obtaining more power from an engine without increasing its size. It might be expressed as

dodging the old adage that there is no substitute for litres We know how engineers seeking this line of action looked hopefully at the supercharger, from the days of Chadwick's experiments in 1908, through the pioneering work of Daimler-Benz who saw forced induction of the mixture as a means of improving the acceleration of production cars, to Fiat's perfection of supercharged racing engines by 1923, which enabled them to dominate the Grand Prix scene and cause other constructors of such racing engines to follow suit, unless the rules specifically prevented them from so doing.

That was followed by sports car makers such as Austin, Alvis, Lea Francis, Bentley, Bugatti, Stutz and others following Mercedes into blowing their engines, and then followed a spate of tacking belt-driven and chain-driven supercharger sets onto all manner of long-suffering family car engines, even onto flat-twin Jowett, Armstrong Siddeley, Ford Eight and Ten, Hillman Minx and the like, in the hope of endowing them with a little additional urge over and above their normally pedestrian performances. Here I must restrain myself from listing the surprisingly large number of supercharger makes available, beyond the best remembered, such as Zoller, Powerplus, Marshall,

Arnott, etc and from discussing which was the better approach, blowing through, or sucking from, the carburettor

The fact is that in racing, a supercharger (or turbo) gives an artificial answer to a given cylinder capacity limit. A fact which the taxation authorities never took into account, to Duckworth's amusement. In Grand Prix racing this should be of no moment whatsoever. I have long believed that in the top form of motor racing no limits should be imposed, in the interests of technical advance. That engines of all sizes, and all types, gas turbine, blown and non-blown, should be allowed to compete together, with perhaps certain thoughts in the realms of safety.

When it comes to events divided into capacity classes the position is different. The first anomaly here is in the field of record breaking. A considerable number of capacity divisions are recognised, but what a car achieves remains strictly within the capacity class to which it belongs. A small-engined car may go faster over a given distance/duration than a larger-engined one, but it cannot claim a record in the latter's class, unless it goes faster than all the cars in all the classes, in which case it owns a World record as well. This was shown up in 1924 when Darracq took records in the 1½-litre category. Alvis had also set records in the then extant Light-Car class, (Class A). Darracq protested in print that Alvis was claiming records which did not belong to them.

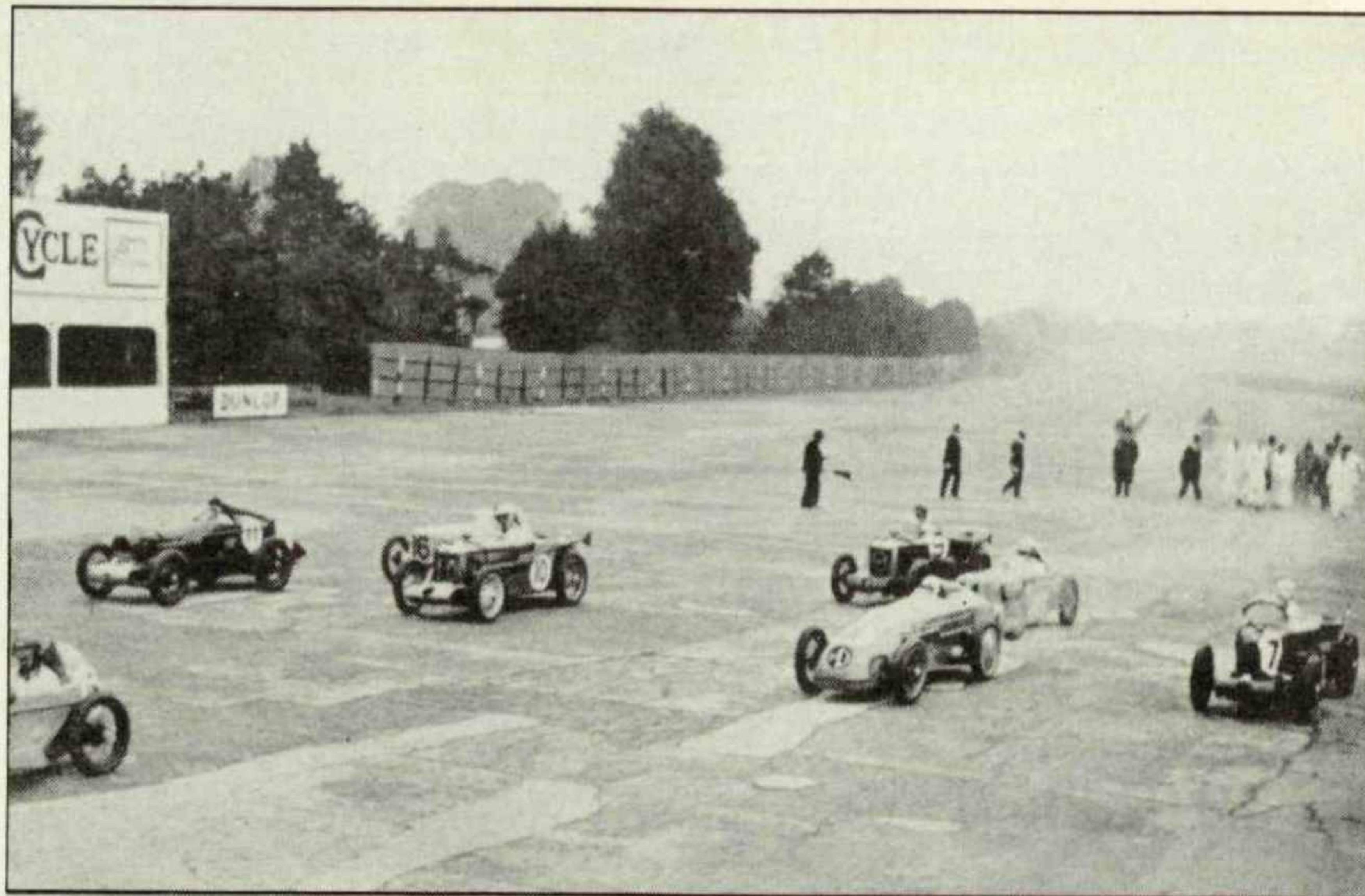
To this G Smith-Clarke, Chief Engineer and Works Manager of the Alvis Car & Engineering Co responded, saying that Alvis did hold certain 1½-litre class records but the records Darracq thought they had claimed wrongly were in Class A, for cars of over 1500cc. To attack these records the Alvis engine had been bored out to 1563cc, after which there was a loss of 2.7 mph in top speed. They added that surely Darracq should be the last to expose the matter, because whereas the Alvis engine used for the Class A records was only 64cc above the 1½-litre class top permitted limit, the 1486cc Darracq which had claimed Light-Car class records had taken them during the 200 Mile Race, in which it had run supercharged. Smith-Clarke calculated that if the efficiency of the Roots blower used was 70% it was capable of delivering 2740cc of charge to the cylinders per two revolutions, so that the comparative capacity of the Darracq engine was 2740cc. (This would have put the Darracq into Class D, for cars of over 2458cc and under 2868cc. At the time the 200 mile record in this class was held by a Wolseley, at 88.93 mph, compared to the Darracq's Light-Car class, under 1500cc record of 102.27 mph). It is interesting that the spokesman for the Darracq Company argued that if a Light-Car class record was broken at a higher speed than a Class A record (their 102.27 mph for 200 miles opposed to Alvis's 94.67 mph) it should count in both classes. It might have been logical but as explained at the beginning of this discourse, that was not

how records were recognised, and the rule holds to this day.

Be that as it may, the advent of the supercharged engine made a mockery of races (and records) to which capacity limits applied. Smith-Clarke calculated that the blown 1½-litre Darracq was the equal of an atmospherically charged engine of 2740cc. When blown (s/c) and non-blown (u/s) cars were permitted to compete together in Grand Prix races from 1938 to 1946 the ratio was set at 4½-litres u/s, 3-litres s/c. This was seen as giving too great an advantage to the forced induction cars and was altered from 1947 to 1953, when supercharged 1½-litre cars were pitted against those of 4½-litres u/s. This worked at first in favour of the big atmospherically charged cars, until the two-stage blown Alfa Romeo Alfettas got into their stride.

When the top limit for non-supercharged engines in F1 racing was reduced to 2½-litres from 1954 the former 3 to 1 ratio of unblown to blown was almost retained, as s/c cars of 750cc were provided for. But as Laurence Pomeroy explained, by this time the 2½-litre racing car engine should have been able to develop 115 bhp/litre at 8000 rpm, equal to an output of 290 bhp. To compete, a 750cc engine would need to be blown at 50 lb to produce a bmep of 520 lb/in. No wonder there were no effective takers. When it came to 2-litre F2 racing in 1947/53 the limit of 500cc for s/c power units was even less encouraging to those who thought in terms of blowers

Once viable supercharged racing car engines had been used by Fiat in 1923 all capacity limits imposed by officialdom, hopeful of creating more efficient machines that might benefit ordinary car users, or in the interests of reducing the speed of GP cars to an acceptable level, had little meaning. Imposing weight limits, fuel restriction, or what have you, retained into the turbocharging age, were tried; the fact is that after 1923 the 2-litre, GP limits had far less meaning than intended. Sadly, my ideal of a for-



The small cars being flagged away at the start of the 1932 BRDC 500 mile race. In the background is the famous A V Ebbelwhite with his flag. The scratch cars are not on the starting line because it was one hour twenty minutes before they were due to leave.

mula *libre* applied only during the doldrums of 1931/33. It was not until 1961 that the authorities offered a real sop to ordinary cars hoping to gain from racing, by banning supercharging and special fuels.

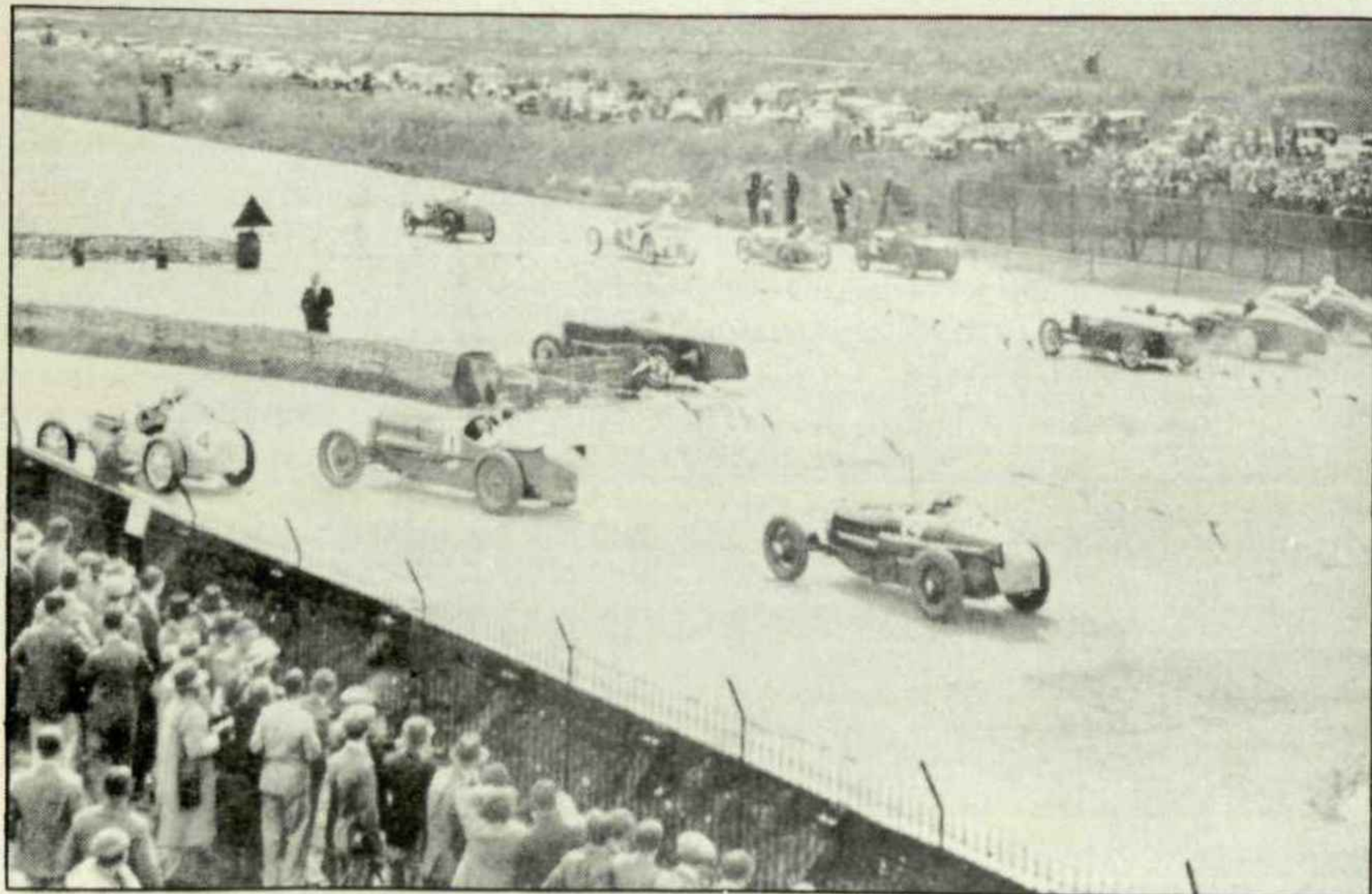
Supercharging, or turbocharging, dismissed cylinder capacity limits more surely than any other tuning factor on an otherwise standard engine. So how did organisers of pre-war races run on a capacity class handicap system treat s/c and u/s cars? When the RAC ran its first Ulster TT sports car race in 1928 it used class divisions as laid down for International record breaking back in 1925. But it failed to apply different handicaps within these divisions for the supercharged cars. It remained the same in 1929 and 1930, except that the carrying of ballast (246 lb in the case of the larger cars) no longer had to

be endured. With no extra handicap on blown cars it was perhaps not surprising that the 1928 TT was won by a s/c Lea-Francis from a s/c FWD Alvis, that in 1929 Caracciola's blown Mercedes-Benz won, with the next ten places filled by s/c cars, and that the 1930 TT was dominated by the team of s/c Alfa Romeos, and the 4th, 5th and 6th places taken by supercharged cars. I think I can see Keith Duckworth's wry smile.

By 1931 the RAC had learned its lesson. It decreed that in the up to 750cc class the blown MG Midgets would receive a start of 4 laps and 8 minutes over the scratch 38/250 hp Mercedes-Benz but the lone u/s MG Midget had an advantage of five laps. In the 1100cc class the u/s cars were handicapped at 3 laps 5 min, against 2 laps 8 min 48 sec for a s/c Maserati. The respective penalties for u/s and s/c 1½-litre cars were two laps, 8 min 48 sec for the blown Maserati against Frazer Nash and Aston Martin at one lap, 9 min 18 sec, and in the up to 3000cc class four minutes with no credit laps, against ten minutes. Rather surprisingly, if the blown 4.9 Bugattis with ace French drivers had started, they would have been penalised only two minutes over the u/s 4½-litre Invictas, a slight start indeed from the aforesaid scratch 7-litre s/c Mercedes.

How did it work out this time? Norman Black's s/c MG Midget won and supercharged cars were second and third. In spite of all this, these pre-war TT's did produce some very close finishes — but the poor starter, the results officials, and the less knowledgeable spectators would perhaps have deserved our sympathy! The RAC gave up by 1934 and banned supercharged entries from the TT; by then the magic of forced induction was less popular with ordinary sports car drivers than it had been in the late 1920s.

The BRDC was also aware that supercharged cars should go faster than normally charged ones. For example, in its 1931 500



The ingenious Junior Car Club in its International Trophy races dispensed with handicapping by time, using instead handicap channels of varying severity.



K Lee Guinness in the supercharged 1½-litre Darracq that caused a controversy in record breaking circles in 1924.

Mile Race round the Brooklands outer circuit Mr AV Ebbelwhite had handicapped the lone u/s MG Midget to set off 24 minutes before the gaggle of blown Midgets. Of the 1100cc cars, a blower earned a start penalty of 12 min 4 sec, and the u/s 1½-litre cars were released at the same time. Curiously, an u/s 2-litre straight-8 Bugatti was regarded by "Ebby" as the equal of a supercharged one, and both Bugs left with the u/s 3-litre Roesch Talbots.

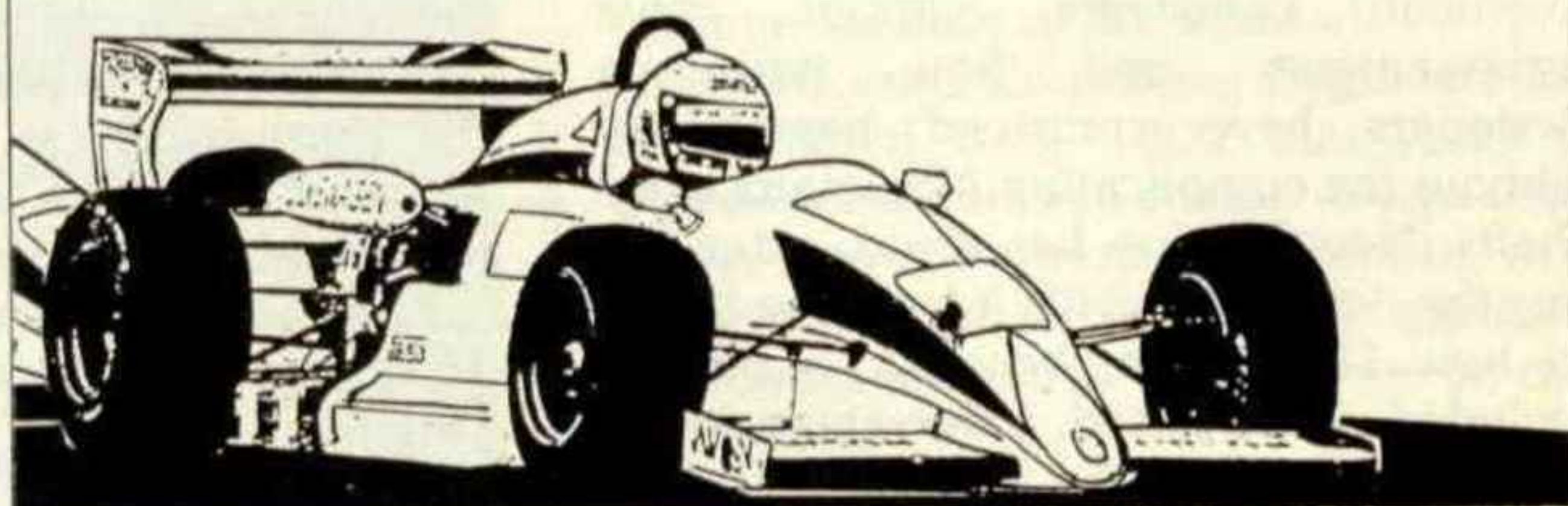
But if you were in a s/c 2.3 Bugatti or Alfa Romeo you were held for an additional 3 min 1 sec (trust "Ebby" to resort to a single second in a 500 mile race). In the up to 5000cc class the normally aspirated cars had a start of 3 min and that odd second again, from the Birkin blower 4½ single-seater Bentley. Finally, the heavy metal was assembled, ready to receive the starting flag more than 1 hr 20 min after the first car, that MG, had left the line, and the "Old No.1" 6½-litre Bentley was dispatched on its victorious run. The blower 4½ Bentley and both Mercedes-Benz, would have a further 3 min 1 sec to wait before joining in, the field then complete.

It was perhaps fair enough. The 6½-litre Bentley won, from a Talbot, with a blown MG Midget third. Anyway there were prizes for the best blown and unblown cars in each class. It was left to the ingenious Junior Car Club, with its 250 mile International Trophy races, to devise a means of running a handicap race without resorting to time or credit lap starts. It did this by deflecting cars of different engine capacities into bends, or channels, of varying severity, once per lap of a special course at Brooklands. Thus the spectators could see which car was leading on any given lap, without recourse to calculations or elaborate scoreboards. Clever! How did s/c cars fair, under this system? Well, in the first of these races, in 1933, blown 750s took the same channel as u/s 1500s, blown 1750s that used also by u/s 3-litre cars, and s/c cars of over 1750cc took the same course as u/s unlimited ones, but for some reason all eight-cylinder entries were regarded as in the latter class. By 1936 the handicap channels had increased to five, the categories now s/c 750 and u/s 1100, s/c 1100 and u/s 2000, s/c 1500 and u/s 2000, s/c 2000 and u/s 3000, and over 3000cc cars of either type, a closer call for u/s cars than under F1 and F2 rulings. For readers with a mathematical bent, it should concentrate the mind!

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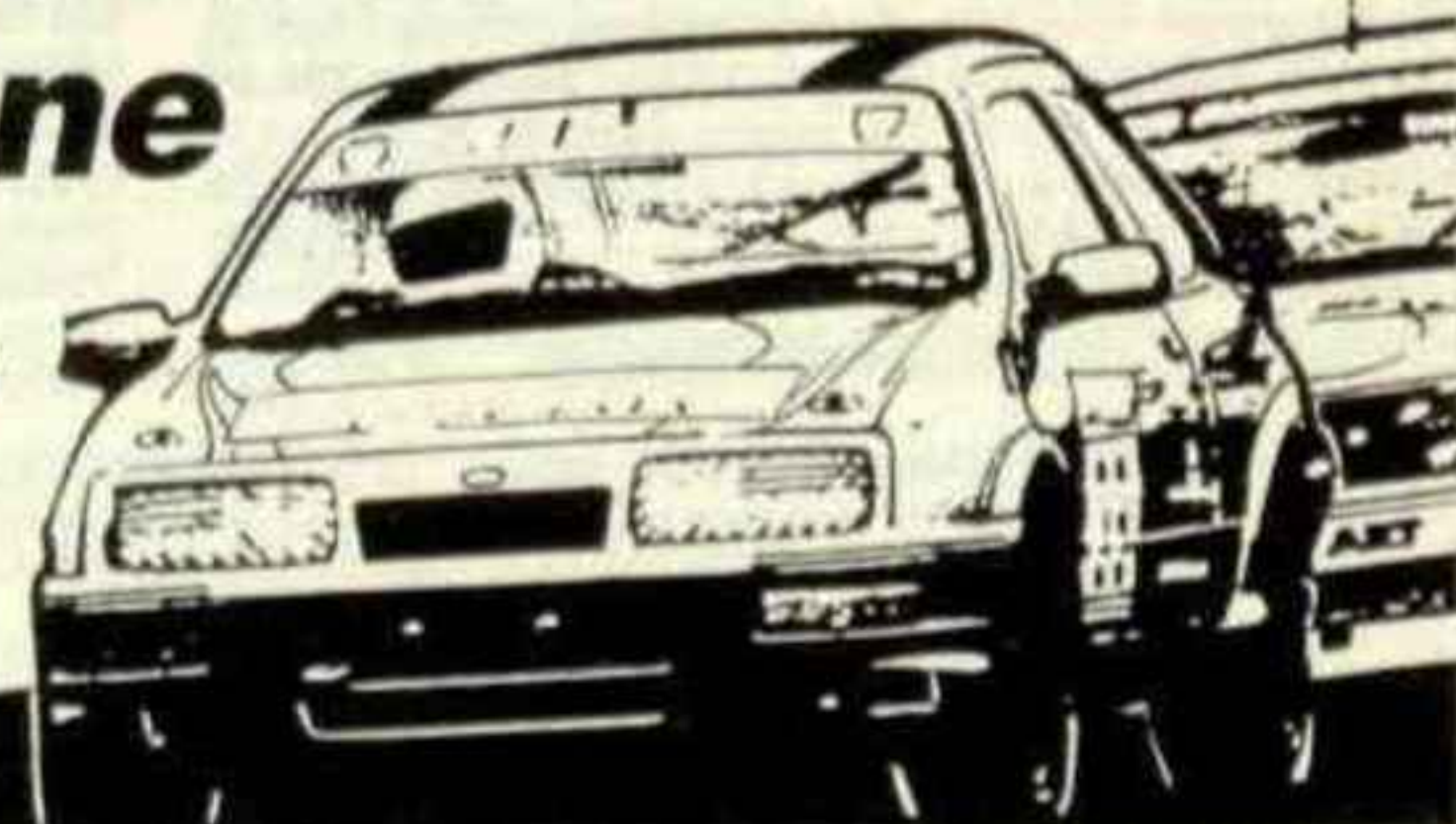
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In that very enjoyable book *Cosworth*, by Graham Robson, reviewed last June, the author makes the important point that the great racing-engine designer and tuner Keith Duckworth, whom his book is mostly about, was the first engineer to use a narrow-angle, four-valve cylinder head with the valves operated by twin overhead camshafts.

From time to time MOTOR SPORT has looked at the different ways of driving overhead camshafts, various valve arrangements, and how ingenious designers have contrived hemi-heads without the complication of upstairs camshafts. Now Robson has drawn attention (for the details, read his interesting book) to how Duckworth went for a narrow included, or opposed, valve-angle in his Cosworth-Ford FVA and DFV racing engines of 1966/67, which were financed by Ford of Britain and were extremely successful, DFV-powered Formula One cars winning 154 races between 1967 and 1983.

Duckworth's four-cylinder sixteen-valve FVA engine had its valves at an included angle of 40-deg, the 32-valve DFV V8 an included valve-angle of 32-deg. Robson as we all do, traces the origin of the race-winning twin-cam multi-valve engine back to the Henry-designed (or drawn) 1912 GP Peugeot, with which Georges Boillot won that year's 956 mile French classic at Dieppe at 68.45 mph. That was enough to cause many other racing car

Valve Angles

designers to use twin overhead camshafts to actuate four valves per cylinder and Peugeot to refine its concept for the purpose of winning the 1913 French Grand Prix and the 1913 Coupe de *L'Auto* races. In the 1920s the true hemi-head, using two valves per cylinder gradually took over, but today the multi-valve twin-cam engine has returned, for both the racing car and the production car. It was Duckworth, however, who, as Robson says, "set a new benchmark" with his narrow-angle valves.

It is debateable how the valves in the 1912 Peugeot GP engine were angled. Laurence Pomeroy, as Robson remembers, quotes 45-deg, Griffith Borgeson (in his book *The Classic Twin-Cam Engine*) says possibly 60-deg, but drawings studied later suggest 90-deg. As no GP Peugeot of this kind has survived, we may never know. (Incidentally, Borgeson's profound knowledge of old engines does not seem to extend to new ones, as a photograph caption in his aforesaid book fails to identify Keith Duckworth in a group of people standing round one of his own DFV power units!) Incidentally, Robson notes that a modern Cosworth racing engine betters the efficiency of the 1912 Peugeot engine by a factor of eight or ten; however, the power output of that Peugeot engine has been variously quoted as 130, 148 and 175 bhp.

When WO Bentley was working on his 3-litre Bentley engine in 1919 it was given a valve included angle of 30-deg, which as Robson points out, "was almost the benchmark set by Cosworth five decades later!" On the other hand, perhaps the lower compression ratios, lower power outputs and lower fuel octane ratings make any comparisons invalid.

It is well known that WO was assisted by Fred Burgess, who had designed the 1914 TT Humbers, when planning the 3-litre Bentley and that he had one of the Humbers (which one of the team remains an intriguing mystery) to dissect and study. The TT Humber engine followed closely the design of

the 1913 3-litre Coupe de *L'Auto* Peugeot, so might be expected to have had a wider valve-angle than the Bentley, that of the Peugeot being 90-deg. In fact, the Humber's valve-angle is 90-deg.

I think therefore, that the Bentley engine was given this very narrow valve angle simply because, with a single overhead camshaft, rockers were necessary for prodding the valves, and they could be kept decently short if the valves were not too widely inclined. Indeed, the valve-gear of the production 3-litre Bentley, using a forked-rocker to open the two inlet valves and separate rockers for the two exhaust valves, with triple cams per cylinder, was notably compact. There were other engines, both push-rod and overhead camshaft, which had a small valve angle, and even in some case near-vertical or vertical valves, no doubt in the interests of short rockers, a narrow cam cover, and perhaps reduced costs in head casting, etc. Even with twin overhead camshafts, the less the valve inclination, the closer together could be the camshafts, resulting in a reduced chain-run, or fewer gears, in the camshafts' drive.

Robson remarks, I think quite rightly, that if the designers (of the 3-litre Bentley) had only realised it, they were onto an efficient combustion chamber shape, for which reason Duckworth opted for narrow-angle heads 50 years later. Or did WO know about this design factor which was later employed in Cosworth engines? Are we, in fact, in thinking otherwise, doing Walter Bentley a grave injustice?

In the case of the Bentley and other fixed-head engines, another reason for a narrow valve angle could be that, as Graham Robson himself reminds me, machining the valve seats etc up such a casting, a matter of over 150 mm in the case of the Bentley, might have been difficult if these had been acutely angled. The 1914 GP Mercedes engine, which WO had looked at before planning his 3-litre Bentley, had valves inclined at 60-deg as had the Bentley and would have had the seats machined up a bore length of more than 165mm. WB

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Until about 25 years ago, power-train design had advanced little since the time of Nicholas Otto or Rudolf Diesel. Engines were designed and built on the basis of imitation, trial and error, accumulated experience, or the occasional flash of inventive genius. The pencil and drawing board were the main tools of the trade, occasionally supplemented by nothing more sophisticated than a slide rule or logarithmic table. All that has now changed as environmental concerns and legislation, customer demands for greater performance and fuel economy, and manufacturers' need for increased reliability and durability have forced engineers throughout the industry to use new, high technology and, especially to take advantage of the enormous analytical power available with computers.

At the heart of this technological change and, indeed, at the vital centre of the world motor industry itself are a small number of independent Research & Development firms or institutes — no more than a handful — having the facilities and trained personnel to undertake basic research, design, analysis, and testing for the motor industry, and of these, only two — AVL in Austria and the Ricardo Group, located at Shoreham-by-Sea, Sussex — are able to carry out all aspects of engine, transmission, and vehicle integration research and development work.

The Ricardo Group was founded by HR (later Sir Harry) Ricardo, who for more than half a century immersed himself in the scientific investigation of engines of all kinds and became recognized as a world

authority on internal combustion engine design. Established during the Great War, much of Ricardo's work during its early years was for the Air Ministry though increasingly the company looked to other sources for research contracts. Supported by the Shell Petroleum Company, for example, Ricardo undertook fundamental and important research on fuel and combustion. Because of the confidential nature of the company's relations with clients, few of Ricardo's achievements have ever been made public, and until recently the company has shunned publicity.

Ricardo's are known, if known at all, mainly for the 'Comet Mk V' combustion chamber used on virtually all indirect injection diesel engines, save those of Mercedes-Benz and Fiat.

As a result of the 'Comet' the name of Ricardo has been associated with diesels in the public mind, but the firm has a long history of research and development work on high-performance petrol engines. Some readers will no doubt recall that Ricardo was responsible for the 4-valve Triumph motorcycle engine of 1921, and in the following year designed the 3-litre Vauxhall 16-valve DOHC engine. It was an extremely advanced design and, at the time of its introduction, produced the 'highest output ever obtained from an engine of this size'. Nowadays, petrol engines account for well over 50% of the company's engine work. While most of this research and development naturally is focused on road vehicles ranging from mundane Eastern European saloons to turbocharged high-performance cars, the

company has recently set up a special division, Ricardo Racing, whose plans and activities are described below. This division will not only involve the company more directly and deeply in motor racing and enable the firm to derive directly some of the benefits of racing, but it will also make available for the first time to the racing fraternity the considerable design, analysis, and manufacturing facilities possessed by Ricardo.

Since the days of the Vauxhall TT car of 1922, Ricardo Consulting Engineers has accumulated over 1000 man-years of experience within the engine design team alone, and the group, as a whole, now consists of close to 500 skilled, specialist employees located at four centres on two continents.

At the Shoreham-by-Sea site, there are over 90 test-beds, as well as rolling road facilities, anechoic chambers, and various other specialized test rigs. These facilities allow the company to develop engines of almost every type (petrol, diesel, or spark-ignited gas) and size from 5 hp two-stroke chain-saw engines up to 5000hp diesel locomotive powerplants.

In addition to its test facilities, Ricardo has exceptionally well equipped machine shops and design offices. As part of a comprehensive consultancy service, Ricardo has offered clients a prototyping facility capable of producing small batches of parts of the highest quality and with a minimum lead time. Recent additions to the workshops include sophisticated computer numerically-controlled (CNC) tools able to machine complex components quickly and precisely. In the past the firm's machining facility was available only for in-house projects or as part of general development contract work for clients, but now these facilities will be offered directly to customers, such as racing firms, who may need at short notice a small number of precisely machined components.

Over the last ten years major investments have been committed to creating a computer aided design/computer aided manufacturing (CAD/CAM) capability. Complete engine lines can be designed and prototypes made largely by these systems. Jobs are now completed in a fraction of the time that such work traditionally took. Not long ago, for example, the company received a request from a large manufacturer for six prototype sets of overhead camshaft valve gear for cylinder heads of considerable sophistication. The ports, etc. had to be designed from scratch, and were fully machined, assembled and tested in under three weeks. If Ricardo is to succeed in the racing business, this is the sort of time scale to which the company will normally have to work. Such jobs can now be accomplished because the firm's CAD/CAM systems and CNC tools will allow, for example, the profiling or reprofiling of inlet and exhaust ports, combustion chambers, and pistons directly from CAD definitions and dimensioned on-

screen drawings: the time consuming process of hand producing engineering drawings and patterns is no longer necessary.

CAD/CAM capability is by no means unique to Ricardo; most engineering firms these days use it to some degree. Systems can be purchased off the shelf, but some of the software used by Ricardo has been written or modified by the company to fit specific engine design requirements. But even the best computer systems are only as good as the people using them. As one might expect, the firm of Ricardo believes that its engineers with all their accumulated knowledge and undoubted skills are special and that it is the availability of skilled operators, not just design systems, that is the real service they are offering. Like CAD/CAM, the other sophisticated software package used at Ricardo is finite element (FE) analysis, a technique employed by them for over fifteen years to determine strength and potential stress characteristics of components under realistic dynamic operating conditions. The company, however, is also developing advanced post-processing FE systems with failure prediction modes that may be suitable to racing engine design.

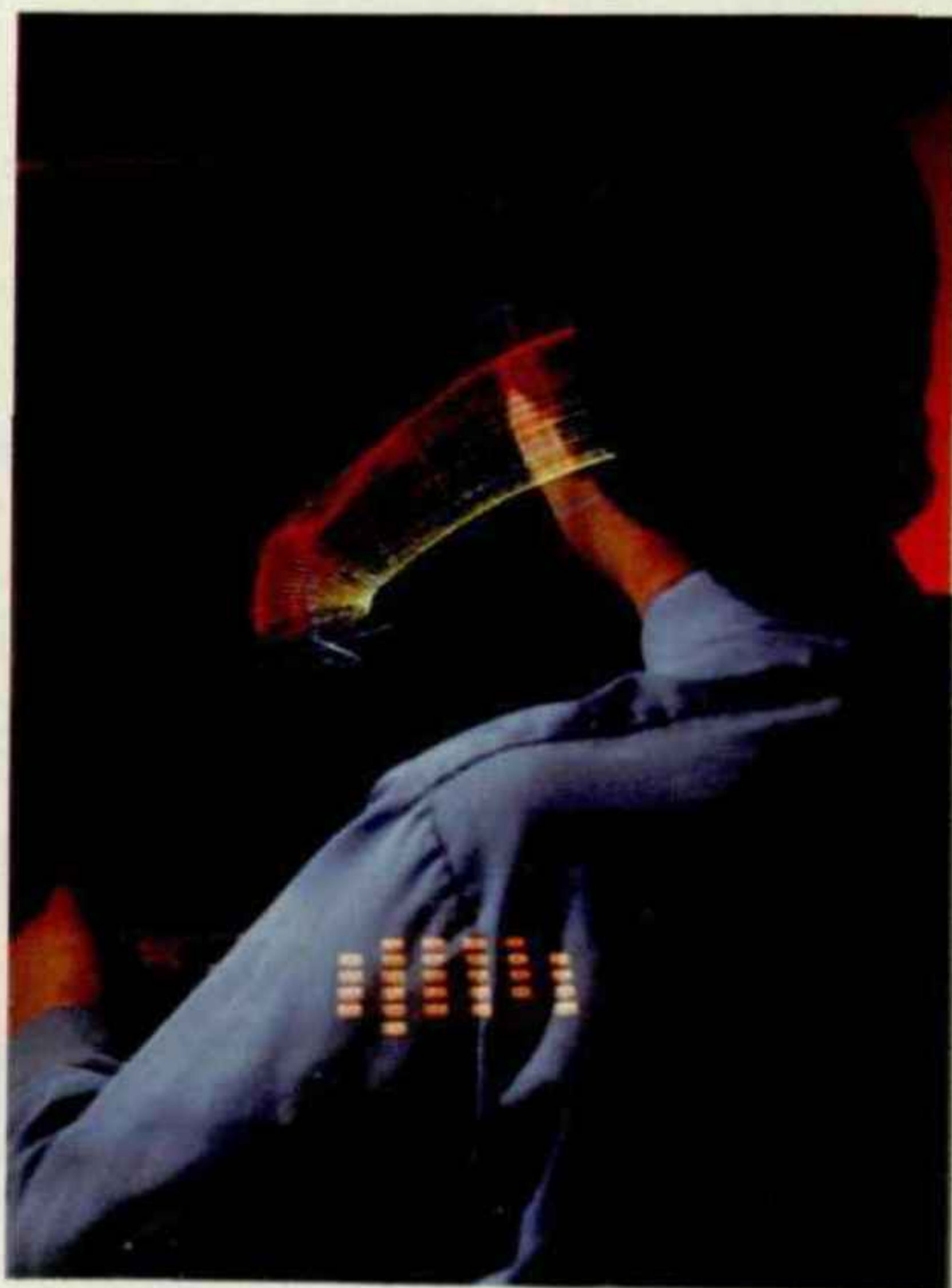
Computational fluid dynamics (CFD) is another new tool being used by Ricardo to develop and improve breathing and combustion models which will be available to racing clients. With CFD, for example, the cooling system of an engine can be optimized relatively quickly by simulating coolant side boundary conditions precisely at any location in an engine. The firm's engineers believe that these analytical facilities and programmes will enable Ricardo to eliminate many of the problems of racing engine design that normally are resolved only after a costly and time-consuming development period. Moreover, techniques like CFD in conjunction with combustion and air-flow modelling can be used to liberate more power from racing engines. Much engine development up to the present, as Technical Director Martin Overington observed, has been playing with valve gear, ie, concerned with getting gases into or out of the cylinder; but the really difficult problems associated with fundamental combustion technology have been side-stepped by and large. Now, however, by using CFD, high-speed combustion photography, and laser doppler anemometry the enormously complex events that take place inside the combustion chamber can be analyzed systematically, and, it is anticipated, the process improved to release more power with less fuel.

As part of the company's in-house research programme, Ricardo plan to take this computerised design process a stage further. Since 1984 the firm has participated in Alvey, a government sponsored project developing 'expert'



New 3D CAD/CAM development techniques promise a significant reduction in prototype cylinder head procurement lead times, and an improved accuracy of transfer of the developed port shapes to prototype multi-cylinder head castings.

systems. Sometimes referred to as 'artificial intelligence' programmes, these systems — when fully developed — will guide users on virtually all aspects of powerplant design and manufacture from the selection of design features, geometry, materials, and production processes; they will even offer suggestions on how to improve performance over parametric designs in current use. It may be an over-simplification of these developments (but not a too fanciful one) to say that at some time in the not so distant future, Ricardo engineers might be able to ask the company's 'expert' system to design and prepare for manufacture a 3.5-litre Grand Prix engine. The designer will only need to key in design priorities, weights and outside dimensions, etc. and leave the



3D CAD provides a useful tool for inlet and exhaust port design and definition.

rest to the 'expert' system.

For such a system to work, or indeed for the current highly sophisticated design systems to be used at all effectively, skilled and knowledgeable engineers are needed. Whereas only 10 years ago, design analysts were outnumbered by draughtsmen ten to one, now at Ricardo's they comprise more than half of the technical design labour force. These engineers and technical specialists can draw on the firm's extensive experience base. Probably no other company has been involved in researching, designing and developing such a wide variety of engines and related components for so many customers for such a long time. Moreover, as an independent consultancy firm, Ricardo may benefit from its independent status in several ways.

With over 120 clients worldwide, a company like Ricardo can gain a broad perspective on design and development problems common to the industry; in turn, individual motor industry clients benefit from this diffusion of experience and accumulation of knowledge. The relationship is symbiotic in another way. Every engine design involves a series of compromise over objectives (eg, strength v weight or peak output v a broad power band), materials and production methods v costs etc. The compromises or engineering decisions are arrived at by weighing and balancing qualities, singly and in combination, but the judgments that are made are never purely objective, they reflect a system of values, presumptions, and traditions that form a particular company's or nation's engineering culture. The widespread client base may help Ricardo avoid the mental blind spots and prejudices inherent in the engineering cultures that pervade nearly every manufacturer and the engineering schools of most nations.

Behind individual engineers and their personal experience and knowledge, stands the firm's technical library and data base. Ricardo probably has the finest powerplant library in the United Kingdom, if not the world. It contains over 100,000 items and receives by subscription approximately 350 specialist periodicals. Use of the computerised data base and library resources is one of the unrivalled services offered to Ricardo clients. As a test of the system's efficiency, the data base was interrogated to see if it could find a technical paper of which neither the title nor date of publication were known, only that it was on high performance aero-engines and had been given in Rome 1934. Within a few seconds after keying in the request, the full citation appeared on the screen and a copy of the article was made available within minutes.

Most of the current research and development work is focused on meeting recently legislated emissions requirements or the even more stringent

ones projected for the 1990s. Although exhaust emissions for production petrol engines and diesels may seem far removed from racing, Ricardo believe that many of the analytical design techniques and facilities of the group are applicable to racing powerplant and racing car design. In early 1989, a separate racing division within the Ricardo Group was set up to co-ordinate the firm's motoring activities. To date, involvement has been limited. Ricardo has designed, built, and sponsors a four-cylinder two-stroke engine for side-car racing. Of unusual 'Z' configuration, this engine, which has been very successful in its class of racing, produces 272hp/litre. Though this amount is less than the 320hp/litre now developed by Grand Prix motorcycle engines of the same capacity and number of cylinders, it is a good output for a 500cc side-car engine which needs to trade off peak output for a broader band width of power. Racing at the highest international levels of the sport is very competitive, and the condition under which engines function, for example, are quite far removed from normal modes of operation, as many a firm has found to their detriment when they embarked on a racing programme. Every new venture has a learning curve, and it will be interesting to see how quickly Ricardo learns to be competitive at the highest levels of the sport.

Traditionally, racing engines, the acme of the engineer's art, have been designed largely by empirically based methods. However, this approach has severe limitations, a fact demonstrated by the early difficulties and frequent revisions made to every one of the new engines developed for the 3.5-litre formula. A more sophisticated analytical design approach might have anticipated and eliminated many of the problems at the design stage, at least that is what Ricardo believe.

Certainly, it has become apparent that international motor sports requires high technology and scientific expertise and skills both in design and manufacture. The cost of acquiring or developing this capacity in-house is far beyond the resources of most racing teams and not, generally, very cost-effective for major companies to undertake. Since the Ricardo Group already has most of this technology and much expertise in place, it was decided to make these available to the racing world. Recently, the firm has put together a proposal for the design and initial development of a race engine for either Sports Prototype or Formula One; by using all the advanced tools and techniques described above, Ricardo believes that the design and development and a significant amount of in-car development can be completed within a space of two years, the sort of time frame racing clients are likely to require.

Racing clients coming to Shoreham-by-Sea will be able to take advantage of

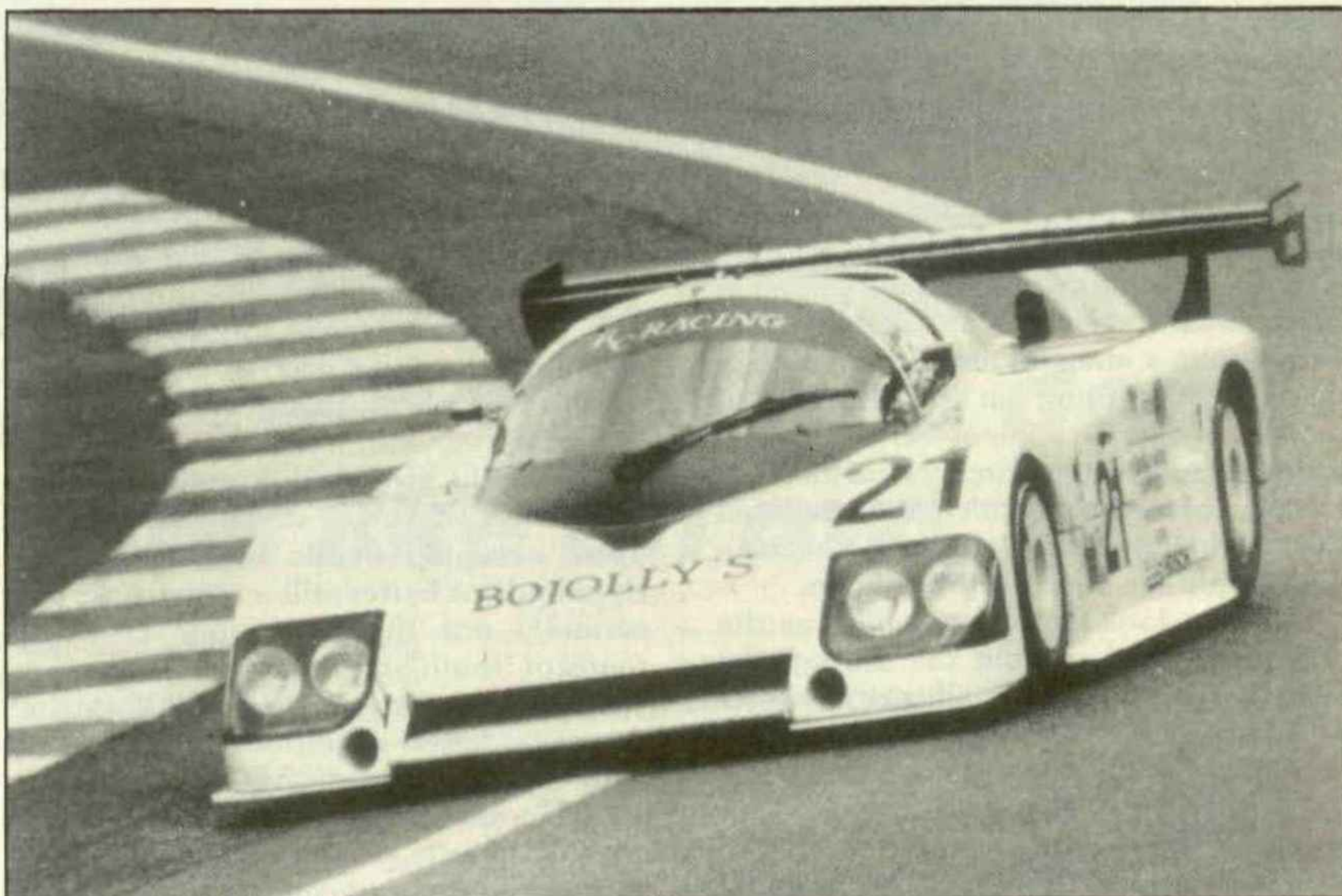
the company's design and testing capabilities in four major areas. 1) high-speed actuation and camshaft drive mechanisms, including unique programmes on valve motion prediction, stress levels, oil film behaviour, camshaft torsional vibration characteristics; 2) crankshaft design, in particular 3-D crank vibration analysis, crankcase stiffness and bearing behaviour prediction; 3) thermal and stress analysis of block and heads by finite element methods; and 4) combustion chamber and inlet and exhaust system design using advanced simulation techniques, validated by test rig experiments, and taking advantage of the company's large data base on combustion chamber and port shapes. Not only are these design facilities available, the company can also develop and build a transient test bench to optimize engine management systems for racing engines of up to 1000hp.

As became apparent during the 1989 Grand Prix season, a good gearbox, like the semi-automatic one on the Ferrari, in conjunction with a good engine can help reduce lap times considerably. Some years ago, Ricardo anticipated the greater integration of engines with transmissions, and acquired an expertise (through Ricardo-Tuck Inc., Livonia, Michigan) in this specialized area. Company engineers foresee even closer powertrain integration with a single micro-computer co-ordinating both engine and transmission to achieve optimum performance. Under the guidance of Peter Windsor Smith, formerly of Coventry Climax and latterly of Maxwell Transmissions, the Ricardo Group has schemes for a new concept, semi or fully automatic, 8-speed transmission featuring operation with 'hot shifting', a technique that reduces the time and power losses between gear changes. A transmission of this sort should appeal to racing car designers and drivers alike.

Finally, Ricardo intend to push the integrated approach in racing beyond the linkage of engine and transmission; for example, at the design stage, aerodynamics of a vehicle must be integrated with the powertrain design in such areas as the cooling system. Through another recently acquired subsidiary, Ricardo-AS & A of Letchworth, the group will be able to offer to clients, as part of a racing package, vehicle concept and a sophisticated and proven aerodynamic design capability.

The actual racing experience of the company is limited which may be one reason why the approach of the racing division is now both general and flexible. The company has indicated a willingness to undertake a variety of racing type work. Ricardo will investigate the sort of small-scale but persistent problems that afflict most racing powerplants at some time during their development and operational cycles by making use of the full range of the group's analytical and test facilities. If requested, however, the company is also prepared to design, prototype manufacture, develop, assemble and provide field support for a completely new racing engine/transmission combination, as well as its integration with the racing vehicle that it will power.

At present there are no plans to expand to include production of special, racing derived engines or cylinder heads, like Cosworth do, for example; but one cannot help but wonder whether this will change as the Ricardo Group bring its light even further out from under the bushel and becomes more deeply involved in racing. Automobile or motorcycle manufacturers may want to advertise their association with such a 'high-tech' company; it is not fanciful to imagine that before too long one might see emblazoned as a status symbol on the boot of a special high performance vehicles the name 'Ricardo'. DDH



Ricardo-AS and A has successfully applied their aerodynamic experience to sports car racing.



A Regular Ben Hur!

Having mentioned, in last month's MOTOR SPORT, a few of the competitive machines at the TT races, it seemed appropriate to road test one or two of the road-going versions of those motorcycles. Some test dates were soon arranged and since it was a Yamaha that was available first, it was to Chessington that I made my way in early September, to collect their FZR 600.

It was a rather tuned up version of this machine that propelled one Mr Reid to victory in this year's Supersport 600 TT race at an average speed of about 113 mph, and so it was with mixed emotions that I disembarked from the train, helmet in hand at Chessington North; would I survive the journey home? Would I be able to keep its 90 bhp in some semblance of order? I was also slightly worried about the gear-change: my own motorcycle is a 750 Laverda with the good old left-hand foot brake, right-hand gear-change. The Yamaha is the other way around. There were other differences too: my Laverda has its red line two-thirds of the way around its Japanese tachometer at 6500 rpm. The red line on the Yamaha was up in Formula One territory at 11,500 rpm. Being quite a merciful person, the idea of deliberately turning an engine over at those speeds struck me as verging on the sadistic. However, lurking behind all these feelings of nervous anticipation was an overwhelming desire to get on the bike and simply see how fast it would go.

I had a look around the bike as the engine warmed up, but the fairing was such that one couldn't really see the heart of the machine. Throbbing silently away behind that wall of fibreglass was a 599cc four-stroke engine; a liquid cooled unit with double overhead camshafts, and four valves per cylinder. This parallel four-cylinder engine sits transversely

across the frame, which is of box section high tensile steel, and is based on the Yamaha YZR Grand Prix frames. The engine is angled forward to lower the centre of gravity, and optimise the front/rear weight distribution. This also allows space for the Mikuni carburettors nestled between the widest part of the oval shaped chassis. The exhaust is a four into one free-flow affair and is pulse tuned. The front suspension consists of rigid 38mm forks, the rear is a double-sided swing-arm of steel box section, with a single adjustable shock absorber and damper. The brakes are twin 298mm discs and four pot calipers at the front and a single 245mm disc at the rear. Add all that to the rear-set foot rests and low handle bars, and this is clearly a purposeful machine.

Climbing aboard I hastily acquainted myself with the controls, before knocking it into first gear, and revving up the engine to move off. A slight blip on the accelerator saw 5000 rpm on the tachometer, such was the free-revving nature of the engine, and it took one or two attempts before I got the whole operation sorted out. Even then it was noticeable how unwilling the bike was to be trundled along at apathetic town driving speeds. From the very start it felt as though I was on a highly strung thoroughbred that really needed to be shown some wide open sweeping bends in the Scottish Highlands or better still a race track, but certainly not the rush hour crowded roads of South London.

Keeping the engine below 5000 rpm in those congested conditions still provided ample overtaking urge, but was perhaps a mistake: my superficial impression after the first quarter of an hour was that the engine was not that smooth, nor was the machine quite as fast as I had expected.

That, however, was before I saw my first open straight, and over 7000 rpm on the tachometer; now nothing will ever be quite the same again. My innocence has vanished. I thought that Formula Ford's were quick, I thought that a Ferrari GTO was quick, I even enjoyed the warp drive special effects in Star Trek, but nothing had quite prepared me for the absolutely staggering surge of acceleration from 7000 rpm all the way through to peak power at 10,500 rpm. The hair dryer whine of the four-cylinder engine turned to a glorious roar of power and speed as the bike hurled itself toward the horizon in a crescendo of frenzied enthusiasm. At these sorts of speeds the gear-change started to make sense as well, the long clonky throw of low speed changes turning to delicate and lightning fast knocks through the gearbox. The ratios are very closely spaced, some of the changes making a difference of only three or four hundred rpm, and there are six gears. For the car driver used to yawning gaps in the gearbox it is quite easy to lose track of what gear one is in. Top gear is some 13 mph per 1000 rpm, but it is the fact that the machine revs so highly, and that the engine doesn't really come on song until 6000 rpm that makes this bike fairly inappropriate as a town machine; the engine isn't really happy until you are exceeding the urban speed limit in first or second gear or the national speed limit in third. Conversely the top speed is not incredibly high although 130-140 mph is fast enough for anyone with a brain between their ears. The excitement in this bike is that it is an utterly uncompromising sportster with ratios and power calculated to give real high-speed capability at speeds that are at least theoretically possible on an uncrowded good quality country road.

The handling is an easy match for the power and was just as much a revelation, the ease with which the machine could be leant into corners and flicked from side to side being particularly impressive. But not quite as impressive as the actual angle of lean that was possible. The tucked away exhaust and neatly sculpted fairing offered some indication of the capabilities of this box section chassis. Even then, despite what I hoped was some pretty racy cornering the very edges of the tyres remained relatively unscathed. In four-wheeled terms this bike most closely equates with a taut and precise single-seater, it having none of the slop found in even the best saloons and hatchbacks.

The whole of the machine has its *raison d'être* in speed; be it the straight line performance, the superb brakes, the seating position, or the handling capability. To the car driver it offers a mixture of despair and hope. Despair because there is very little on four wheels that, at speeds of below 80 mph at least, cannot be overtaken with consummate ease. Hope because it costs less to buy an FZR600 than it does a Mini. CSRW.



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The badge on the nose of the GTA V6 Turbo is the only clue to the Alpine influence which is obscured in Britain for copyright reasons.

French Without Tears

If one needs an excuse at all to drive supercars, then it was the arrival of the GTA 'Le Mans' in August which triggered our desire to drive the GTA V6 Turbo, the model from which Renault's latest special edition is derived.

This most Gallic of sports cars is one that hides its light under a bushel in this country, but one which is popular and respected in mainland Europe. Does it deserve to be overlooked in Britain, the land of the Lotus, the Jaguar, the TVR and even the Ginetta, or is there more to it? A reacquaintance (see MOTOR SPORT, February, 1987) was felt to be more than justified.

As a marque, the Alpine took a long time to reach these shores, and as a model, the GTA took its time as well. Announced at the Amsterdam Show in early 1984, it took another two years for the car to cross the Channel, and then when it did, it was minus part of its nomenclature.

Due to the copyright of the Alpine name being held by Peugeot in this country (formerly Chrysler UK née Rootes), it has been robbed of the essential part of its inheritance. In the early Sixties the Dieppe concern ran A210/A220 models in French events and also at Le Mans, even winning the Index of Thermal Efficiency in 1964, but it was at the end of 1969, when Alpine

withdrew from racing to concentrate on rallying, that the Alpine name became internationally famous. The fabulous little Alpine A110 Berlinettes encompassed everything that was good about rallying at the end of the Sixties, being pretty, successful and, as it turned out, representing the dawn of the supercar in rallying.

Such was the impact of the model that it remained in production until 1976, long after its scheduled retirement. Indeed its planned successor, the A310, which was shown to the world in 1971, was actually produced alongside the A110 for the next five years.

By this time the involvement with Renault had greatly increased. In the Sixties, Alpine-Renaults were sold through the Regie's dealer network in France, in 1970 Alpine became responsible for the entire Regie Renault competition department and then in 1978, Renault completely took over the Dieppe company. Although Alpine-Renaults were still manufactured, the Dieppe factory produced the highly specialised, but low volume, cars such as the 5 Turbo One and Two and the Maxi 5 Turbo. It was still years away, though, before the first Alpine would be officially imported into Britain.

Everything about the GTA range differentiates it from the normal Renault: looks, construction and price. Even the

normally aspirated GTA V6, at £25,135 is £1200 more expensive than the top of the range 25 Baccara V6, while the GTA V6 Turbo, at £29,995, is almost £5000 dearer. The newly announced GTA Le Mans is a cool £36,995.

The proportions of the sleek glass-reinforced-plastic (grp) disguise the fact that, unusually, this is a rear-engined car and not mid-engined. The all-aluminium, single overhead cam per cylinder head unit is mounted longitudinally, supported by three mountings in a detachable sub-frame, in the rear with the five-speed transaxle gearbox in front of it.

The engine itself is a development of that found in the Renault 25 V6 Turbo, but produces 10 per cent greater power and 3½ per cent more torque at 214 lb ft at 2500 rpm.

Integrated into the fully mapped Renix engine management system is the Garrett AirResearch T3 turbocharger which works in conjunction with an air-to-air inter-cooler. Unlike the earlier versions, the latest models are fitted with a three-way catalytic convertor, shaving the maximum brake horsepower from 200 to 185 at 5750 rpm, but necessary in the name of ecology. Unleaded fuel is obviously mandatory.

The transmission is actually located behind the driver, as it was on the A310, and is operated by a twin-tube gearlever mechanism. The gearbox is driven through a hydraulically operated, single dry plate, diaphragm spring clutch.

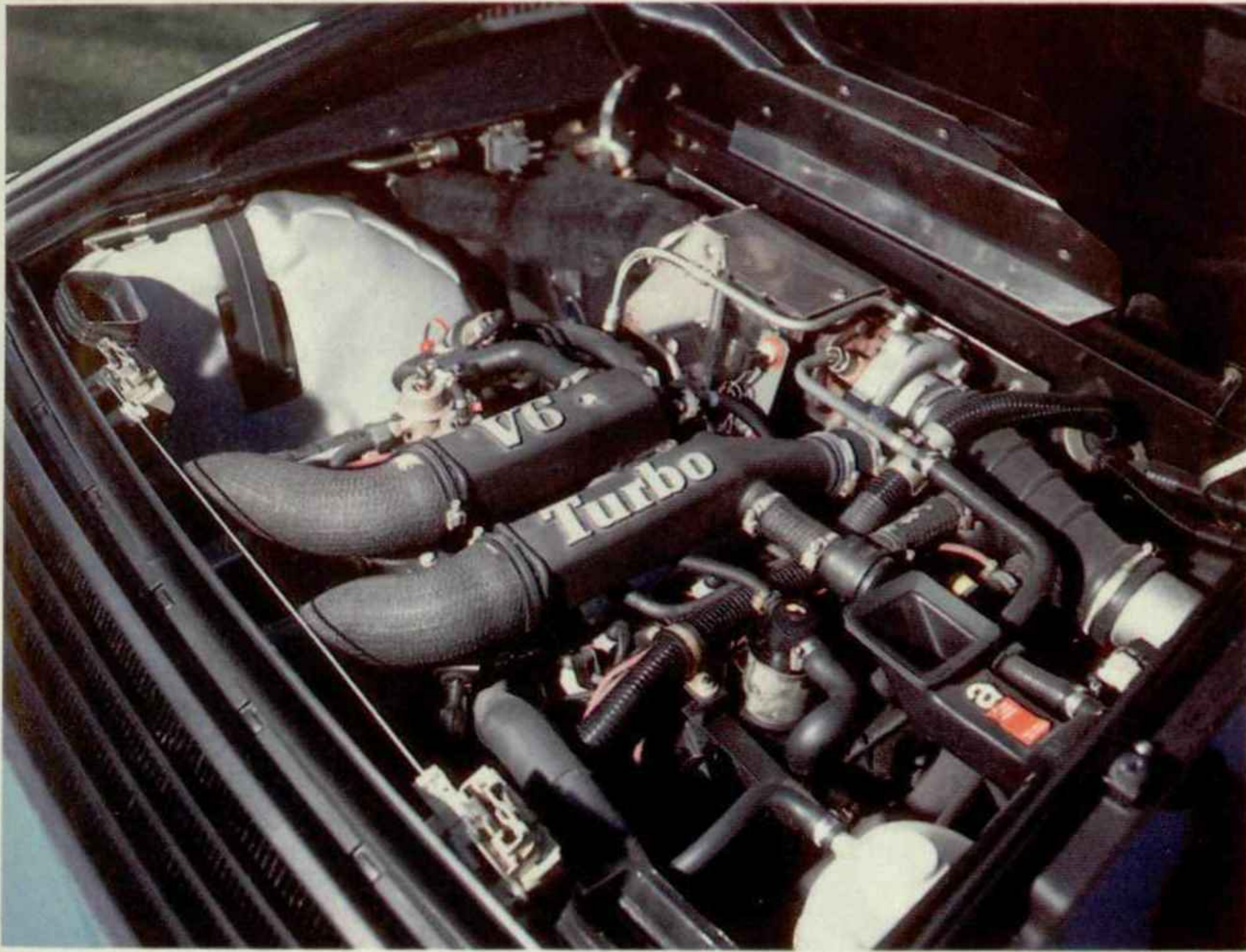
The engine bay is accessed via a glass

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The V6 Turbo engine sits aft of the rear axle and snugly in its bay.

hatch, which is raised on gas struts, and is underneath a carpeted and insulated engine cover. Despite the incorporation of air ducts leading out of the area, the heat dissipation is still inadequate and can cause the engine lid to become too hot to touch after a lengthy and fast run. The space-saver spare wheel, located on the nearside of the engine compartment, is insulated to a certain extent by a heat-protective cover.

Overall, the method of construction is quite noteworthy. It was on the A108, the Dauphine-based model of 1957, that Jean Redelé, the founder and designer, first used fibreglass, and it was on a notable variant of that model, the Berlinette Tour de France of 1961, that a backbone-type chassis was first used in the construction of the car, and both factors have been retained in the construction of Alpines ever since.

The bodyshell of the GTA is both light and strong, having been manufactured out of grp, which is reputed to be three times stronger than steel by weight. It also has the side benefit of having a greater resistance to corrosion. Extra passenger safety is provided for by the addition of a tubular safety cell made up of reinforcing tubes, steel-reinforced body sides and front and rear panels. The wings have been made by the reinforced reaction injection moulding process to give better resistance to deformation. Altogether the car tips the scales at 23.3 cwt (1187 kg), which actually is not any lighter than comparable cars.

Great attention has been paid to design detail to keep the drag factor to a low 0.30Cd. The front air dam, flush windows, flush door handles, headlamps, air intakes and generally slippery shape have played their part here and helped caress a superb performance out of the 'modest' 185 bhp that is available.

Double wishbone suspension front and rear, ventilated discs all-round and constant velocity universal joints fitted to both ends of each driveshaft ensure that the car has the best set-up for a rear-drive performance car.

Inside, the dashboard and layout is quite unlike any other car. The ergonomics are reasonable, but there is room for improvement. The two large dials directly in front of the driver are the speedometer on the left and the rev counter, red lined at 6100 rpm, on the right and in between them is a turbo boost gauge and the LCD computer display. The binnacle containing these dials is flanked by switchgear. Above is the heating and ventilation control, and housed underneath on the left is the water temperature gauge, oil pressure gauge and, sensibly, an oil level indicator. Beneath these are switches for the rear screen heater etc while on the right are a row of four other switches.

The central console houses a Philips stereo radio/cassette system which can be remotely controlled from a stalk on the steering column which is just as well as the control panel is so complicated that you would need to sit in a traffic jam of Dartford Tunnel rush hour proportions to justify the time spent in mastering it. The switches for the electric windows are to the left of the short stubby gearlever and the handbrake is unusually on the right, between the driver's seat and the door. There are no door handles, but as you press a switch, the door slightly comes ajar, a method of opening which also applies when gaining entry from the outside.

The driving position is reasonable, despite the steering wheel not being adjustable, but it is not helped by the poor pedal arrangement. To start with, the pedals are located too closely together. Worst pedal

is the clutch which, being hinged at the bottom, as are the brake and accelerator, too often cause the driver's foot to get caught up in the bottom of the fascia. It was never hazardous when driving, just immensely irritating as the toes on the left foot were momentarily wedged out of position. Another astonishing oversight is the lack of a footrest for the left leg. There is a slight gap between the clutch pedal and the central console, but it is designed for only the daintiest of feet. Motorway journeys entail placing the left foot in front of the pedal, which becomes tiring after a while.

The wipers are extraordinary. Press the left-hand switchgear down and the wipers appear as if a giant, slightly drunk, butterfly has decided to spread its wings. The two blades meet up in the centre, travel together slightly off-centre to the left, then flap down again. They really did remind us of a daddy longlegs in that they were ungainly, spindly and slightly uncoordinated. They also did not do a very efficient job as we found when the screen dried out and we saw the subsequent thick muddy stain on the screen left after the wipers had performed their mating ritual.

The sun visor for the driver is not particularly good either because it doesn't actually flap forward onto the windscreen, in fact there is a gap of about two inches between the forward movement of the visor and the windscreen. It also has a mirror on the back which is very off-putting.

In front of the passenger there is a sort of leather pouch, too slim for anything but the odd parking ticket, but underneath there is the usual cubbyhole, although it is not particularly large. Other oddment space includes hinged shelves in both the doors and in the centre console between the seats there are two compartments suitable for cassettes.

Unlike most mid-engined cars, the rear seating is actually not too bad. Admittedly you have to be under 12 years of age not to be too uncomfortable, but a six-footer can be seated at a pinch. The front seats are supportive and adjustable for rake and height and I found them to be almost as comfortable as the Recaros in my RS Turbo.

Visibility to the front and side is good, but the C pillars obscure the rear three-quarter view, while the engine cover takes up a portion of the area visible through the rear-view mirror.

Even with 'only' 185 bhp at its disposal, the GTA V6 Turbo still has a top speed just in excess of 150 mph and is capable of sprinting to 60 mph in 6.5 seconds and onto 100 mph in only 17.3 secs. With 63 per cent of the weight biased to the rear you can feel the 255/45 Pirelli P7s really dig in when the clutch is dropped. In fact so great is the grip, the clutch can be dropped from very high revs before prompting any wheelspin at all.

Quick as the GTA V6 Turbo is in a straight line, it is not this aspect which pleases most, for that is provided by the torque characteristic. It was a journey on the A10 between Ely and King's Lynn that

the brisk overtaking abilities of the car came to the fore. One would come up behind a couple of fully laden lorries, find the road ahead clear, and having ensured the engine speed was greater than 3500 rpm to get over any turbo lag, stab the accelerator pedal to catapult past the obstruction, until one reached the next mobile roadblock. Below 3500 rpm, one has to wait for the turbo boost to build up, which means that the rev range of the car is in effect limited to the 2600 rpm band between 3500 and 6100 rpm.

The gearbox was consistently superb, the gearchange in every case being one precise, slick movement. Indicated speeds at the 6100 rpm rev limiter were 38 mph in first, 60 mph in second, 95 mph in third, 130 mph in fourth and a top speed of 151 mph.

Despite the proximity of the V6 engine and the plastic body, the car's refinement is really quite reasonable. Wind noise is almost non-existent, even to the extent of being able to lower the window at speed and not be drowned out by the roar of the wind. The engine noise is subdued and is easily drowned out by the roar of the tyres.

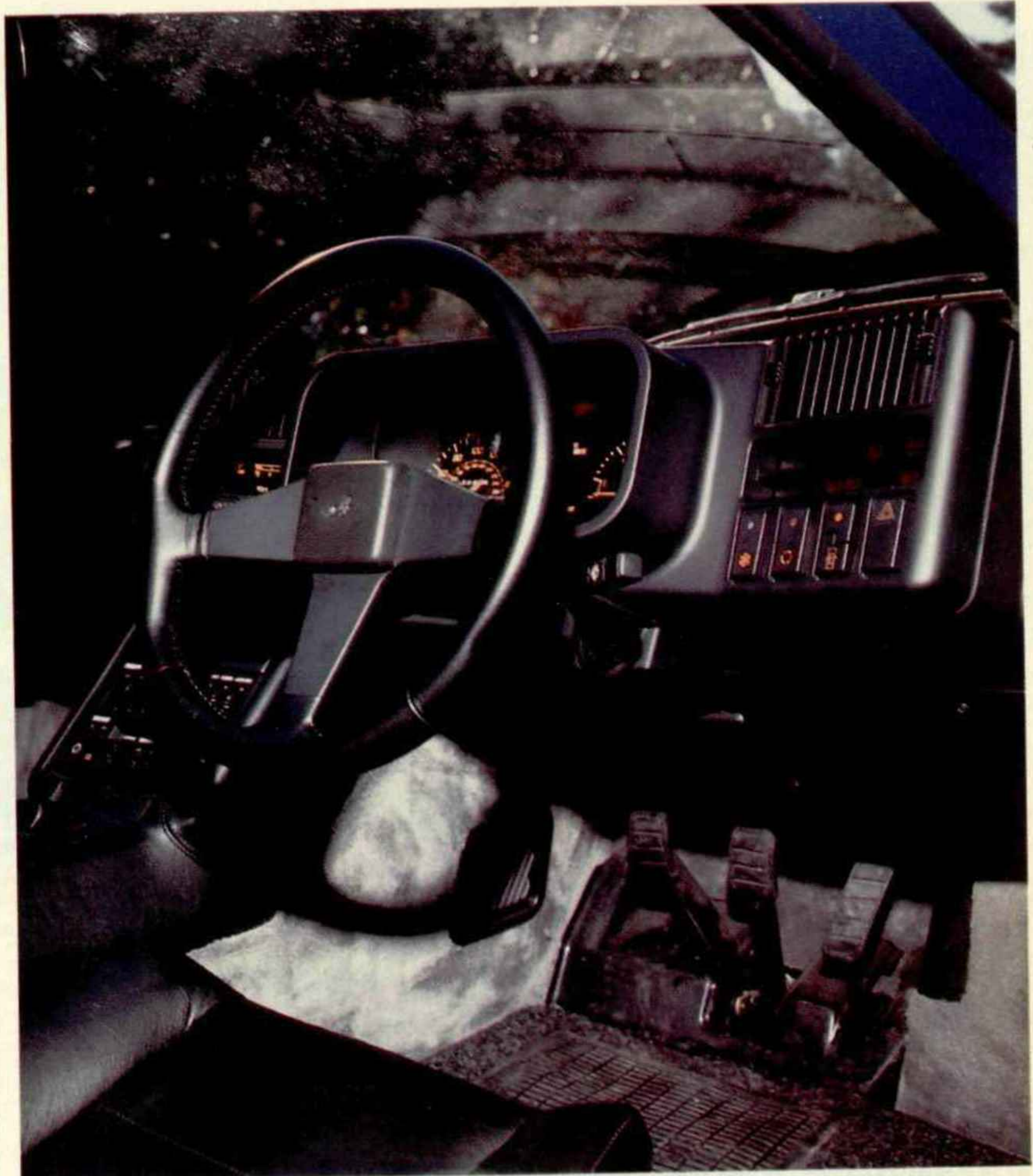
Despite a relatively soft suspension, the ride is quite hard, particularly at low speeds over pockmarked roads, small potholes and ripples showing up the deficiencies the most glaringly, but on the other hand, there is hardly any body roll when cornering hard.

Being a rear-engined car, one naturally has to treat corners with respect, especially in the wet. In the dry, the enormous grip of the tyres actually endows the GTA with the more predictable understeering characteristic, but enter a corner too quickly and lifting-off to tighten the line can result in the back of the car swinging way out of line into a massive oversteer before swinging back the other way as you fight to keep it in shape. Unnerving in the dry, the pendulum effect can be catastrophic in the wet.

Another aspect one has to be aware of is the effect of the turbo boost. Unleash the power too soon into a corner and the rear wheels will lose their grip as a sudden surge of power is transmitted to the road surface. In the dry, this can be contained by feathering the throttle, but in the wet you could be asking for big trouble. After much practice, and plenty of open space, it was possible to get the tail out in a controlled manoeuvre when cornering, but all it takes is the slightest ripple in the tarmac to upset the equilibrium and to set in motion the pendulum effect. Under normal traffic conditions, though, the car is quite predictable, although one should never become complacent.

The steering is rack and pinion and is very precise. There are almost three complete turns from lock to lock.

The ABS brakes stood up to quite an amount of abuse on the test, but the chance to do a few non-competitive laps around a circuit soon showed up the inadequacies of the all-round ventilated discs. Within no time at all, the brake warning light was



The pedals hinged at the bottom and their location was a source of discomfort.

coming on advising me to stop. In fact, the pads had not worn down, but had just become too hot and had lost their efficiency temporarily. Fitted with ABS, though, they give the driver a reassurance under normal road conditions.

This is a car more in the image of a Porsche than that of a Lotus, meaning that it can be used as an everyday car without causing the stress sometimes engendered in supercars on a daily basis. It is not an ideal town car, but in having good visibility, it is better than some. It thrives on cross-country runs and has the power to sustain fast motorway journeys, although the pedal arrangement takes away some of that pleasure.

The GTA V6 Turbo may be getting a little long in the tooth now, but it still remains a fine car. It does not have many rivals, although the obvious one is the Lotus Esprit Turbo, and at £5 under £30,000 represents quite good value for money. One does have to remember, though, that this is a driver's car, and one that does not like being mistreated. If it is, it will react strongly and dangerously. One also has to remember that there are a few niggling little faults which may seem unimportant in a week's drive, but which could become very irksome when living with the car. WPK

TECHNICAL DATA

Model: Renault GTA V6 Turbo.

Manufacturer: Soci t  Alpine-Renault, Avenue de Breature, 76201 Dieppe, France.

UK Distributor: Renault UK Ltd, Western Avenue, London, W3 0R2.

Specification: 2+2 seater coup  with a synthetic body, available with a 2.5-litre turbo-charged V6 engine giving 185 bhp.

Body Weight: 23.3 cwt (1187 kg).

Engine: Cylinders: 90  V6.
Bore/Stroke: 91 x 63mm.
CC: 2458.
Compression Ratio: 8.6:1.
Max Torque: 214 lb ft at 2500 rpm.
Max Power: 185 bhp at 5750 rpm.
Garrett Air Research T3 turbocharger with charge-air cooler.

Transmission: 5 speed manual. Final drive ratio 3.444.
Gear ratios: 1st 3.364.
2nd 2.059. 3rd 1.381. 4th 1.037. 5th 0.821.
R 3.545.

Suspension: Front and Rear: Independent, double wishbone, coil springs, telescopic dampers, anti-roll bar.

Brakes: Dual circuits, split diagonally. 10.2 in dia ventilated discs all round. ABS.

Dimensions: Wheelbase: 92"/2339mm.
Front track: 58.7"/1493mm.
Rear track: 57.5"/1462mm.
Length: 170.5"/4330mm.
Width: 69.1"/1755mm.
Height: 47"/1197mm.

Performance: Max Speed: 151 mph;
0-60 mph - 6.5 secs.;
0-100 mph - 17.3 secs.

Price: £29,995.

PREDATOR



The headlamps were the most controversial part of the C-V8's idiosyncratic styling....

It seemed like it was going to be the hottest day in August when I went to see last month's strange Anglo-American V8 cocktail, the Allard J1, but it would have been Murray Walkerish of me to assume that it was before August had actually ended, because it seemed just as hot, if not hotter, when I went to drive in and photograph this beautiful Jensen C-V8.

I had covered most of the journey to Herne-Bay, the home of this car and its owner Tony Clark, the night before and I stayed in neighbouring Whitstable.

Whitstable, as you probably know, is a rather pleasant seaside town on the North Kent coast, and when I arrived the Whitsta-

bleites had just finished a week's festivities concerned with that squidgy crustacean, the oyster. I suppose that I am a culinary Philistine because I can't stand the things, and so it is not for the sake of the oyster that the name Whitstable will remain forever etched on my mind. It will be for the sake of a rather potent local brew, aptly named Spitfire, for that is exactly what it did.

It was with bleary eyes therefore, that I first saw the shining paintwork of Tony's C-V8 the following morning, and it was feintly numbed senses that struggled to appreciate the idiosyncratic beauty of this early Sixties sports tourer.

By the end of the Fifties the Jensen brothers were beginning to develop ideas

on a replacement model for the 541, and anxious to put these to some efficient use, and to inject some fresh insight into the development of their cars, they decided to appoint a new deputy chief engineer. This post eventually fell to Kevin Beattie, who had cut his teeth in the automotive industry with the Rootes Empire, working for them in Australia but returning to England in the late Fifties. On his return he was disappointed to find that the Unions were casting their Medusa like spell on the Rootes production performance, as they were on much of British industry, and he became keen to dedicate his enthusiasm to a smaller company, less hampered by constant ratifications and tea-breaks.

From the outset of his appointment he involved himself with the development of the new car. At the time the fashion in Grand-Tourer sports design was very much turning towards using automatic transmission. Jensen had been receiving more and more orders for automatic transmission on their 541, to the extent that by the end of the Fifties it was standard specification, with manual being an option that needed to be specially ordered. However there was a problem involved in making the 541 automatic; the Austin DS5 4-litre engine had rather inappropriate torque characteristics, and it certainly didn't offer the sort of performance expected of the Jensen marque. Aston Martin had suffered a similar problem with the automatic option of their DB4, but the twin-cam Aston engine was still considerably more powerful than the Austin unit.

The solution for Jensen was obviously to get more power at lower revs, and as the philosophy of WO Bentley would testify, there is no substitute for cubes! Jaguar were heading down the right road with the introduction of their 3.8-litre and 4.2-litre engines, and as we saw last month Sydney Allard had spotted the advantages of a large V8 engine with locomotive pulling power. It was Jensen's turn to cast their eyes over the Atlantic and seek the answer to their problems in a large, firing at every lamppost, American V8. Unlike Allard who had gone to Ford, and Gordon-Keeble who had used a Chevrolet engine, Jensen courted Chrysler for the use of their 5.9-litre V8 and the fine Torque-Flite transmission that came with it. It was a fairly mildly tuned lump, with quiet hydraulic tappets, an unambitious compression ratio of 9:1, and a maximum rpm of 5100. Nevertheless it was still adequately powerful, and when it wasn't struggling to power an American gin-palace on wheels it could coax a decent turn of speed out of a more athletic and less obese European chassis. In fact it produced 305 bhp and the contrast between this and the Austin's asthmatic 130 bhp was sufficient to persuade the Jensen engineers and management of the need to build a new chassis to accommodate the engine.

Kevin Beattie took it upon himself to design the new chassis frame, but it was his first attempt at a complete chassis design and the end result was somewhat flawed. It



...but the car has a distinctive beauty made all the more apparent in our contemporary era of jelly mould styling.

consisted of two parallel 4-inch tubes running down the centre of the car, with cross members to support the suspension, the scuttle and the rear seat pans. It was lighter than the 541 chassis, but it had less structural rigidity, and by the time sill sections and outriggers had been added to compensate for this, it was heavier and had more confined foot room. Despite the problems production went ahead, with Eric Neale designing the bodywork, and thus the C-V8 was born.

The design of the bodywork was the subject of mixed praise at the time, and



C-V8 one important fact was never published; ie, the headlamp clusters were designed to have a perspex cover held in the peripheral chrome-plated mouldings, thus giving the finest airflow and appearance. However, at the last minute Richard Jensen said 'no', because he was scared of their affecting the light emission. If I had known earlier that we were not to use the perspex covers I would have designed the headlamp layout differently, and of course there would have been no need for the peripheral chrome-plated mouldings; I would have



even today the car looks slightly awkward; but I think that it has an eccentric charm made all the more pronounced by its nonconformist lines and proportions. The most striking feature of the car, the shark-like nose and the predatory headlights was also the area that came in for most criticism. Certainly the styling aroused strong feelings, but as Eric Neale realised, that was no bad thing; there is probably no stronger evidence for the fact that something will be viewed as historically insignificant than unexcited universal assent at the time of its creation. Neale later defended his design as quoted in Keith Sanderson's excellent book on the Jensen marque: "My natural concern was to try to maintain good airflow, and so I placed the lamps in position following the contours of the body; the smaller lamps inboard of the larger ones and mounted lower and further forward. To be successful as a designer of car bodies one must create a very positive reaction from potential customers; either love or hate, or both! I was always dismayed that in the case of the





Just when you thought it was safe to go back on the sea front...The Jensen C-V8, however, was by no means all mouth and no trousers: 0-60 mph took seven seconds, and it had a top speed of 130 mph.

designed separate bezels for each lamp."

The rest of the bodywork excited less criticism, apart from the ridges above the wheel arches that were necessary to give the fibreglass structural rigidity, but it remained a design notable for the fact that people either liked it a lot, or couldn't stand the sight of it. The curvaceous waste over the rear wheel arch, and the shape of the side windows and door were particularly pleasing, and the air intake on the bonnet was better than that of the Gordon Keeble, although as a whole it lacked the latter's unity of design: it had a more old fashioned and dated feel to it.

Mechanically the focal point of interest was the Chrysler V8 engine. The older cars were fitted with the 5.9-litre Chrysler engine, before Chrysler discontinued this unit and replaced it with a 6.3-litre engine. The compression ratio was revised in the later engine to 10:1, and the power of 330 bhp was also more considerable. This in fact made no difference to the rev-limited top speed, but it made the acceleration more brisk. This Chrysler engine is particularly smooth and of course has that characteristic V8 burble, although the note is sharper and more aggressive than that of the Gordon-Keeble's Chevrolet. The Allard's Mercury was positively amicable. The smoothness of the engine was promoted by the inherent qualities of the design, and also the fine Chrysler engineering. The crankshaft was also counterbalanced, and had torsional vibration dampers.

The engine was mated to a fully automatic three-speed gearbox in line with an hydraulic torque converter that was operative in all three gears. Such is the quality of the Torque-Flite transmission that gearchanges are barely perceptible; moreover when the automatic was tested against a manual car by *The Autocar* it proved to be considerably quicker in acceleration. It only lost out against the manual in terms of absolute speed, presu-

mably because the automatic transmission absorbed rather more power than the manual box.

The one significant criticism of the transmission set-up, and even pottering about Herne-Bay one had an inkling of this from the acceleration in first gear, was the fact that using the kickdown gearchange at speeds below 43 mph would drop you into first gear and the resultant surge of acceleration was genuinely savage; it could have you up the back of the car you meant to overtake, or scrabbling for grip on a loose and slippery surface. All the more fun in my opinion; as PJ O'Rourke said, if you create a completely safe horse you end up with a cow, and wouldn't life be dull?

The suspension of the C-V8 was fairly conventional, with wishbones, helical springs, and an anti-roll bar at the front, and with the rear axle on semi-elliptic springs with a Panhard rod. Unsophisticated, but very practical, to judge from the contemporary road reports: "The car is extremely well balanced for cornering with almost neutral handling characteristics biased to the slight understeer that most drivers prefer. When hurried through corners almost to the limit the Jensen remains predictable and easily manageable." "With its nearly even weight distribution, and fairly high geared rack and pinion steering, the Jensen handles in a precise, responsive, almost sprightly way that suggests a much smaller car."

For the Mark II model Jensen fitted Selectaride adjustable rear dampers, with four different settings controlled from the driver's seat. Whether this was quite the "electronic, self regulating, variable damping, suspension system" fitted to some of today's cars I'm not sure, but it takes less time to say 'Selectaride'. Other modifications during the course of production were confined to insignificant detailing:

the removal of the ridge from the boot, the removal of the door handle from the front of the bonnet, and in the Mark III the redesigning of the headlamp clusters and the removal of the controversial chrome moulding.

As we threaded our way through the holiday traffic and past the numerous road works that had been carefully placed to further complicate the Herne-Bay road system, it struck me that a powerful V8 sports-tourer affords one the best of both worlds. The engine is large enough to propel you, a couple of passengers and a considerable amount of luggage at speeds that make motoring exciting rather than something that has to be endured. In a Ferrari there is pure excitement, in a Rolls-Royce there is pampered luxury; a car like the C-V8 combines something of the two.

In terms of basic equipment the C-V8 came with a Motorola transistor radio with twin rear speakers, a petrol filler cap unlocked by a switch on the dashboard, a fire extinguisher, bonnet and boot lights, an illuminated cigarette lighter, a first-aid pack and detachable storage boxes in the front and rear armrests. The seats were fully adjustable, the accelerator pedal was adjustable for height and the steering column was telescopic. There was a vast cubbyhole, a clock and a map light, and the instrument panel consisted of matching Jaeger dials.

But it wasn't simply in terms of specification that the Jensen flattered its occupants. The atmosphere of the car was equally important and sinking back into the leather seats, amid the tanned cloth lining and the veneer finish and dashboard, is rather like relaxing in an English country house's drawing room, or the Drones Club without the food fights. And so it was no coincidence that Jensen commissioned Hardy Amies of Savile Row to redesign the interior of the Mk III model. In the end however, the venture proved unsuccessful, and the Jensen management resorted to their own good taste, which was quite clearly good enough.

A couple of small boys on the Herne-Bay sea front seemed to appreciate the car too, although not surprisingly their questions were confined to "how fast does it go?", and "how much is it worth?". Tony's answers of "90 mph in second gear", and "a fair amount" seemed to keep them happy enough, and their eyes lit up with excitement at the boom of the exhaust as Tony fired the engine, and moved off with a little demonstration display of first gear acceleration. They certainly didn't seem too bothered about the headlight arrangement or the car's eccentric lines, and it was a shame to think that as petrol prices rise due to Saddam Insane's antics in the Gulf, machines like this could all too easily be confined to the garage, and we might all be left to wonder at only the muted whine of an electric shopping trolley. I hope not.

CSRW
MOTOR SPORT would like to thank Tony Clark for allowing us to photograph and ride in his Jensen C-V8.



Included in the auction is a 1955 Jaguar D-type sports racing car est. \$A2-3 mil.

Important Motor Car Auction.

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CHRISTIE'S



Rare sight: a 16/60 Turcat Méry in the Surrey countryside in 1925.

Turcat Méry

At the end of the piece about the ABC light-car July issue, I mentioned that when the Company responsible for this vintage light-car ran out of steam its Sales Manager, HH Vaughan Knight, moved on to look after the interests of the Windsor. Sure enough, this gentleman led a team of these well made 10.4hp British small cars with the R-R like radiators in the MCC Exeter Trial at the end of 1924, the other drivers being RC Glazier and AF Milne; all three gained gold medals.

So it seemed appropriate to devote the next article in this long running series to the Windsor. However, it is not the practice among motoring writers for 'dog to eat dog' (or is it?) so when I heard that

another motoring-scribe, in another place, is about to tell us about this make of car, I decided I had better drop the idea. Instead, let us think about an automobile of far-longer standing and which is probably even less well remembered, the Turcat-Méry. This make was, indeed, among the pioneers of the motoring movement, having first appeared in the now far away year of 1898.

The horseless carriage was then a decidedly unknown quantity. But inspired by the Paris-Bordeaux-Paris race of 1895 (won by Emile Levassor's Panhard-Levassor, at the tiller of which this early racing exponent spent not far short of 49 racing hours, in covering the 732 mile route) Alphonse Méry bought a replica (no

problems with the word then!) of the winning car, the first motor vehicle in Marseilles. This Panhard with its verticle-twin cylinder Daimler motor gave Méry his first taste of the freedom of travel that was to come. It was replaced by an early Peugeot, which was a considerable improvement on the Panhard. After experience of both cars M Leon Turcat, who had collected the Peugeot for his brother-in-law Alphonse Méry and had met M Armand and Mme Peugeot, decided with Méry's brother Simon to build a car of their own, improving on what they had discovered, rather as Henry Royce bought a French Decauville and used it as the basis on which to construct a rather better two-cylinder Royce car. Turcat and Méry knew of the electric ignition that the Marquis de Dion was using for the high-speed engines of his tricycles and they intended to use this system, instead of hot-tube ignition, and to have a four-cylinder engine instead of the two-cylinder power units they had experienced in the Panhard and the Peugeot.

The firm of Turcat Méry et Cie was formed and the first car built in a rented shed. It had the intended four-cylinder engine, a five-forward speed gearbox, the 'electric firing', and home-made parts. A pump manufacturer did the necessary machining and a flour miller made the transmission and ball bearings for its wheels. Eight orders were received.

This enabled the partners to move into their own works, in their home town of Marseilles.

This was eventually to be equipped with ten lathes, two gear-cutters, a planing machine, a honer, an upright lathe, and stations for the fitters, die-makers, blacksmiths and the other workers. At a time when factory machinery was usually driven by steam engines, Turcat et Méry used a gas engine, and overhead shafting with American type split wooden pulleys instead of keyed pulleys. The partners in this pioneering car manufacturing venture were thus Simon Méry, who managed the factory, and Leon Turcat. Méry, whose eldest brother Alphonse had supplied the Panhard and Peugeot on which the ambitions were founded, had graduated from the Engineering School at Marseilles. Turcat had studied at the Ecole Polytechnique before leaving to run the family firm of cooking fat suppliers. Before that he had been at the Commercial High School in Marseilles and had been to Liverpool to study English.

For a time it was hard going. The company had been started on a capital of 350,000 francs, part of which was used to build the works. When this was nearly exhausted Ernest Fabre, whose father had pioneered the hydroplane, came generously to the rescue. Turcat's father took a considerable interest in his son's efforts and Méry's brother Louis came into manage the Marseilles factory and meet customers such as General Lyantey. Another person who assisted financially

was M Farconnet, who managed a big sulphur refining plant. He also introduced Turcat to Jellinek of Cannstatt, head of Daimler-Mercedes, who effected a meeting with Robert Bosch, with whom Turcat co-operated in improving the l.t. magneto.

A second prototype car was built but was deemed too heavy and costly. So a lighter car was devised, completed by 1901. This was the commencement of the Turcat-Méry marque. However,* Forconnet had introduced Turcat to Paul Meyan, a very influential figure in French automobile circles, who in turn introduced him to Baron de Turkheim of de Dietrich in Luneville, well established producers of railway equipment. The company had thought of making cars but was not impressed with those available, until in 1902 the Baron tried a Turcat-Méry. This led to Turcat and his partner Méry leaving their Marseilles factory in charge of Louis Méry when they moved to Luneville, and later to Paris, to design cars under the systeme Turcat-Méry, both for de Dietrich and for their own company. All experimental work was, however, carried out at the Marseilles factory.

Production eventually got into its stride and the Turcat-Méry of pre-1914 times gained a very good reputation. It was made in various sizes, from the 18hp model to an inspiring chain-drive 10.2-litre six-cylinder chassis introduced in 1907. Mostly, however, the cars from Marseilles in the Edwardian period were conventional L-head types, of from 3.3-litres to 6.3-litres. The bigger engines had pressure lubrication, with the novelty on the 35hp of a warning bell to indicate low oil pressure! The de Dietrich association caused the make to acquire a mild competition flavour. Henri Rougier managed to finish in the ill-fated Paris-Madrid race of 1903 and he did well in the Mont Ventoux hillclimbs. For the Gordon Bennett eliminating trials Turcat-Méry built two 12.8-litre racing cars which were identical to the 1904 GB de Dietrich entries. Rougier's TM ran in the GB race itself, and was third home behind Théry's winning Richard-Brasier and Jenatzy's Mercedes, averaging 46.8 mph for the 318 miles.

Around this time sporting bodywork, some of it unusual in concept, was put on the TM chassis and in 1911 Rougier put the make once more in the public eye by winning the first Monte Carlo Rally with a Turcat-Méry saloon, starting from Paris in this winter marathon. The sole concessionaire in England was the Westminster Motor Car Garage Ltd, of Page Street, Westminster. Young draftsmen like Cotal, and Paul Englehard who later managed the Rochet-Schneider Company, were engaged, and mica for the l.t. sparking plugs was bought from Citroën and Hinstin long before they made cars. In 1907 Leon Turcat went to the USA to study the production methods of companies ranging from Ford to Packard.

After the 1914/18 war the Marseilles factory of Turcat-Méry SA came up with a 15/25hp car of pre-war design, of which the

fixed-head engine and cone clutch bore some evidence. It was handled here by Chas Jarrott & Letts Ltd, who had strong de Dietrich connections. They showed two closed cars, a tourer, and a chassis, at White City in 1920. The chassis price of this 15.9hp 80 x 150mm (3016cc) monobloc four-cylinder TM was £1050. It had pressure lubrication and a unit four-speed gearbox but retained a cone clutch. Unusual care had been taken to assist the owner driver with engine oiling. In those times even new cars consumed quite a lot of oil. I will not bore you with the very minute quantities of Castrol my Ford Sierra needs between 6000 mile servicing after 40,000 miles, but it was not always like that! And TM had a large oil filler, an oil level indicator, and a reserve tank from which, on operation of a lever, a supply of oil could be let into the sump. Another refinement not general in the early 1920s was a fuel gauge and a speedometer drive from the gearbox tail-shaft. The closed coachwork was delightfully 'French'.

Another thoughtful item was the provision of a funnel for the petrol filler, on the engine side of the bulkhead, which a cam folded down as the bonnet was closed. The TM radiator was lipped, rather like that of a Léon-Bolleé, and its filler cap was attached by a link to prevent loss. The flirtation with the English market soon receded but in France the make was kept in the eye of the public when a team of very neat sports four-seaters with large front wheel brakes pedal-operated with the transmission brake, was entered for the 1921 Circuit de Course, Rougier's Turcat-Méry being second to a Bignan and his team-mates third, fourth and fifth. The make was also successful in some of those prolific smaller French speed hillclimbs.

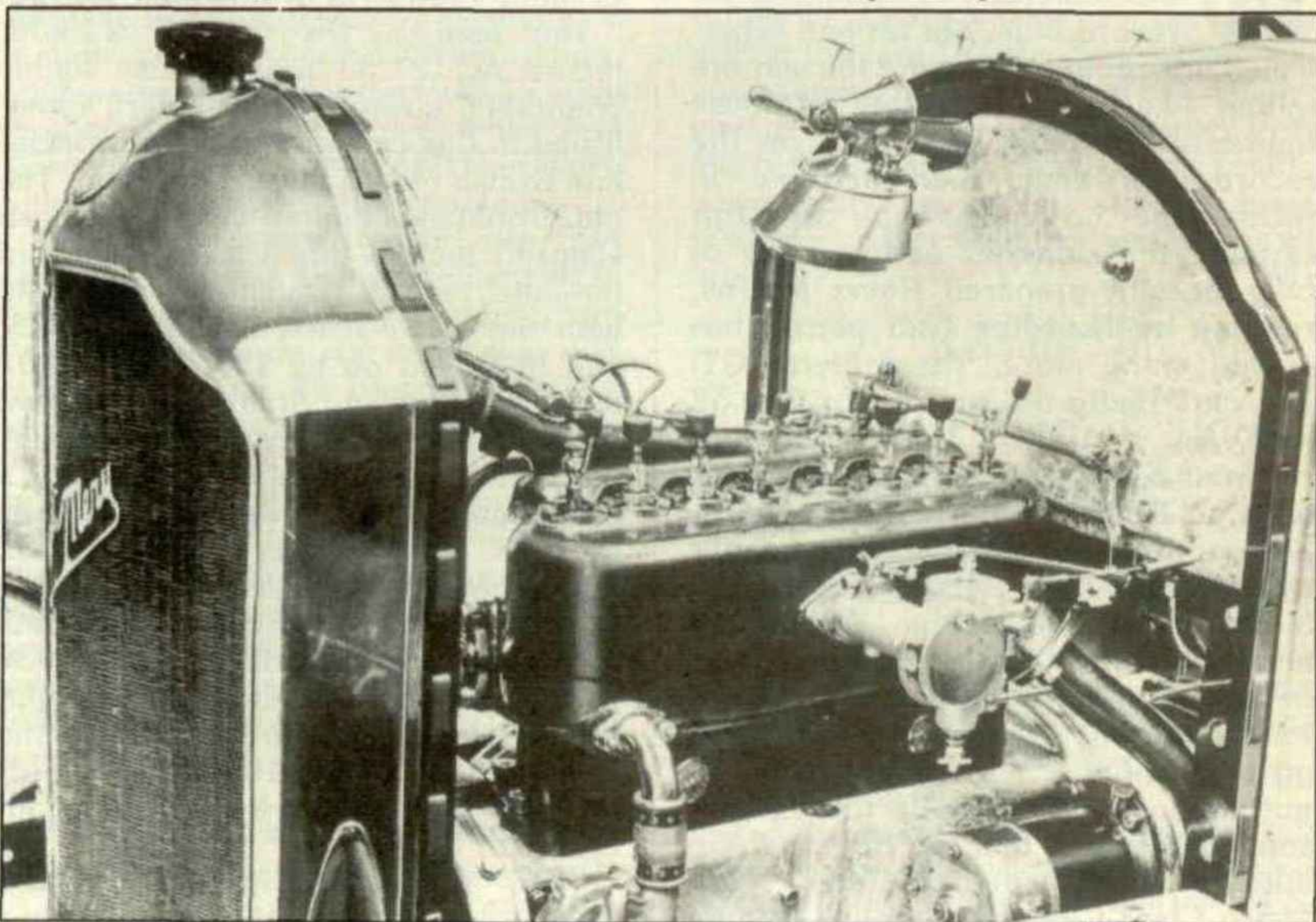
The next development was the introduction of a very neat overhead camshaft Turcat-Méry, known here as the 16/60hp model, its engine a four-cylinder of 79.6 x 120mm (2376cc), which had near vertical

valves, rocker prodded from the vertical shaft driven camshaft, a very accessible magneto, and a clean outline. To this end, too, the vacuum tank and the electric horn, on the driver's side of the bulkhead, were concealed behind TM monogrammed lids, between which was an extensible under-bonnet lamp. Warwickshire Motors of Gt Portland Street were trying to interest buyers in this new ohc car, and had a trial touring body hastily put on their demonstration chassis. It had gear ratios of 18.7, 12.9, 8.5 and 4.9 to 1, a wheelbase of 10ft 6in, and ran on 820 x 120 tyres. The standard tourer sold for £665 and had a new style radiator.

It must have been interesting to try such a rare car. On a short excursion into Surrey one tester discovered that the gears had to be used, which the engine would repay by attaining 'a really high crankshaft speed'. The gearchange, up and down, was praised to the hilt, in spite of no stop being fitted to the plate clutch. Hills like White Downs were climbed effectively, but hailing from France, the noise from the TM's new valve gear and exhaust were noticeable to English ears. The steering, with very large but plain bearings, was stiff, with absolutely no castor-action. However, the rough period found in many Continental engines was absent and the clutch was light, with 'beautifully progressive action'. The car held the road well and the brakes were dismissed as excellent, in the forward and reverse direction, lever and pedal both operating on all four wheels, with a total of eight shoes. Incidentally, the tool-kit included a hammer and large chisel!

The cooling system incorporated a friction driven fan and the petrol tank held 14 gallons, enough for a run of some 350 miles. That was the 16/60 Turcat-Méry, about which so little was otherwise known in this country.

After 1926 this long-lived concern turned to cars with proprietary power units, and lasted for a couple more years before the whole enterprise expired. WB.



A Turcat Méry engine at the 1921 Paris Salon — note the retractable petrol funnel!



At last, after 68 years, the classic 2000km record set at Brooklands by the famous Aston-Martin "Bunny" has been broken.

Like Ninepins

With more use being made of the banked track at Millbrook for record bids, old targets established at Brooklands before the war are falling like ninepins. Some of these figures which have been long on the record-book have been bettered in recent times by vintage-type cars. But recently the splendid performance of two specially-prepared Rover Metros, running on lead-free Gulf petrol, has erased many more. These Metro GTi 16v cars really did motor, for 120.52 mph for the UK Class-F one-hour record is not to be sneezed at! In 1934 it took an 8-litre single-seater Panhard-Levassor to break the World's one-hour record, driven by George Eyston at Montlhéry, at 133.01 mph. The big car needed considerable strength to handle, as its steering had been set up for straightline sprints. Eyston had to go into training beforehand, but I do not suppose he had quite the 80 persons to help him that the Rover Group laid on at Millbrook. Moreover, this Metro Class-F record is only 1.22mph slower than Parry Thomas' absolute

British record with the 7.2-litre Leyland-Thomas at Brooklands in 1926.

The Metro's UK Class-F 24-hour record at 121.33 mph is also highly creditable, a target never before established in this category and a new absolute British record for this duration. The old Brooklands figures which have been eclipsed include the Class-F five and ten-mile records which Segrave held with the single-seater Talbot in 1925, and improved on by 13.75 and 14.35 mph respectively, Staniland's Bugatti 50- and 100-mile records, bettered by 0.85 and 4.53 mph and Staniland's equivalent kilometre records, all made in 1928. Then Eyston loses his 1932 200-kilometre and mile records, with a Riley, Scott and Baumer their 500- and 1000-kilometre records set up in 1930 with one of those fabulous GP straight-eight Delage cars, and Cushman and Harvey the 500- and 1000-mile records made the year before with an eight-cylinder FWD Alvis.

Then the once-impressive British Class-F hour record which Eyston took in a straight-eight supercharged Bugatti

back in 1927 has fallen to the Metro by 4.97 mph and the three, six and twelve-hour class records belonging to the aforesaid GP Delage have gone, together with the Alvis 12-hour figure. Moreover, that rather classic record in this 1101 to 1500cc division, the 2000 kilometre set up back in 1922, has likewise fallen to a Metro. It was the occasion when both AC and Aston-Martin set off at dawn on May 24th and the side-valve Aston 'Bunny' went on and on after AC had completed their runs, records having fallen almost alternately to both cars. To the surprise of the AC personnel Kensington Moir, SCH Davis and Clive Gallop were after truly long-distance honours; now that great run which had lasted from 4.30am to 9.20pm and established the first World's light-car records, has been bettered by a modern Metro, by no less than 44.44 mph.

Well, it's progress! More modern cars which these two Metros also trounced are Ford and Mini Marcos. One's respect for the new Rover Metro is thereby enhanced. WB.



Young Ben Collings gained a 3rd class award in his very first competition in a 1931 Riley Monaco.

VSCC Madresfield

Vintage fun and games in perfect weather at Madresfield Court near Malvern could not have been more pleasant, on September 2nd. This enjoyable annual Concours d'Elegance and Driving Tests assembly is the responsibility of the VSCC Midlands Section, held on the long, straight, narrow drive of this one time speed-trial venue by permission of the Trustees of the Estate and Mr C Tolley; Rosemary Adams manages to run it with pleasant informality, yet the marshalls handle the entries (nearly 90 drivers this time) efficiently. There were even some happy doggies present, as they are allowed here on their leads.

There were the traditional five tests, the second of which was that Slow/Fast business, giving some young officials much exercise as they walked/ran beside cars at the crawl, to make sure drivers didn't dip clutch pedals or stroke foot-brakes. The warm weather seemed to have a beneficial effect. No-one stalled in the slow bit, and in test 3, the Pit Stop (in which the once compulsory check of the tyre pressure in one tyre had been abandoned) only one bollard was bowled over (ten marks lost).

Some random notes: Veterans and Edwardians joined in the frolics. Rosoman had substituted his little De Dion Bouton for his vintage Humber, Jane Arnold-Forster courageously mounted the driving seat of that big 1914 Renault, and Roger Collings drove Gray's 1904 18/22hp Mercedes, a car notably original as to car-

burettter, scroll clutch and l.t. magneto ignition, in fact, a scaled down edition of the Sixty Roger usually drives. Mitchell had the ancestor of all existing GNs, Chris Gordon ran the 1915 Hudson that is still advertising on its back panel the services a garage long gone could have effected for you, and Walker again elected to bring his impressive 1913 R-R Ghost, thus cocking a snoot at those who have decided that the only place for such expensive machinery is in static, centrally-heated auction-rooms. Adnams rushed along in the 1912 25/50hp sporting Talbot. The driver of the A-M 'Green Pea' wore a topee, as if fearful of a sudden increase in Global warming.

The Threlfalls shared their nice BSA two-lunger lightcar, Di just beating Tom in the first test, involving 'unparking', and David Marsh was the star of the slow part of the second test, his Brescia Bugatti, a car designed to go fast, managing a miraculous 101 sec, not even approached until Maeers' 1930 Morris Minor saloon lost 48.8sec - it then accelerated well for its size - and Miss Winder's Riley Monaco went a bit slower than Maeers. This reminds me of how good it is to see so many girls, and sons of VSCC fathers, competing. For example, Roger Collings' youngest son Ben was doing his first ever competition in a 1931 Riley Monaco saloon seemingly in 'as just rescued' condition, its exhaust manifold down-pipe repaired with a Heineken beer can, proving once again that this is the beer which

reaches the parts other beers cannot reach! Colquhoun's 2-litre Lagonda tourer could be sedate when required to be, Peter Harris' 3-litre Bentley was another temporarily slow one, smoking under pick-up, as was P Sutcliffe's 1750 Alfa Romeo two-seater. President Bruce Spollon made his 30/98 trot meekly in that slow test but got its gears a bit mixed up in Test 3. I Rendall's 6½-litre Bentley tourer overshoot the stop line. However, its long wheel-base would already have earned it bonus marks.

Mrs Moore was neat, in her smart Type 319 Frazer Nash-BMW, one of nine entries in the Beauty Contest, Garfitt was fast in his FN/BMW. Mrs Brewster handled her A7 Nippy very well indeed, the Morris Sports set the biggest smoke-screen I remember, Mrs Mitchell failed to curb her A7 Chummy's gallop in the slow bit and then stopped too soon, Hall's Ulster-like A7 grumbled at having to go slowly, Parkin's A7 Chummy was extremely clean, as was C Hancock's impressive Royal Series-R1/6/30 Daimler, which exhibited no signs of objecting to the strange Madresfield treatment and didn't even smoke. Miss Hooke's A7 had a Swallow's beak, Marsh's daughter's A7 went very well but had not quite given up smoking, A Saunders' 1921 24hp Sunbeam tourer, with a second windscreen for its remote tonneau, had the longest bonnet I have seen for quite a while and hesitated slightly when asked to get a move on and Mrs Brerston had full control of her A7 but I can only comment on what I saw.

The Pit Stop test saw the Hudson hit that marker cone, the 1913 GN reversed by two pushers, in lieu of a reverse gear, Keith Hill do a determined run in the Crouch Helix, Bond's Morris Oxford cabriolet emit one loud brake shriek to remind us of its make, Brewster's P-type Lea Francis stall momentarily in the 'garage'. A late type 30/98 seemed to have as good brakes as Rouses' 1932 Alvis Speed 20. Taylor and his wife were doing well in the rare Drance, Mrs Walker was again taming the Frazer Nash Special, the vintage Rolls-Royce was represented by A Mitchell's varnish & wood Twenty Estate, it was good to see an OM competing again (Knight's smart 15/60), and variety was all around. WB

Results

Concours d'Elegance - Montagu Trophy:
J Ryde 1933 3-litre Lagonda.

Driving Tests

1st Class awards: D Marsh (Bugatti). C Marsh (Morris). A Hall (A7). P Bullett (GN). K Hill (Crouch-Helix). M Walker (Hispano-Suiza)

2nd Class awards: T Tarring (Frazer Nash). M Parkin (A7). A Jones (30/98). Mrs Threlfall (BSA). Mrs Walker (Frazer Nash Special). J Walker (Rolls-Royce). R Adnams (Talbot).

Ladies award: Mrs Walker

3rd class awards: A Moore (FN/BMW). P Tebbitt (Riley). M Bullett (GN). K Stinson (Riley). B Collings (Riley). M Lemon (30/98). M Garfitt (FN/BMW).

Sunshine and Castrol R.



Sir John Venables-Llewelyn rounds Barn corner in Lord Raglan's type 51 Bugatti on his way to victory in the Williams Monaco Trophy race.

The final VSCC meeting of the year at Cadwell Park on August 26th was blessed with perfect weather. The peculiarly appetising smell of disjunct-burgers, the undeniably pleasant smell of Castrol R, the wooded parkland, and the meandering circuit, summarise for me what is the most enjoyable race meeting of the year. Not forgetting the cars of course, and a brief walk around the paddock showed that there was a typically interesting array of machinery this year: from the regulars, such as Lord Raglan's Bugatti Type 51, Caroline's Morgan, and Dick Smith's supercharged Nürburg Frazer Nash, to some beautiful cars that at least I hadn't spotted at the Park before, most

notably Boswell's 12-litre Bequet-Delage, and Marr's 4.8-litre supercharged V8 Maserati. One rather enjoyable surprise was a collection of at least half a dozen Brough Superior motorcycles.

The first event of the meeting was the Spero and Voiturette five lap scratch race for 1100cc unsupercharged and 750cc supercharged machines. DF Fletcher-Jones surprised no-one by finishing first in his 1100cc Lagonda-Rapier, thereby winning the Spero Trophy. The Voiturette Trophy is awarded to the first 750cc car home and the Austin Seven of F Hernandez continued the unbroken run of success of those little cars in this event, finishing second overall. The winner of the handicap was WS Gordon in

the Trice Special.

The five lap scratch race for Frazer Nash and GN cars was once again won by Andrew Smith in his father's Nürburg Frazer Nash. He quickly pulled out a lead over Martin Stretton, who despite a considerable amount of sideways acrobatics, could do little to reduce the gap. J Giles brought his AC/GN home in third place, and the real battle of the race, for fourth place, was eventually decided in favour of Adam Smith in his father's highly developed (to the point of fitting two spark plugs per cylinder) 1800cc Frazer Nash.

There then followed a four lap handicap event which was won by F Giles in his GN with a fastest lap of 2 min 2.20 secs. Redmond came home second in his 1937 3½-litre Jaguar, and third was J Guyatt in his 1936 Talbot.

Event four, a ten lap scratch race for pre-war racing cars proved to be a relatively easy win for Mayman in his ex-Raymond Mays ERA R4D finishing some nine seconds ahead of Martin Morris in R11B. Duncan Ricketts finished third in R1B pursued by Bruce Spollon in R8C. Further down the field there was some exciting racing between Gillies in a Riley, and Marr in his supercharged Maserati, the Riley proving more nimble in the corners, the Maserati's power pulling it ahead on the straights. Eventually the Maserati's engine went slightly off-beat and the duel was decided in favour of M Gillies. There was also a good dice between Jaye in his Alta and Morris in Chapman's ERA E-Type, the pair making a fine sight as they circulated together. The fastest lap of the race fell to Mayman at 1 min 50.10 secs, and the winner of the handicap was Morris in an ERA.

Event five was a four lap scratch race that was won with relative ease by Summerfield in his Avon Bentley, although by the end only two seconds separated him from D Robinson charging hard in his Riley, and setting fastest lap in the process. Third place went to D Barbet in his 1937 1½-litre Riley, with Black winning the handicap in his Aston-Martin.

A fierce contest in the sixth race for vintage racing cars saw Ivan Dutton lead in his Type 35B Bugatti, hotly pursued by Tim Llewellyn in the 8-litre Bentley, Boswell in the Bequet-Delage (a 12-litre First World War V8 aero engine in a 1923 Delage Grand Prix chassis), Cardy in another Bugatti and Caroline in his quick Morgan. Stretton once again provided us all with some spectacular driving, once or twice straying from the racing surface and in one frantic oversteering slide showering me and my ice cream with grass and dust as I crouched to take photographs at The Mountain. Dutton held his lead until the eighth lap when a mechanical problem befell him at the back of the circuit beyond Park Straight. The lead was therefore handed to Llewellyn who brought his vast and slightly oversteering Bentley home in first place ahead of the awesome Delage and Caroline who had overtaken Cardy. Fastest lap was achieved by Dutton in 2 min 0.60 secs.

The seventh race was a four lap handicap

event and it was a delight to see P Harris win in his 1924 3-litre Bentley on proper vintage tyres, and with lights etc all on board. Second place went to J Moss in a 1930 Invicta and third to A Metcalfe in a 1934 Lagonda. C Mann in his Triumph drove the fastest lap of the race in 2 min 17.20 secs.

The eighth race of the day, a ten lap pre-1961 scratch race, had a sadly depleted entry list. Promised for the event were a pair of 1958 BRMs, two Cooper-Bristols, and a host of other machinery that failed to materialise. Consequently the race was won by a

Riley and T Metcalfe in a 1-litre Lagonda. Fastest lap went to J Guyatt in a 3½-litre 1936 Talbot at 2 mins 10.50 secs.

The final race promised to be one of the most exciting of the meeting. It was the Williams Monaco Trophy race, an eight lap scratch event for two-seater Grand Prix cars that Sir John Venables Llewelyn has more or less made his own, winning every race but one since 1983. This year as always he was driving Lord Raglan's 1932 Bugatti Type 51, and he got off to an excellent start pulling out a clear lead from Ivan Dutton also in a

was hotly pursued by Dick Smith in the Nash, and then Boswell in the Bequet-Delage. Behind them came a stream of raucous Bugattis headed by Dutton in the Type 51. Quite a ding-dong battle raged between Horton and Cardy for the short-nosed five lap race, Horton eventually nipping past Cardy on the final lap to claim fifth place.

Smith ran out of fuel on the last corner of the last lap, and although Boswell nipped inside him, and beat him to the flag, Smith nevertheless came second on

Results of the 1990 MOTOR SPORT BROOKLANDS MEMORIAL CONTEST

1st	A. J. Mayman	Alfa Romeo and ERA	126 pts
2nd	T. Llewellyn	Bentley	75 pts
3rd	I. Dutton	Bugatti	54 pts



This is what Cadwell Park VSCC is all about: relaxing amid beautiful countryside to watch some excellent vintage racing.

country mile by Mayman in his Climax-engined Lotus 16. Some 66 seconds behind was Bill Morris in his E-Type ERA followed by Payne in a Cooper and Stephens in ERA R12C. The race was really more of a procession than anything else, the only excitement being the dice between R Burrell in his Lea-Francis engined Connaught and M Gillies in his Riley. Burrell managed to hold off Gillies for the full ten laps, however. The fastest lap unsurprisingly went to Mayman at 1 min 45.30 secs.

Race nine was a four lap handicap won by Milligan in a 1½-litre supercharged MG, followed by J Mason in his 1936 1½-litre

Type 51 and Dick Smith in his Frazer Nash Nürburg. Behind him was Dean in another Type 51, Boswell in the Bequet-Delage, Horton, Cardy, Willis and Conway, all in Bugattis. The race continued at a furious pace until the third lap when a shrill whistle signalled the marshalls to bring out the red flags, and stop the race. Jardine had unfortunately rolled his Bugatti, although he still managed to walk back to the paddock, while his car did not look that badly bent.

The restart saw Venables-Llewelyn once again take the lead, but the order behind him was significantly revised. He

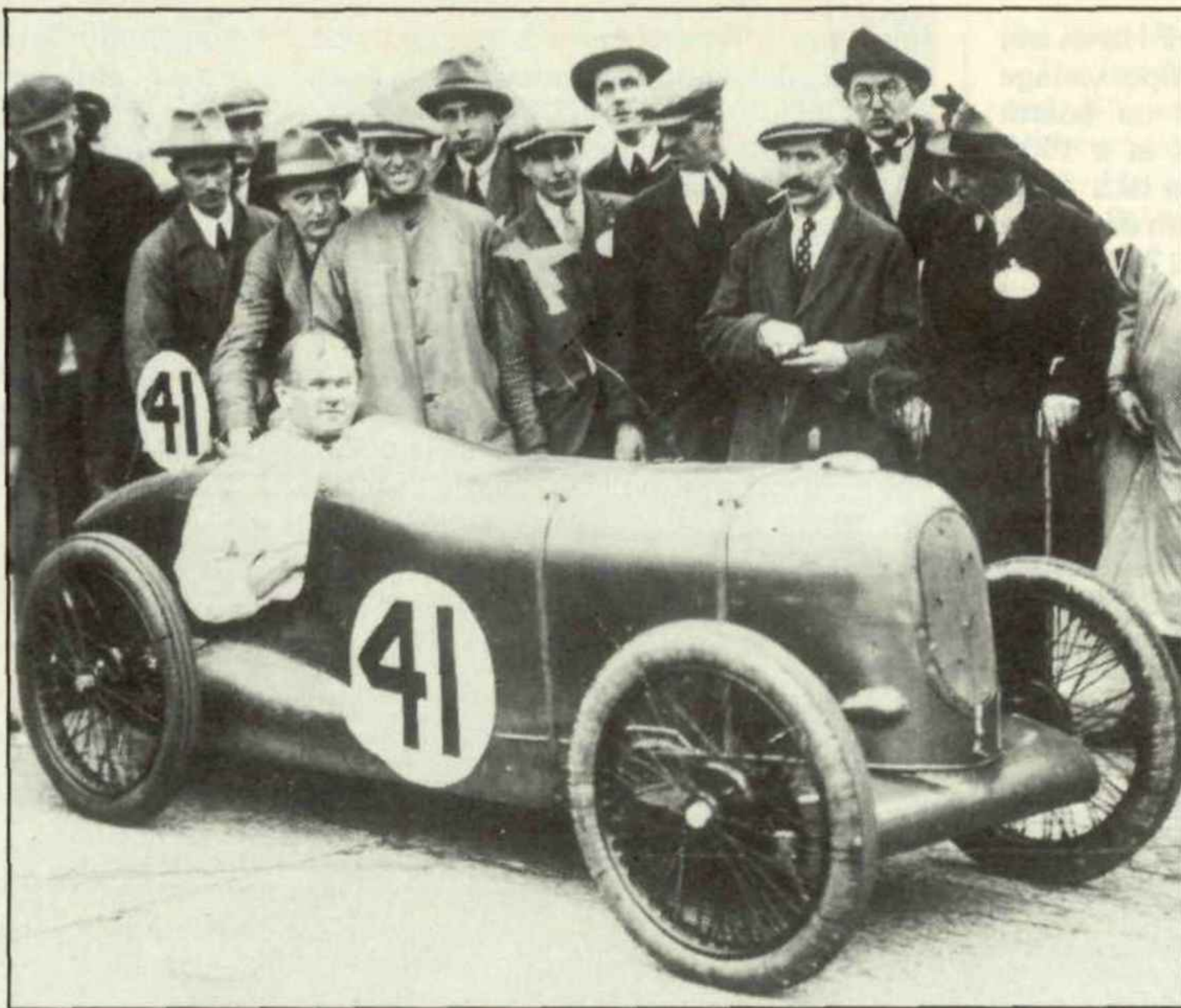
the aggregate scoring from the two halves of the race. The final order therefore was Llewelyn, Smith, Boswell, Heimann, Horton, Cardy, Willis and Conway, with the fastest lap going to Venables-Llewelyn at 1 min 56.00 secs.

It was a good finish to a superb day's racing. The really delightful thing about Cadwell Park is that there are never any awful traffic jams on the way out, and only a few Bank Holiday caravans to contend with on the way home. I shouldn't think that Lord Raglan had too much trouble passing those on his way back to Wales in the Type 51. CSR-W.

It has been said that truth is stranger than fiction. Here is a racing mechanical disaster which endorses this. We have heard of drivers coasting to the finish of a race because their car has suffered a breakdown or has run out of fuel, even of them pushing a stricken car over the line. But these episodes have nothing on what occurred to E C Gordon England's Austin 7 when it won the 1924 JCC 200 Mile Race at Brooklands.

In 1923 England had finished second to RBueno's 1100cc Salmson in the 1100cc section of this long distance light-car contest. For the following year's "200" the advent of these very quick A7s caused the JCC to institute a 750cc class, which Gordon England, now very much into the Baby Austin commercially after a successful career as a test pilot, a glider exponent and driver of an air-cooled ABC at Brooklands, was anxious to win. To this end he prepared a very well streamlined two-seater racing A7, with a special crankshaft, pistons and valves, a raised compression ratio and a very light body, as recounted previously in MOTOR SPORT. These little cars had been running big ends when their engines were asked to turn over at exceptionally high speeds, a calamity which had befallen England at one of the smaller 1924 Brooklands meetings.

But with an extra oil supply he felt confident of winning the new 750cc class in the prestigious 200 Mile Race. So it proved, although at one point a fearful noise emanated from the little car and just as its driver was thinking he had better pull in to his pit he discovered it was caused by the fact that the aluminium seat had slipped, so that it was being struck by a projection on the propellor shaft. He continued non-stop, to win at 75.61 mph, having spent 2 hours 40 min 15½ sec in the cramped cockpit — England was a big man. The tiny engine had maintained 4700 rpm throughout, lubri-



E C Gordon England in the well streamlined Austin 7 with which he won the 750cc class of the 1924 JCC 200 Mile Race at Brooklands, in spite of finishing on three cylinders.

Lucky Seven

cated with Speedwell oil, fed with BP petrol from Zenith carburettors, ignited by a BLIC magneto, the chassis damped by Hartford shock absorbers and running on Palmer tyres. The standard A7 crankcase was praised for standing up to this treatment.

Towards the end of the long race, after 69 of the 74 laps, one cylinder had cut out, but it was too late to stop and investigate. This would explain why England's 1924 winning speed was one mph slower than his speed in the 1923 race, although before the engine lost power he had done one lap at nearly 90 mph but had otherwise held the engine back to the aforesaid speed in order to prevent what he knew was a weakness with the big ends. (Of the eight A7s that started the race, six retired due to big end failure). After the loss of power he drove the remaining laps at 70 mph.

Now we come to the remarkable part. After the finish of the race England drove the winning A7 straight into the official enclosure, since he was not allowed to touch it, and handed it over to the Official Observer. Later that afternoon the winning cars Darracq, Salmson and the A7, were driven over to the aeroplane sheds and locked up for the night. The A7 went there still firing on three cylinders. The next day their engines were stripped for sub-

mission to the Official Measurer. Imagine the surprise that was caused when, the A7's cylinder head having been lifted, no piston or con-rod was to be seen in number four cylinder. The big end of the broken con-rod was still attached to its crankpin and no damage was apparent. Investigating further, after getting the car back to Gordon England's works, more surprise was occasioned when it was seen that laying on the gauze oil strainer that topped the sump were the bits of the shattered piston, an undamaged gudgeon pin and a doubled-up con-rod! Any A7 owner who knows how restricted are the apertures below the cylinder bores may well find this surprising and the reader of a weekly motor paper could be

excused for expressing doubt that it could have happened.

His letter caused Gordon England to explain that the familiar failure of number four big end, which he had been driving to try to avoid, had caused the light tubular con-rod to snap and double up when struck by the crankshaft. The gudgeon pin had slipped unharmed out of the little end of the rod and the piston, so thin that it could be crushed by gripping it in the hand, it had been reduced to many minute fragments of aluminium. After this unusual mechanical calamity all that was needed before the same A7 went off to race successfully at Montlhéry, were a new piston and rings, a new con-rod, and a replacement crankshaft, the latter put in only because it incorporated a slight modification to the oil feed to the big ends. The car then won the Cyclecar GP, with its Birmingham mates 2nd, 3rd and 4th and went on to break records at nearly 81 mph, lapping at 86 mph. While at the French track the England A7 ran some 1000 miles, the only parts requiring replacement being three tappet pads.

No more big end failure was experienced because, four days after the 200 Mile Race, Sir Herbert Austin had found a solution. WB

Rob Roy

The VSCC of Australia's Newsletter for June had some recollections of the famous Rob Roy speed hillclimb, by Earl Davey-Milne who was taken there when he was 14 by his late brother. That was during the war, but he went to his first event in 1946 and remembers such competing cars as the Ballot-Oldsmobile Special of Jimmy Gullan, Doug Whiteford's Ford V8 Special, Teddy Gray's V8 Alfa Romeo Special, the Chamberlain Special and the Itala V8, etc. This commentator went to the venue again this year with Lyndon Duckett, who made his

first appearance there in 1946 with the 18-litre chain-drive 1908 Semmering Mercedes, Davey-Milne having been taken there in the ex-Joan Richmond Riley 9, driven by founder member Alan Roberts, who had the 38/250 Mercedes-Benz that was later campaigned by Lex Davidson.

His own first drive at Rob Roy was in the Bugatti-Hudson Eight Special. The hill was 760 yards long. Opened in 1937, Jack Day (Bugatti V8 Special) set the record in 35.42 sec over the then dirt surface. Peter Whitehead (ERA R10B) knocked this down to 31.46 sec the following year, and at the outbreak of war it was held by Wylie's Ford A Midget racer (29.47 sec). The hill has now fallen into disrepair. WB

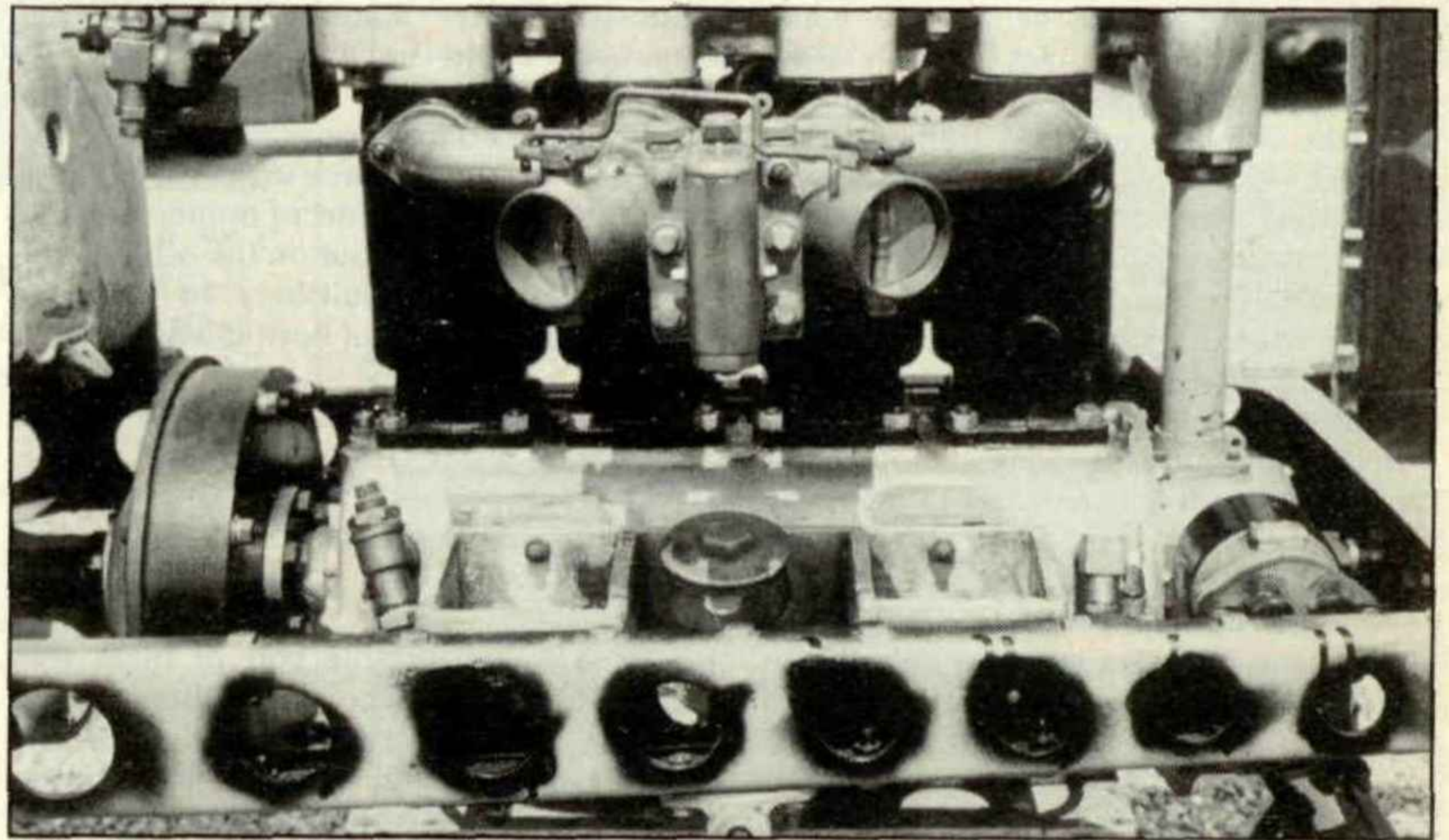
Nothing New!

For some seasons now the VSCC has been able to award the Ford Trophy to cars which have been licensed and driven to their race meeting, this year's winner, decided on a points system, being Ian Bentall in a 1937 Bentley Special.

That there is nothing new in this becomes apparent when it is remembered that at Brooklands, in 1924, there was a race for competitors who had driven to the Track that day, a race won by Mrs Eric Gordon's Studebaker, at 45.65 mph, from George Duller's Paige and a motorcycle outfit. WB

Exciting Discovery

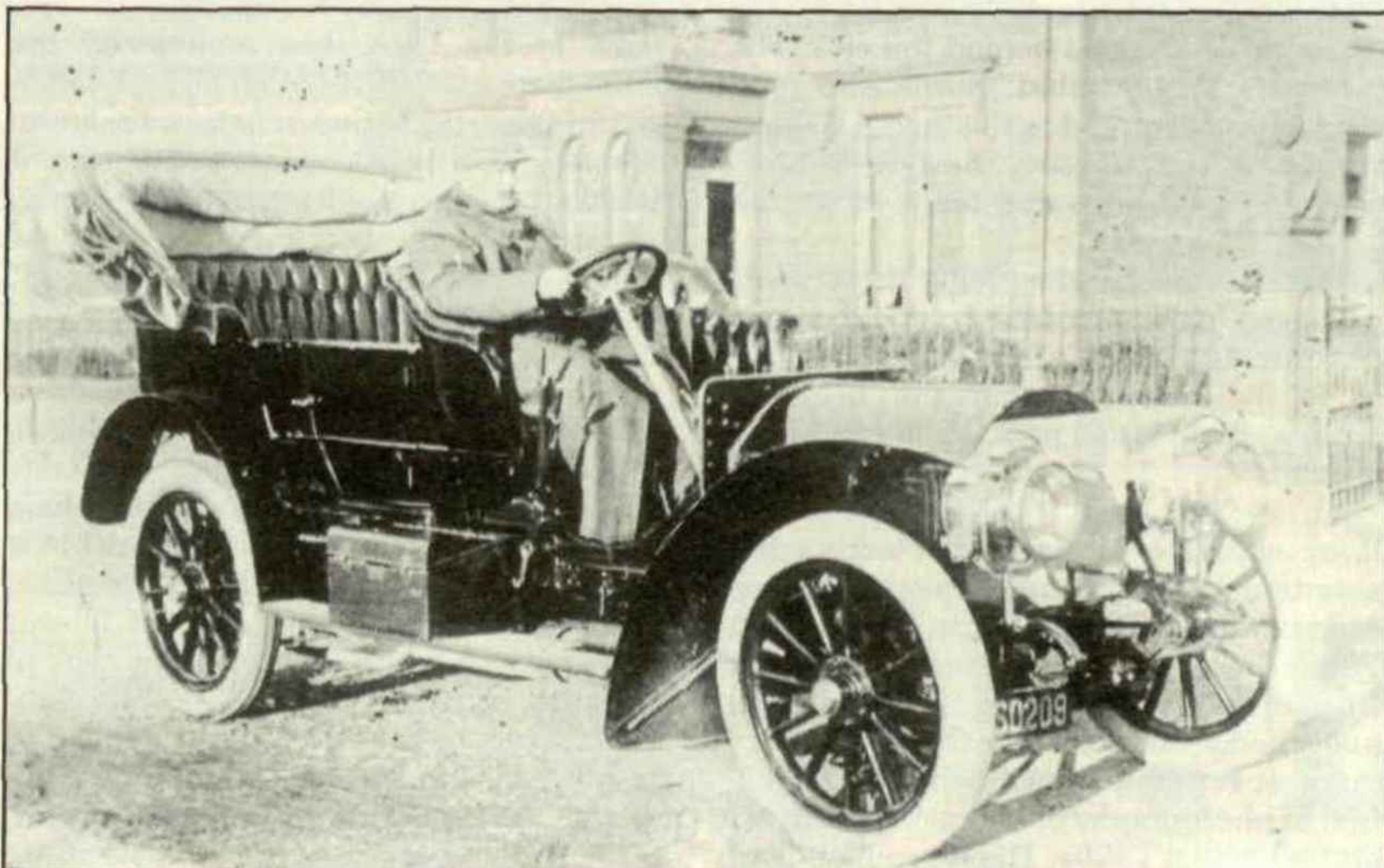
Even now, undiscovered old cars continue to turn up from time to time. For instance, Chris Gordon, who has a 1915 Hudson tourer and enlivens VSCC meetings with his Tamplin cyclecar, not long ago came into possession of a mysterious early vintage light-car, which investigation suggests to be a Silver Hawk with an overhead camshaft Sage engine. The chassis is extensively drilled, even to the levers, pedals, etc, the rake of the steering column suggests that a single-seater or "1½ seater" body was once fitted, and the five-bearing engine has the expected separate cylinders of a Sage power unit and is fed from an unusual Zenith 30DRK0959 carburettor with two angled choke tubes with a single float chamber, each choke tube delivering to its own two-branch inlet manifold on the off-side. On the nearside there is an impressive fabricated four branch exhaust manifold.



Chris Gordon was fortunate enough to unearth recently this Silver Hawk.

There is no starter ring on the flywheel and the large separate gearbox has ENV gears. This interesting light-car was found in pieces but is now being assembled. It seems that it is not the Silver Hawk which took records at Brooklands in 1920, driven by Gedge, helped by Miss Violet Cordery, unless the

engine has been changed, but it could be one of the team of these cars with which René Thomas and Gedge finished 6th and 7th in the 1920 *Coupe des Voitures* race at Le Mans, although if so the frame must have been drilled afterwards, and we look forward to seeing it in action at a VSCC meeting. WB



Mr W G Christie's 1905 40hp Mercedes. What became of it?

Mercedes Mystery

David Burrows of Norwich sends the accompanying photograph of a 1905 40 hp Mercedes which belonged to WG Christie, his father's closest friend, who died last year. The car was then painted red and its Reg No appears to be SD 209, it being kept at West Point, Saltcoat, Ayrshire. It was converted into an ambulance in 1915 by its owner and presented to the nation, after which it served in Flanders. It returned after the war and was on show in the Glasgow Exhibition of 1921/22. Does anyone know what became of it after that? WB

The Rover V8 Engine
by David Hardcastle. 208pp. 11"x 8". GT Foulis and Co, Sparkford, Yeovil, Somerset, BA22 7JJ. £17.95.

There have been several books about Rover cars powered by the General Motors alloy vee-eight engine (I thought "V8" was a Ford trademark, but perhaps the rights have expired?), which a Rover executive discovered quite by chance and adapted to the British car when Rovers were an all British designed make. Now David Hardcastle has a book in which he takes a truly deep look at this remarkable and popular power unit, devised originally for the 1961 Buick Special and Oldsmobile F85 and available as an option for the Pontiac Tempest at a time when America was into compact cars.

The story is satisfactorily complete, from the 3.5-litre engine's trans-Atlantic origins to its adoption by Rover and on to other production and specialist applications: in the Marsh hillclimb car, the Range Rover, the Morgan Plus 8, the Triumph V8, and other obvious implants. The book also deals in detail with the competition developments of the engine, with the specialist companies who devote their time to it, and it is useful and in depth on the technicalities of the Rover V8 engine, all simplified by many photographs. A covetable book for anyone who has worked on this impressive lightweight power unit or who has had the pleasure of driving behind it. WB.

Alain Prost — Life in the Fast Lane
by Alain Prost with Jean-Louis Moncet. 189pp. Stanley Paul and Co Ltd, Random Century House, 20 Vauxhall Bridge Road, London, SW1V 2SA. £6.99.

It was perhaps unfortunate that I had taken this book as holiday reading; the family had gone to Monte Carlo for the day and I was left with some free time for some serious reading; but I was presented with a choice: should it be *The Autobiography of a Liar* by ex-Monty Python member Graham Chapman, who died last year, which I had been given years ago but had never read, or should I read *Alain Prost?* Business of pleasure? It was my holiday after all, so I put pleasure first.

Graham Chapman's book was zany, confused, and parts of it downright disturbing, but what made the book invigorating and ultimately entertaining was that he did not pull any punches — remarks about former colleagues and friends were hilarious and toe-curling.

As the family were still giving the credit card a battering by the time I had finished this book, it enabled me to turn to *Alain Prost*, albeit with a little hesitancy. After the anarchic autobiography I had just read, my fears that the assuredly chronological piece by the little Frenchman was going to be dry and dull turned out to be well founded.

It was easy enough reading, though, and the slim volume was completed in one

easy sitting, but by the end of it nothing new had been learnt. There were occasional outbursts from Prost on a few colleagues, but the remarks were about as inflammatory as Bruce Forsyth's stated political ambitions. No insight was gained into the way Alain Prost's mind works, no hints were given on his true feelings about the different situations he had found himself in over the years, and very little was learnt about those who have played a major part in his career. What we had here was a story bland enough to be shown on *This is Your Life!*

The final chapter, which differentiates this paperback version from the hardback published last year, contained "interviews" by Derrick Allsop, except that the questions were statements and Prost's answers could have been culled from *Motoring News* over the last 12 months. There were no fresh revelations here.

The one saving grace was the low price of £6.99. With that sort of money you can hardly go wrong — but on the other hand, why encourage publishers to continue producing this sort of boring work! WPK

Les Grandes Routiers
France's Classic Grand Tourers
by William Stobbs. 183pp. GT Foulis and Co, Sparkford, Yeovil, Somerset, BA22 7JJ. £24.95.

This is a coffee table sort of book that contains some fine colour studies of some of the great French cars through the years, confined in fact to Hispano-Suiza, Bugatti, Delage, Delahaye and Talbot-Lago. It gains from the work of photographer David Sparrow, with the proviso that many of his best pictures are bisected to fit them into the book, an argument in favour of the landscape style. This is not a technical book apart from some specification tables. Running through it is a rather superficial but readable comment on France and the French, again through the years, by Francophile Stobbs. When he gets to the cars he tells us little that is new apart from a few perhaps fresh asides about the great men behind the cars. His inclusion of a morbid journalistic type story of a girl burned to death in a Bugatti seems an unnecessary introduction to Grand Prix Bugattis and tends to set the style of the book.

There is fun in identifying the current cars used for many of the splendid colour pictures, and they are fine, in detail as well as in the complete cars and beautiful houses that form part of their backgrounds. WB

If we writers are honest and accept the assertion that a picture is worth a thousand words we cannot fail to recommend *Fifties Motor Racing* as seen through the lens of enthusiast Alan R Smith, as published by GT Foulis & Co for £9.95. I do most certainly recommend this collection of photographs of GP racing here and abroad, in the 1950s. The reproduction of first class prints is excellent, the pictures

themselves great reminders of the cars and personalities of these days. Alan Smith tells of how he became interested in motor racing after a Brooklands visit in the mid 1930s, after having taken his box camera to Croydon Aerodrome. In fact, the book's first chapter is titled "Box Camera View of Brooklands and Donington" and I was personally disappointed to find only two "shots" taken at the Weybridge Track.

But the rest is splendidly evocative, and there are 191 black and white pictures, so here you have 191,000 "words", for the cost of less than 1p per picture. Only a few are bisected over two of the 144 11" x 8" pages; I like the ones of a coil for use on Salvadori's Cooper being removed from a unsuspecting spectator's A7 Chummy and the stream of cars on the Stowe road approaching Silverstone for a 1950's race meeting. The Foreword is by Roy Salvadori. WB

The attention of anyone wanting a full account of what the 1957-1963 Colin Chapman Lotus Elite was all about, with a list of chassis numbers against owners, historic racing commitments, and a Foreword by John Wagstaff, is drawn to PSL's *The Lotus Elite* by Dennis E Ortenburger, priced at £17.50. WB

Our apologies to Motor Racing Publications for inadvertently saying, in our review of another book, that their *Camel Complete History of Motor Racing*, which I had already reviewed, was published by another publisher. This very complete coverage of GP racing is, of course, published by MRP of Unit 6, The Pitlake Estate, 46 Pitlake, Croydon, CRO 3YR and is highly recommended. WB

The Anatomy and Development of the Formula One Racing Car from 1975 by Sal Incandela, a work of 334 pages, has gone into a third edition, priced at £16.95 from Haynes/Foulis of Yeovil. WB

B&M Automotive Products, a leading manufacturer of street supercharger systems in the USA, has announced the immediate availability of an all-new publication titled *B&M Supercharger Technical Manual*, not a re-write or revised version of B&M's previous publication *B&M Supercharger Systems* but a completely new book.

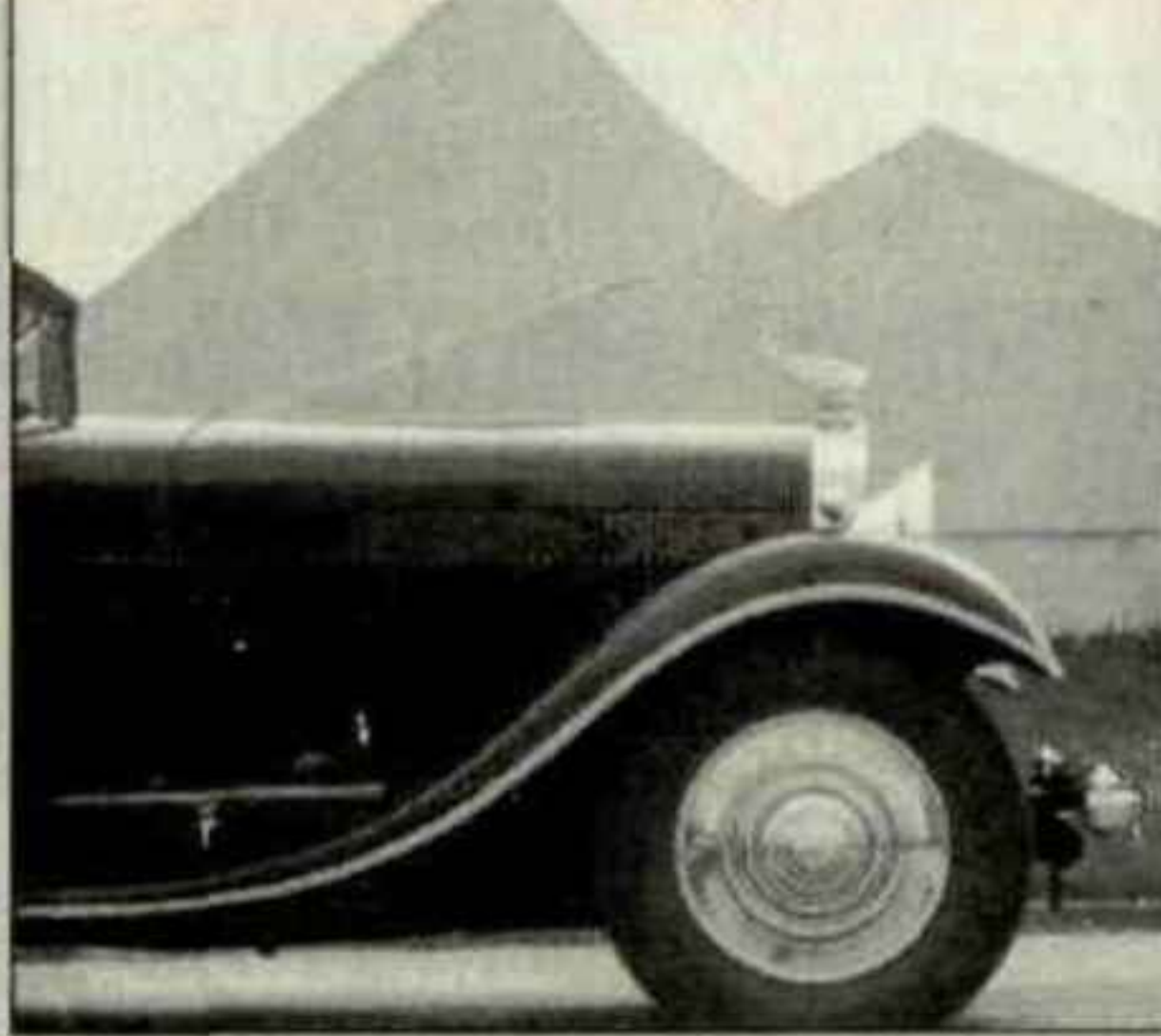
It is in full colour and within its 60 pages there are 38 illustrations and photos, 21 charts including a number of dyno tests and text covering a wide range of subjects related to street supercharging. The tests and the text primarily cover small block Chevy, big block Chevy and the small block Ford engines and there is an extensive section on how to build a street blower engine which relates to nearly any type of engine.

The book has a retail price of \$5.95 and is available from B&M Automotive Products, Customer Service Department, 9152 Independence Avenue, Chatsworth, California 91311, USA. WPK

NEW BOOKS

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France's Classic Grand Tourers
William Stobbs



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ESCORT

Mks 1,2,3&4

The Development & Competition History

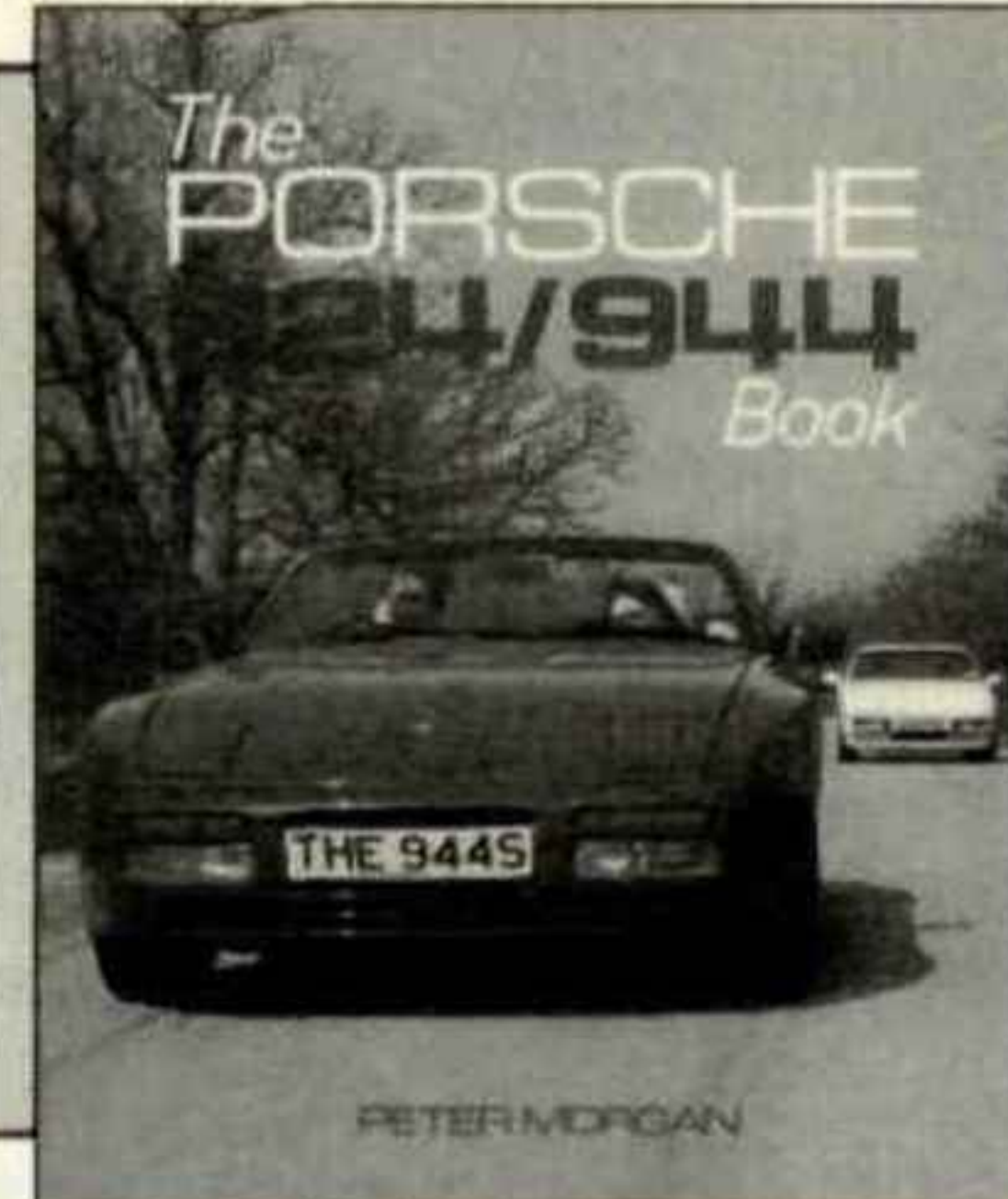


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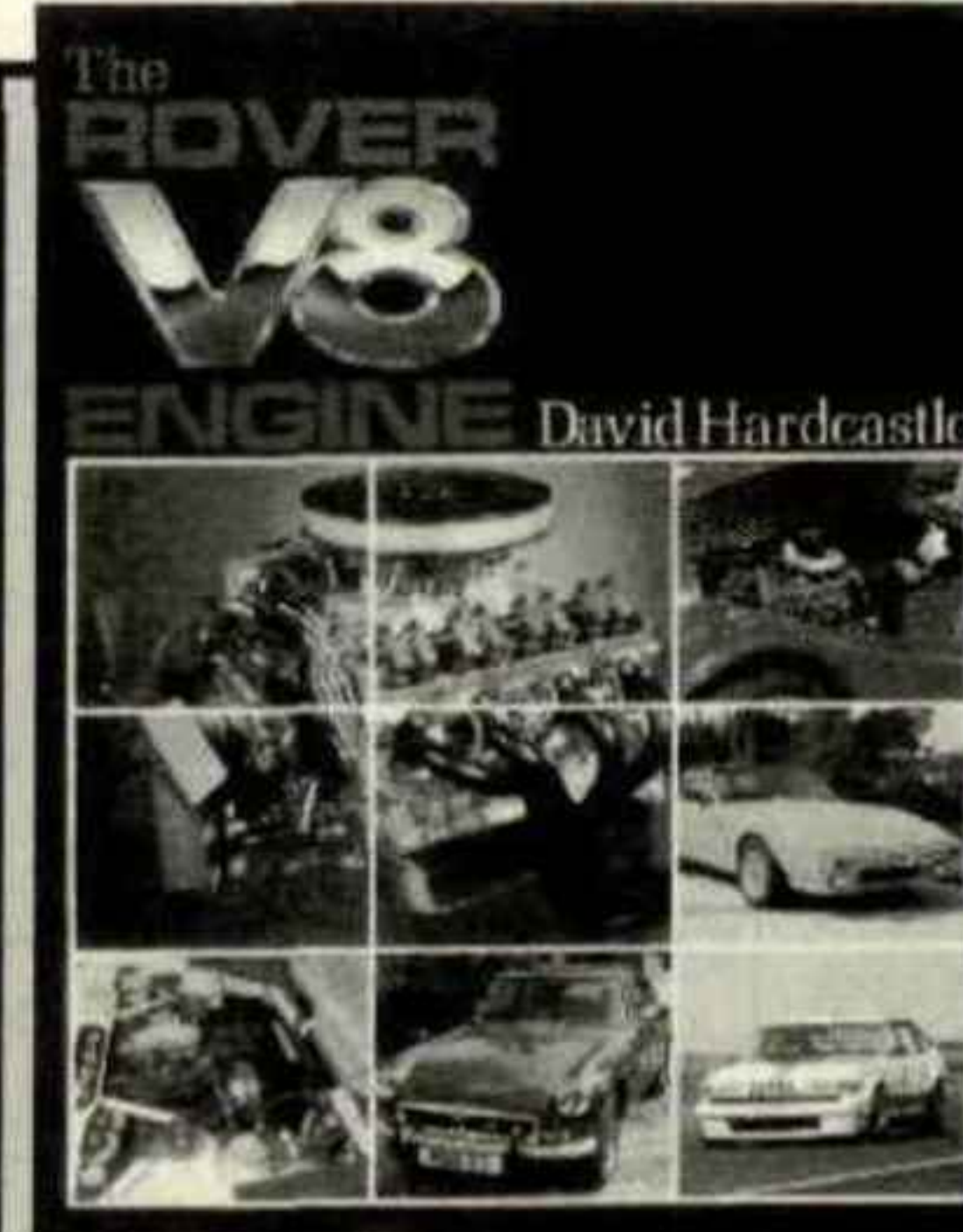
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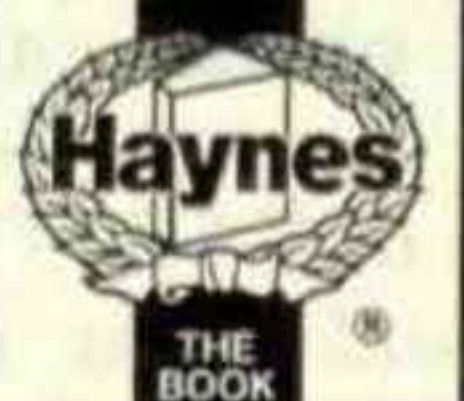


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Value for Money

Sir

As a longtime VSCC competitor and spectator, I treated myself this year to a seat at Copse for the British Grand Prix on 15th July. I wanted to hear, smell, and see Grand Prix racing machines of today, for real. I saw an exciting sprint of some 78 minutes. Cost: £75. The rest of the days' 'entertainment' was of little interest.

On 28th July, I went to Silverstone, to the Historic Festival. I have never seen such a selection of motor cars. And, there was high standard racing all day. Plus the Vanwall, the W125 Mercedes, and, oh yes, the Auto Union!! Tears in the eyes, lump in the throat all day!! Cost: £5.00!!

Then, on 4th August, I went along to the VSCC Prescott practice, spending a lovely day with friends in the paddock, and in the warm sunshine, watching the usual fascinating variety of vintage machinery. Cost: NIL!!!

Value for money? Well, Mr Ecclestone, my seat for the Grand Prix in 1991 will cost £85, and I expect that the race will be even shorter! So, I am afraid, that you and your expensive prima donnas have priced me out. It's back to dear old Muddly Walker and the silver screen. After the race, my wife and I will go out for dinner, and I shall still have half the price of my seat left in my pocket.

Thank you for reminding me where value for money really lies. It's back to proper Grand Prix cars and real people racing.

Michael Hawley,
Henley in Arden, Warwickshire.

The 1913 Theophile Schneider GP

Sir

Following your article in MOTOR SPORT September, pages 1000/1001 relating to The Edwardian Race at Oulton Park, I note your attempt to put the record straight as they say, but perhaps your attempts have served to confuse matters even more so, but there we are. Your love of one of the cars perhaps prevented you from informing us that this neither had its original body nor front axle and indeed perhaps many other items of non-original equipment which you may not wish to declare.

To correct the misleading statements covering my car, will you please print this letter in its entirety so that your readers are not fooled.

My research on the car to date is as follows:

The car was purchased by A Edgell Baxter from George Newman of Boston Road in 1924 who claimed that Captain Duff lapped Brooklands in it at 98 mph (his reference to a 1914 Rocket Schneider is this car — see VSCC Bulletins Vol V11 No 2, May 1984, page 14 and Vol V11 No 3, September 1938, page 11).

The car was kept at Baxters factory and when the receiver was called into his Company, the car remained there and eventually finished up in the scrapyards which was next door to his factory. What happened to the car next is not clear, but in the Sixties Ted Wooley found the remains of it being used as an emergency power unit at a mill in Wellingborough. This was the engine, gearbox, radiator, front axle and steering which were still in the chassis that had been cut off at the rear of the gearbox subframe and the whole then bolted to a massive iron frame.

Ted Wooley managed to locate Baxter's daughter who remembered, and confirmed, that her father had owned it soon after the Kaiser War. Wooley searched for the remainder of the Schneider but was unable to find any further parts.

Another chassis was obtained as a result of meeting the Mayor of Besançon together with a rear axle of 1918/20 manufacture and they were sent with the new chassis to Rubery Owen who mated them up. A body was then manufactured as per the original.

The chassis number is 14122 and all the engine numbers, including the original racing pistons and other internals of the engine, relate to 22. Following considerable research by Ted Wooley, John Rowley and Dennis Field, the VCC then issued a Certificate of Dating, numbered 1274, on the 16 December 1971. Which of the GP cars this is I do not know, but it has been said that it is Gabriel's car.

I am of the opinion, and so are others, that this is more of a GP racer than you may wish to acknowledge, so your remarks which indicate that the car is two mated parts is somewhat misleading.

Roger Firth.
Cheshire.

To appease Mr Firth I publish his letter in full, as requested, but it merely repeats what I wrote about this car in MOTOR SPORT, in January 1976, after going out in it with the late John Rowley, and consulting with the late Ted Wooley who built it up.

My Brooklands records show no sign of John Duff or anyone else racing a GP Th Schneider there from 1921 to 1924 although A Bovier did so in 1914 (best lap 85.43 mph). WB

Car Emissions

Sir

I write with reference to the editorial references on the amount of emissions pouring forth from the private car. You should note that although road transport accounts for 18% of the total greenhouse emissions in the UK, private cars and company cars together account for only a fifth of this amount, or 3.6%. The remainder is due to goods and other vehicles that are not motor cars.

It seems illogical to me for the government to put so much emphasis on reduc-

ing car emissions when they account for only 3.6% of the total. We hear very little about the 60% that is produced by appliances keeping us warm in our homes and at work.

No doubt our politicians can explain why this is; I cannot believe that they are that ignorant.

Dr CB Mynott
Stalybridge, Northamptonshire

Petrol Problems

Sir

Having just read the August 1990 edition of MOTOR SPORT I have the following comments.

Firstly, in Petrol Problems in 'Matters of Moment' you mentioned the increase in car fires which jogged my memory. Last year I attended a Car Restoration course at Farnborough Technical College (Hants). One of the 'students' asked 'Tom' (the lecturer) to have a look over his car. On opening the bonnet Tom said, "Aha, fuel injection, make sure you check all of the joints for petrol leaks, especially after a service, because there have been a lot of fires in fuel injected cars."

Perhaps somebody should conduct an investigation to see if fuel injection is the problem. A leaky joint could result in a fine spray rather than a drip. Another factor which could also aggravate the situation is the electronic nonsense fitted to most modern cars. The engine bays nowadays look like spaghetti junctions of wires draped over the fuel injection pipes! Mind you, my daughter had a lucky escape recently when her Mk II Escort burst into flames due to petrol dripping onto the exhaust manifold.

Thus the message is, when checking the oil, water, hydraulic fluid, fan belt and tyres at weekly intervals (?) we should all check our fuel systems.

Luckily my own favourite marque had the good sense to fit the carbs on the opposite side of the engine to the exhaust manifold (Alfa Romeo before Fiat).

Secondly, if 'Ceramic engines' last five times longer than conventional engines then they must be dead ducks. The manufacturers will simply go bankrupt through lack of sales. I suspect that this idea will be suppressed just as the petrol companies have suppressed Liquid Natural Gas which solves all the pollution problems at a stroke.

Peter Gambardella.
Farnborough, Hants.

Sir

Your August Editorial headed 'Petrol Problems' referring to the particular problems faced by vintage car owners, is both commendable and timely. However, I do not believe that the blame for this state of affairs is to be laid entirely on the petrol companies.

It is true that last year the companies withdrew 2 star petrol which was the staple diet for our cars but, whilst I hold no

brief for the companies, it should be borne in mind that we had several years' warning of what was likely to happen (during which the lead content of petrol was progressively reduced) and yet failed to explore ways of 'living with' the new situation. Also I understand that the companies set up an Unleaded Petrol Group Committee around 1986 or 1987 containing representatives of all interested groups but, as far as I am aware, this did not include anyone from the vintage car movement.

The clock will not be put back and I believe leaded petrol will be withdrawn altogether in a few years to make way for further grades of unleaded. I am informed that some other European countries already have three grades. Furthermore, in the meantime, it seems to me that its content is also likely to change, possibly quite rapidly, to keep pace with new engine development for the present 'green' era. The proposed introduction of exhaust emission testing into the MOT may also be relevant in this connection. If this assessment is correct, I hope the vintage car movement will at last concentrate its considerable resources in finding ways of accommodating these changes. There seem to be three main areas in which this should be tackled:

1. To establish which cars can safely run on unleaded petrol without engine damage and which of the remainder will take hardened valve seats and any other alterations necessary to render them capable of running on unleaded without damage.

2. To encourage the marketing, possibly by the petrol companies, of a suitable and reliable additive to cover those cars falling outside the above category. In this respect, I am assured by a leading additives' manufacturer that the necessary technology to produce this already exists.

3. To establish permanent lines of communication with the petrol companies through which the impact of proposed future changes in the content of petrol on vintage cars can be assessed and possible problems recognised at an early stage.

These tasks are urgent and, unless the policy of non-involvement apparently adopted by the Federation of British Historic Vehicle Clubs can be reconsidered, will require some new co-operation between clubs. My own small efforts in this direction as a club member have fallen on very stony ground and, if this is typical, then the long term outlook for the continued enjoyment of vintage motoring in this country looks bleak. It would be ironic indeed if, at a time when we seem to have made a good start in learning to play the EC motoring 'game', we finally succumb to an own goal!

Garnet W Wrapsen
Cottingham, North Humberside.

Sir
Your editorial 'Petrol Problems', in the August issue, implies that the volatility of petrol may have changed. Certainly, the

incidence of car fires, following accidents or otherwise, would seem to be on the increase as instanced in the local newspapers. Surely we, the consumers, have a right to know about any changes potentially affecting our safety? Considering the misinformation that we've been fed during the great 'unleaded propaganda war' (eg: retarding the ignition timing by up to 6 degrees won't reduce performance or economy; 4 star leaded is a safe substitute for 2 star in low compression side-valve engines, etc) can we trust the oil companies and the government to tell us the truth?

A sign of the times, of course, is that WPK's Pirelli Classic mount had been converted to run on unleaded. But those of us fortunate enough to own and use several older vehicles are hardly likely to be able to afford expensive cylinder head modifications to each and every one. My wife and I consider ourselves to be average, impecunious enthusiasts. We don't have a modern car, but yet, over the years, we've somehow managed to amass five post-war cars and a couple of motorbikes, all of which we intend to keep and use. Imagine the cost of fitting hardened valves and seats to that fleet.

Incidentally, WPK suggested that Triumph TR4s were always noisy. I don't know which 'contemporary road test' he refers to, nor whether the works cars were much worse in this respect than the standard production model, but the truly noisy TR was, without doubt, the early 2, fitted with the short silencer. Indeed, it has been said that the coming of the final apocalypse may well be presaged by a din not unlike the sound of a long-door TR2 chasing a BSA Gold Star up a long hill, past a heavily laden Commer two-stroke diesel!

David M. Landers
Morpeth, Northumberland.

The Adams Post

Sir
Being a former apprentice of the Igranic Electric Company, the article Adams Car (August, 1990) bought back memories. In about 1964 the company, then known as Brookhurst Igranic, purchased a single-cylinder Adams car and rebuilt it using apprentices.

If my memory serves me right this had no radiator as such and was eventually put on loan to the Shuttleworth Museum. It was in 1913 that the company changed its name to the Igranic Electric Co Ltd. I have a photograph of the company at that time together with a 4-cylinder side-valve 16hp Adams last known in Australia in 1973. Eventually the company became known as Cutle-Homman in the mid 1970s.

John W Cox
Edinbridge, Kent

Dual Standards?

Sir
I have recently spent a couple of very

enjoyable days as Medical Officer at the International Historic Festival and the Bentley Drivers Club meetings at Silverstone. The great appeal of these events was the sight and sound of the older sporting vehicles being used as they were intended and this makes for a considerably better day out than say a visit to Beaulieu.

However, at both events a driver was unfortunate enough to roll his car and as a result be sent to hospital for in-patient treatment for moderately severe injuries. In both cases the cars were sufficiently old not to require roll bars or harnesses and in each case the drivers were thrown clear. Each was indeed fortunate not to be crushed either inside his upturned car or as a result of his car landing on top of him. Equally neither driver was run down by an oncoming vehicle.

Now if I chose to race my TR2 I have to accept the rule that the car must be fitted with a roll bar and harness despite the fact that neither would have been fitted in the Fifties. I cannot accept the supposition that since this car is twenty years younger than another it should be more likely to roll; so why do we have different rules for cars based purely upon age?

I seem to recall some years ago an article in *The Observer* on Grand Prix racing in which Stirling Moss pointed out that one reason it was harder to progress these days was the advances that had been made in safety. In his day an average of four drivers were maimed or killed each season. Now such injuries are quite exceptional.

Whilst I sympathize with owners who feel that roll bars spoil the appearance of their valuable cars, surely it would take no more time to fit a roll bar for racing than it would to remove the mudguards and lights.

Let us not wait for another fatality but let common sense prevail and let us see the introduction of mandatory bars and harnesses for all cars irrespective of age. Owners who really are concerned about appearance might well indeed be better off polishing their cars for static exhibits.

Christopher R. Pearson.
Bungay, Suffolk.

Unique or Very Unique?

Sir
L Wickham deplores the damage being done to the English language by some advertisers. I wonder if he noticed a Willment Ghia Cobra, in the September issue, described as 'very unique?' The car may be rare, it may well be very rare, but if it's unique, it is just that - unique!

DM Landers
Morpeth, Northumberland.

Wet Squibb

Sir
The letter headed Bright Spark in the September issue appears to me to be

contradictory. Most sincerely I endorse Mr Wickham's first paragraph. His second paragraph is an argument in favour of the checking of quotations rather than examples of the use of incorrect English.

His third paragraph - there lies the rub. As any school boy who pays attention knows, a single advertiser, eg one of your advertisers, would not be the subject of a clause which continues 'who have shot themselves in the foot'. Perhaps Mr Wickham subscribes to the modern incorrect and inept convention of using the third person plural to avoid offending any lady who feels left out of the human race when a writer uses himself in this context. Do not worry Mr. Wickham, as you were reporting an error no lady could be responsible; ask any married man.

If L Wickham is Lou Wickham of Alvis 12/50 fame, I would prefer that he should write about his motoring exploits which, from the little I know of them, would be most entertaining and a fine example to all young VSCC members.

Geoff Rigg
Amlwch, Gwynedd.

An Austrian Fox

Sir
The 'Fox-Kleinauto' referred to in Robin Morgan-Giles' letter (June p.641) is, undoubtedly the Austrian Fuchs (which literally translates as 'Fox'). It was produced 1922-25 by Inzerdorfer Industriewerke Hans Fuchs AG of Invalidenstrasse No 1, Wein 111, founded on the 3rd September 1920 with the object of producing motors, body parts and other metalwares. The company specialized in small engines, radiators and exhaust systems.

A four-cylinder 1180cc *Kleinwagen* took part in the Riederberg race on the 11th June, 1922, and a three-seater (two passengers behind the driver) was produced in following years together with a small truck able to carry 600kg.

The Fuchs is not mentioned in the original edition of Doyle, but is added (p.79) in the 1963 edition. It figures briefly in Georgano's *Encyclopedia* 1968 on p. 237.

JD Scheel
Ontario, Canada.

Putting the Record Straight

Sir
I read with interest Jan Mackay's letter entitled 'Honda Problems' in the September 1990 issue. Indeed I agree with his comments but, as something of a Grand Prix historian, I must query his photograph of John Surtees. He states that the picture was taken during practice for the 1967 British Grand Prix at Brands Hatch. This cannot be correct since the 1967 event was held at Silverstone! During that year Surtees drove the Honda RA300 with exhausts within the 'V' of the V12 engine, claiming victory in the Italian GP at Monza.

In 1968 Surtees drove the Honda RA301

with exhausts outside the engine 'V'. Mr Mackay's photograph clearly shows this later configuration and so I conclude that it was taken at the British Grand Prix at Brands Hatch, but the year was 1968!

Incidentally the race was won by Jo Siffert in Rob Walker's privately entered Lotus 49, beating the works cars of Graham Hill and Jackie Oliver who took turns to lead the race but both retired with mechanical failures. I hope this puts the record straight and adds to it just a little!

David J Farrow
Leatherhead, Surrey.

The Radical Approach

Sir
With regard to the views apropos motor racing and the environment expressed by Mike Cotton in his regular column in the September issue, I could not agree more that the sport must be seen by outsiders to be moving with the times with regard to its effect, as perceived by the 'greens' on the environment. Failure to do so will result, sooner or later, in it being used as yet another bandwagon to be climbed on by these frequently hysterical, politically motivated go-getters.

I would suggest, however, that recent history has shown that a fuel consumption restriction formula is not the way to go if we wish to retain the maximum possible spectacle for the viewing public? It always struck me as ludicrous during the middle to late Eighties that, having created a formula which resulted in the most powerful Grand Prix cars in history, their performance during races should have been emasculated by an arbitrary fuel restriction.

The purpose of the restriction was primarily to make a statement to the world at large that the sport cared about the energy crisis. Yet nothing of any great technical merit was achieved in engine design during this period as a result. What did happen was that at race after race, the viewing public was confronted by the less than riveting spectacle of cars being driven, frequently in tandem and at a fraction of their true potential, by drivers who were endeavouring to finish the races in the car rather than on foot, as opposed to trying to win them. I am inclined to wonder whether the banning of the turbos was to some extent motivated by the team sponsors threatening to pull the plug on the sport if the spectacle was not seen to improve. Certainly the argument that turbo development was too expensive has been eroded by the vast expenditure since invested by the major players in the development of normally aspirated engines.

I would like to propose an alternative course of action. Though it may at first seem extremely radical, let us not forget that we are dealing with a sport in which radical solutions to technical problems have been applied throughout its history. Might I suggest that the governing bodies consider the adoption of hydrogen as the only legal fuel for Formula One? The adoption of this gas as a fuel would eliminate the exhaust pollution problem at a stroke. It is also a resource which the Earth is

not exactly short of. What we are lacking at the present time, however, is a cheap way of extracting the gas from the atmosphere or water. I would suggest that the adoption of this fuel by a sport which has such wide exposure may stimulate pressure for research from the 'green' political element towards the solving of this problem. Among its other attractions are a reduced fire risk compared to petrol. This has to be good news.

Of course there would be technical problems to be overcome by the engine manufacturers. But is this not what they are paid for? Surely, a three to five year breathing space before the adoption of the rule, to allow research and development, ought to be sufficient for the likes of Honda, Renault, and Ferrari to produce useful and potent engines. The problems involved are by no means fundamental. Both standard I/C and jet engines can already run on liquified hydrogen with very little modification. With regard to the fuel companies, they have known for twenty years and more that the resources of fossil fuels are not only finite, but increasingly limited, not least by political considerations. They should be in the vanguard of research into alternatives. Indeed some already are, witness the initiative by Gulf Oil several years ago to sponsor research by the Chloride battery people into new types of batteries for electric car propulsion.

Motor racing has always enjoyed the distinction, unique among sports, of providing technical advances in tyres, brakes, metallurgy etc, which are to the benefit of everyone, even non drivers, in all walks of life, rather than merely entertainment to its followers. Perhaps the time is now ripe for the sport to take the initiative and be in the forefront of research and development aimed towards the ultimate solving of the energy crisis by the exploitation of this abundant alternative fuel. Surely such an exciting initiative would be preferable to a return to the technically stifling, dreary spectacle of high-speed economy runs in Formula 1, rather than motor races.

MW Hicklin
Derbyshire.

Bill Little's Alfa

Sir
I can answer Mr McDonald's queries on the above (Letters, Sept 1990). This car was abandoned at London Airport by a navigator of Air India Airways nearly 40 years ago. It was commandeered by HM Customs and sold by them to me for £50 via the late Ken Taylor of Thompson and Taylor.

Some bearings in the rear axle had failed so I rebuilt it, did some work on the engine and swapped it with Bill for a 1928 Lambda DHC and some cash.

When I bought it the car was full of junk including the original 1939 catalogue. This showed the car to be a standard production work on the long chassis. Also on this chassis were a saloon of similar shape and a Coloniale which was a desert or army vehicle.

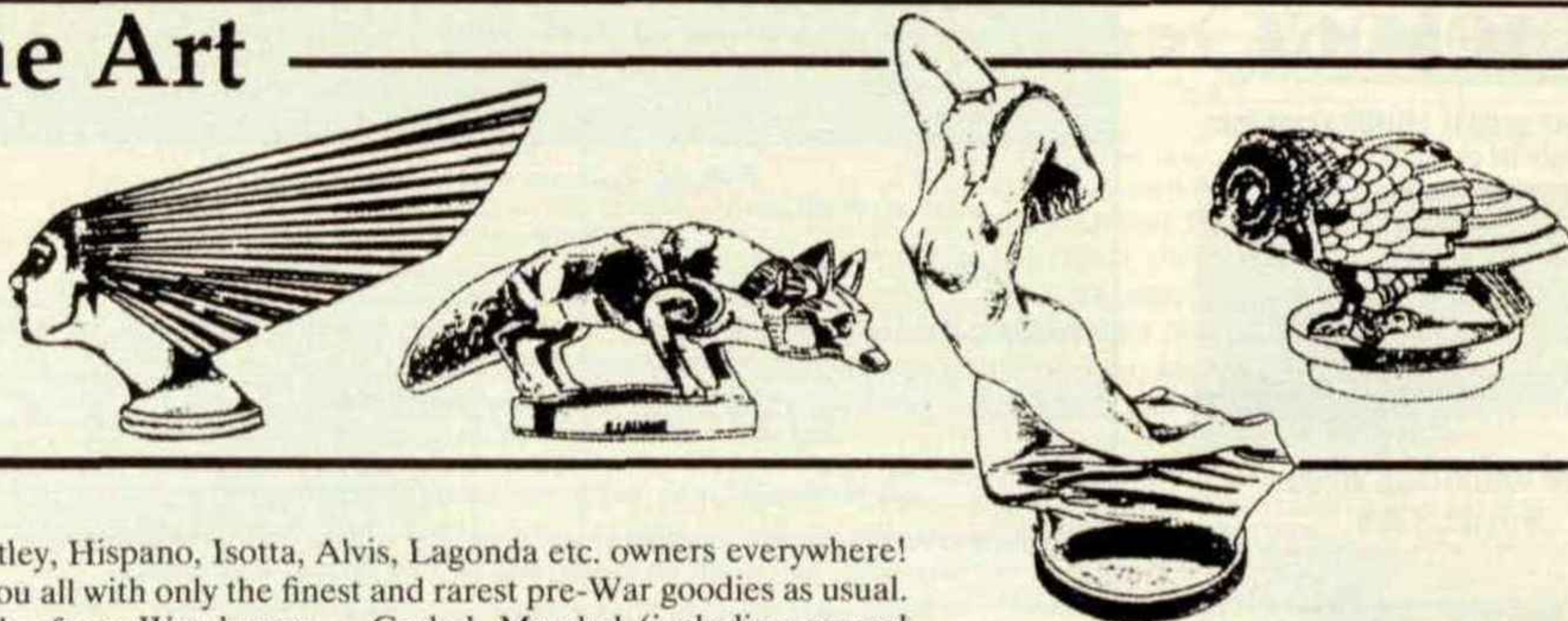
Incidentally the King of Morocco had an identical car.

AH Piper, Ewhurst, Surrey.

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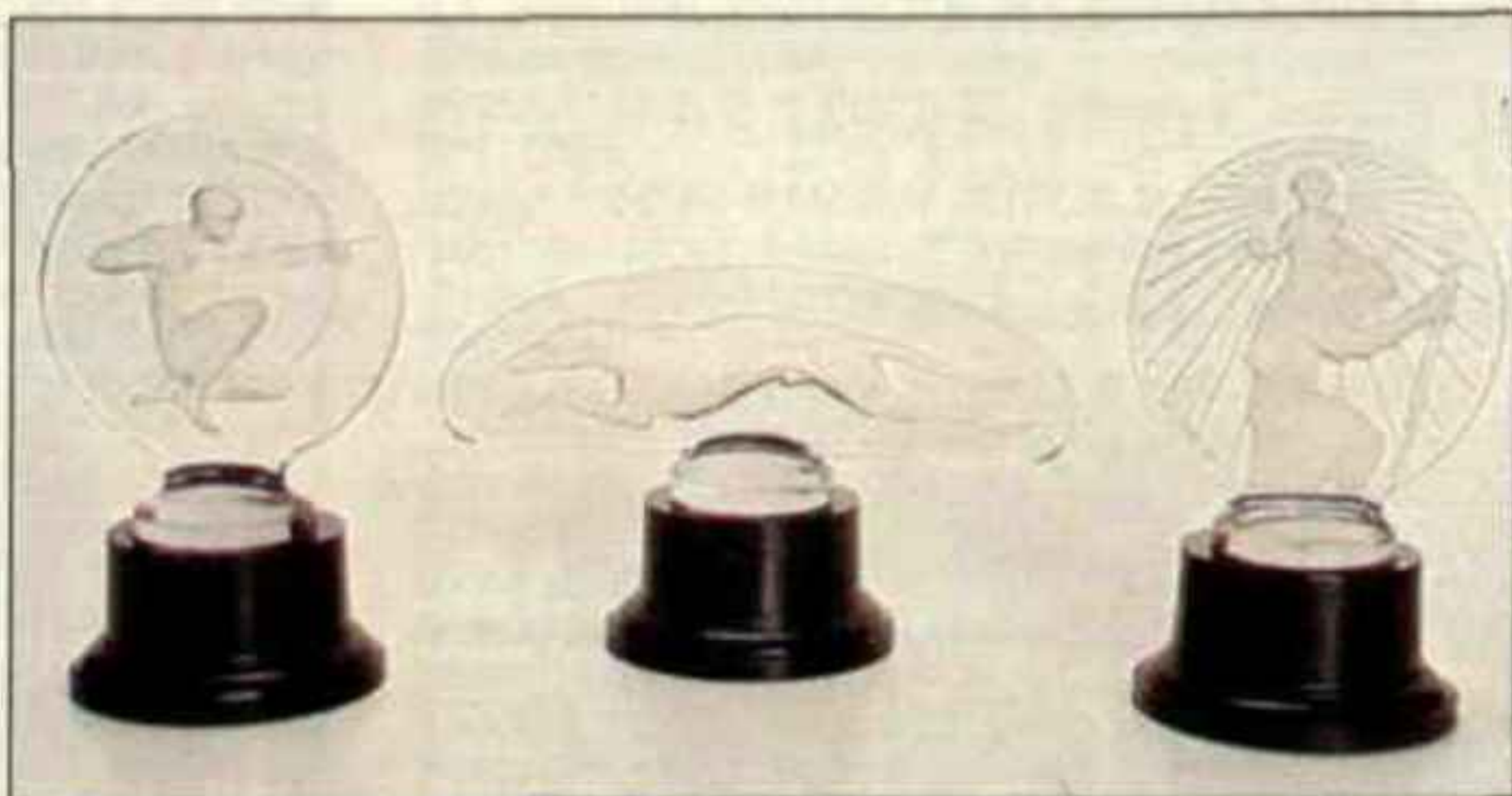
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PACE ARROW T27 American Motorhome, 1982 (Y), good working vehicle in regular use, fully equipped including awning tent, poss exchange car, £19,750. (034282) 2274 (Trade).

JAGUAR 1 1/2 LITRE Saloon, 1948, two-tone grey, good original condition, tax, MoT, £9,750. (034282) 2274 (Trade).

ASTON MARTIN DB4, 1960, to full GT specification by factory during 1960/61, history from new, low mileage, interesting car, lovely original condition, offers/exchanges. (034282) 2274 (Trade).

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JAGUAR E-TYPE V12 2+2 Manual, 1971, 56,000 miles, with history, dark blue, grey leather, chrome wheels, lovely original example, £18,950. (034282) 2274 (Trade).

JAGUAR V12 XJ, short wheelbase, 1973, 1 owner, 17,000 miles, as new, £11,950. Also Daimler Double Six, 1973, 30,000 miles, short wheelbase, Series I, £8,950. (034282) 2274 (Trade).

GREGORY, 1956, 1172cc Special, similar to Lotus 6/7, BRG, good condition, £6,995. (034282) 2274 (Trade).

BENTLEY CONTINENTAL M.P.W., 1965, 3rd from last manufactured, Regal red/black interior, £39,950. (034282) 2274 (Trade).

FERRARI 365 GTB Daytona, 1973, a low mileage car in perfect condition, silver blue, £275,000 o.n.o. Also Ferrari 365 GT 2+2, 1970, blue, low mileage. A perfect original example of this rare model, £145,000 o.n.o. (0323) 506152. Private sale. (CC 034282) 2274 (Trade).

FERRARI DINO 246 GT, 1972, 20,500 miles, full history from new, blue, excellent in all respects, drives perfectly, £80,000. (0653) 628283 (Trade). (231768)

1939 ROLLS ROYCE WRAITH 25/30 7-seater Limousine, West of England cloth to rear, £20,000 o.n.o. Telephone 0606 74615. (CC07821)

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FERRARI 308 GTB Glassfibre, red with magnolia, 36,500 miles, FSH including all MoTs, plus bills, just had £3,000 expenditure at main agents, superb original car, £45,000 o.n.o. (0425) 273682. (CC 034282) 2274 (Trade).

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FOR SALE - continued

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PORSCHE 911SC, 1980, ice blue, FSH, 110,000 miles, very good condition, £16,000 o.n.o. (0268) 757779. (CC61242)

MORGAN + 8i, 1988 (F), 1,600 miles, red, black leather, aluminium body, luggage rack, immaculate, £27,500. Tel: 0604 412948 (Northampton). (011372)

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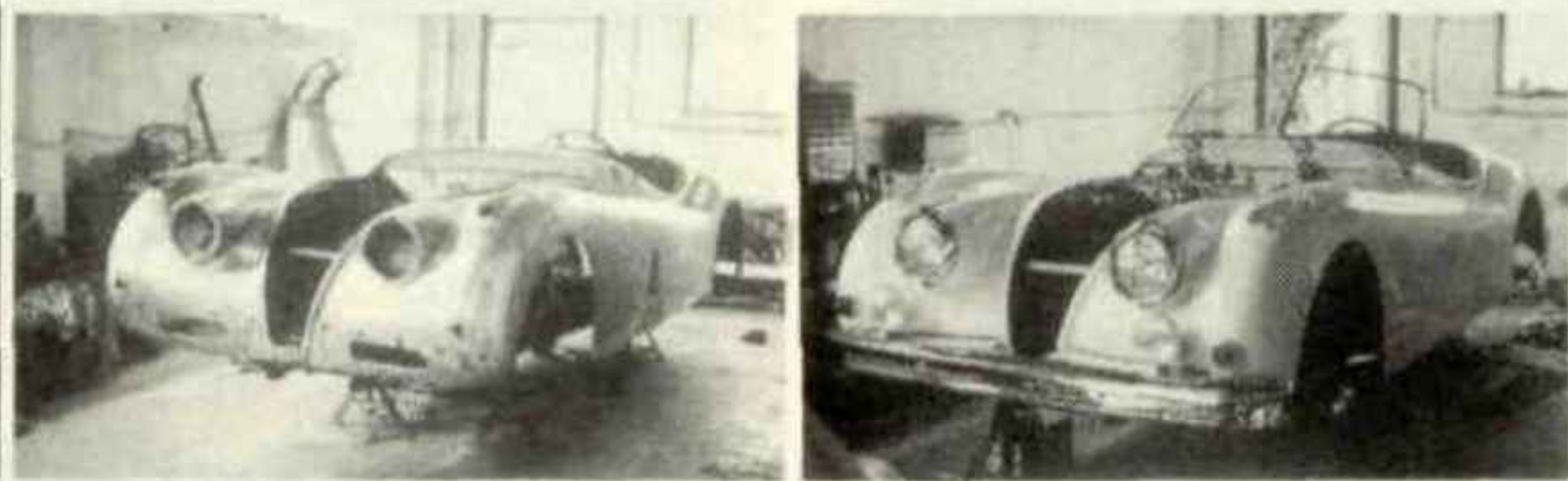
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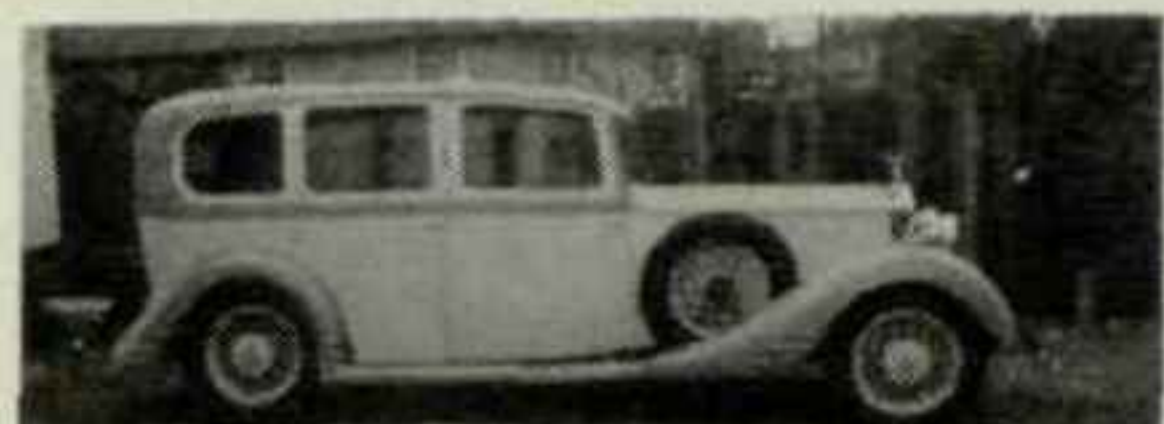
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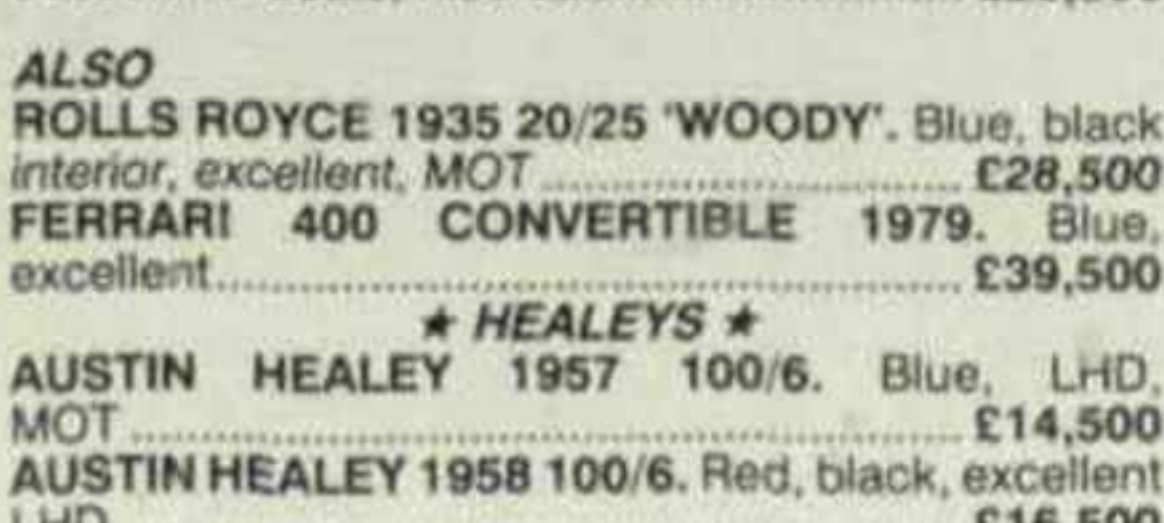
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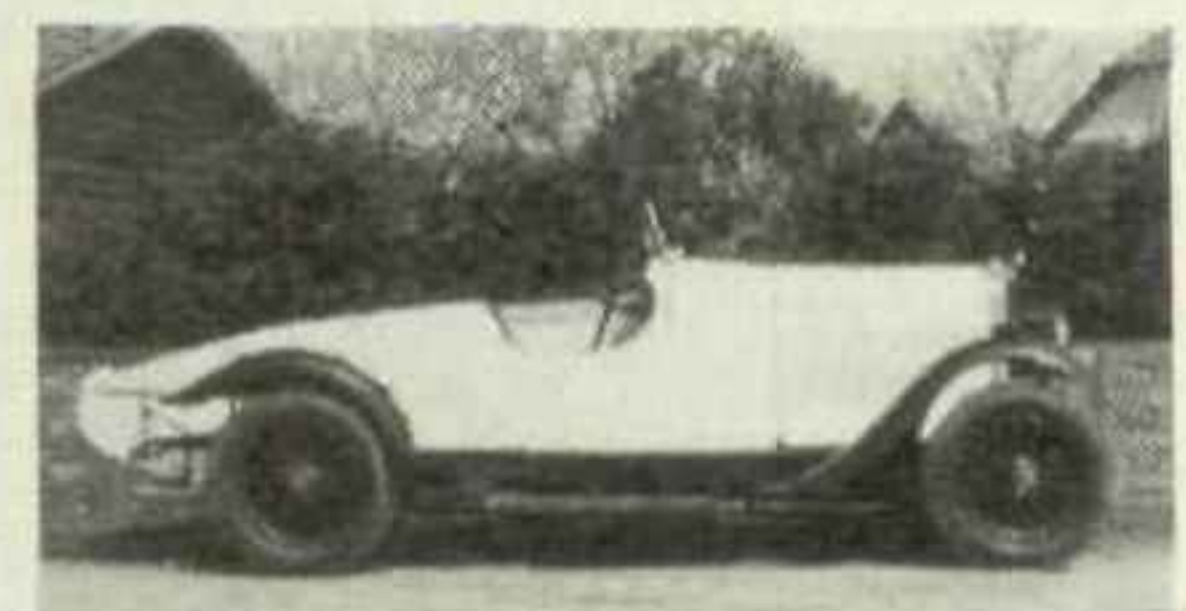
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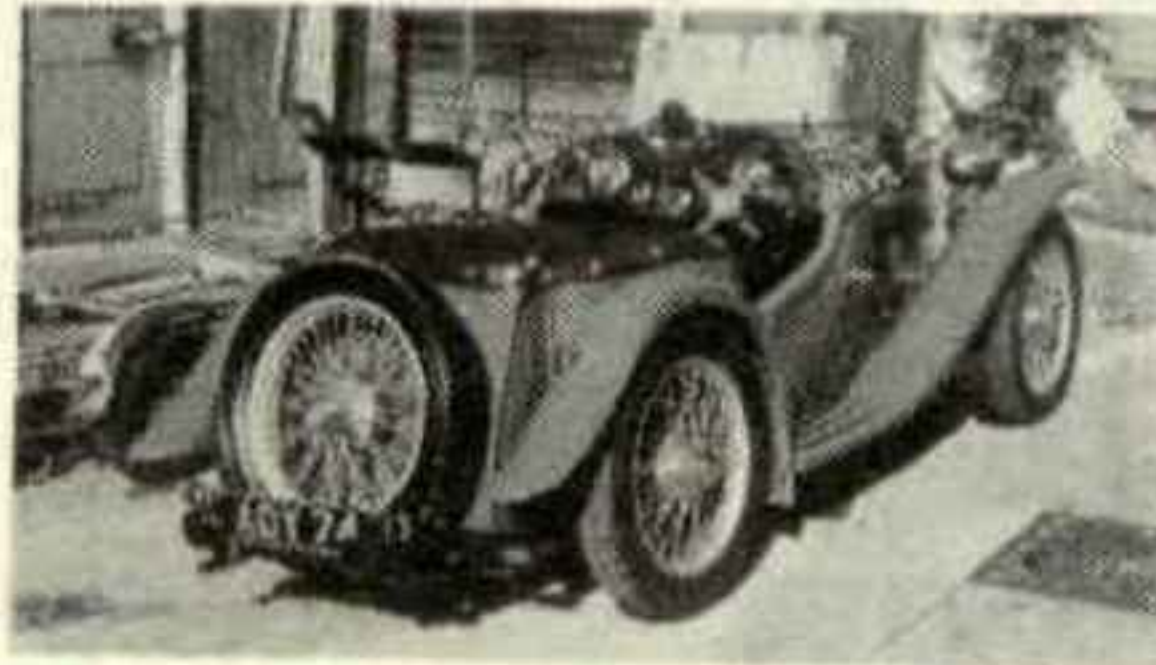
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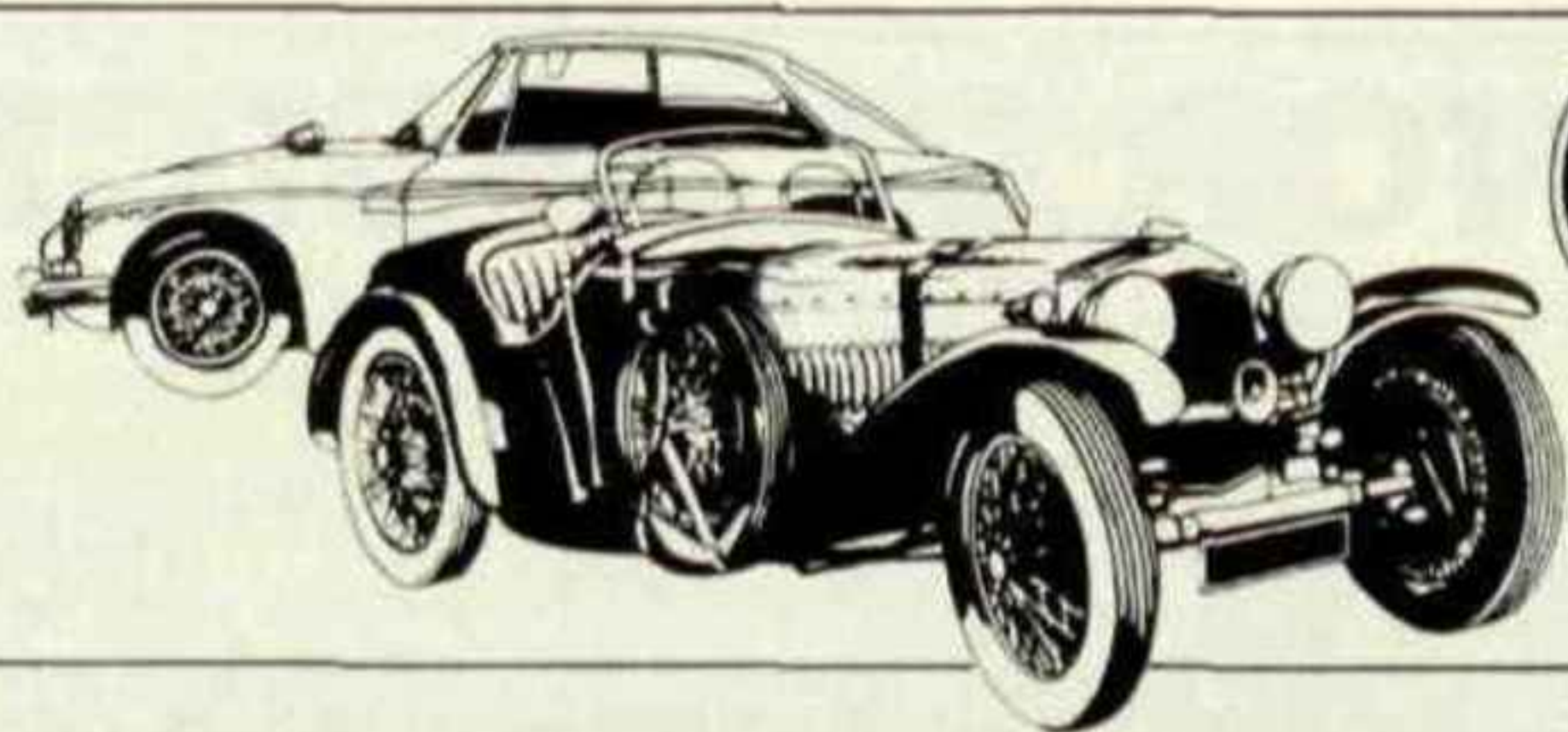


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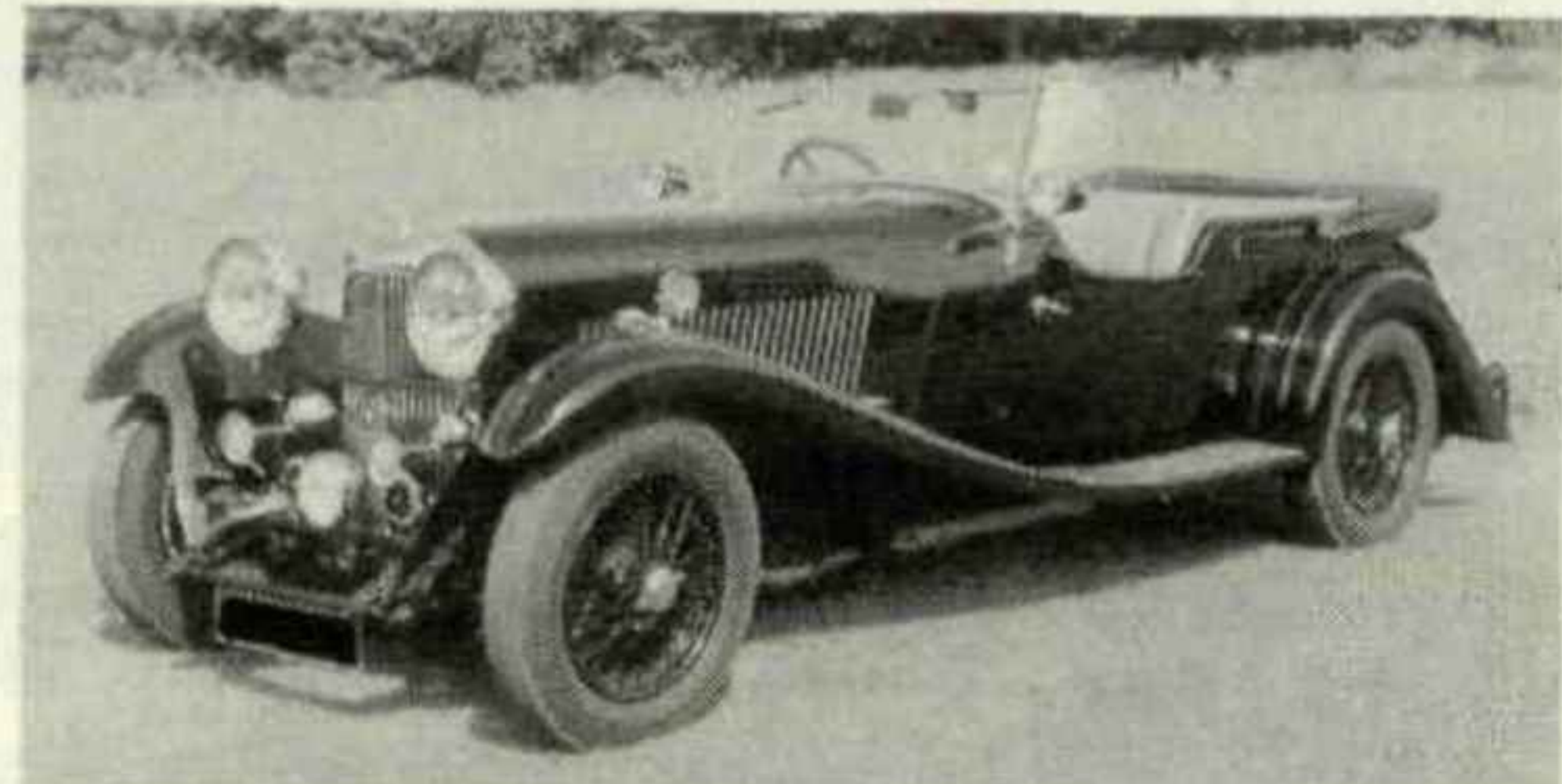
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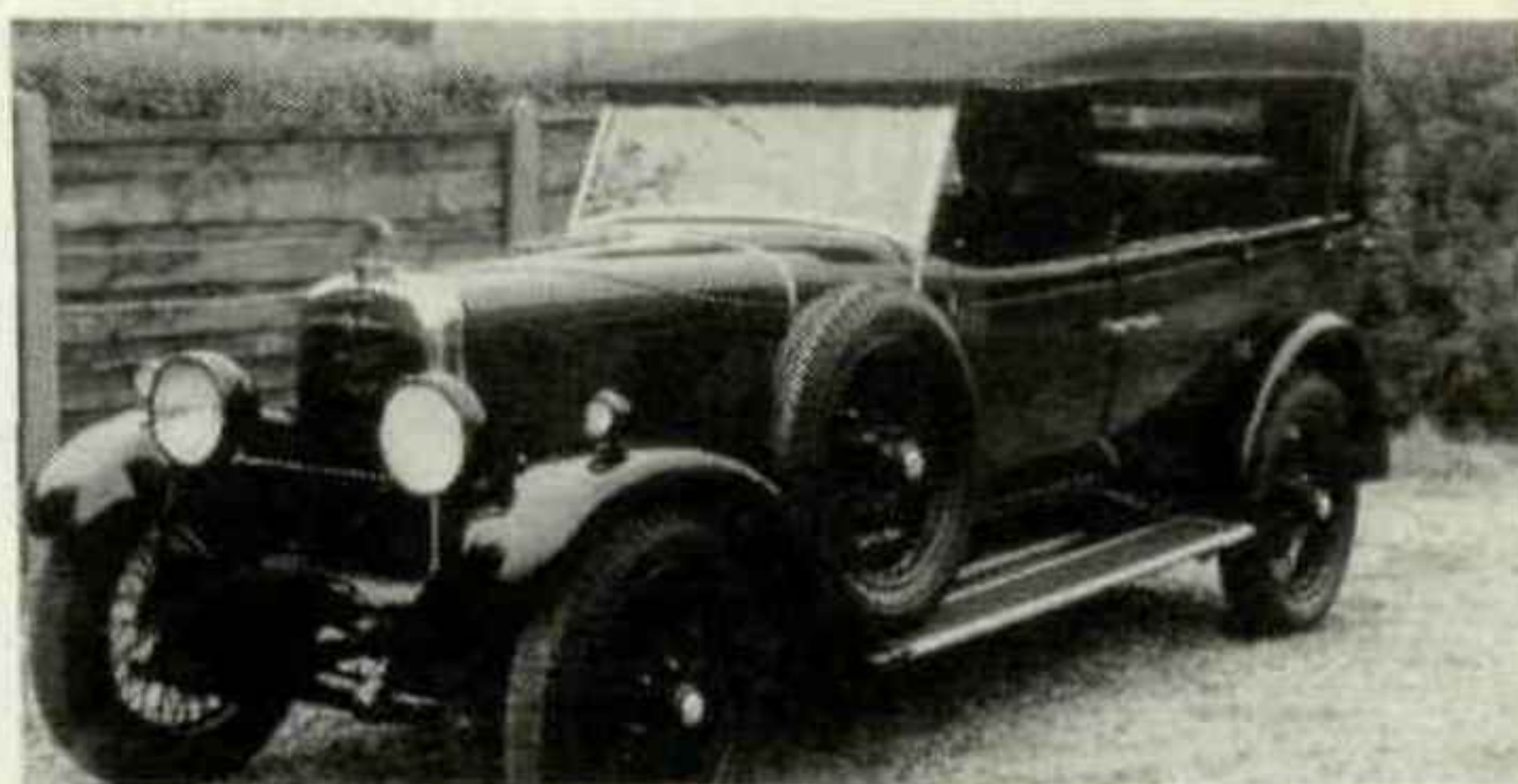


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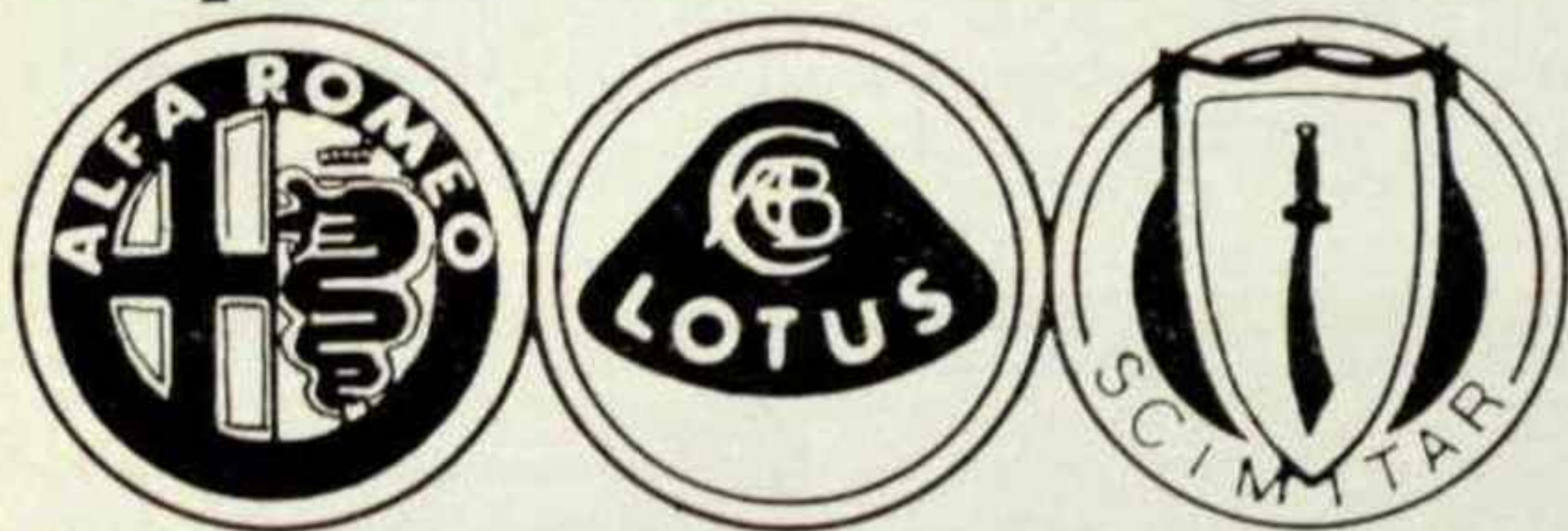
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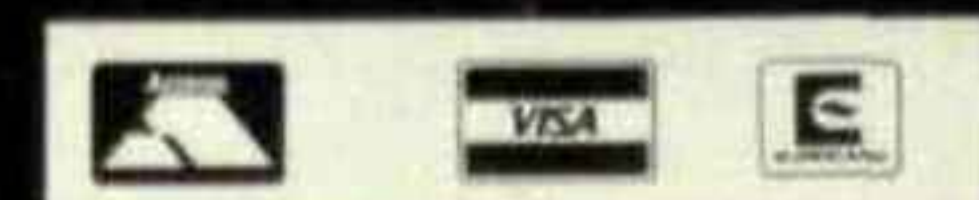
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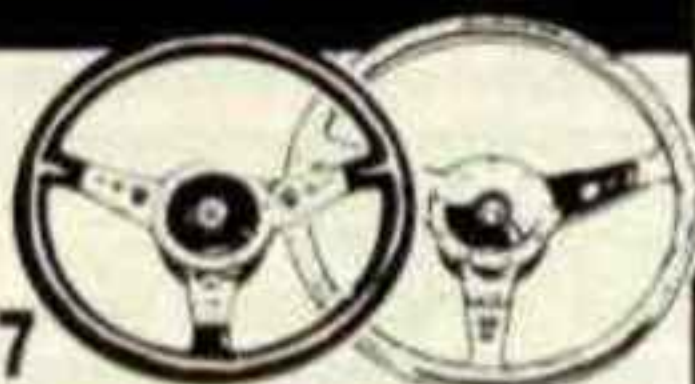
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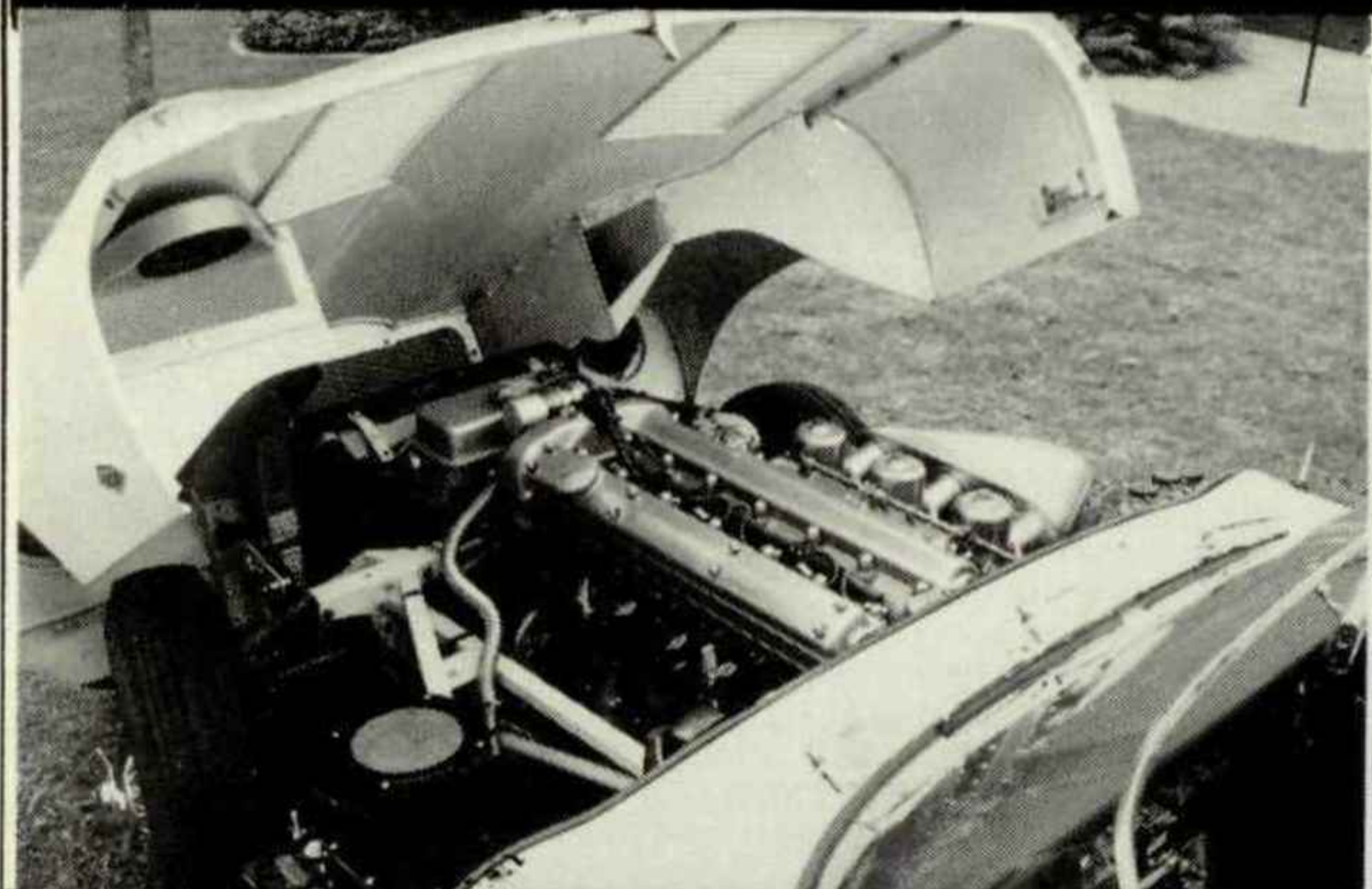
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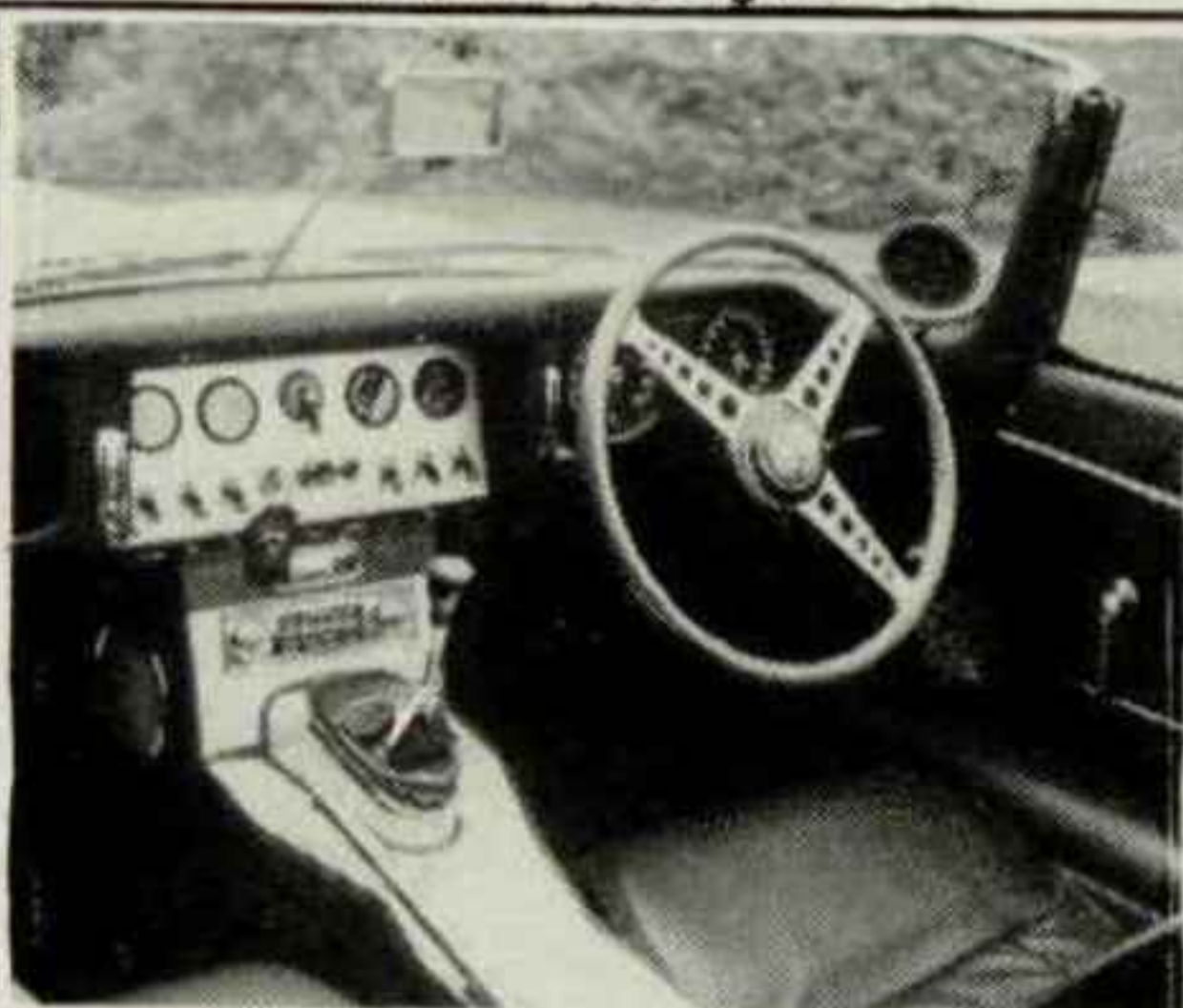
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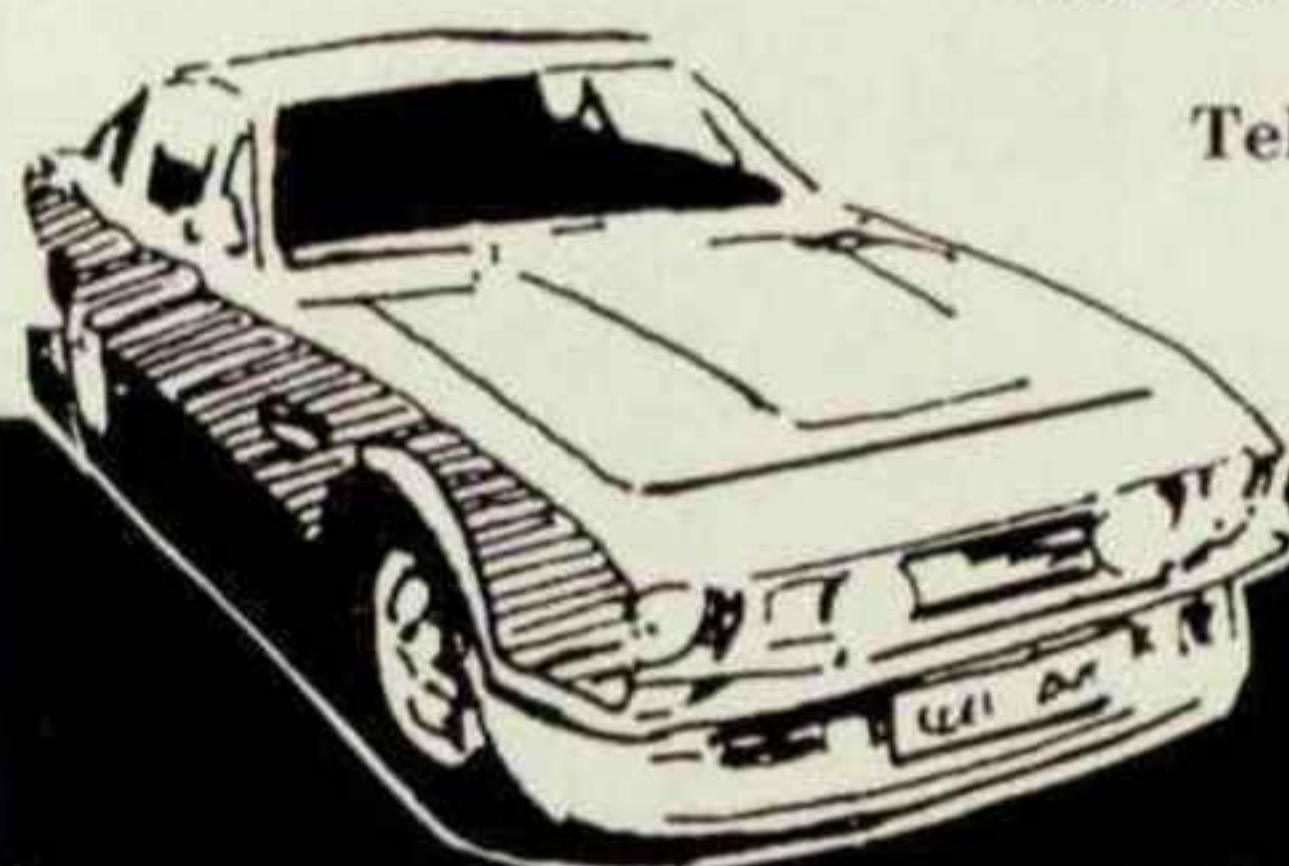
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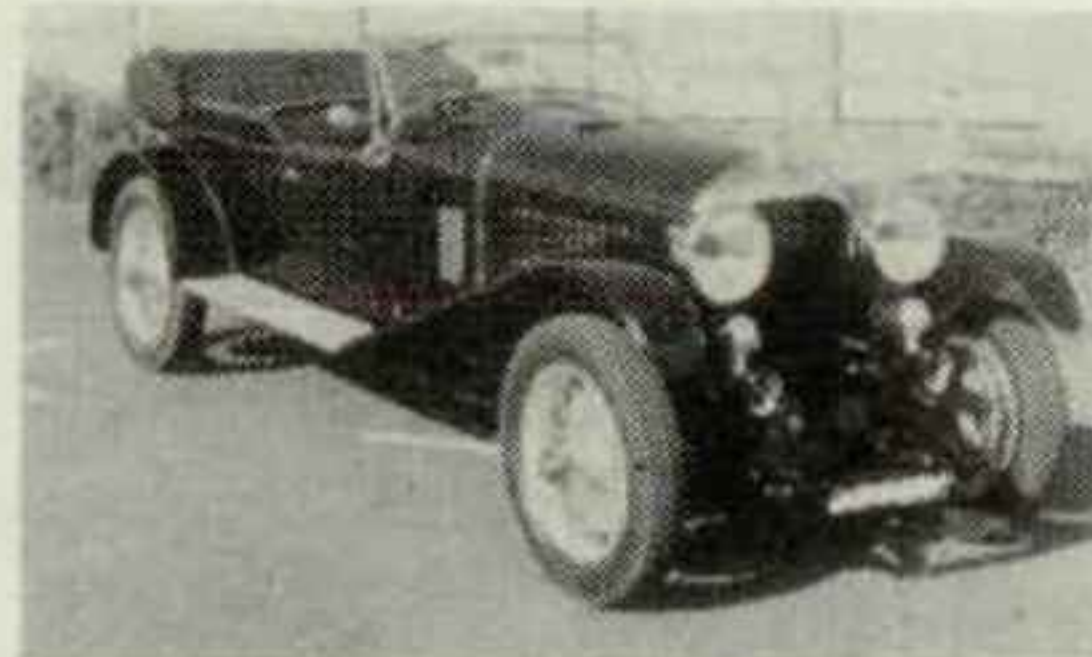
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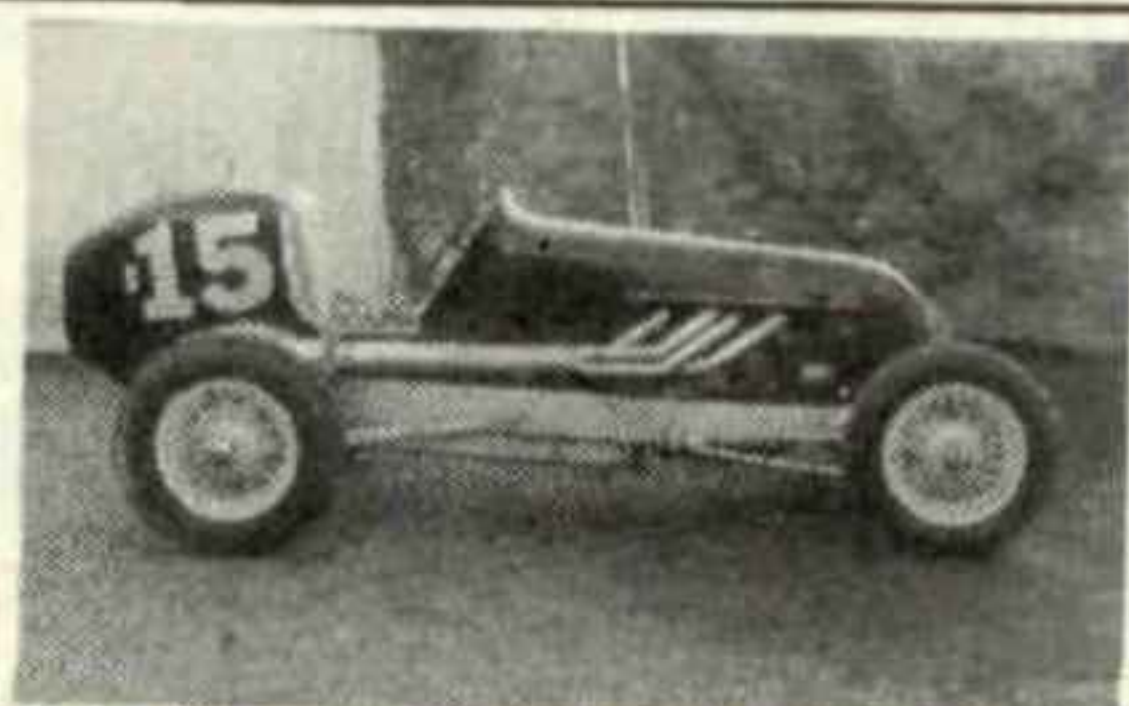
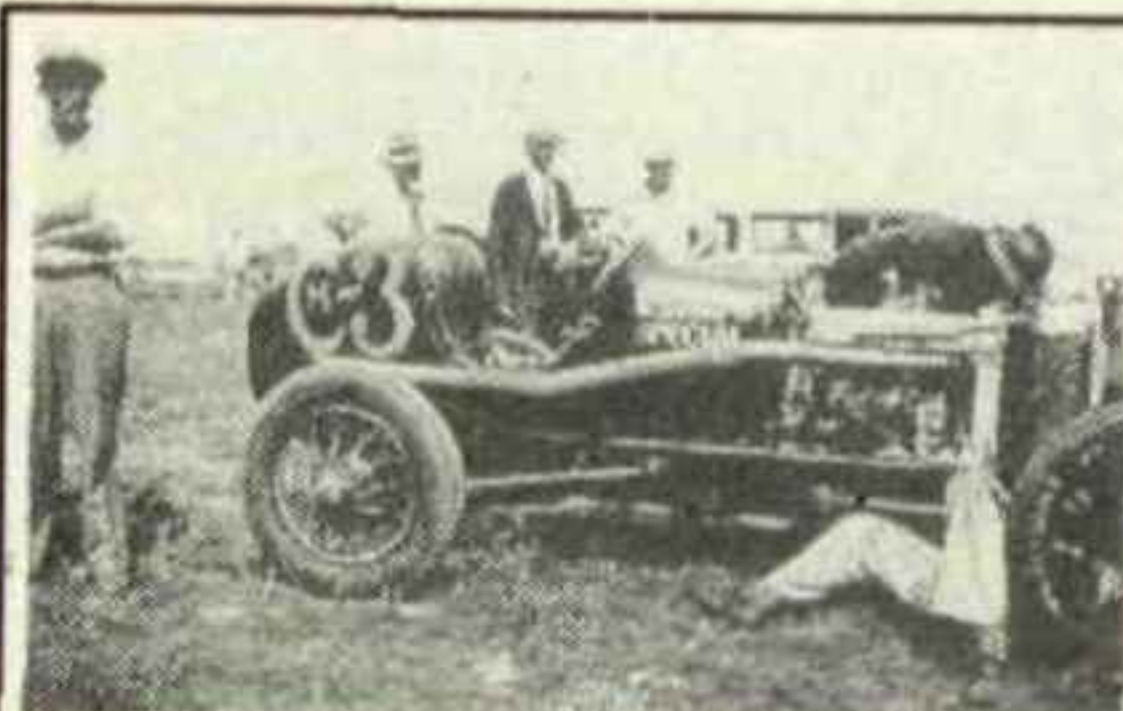
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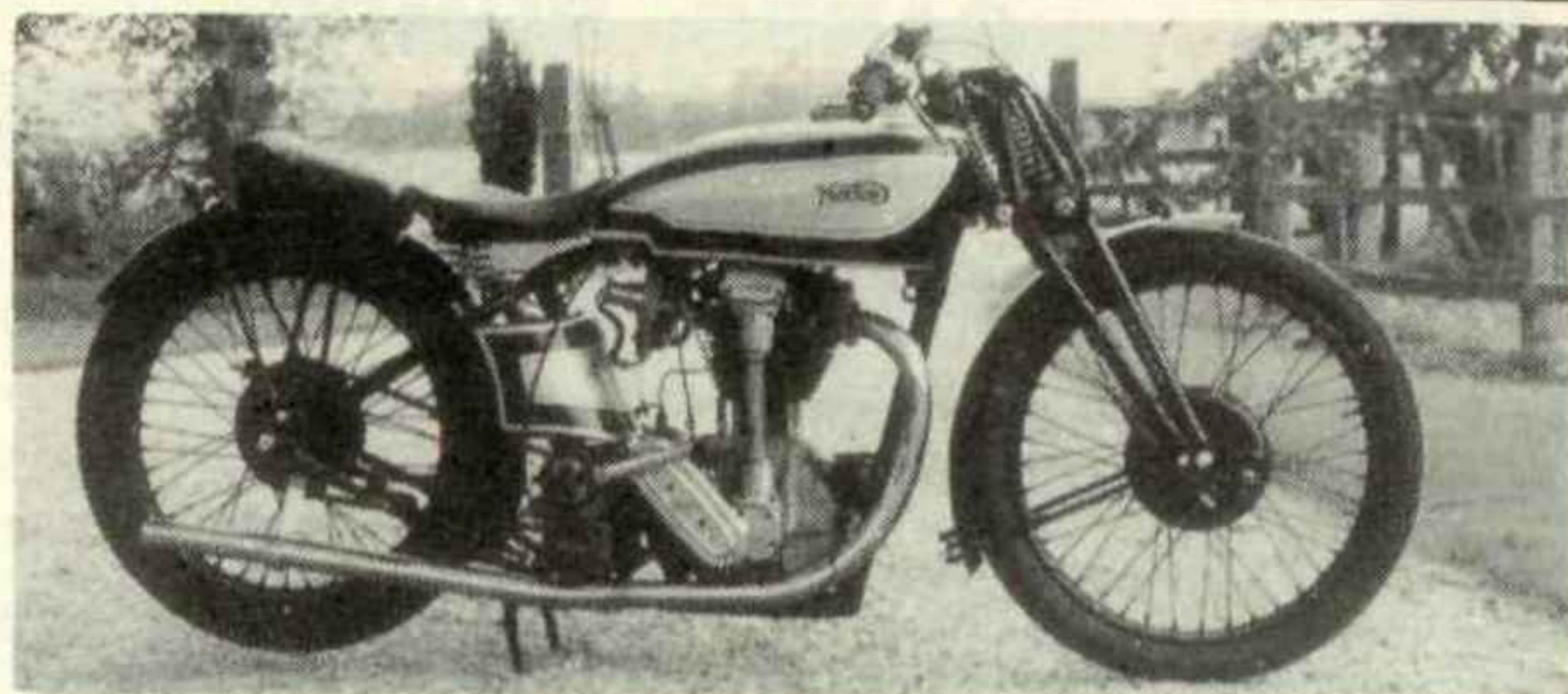
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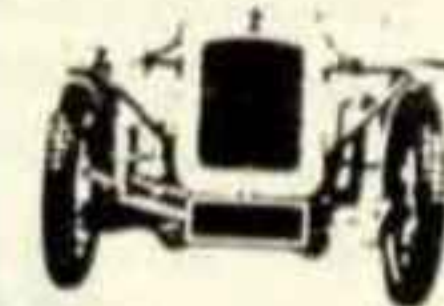
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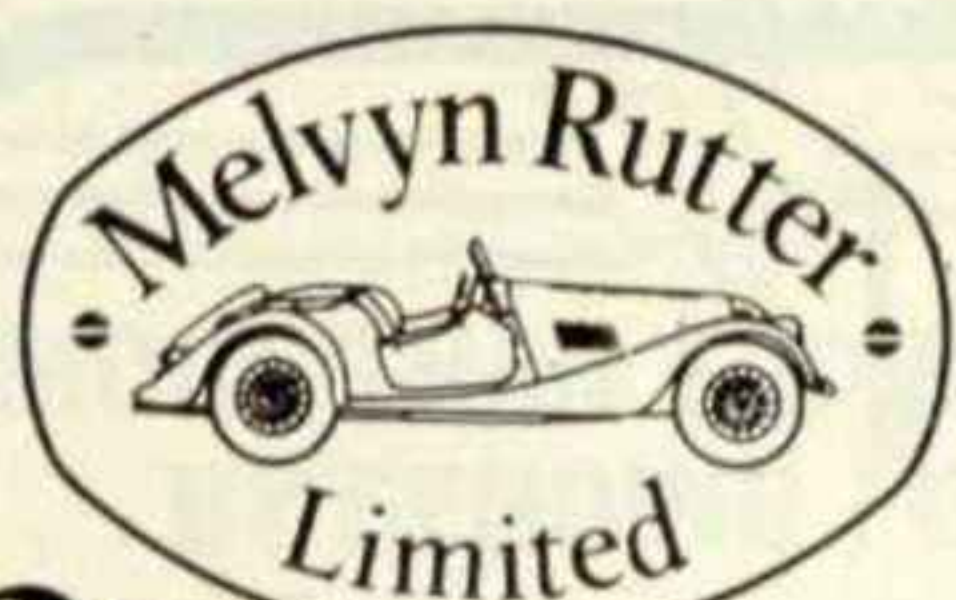


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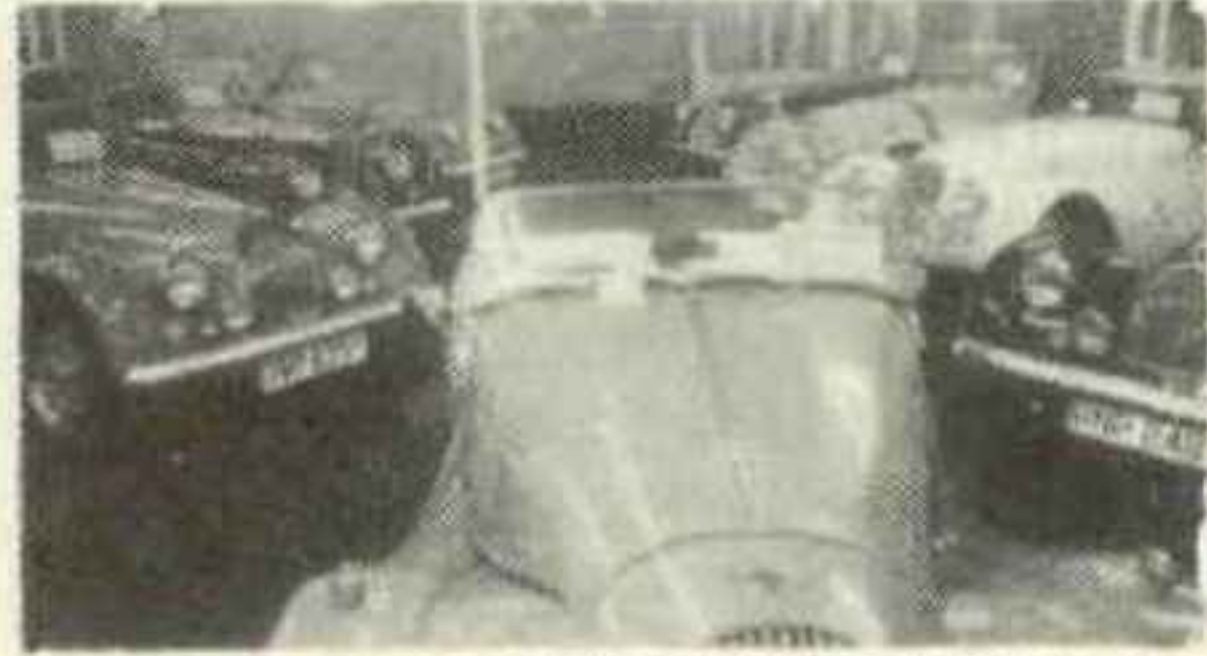
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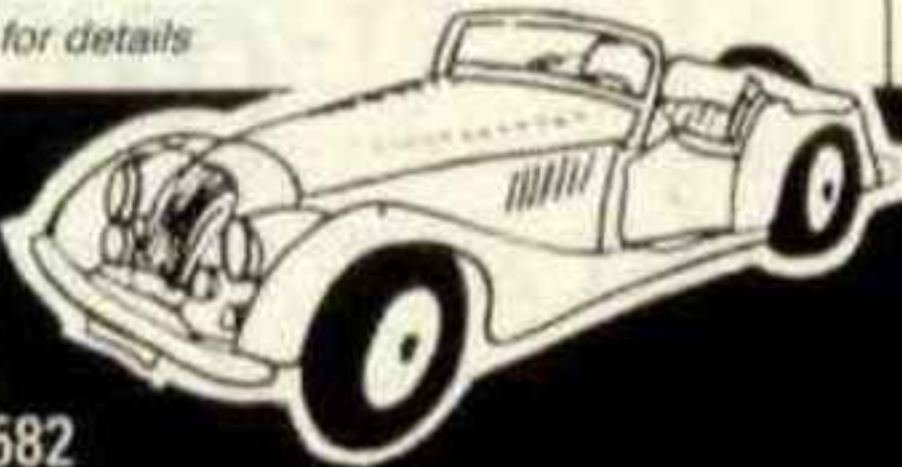
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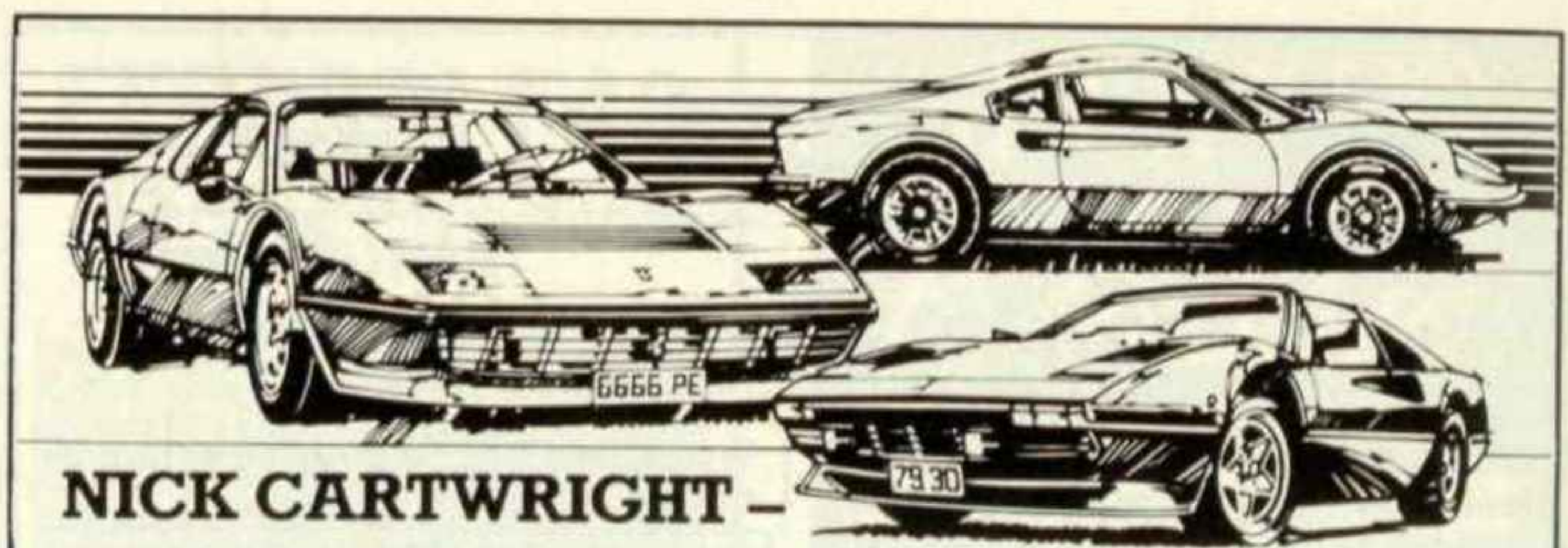
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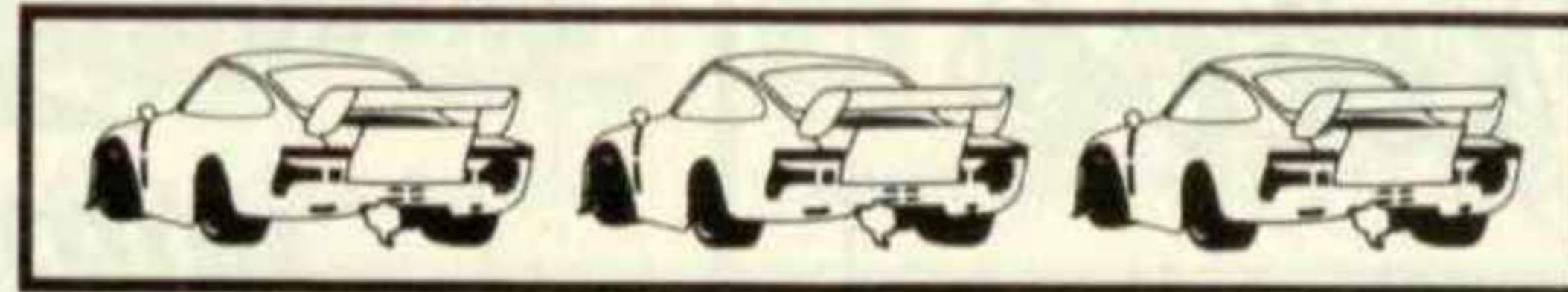
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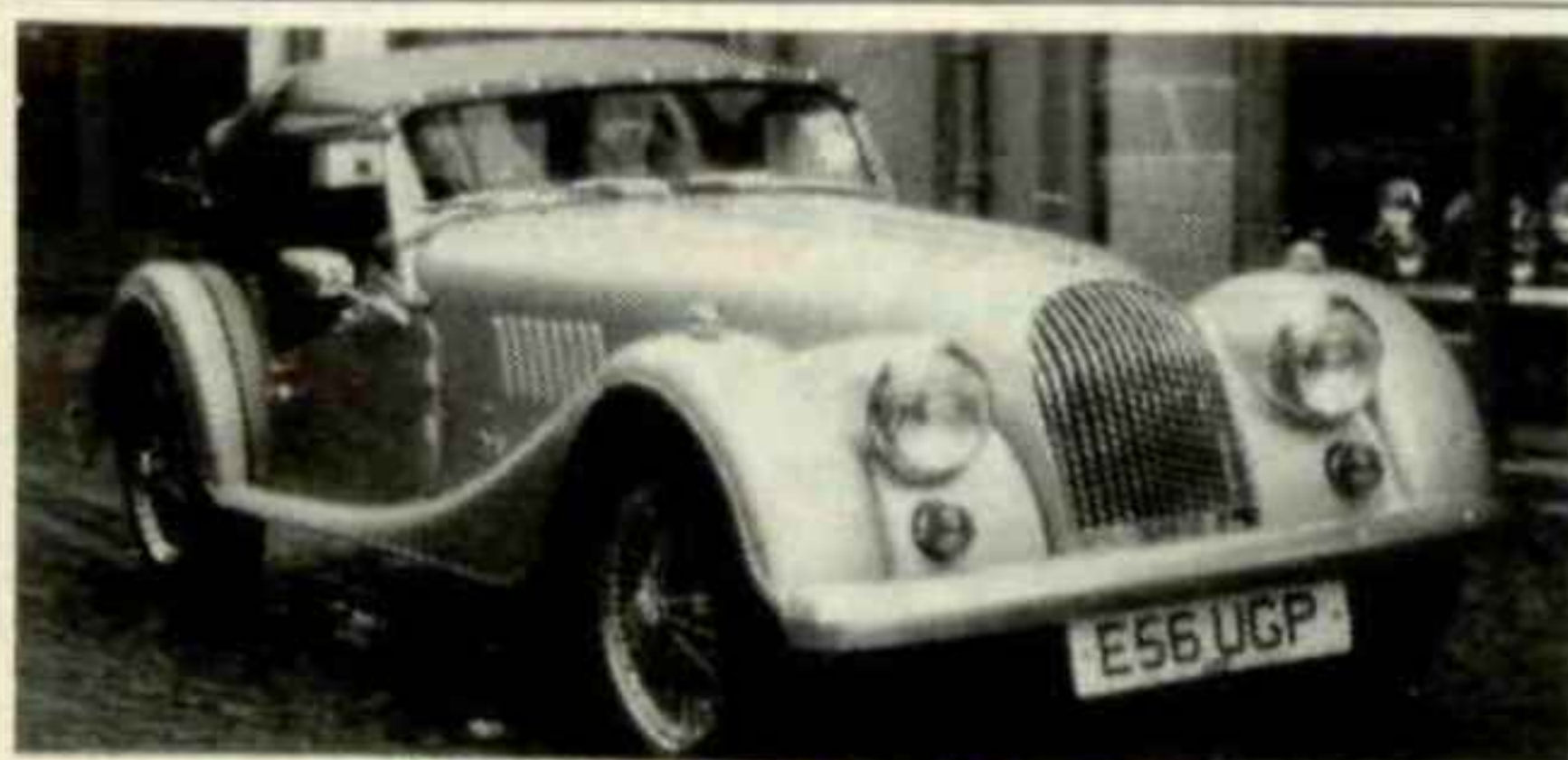
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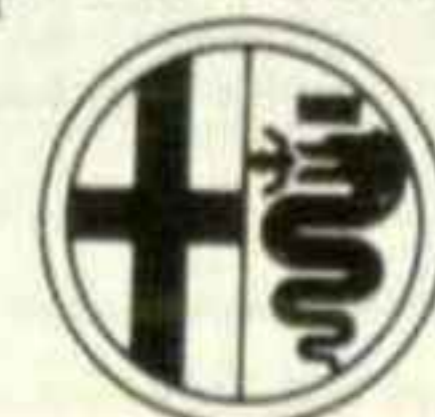


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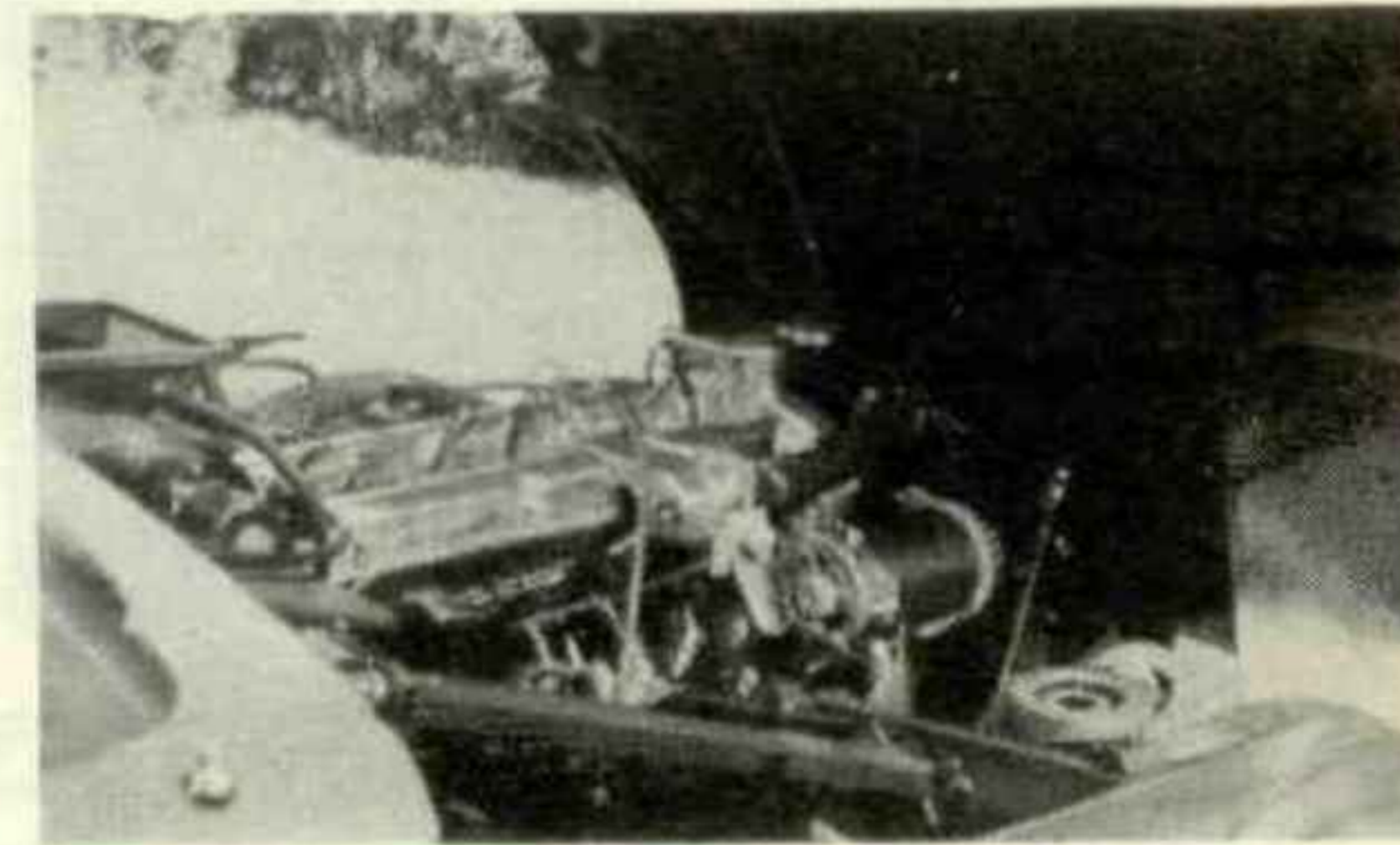
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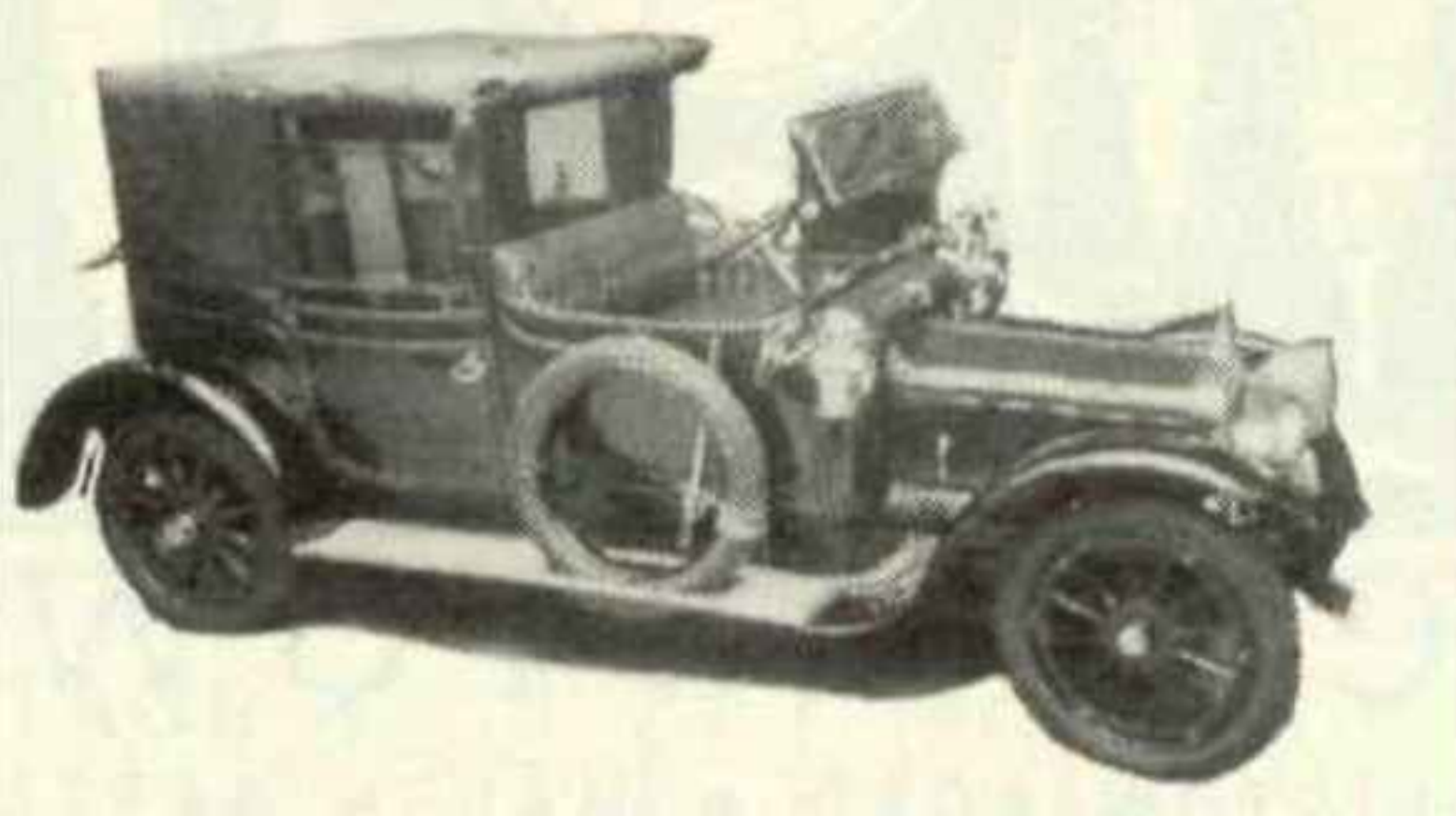
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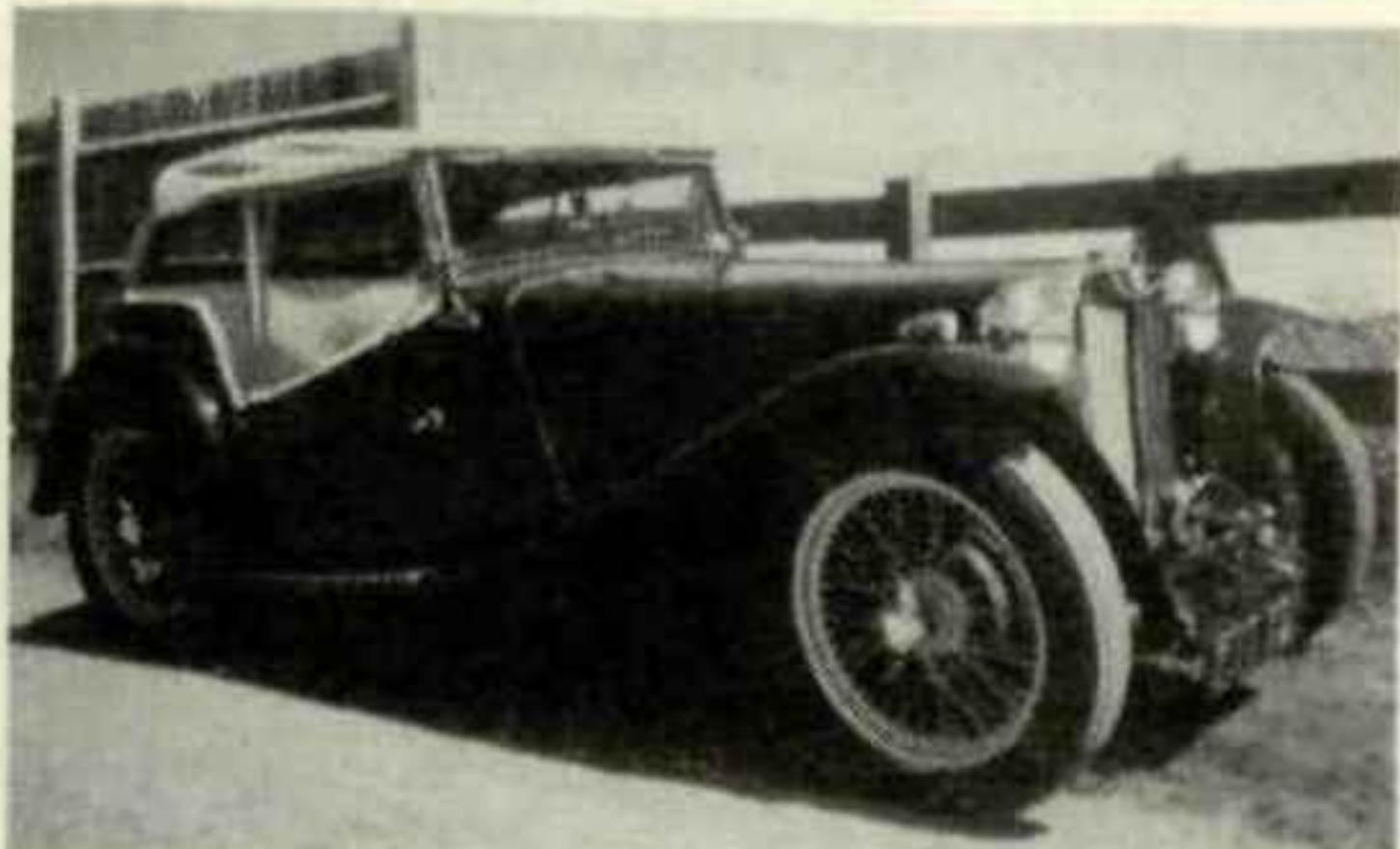
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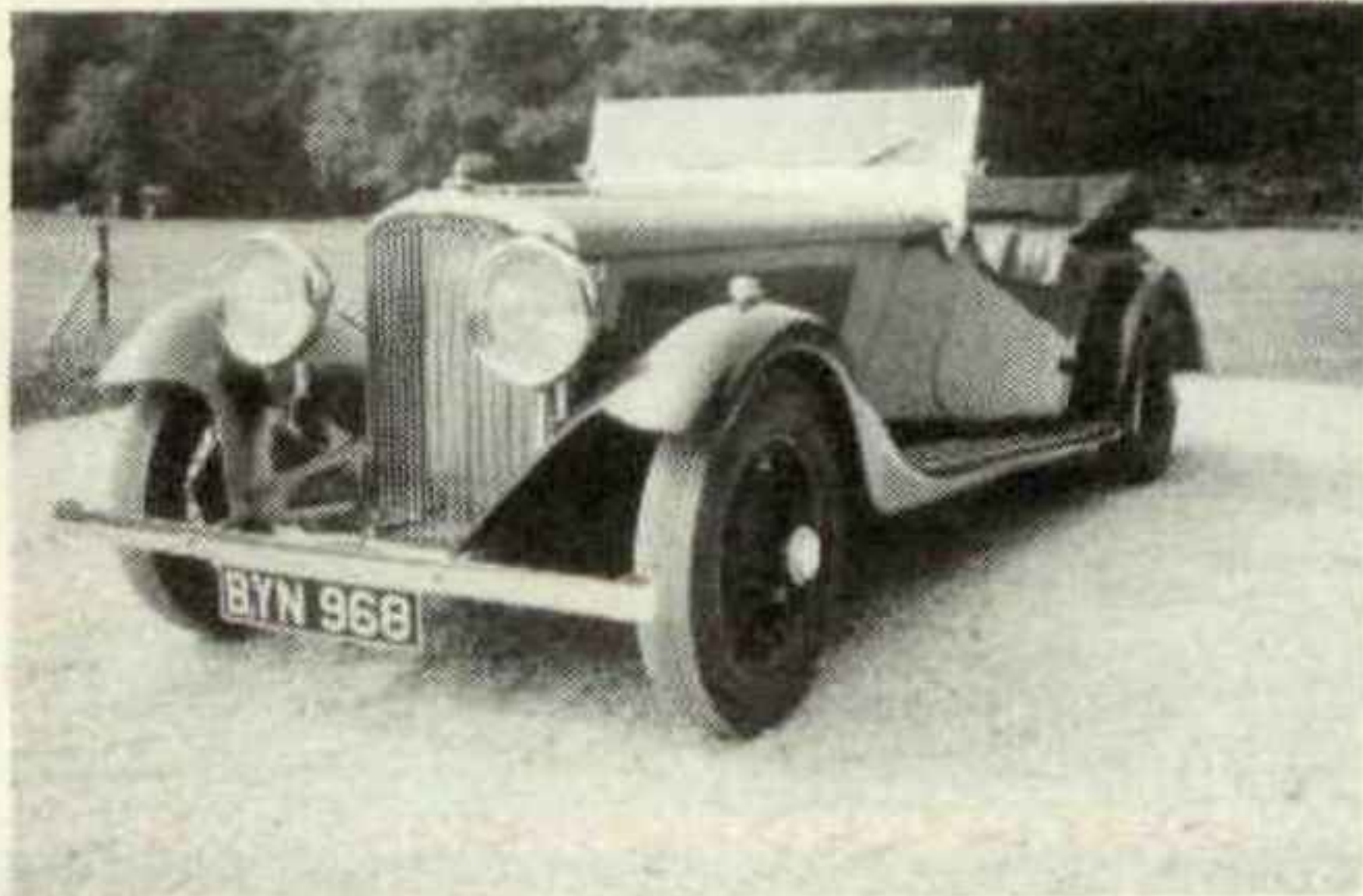
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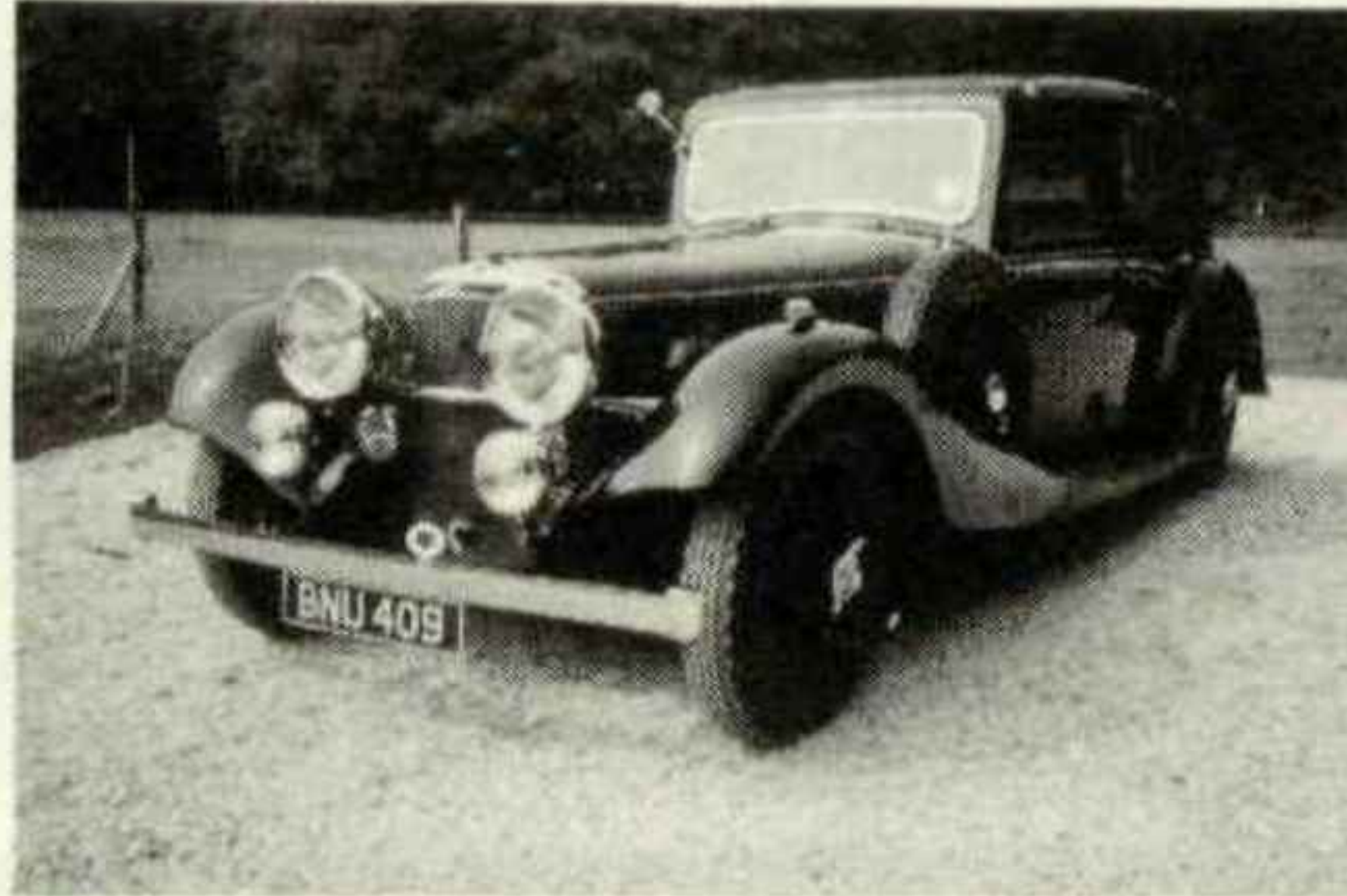
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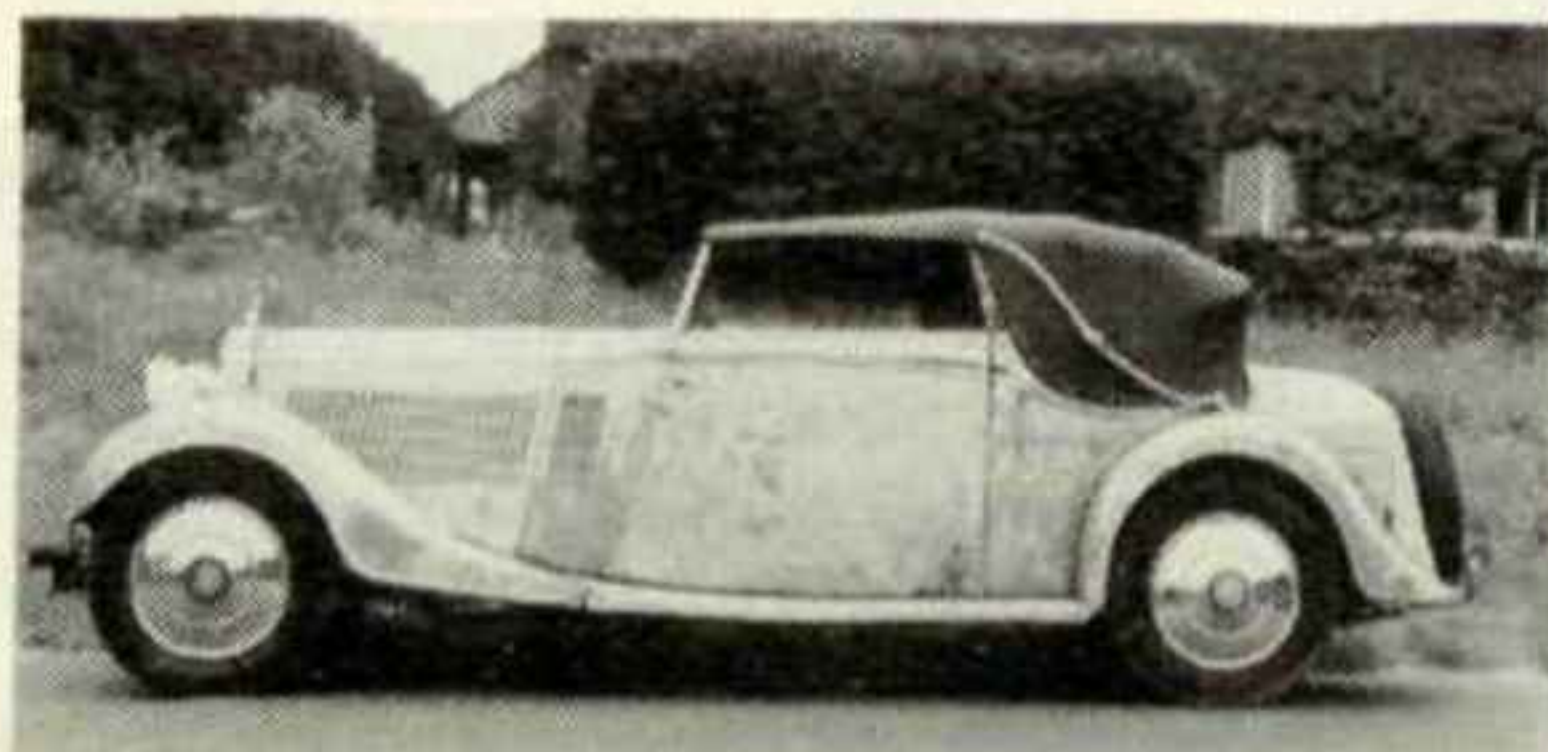
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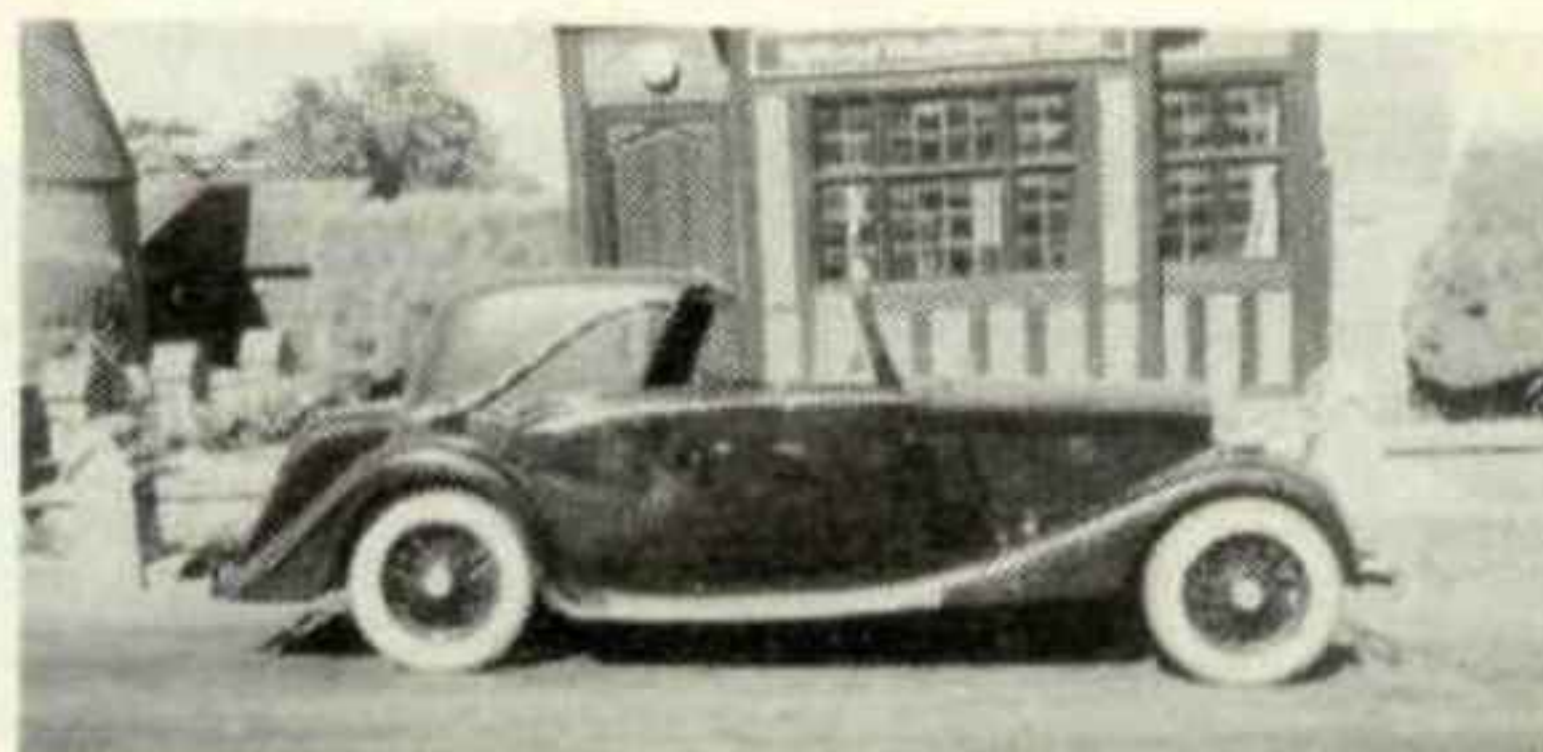
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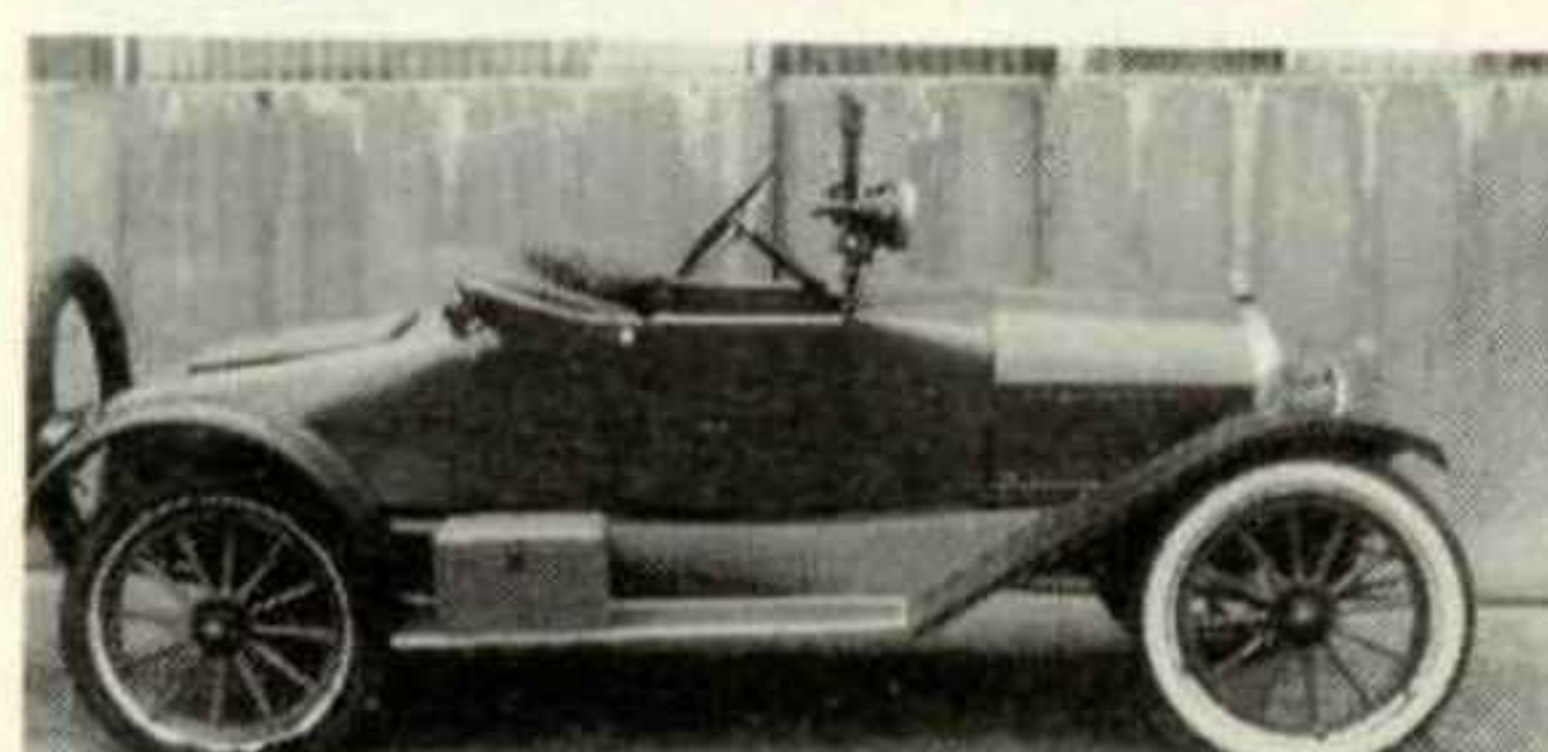
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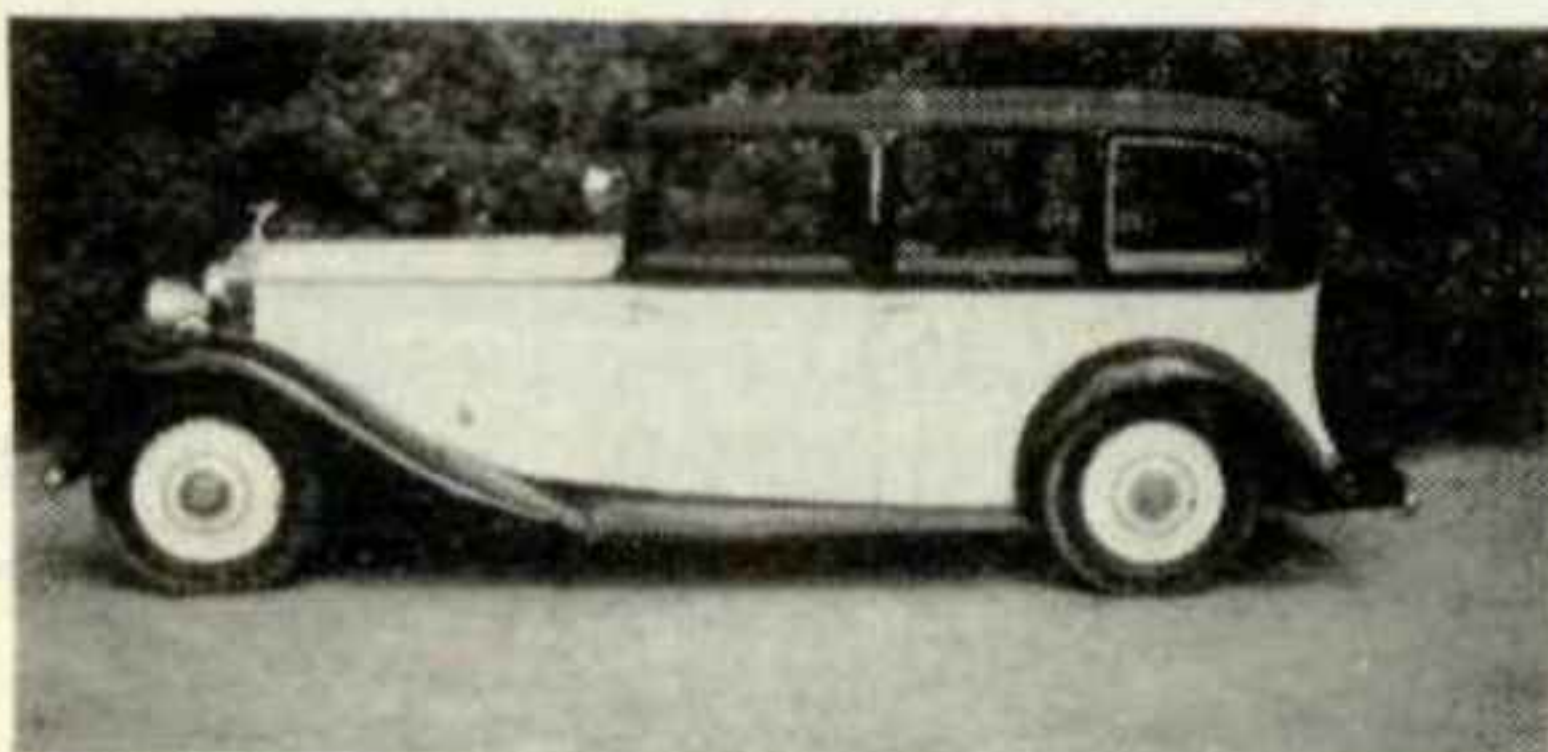
1933 Rolls Royce 20/25 Thrupp and Maberly Convertible..... £65,000



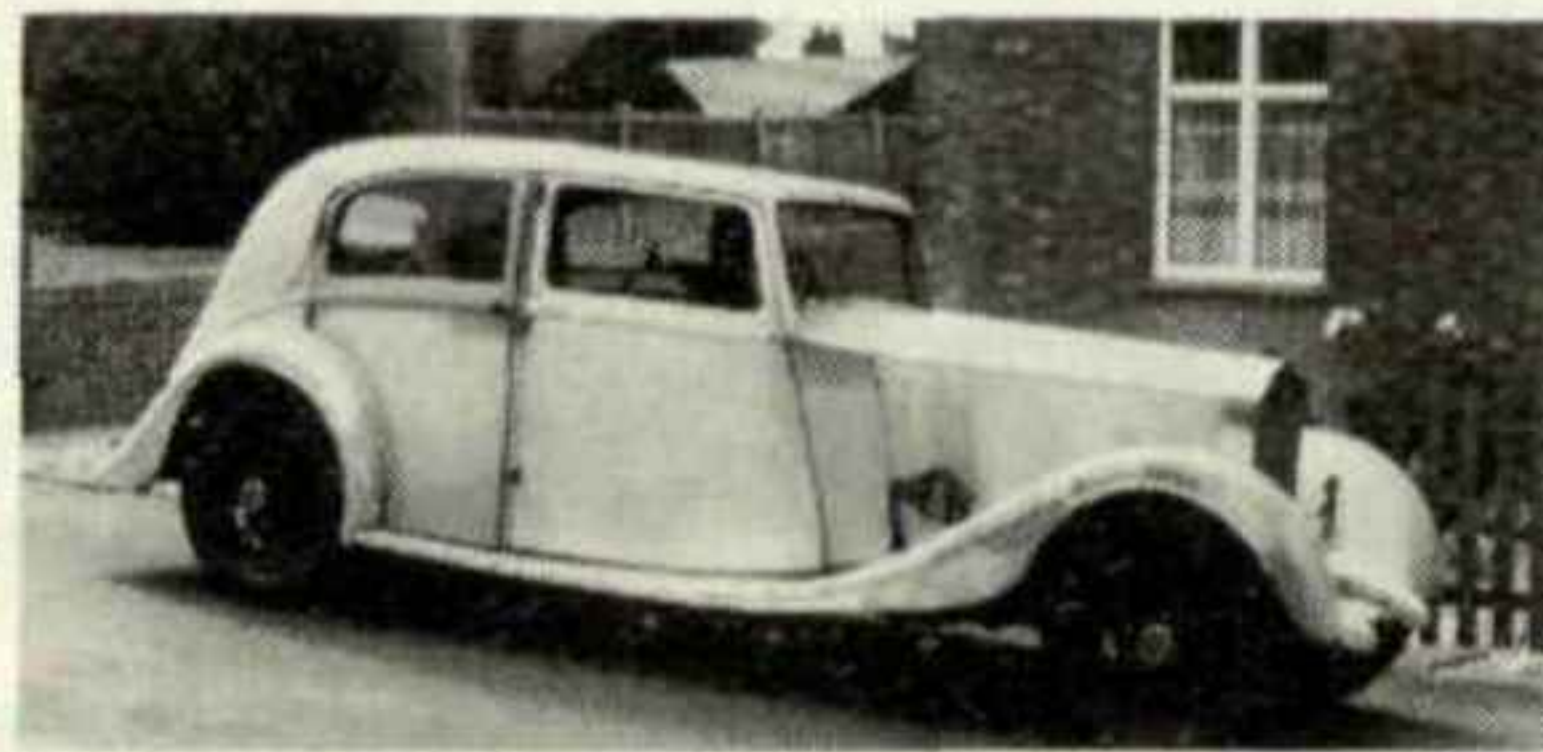
1937 Rolls Royce 25/30 Barker Sedan Coupe..... POA



1918 Metz with variable transmission £9,750



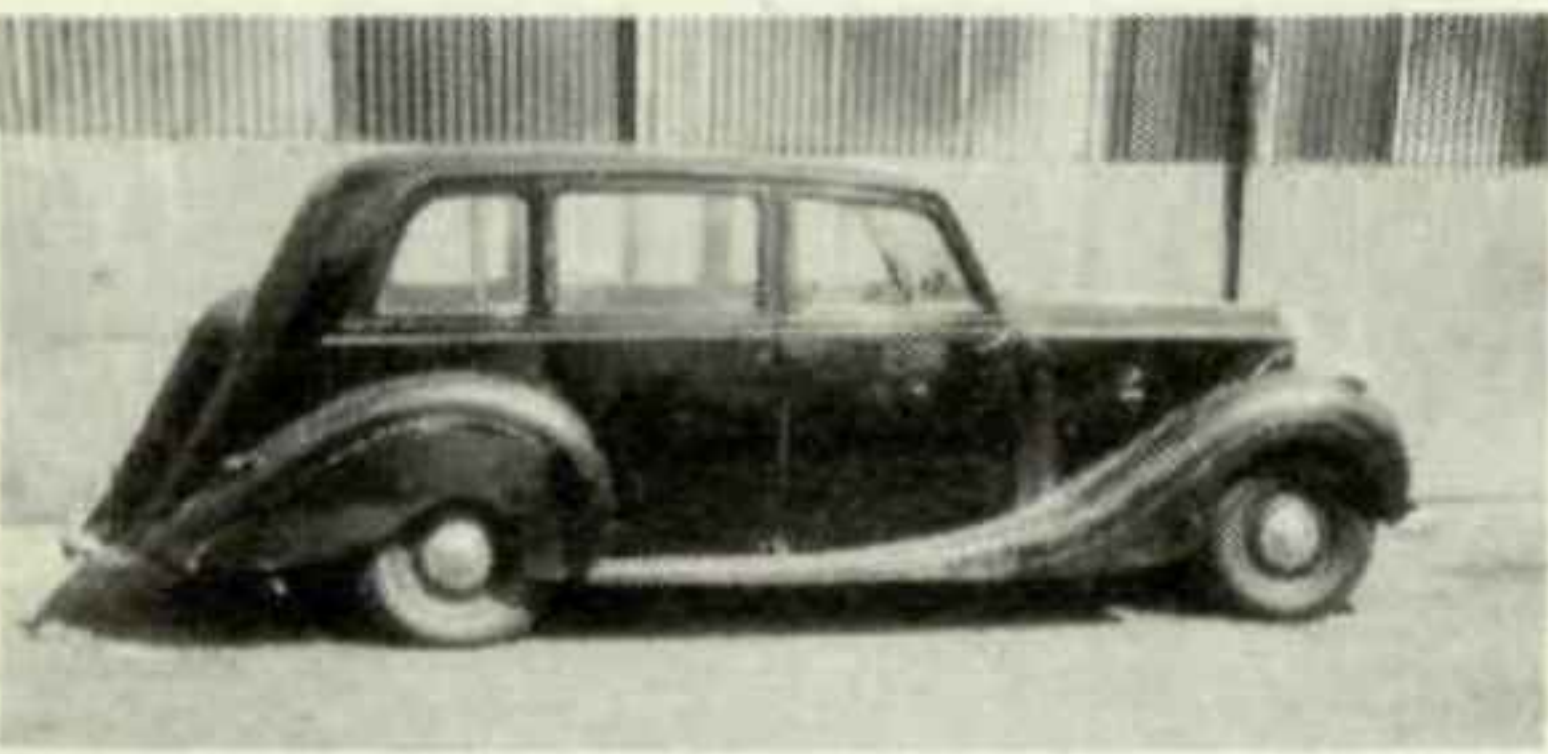
1933 Rolls Royce 20/25 Parkward Limousine £22,500



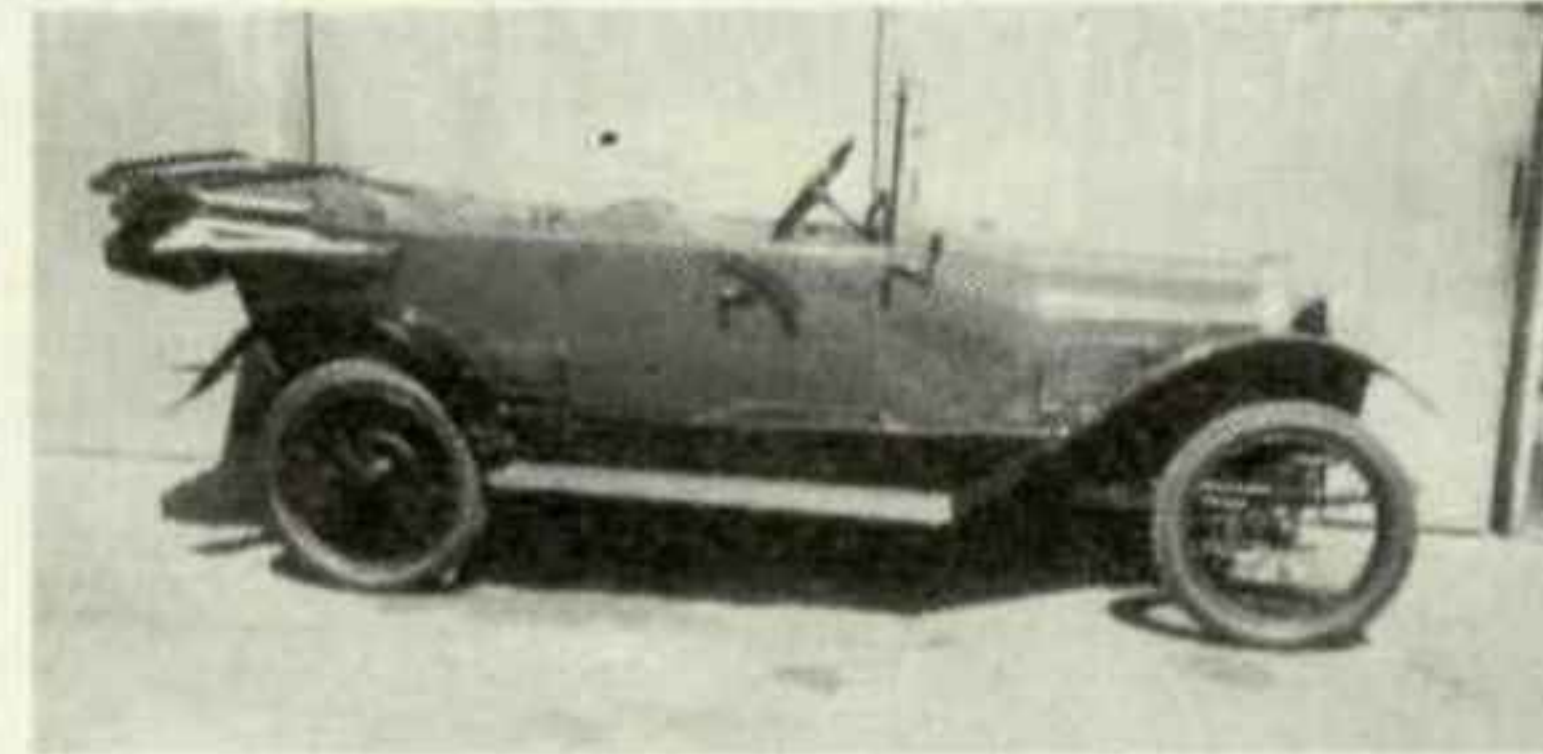
1937 Rolls Royce 25/3 Parkward Saloon with division..... £18,500



1935 Rolls Royce Windovers Limousine £22,500



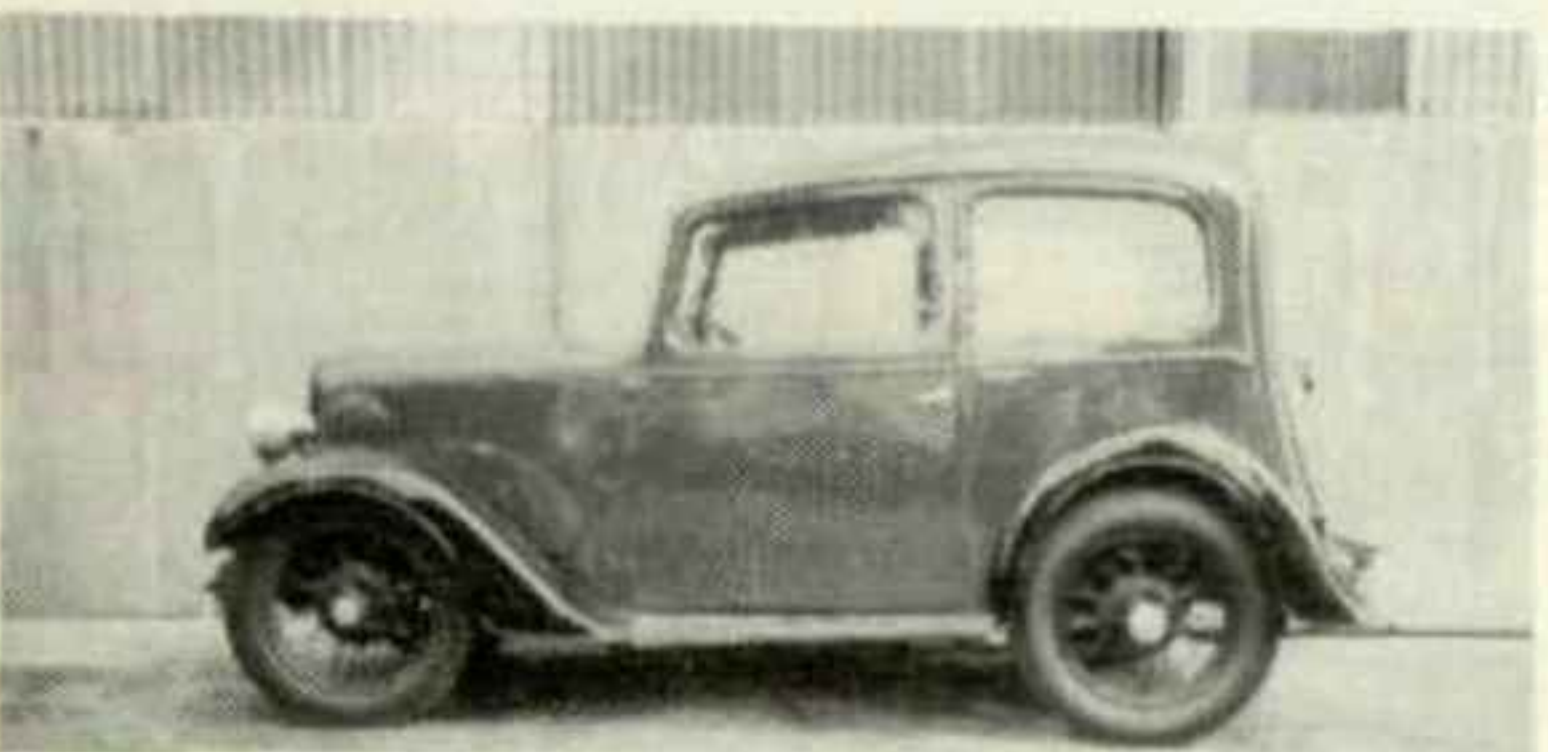
1949 Rolls Royce Silver Wraith Parkward Limousine £11,750



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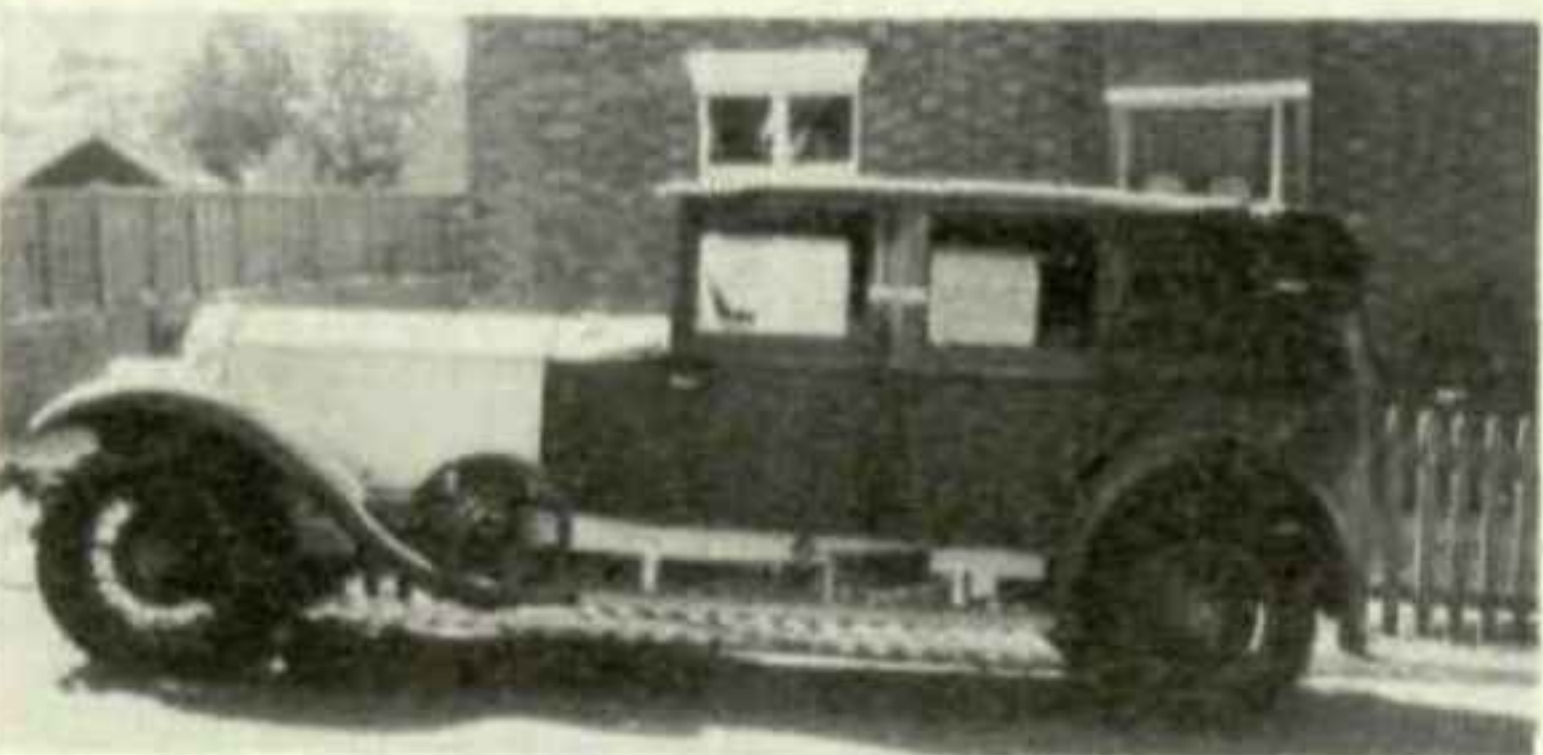
1954 Austin A30/35 Racing Saloon. Much modified, unused since '67 £3,250



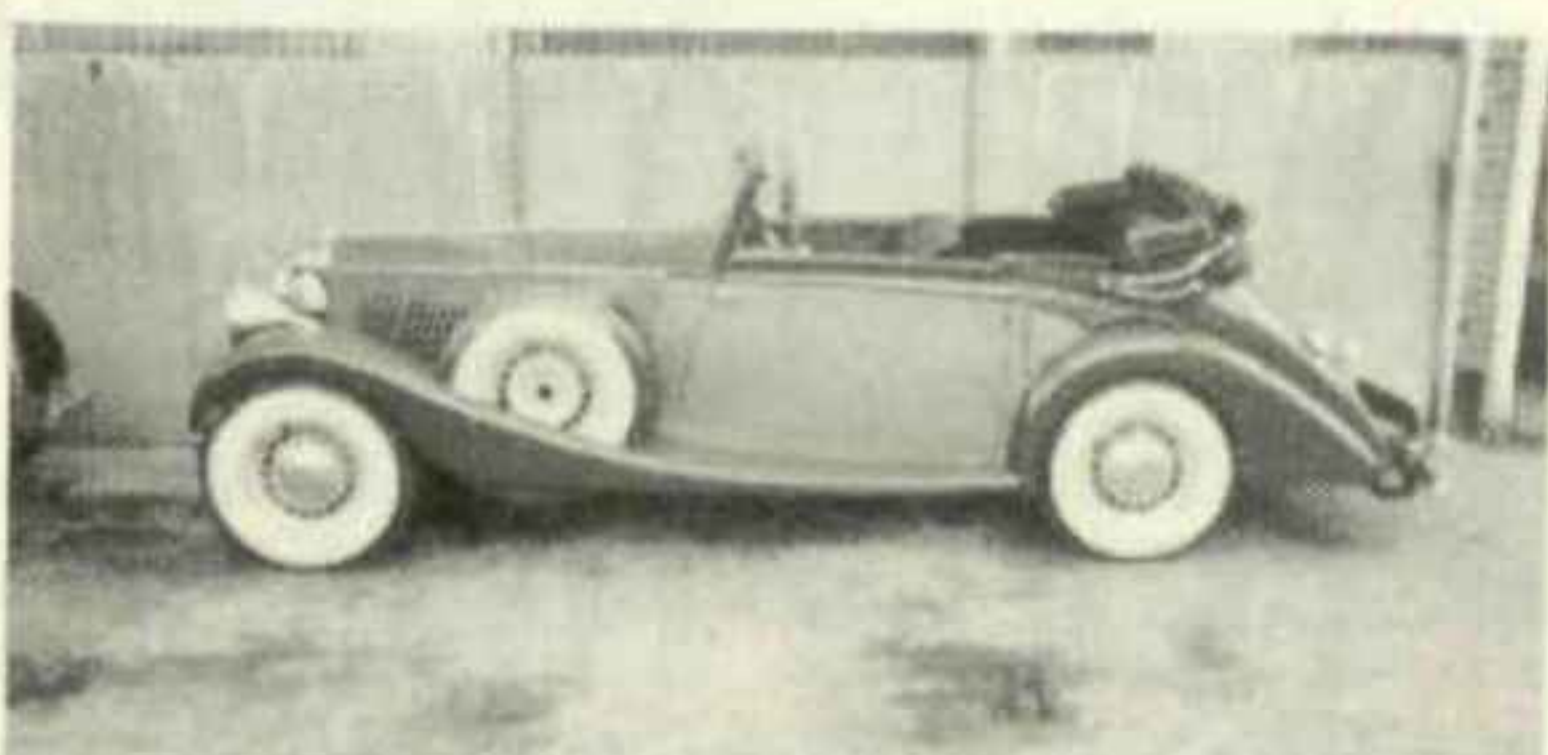
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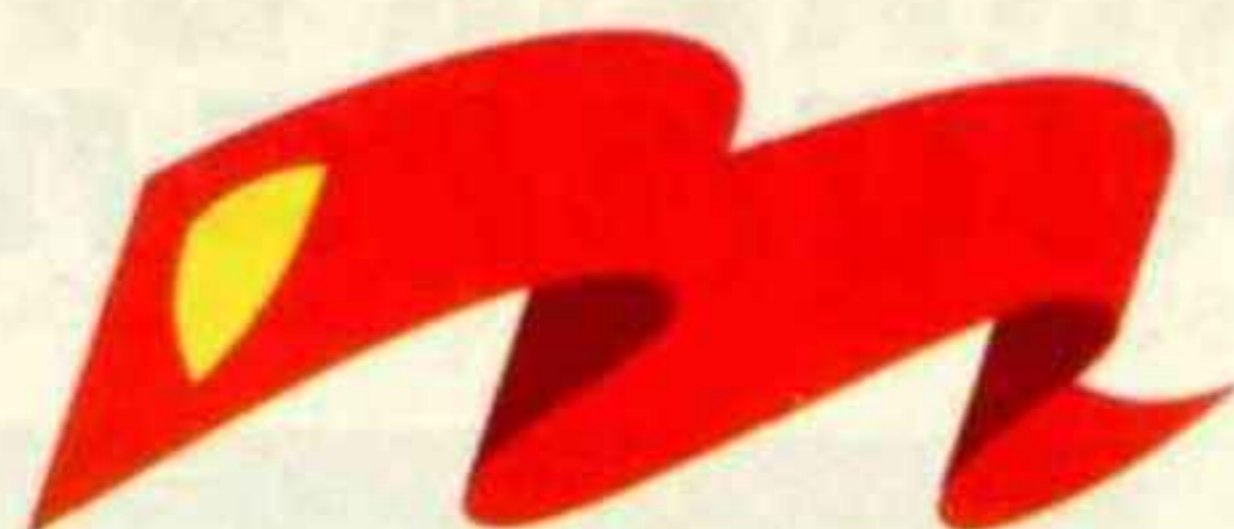
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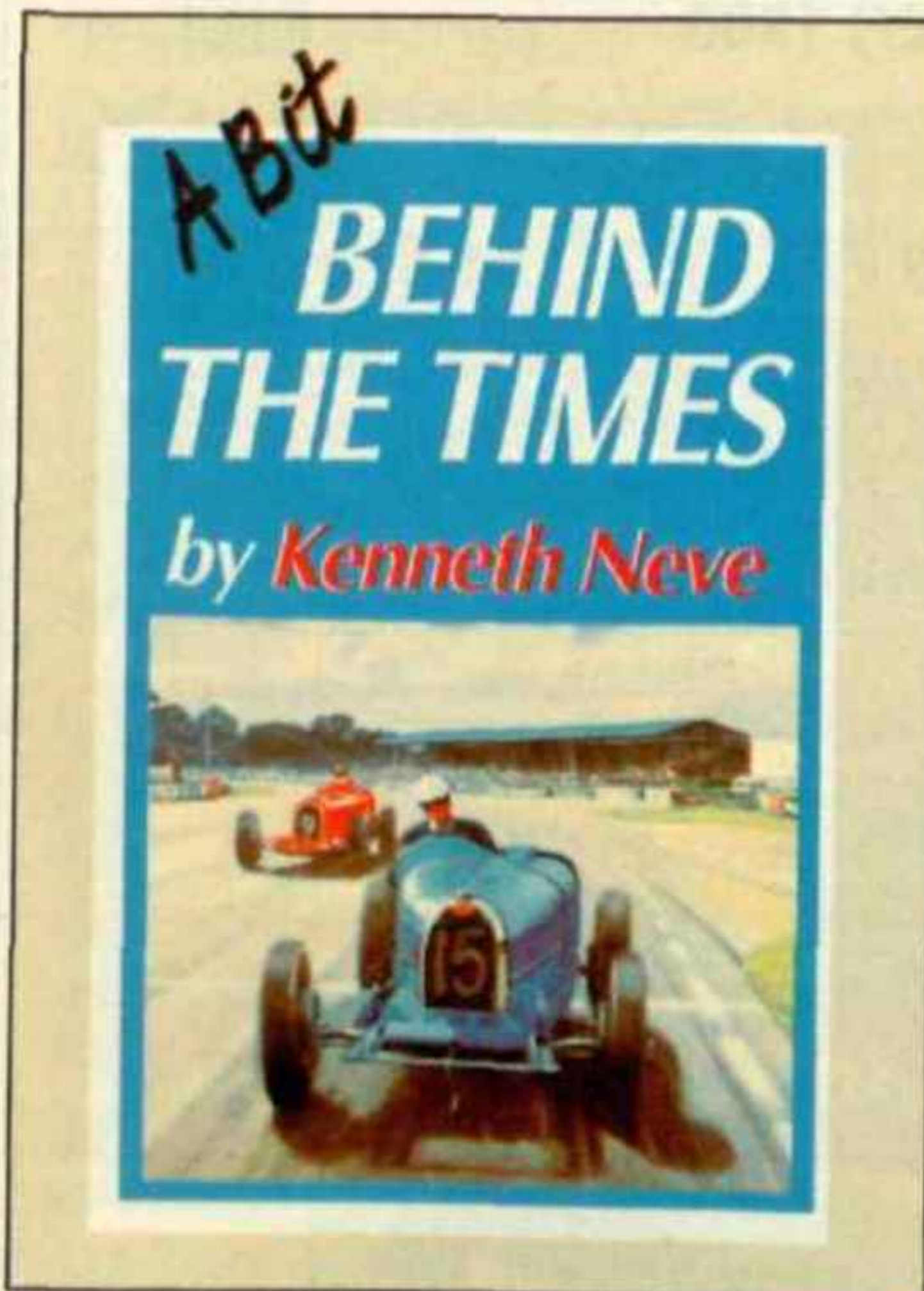
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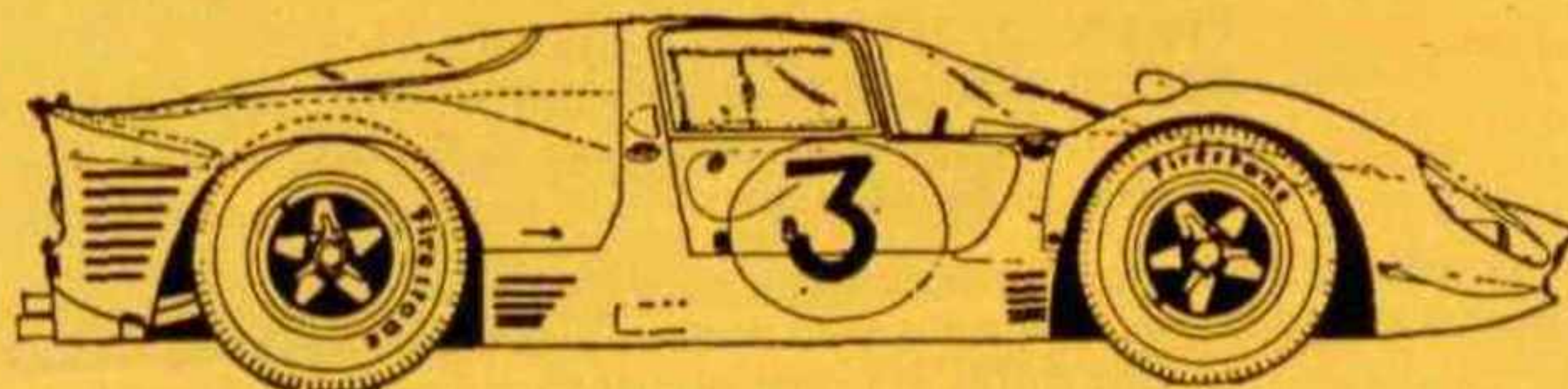
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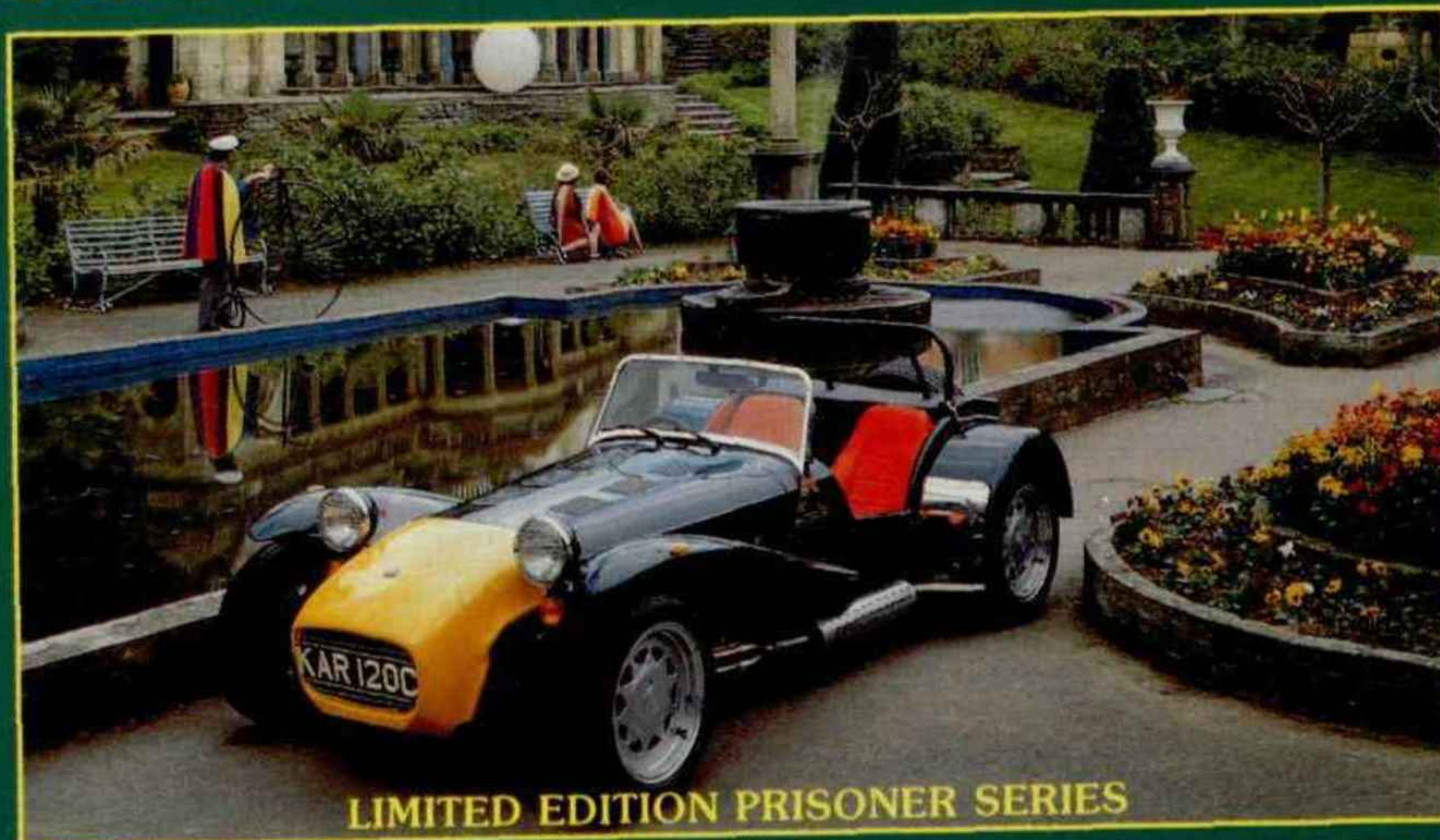
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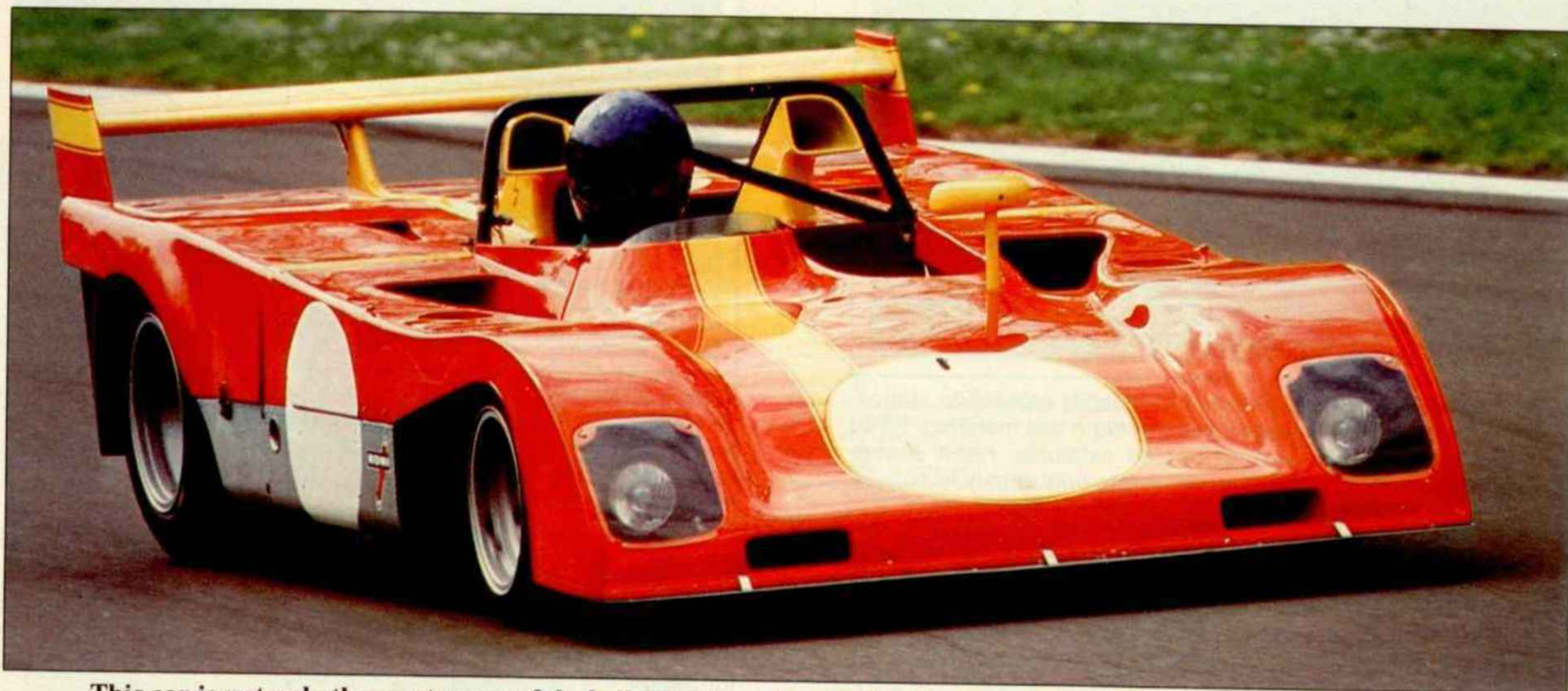
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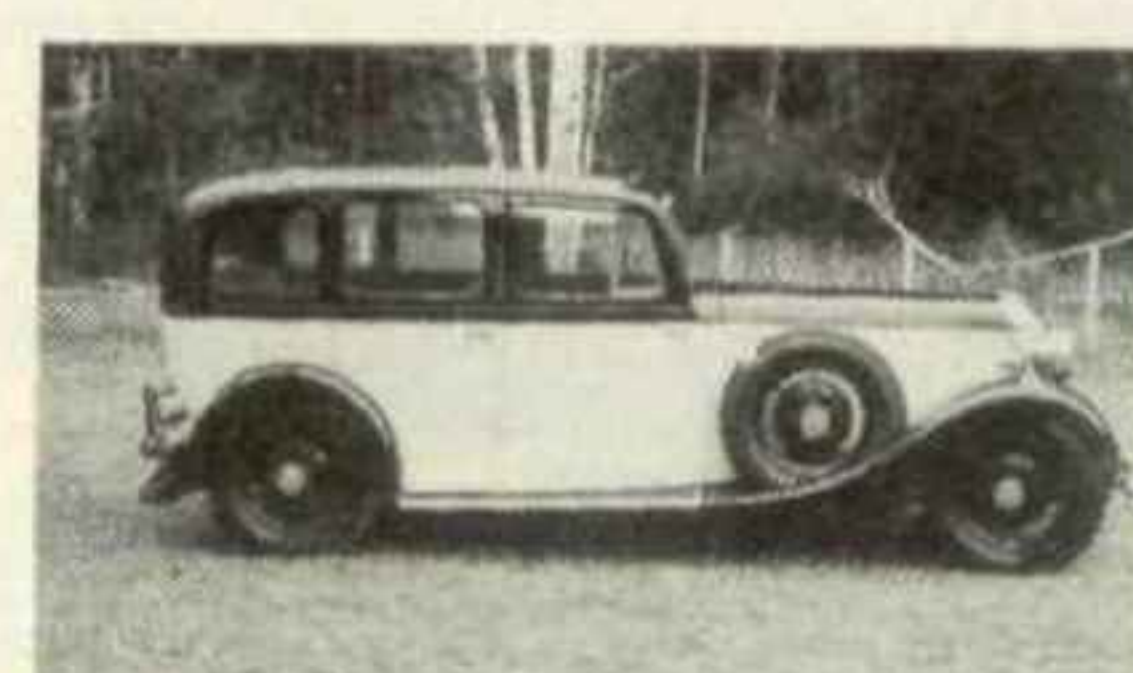
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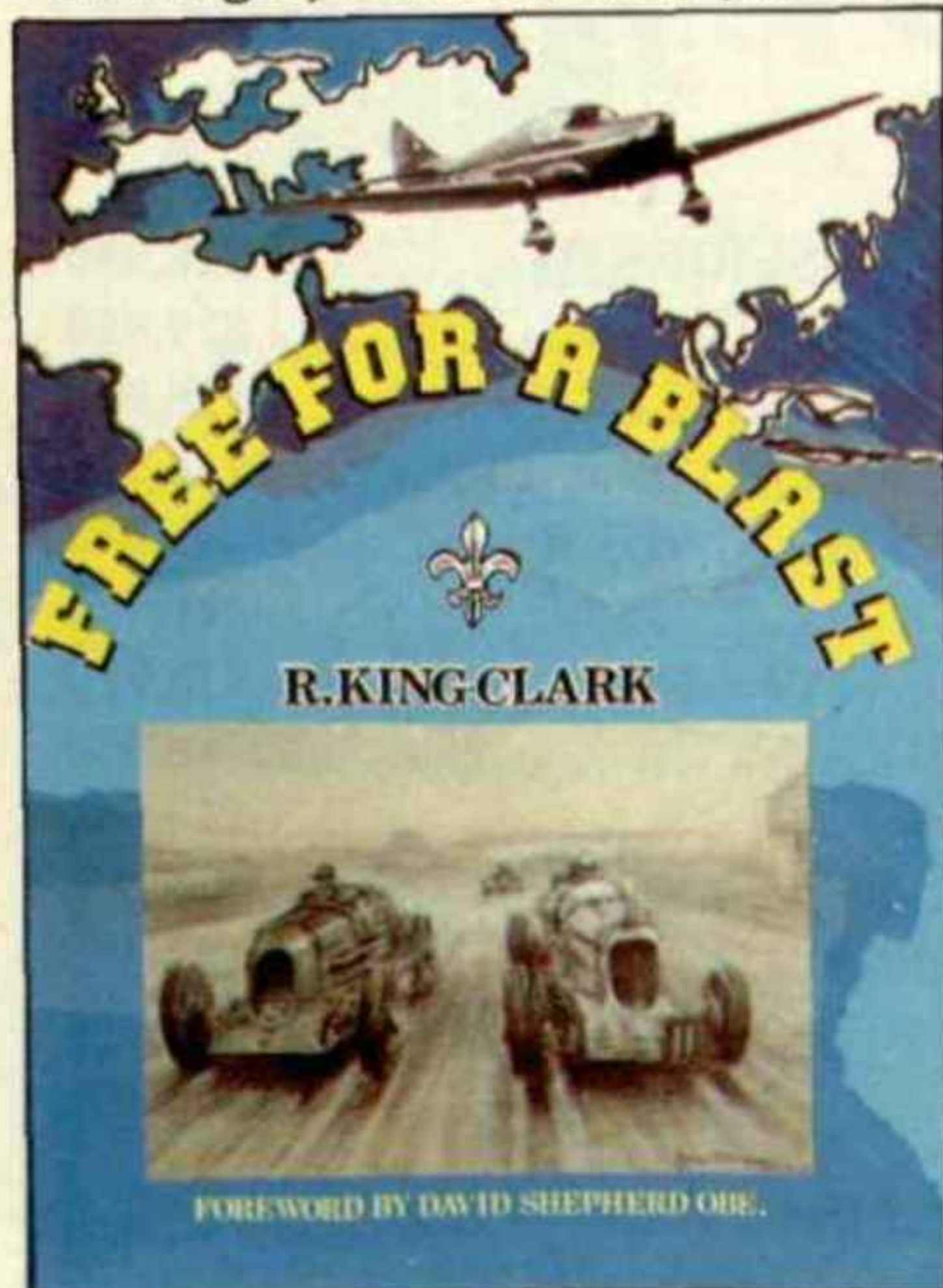
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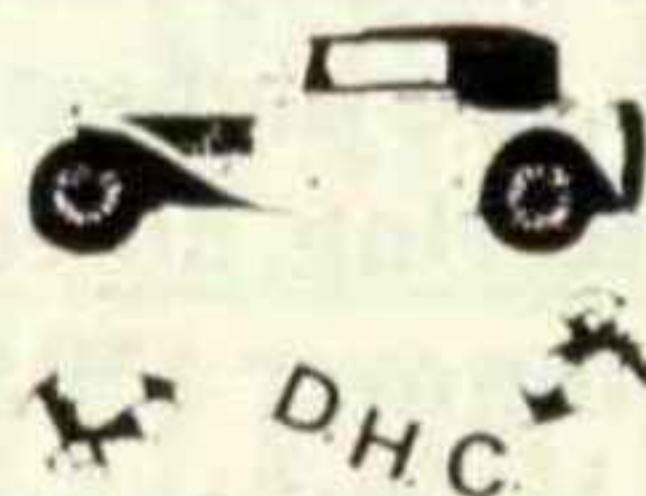
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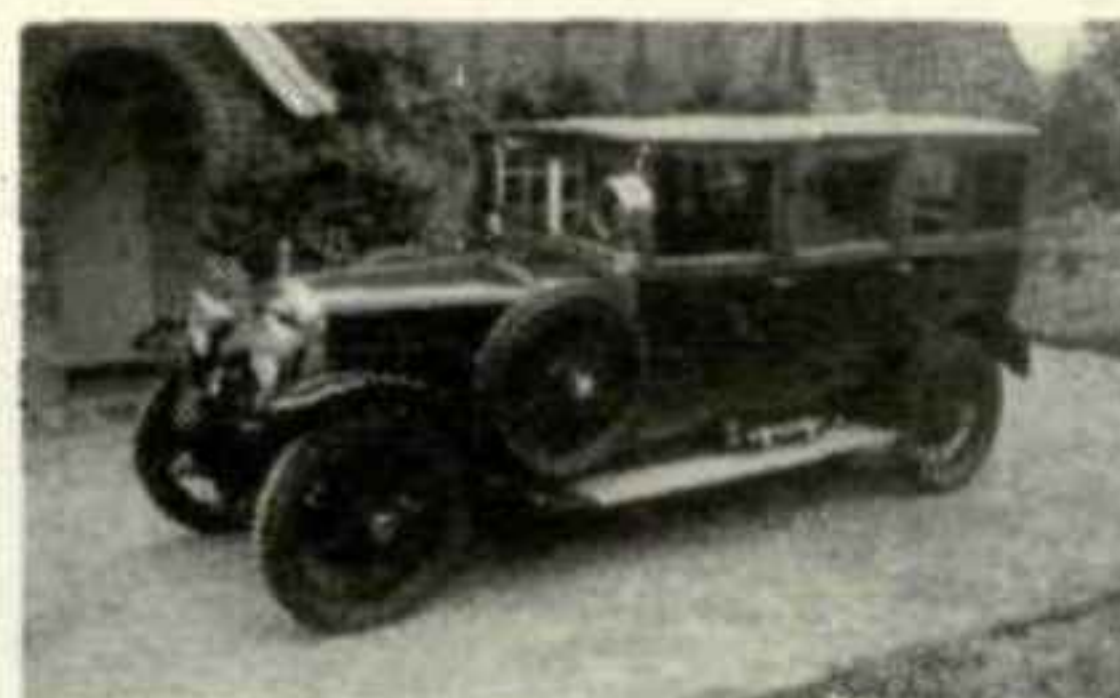
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The completion of the EX-WORKS HEALEY SILVERSTONE to its original Alpine Rally presentation is anticipated for October. As the most famous Healey of them all (Reg. No. JAC 100), it will be worth the wait . . . the second of the two AC/ACE-FORDS has now arrived and is the best that I've ever seen . . . Also here is the A/HEALEY 3000 (or 5000!) MkIII V8, which is proving even better than expected — over 250b.h.p. but absolutely standard in appearance makes it a superb 'Q' car! **Finally, please note that the very last example of Nostaligia's new limited edition 'LIGHTWEIGHT C/S' Mk4 AC COBRAS is scheduled for December, and that Autokraft's production will then concentrate on fulfilling a 5-year contract with Japan.** More news and a new photo next month . . .



THE FOLLOWING ARE GENUINELY AMONG THE BEST, IF NOT THE BEST ANYWHERE

1949 EX-WORKS HEALEY SILVERSTONE 'ALPINE' — CH. NO. D1. 2nd overall Alpine Rally; ex-Healey/Appleyard/Salvadori. (Not shown)
 1950 EX-WORKS TEAM HWM-ALTA GRAND PRIX — CH. NO. FB101. 2nd overall Naples GP, 3rd overall Bari GP etc.; ex-Moss/Abecassis.
 A very famous part of British motor-racing history (Photo as sports-racer — conversion to Grand Prix Single-Seater takes ten minutes)
 1958 AC ACE-FORD RUDDSPED 2.6. One owner since 1968. 180 b.h.p. Stage V + Rew engine. O/Drive. Total restoration. (Not shown)
 1963 AC ACE-FORD RUDDSPED 2.6. One owner since 1968. 180 b.h.p. Stage V + Rew engine. O/Drive. Total restoration. (Not shown)
 1964 (Model) AC COBRA 289 Mk2. Total Autokraft reconstruction, with Mathwall 300 + b.h.p. engine (Photo)
 1965 AUSTIN-HEALEY 3000 Mk3 V8 — L/Hand drive. Fitted with Cobra 5 litre V8 engine (some performance!) & T10 gearbox, otherwise totally standard in appearance. Ice blue, black trim. Extremely well presented. Conversion to right-hand drive possible. (Not shown)
 1972 AC 428 FRUA D.H.C. Only 26 built, this the last of 5 with manual g/box, 32,000 miles. Simply the best, bar none! (Photo)

1985 AC COBRA 302 Mk4 — 'STANDARD' 230 B.H.P. LEFT HAND DRIVE, US/EUROPEAN SPEC/TYPE-APPROVED.
 0 to 100mph (160kph) in 13 secs, 73 miles/117km from new. Stored for 5 years in Arizona. Unique! (Photo)
 1988 (F) AC COBRA 302 Mk4 — 'STANDARD' 240 B.H.P. — UK SPEC. 1 of only 4 with hard and soft top's, 1,800 miles & as new. (Photo)
 1989 (G) AC COBRA 302 Mk4 — 'STANDARD' 230 B.H.P. — UK SPEC. Dark blue with white stripes, 63 miles from new. (Not shown)
 1990 (Unregd.) AC COBRA 302 Mk4 — 'LIGHTWEIGHT COMPETITION/STREET' 340 B.H.P. — UK SPEC. Limited edition model. 0 to 100mph (160kph) in 10.8 secs. Dark blue, blue trim, roll cage etc. (Not shown but similar to white car at rear in photo)
 1990 (Unregd.) AC COBRA 302 Mk4 — 'LIGHTWEIGHT COMPETITION/STREET' 340 B.H.P. — UK SPEC. Metallic maroon, black trim.
 1990 (Unregd.) AC COBRA 302 Mk4 — 'LIGHTWEIGHT COMPETITION/STREET' 340 B.H.P. — UK SPEC. Metallic silver, burgundy trim.
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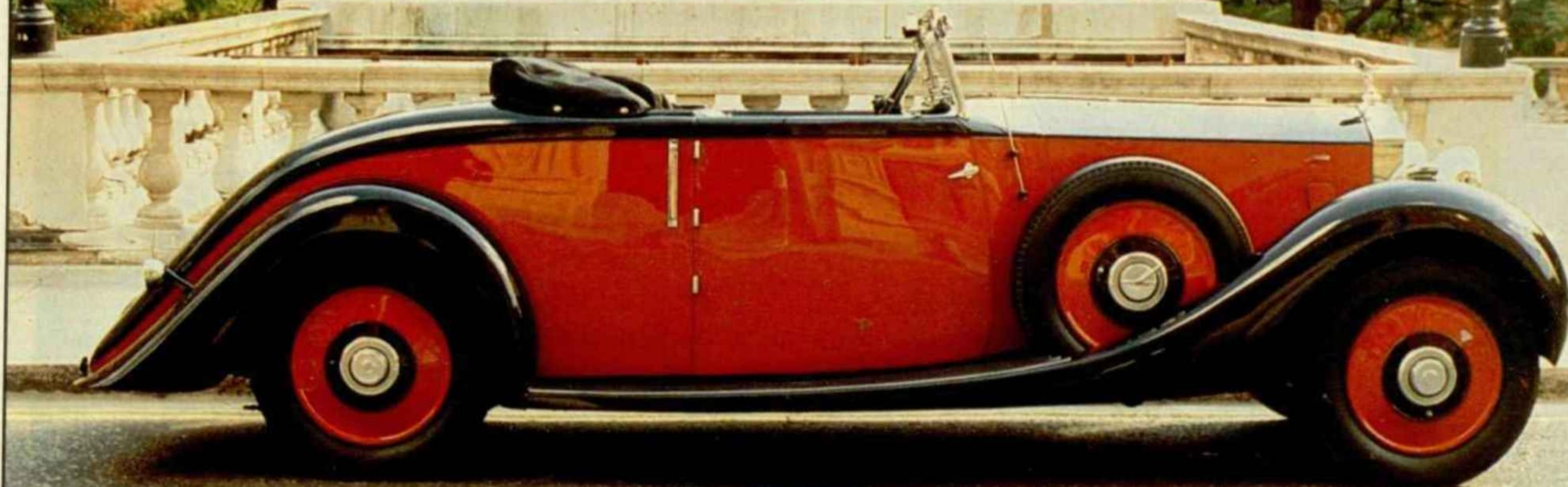
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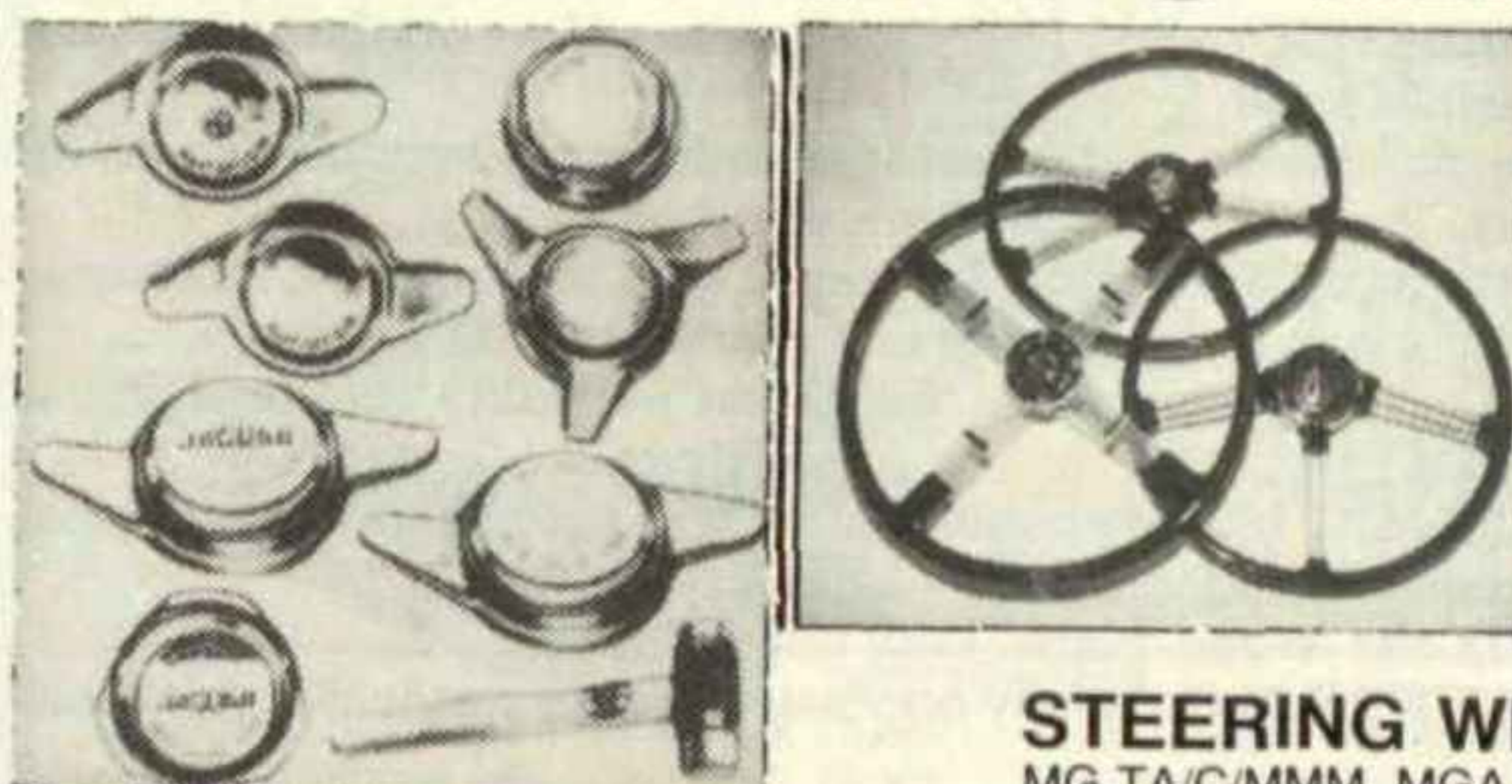
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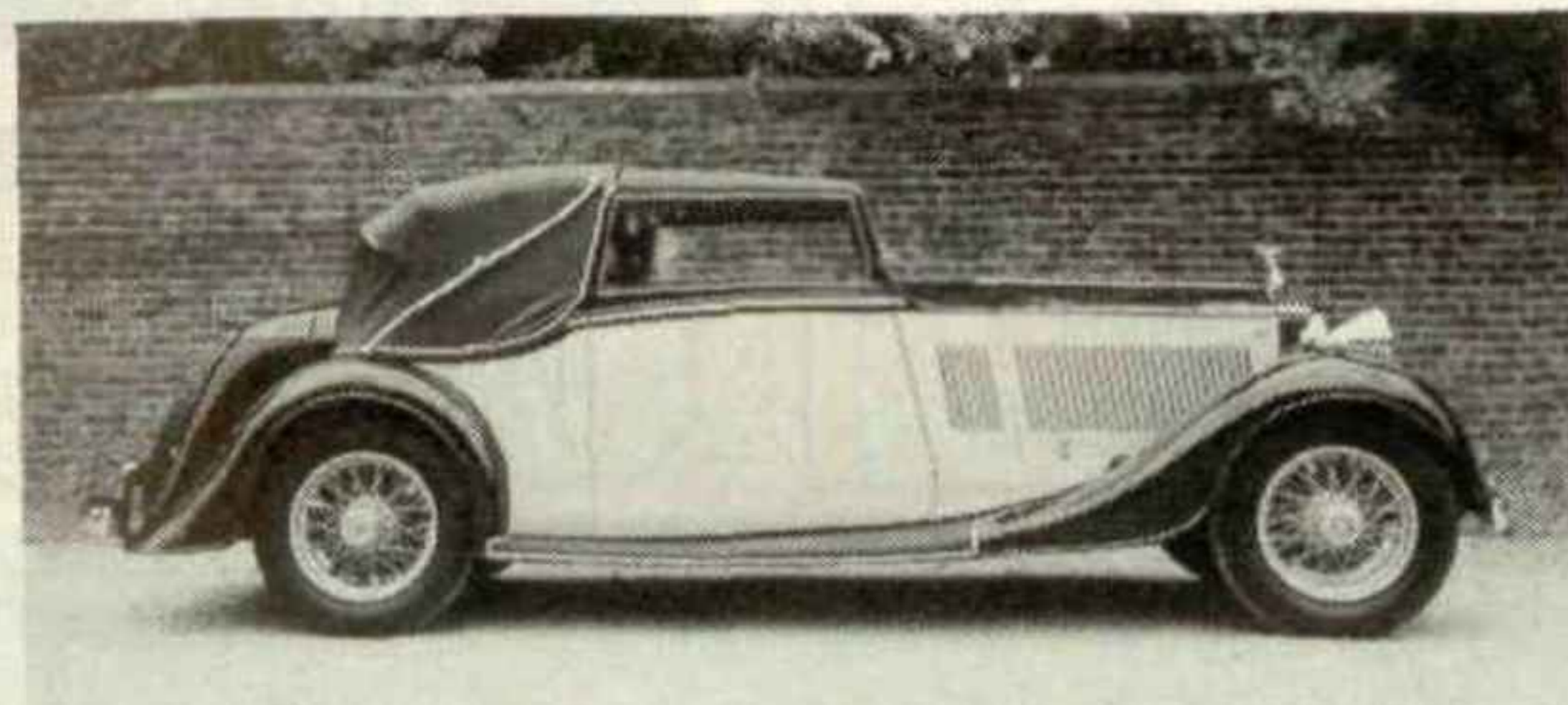


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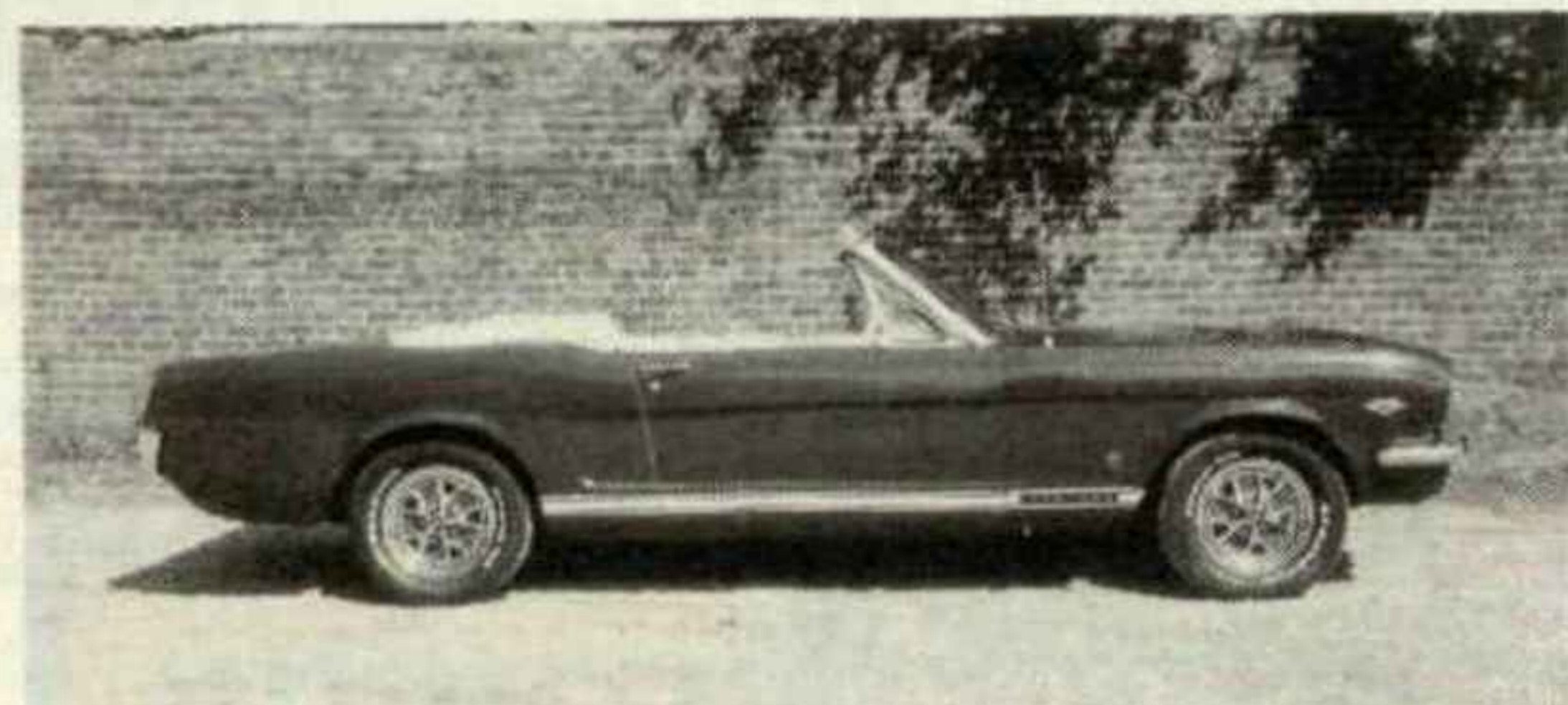
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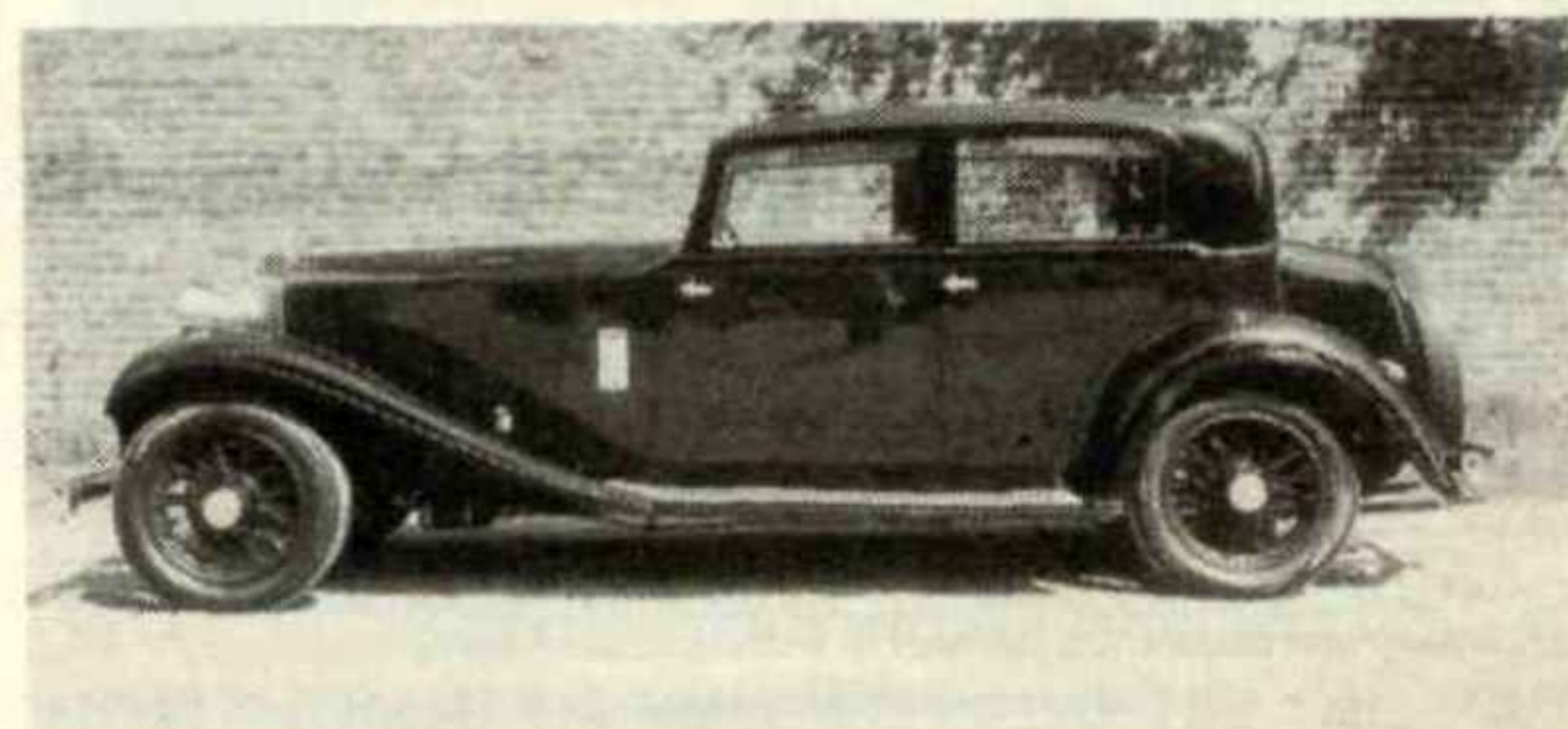
1935 ROLLS ROYCE 25/30 3 POSITION DROP-HEAD with coachwork by Thrupp & Marberly. Superb throughout.



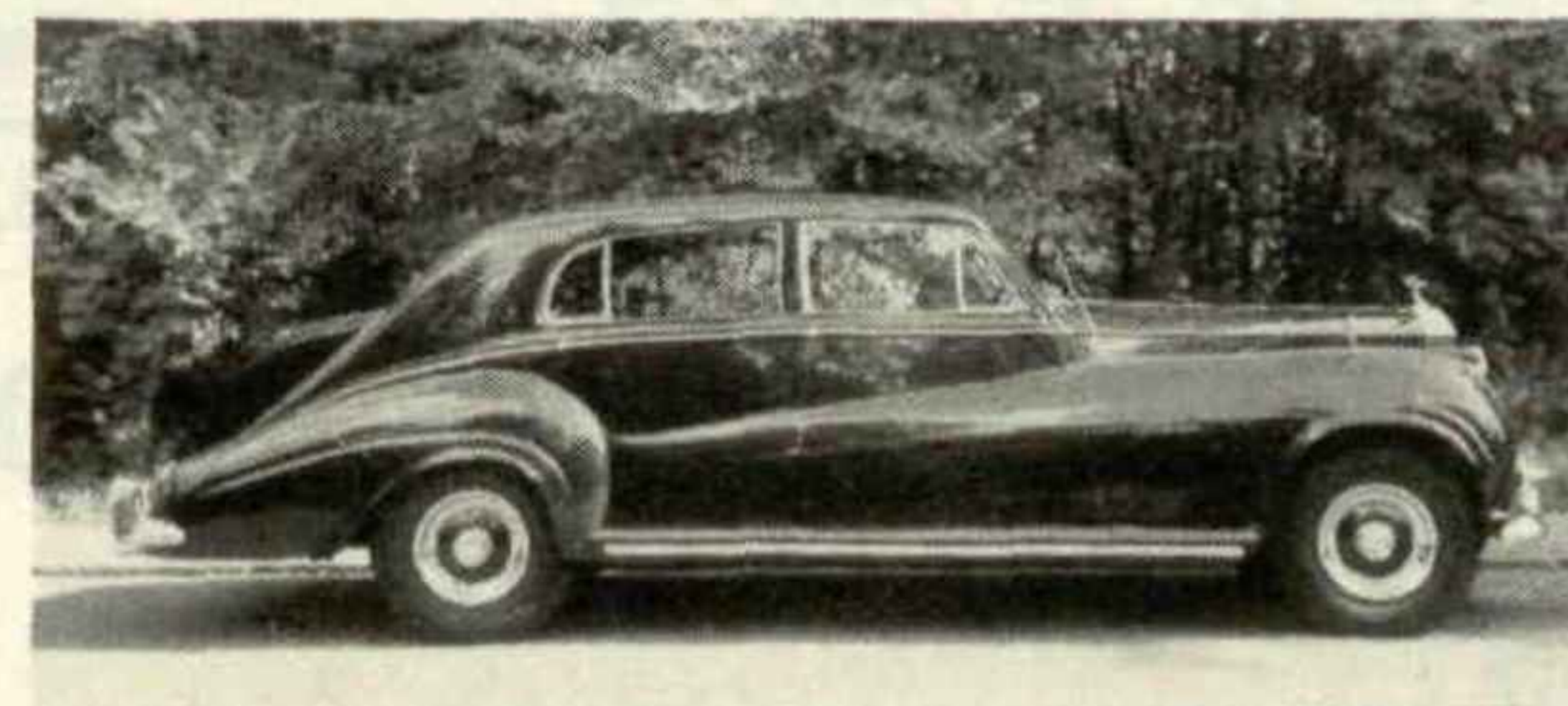
1964 ASTON MARTIN DB5 finished in Mink with burgundy hide. Magnificent condition.



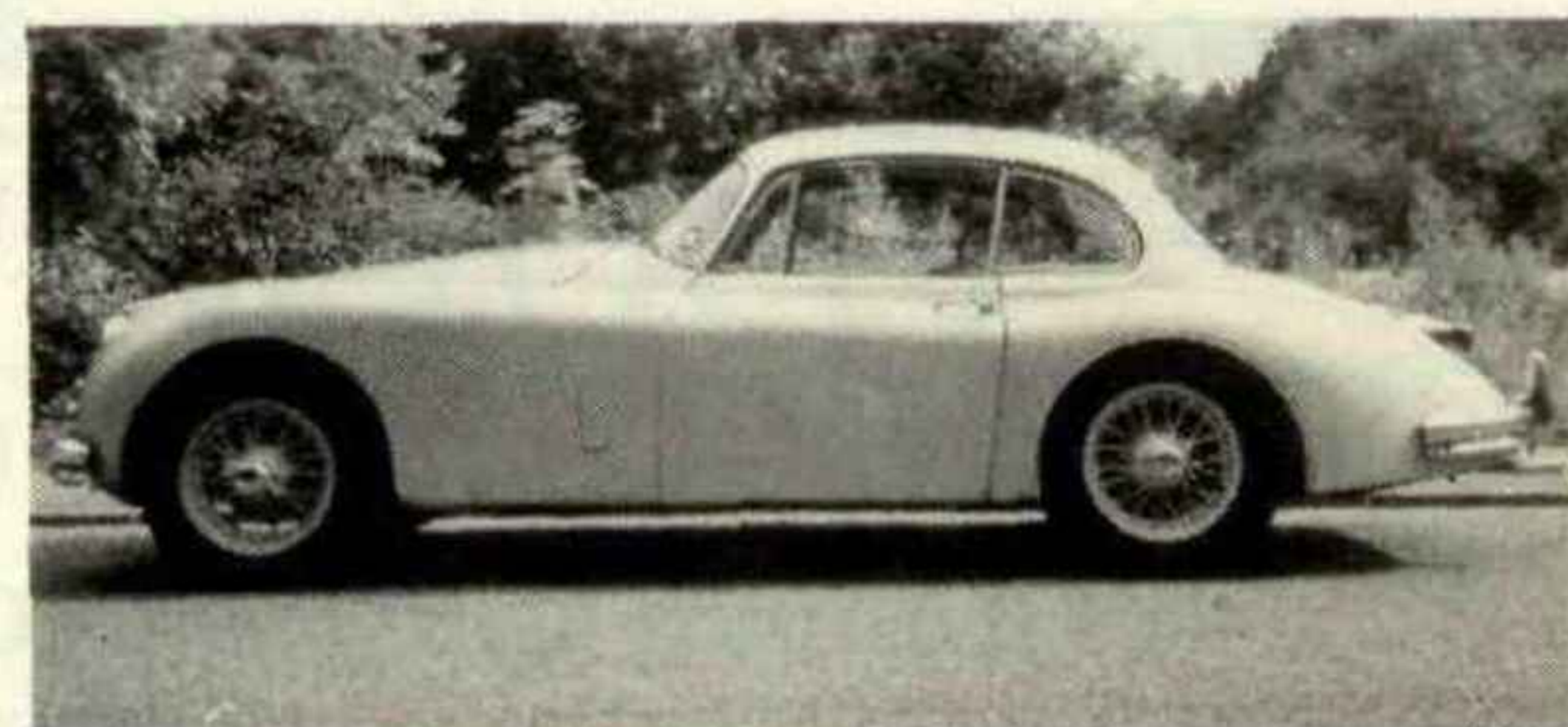
1965 FORD MUSTANG 289 GT CONVERTIBLE in red with white "pony" interior. Restored to concours condition.



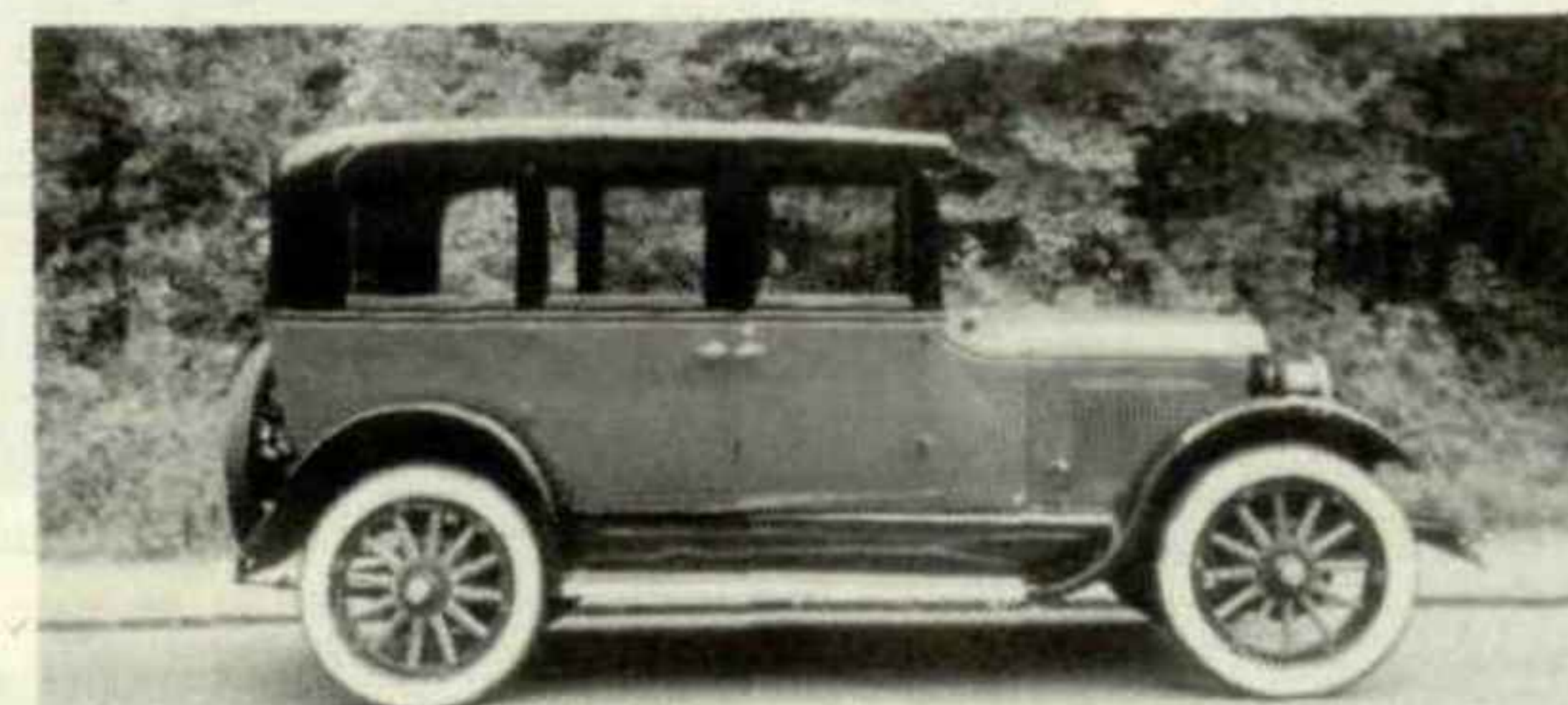
1932 ROLLS ROYCE 20/25 SPORTS SALOON with very attractive coachwork by Hooper.



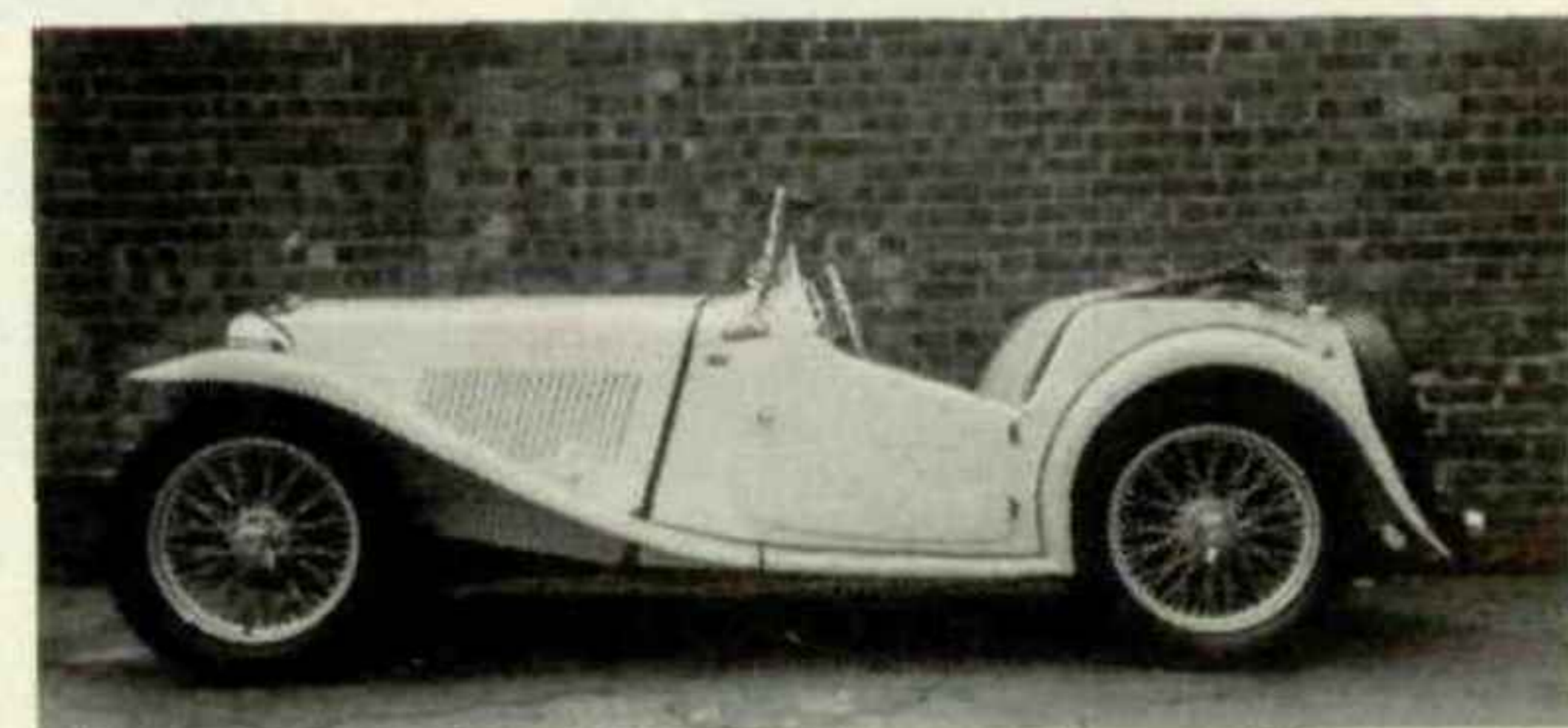
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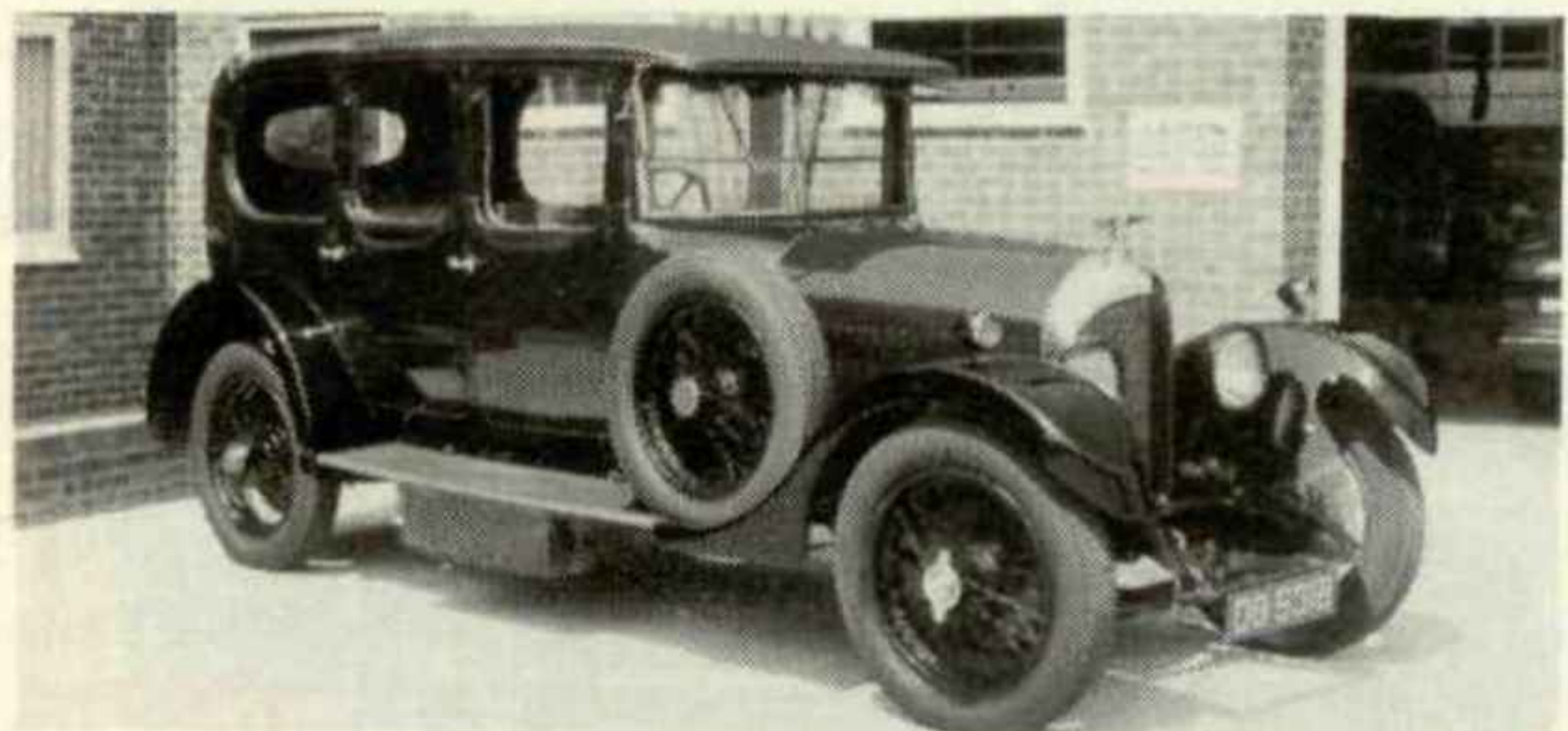
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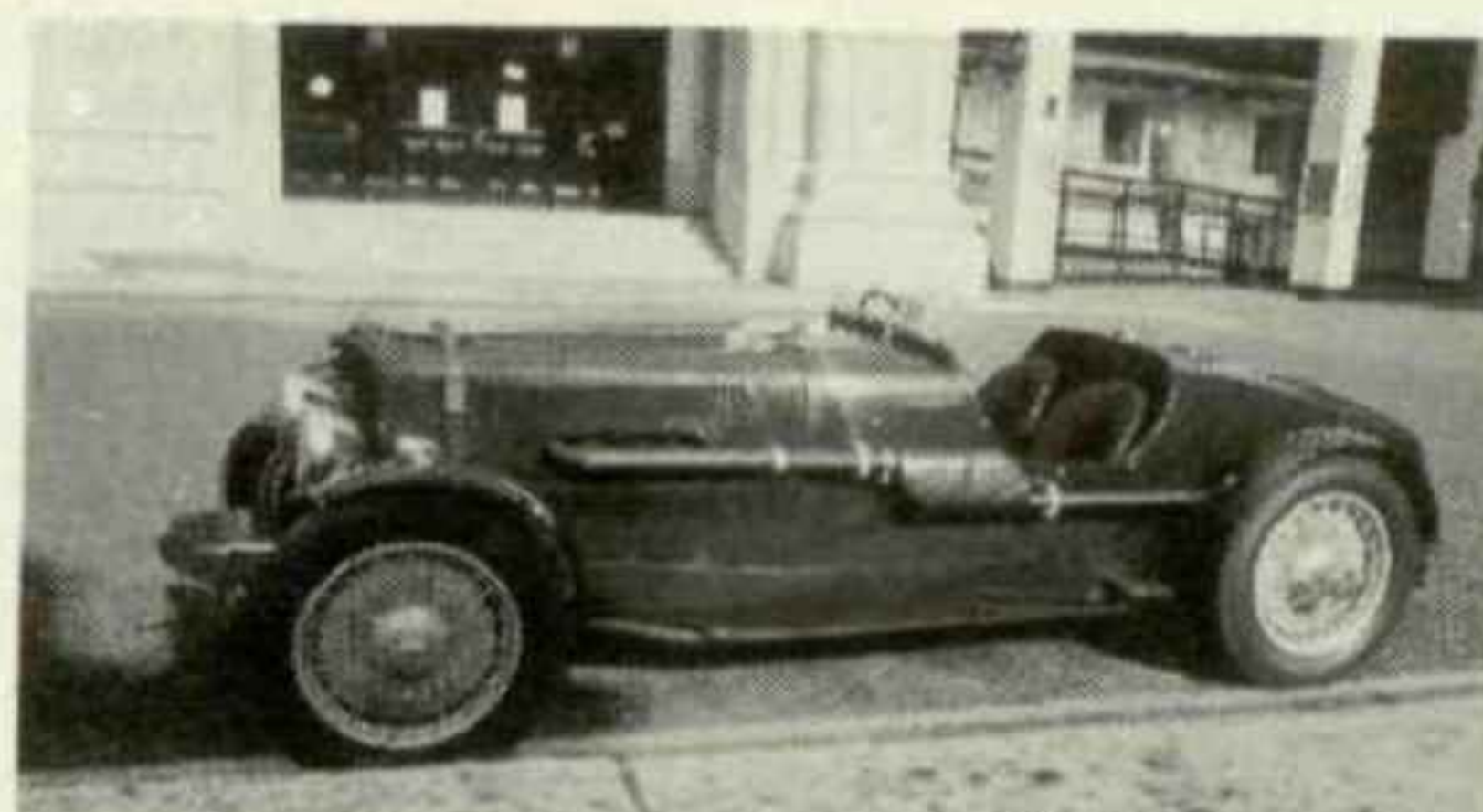
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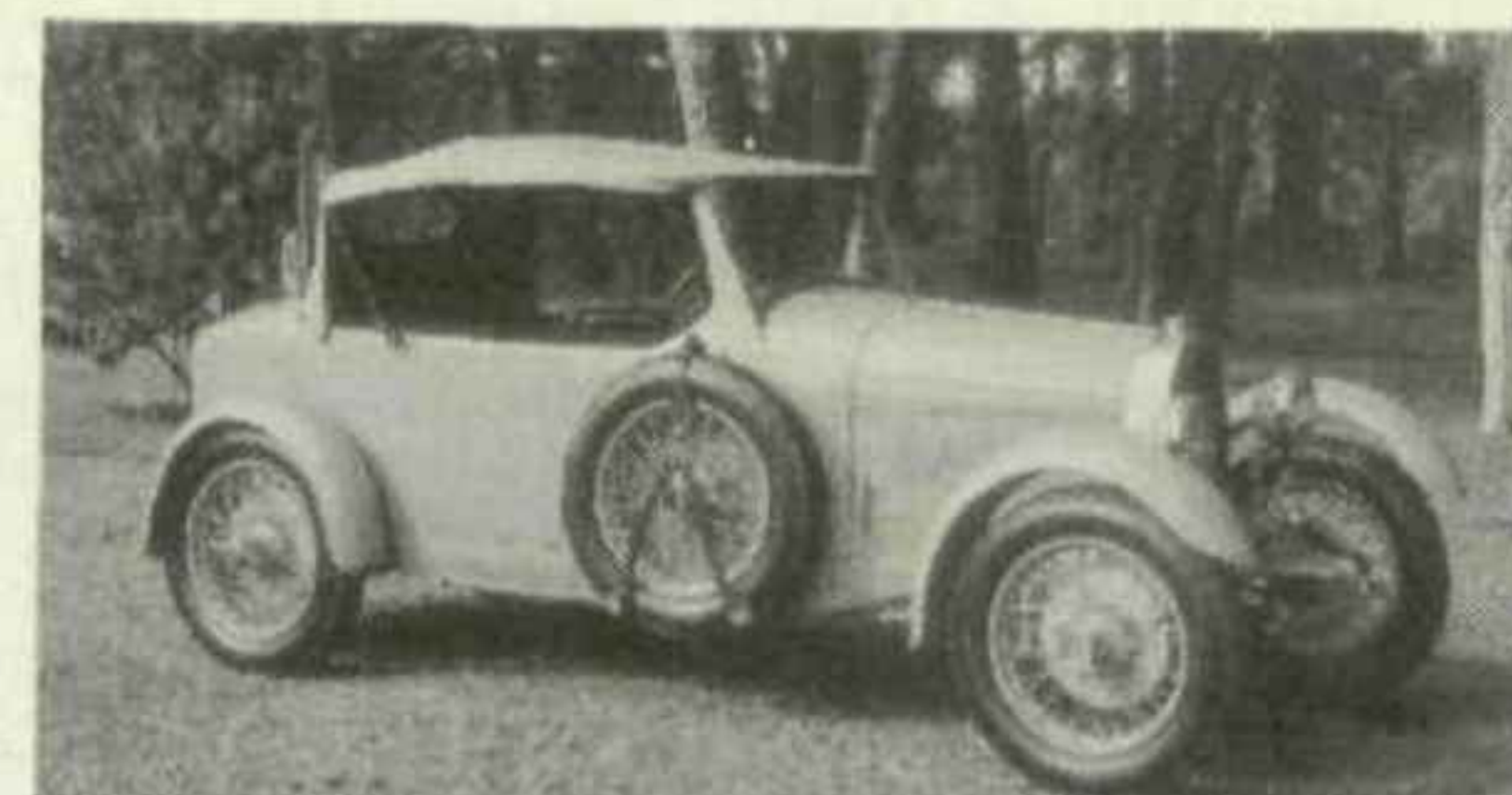
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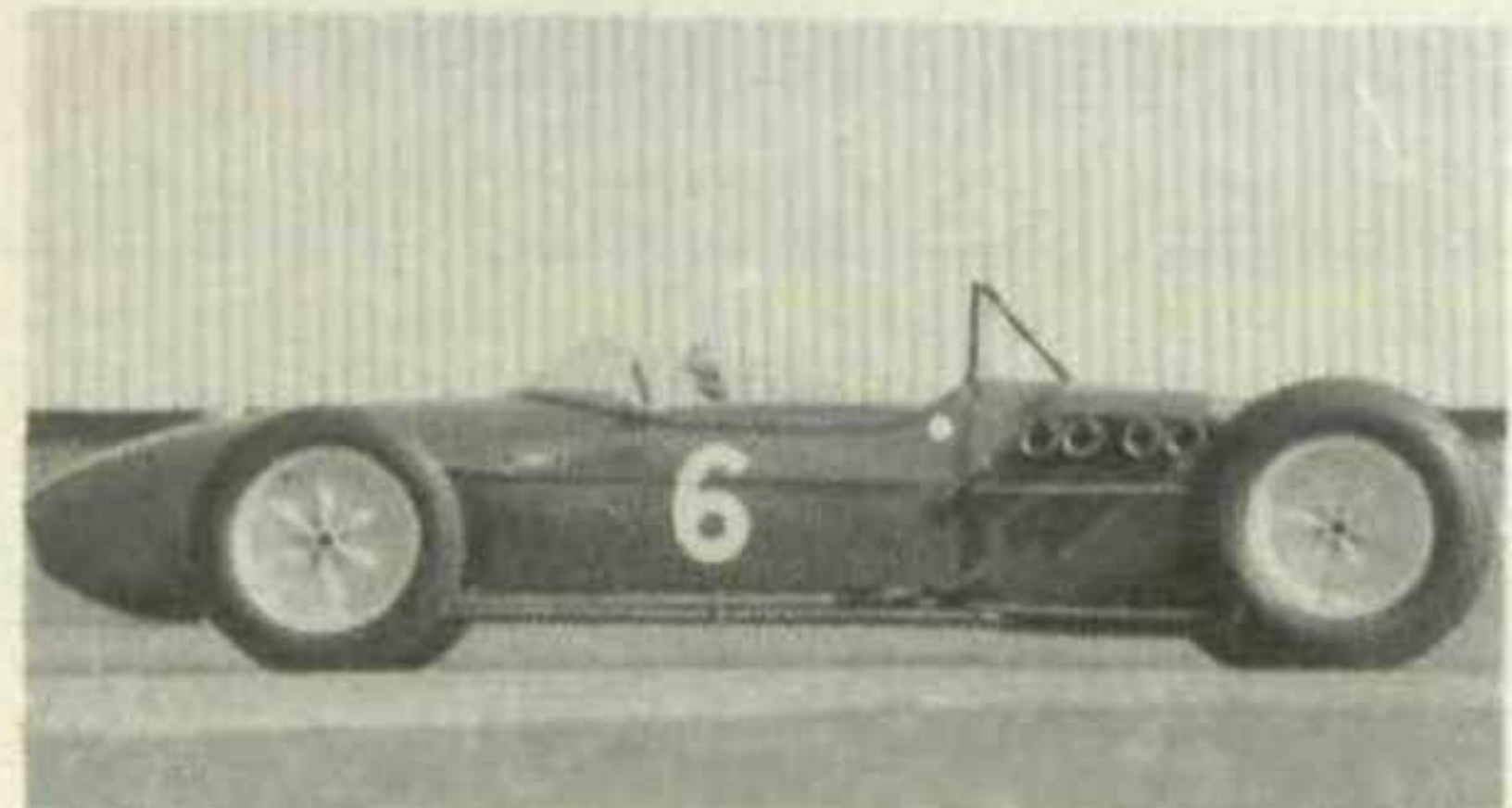
1927 Bentley 6 1/2-litre Le Mans type Tourer. Complete restoration.



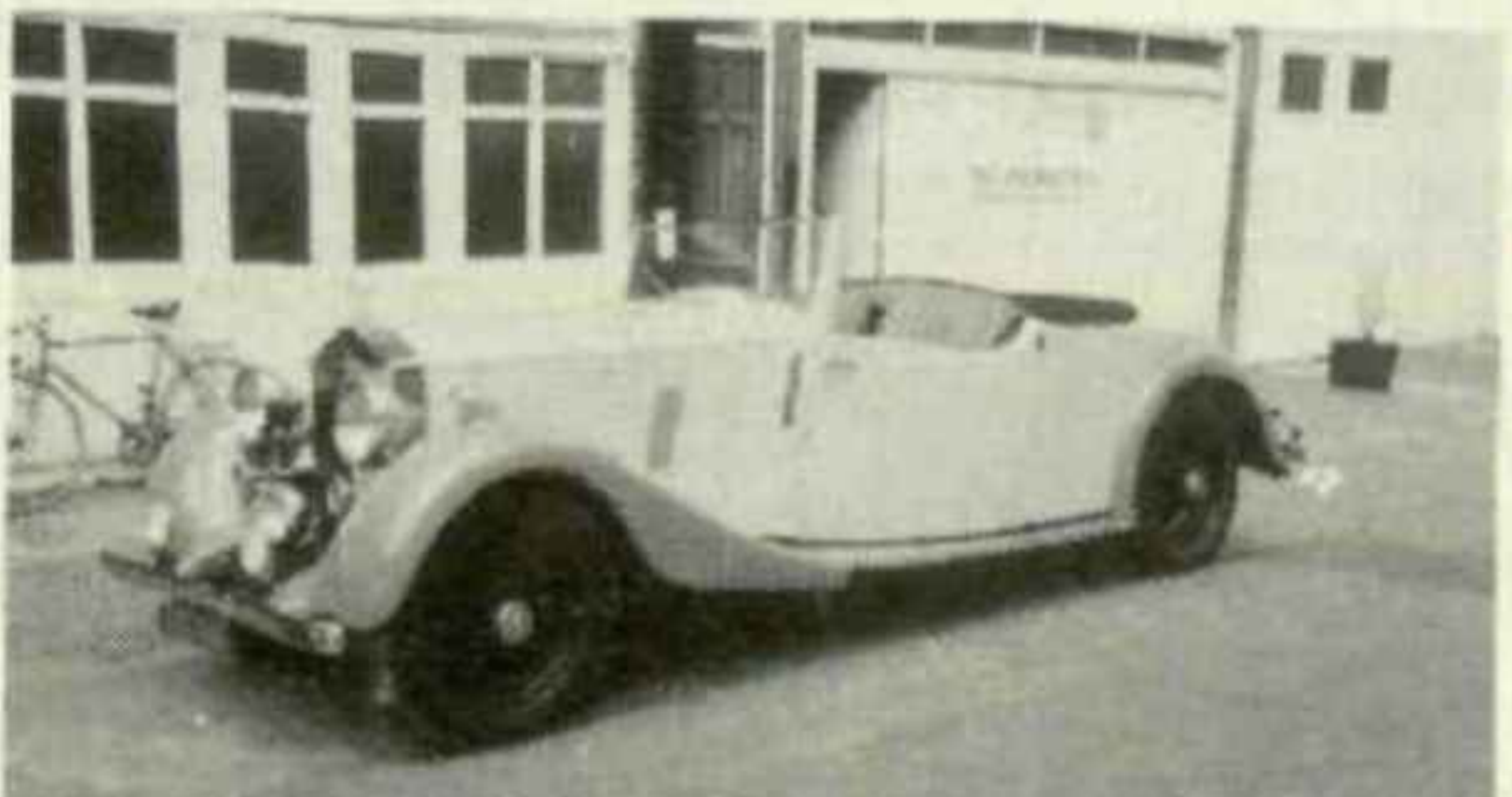
1934 Aston Martin Mark II. Rebuilt to full Ulster specification.



1927 Bugatti Type 40 Grand Sport. Fitted twin plug type 40A engine.



1960/61 Lotus Climax 2.5 Litre Type 18 Formula 1 Single Seater.



1937 Rolls Royce 25/30 by Park Ward. Original one off body design.



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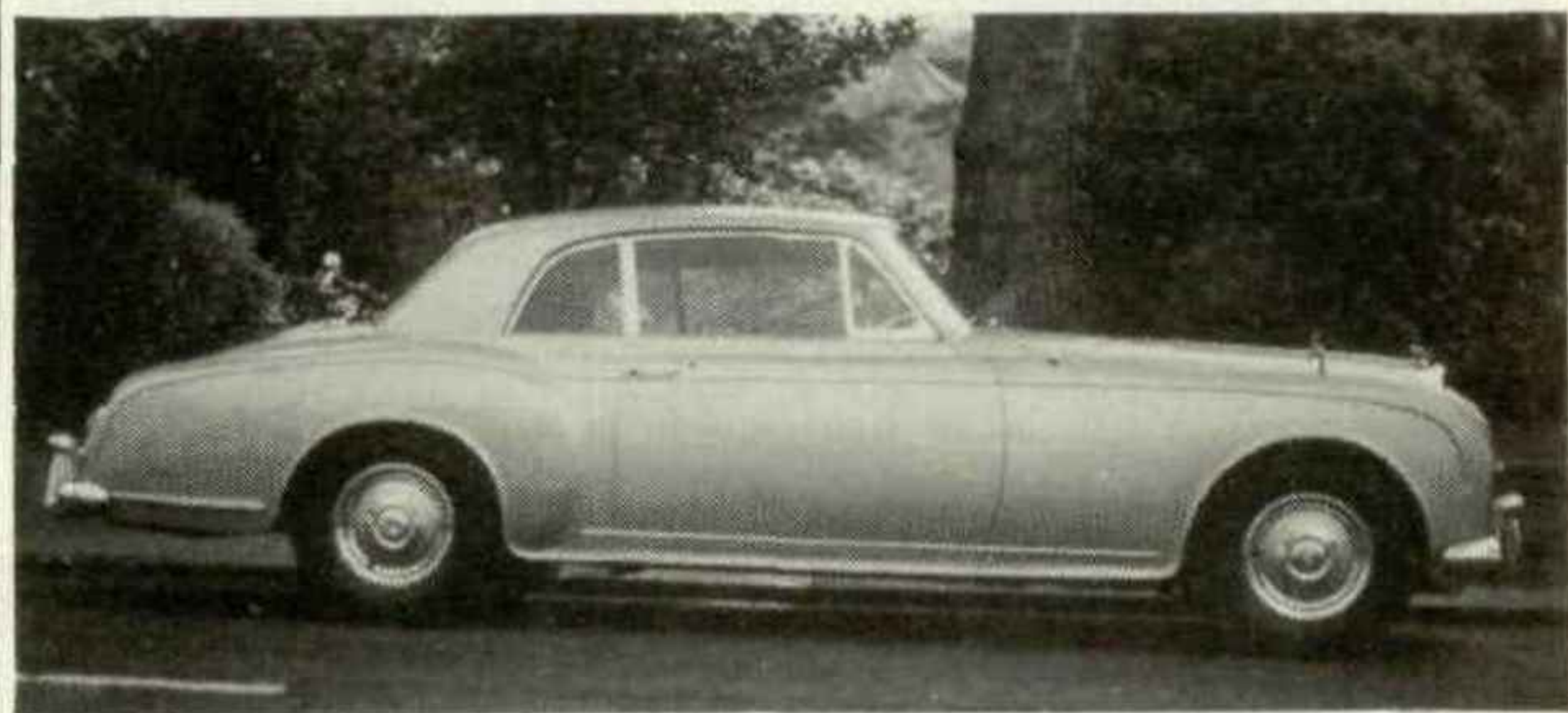
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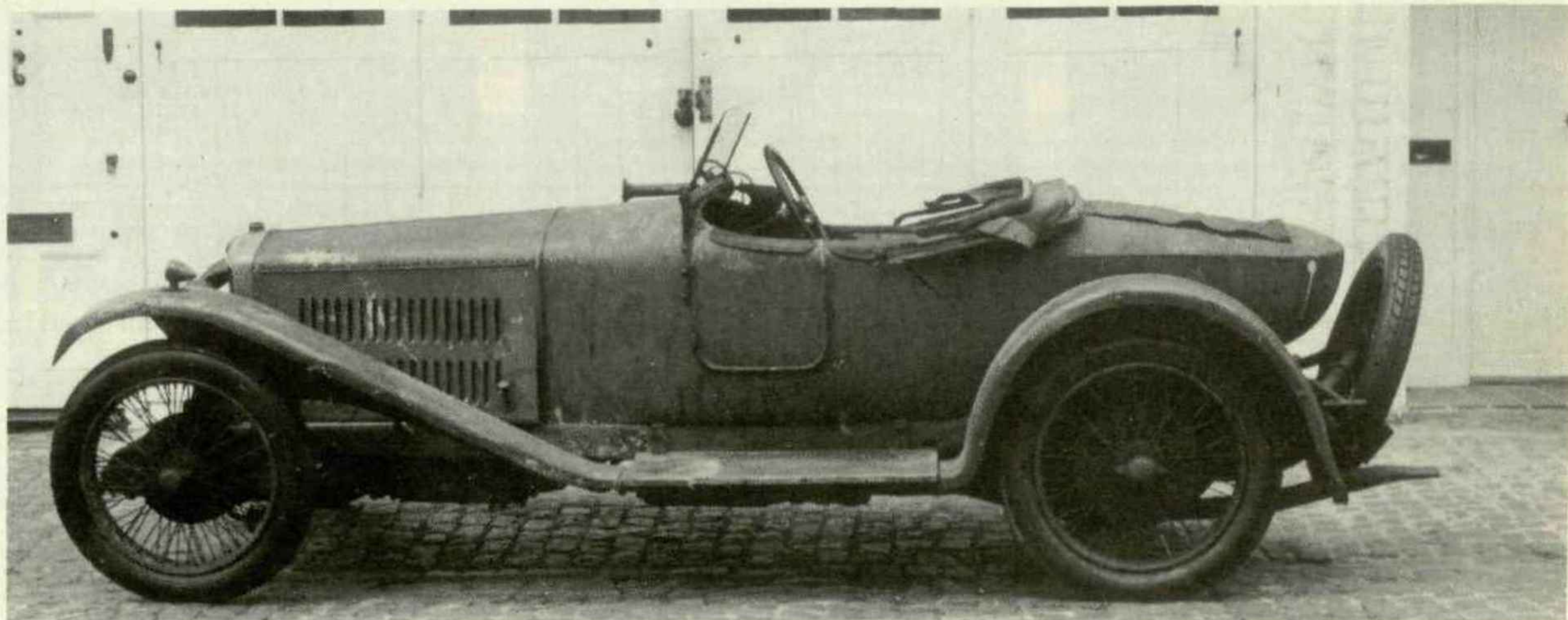
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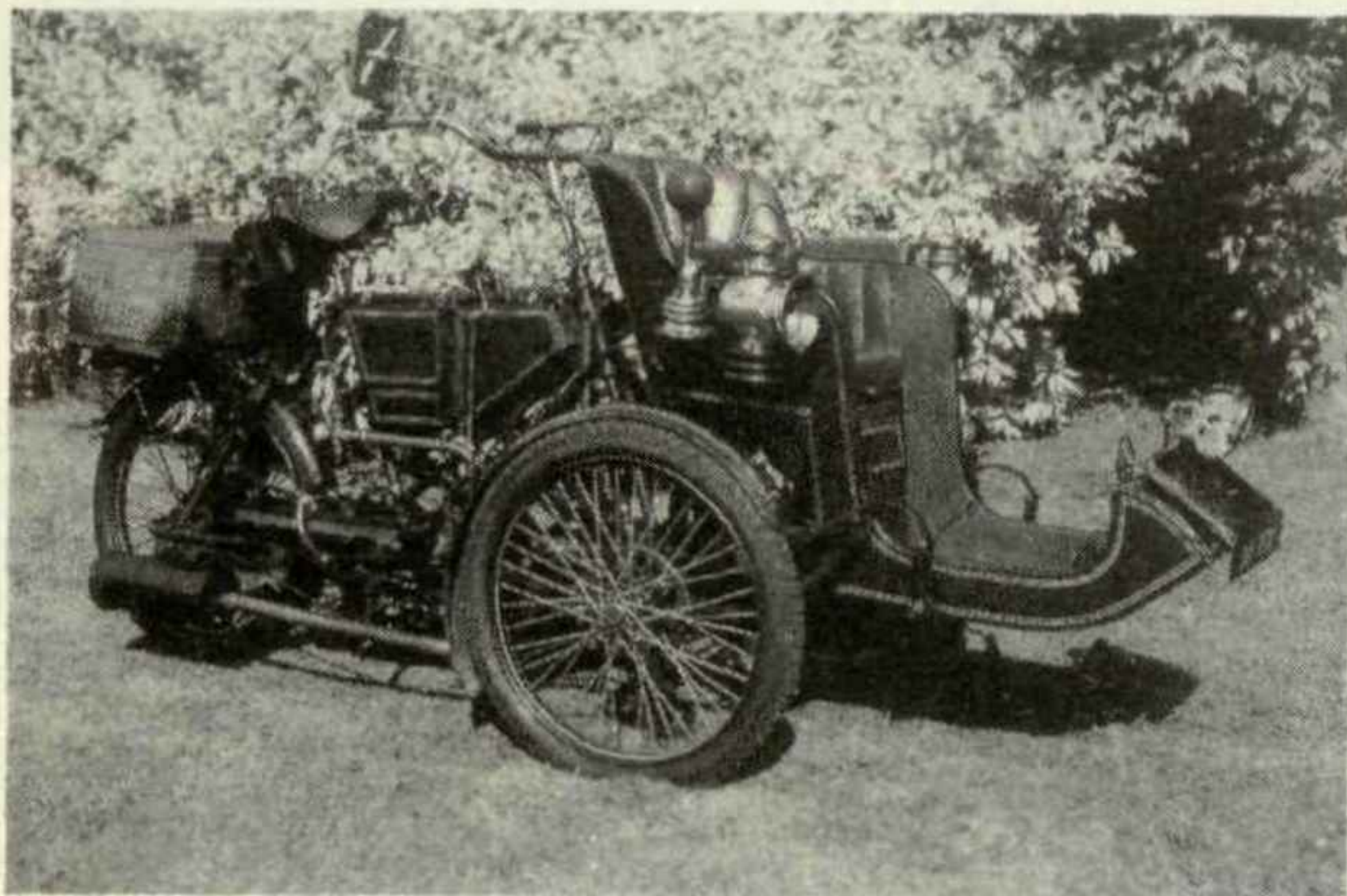
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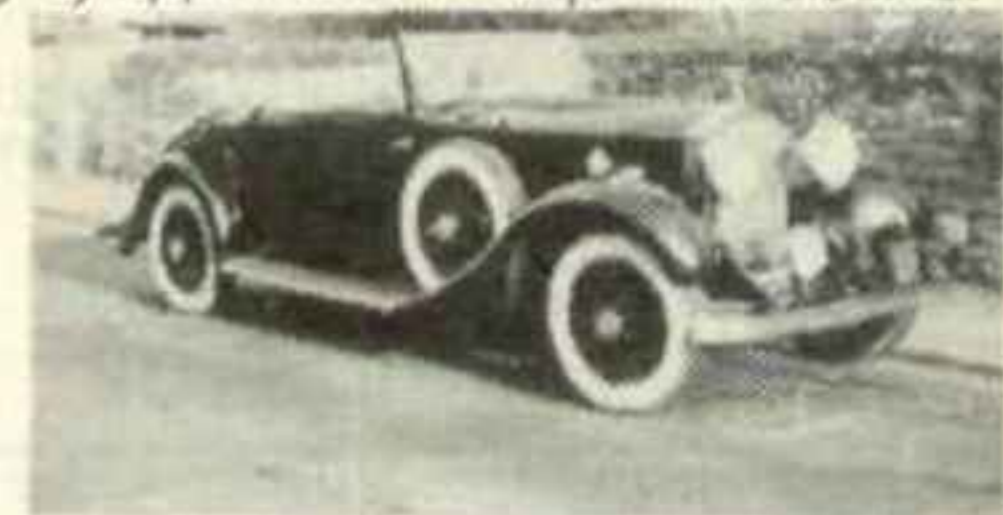
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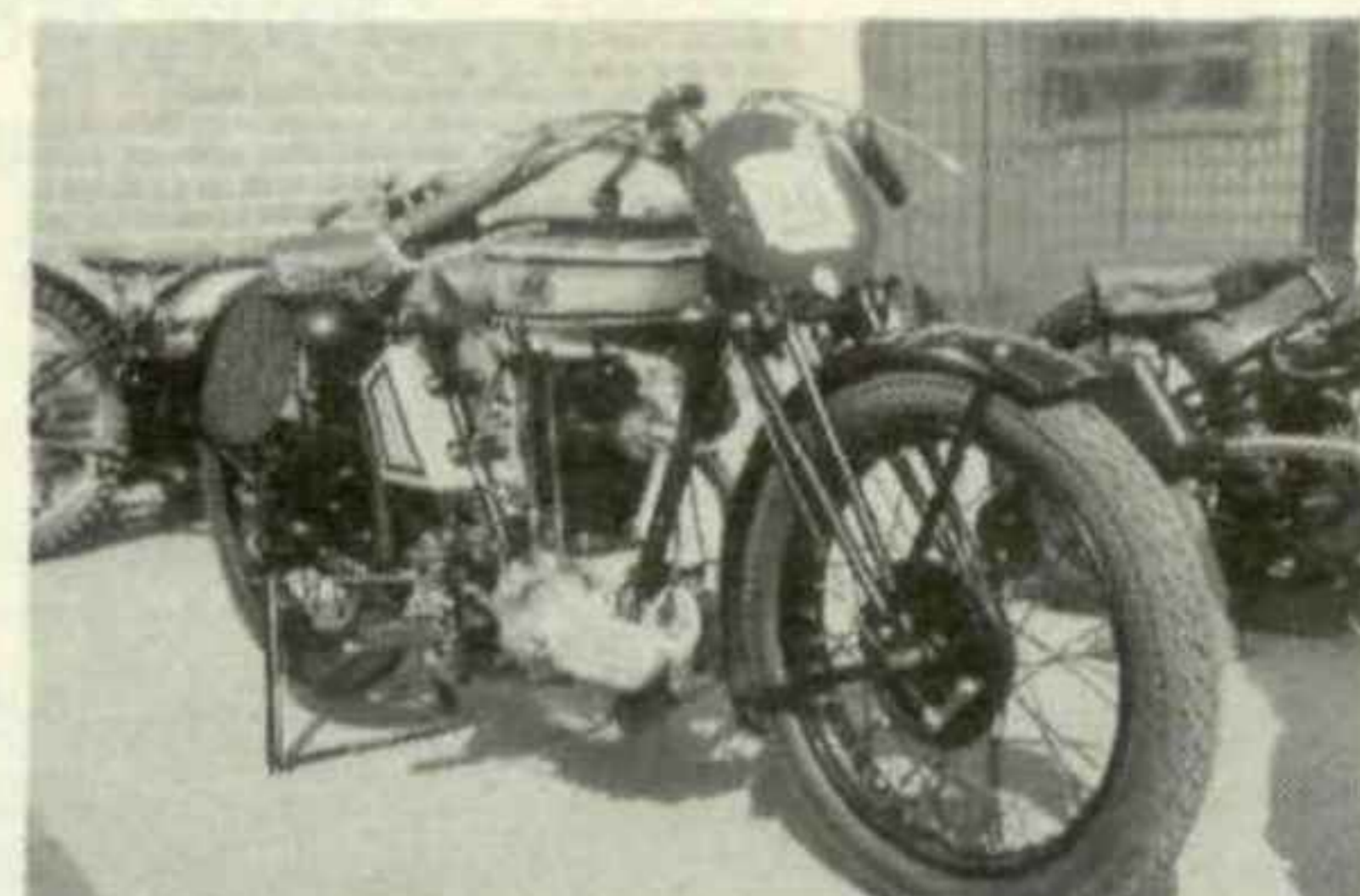
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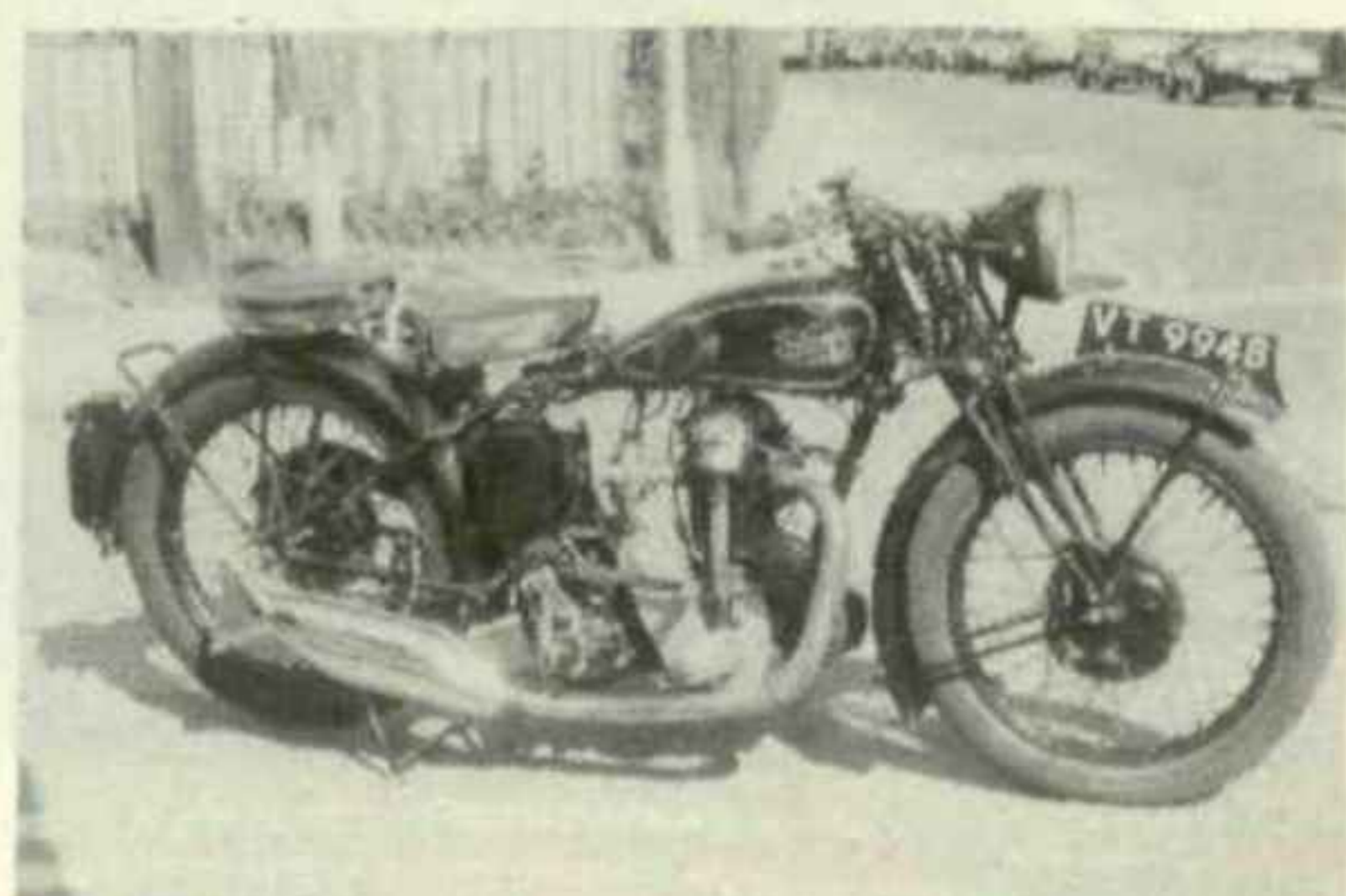
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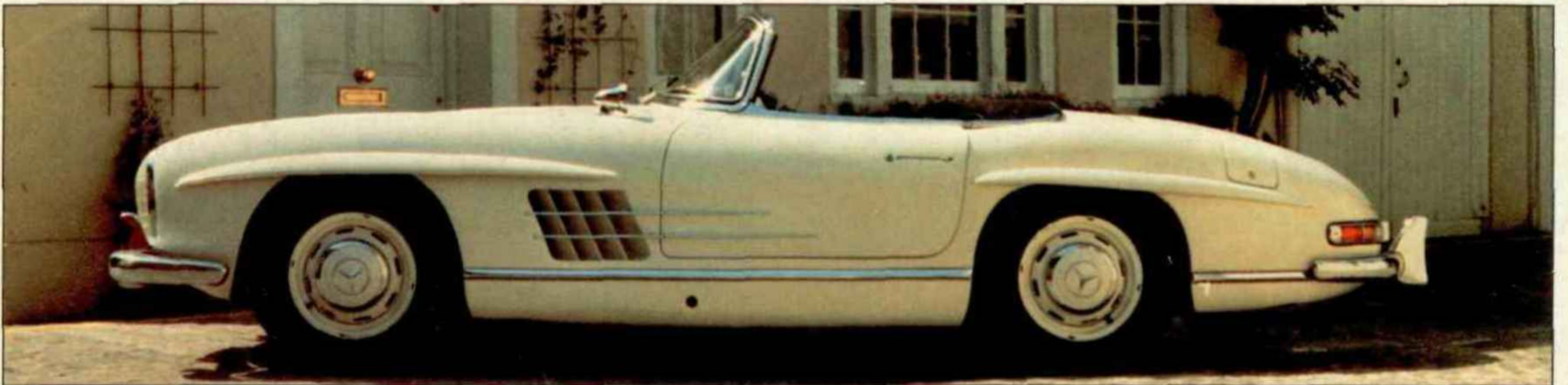
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