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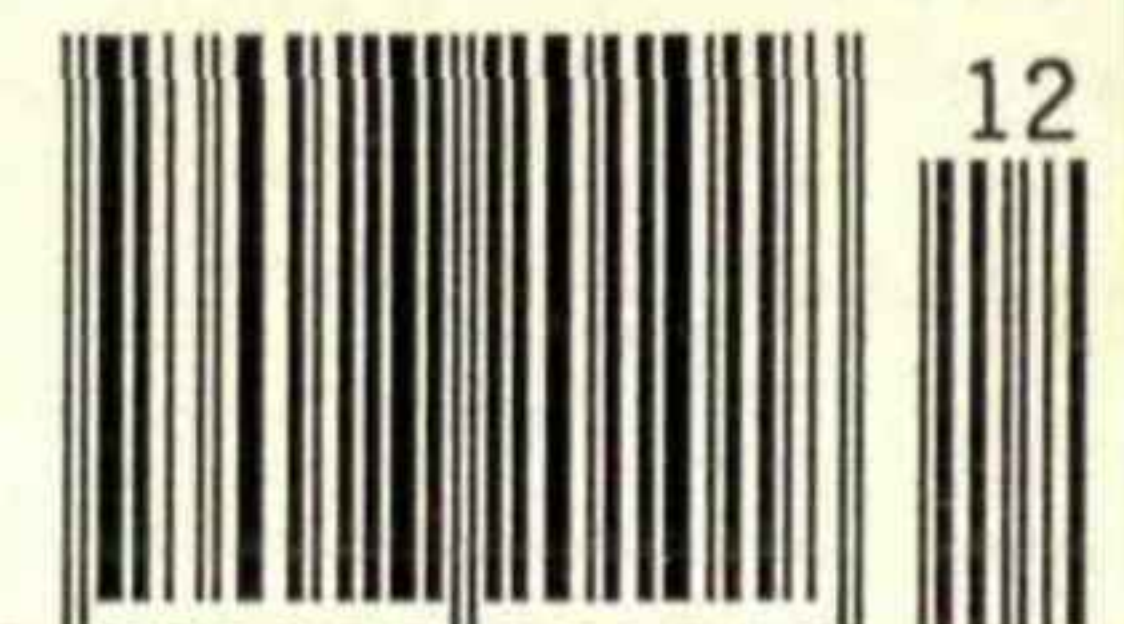


CONTROVERSY: World Championship marred

TRIUMPH TRs: Three models put through their paces

LOTUS: Elan and Carlton examined

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BROOKS

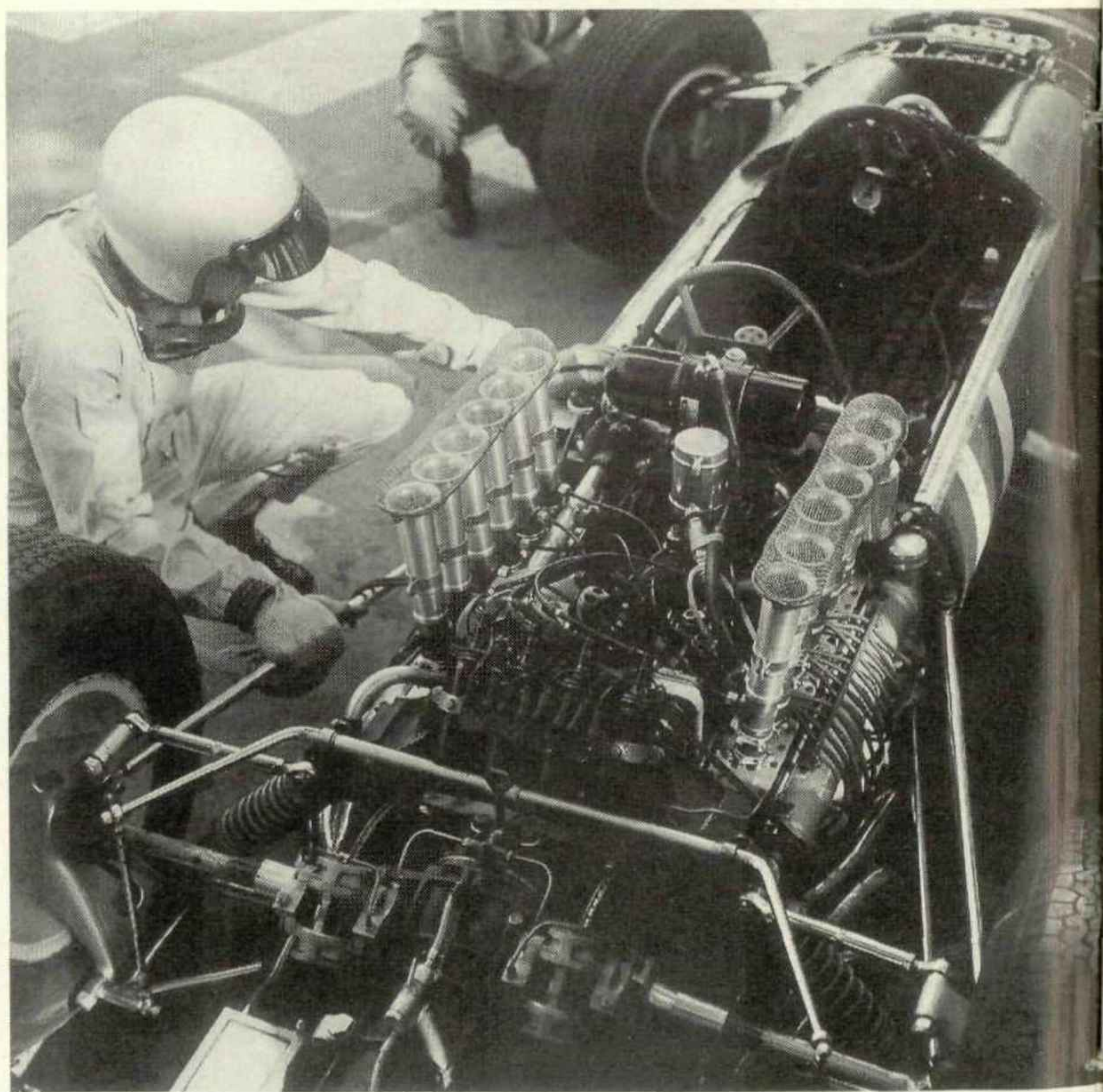
MARCH

OLYMPIA 91

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Editor: William Boddy

STANDARD HOUSE
BONHILL STREET
LONDON EC2 4DATelephone: 071 - 628 4741. Fax: 071 - 638 8497
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FRONT COVER:

Ayrton Senna, the 1990 World Champion.

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MATTERS OF MOMENT

Bang-on Champion

Ayrton Senna is one of the top F1 drivers, perhaps the greatest of all time, and few will wish to deny him the 1990 World Championship; the pity is that it went out with a bang, of the unwanted kind, all too soon, at Suzuka. A bang that will live on in motor racing history and continue to be discussed and argued about for a very long time.

Did Prost deliberately 'shut the door' on his rival or did he have a right to that crucial first corner? Surely Senna did not clinch the Championship by deliberately ramming Prost? Could the race have been stopped on the grounds of debris on the track or because the dust raised by the colliding Championship contestants made the course sufficiently slippery to cause Berger to slide off when running at his customary pace in order to put a 'cushion' between himself and Mansell, after his No 1 driver was out of the race? Surely it wasn't because the race was being run in Japan and the Championship was already safe in the hands of Senna in his Honda-powered car that it wasn't?

To ask such questions without being at the race is unfair, so over to our man on the spot and his report on page 1268. What was unfair was that, in a post-race discussion of the dramatic Senna/Prost coming-together on British TV, Senna gave his views and later Ron Dennis was in the BBC studio, but not Prost nor Ferrari-Fiat. Whatever the truth behind an incident which ruined what could have been the most exciting Grand Prix of the year one must feel commiseration not only for Prost but for the organisers of the Australian GP, which if there were no Championship points to be earned, would have stood as another important race in its own right, instead of rather an anti-climax. In fact, it turned out to be a great race, quite in the tradition of hard fought Grands Prix. The Japanese GP was disappointment enough, after Mansell had retired with what looked to be a return of Ferrari gearbox failure but was apparently caused because Nigel had been so eager to get

after Piquet that he had too many revs on when his car was dropped off the jacks after a brilliant wheel-change and he thus broke both drive shafts. But then, Mansell has always been a charger! This does not in any way detract from the fine win by Nelson Piquet and his Benetton-Ford, repeated magnificently at Adelaide.

While Drivers' and Constructors' Championships add interest to Grand Prix racing, one has to question whether the titles should be based on leading performances until these have been surpassed, as in boxing for instance, instead of them being won on a year-to-year timetable? That the Drivers' Championship has given some extra spice to modern racing cannot be denied, if one thinks of times when it has been won by a single point (as in 1958 by Hawthorn from Moss) or occasions when a driver has lifted off or changed cars to enable his team-mate to clinch the crown, or perhaps when a last lap retirement has changed the Championship result in the closing minutes of a race. On the other hand, there is the memory that Moss was one of the 'Greats' yet he never took the Championship, even though he won four times to Hawthorn's one victory in 1958, but lost the title by a mere one point.

In today's racing 'closing the door' on a rival has become commonplace but it does lead to too many shunts and while the very safe modern cockpits prevent a driver from injury in most cases and so perhaps encourage this habit, one has to consider how much pursuit of Championship points promotes such driving methods. It happened to Prost and Senna at Suzuka last year and has already done so to many lesser drivers; how many shunts has Senna had? F1 racing must not take on the mantle of a Saturday night's stock car bumping match at the local stadium! Such random thoughts occur after considering how this year's World Drivers' Championship ended with a bang.

But nevertheless, congratulations
Senna. WB

Sports Car Driver Shuffles

As Martin Brundle returns to the Brabham Formula 1 team, his place with Silk Cut Jaguar has been taken by Derek Warwick who resigned from Lotus. Warwick, 36, was almost a founder member of the Tom Walkinshaw-directed Jaguar Group C programme, having driven the XJR-6 to its first victory at Silverstone in May 1986.

At the end of that season, he missed the Drivers' Championship by one place at Fuji, third when second would have earned him the title, and we wish him better luck this time.

Walkinshaw has not made any further announcement about his driver line-up for 1991, but TWR is committed to running two new XJR-14 3½-litre cars and need be in no hurry. Still available, apparently, are existing contractees Jan Lammers, Andy Wallace and John Nielsen.

Second drivers are going to draw the short straw next year as the races are reduced to 430 kilometres, or a maximum of three hours. The 'middle shift' is going to be short and sweet, about 40 minutes at Monza, and there will be plenty of broken hearts as the season goes on.

Reigning World Champion Mauro Baldi has been dropped by Mercedes and goes to Peugeot. That was the news at the end of October, but it was hardly a surprise. As expected Michael Schumacher and Karl Wendlinger will share the second Mercedes C291 all season, and Jochen Mass rejoins Jean-Louis Schlesser in the number 1 car. Simply Schlesser insisted on having number one status in the team and Baldi, understandably, couldn't agree to being number two.

At Peugeot Baldi joins Keke Rosberg, Philippe Alliot and Yannick Dalmas in what should be a very effective World Championship contender. The V10 engined 903 which ran at Montreal and Mexico is thought to be an interim car, with the evolution due for testing in the new year. It's hard to think of two faster men than Rosberg and Baldi, so Jean Todt will keep his fingers crossed that their French co-drivers won't do anything silly.

Spice Engineering is expected to be the fourth manufacturer in the new World Sportscar Championship, Walter Brun the fifth. Gordon Spice and Jeff Hazell

returned from a successful sponsorship raising trip to Japan at the end of October, and were expected later to announce team plans for 1991, including the eagerly awaited Lamborghini V12 engine.

The plans for Walter Wolf, the Canadian oil millionaire, to return to World Championship racing in sports car form in collaboration with the Austrian, Franz Konrad, have now been changed. The original idea of running a couple of John Thompson-designed chassis foundered when it was learnt that the new car would not be ready for the start of the '91 season. It is believed instead that Wolf has struck a deal with Spice Engineering to run their two-car team.

Walter Brun is pressing ahead with his own car, powered by the Judd V8 engine, in place of his ill-fated EuroBrun F1 operation. The chassis has been designed by Chris Humberstone at the Brun Technics technical base near Basingstoke, and the plans should include Brun himself, Oscar Larrauri, Jesus Pareja and, perhaps, Bernd Schneider. MLC

TWR Strikes Again

Away from its racing programme, Tom Walkinshaw Racing has also been busy developing yet another supercar, the XJR-15. This is not to be confused with Project XJ220, the Jaguar-Sport car developed jointly by TWR and Jaguar Cars, but another project entirely.

To try and distance this new car from the XJ220, purchase guarantees entry in a proposed 3-race series, which not only will be support races at 3 European Grands Prix, but will have a US \$1 million purse. The XJR-15 will thus only be offered in race car guise, although TWR expect a number of the 40 being built being converted for road use.

It was the 1988 Le Mans winning car, the XJR-9, which was the inspiration behind this new supercar, but as development has progressed, it has left its roots far behind, although the monocoque required little modification. The body, though, is new, Peter Stevens' design taking into account increased safety margins, a more comfortable interior and its possible use as a road car. The 7-litre engine as used in

1988 has been reduced to 6-litres in the name of driveability, although it is rumoured that it would otherwise have been a quicker car than the heavier turbocharged V6 XJ220.

Production of the carbonfibre car is due to start soon after the new year with production limited to around 40. The US \$1 million price has not put customers off as, like the XJ220, customers have already been falling over themselves trying to place an order. WPK

Wolti Moves on

In a move that shows how seriously Porsche are taking their return to Formula One, they have tempted Max Wolti away from the Sauber Mercedes Group C team. Appointed as Project Manager for the F1 programme, it will be his responsibility to oversee all Porsche matters within the Bletchley based Footwork team. WPK

(For further Formula 1 technical news, please turn to page 1284)

Sotheby's

It is at the Sotheby's auction at the RAF Museum at Hendon on Monday, 3rd December that two of the original Blower Bentleys will be coming under the hammer. Of most interest is chassis number SM3909, the 1929 Show Car with coachwork by Gurney Nutting, which became Woolf Barnato's personal car. Alongside it will be another Blower Bentley, a 1931 four-seater Sports Tourer with coachwork by Vanden Plas, which has recently returned to this country from the USA.

A Bugatti Type 40 supercharged Fiacre drophead, which belonged for very many years to Lidia Bugatti, older daughter of Ettore, is also coming up for sale. This is the car which was included in the Royal College of Art's "Amazing Bugattis" exhibition 11 years ago.

Of the several other interesting cars coming up for sale, the two that will be of specific interest to MOTOR SPORT readers will be a 1925 Vauxhall 30/98 OE two-seater tourer and a 1931 Aston Martin 1½-litre International. The former has an extensive history of racing at Brooklands and Donington while the latter is an ex-works team car which was regularly raced in the Thirties. WPK

DECEMBER FIXTURES

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

Date	Organiser	Venue	Event	Type
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Nov 25-29	RAC MSA	Harrogate, West Yorkshire	Lombard RAC Rally	INT
Dec 1-2	RAC MSA	Rallycross GP Brands	Rallycross	INT
Dec 9	BHLRC	Brands Hatch, Dartford, Kent	Race Meeting	R
Dec 9	Lydden IMRC	Lydden Circuit, Dover, Kent	Rallycross	R
Dec 16	Enterprise AC	Brands Hatch, Dartford, Kent	Rallycross	R

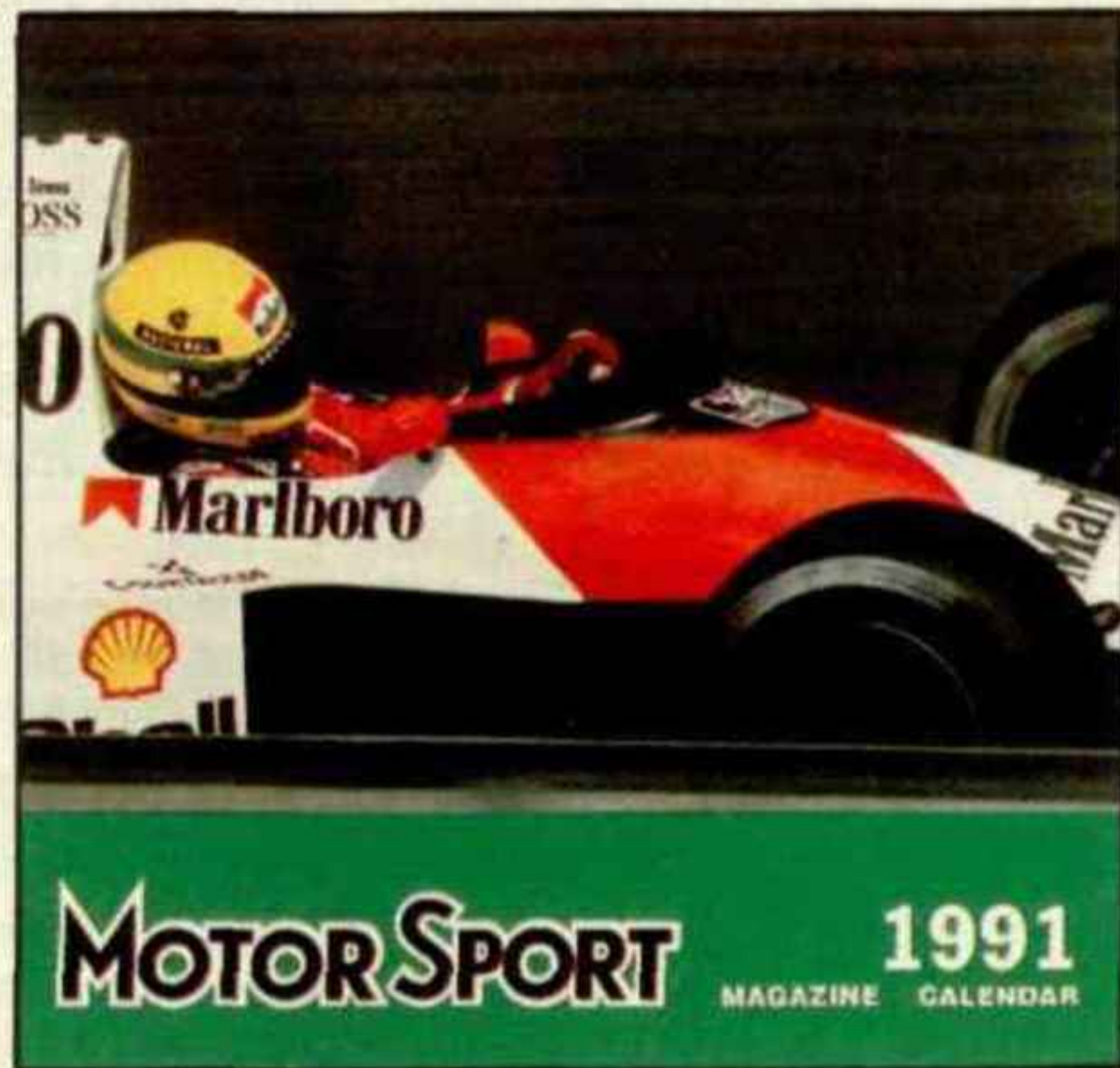
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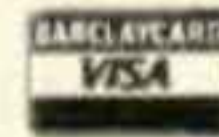
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Far Eastern Fantasy



Moreno's fine drive to second place in Japan was not so much a surprise, as a pleasure to see.

The worldwide Formula One Championship took the travelling 'circus' to Japan on October 21st, to the medium fast interesting Suzuka circuit with its unusual figure of eight layout with a flyover in the middle, and then south to the Adelaide street circuit in Australia on November 4th, there to wind up the 1990 season of sixteen races. The Australian Grand Prix was the 500th event to count for the FIA World Championship for Drivers, not the 500th Grand Prix race, nor even the 500th World Championship Grand Prix race, as so much of the media quoted. It was hoped that the Championship would be settled between Senna and Prost with a stirring race to the end in the Australian Grand Prix, or at least an exciting finale in Japan to keep Honda happy.

But it was not to be, for exactly 9.2 seconds after the start of the Japanese Grand Prix Prost and Senna collided and the FIA's 'sacred' World Championship ended in a cloud of dust as the Ferrari and the McLaren spun off across the wide run-off area of the first corner. While the marshals cleared the wreckage out of the way Senna walked back to the pits as the 1990 World Champion, and Prost prepared a whingeing campaign that was to continue for two weeks.

If you have always viewed the World Championship as a bit of a farce, or at least since 1958 when Stirling Moss was not World Champion as I have, this unhappy ending to the 1990 Championship was about par for the course.

Since October 21st when 'the world and his wife' saw what they thought happened in those critical 9.2 seconds on television they have been joined by 'every man and his dog' in taking sides, explaining what happened, making judgement on both drivers and banging on about the rights and wrongs of the incident which appeared to be a motor racing accident that was all over in a few seconds, as was the Japanese Grand Prix for the media and the casual spectator.

For more serious people whose interest is the actual race, the disappearance of the two best drivers in Grand Prix racing on the first lap left the race open for a lot of other drivers and teams. When Gerhard Berger threw it all away on lap 2, while leading into 'World Champions Corner' the race really was wide open. Berger just went too fast into the corner which was still a bit slippery from dust thrown up on lap 1.

Stefano Modena had spun off on lap 1 in the general melée after the start, so the field was getting a bit thin before the race got into its stride as there had only been 25 cars on the grid anyway. Jean Alesi missed the race altogether as an excursion off the track during Friday practice had strained his neck muscles and caused him to miss the whole of Saturday's practice and qualifying. He tried again in the race-morning 'warm up' but the pain was more than he could stand, so he was withdrawn by Team Tyrrell. There had been quite a lot of reshuffling of the Grand Prix cast before practice began at Suzuka, for

Martin Donnelly was still in hospital, recovering slowly from his big accident at Jerez, and Alessandro Nannini was very much on the sick list after a very bad accident in a helicopter. The number two car at Lotus was taken over by Johnny Herbert, and the number two Benetton by Roberto Moreno, the quiet Brazilian, with a lot of experience behind him, but not much fortune in Formula One. His regular drive with the EuroBrun team had just fizzled out, as the Swiss/Italian team had pulled out of the World Championship for these last two races, as had the Life team, so Moreno was in luck for once, and joined his friend and mentor Nelson Piquet in the Benetton/Ford backed team.

With Senna, Prost and Berger throwing away their chances of winning the Japanese Grand Prix it was an easy job for Mansell to take command, which he did with authority. However, he could not relax as behind him were the two Benettons, settled in to make a non-stop run whereas Mansell was scheduled to make a pitstop for tyres half way through the race. This question of tyre stop or nonstop running has been an interesting part of the 1990 season, particularly on medium-speed circuits. The Cosworth V8 EXP works engine in the Benetton cars is quite a lot down on the power available from Honda, Ferrari and Renault engines, but it is all a question of how you use the power available to you. If your chassis and suspension needs a lot of downforce created aerodynamically and you have a surplus of power then you can overcome the drag



Johnny Herbert was another of the New Guard to put in an impressive performance in Japan, before retiring due to mechanical failure.

caused by aerofoils. If your chassis and suspension are good you can run with less downforce, and if your engine has less power than the others, you can compromise to attain equality. With lap speeds around 120mph it is just possible for a car like the Benetton to keep the leaders in sight and run through nonstop with less downforce on the tyres encouraging less wear. On a circuit with lap speeds around 150mph this does not apply, the more powerful cars getting too far ahead, even with more downforce, and having enough lead to make a pitstop for new tyres without being caught.

Suzuka is a Benetton-type circuit, and also a Tyrrell, Leyton House, Minardi, Ligier, Arrows and Brabham type as well in theory, except that there are a lot of other ingredients required to do what Benetton do, with Mansell leading the race comfortably, but conscious of his forthcoming pitstop, Piquet settled into a steady pace that kept the Ferrari driver on his toes. This in itself was not so remarkable because Piquet should never be underestimated; after all, he has won three World Championships, a lot of races, and has always been a 'crafty racer' with a lot of trackcraft. The real surprise was that Roberto Moreno was following Piquet's every move, literally running in his wheel tracks and looking very comfortable and confident. It tended to make you forget that there were a lot of 'famous' drivers behind him, Boutsen, Patrese, Warwick, Nakajima, Bernard and Capelli for example.

In qualifying, and on the grid therefore, Piquet had split the two Williams-Renault drivers, and Moreno was just behind them. In fact, Moreno was half a second slower than Piquet, which was an impressive debut for the quiet Brazilian in his first time in a 'halfway decent car'. Right from the start of the race he had followed Piquet through and was very happily ensconced in his wake.

On lap 27 Mansell was into the pit lane for his scheduled tyre stop, which went quickly enough, and he took off with a blue smoke haze from his new rear tyres as he headed down the pit lane for the exit. He didn't reach it! An output shaft from the transmission sheared under the load and a frustrated Nigel Mansell coasted to a stop and out of the race.

A smiling Piquet inherited the lead with his little brown friend following dutifully into second place. Impressively Nelson Piquet settled into a regular pace that suited Moreno and led the way to victory for the Benetton team. Meanwhile there were a lot of teams and drivers following along behind wondering what they had done wrong, especially as in third place was the Japanese driver Aguri Suzuki in a Lola-Lamborghini V12 of the Larrousse team which was running like clockwork.

When Nelson Piquet got the chequered flag, followed by Moreno, he slowed up

and let his team-mate draw alongside and the sight of the two Benettons on their slowing-down lap running in close team formation was an emotional occasion which put some sense into the turmoil going on behind the scenes in the paddock over the first lap shambles. The emotions of the two Brazilians when they got out of the cars just overflowed and the photograph published in *Autosport* in their issue of 25th October, of Piquet and Moreno hugging each other says it all, and gets my vote for 'The Photograph of the Year'. At the post-race 'press conference' at which the first three drivers in the race talk to the media, Nelson Piquet put the finishing touch to a very happy occasion when he arrived and said 'Good afternoon, you may not remember me, my name is Nelson Piquet'.

By November 1st the 'circus' was set up once more, this time in Australia, on the Adelaide street circuit, the 'movements plans' and transportation of about 2000 people and all the cars and materials and equipment being one of the wonders of the modern racing scene and a tribute to all those who work away behind the scenes to make it all happen. Before the racing engines were started up there was a lot of talking about the rights and wrongs of the world of Formula One, much of it doing nobody any good and a lot of it just stirring up more hatred, bitterness and controversy which seems to be the lifeblood of the daily paper, television and media world. 'Negative is news, positive is boring' seems to be the motto of the media, and presumably the people who read it.

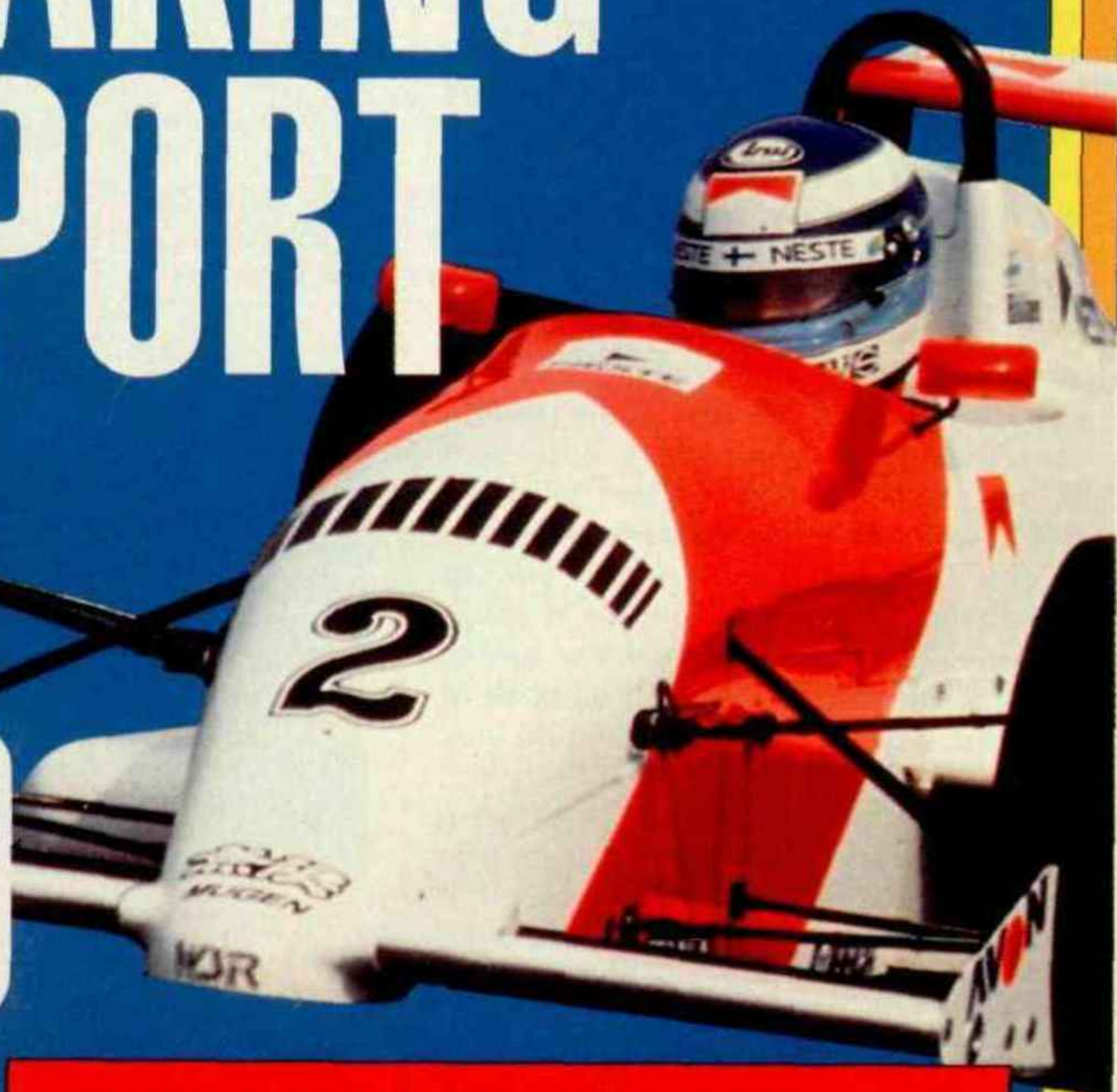
If there was time to reflect on the happenings in Japan they should have been on the good things, though some were brought about by sadness. Nannini's unfortunate helicopter accident looks like putting him out of racing for a long time, maybe forever from Formula One, as the chances of his arm injury mending to be strong enough for Grand Prix driving look pretty slim. Donnelly's recuperation looks like being a long process, and spare a thought for Regazzoni



The highest finish yet for a Japanese Formula One driver got Aguri Suzuki onto the rostrum.



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and Philippe Streiff who are still with us, but can never race again because of the injuries that racing caused them. These sadnesses have meant that someone has had to take their places, and in Japan we saw Roberto Moreno do everything that was expected of him when he took Nannini's place in the Benetton team. Moreno has always puzzled me, ever since he was given a chance to drive a works Lotus way back in 1982. I watched him then as he failed to qualify for the Dutch Grand Prix and could never really convince myself as to why, other than perhaps he was thrown in at the deep end before he had learnt to do a strong 'overarm' and in Formula One there is no room for the 'breast stroke'. He never disappeared for very long, always racing something, somewhere and even when he wasn't racing, or had failed to qualify some rather hopeless Formula One car, you would see him in the pits or paddock watching the top people at work, with a look of envy on his face, not one of bitterness thinking 'I could do what he is doing', but a genuine look of 'I would love to be there'. Pushy is a word that I am sure does not enter into the Moreno vocabulary, which is why I have had a soft spot for him for many years, but always with a touch of sadness, so my joy at his performance in Japan was nearly as much as his own. It is odd, but I have always had this same feeling about Emerson Fittipaldi since he bowed out of Formula One, so that when I heard he had won the Indianapolis 500 Mile race I gave a loud cheer of 'Good old Emmo'.

I have always been a Piquet fan, and during his disastrous two seasons with Lotus I could not bring myself to get too close, but merely watched from afar. He always made it clear that he was not going to 'bust his gut' to drag a Lotus from 16th place up to 14th place. If there was the slightest hope of getting into the first six, then he would rise to the occasion. His detractors would say 'Oh yes, and if the occasion arises he will have forgotten how to do it' but Brian Hart, another Piquet fan, used to say to me 'People tend to forget that Piquet has won a lot of races, and been World Champion three times if you rate that sort of thing'. This past season we have seen Piquet keeping his promise about a chance of getting in the first six, and some of his performances in the Benetton have been very good. Even he knows he is no longer in the Senna and Prost class, but he is still near the top, and though his win in Japan was occasioned by a certain amount of good fortune, if he hadn't been in second place behind Mansell when the Ferrari broke, someone else could have won. While Japan was a joyday for Piquet fans, little did we imagine what was going to happen in Australia.

What was certain was that the Australian Grand Prix had little to do with the Drivers World Championship, it was a Grand Prix standing on its own merit on a circuit that most people seem to enjoy, and in an ambience that makes a fitting end to a season, even if there is a very long journey



Mansell, Japan and Australia 1990: still quick, still motivated, still unlucky.

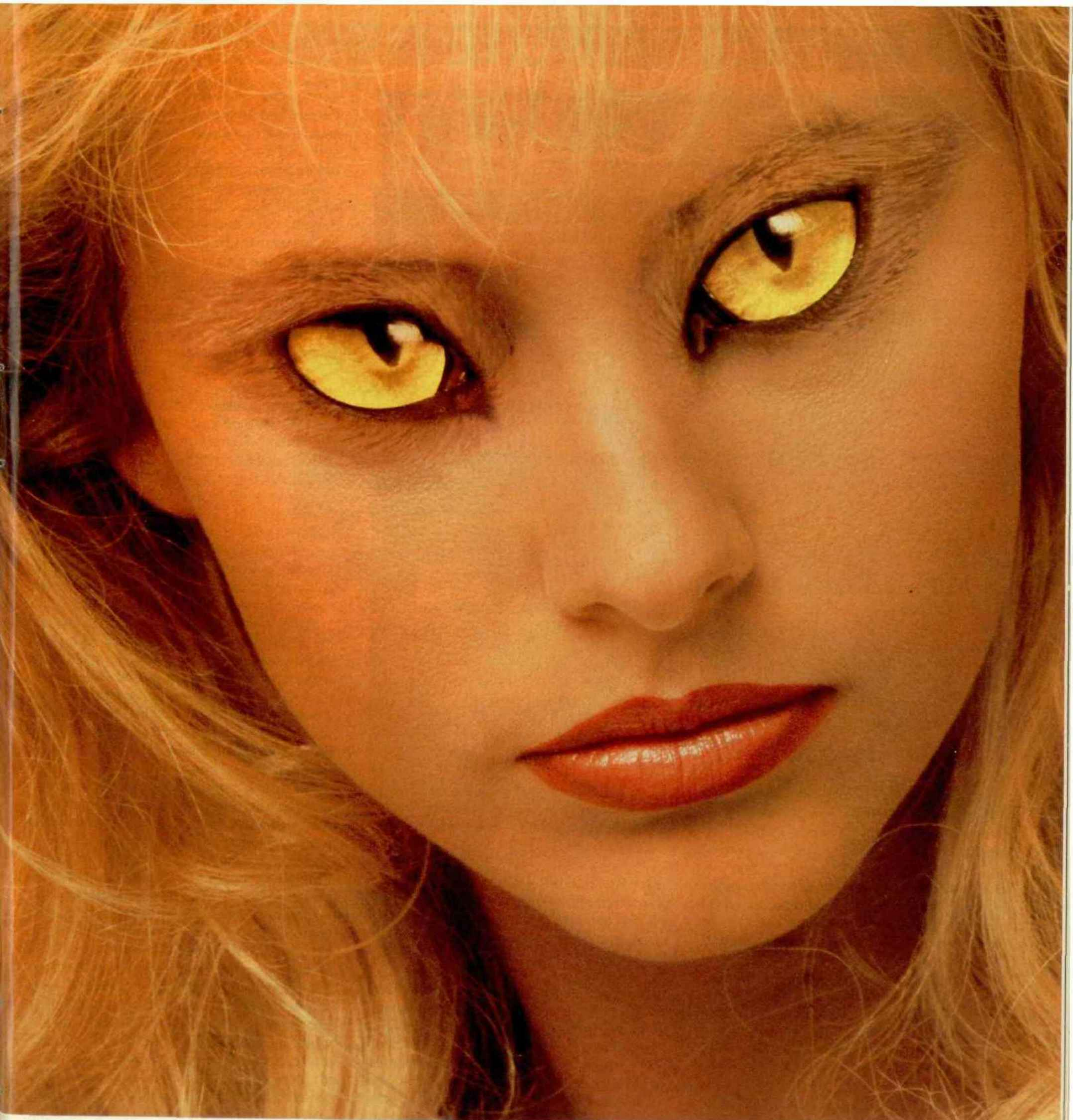
home afterwards for most people. What was equally evident was that Ayrton Senna approached it as he does every race, to be on pole position on the grid and to win the race, preferably leading from start to finish. Equally evident was that Alain Prost was taking his World Championship defeat rather badly, taking over the title of whinger of the year from Nigel Mansell by a country mile. This season 'Our Nige' has almost been 'the sunshine boy' and won the hearts of a lot of British mums and dads by announcing his retirement after the British Grand Prix last July, to spend more time with his family. When he signed a contract to drive for Williams-Renault in 1991 one began to wonder...At least we now know that we don't have to take too much notice of anything Nigel Mansell says in future, not that some of us ever did.

This race was going to be a 'last' for a lot of people. It was Mansell's last drive for Ferrari before moving to Williams, it was Boutsen's last drive for Williams before he moves to Ligier, it was Alliot's last drive for Ligier before he moves to Peugeot, it was Warwick's last drive for Lotus before he moves to Jaguar sports cars, it was Modena's last drive for Brabham before he

moves to Ken Tyrrell's team, it was Alesi's last drive for Tyrrell before he moves to Ferrari to join Alain Prost and all the way down the list there seems to be moves pending.

Even a lot of teams were having their 'last event' moving either into obscurity or to better things and even into pastures new. McLaren were having their last race with the Honda V10 engine, the new V12 already being tested, Tyrrell were about to abandon Cosworth engines in favour of the Honda V10, Larrousse were having the last use of the Lamborghini V12 engine into which they have put so much effort, being forced to turn to Cosworth power, and Lotus were also having their last use of the Italian V12 engines through no choice of their own. The Leyton House team were hoping it would be their last race with the Judd V8 and that the Chevrolet Ilmor engine would soon be appearing, and Brabham were also pulling out of using Judd engines, now that Yamaha had revealed their V12 engine for 1991.

There were so many changes imminent, and many more in the planning that you felt like putting all the variables into a pot, stirring them thoroughly over a low heat



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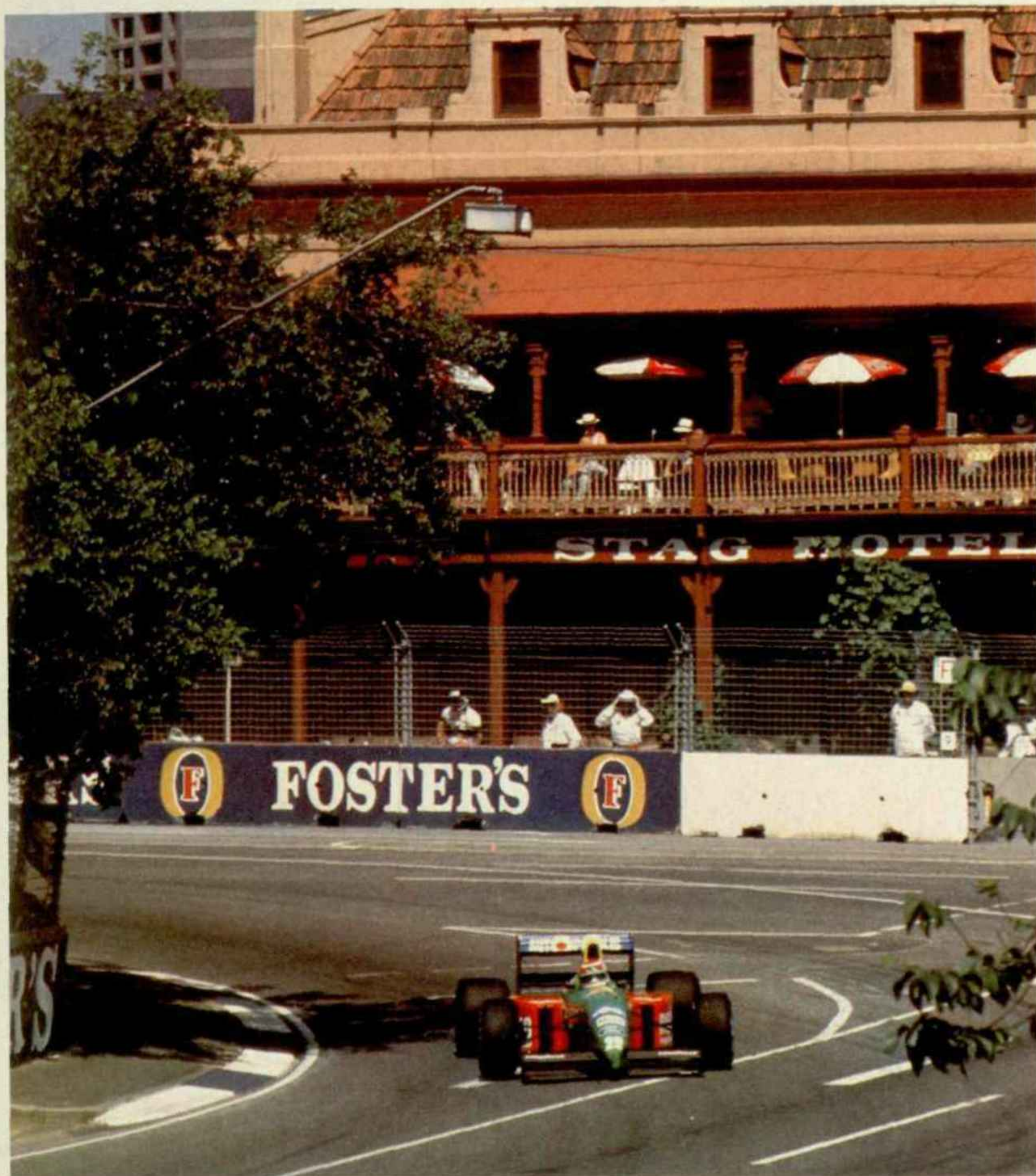
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Nelson Piquet was back from the middle of the pack with an inherited win in Japan, and an excellent win in Australia.

and then ladling out a portion to each aspiring team for 1991. If you did this you would probably get the same answer as in 1990. Up at the front would be McLaren, Ferrari and Williams; nibbling at their tails would be Tyrrell, Benetton and possibly Leyton House, with one or two interesting prospects in the offering, and most of the teams who have been down the back all this season would probably still be there. On the driver front Senna, Prost, Mansell, Berger and Alesi will be to the fore, with Piquet in there somewhere and Capelli, Gugelmin, Suzuki, Patrese, Martini and Nakajima forming a fairly strong chorus.

But how about the Australian GP? There was nothing to lose for anyone, much to enjoy and the sun was shining. Qualifying had seen Senna as dominant as ever, scoring his 52nd pole position and Berger was in front of both Ferraris. Almost alongside Prost was Alesi with the Hart-powered Tyrrell 019, which makes you wonder where he will be next year when he is in a Ferrari. Then came the two Benettons, still on a 'high' after their wonderful time in Japan, and this time Moreno was less than half a second behind Piquet. As he said, 'learning is easy for me, with Piquet to teach me'. They were intermingled with the two Williams-Renaults, which did not look good either for Williams

or for Renault, but it could be different next year when Mansell rejoins the team.

Prost had clearly given up, as he does too often, and Senna ran away from everyone from the green light. Mansell ousted Berger from second place on lap 2 and on lap 9 Piquet got past the Austrian, but Prost stayed back in 5th place, no doubt 'whingeing' quietly to himself and not concentrating on the job in hand. With Piquet up near the front and racing hard, no one in their right mind could expect Moreno to stay with him, but the second Benetton was running a good 9th, ahead of Warwick who was 'best of the rest'.

While tyre wear was not critical in this race, brakes were, though it was more a question of brake temperature and cooling than simple pad wear. There are places on the circuit where brakes have to be used very hard before a corner, thus generating a lot of heat, and then have to be used really hard again before the initial heat has dissipated, so that a heat build-up can begin if a driver does not play it carefully, and fading brakes can be the result. When this happens you cannot guarantee that the brakes will pull evenly on all four wheels and a number of drivers were suffering this problem, even Senna out in front. While Mansell was securely in second place, he could not make

any inroads on Senna's lead and when the Ferrari had a spin into an escape road it seemed second place was gone, but Mansell gathered it all up and was back into the race before Piquet appeared.

The Ferrari had worn flats on the tyres as it spun and Mansell wanted to head straight for the pits and a new set at the end of that lap, but his team told him over the radio phone to stay out for a bit as they hadn't got a new set warmed up properly in the portable oven. Whether to change onto 'cold' tyres or to delay for a couple of laps while they are 'warmed' is one of those moot points that a driver/team manager pairing has to make on the spur of the moment. It really is a case of 'six of one and half a dozen of the other'. By the time Mansell was back in the race on new tyres he was down to 5th place, the order now being Senna, giving a good demonstration of why he is World Champion Grand Prix driver, the crafty Piquet in second place, driving with all his long-accumulated craft, Berger in third place, and Prost fourth. The Italians call Mansell The Lion, but in motor racing parlance he should be called The Tiger, because 'to tiger' means to give it all you've got and a little more, but not so much that you have an accident.

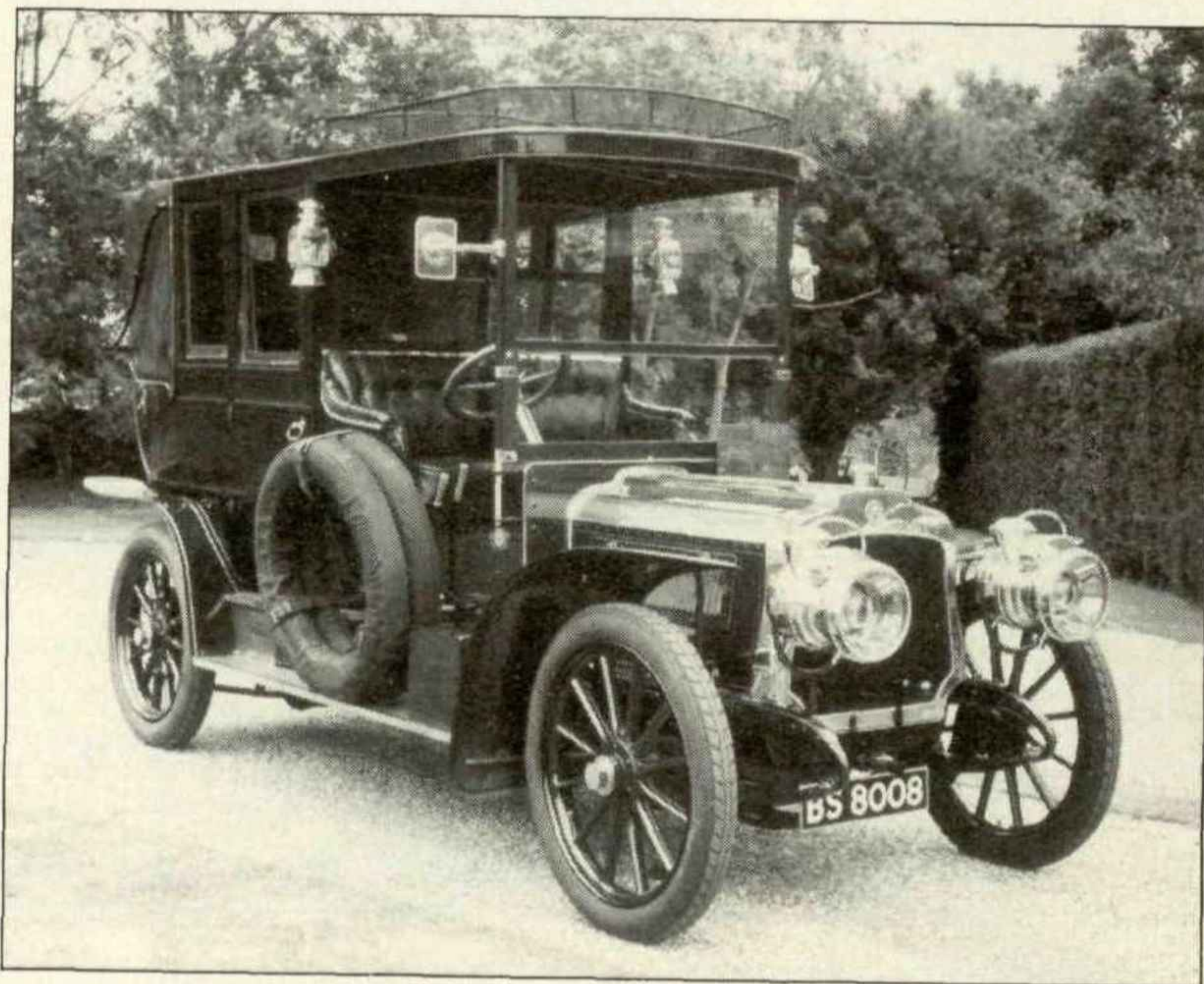
There was little hope of catching Senna, but second place was rightfully Mansell's and he was out to retrieve it. This situation woke up Prost who responded with laps in the low 1 min 20 secs and even into the 1 min 19 sec bracket, whereas he had been cruising round in the 1 min 21 sec and 1 min 22 sec bracket, and he passed Berger and took third place.

On lap 62 the whole scene changed dramatically as Senna changed down for a relatively slow corner and found himself in neutral instead of second gear, and at racing speeds there is little chance of having time to try again. The result was that the McLaren went off into the barriers and Senna lost another assured victory. For the second race in succession Piquet was grinning to himself as he inherited the lead, but it was no foregone conclusion because Mansell was really flying, lapping in the low 1 min 19 sec bracket, and then the 1 min 18 sec bracket. As a final farewell to an unhappy relationship with his Ferrari teammate, from whom he thought he was going to learn so much, or so he said when Prost joined the team, Mansell flashed by him with ease on lap 73 and was hard after the Benetton. Right to the end of the 81 laps Mansell tried all he knew to get past Piquet, but the Brazilian wasn't about to give way, and in a wonderful piece of true Grand Prix racing Piquet led Mansell over the line by 3.1 seconds, after the Ferrari had been alongside at one point in a desperate out-braking manoeuvre that just failed to come off, but with no hard feelings or acrimony anywhere. It was a really healthy finish to the race and to the 1990 season.

Back in midseason someone in the paddock once said "Why don't we share Championship points and the money between Senna and Prost before the races, then they can go home and we might get some good racing". Not a bad idea. DSJ

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SOTHEBY'S
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STARTING GRID



1 PROST Ferrari F1/90 1 min 37.228 secs	27 SENNA McLaren MP4/5B 1 min 36.996 secs
28 BERGER McLaren MP4/5B 1 min 38.118 secs	2 MANSELL Ferrari F1/90 1 min 37.719 secs
20 PIQUET Benetton B190 1 min 40.049 secs	5 BOUTSEN Williams FW13B 1 min 39.324 secs
19 MORENO Benetton B190 1 min 40.579 secs	6 PATRESE Williams FW13B 1 min 40.355 secs
23 MARTINI Minardi M190 1 min 40.899 secs	30 SUZUKI Lola L90 1 min 40.888 secs
16 CAPELLI Leyton House CG901 1 min 41.033 secs	11 WARWICK Lotus 102 1 min 41.024 secs
12 HERBERT Lotus 102 1 min 41.558 secs	3 NAKAJIMA Tyrrell 019 1 min 41.078 secs
29 BERNARD Lola L90 1 min 41.709 secs	15 GUGELMIN Leyton House CG901 1 min 41.698 secs
21 PIRRO Dallara BMS 190 1 min 42.361 secs	25 LARINI Ligier JS33C 1 min 42.339 secs
26 ALLIOT Ligier JS33C 1 min 42.593 secs	24 MORBIDELLI Minardi M190 1 min 42.364 secs
7 BRABHAM Brabham BT59 1 min 43.156 secs	8 MODENA Brabham BT59 1 min 42.617 secs
9 ALBORETO Arrows A11B 1 min 43.304 secs	10 CAFFI Arrows A11B 1 min 43.270 secs
	22 DE CESARIS Dallara BMS 190 1 min 43.601 secs

4 J. Alesi, Tyrrell 019, 1 min 40.052 secs withdrawn after Sunday warm-up, driver not fit.

25 cars started

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 38.684s	1m 37.228s	no lap
2	Nigel Mansell	Ferrari F1/90	G		1m 38.969s	1m 37.719s	1m 46.272s (22)
3	Satoru Nakajima	Tyrrell 019	P		1m 41.208s	1m 41.078s	1m 45.887(27)
4	Jean Alesi	Tyrrell 019	P		1m 40.052s	no practice	withdrawn
5	Thierry Boutsen	Williams FW13B	G		1m 39.577s	1m 39.324s	1m 45.706s (47)
6	Riccardo Patrese	Williams FW13B	G		1m 40.355s	1.40.664s	1m 44.233s (40)
7	David Brabham	Brabham BT59	P		1m 43.156s	1m no time	1m 54.765s (2)
8	Stefano Modena	Brabham BT59	P		1m 42.617s	no time	no lap
9	Michele Alboreto	Arrows A11B	G		1m 43.304s	1m 43.610s	1m 47.094s (27)
10	Alessandro Caffi	Arrows A11B	G		1m 43.270s	1m 43.887s	1m 46.849s (42)
11	Derek Warwick	Lotus 102	G		1m 41.482s	1m 41.024s	1m 46.042s (23)
12	Johnny Herbert	Lotus 102	G		1m 43.111s	1m 41.558s	1m 46.463s (27)
14	Olivier Grouillard	Osella FA1M	P		1m 43.993s	1m 43.782s	
15	Mauricio Gugelmin	Leyton House CG901A	G		1m 42.049s	1m 41.698s	1m 49.471s (5)
16	Ivan Capelli	Leyton House CG901A	G		1m 41.657s	1m 41.033s	1m 48.035s (9)
17	Gabriele Tarquini	AGS JH25	G		1m 44.281s	no time	
18	Yannick Dalmas	AGS JH25	G		1m 44.410s	1m 46.326s	
19	Roberto Moreno	Benetton B190	G		1m 41.719s	1m 40.579s	1m 45.539s (45)
20	Nelson Piquet	Benetton B190	G		1m 41.041s	1m 40.049s	1m 45.114s (47)
21	Emanuele Pirro	Dallara BMS 190	P		no time	1m 42.361s	1m 48.506s (18)
22	Andrea de Cesaris	Dallara BMS 190	P		1m 43.601s	1m 43.647s	1m 49.761 (13)
23	Pierluigi Martini	Minardi M190	P		1m 40.899s	1m 41.964s	1m 46.897s (43)
24	Gianni Morbidelli	Minardi M190	P		1m 42.858s	1m 42.364s	1m 48.865s (15)
25	Nicola Larini	Ligier JS 33C	G		1m 43.396s	1m 42.339s	1m 46.681s (21)
26	Phillippe Alliot	Ligier JS 33C	G		1m 44.106s	1m 42.593s	1m 46.106s (44)
27	Ayrton Senna	McLaren MP4/5B	G		1m 38.828s	1m 36.996s	no lap
28	Gerhard Berger	McLaren MP4/5B	G		1m 38.374s	1m 38.118s	1m 49.573s (1)
29	Eric Bernard	Larrousse-Lola 90	G		1m 42.141s	1m 41.709s	1m 47.518s (19)
30	Aguri Suzuki	Larrousse-Lola 90	G		1m 41.442s	1m 40.888s	1m 44.850s (40)
31	Bertrand Gachot	Coloni-Subaru	G		no time	1m 45.393s	
33		EuroBrun 189B	P			Entry Withdrawn	
34		EuroBrun 189B	P			Entry Withdrawn	
39	Bruno Giacomelli	Life L190/1	G			Entry Withdrawn	

RESULTS

Japanese Grand Prix, Suzuka, Oct. 21
53 laps of 5.859 km circuit (310.527 km; 192.952 miles)

Pos.	Driver	Nat.	Car/Engine	Time
1st	Nelson Piquet	(BRA)	Benetton B190-Cosworth V8 EXP	1h 34m 36.824s
2nd	Roberto Moreno	(BRA)	Benetton B190-Cosworth V8 EXP	1h 34m 44.047s
3rd	Aguri Suzuki	(J)	Lola L90-Lamborghini V12	1h 34m 59.293s
4th	Riccardo Patrese	(I)	Williams FW13B-Renault V10	1h 35m 13.082s
5th	Thierry Boutsen	(B)	Williams FW13B-Renault V10	1h 35m 23.708s
6th	Satoru Nakajima	(J)	Tyrrell 019-Cosworth V8 DFR	1h 35m 49.174s
7th	Nicola Larini	(I)	Ligier JS33C-Cosworth V8 DFR	1 lap behind
8th	Pierluigi Martini	(I)	Minardi M190-Cosworth V8 DFR	1 lap behind
9th	Alessandro Caffi	(I)	Arrows A11B-Cosworth V8 DFR	1 lap behind
10th	Phillippe Alliot	(F)	Ligier JS33C-Cosworth V8 DFR	1 lap behind
11th	Derek Warwick	(GB)	Lotus 102-Lamborghini V12	retired on lap 39
12th	Johnny Herbert	(GB)	Lotus 102-Lamborghini V12	retired on lap 32
13th	Michele Alboreto	(I)	Arrows A11B-Cosworth V8 DFR	retired on lap 29
14th	Nigel Mansell	(GB)	Ferrari F1/90-Ferrari V12	retired on lap 27
15th	Emanuele Pirro	(I)	Dallara BMS 190-Cosworth V8 DFR	retired on lap 26
16th	Eric Bernard	(F)	Lola L90-Lamborghini V12	retired on lap 25
17th	Gianni Morbidelli	(I)	Minardi M190-Cosworth V8 DFR	retired on lap 19
18th	Ivan Capelli	(I)	Leyton House CG901-Judd V8	retired on lap 17
19th	Andrea de Cesaris	(I)	Dallara BMS 190-Cosworth V8 DFR	retired on lap 14
20th	Mauricio Gugelmin	(BRA)	Leyton House CG901-Judd V8	retired on lap 6
21st	David Brabham	(AUS)	Brabham BT59-Judd V8	retired on lap 3
22nd	Gerhard Berger	(AUT)	McLaren MP4/5B-Honda V10	retired on lap 2
23rd	Stefano Modena	(I)	Brabham BT59-Judd V8	retired on lap 1
24th	Ayrton Senna	(BRA)	McLaren MP4/5B-Honda V10	retired on lap 1
25th	Alain Prost	(F)	Ferrari F1/90-Ferrari V12	retired on lap 1
26th	Jean Alesi	(F)	Tyrrell 019-Cosworth V8 DFR	did not start

Fastest lap: Riccardo Patrese (Williams FW13B) 1 min 44.233 secs on lap 40, 202.358 kph (125.739 mph)
Winners average speed: 196.923 kph (122.362 mph). Conditions: Hot.

DNQ	Olivier Grouillard	(F)	Osella FA1M-Cosworth V8 DFR	1 min 43.782 secs
DNQ	Gabriele Tarquini	(I)	AGS JH23-Cosworth V8 DFR	1 min 44.281 secs
DNQ	Yannick Dalmas	(F)	AGS JH23-Cosworth V8 DFR	1 min 44.410 secs
DNQ	Bertrand Gachot	(L)	Coloni C3B-Cosworth V8 DFR	1 min 45.393 secs

1990 WORLD CHAMPIONSHIP

DRIVERS	POINTS	CONSTRUCTORS	POINTS
Ayrton Senna	78	McLaren-Honda	118
Alain Prost	69	Ferrari	100
Gerhard Berger	40	Benetton-Cosworth	62
Nelson Piquet	35	Williams-Renault	54
Thierry Boutsen	32	Tyrrell-Cosworth	16
Nigel Mansell	31	Larrousse-Lamborghini	11
Riccardo Patrese	22	Leyton House-Judd	7
Alessandro Nannini	21	Lotus-Lamborghini	3
Jean Alesi	13	Arrows-Cosworth	2
Ivan Capelli	6	Brabham-Judd	2
Roberto Moreno	6		
Aguri Suzuki	6		
Eric Bernard	5		
Derek Warwick	3		
Satoru Nakajima	3		
Alessandro Caffi	2		
Stefano Modena	2		
Mauricio Gugelmin	1		

STARTING GRID

27 SENNA McLaren MP4/5B 1 min 15.671 secs	28 BERGER McLaren MP4/5B 1 min 16.244 secs
2 MANSELL Ferrari F1/90 1 min 16.352 secs	1 PROST Ferrari F1/90 1 min 16.365 secs
4 ALESI Tyrrell 019 1 min 16.837 secs	6 PATRESE Williams FW13B 1 min 17.156 secs
20 PIQUET Benetton B190 1 min 17.173 secs	19 MORENO Benetton B190 1 min 17.437 secs
5 BOUTSEN Williams FW13B 1 min 17.596 secs	23 MARTINI Minardi M190 1 min 17.827 secs
11 WARWICK Lotus 102 1 min 18.351 secs	25 LARINI Ligier JS33C 1 min 18.730 secs
3 NAKAJIMA Tyrrell 019 1 min 18.738 secs	16 CAPELLI Leyton House CG901 1 min 18.843 secs
22 DE CESARIS Dallara BMS 190 1 min 18.858 secs	15 GUGELMIN Leyton House CG901 1 min 18.860 secs
8 MODENA Brabham BT59 1 min 18.886 secs	12 HERBERT Lotus 102 1 min 19.091 secs
26 ALLIOT Ligier JS33C 1 min 19.202 secs	24 MORBIDELLI Minardi M190 1 min 19.347 secs
21 PIRRO Dallara BMS 190 1 min 19.476 secs	14 GROUILLARD Osella FA1M 1 min 19.722 secs
29 BERNARD Lola L90 1 min 19.858 secs	30 SUZUKI Lola L90 1 min 19.970 secs

1990 WORLD CHAMPIONSHIP

DRIVERS	CONSTRUCTORS
Ayrton Senna.....78	McLaren-Honda.....121
Alain Prost.....71	Ferrari.....110
Nelson Piquet.....43	Benetton-Cosworth.....71
Gerhard Berger.....43	Williams-Renault.....57
Nigel Mansell.....37	Tyrrell-Cosworth.....16
Thierry Boutsen.....34	Larrousse-Lamborghini..11
Riccardo Patrese.....23	Leyton House-Judd.....7
Alessandro Nannini.....21	Lotus-Lamborghini.....3
Jean Alesi.....13	Arrows-Cosworth.....2
Ivan Capelli.....6	Brabham-Judd.....2
Roberto Moreno.....6	
Aguri Suzuki.....6	
Eric Bernard.....5	
Derek Warwick.....3	
Satoru Nakajima.....3	
Alessandro Caffi.....2	
Stefano Modena.....2	
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 16.365s	1m 17.021s	1m 19.434s (70)	
2	Nigel Mansell	Ferrari F1/90	G	1m 17.294s	1m 16.352s	1m 18.203s (75)	
3	Satoru Nakajima	Tyrrell 019	P	1m 18.738s	1m 19.066s	1m 21.713s (51)	
4	Jean Alesi	Tyrrell 019	P	1m 16.837s	1m 17.246s	1m 19.732s (59)	
5	Thierry Boutsen	Williams FW13B	G	1m 17.596s	1m 18.112s	1m 19.717s (59)	
6	Riccardo Patrese	Williams FW13B	G	1m 17.156s	1m 17.449s	1m 19.818s (57)	
7	David Brabham	Brabham BT59	P	1m 20.846s	1m 20.218s	1m 25.703s (6)	
8	Stefano Modena	Brabham BT59	P	1m 19.861s	1m 18.886s	1m 22.693s (55)	
9	Michele Alboreto	Arrows A11B	G	1m 20.630s	1m 20.545s		
10	Alessandro Caffi	Arrows A11B	G	1m 21.101s	1m 20.609s		
11	Derek Warwick	Lotus 102	G	1m 19.579s	1m 18.351s	1m 22.524s (16)	
12	Johnny Herbert	Lotus 102	G	1m 19.091s	1m 19.185s	1m 22.142s (51)	
14	Olivier Grouillard	Osella FA1M	P	1m 21.047s	1m 19m 722s	1m 25.642s (50)	
15	Mauricio Gugelmin	Leyton House CG901	G	1m 19.804s	1m 18.860s	1m 22.200s (21)	
16	Ivan Capelli	Leyton House CG901	G	1m 19.341s	1m 18.843s	1m 22.583s (43)	
17	Gabriele Tarquini	AGS JH25	G	1m 21.222s	1m 20.296s	1m 23.147s (56)	
18	Yannick Dalmas	AGS JH25	G	1m 21.342s	1m 20.570s		
19	Roberto Moreno	Benetton B190	G	1m 17.437s	1m 18.089s	1m 19.707s (38)	
20	Nelson Piquet	Benetton B190	G	1m 17.640s	1m 17.173s	1m 18.527s (74)	
21	Emanuele Pirro	Dallara BMS 190	P	1m 19.476s	1m 19.609s	1m 22.505s (61)	
22	Andrea de Cesaris	Dallara BMS 190	P	1m 19.107s	1m 18.858s	1m 23.897s (19)	
23	Pierluigi Martini	Minardi M190	P	1m 18.235s	1m 17.827s	1m 21.257s (57)	
24	Gianni Morbidelli	Minardi M190	P	1m 19.408s	1m 19.347s	1m 24.272s (17)	
25	Nicola Larini	Ligier JS 33C	G	1m 19.567s	1m 18.730s	1m 21.209s (68)	
26	Philippe Alliot	Ligier JS 33C	G	1m 19.202s	1m 19.835s	1m 21.921s (69)	
27	Ayrton Senna	McLaren MP4/5B	G	1m 15.671s	1m 15.693s	1m 19.302s (50)	
28	Gerhard Berger	McLaren MP4/5B	G	1m 17.431s	1m 16.244s	1m 20.025s (45)	
29	Eric Bernard	Larrousse-Lola 90	G	1m 21.489s	1m 19.858s	1m 23.272s (18)	
30	Aguri Suzuki	Larrousse-Lola 90	G	1m 19.970s	1m 20.235s	1m 24.007s (6)	
31	Bertrand Gachot	Coloni-C3B	G	1m 23.135s	1m 23.975s		

RESULTS

Australian Grand Prix, Adelaide, November 4
81 laps of 3.78 km circuit (306.180 km; 190.251 miles)

Pos.	Driver	Nat.	Car/Engine	Time
1st	Nelson Piquet	(BRA)	Benetton B190-Cosworth V EXP	1h 49m 44.570s
2nd	Nigel Mansell	(GB)	Ferrari F1/90-Ferrari V12	1h 49m 47.699s
3rd	Alain Prost	(F)	Ferrari F1/90-Ferrari V12	1h 50m 21.829s
4th	Gerhard Berger	(AUT)	McLaren MP4/5B-Honda V10	1h 50m 31.432s
5th	Thierry Boutsen	(B)	Williams FW13B-Renault V10	1h 51m 35.730s
6th	Riccardo Patrese	(I)	Williams FW13B-Renault V10	1 lap behind
7th	Roberto Moreno	(BRA)	Benetton B190-Cosworth V8 EXP	1 lap behind
8th	Jean Alesi	(F)	Tyrrell 019-Cosworth V8 DFR	1 lap behind
9th	Pierluigi Martini	(I)	Minardi M190-Cosworth V8 DFR	2 laps behind
10th	Nicola Larini	(I)	Ligier JS33C-Cosworth V8 DFR	2 laps behind
11th	Philippe Alliot	(F)	Ligier JS33C-Cosworth V8 DFR	3 laps behind
12th	Stefano Modena	(I)	Brabham BT59-Judd V8	4 laps behind
13th	Olivier Grouillard	(F)	Osella FA1M-Cosworth V8 DFR	7 laps behind
14th	Emanuele Pirro	(I)	Dallara BMS190-Cosworth V8 DFR	retired on lap 69
15th	Ayrton Senna	(BRA)	McLaren MP4/5B-Honda V10	retired on lap 62
16th	Gabriele Tarquini	(I)	AGS JH25-Cosworth V8 DFR	retired on lap 59
17th	Johnny Herbert	(GB)	Lotus 102-Lamborghini V12	retired on lap 58
18th	Satoru Nakajima	(J)	Tyrrell 019-Cosworth V8 DFR	retired on lap 54
19th	Ivan Capelli	(I)	Leyton House CG901-Judd V8	retired on lap 47
20th	Derek Warwick	(GB)	Lotus 102-Lamborghini V12	retired on lap 44
21st	Mauricio Gugelmin	(BRA)	Leyton House CG901-Judd V8	retired on lap 28
22nd	Andrea de Cesaris	(I)	Dallara BMS 190-Cosworth V8 DFR	retired on lap 24
23rd	Eric Bernard	(F)	Lola L90-Lamborghini V12	retired on lap 22
24th	Gianni Morbidelli	(I)	Minardi M190-Cosworth V8 DFR	retired on lap 21
25th	David Brabham	(AUS)	Brabham BT59-Judd V8	retired on lap 19
26th	Aguri Suzuki	(J)	Lola L90-Lamborghini V12	retired on lap 7

Fastest lap: Nigel Mansell (Ferrari F1/90) 1 min 18.203 secs on lap 75, 174.009 kph (108.124 mph)

Winner's average speed: 167.399 kph (104.016 mph). Conditions: Warm & Dry.

DNQ	Michele Alboreto	(I)	Arrows A11B-Cosworth V8 DFR	1 min 20.545 secs
DNQ	Yannick Dalmas	(F)	AGS JH25-Cosworth V8 DFR	1 min 20.570 secs
DNQ	Alessandro Caffi	(I)	Arrows A11B-Cosworth V8 DFR	1 min 20.609 secs
DNQ	Bertrand Gachot	(L)	Coloni C3B-Cosworth V8 DFR	1 min 23.975 secs

Age Concern

To hear some drivers talk, it would be natural to assume that handling 750 horse-power sports cars is an acceptable way of drawing on old age pension once the sun has gone down on a Formula 1 career. The Americans must be even more chagrined to hear the CART series referred to as a fall-back, and the IMSA series as a last resort.

It would be better not to name any names, because one man in particular would not now like to be reminded of his remarks as one GP team door closed after another. We can only imagine the frustration of a still ambitious driver as this happens, a man still well on the right side of 40, and wish him well in his second quest to capture the Group C Drivers' World Championship.

Watching Martin Brundle drive his heart out in Montreal and Mexico, the action didn't seem at all like a garden party jaunt. "What did it look like?" asked Brundle, with irony in his voice when the subject came up later.

In both races he'd held off the two Mercedes for quite a while, losing second place to Baldi in Mexico with an elegant, well-held 360 degree spin. "It's bloody hard work, I can tell you. The cars are much heavier than those in Formula 1, they're hotter because they're closed, and you give it all you've got."

A driver needs to be young and healthy to be as fast at the end of the race as he was at the start, but it helps to be in one of the best cars, as the more successful older drivers tend to be. It hardly seems likely that Mario Andretti and Emerson Fittipaldi, whose combined ages are 93, would still be at the very top level in Indy-car racing if they weren't in the best cars, but encouragingly this year's championship was fought to the very last race by Michael Andretti and Al Unser Junior, both 28 years of age.

Strangely Jean-Louis Schlesser's admitted age leapt from 38 to 42 after he won the Sports Car World Championship in October, and next year he'll be partnered by Jochen Mass, a man two years his senior. In the second car will be Karl Wendlinger and Michael Schumacher, whose combined ages will be 44, and it's not impossible that the youngsters will be quicker on occasions. In fact it would be bad for the image of the World Sportscar Championship if they were not!

Given a competitive car, a man of 45 can win races just as well as a man of 25, and Juan Manuel Fangio still holds a record, easily, for winning his fifth World Championship title at the age of 47. That, however, didn't mean that Formula 1 was labelled as an old man's sport; rather, it

earned Fangio a special reputation, a 'handle' that now goes everywhere with Mario Andretti.

Just because Formula 1 is so intense nowadays, the drivers tend to assume that nothing else on earth can be quite like it. "But some of them are so wrapped up they don't know what's happening at the other end of the pit-lane, never mind about the world outside," observes Brundle, the thinking man's racing driver.

They may have forgotten, temporarily, that they fought just as keenly in karts, Formula Fords and F3s to reach the upper slopes, perhaps because they enjoyed themselves and believe, therefore, that they can't have been so committed.

Twenty years ago Pedro Rodriguez, Jo Siffert and Jacky Ickx were at the height of their careers. It was then entirely possible to combine sports cars and Formula 1, and we thought highly of them because they did so. Sports car racing was immensely popular, even more than Formula 1, and there was never a hint that the Porsche 917s and Ferrari 512s were in any way inferior to the Grand Prix cars of the period because in fact, they were much more powerful and were quicker on most circuits. Typically there were 10 Grands Prix and seven or eight World Championship sports car races, and with a minimum of testing it wasn't difficult for the top drivers to do most of them.

It isn't now possible for a Formula 1 driver to do any but the odd sports car event and the likes of Brundle, Cheever and Warwick who tried to do both simply wore themselves out by September. Therefore sports car racing is now an alternative to Formula 1, and rates about half-way up an F1 grid in terms of appeal to well established, reputable drivers. Of course Warwick would rather be in a decent F1 car, but he'd prefer a Jaguar to a Coloni any day. As the reputation of sports car racing rises, as it surely will, more youngsters like Karl Wendlinger and Michael Schumacher should regard it as a stepping stone to F1. They've had silver spoons put into their mouths by Mercedes which is very nice for them, and good of the manufacturer, and in the past season the young men rose to the occasion admirably.

The 900kg Group C turbos must have seemed like buses to any youngster fresh from Formula 3, but they were anything but easy to drive on the limit. The 750kg, 3½-litre cars will be much nicer and more responsive, "more like proper racing cars" as the Spices were described by Eric van der Poole, and ought to be more interesting for youngsters on their way up the ladder.

Shaky start?

While the long-term future of sports car racing allows room for optimism, there is great concern about the inaugural season. FISA can be sure of receiving two entries each from Mercedes, Peugeot and Jaguar, but Nissan have withdrawn for a year, Toyota are deciding whether to stay in or pull out and Mazda are having second thoughts about doing the full series with the 787 rotary.

At worst FISA might receive 14 entries for the 1991 World Sportscar Championship, at best 22, and we could regard only the Mercedes, Peugeots and Jaguars as likely winners with Brun-Judd, Spice-Cosworth and ALD a rung or two below. The reason for the paucity of entries will not only involve the change of formula because the private teams have been largely driven out of the series. Under the tight grip of FISA the last two seasons have been all take and no give, and now none of the regular teams, except the factories, have two pennies to rub together.

It has been a matter of great sadness to see how the likes of Kremer, Lloyd, Brun, Lee-Davey, Spice, Chamberlain and Prewitt, every one a true enthusiast, have been ground under FISA's heel. The entry fee of around £12,000 is only the start, because each car registered for the series has to be presented at every round; failure to produce a car will cost a team \$250,000, which is no laughing matter.

FISA set out to take a fee of \$600,000 off the promoters of the race (but settles for far less in most cases) and pays the teams \$3,000 per car appearance money, regardless of whether the race is up the road or around the globe. Unlike Formula 1 there is no prize money, no performance bonus, nothing. If 33 cars appear FISA pays out \$99,000, and the balance is never seen again — not by the competitors, anyway.

If there is any FISA promotion it's not enough to be noticed, but with Formula 1 ticket prices charged, attendances have plummeted. Corporate sponsorship is now so overcharged that not even Mercedes will take advantage of the 'opportunity'. Slowly but surely we have seen the World Sports-Prototype Championship strangled by the very organisation that's supposed to be encouraging and helping the participants and nurturing the future.

Almost without exception the private teams have ended the 1990 season across the Atlantic, with hardly enough money to get home. It really is a terrible state of affairs, because realistically only the full-blown works teams, Mercedes and Peugeot, can afford to take part in the 1991 World Sportscar Championship. A really excellent sponsor could make it worth the while of a private team, but there are few such sponsors around; say Gallahers, Repsol and Hydro Aluminium, and you've said it all!

(Continued on page 1281)



Gordon Murray

Specification

Engine: "Large" — Naturally aspirated

Cylinders: "Lots"

Power output: "Plenty"

Suspension, brakes and steering:

"Formula 1 standard"

Availability: From 1994

Price: "More than anything in view today"

Manufacturer: McLaren Cars Limited,
South-east England

If the specification for the forthcoming McLaren "supercar" looks decidedly vague, it's not because the directors are trying to keep dark secrets. We have the assurance of technical director Gordon Murray on that; "When we've got something to tell you, we will. We may announce the name of the car at the end of the year. We may show you the concept at the end of next year."

"What we will not do is give a load of hype, 'we're going to do this, we're going to do that' and we'll go to great lengths to avoid it. Sure we'll talk to you about what we aim to do, but we won't give you any information that might turn out to be wrong."

What strikes you in a conversation with Murray, the leading Formula 1 car designer of the 1970s and 1980s, is a nice mixture of futuristic concepts and old fashioned virtues. He, principal directors Ron Dennis, Mansour Ojeh, and commercial director Creighton Brown are jointly dedicated to producing the best sports car that modern techniques will allow, at a price that has no label. The McLaren will be hand-built, more expensive than anything envisaged today (certainly in excess of £500,000) and will be produced only as long as there are enough wealthy people to buy it, but on the other hand it won't be a limited edition model.

And yet, while designing an esoteric car that will guide the volume manufacturers for the next decade, Murray has put his

roots down in the past. He'll emulate Henry Royce, Ettore Bugatti and Henry Leyland in their desires to make the finest cars of their era, and he just might use some of their techniques as well, blending traditional materials inside the cockpit with carbonfibre and composite materials used for the chassis and body.

"The quality of the engineering will be Formula 1 standard," Murray insists. "We'll be putting a massive amount of work into vehicle dynamics, noise and vibration control, suspension compliance, outstanding performance and driver satisfaction. Above all, the McLaren will be designed to give maximum satisfaction to the driver."

When all is said and done, though, the McLaren will also be a classic. "I don't think that any cars in production today are destined to be classics. Let's just say, though, that someone found a Mercedes 500SEL in a barn somewhere, in 50 years time. All the plastic mouldings are split and cracked, so how would you restore them? You couldn't, unless you had the original moulds! The dashboard, the headlining, the underfloor covers, they're all injection moulded.

"The cars I admire were built in the 1930s, things like the Bugatti Royale I suppose. They were built from the real stuff, trees, leather, metals that you could reproduce. I don't know how much of that we can use, but I'd like to try because I want the McLaren to be a classic for ever, if that's possible."

Mansour Ojeh is the principle of Techniques d'Avant Garde (TAG), responsible for the V6 engine made by Porsche for McLaren Racing. He made a bit of folklore along the way by ordering the most exotic Porsche Turbo ever produced for road use (at the time, in 1983), half way between a road 911 Turbo and a 930 racer. "It had to be the most technically advanced, luxurious and fastest 911 Turbo ever" reported Rolf Sprenger, head of Porsche's customer department in Stuttgart.

The spirit lives on today, and it was mirrored by Ron Dennis, head of the McLaren International group. He and Ojeh have determined that they'll take the same path as Ferrari in establishing a manufacturing company, McLaren Cars, that will move to the centre of the group before the end of the Nineties.

The group HQ will be based somewhere in south-east England and will have a test track alongside, as Dennis announced to a surprised audience some 18 months ago. Not surprisingly there are serious planning difficulties attached to the track, and Murray and Brown have even considered running it underground.

McLaren Cars, with a staff of 29, occupies the same new building in Old Woking, Surrey, as TAG Electronics (staff of 80), which will soon be seen to provide an advanced engine management system to Mercedes for the C291 sports-racing car. It is reasonable to suppose that TAG Electronics will also supply the management system for the McLaren, though

Murray won't say so in as many words.

There are lots of things he won't say, in as many words. The concept of the engine was decided some months ago, but we wait to be told (a) the capacity, (b) the number of cylinders and (c) the power output. "What has been taking the time is talking to the people who'll actually make it. I can't even tell you if it'll be made in England, but it's an option."

"One of the options we're considering is that it could be someone else's design that we build, here. It will not be turbocharged, so it follows that it'll have a reasonably high capacity because it's got to have lots of power! The car's power to weight ratio will equal that of a Ferrari F40, so you can get some idea of what I'm saying."

This engine, definitely located ahead of the rear wheels, might be placed transversely in the style of the Lamborghini Miura ("That would be telling. . . . but think of the problems with the exhausts on the forward bank"). It will drive through a McLaren gearbox, perhaps with semi-automatic control.

The suspension will be conventional, it's thought, brakes will be exceedingly powerful, the steering high geared, all to give the driver the feeling of handling a Formula 1 car on the road. Four-wheel drive has been ruled out, mainly on the grounds of weight and complexity, but also because Murray feels it shouldn't be needed in such a car. If the owner wants to go out in the snow, he's got an off-road vehicle in the garage.

How about active suspension? "No, I've rejected that. I could look at electronic dampers, maybe, but not active suspension. It's too complicated and too heavy. The McLaren will be very exciting dynamically, and all the active cars I've driven have been the exact opposite.

"They're fine over bumps, that's what they're good at, but there's no feel at all when you try to hustle them along, they actually feel unsafe. There's no feel of contact patch at all. Active suspension's valid in the same way as flying to the moon was valid, strictly from an engineering point of view."

Compactness, and intelligent use of the car's overall dimension, is a gospel for Murray. For family transport he swears by a Renault Espace, while for fun it's a toss up between his Ducati motor cycle and his pristine, 1960 Lotus Elan which was built, as a matter of a fact, a year before he arrived in Britain from his native South Africa.

"Ordinary passenger cars are getting bigger and heavier, and that's an awful trend. If everyone drove around in Volvo 760s there's be no room on the road for you and me! It's ridiculous making these massive cars for people to travel around on their own.

"Sports cars should be dynamically exciting and enjoyable, and to me that means compact, light and powerful. I have set a weight target, which I'm not telling you exactly, and the McLaren will be very light. . . . but it'll be a hell of a lot safer



The learning curve

Mercedes-Benz are World Champions again, but the real winner is advanced technology



Group C racing teaches hard lessons, and they've been well learnt by Mercedes-Benz, just declared World Sports Car Champions for the second successive year. As all competitors discover, racing at this level punishes cars in ways that no computer model or wind tunnel experiment can match. It is final proof of the strength or weakness of design ideas and materials.

Mercedes-Benz scored eight wins in the nine-race 1990 season. An overwhelming success. And the team's satisfaction is broadly based: pride in the talent and consistency of Sauber-Mercedes drivers and engineers; delight that the racing chassis is once again in a class of its own; gratification that the basic multi-valve V8 engine, also used in Mercedes road cars, has proven its reliability and strength, as it did last year.

Spin-off benefits are also emerging.

For example, the 730bhp racing version of the 5.0-litre V8 is teaching Mercedes-Benz engineers new paths to greater

fuel economy through refinements to the sequential fuel-injection, among other things. All without sacrificing power or speed (petrol was strictly rationed in the nine-race series).

Such secrets will now find their way into Mercedes-Benz road cars. And so, in the foreseeable future, will new components technology, stress-tested in these mobile research laboratories at speeds of up to 250mph: carbon fibre-reinforced plastics, titanium alloys, super-light ceramics that most successfully tolerate racing engine power loads and temperatures.

The World Sports Car Championship is an examination of engineering excellence that presses all competitors to the limit. It is also a speed, endurance and economy trial where the results speak for themselves. Now, for the second year running, the most convincing answers



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And, for the second year running, the real winners are the drivers of Mercedes-Benz production cars.

than the big and heavy cars. You'll see, one day, the amount of effort we've put into things like visibility and controls. We're on our third pre-production buck at the moment, and we've had several people working on controls for seven months now."

The choice of wheels and tyres could be a major headache for Murray and for styling chief Peter Stevens, who joined McLaren earlier this year after completing the new Lotus Elan. Ultra-wide wheels, as Murray knows all too well, are the enemy of everything he wants the McLaren to be. They reduce comfort, they increase rolling resistance, drag and unsprung weight, they cause problems with suspension geometry and camber change control, they increase the turning circle.

"However, a car with such high power-to-weight ratio needs a lot of rubber on the road. If there isn't enough you've got problems. You'd have to go to a harder compound, and that means you'd lose grip."

Murray's ideal sports car, the original Lotus Elan, managed brilliantly on 4½ inch rims, the same dimension as on the Austin A35 saloon, but while the future McLaren won't go down to that dimension, it certainly won't have full-size Formula 1 wheels either.

Small really is beautiful in his book. Looking to the future, Murray agrees that there will be a successor to the 'supercar' and it may not be a sports car at all. "I've got a very, very good design team here, hand-picked guys, and I never want to let

them go. Once we've designed this car we've got to go on to the next. So yes, we will have to have another programme and soon we'll have to start talking about it.

"The way the world's going, this might be the ultimate and final statement in supercars. Personally I'd like to build a proper town car. Building a sports car is fine, but sports cars are for fun. We should learn something from Japan, with the micro car. A small sports car is highly efficient, and a town car is a logical progression."

After spending 20 years in Formula 1 racing, Gordon Murray has no withdrawal symptoms at all. "I have found this entire exercise very fascinating. The design of the car is only one small part of setting up an operation like this. We've been talking about marketing, servicing, customer requirements and the like for the past three years, and I'm immersed in that. We've got some unique ideas in these areas, and the whole thing is very refreshing.

"The best market researchers in the world couldn't tell us anything we don't know already, because Creighton and I have been mixing with our potential customers for the last twenty years. We know their profiles, we know what they want and what they don't want. It's not always the things you'd expect. It's more often the little things they'd like to see included, or left out.

"Basically, the McLaren will be hand-built, in the way that a Formula 1 car is hand-built. Everything you can see and

touch will be designed and made specifically for this car, even door handles and locks. Things you can't see, like windscreen wiper motors, we'll look around and buy the best available. We're not going to be bloody-minded about making everything ourselves, we're not going to re-invent the wheel, but there will be no compromises whatsoever.

"Ordering and owning a McLaren is going to be a very personal experience, going back to the 1930s again I suppose. It's going to be the best car that money can buy, we've got to match that in every way. There can be no breakages, no things falling off, and our service has got to be second to none."

Within a few weeks McLaren Cars will announce the name of the supercar. At the same time, or soon after, more information will be released about the engine, when a contract has been signed. At the end of 1991 we may see the concept, a year later the first working prototype, while the first customer car should be completed by the end of 1993. It all sounds rather relaxed, but in reality there's an enormous amount of work to be done in a fairly short space of time.

The whole concept of the McLaren supercar would sound like dreamland to anyone in the motor industry, yet the project has a simple beauty; if only one customer, possessed of almost infinite wealth, wanted to purchase the unique machine, McLaren would make it then turn the page, get on with something else. They're in another world. MLC

(Continued from page 1278)

The embrace offered by FISA in 1988 has turned into a stranglehold, and the patient has turned blue. It's probably too late in some cases for resuscitation, but the offer to return to OSCAR's financial arrangements could start a transformation.

OSCAR, the entrants' organisation that was firmly quashed and denigrated by FISA, negotiated with promoters and secured travel, and sums of money on behalf of its members. No team would pay for its cars and personnel to travel to Japan, for example, while European races would bring in enough guaranteed money to cover all expenses. It only needed a moderate sponsor and a paying driver to allow the team owner to make a profit, which was right and proper.

Reinhold Joest runs one of the better-off private teams with assistance from the Porsche factory, but he discloses that in April he spent DM540,000, say £180,000, taking three cars and his entire team to Suzuka. "In return I received 9000 dollars from FISA. That is all. It's a joke, and I'm sick of it." In the days of OSCAR, he went on, he could count on 80% of his overheads being covered by the promoters, but now, he points out bitterly, FISA requires \$10,000 to provide TV monitor screens in the pit garages, this being the equivalent of start money for one car in three races.

Then of course, if a driver should be five

minutes late for a personal weigh-in he could be fined \$5,000, or 5,000 francs, depending on the mood of FISA's wonderfully charitable officials, and someone of Tim Lee-Davey's standing could be told that "your financial status is no concern of the stewards." It's situations like that which really discourage the smaller teams and turn them away from the sport they love.

Miracles do happen every now and again, and we can only hope for one that will save sports car racing from a sad demise. The Automobile Club de l'Ouest has insisted on the right to invite 'all comers' to the 24 hours in June, unless FISA can produce 50 starters, and that should be the saving of the race, both for the ACO and the Japanese manufacturers.

For guidance, I turned to the records of 1972. That was the year when the CSI (Commission Sportive Internationale) of the FIA banned the 5-litre Porsches and Ferraris, and placed a ceiling of 3-litres on naturally aspirated engines or 2.14 litres on turbos (equivalency of 1.4).

At Buenos Aires in January we had a particularly good race involving three Ferrari 312PBs (Ronnie Peterson/Tim Schenken, Mario Andretti/Jacky Ickx and Clay Regazzoni/Brian Redman), three Auto-delta Alfa Romeo T33-3s (Rolf Stommelen/Toine Hezemans, Andrea de Adamich/Nanni Galli and Vic Elford/Nino Vaccarella), two Ecurie Bonnier Cosworth-powered Lola

T280s (Jo Bonnier/Reine Wisell and Gerard Larrousse/Chris Craft), plus a squadron of 2-litre Lolas, Abarths and Chevrons. Only one Porsche, though, the ballasted 908/3 of Juan Fernandez/Jorg de Bagration which qualified 15th in a field of 24 cars.

It wasn't a very big grid, by any means, and the Ferrari team managed by Peter Schetty was a class above all the others; two went the full 1000 kilometre distance without any trouble and beat the third placed Alfa Romeo by six clear laps, a margin they maintained for most of the season!

By the time the teams got to Le Mans in June there were still only 26 Group 6 sports racing cars, lacking the Ferraris but including the four Matras which had a field-weekend, and there were 30 Touring and Grand Touring cars which included six Porsche 911s (quickest in qualifying were John Fitzpatrick and Erwin Kremer), nine Ferrari Daytonas and a number of Chevrolet Corvettes, de Tomaso Panteras, BMWs and Ford Capris (the latter included Hans Stuck and Jochen Mass, at Le Mans for the first time).

Nineteen years ago the regulations allowed such a mixed bag, and the spirit of the competition was wonderful. Not all the cars carried the pedigree that now seems so important to FISA, but the natural laws prevailed; if the entry was good enough lots of spectators would pay to watch, and everyone would be happy. It was, they did, and we were! MLC



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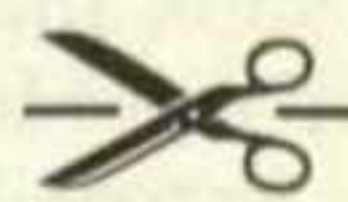
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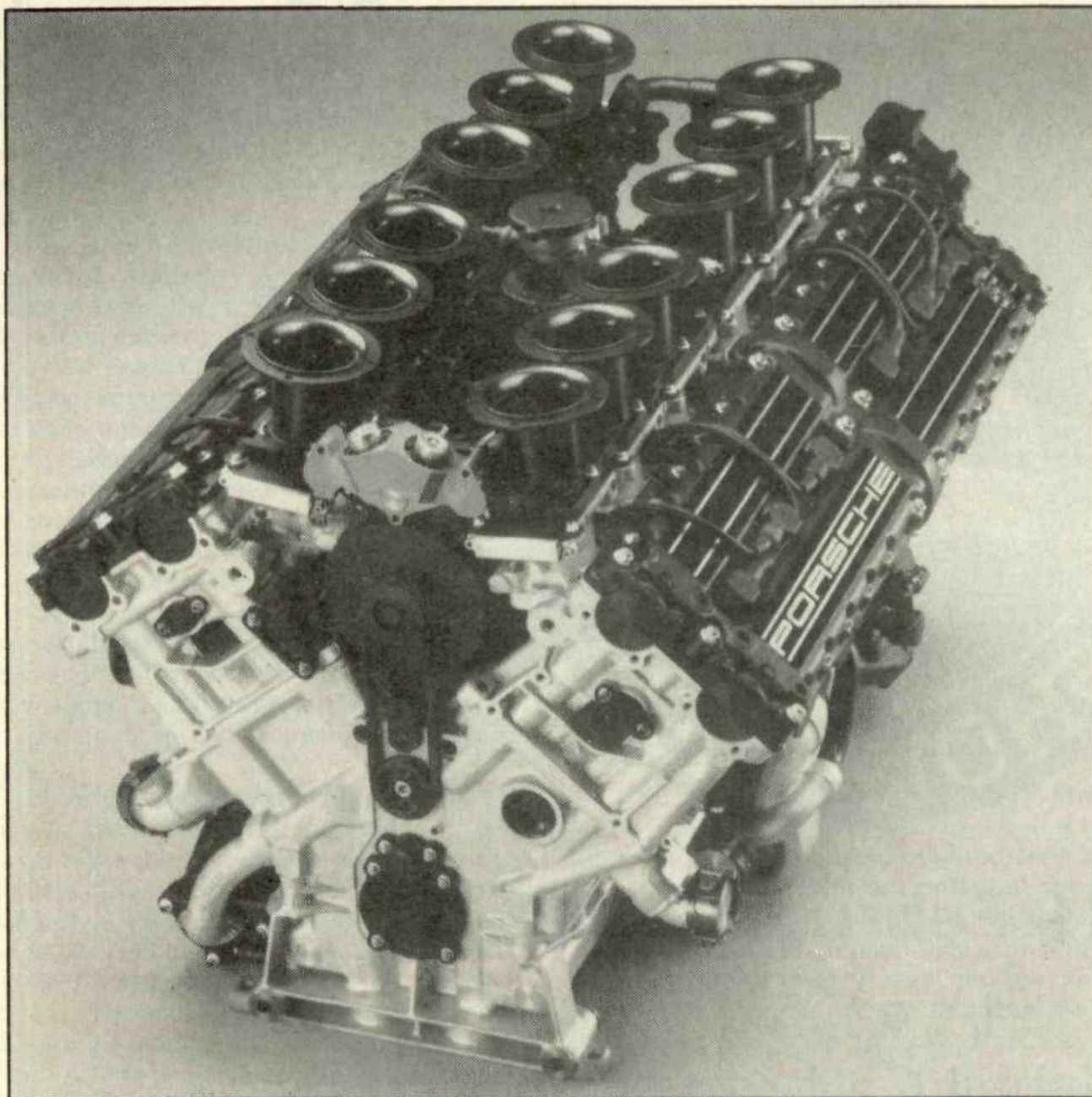
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Porsche V12 3½-litre Formula One engine for Footwork (late Arrows).

Engines

I have always said there is never a dull moment in Formula One, and if there is it is of your own making. With teams from all over the world involved, drivers from Brazil to Japan and Australia to Finland taking part as well as an equal mix in all parts of the periphery of Formula One it has little hope of being dull. Shambolic it may be at times, dangerous it certainly is, riotous and noisy as well, so it is hardly a socially acceptable activity for normal people. For anyone in the thick of it and up to their eyebrows, it is a wonderful and magical world, totally self-ish, self-contained and having little in common with the real world outside. Needless to say I love it.

The past season had its ups and downs, but the progress on the mechanical and racing front has been most impressive considering that the present Formula for cars with normally aspirated 3½-litre engines has only just finished its second year of existence. Turbocharged engines seem to be from an era in the dark ages, and though I regretted their passing the 3½-litre age has been stimulating and there is much more to come. With the dust barely settled since the last race of the 1990 season there is much happening already and much more

in the offing for 1991.

Engines are the keynote for the future and if a team has not got an exclusive deal with an engine manufacturer or engineering concern there is not a lot of hope for them. The appearance on the scene of Porsche and Yamaha, and the Ilmor engine which is a Chevrolet by another name should keep Honda, Renault, Ferrari, Cosworth and Lamborghini on their toes. Gone are the days when Formula One contestants could buy a ready-made racing engine and build a car around it, as they did in the 'kit-car-Cosworth' days before the turbocharged era of racing. Nowadays it is a case of the chassis, suspension and aerodynamic designers working closely with an individual engine manufacturer to design a really homogeneous car, and the end result is all the better for it. Today's Formula One cars are really beautiful looking projectiles, and if you don't believe me just look at the Lotus 49 for example, or the first Tyrrell. Racing car design has really made big strides since some serious engineering concerns have got into the business.

McLaren are well under way with test sessions for their new Honda engine, a V12 this time, while Honda are letting

Ken Tyrrell have the latest versions of the 1990 V10 engine for next year's Tyrrell 020. Like Honda the Regie Renault's racing arm never rests, the development of the French V10 for the Williams team being a continuous process.

In 1992 they are planning to supply engines to the Ligier team, but in the meantime Guy Ligier has done a deal to use Lamborghini V12 engines. Why Lamborghini have terminated their engine supply to Gerard Larrousse's team is not very clear, especially after all the efforts that have gone into the Lola L90 Lamborghini V12, and the performances this past season of Bernard and Suzuki. They may not have won any races, but with Prost and Senna, and Ferrari and McLaren about the place there is not a lot of chance for anyone else to do much winning, but the Larrousse cars have been a roaring success compared to the Lotus 102-Lamborghini V12 which has been a total disaster. It was no surprise that Lamborghini have dropped Team Lotus and I am not sure that Ligier will do a lot better than Larrousse.

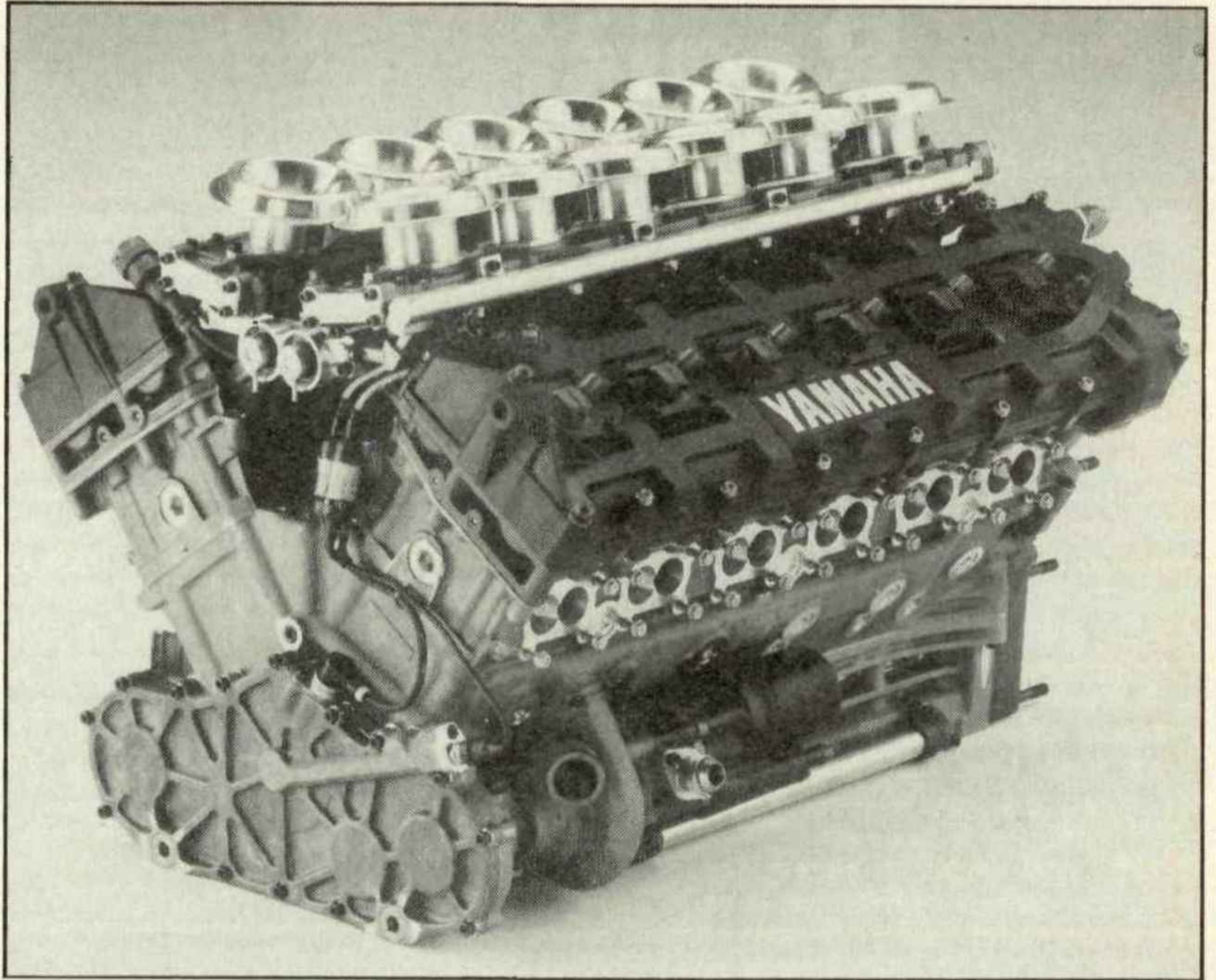
Just where Team Lotus are going is anyone's guess, and at the last Grand Prix there was a lot of guessing, so we will have to wait and see, but talk of using 1990 Judd V8 engines sounds a rather desperate measure, like a drowning man without a lifebelt.

Two teams that have not achieved very much during 1990 are Arrows and Brabham, but on the face of things both are going to get their big chance next year, but they are going to have to pull their socks up. The Arrows A11B never looked at all promising, being a bit of a hash-up of the 1989 car that appeared to be worse at the end of the season than it did at the beginning. Neither Alboreto nor Caffi qualified for the Australian Grand Prix, and that is bad news in anybody's book. Their Cosworth DFR engines were prepared by Brian Hart's firm, in the same way that he prepared the DFR engines for the Tyrrell team, and Alesi showed consistently that there wasn't much wrong with a Hart-prepared DFR, while even Nakajima got some good results in the second Tyrrell. The Arrows firm was taken over by the Japanese Footwork concern, who are involved in all manner of domestic business in Japan, and they have done a deal with Porsche for the German firm to design, build and supply engines for 1991. The Porsche Weissach research centre produced a V12 engine in a remarkably short space of time, which has already passed its initial testbed running, followed by test track running in a modified A11B chassis and has now been seen out in public on serious track testing at Silverstone. The A12 chassis designed around the engine and in conjunction with Porsche should be out on test well before the season starts in 1991. The name Arrows has been dropped from the project and the Milton Keynes team are now officially called Footwork, and at the Stuttgart end of the alliance Porsche have

taken on Max Welte to supervise the Formula One project. The Swiss Welte was part of the original Sauber-Mercedes sports car team, and when Mercedes-Benz took over the whole Sauber project and painted the cars silver with a three-pointed star on the nose, Max Welte was taken on as team manager. Since that day the silver Mercedes-Benz sports/racing Group C cars have never looked back. Will Porsche follow in their footsteps eventually, in Formula One? Before they do they will need two better drivers, unless Caffi turns out to be another Moreno, which is quite possible, but Michele Alboreto has had his days of glory.

The V12 Porsche engine is different to other V12 engines in that the four overhead camshafts are not driven from the crankshaft by a drive at the front or at the back, but from a drive between cylinders 3 and 4 and 9 and 10. In other words at the centre of the engine. This has not been done just to be different, but must be in the interests of torsional vibrations, which suggest that the engine is designed for very high rpm. As Honda and Ferrari are already running at 13,000 rpm the Porsche must be aiming for nearer 14,000 rpm. By having the drive in the centre of the crankshaft the engine becomes like two very short and stiff V6 engines bolted back to back, though it is not quite so simple as that, but shafts are very short. The Porsche initial announcement did not tell much in the way of details, apart from acknowledging that the engine existed and had been running on the testbed; it is a project that will be watched with great interest, not just because I drive a Porsche car, but I have always had a great respect for things that come from the Weissach Research and Development centre in Germany.

The other team who is going to have a 'moment of truth' next year is the Brabham team, for they have a three year contract with Yamaha for the supply of engines, and the Japanese giant has produced a V12 engine using all their patented 5-valves-per-cylinder technology and much more besides. Once again I shall be watching this project with great interest, somewhat biased because I have a pretty fast Yamaha motorcycle that I cannot fault as a sports bike, and anyone who follows motor cycle racing knows that Yamaha are a serious force to be reckoned with. We all know that Yamaha appeared in 1989 with an enlarged Formula 3000 V8 engine in the rather unsuccessful Zakspeed, but anyone who thought Yamaha were doing that probe into Formula One to learn about V8 engines needs to think again. One day we may get a full report on Yamaha racing which tells us what they learnt with Zakspeed, but apart from 'feeling the temperature of the water' my guess is that they were learning a lot about materials for the inside of a racing engine, and what they learnt has gone into the new V12.



Yamaha V12 3 1/2-litre Formula One engine for Brabham.

The Ferrari V12 engine has been a 5-valve-per-cylinder layout since its conception, and I am told that Fiat pay royalties to Yamaha for the more subtle details of the patent. Regardless of what the drivers say to journalists, there is not much wrong with the Ferrari engine and it has been the only one to challenge the Honda V10 seriously. While the Germans and Japanese release a limited amount of information about their engines Ferrari say nothing, barely admitting that they actually have a V12 cylinder unit, and as far as their press information is concerned it could be a two-stroke or a rotary unit, except that such engines are barred from Formula One. When Enzo Ferrari ran the team this reticence was understandable as he never trusted the outside world and back in the 1950s was always afraid that Maserati would steal his ideas. These days, with Fiat louder and clearer than Ferrari it never ceases to surprise me that so little is given out by the team officially.

Another engine project that is due to appear next year is the one from Ilmor Engineering, due to go into the Leyton House cars for Ivan Capelli and Mauricio Gugelmin. Ilmor was started some years ago by Mario Ilien and Paul Morgan who spent their formative years at Cosworth Engineering with a lot of experience of the Cosworth DFX turbocharged Indianapolis engine. They produced a new V8 engine for Indycar racing that literally swept the Cosworth V8 off the board and attracted support from Roger Penske and through him, also from Chevrolet. So successful was the Ilmor V8 Indycar engine that it is now called a Chevrolet V8! Just as Enzo Ferrari learnt his trade with Alfa Romeo and then went away on

his own to beat them, the Ilmor pair did with Cosworth. Their entry into Formula One holds much in store.

Leyton House may seem a strange name for a Formula One car, but it came from March cars, which was also a strange name for a Formula One car, back in 1970. The process of changing the name of a team seems to be growing, particularly now that Japanese interests are spreading. It makes sense to come to Europe and buy a ready-made racing team, rather than starting from scratch, and there are plenty of not very successful teams who would jump at the chance of cutting their losses and selling out. In 1991 we will have cars called Footwork to race alongside the Leyton House. While we are on names, next year will see a real tongue twister for the Minardi team have been promised a supply of Ferrari V12 engines and we will have Martini driving a Minardi-Ferrari.

One final word; yes, I know that Vittorio Jano's beautiful 8-cylinder Alfa Romeo engine of 1931 had the camshafts driven from the centre of the crankshaft, just like the new Porsche V12, and agree that there is very little that is new in engine design. If only we could be told about what is going on inside the engine, especially in the combustion chamber, we would realise that there is a lot of new technology about in Formula One engines. Of passing interest to engine-minded readers I question whether the 2-litre V12 Delage of 1924 was the first 12 cylinder racing engine? It must have sounded glorious to 1924 ears, and I know that 1991 Formula One ears are going to get a lot of pleasure from the V12 engines on next year's grids.

DSJ

Registers

Dear Reader, I am not referring to Cash Registers, but to car Registers, in particular those kept by one-make car clubs, or small groups of people with enthusiasm for a particular make or model. These Registers of Cars range from the Aston Martin Owners Club, the Bentley Drivers Club, the Bugatti Owners Club, which deal with many hundreds of cars, to a small hand of enthusiasts for a long-extinct make like Dellow or Kieft, of which only a handful or more still exist.

Collecting data to compile a Register is a fascinating pastime, as I know from personal experience with Alta, Delahaye, Frazer Nash, Lago-Talbot, MG and one or two more. It is very time-consuming, but very satisfying if you enjoy facts and figures, and many a phone call has brought a smile of contentment to my face when the caller says, "I have found number 423 that we were looking for", or "You know that car in Italy that we thought was number 10, well I had a good look at it and found everything is marked underneath as number 8, which explains that anomaly we seemed to have." Other phone calls come from 'dealers', either bone-fide well known people, or those posing as 'enthusiasts' and such calls can either be dealt with in a straightforward factual manner, or they get the reply "Oh really! Tell me more," though usually there isn't much more to tell. Even with genuine enquiries you have to be cautious and it pays to get the caller to give you his numbers or identification letters on a car, rather than tell them what it ought to be.

Then there are the devious callers, who naively ask: "What can you tell me about number 2345?" to which the answer is "no more than you can tell me at the moment," because you know they have probably just built a completely fake car and hope to give it an identity. I don't think I can be accused of being rude in such cases, but 'short shrift' is the best expression. It is surprising how many queries I get that sound vaguely genuine until I ask for the chassis number, when the caller then says, "I don't have it with me at the moment, I'll call you back". That is the last you hear!

Having compiled your Register, the problem then arises as to what to do with it. Some people and clubs think it should be kept secret, made available only to owners of the car concerned, while others are happy to publish their data for all to see and use. Unfortunately there are those amongst us in the 'old car world' who abuse the knowledge provided by a Register, and it only needs one example of dishonesty to make those who feel that Registers should be kept secret, to become almost hermit-like, which means that much interesting data and information is kept under lock-and-key. It tends to ques-

tion the point of compiling a Register.

One activity of the dishonest few is to 'discover' a long lost car. By looking through a Register of cars these people pinpoint one that disappeared long ago and then claim that the car they have just made, claimed as being 'rebuilt' or 'restored', is that long lost car. Before the making of fake cars was really under way, these people would usually open the conversation with, "You will never believe, but. . . ." There have been some wonderful stories, but that gambit seems to have worn a bit thin and is no longer in use.

It might pay to read some of the Auction House catalogues - if you can afford to buy them! - for classic examples of "not quite saying what you mean".

Most of the problems confronting a Registrar arise from cars that the cottage industry or professional Fakers have created. One classic example is a car that was completely manufactured a few years ago and fitted with an original carburettor from a 1935 model. The constructor gave his finished "new, old car" the identity of the long lost 1935 car from which the carburettor had survived. How did we know the carburettor was genuine? Because it came from the man who destroyed the original car.

Some Registrars and clubs don't want to know about fake cars, while others expose them for what they are by listing them in their Register, with all the details of their construction. The Aston Martin Owners Club have a very thorough and detailed register of all known Aston Martins, including "new" ones made long after a particular model ceased production. The Bugatti Owners Club also list all known Bugattis with detailed notes on each car's history, and make no bones about saying "This car has no known history and was built in 1985 from second-hand parts and newly manufactured parts." There can be problems for the Registrar or club when owners challenge their remarks and threaten lawsuits, so one has to be pretty certain of the facts before

you say "This car is a fake." It might pay to read some of the Auction House catalogues (if you can afford to buy them!) for classic examples of "not quite saying what you mean." Quite often you read the blurb on a totally fake car, described in glowing terms as "a Replica" and almost believe that the car in question is a real one!

The French Delahaye Club had a rather nice idea when they welcomed all Delahayes to a gathering, but in the parade they were due to make round a circuit, they specified that any fake car should go at the back of the column.

Very few people are able to make a car in its entirety, but modifying a standard production car into a fake "competition" or "Le Mans" model, even if it means shortening the chassis frame, is not too difficult. Altering the axles, brakes, steering column and engine, and making a new body can transform a saloon or cabriolet into a "Le Mans Type", according to many advertisements. There is nothing particularly wrong in doing that, in fact our National Motor Museum at Beaulieu was one of the first to put on display a fake Le Mans car, although the information placard never said "This car never ran at Le Mans," equally, it never said it did.

Examples are known of Alfa Romeo, Bentley, Delahaye, Delage, Talbot and many others, and in some cases a car that appears to be a 1938 Le Mans car was actually made from a 1947 production saloon. Such cars are not only fakes, they are dishonest fakes.

My feeling is that all the Registrars should keep details of unacceptable cars and keep them on record for all to see. Some very good fakes are getting quite old now and with the passage of time people, and journalists in particular, forget that an apparently 1937 car was made in 1972. In my filing system I have a "Black" file for apparently genuine cars that are known to have been built long after the model went out of production.

If a Registrar is going to keep the knowledge and information secret it means that fake cars can be sold without anyone knowing it is fake, apart from the man who built it, as only he and the Registrar will know the truth. If a Register is published then the facts are there for anyone to see, and the good it does should compensate for the occasional abuse by dishonest people. But always in the background is the risk of lawsuits and legal attacks, and with our funny law system a judge need not necessarily consider the truth to be the end of the story. If a Register concerns itself solely with known established facts, which can be proven, there should not be too much trouble. What is never going to be published are the details and information in my "Black" file, and I am sure many Registrars have similar files.

Perhaps the safest thing is to remain hermit-like and revel in your own knowledge, but that can get dull and stultifying. Contact between Registrars and clubs is all important and a cross-pollination of information is invaluable, as well as being interesting and amusing. Yours, DSJ

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Toyota's man may have won the Drivers' Championship but Lancia retained their grip on the Constructor's crown once again.

Sainz and Sinners

When Italy's Sanremo Rally ended in victory for Frenchmen Didier Auriol and Bernard Occelli in their Martini-backed works Lancia, it could not have been a surprise to them that theirs was a triumph which was overshadowed by another. Spanish pair Carlos Sainz and Luis Moya got their Toyota Celica GT4 into third place, Sainz thereby scoring just enough points to clinch the title of World Rally Champion. The celebration in the Toyota camp that night was equalled only by that of the large contingent of visiting Spanish supporters, including the country's Minister of Sport.

Before Sanremo there was a mathematical possibility that Sainz could be beaten for the title by Juha Kankkunen, but for that to happen Sainz had to score no more effective points and Kankkunen had to win the three remaining rounds, Sanremo, Ivory Coast and the RAC. Even then, their scores would have been equal, and Kankkunen would have taken the title by virtue of having scored the greater number of outright wins. It was a tall order, and one that hardly anyone considered any more than highly improbable.

All Sainz had to do was to increase his score by just two points, the minimum he could gain, and he did precisely that in Sanremo by taking third place. That position actually brought him twelve points, but

it also increased his number of scoring results to nine, and as the maximum number of scores to count at the end of the year is eight, he had to drop his lowest score, ten, achieved by his fourth place in the Safari. Lancia was also celebrating championship success, for Auriol's victory clinched the makes' title for the Italian team.

When a tree is blown down by wind, it matters little whether its force was 40 mph or 80 mph. The tree is down, and that is that. Similarly, winning margins in motor competitions are of little lasting significance and the main thing remembered is who won, not by how much. After Sanremo, Sainz' championship lead over second-placed Auriol was 45 points, but just two points were all he required to gain the title, irrespective of Kankkunen's scores. As it happened, Kankkunen did not win, so even those two points became academic, although it looked at one time that Sainz would not score anything at all at Sanremo. One can't help wondering whether, had that happened, Auriol might have been told to slow down so that teammate Kankkunen, the only driver with a chance of beating Sainz, would win. That's not an unkind supposition, but one based on incidents which have actually happened in the past.

On the last stage of the Wednesday, with

just the last night to go, Sainz rolled and was extremely fortunate to be able to continue with no greater loss than dropping from the lead to third place. His damaged Celica was restored before the final night, but he was unable to recover the time he had lost. Victory had slipped from his grasp, but he nevertheless became the new World Champion, and an eminently worthy one at that.

Although the drivers' championship was the main point of interest at Sanremo, during the course of the event there was something else which made people sit up and take notice, and that was the performance of the works Ford Sierra Cosworth 4x4s. Again they had various problems, and of the three entered only that of Pentti Airikkala finished, in eleventh place, but whilst they were running they certainly made their marks, often putting up the best times on special stages. Malcolm Wilson was also most impressive and it was good to see a British driver doing so well in a British car. In the Group N category, Sierra Cosworth 4x4s finished first and second, driven respectively by Alessandro Fassina (10th overall) and Gwyndaf Evans (12th overall). Statistically, the result was not much to crow about, but the potential was certainly demonstrated and brought satisfaction to a team which had many new staff as well as a new car. Indeed, several of the mechanics were cutting their rallying teeth at Sanremo.

Lancia, Toyota, Ford and Subaru were the main teams at Sanremo, whilst Ford, a Mazda, a Renault and a clutch of Lancias



Ford had a good result in the Group N category, finishing first and second.

were contesting the Group N category. Among the ladies were Paola de Martini in her Audi and Louise Aitken-Walker in an Opel Kadett entered by GM Euro Sport. The latter added nine points to her score by finishing 18th, but her Italian rival failed to finish and scored nothing.

Lancia's line-up consisted of works cars for Biasion, Kankkunen and Auriol, Jolly Club cars for Cerrato and Fiorio, Group N cars driven by Trelles and Del Zoppo and a Grifone Group A car by Liatti. Trelles' car and three others were prepared by Astra Racing, the outfit run by former driver Mauro Pregliasco. All four of them finished. Toyota also brought three works cars, driven by Sainz, Ericsson and Schwarz.

Ford had Wilson, Airikkala and Cunico in their Q8-backed Group A cars and Evans in a Group N car, whilst a Fina-backed Cosworth was driven by Duez. Ford Italy entered a Group N Sierra Cosworth for Fassina; son Alessandro, not father Toni. Also from Britain came two Prodrive-built Subaru Legacies for Alén and Chatriot. There were no team Mazdas, but de Mevius switched from Group A to Group N to drive a 323 for the Italian Mazda team. Other Group N runners included Orelle (Renault R5 GT) and the capable young Finn Tommi Mäkinen in a Mitsubishi Galant.

Although its predecessor, the Rallye dei Fiori (Rally of the Flowers), used to be on surfaces which were predominantly dirt and rock, even snow and ice when it was a February event, the modern Sanremo Rally is a mixed affair. It spent a few intermediate years as a tarmac rally after the road surfacers got to work in the mountains behind Sanremo, but then went further afield in search of dirt roads. Indeed, on its first such foray it went right across the entire width of Northern Italy, from the French border in the West to the Adriatic coast in the East, its distant sub-headquarters being in the Republic of San Marino, not far short of the resort of Rimini.

Today, it does not go quite as far as the Adriatic, but the long motorway sections are still there, to get competitors from one group of special stages to the next. There were stops this year at Arezzo and Perugia, but the rally still began and concluded in the now-tarmac complex of mountain

roads close to Sanremo, in traditional Rallye dei Fiori country. We are told that next year it will go as far as Rome.

The use of both tarmac and dirt stages calls for extra work in car preparation, not to mention tyre selection, but at least they were grouped in such a way that there were long road sections in which ample time was available for the switch from one type of suspension to another.

Although there were plenty of rest stops, the rally did not follow the daylight-only trend which has been produced by FISA's rest requirements. Indeed, apart from a three-quarter-mile "superspecial" on the Sunday afternoon, the rally began at midnight and the first four tarmac stages were all held in darkness. Six hours of road section later came six dirt road stages in the daytime before a 15 hour stop at Arezzo.

The next leg, spanning eleven stages, ran from 7 am. to 6 pm. and ended at Perugia where there was a 12 hour stop before five early morning stages and the five hour trek back to Sanremo. The final leg was in the area of the first and was also held at night, eight stages being held between midnight and the 10 am. finish on the Thursday.

The opening stage, near the sea at Ospedaletti and just a few miles along the coast from Sanremo, was a very brief affair and it came as no surprise that six drivers shared the lead when it was over, each with a penalty of 1m 09s. However, the short journey there was troublesome for some, especially Alén whose Subaru refused to start in the closed park. A 30 second penalty for failing to move off under the car's own power was followed by a further 1m 30s road penalty for arriving 3m late at the first stage after having the car's engine management computer replaced.

Although rain clouds were moving about, the weather was dry in the hills for the night's tarmac stages. Perhaps it will cause some nostalgia if we say that the first went from Ceriana through Baiardo and San Romolo to Perinaldo, the second from Pigna over the Langan to Molini di Triora, the third over the Colle d'Oggia and the fourth over the Passo Ginestro, all roads which have served the rally well since they were little more than goat tracks.

Alén lost more time in the first stage due to loss of power steering, whilst Airikkala's rally almost came to an end when plastic body parts caught fire. It seems that a seam on the lightweight exhaust pipe cracked and the escaping hot gas ignited the plastic. When they realised what had happened they stopped and quickly put the fire out, but the biggest problem had been the choking fumes. Co-driver McNamee was sick and Airikkala felt really ill for some time afterwards.

It wasn't a good night for the Ford team, for Wilson had a spot of brake trouble whilst Cunico had his throttle cable break. Eventually he rigged up a length of wire to use as a hand throttle, but he lost about half an hour and exceeded his maximum lateness.

Chatriot lost his clutch due to distortion and break-up of the aluminium centre



Carlos Sainz and Luis Moya celebrate their victory in the Drivers' Championship.



Two Prodrive-entered Subaru Legacies were entered, but both suffered transmission problems.

spline. He was able to struggle onwards to have it replaced, but the whole operation took so long that he, too, ran out of time. However, the exclusion would not become effective until the end of the leg, so the Subaru team decided to keep Chatriot going in order to further test the car and the tyres.

In the morning, after the rally got to the dirt stages, Alén lost his drive when changing down to first gear for the exit from a hairpin. There was a considerable bang at the time, and it was at first thought that his clutch had failed in the same way as Chatriot's, but it was later found that the gearbox had failed. Actually, Alén had inadvertently selected reverse instead of first, but before anyone starts blaming the driver for what seems to have been a novice mistake, let us explain.

On road cars there is a block of some kind to prevent accidental selection of reverse, and one has to depress or lift the gear knob, force the lever against a firm spring, or even lift a latch before reverse can be selected. On the Prodrive Subaru this block has been removed, and there has been no trouble during testing or even in practice. However, in the heat of a rally, when grabbing for first after hard braking into a hairpin, it's not so easy to be as precise, especially as the lever travel distance between first and reverse is very small on the Subaru. The moment reverse was selected, that gear disintegrated with a bang and, although Alén managed to struggle off the stage, within a very short time the broken pieces had destroyed the other gears.

The actual cause was not fully recognised until Britain's Audi Sport Rally the weekend after Sanremo, when the very same thing happened. For the Lombard RAC Rally, the Prodrive Subarus will

have reverse blocks in their gear selector gates.

Fiorio rolled on SS.8 but continued having lost no more than about a minute, whilst Evans, although he lost a couple of minutes and dropped from 2nd to 4th in Group N, was actually moving up in the general classification and, having started at number 51, was looking forward to restarting in 17th place and having less dust to face.

After that second leg (the superspecial alone had counted as the first) Biasion led in his Lancia, but Schwarz, Sainz and Auriol were only 7, 11 and 22 seconds behind respectively, followed by Kankkunen who was 1m 05s behind the leader.

But things began happening again very early in the third leg, the first incident when Schwarz went off the road, bent a cross member and damaged his suspension. He only lost about a minute, but the car handled badly for the rest of the day and the Toyota driver lost more time as a result. Meanwhile, team-mate Sainz was gradually increasing his pace, and on SS.14 he moved into the lead, eight seconds ahead of Biasion.

Wilson continued to make several best stage times, but collected a road penalty after stopping to have his gearbox replaced. Aitken-Walker had her exhaust pipe dislodged on a somewhat rocky stage, and it got so close to a half-shaft that its gaiter was burned through.

Sainz increased his lead, especially when Biasion hit a rock and punctured his front right tyre. He continued on the flat, lost about a minute, and later had to have the suspension and half-shaft changed on that corner or the car.

Prior to the return journey to Sanremo, Sainz had increased his lead to 1m 15s, but by this time it was Kankkunen behind

him, Biasion having dropped to third place, three seconds behind his team-mate. Wilson continued to make excellent times, aided by new brake parts which had been flown in overnight from Boreham. Alas, he stopped some 6 miles into SS.25 after a nudge with a bank caused a front upright to break and the whole suspension to collapse. Airikkala had to stop for a front differential replacement and was 13 minutes late (6m 30s penalty) at the start of SS.25.

On the very last stage of the fourth leg, sudden drama changed everything. Little over half a mile after the start, Sainz slid wide on a slippery, 3rd gear right-hander, hit a tree and rolled. After help from spectators, he got going again, but with a broken rear screen, a rear wheel flapping uselessly and about two and a half minutes added to his penalty.

The fast bend was a tricky one indeed, but when Kankkunen came by he saw the efforts to get the Toyota going and, thus warned, he slowed. By the time Biasion came, the Toyota had departed, but the Italian driver said that he was momentarily distracted by marks on the road and what he described as debris from the Toyota. He too went off the road, causing so much damage to the car that the only course was to abandon it.

The final leg started with Auriol leading Kankkunen by 16 seconds and Sainz another 40 seconds behind. Sainz' car had been completely restored after his roll, but he had to consider very carefully whether it was worth going all out to make up 56 seconds in about 110 miles of tarmac stages. It would be very nice to add to his list of victories, but even more important was winning the championship and he could do that simply by holding on to his third place. He chose the latter course, although he did make one fastest time during the night.

His team-mate Schwarz, having had completely new suspension fitted, was much happier not to have to cope any longer with the effects of his earlier accident, but on stage 33, the last but one, he hit a solid bridge parapet very hard and went no further. Prior to that, he had been fifth.

That was about it, except that the simple incident of a wild boar darting across the road almost changed the course of the event further. The animal chose to cross just in front of Auriol, who said that it was pure luck that he didn't hit it. He had no chance to take any avoiding action, and had he been a split second earlier on the road he would have hit the animal and would certainly have gone no further.

The Sanremo Rally settled both sections of the World Championship, so the Lombard RAC Rally, which has a splendid entry list, will see a straight fight to the finish, no points being at stake and the only kudos being that of taking overall victory. On occasions such as this, we wonder if a championship is really necessary!

GP

From the moment the Bandama Rally was held for the first time in 1969, organised by that irrepressible adventurer Jean-Claude Bertrand, it has generated controversy. It began as an attempt to copy the Safari, and then to better it, but it has never succeeded in matching the Kenyan event. Indeed, in an effort to make it more difficult than the Safari in 1972 the sections were timed so tightly they were impossible, resulting in no finishers at all, and there was a huge row when all the prize money was withheld.

Later it became established as the Ivory Coast Rally but repeatedly failed to show that vital spark which sets the Safari apart from other African rallies. It became a round of the World Rally Championship, but later lost its makes' status and qualified only for the drivers' series.

This year the drivers' series developed into a contest between Sainz and Kankkunen, the latter still retaining a slim chance of getting ahead of the former even after September's Commonwealth Bank Rally in Australia. Both Lancia and Toyota therefore kept their options open regarding sending cars to the Ivory Coast, although they were only planning to do so if they really had to.

At Sanremo the championship was decided in Sainz' favour, and immediately all plans by those two teams to compete in West Africa were dropped and the rally gathered a meagre field of just 32 starters, among whom the only notable visitors were Alain Oreille in a Group N Renault 5 Turbo, Austrian Rudolf Stohl in an Audi 90 quattro and Kenjiro Shinozuka in a Mitsubishi Galant VR-4.

Among the leading local drivers were Alain Ambrosino (Nissan March S Turbo), Patrick Tauziac (Mitsubishi Galant VR-4), Adolphe Choteau in what was called a Toyota Corolla 16S and, in similar cars, Patrick Servant, Michel Molinie and lady driver Vivienne Evina. Samir Assef drove a Celica GT-Four.

Over the years, the organising team

behind the event has frequently changed, various people from France having been imported to take over leading roles. This year, after several switches, a Belgian group was brought in to run the event, clerk of the course being Franz Thevelin who runs the Ypres Rally. However, the route had already been finalised before they were engaged, and it covered a larger area of the country than it has in recent years. The notorious section in the Tai Forest, to the NW of San Pedro, was dropped, but there were excursions to distant parts, even close to the borders with Liberia, Guinea and Ghana. A river crossing by ferry was reintroduced, but this time it was a self-propelled, eight-car ferry boat, not a captive, rope-hauled, three-car job as in the past.

Timing throughout was in minutes, and there were no sections timed in seconds as there have been occasionally as a result of the FISA requirement for special stages. Some sections were competitive inasmuch as they were impossibly tight; others were more relaxed, although there was rarely much time for service and it could be said that the whole event was generally on the tight side.

Start and finish were at Abidjan, the commercial capital on the coast, whilst during the four days there were two rest stops, at Man in the West and at Yamoussoukro, the country's political capital, birthplace of the President and site of the enormous and well-publicised basilica constructed at huge expense.

It was Shinozuka who emerged as the leader, although by the time the rally had passed through Yamoussoukro and was in its second leg to Man, his lead was just four minutes. However, in the north-westerly part of the route furthest from Abidjan, his car dived into a hole very hard, landed on its nose and shortened itself considerably. The radiator, among other parts, was wrecked and there was no hope of continuing, so Shinozuka and Meadows had to sit patiently waiting for their mechanics.

It was Tauziac who inherited the lead, but not far behind him was Stohl, and were it not for an unfortunate incident resulting from a mis-sited control the fight might have been very close indeed.

In a hamlet on a main road, a time control was established at a junction with a minor road which led to the next time control. But there were two such junctions, one into a road which took the longer route, and one which took a much shorter route. The correct place for the control was at the mouth of the longer route, but the officials wrongly placed themselves at the other junction.

Tauziac came along, realised that the control was in the wrong place, booked in but decided not to take the short route indicated by the incorrect control position. He took the longer route.

When Stohl appeared, he too booked into the wrongly-sited control, but figured that the officials knew what they were doing and took the shorter route.

Since both short and long routes converged before the next control, both Tauziac and Stohl would arrive from the correct direction. But the problem was compounded by the presence of a passage control, into which Tauziac would arrive from the correct direction; Stohl from the wrong direction. Had Stohl continued, he would have had a very good case indeed for having any penalty at that passage control cancelled, but he encountered a journalist just before that passage control who advised him to go back and take the original, longer route. It was hardly good advice, but Stohl took it and made the long detour, losing some forty minutes and all chances of winning the rally.

Later, penalties at the mis-sited control were cancelled, but not those at the next, which were more significant and certainly more affected by the wrong position of the previous one. It is a matter only for conjecture whether any passage control penalties would also have been cancelled had Stohl arrived there from the wrong direction. As it happened, every car arrived there from the correct direction, for when the officials realised after a few cars had passed that they were in the wrong place, they moved down the road to the next junction, so that later competitors were not presented with a confusing error.

As it happened, Tauziac won by just over an hour from Stohl, who in turn was nearly an hour ahead of Oreille. Those forty lost minutes were crucial to the Austrian, but whether he would have gone faster in an attempt to recover the other twenty is a matter of conjecture.

The future of the Ivory Coast Rally is now in the balance. FISA has said that it may be dropped from the World Championship for Drivers in favour of the ADAC German Rally, and a decision on this will be made in December. If it loses WRC status then its meagre overseas support may vanish altogether, although we don't doubt that it will continue as the main event of the national series. GP

**Sanremo Rally, World Rally Championship,
14-18 October, 1990**

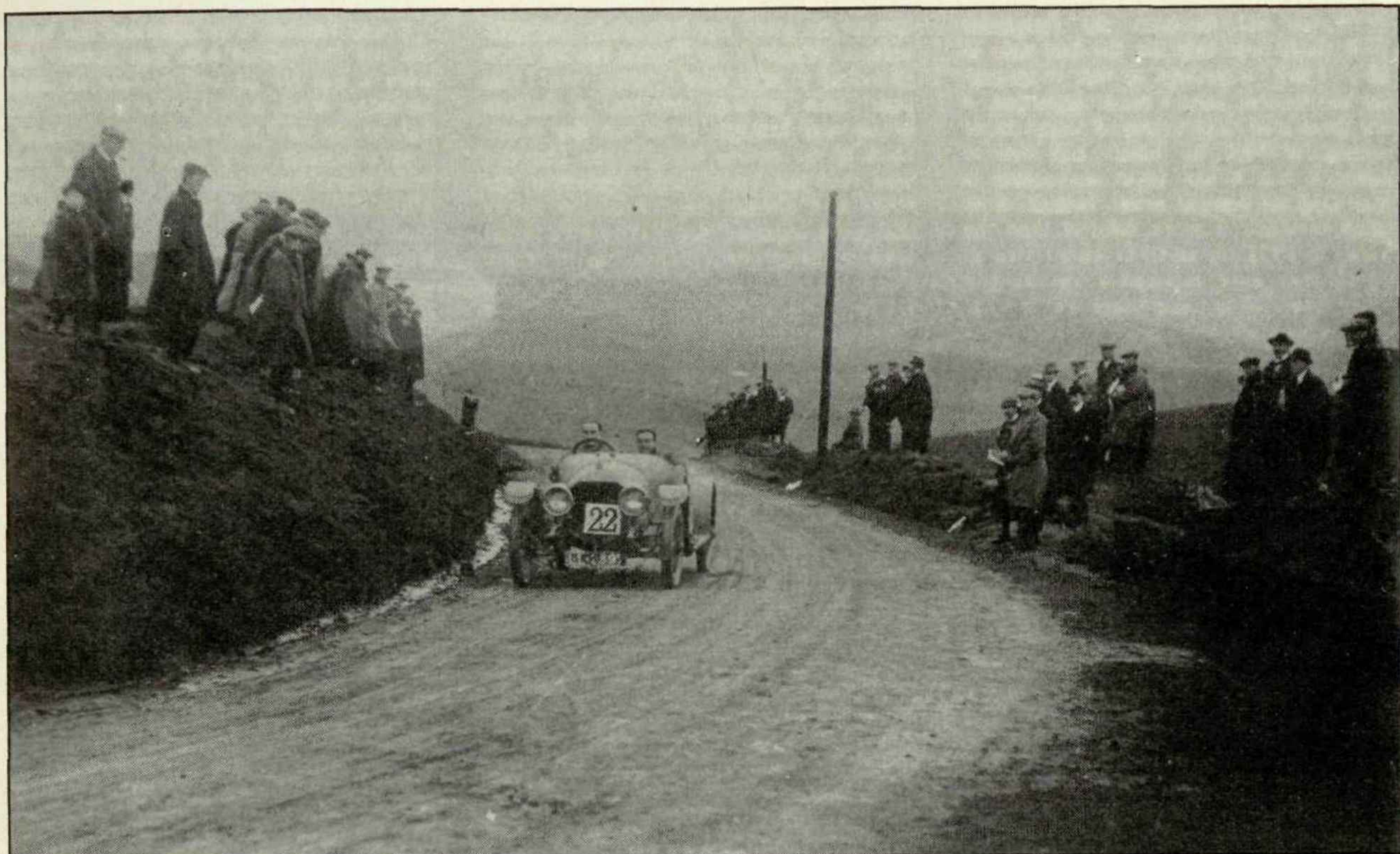
1st	Didier Auriol (F)/Bernard Occelli (F)	Lancia Delta HF Integrale, Gp A	7h 30m 38s
2nd	Juha Kankkunen (SF)/Juha Piirone (SF)	Lancia Delta HF Integrale, Gp A	7h 31m 23s
3rd	Carlos Sainz (E)/Luis Moya (E)	Toyota Celica Turbo GT4, Gp A	7h 32m 23s
4th	Dario Cerrato (I)/Giuseppe Cerri (I)	Lancia Delta HF Integrale, Gp A	7h 33m 25s
5th	Liatti (I)/Luciano Tedeschini (I)	Lancia Delta Integrale, Gp A	7h 36m 52s

**Ivory Coast Rally, World Rally Championship,
28 October-1 November, 1990**

1st	Patrick Tauziac (CI)/Claude Papin (CI)	Mitsubishi Galant VR4, Gp A	4h 54m
2nd	Rudolf Stohl (A)/Ernst Rohringer (A)	Audi 90 Quattro, Gp A	5h 56m
3rd	Alain Oreille (F)/Michel Roissard (F)	Renault 5 GT Turbo, Gp N	6h 52m
4th	Alain Ambrosino (CI)/Daniel le Saux (CI)	Nissan March Turbo, Gp A	8h 09m
5th	Patrick Servant (CI)/David Charbonnel (CI)	Toyota Corolla 16S, Gp A	8h 25m

**World Rally Championship Situation
Drivers (after 11 of 12 rounds)**

Carlos Sainz (E) 132 pts	Alessandro Fiorio (I) 23 pts	Erwin Weber (D) 12 pts
Didier Auriol (F) 87 pts	Alain Oreille (F) 22 pts	Kenneth Eriksson (SF) 12 pts
Juha Kankkunen (SF) 85 pts	Björn Waldegård (S) 20 pts	Ross Dunkerton (AUS) 10 pts
Massimo Biasion (I) 64 pts	Patrick Tauziac (CI) 20 pts	Markku Alén (SF) 10 pts
Mikael Ericsson (S) 32 pts	Peter Bourne (NZ) 18 pts	Tommi Mäkinen 10 pts



The DFP with which W O Bentley won top awards at the 1914 Waddington Fell speed hill-climb.

Forgotten Makes No 95: The DFP

If the DFP is remembered at all it is usually because WO Bentley and his brother HM sold these cars here before the First World War, from the London mews in which the first 3-litre Bentley engine was assembled and run, as a BDC plaque on the building commemorates. Otherwise, this rather good car from Courbevoie on the Seine has been largely forgotten.

The DFP was the concept of Doriot and Flandrin, who had gained experience at Clement-Bayard and Peugeot before commencing to make little single-cylinder, shaft-drive cars of their own brand, in 1906. After Parant joined them the cars became DFPs, and from 1908 four-cylinder Chapuis-Dornier-engined models were produced, as well as the voituertes. There was a venture into the six-cylinder market in 1911, with a 25/30hp DFP. But the model which earned the company the respect of the growing number of French autogarists was the 10/12hp small car, introduced the year previously, with a four-cylinder engine of just 1.6 litres. The company had begun to make its own engines and an even bigger success was its 12/15hp car, of fractionally over 2 litres capacity.

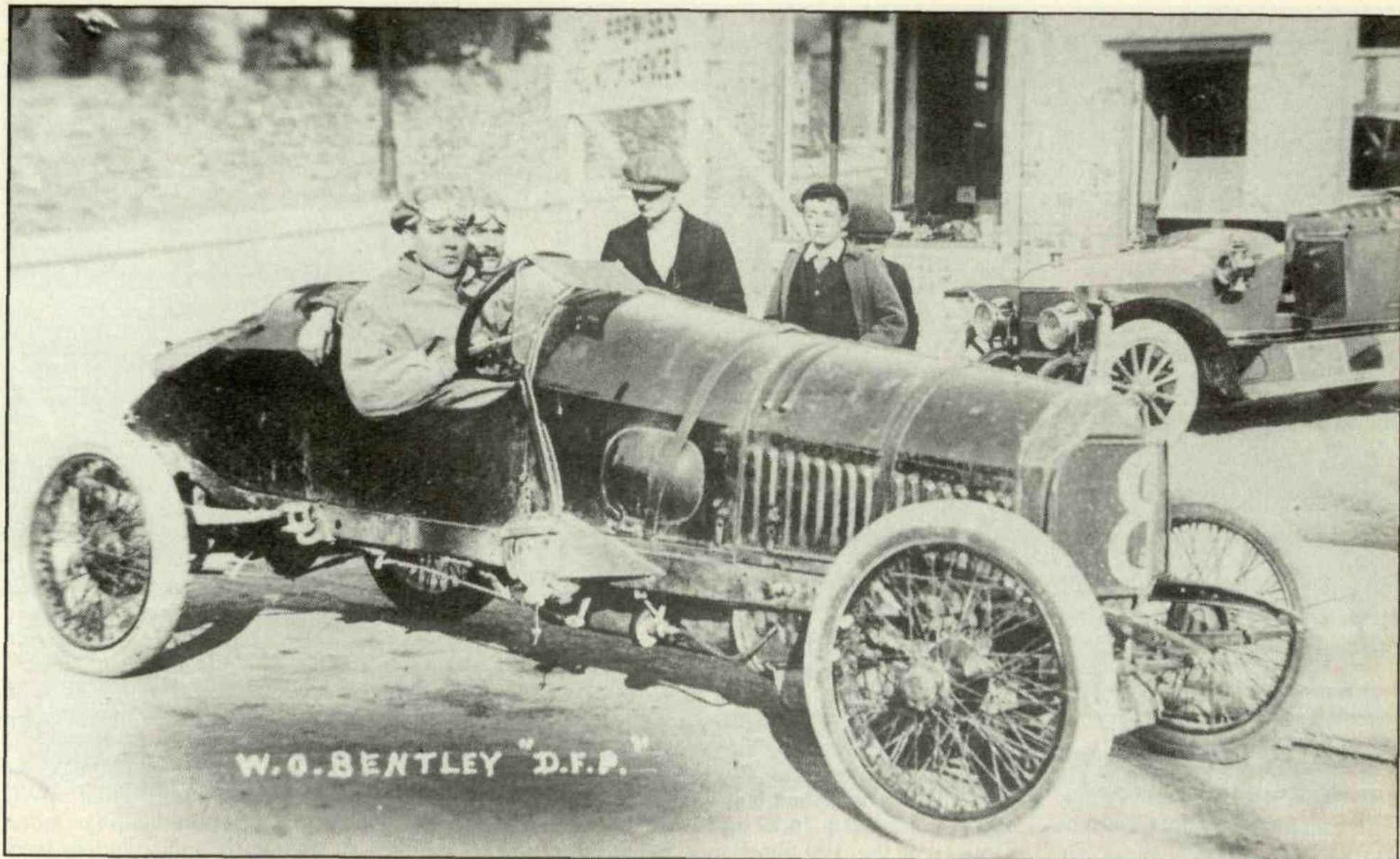
In England the make was handled by Lecoq & Fernie, who also held the agencies for Buchet and La Licorne. It was this

rundown concern which WO Bentley and his brother HM Bentley took over in 1912, after 'WO' had become tired of administering to 500 two-cylinder Unic taxis for the National Motor Cab Co. The brothers paid £4000 for the moribund agency, a lot of money in present-day values. The other makes were dropped and from the showrooms in Hanover Street 'HM' and a secretary, with GP de Freville of later Alvis associations as Manager, sought to improve the DFP's reputation with British motorists. Meanwhile, 'WO' had rented the coachhouse in New Street Mews off London's Upper Baker Street (which was to become famous, as already noted) from JH Easter, who did DFP bodywork trimming.

A great believer in the publicity won by participation in competition events, 'WO' got a hardworking mechanic, Leroux, to come over from France, to help him. This worthy chap not only looked after the servicing and tuning-up of customer's DFPs but prepared the racing cars and went at times as 'WO's' riding mechanic. Chassis were imported from the parent company and bodywork made for them by Harrison's of Stanhope Street. AH Ward joined 'WO' and 'HM' as the third Director of Bentley & Bentley and all three used DFP saloons. Three models were available, the aforesaid 10/12 and 12/15, and a

heavy, sluggish bi-block 15/25, the 3-litre four-cylinder engine which would not respond to tuning. At least one customer was pleased with his 10hp DFP, which did 45mph and, a 1911 model, had run more than 10,000 miles, decarbonised at intervals of 4000 miles, the bearings taken up at 8000 miles, and the tyres replaced every 4000 to 5000 miles — the car owner's chores of those times. . . . The DFP's engine ran sweetly at 37 mph but the ride became too lively at over 35 mph, unless the four-seater body was fully laden.

Be that as it may, it was the 12/15hp DFP on which WO Bentley concentrated. It was a conventional chassis, with a longstroke 70 x 130mm engine, leather-lined cone clutch, four speed and reverse gearbox, a wheelbase of 9ft 7in, running on 760 x 90 tyres on fixed wooden wheels. The three-bearing crankshaft was pressure-lubricated but the Claudel carburettor fed into a two-branch manifold on the offside from where, no doubt to 'WO's' disgust, cast-in passages led through the block to the side-by-side valves. An unusual feature was the gear lever which, instead of sliding across the gate, was pivoted, and dynamo lighting did not become a standard fitting until after the war. In 1913 this chassis sold for £275, compared to £200 for the 10hp chassis, £350 for the 15.8hp DFP chassis. The engine of the 12/25 DFP



W O Bentley with the 2-litre DFP with which he ran non-stop to complete the two-day 600-mile 1914 IoM TT race, competing against cars of up to 3.3-litres.

would run up to 2500 rpm and it was a lively car, capable of 55 mph.

In 1912 'WO' took a standard-looking DFP two-seater to the Aston speed hill-climb meeting, near Tring, with his fiancée Leonie as passenger, and won his class, and the event outright on Formula. His tuning was paying off and he gained other successes at such meetings. When his own car proved capable of 70 mph, notably quick for a 2-litre at that time, he decided it was opportune to go to Brooklands and attack Class B (up to 2048cc) records, which were the preserve of Humber, Calthorpe and Arrol-Johnston cars. The story of how 'WO' went to France to persuade Doriot to incorporate his better induction arrangements on the standard engine, saw an aluminium paperweight on that gentleman's desk, decided this was the future piston material, had DFP's foundry people cast some, and installed them in a 12/15 engine, has become legend. I would not go so far as to say this was the absolute first time aluminium-alloy pistons were used in a production car engine, but it is the best known.

This development enabled 'WO' to offer the Speed Model DFP, with these pistons, a special camshaft, lightened con rods, and the improved inlet manifold. It was distinguishable by a slightly vee radiator and wire wheels, and was able to do 65 mph. It also enabled him to put up some notable performances at Brooklands, such as the Class hour record at 82.15 mph and being timed over the half-mile at 89.70 mph. Sales improved, 'WO' drove

around in his DFP saloon, enlisting sub-agents, and he was able to obtain another mechanic to assist Leroux, while M. Doriot's young son also came to England to help. 'WO' even ran a DFP in the 1914 IoM TT race and although it came home last, at 48.38 mph, for the smallest car entered to have finished this two-day 600 mile contest, from which 23 cars had retired, was further good DFP publicity.

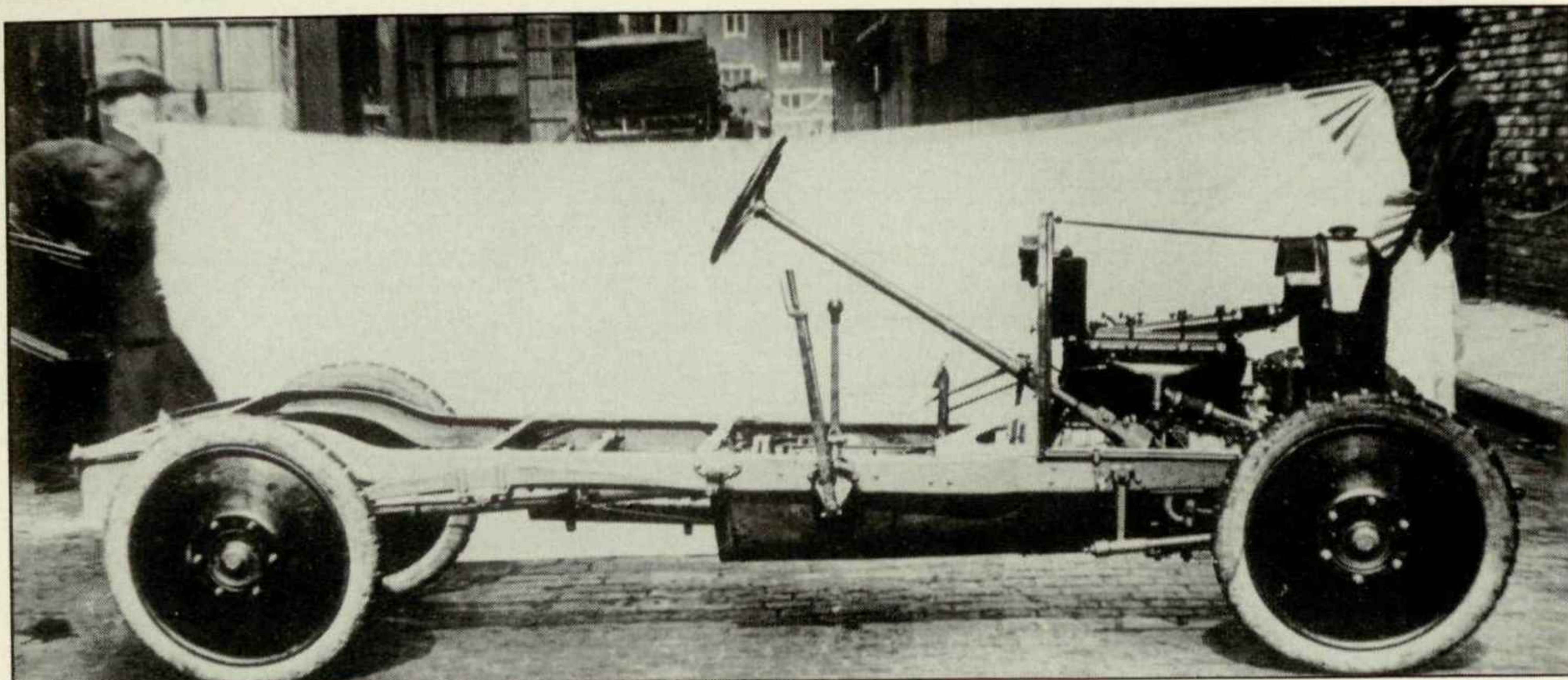
Then came the devastating war. 'HM' went off to the front, Leroux was very soon dead in Flanders, and 'WO' went off to design his celebrated BR1 and BR2 rotary aero-engines at Humber's in Coventry. When the Armistice came 'WO' was fully occupied with his own car but the demand for wheels was brisk, so as the 3-litre Bentley was not yet ready, Bentley & Bentley continued to sell DFPs. The 12hp model was now justifiably known as the 12/40. It retained its pre-war specification except for cantilever back springs, and Michelin disc wheels which were said to rather magnify transmission noises. An electric starter was now fitted, as well as a dynamo but the toll of war was reflected in the increased chassis price, up to £675.

Undaunted, Bentley & Bentley, still in Hanover Court, took a stand at the 1919 Olympia Show, where a mock-up 3-litre Bentley chassis was to be seen on Stand No 126. The DFP had an improved radiator and rumour had it that within an hour of the Show opening the four-seater, exhibited with a 12/40 chassis and a two-seater on Stand No 107, had been sold. AFC Hillsead joined Ward and to combat the

congestion on French railways he, his Service Manager, and Walter Bentley drove DFP chassis, equipped with crude test-bodies, from the factory back to Dieppe. A Stand was taken at the 1920 London Show but by now the 12/40 chassis cost £760 and a four-seater £1050. Critics noticed that you had to lift the back seat cushion to lubricate the differential and that the Westinghouse starter was inaccessible. The 12/40 was little changed for 1921 but was still at the Show, with four-wheel brakes, and the 10/15 with a roomy body had joined it. The bigger four-seater now cost £865.

After 1922 HM Bentley was occupied with establishing the Bentley, so Ward joined with JK Driskell (whom some may remember as the blue-clad driver of DFP, and later Rally, cars in trials and speed events) in the DFP agency. The French Company was reverting to proprietary engines but in 1923 it managed to make its own overhead-valve 13/50hp sports model. At Olympia in 1923 Ward & Driskell of N Audley Street, showed 10/12 and 13/50 DFPs and also the 9.5hp 1095cc DFPetite, for which 60 mph was claimed from a sports 3-seater with polished boat-type body decking. But they were absent from the Show in 1924, and had by then moved to Albermarle Mansions, W1. It was all finished, when the parent factory was taken over by Lafitte in 1926.

However, this did not spell the end of DFP racing activities. In 1921 'Mr HRS Birkin', (who, of course, became Sir Henry Birkin, Bt, the famous 'Bentley Boy', who



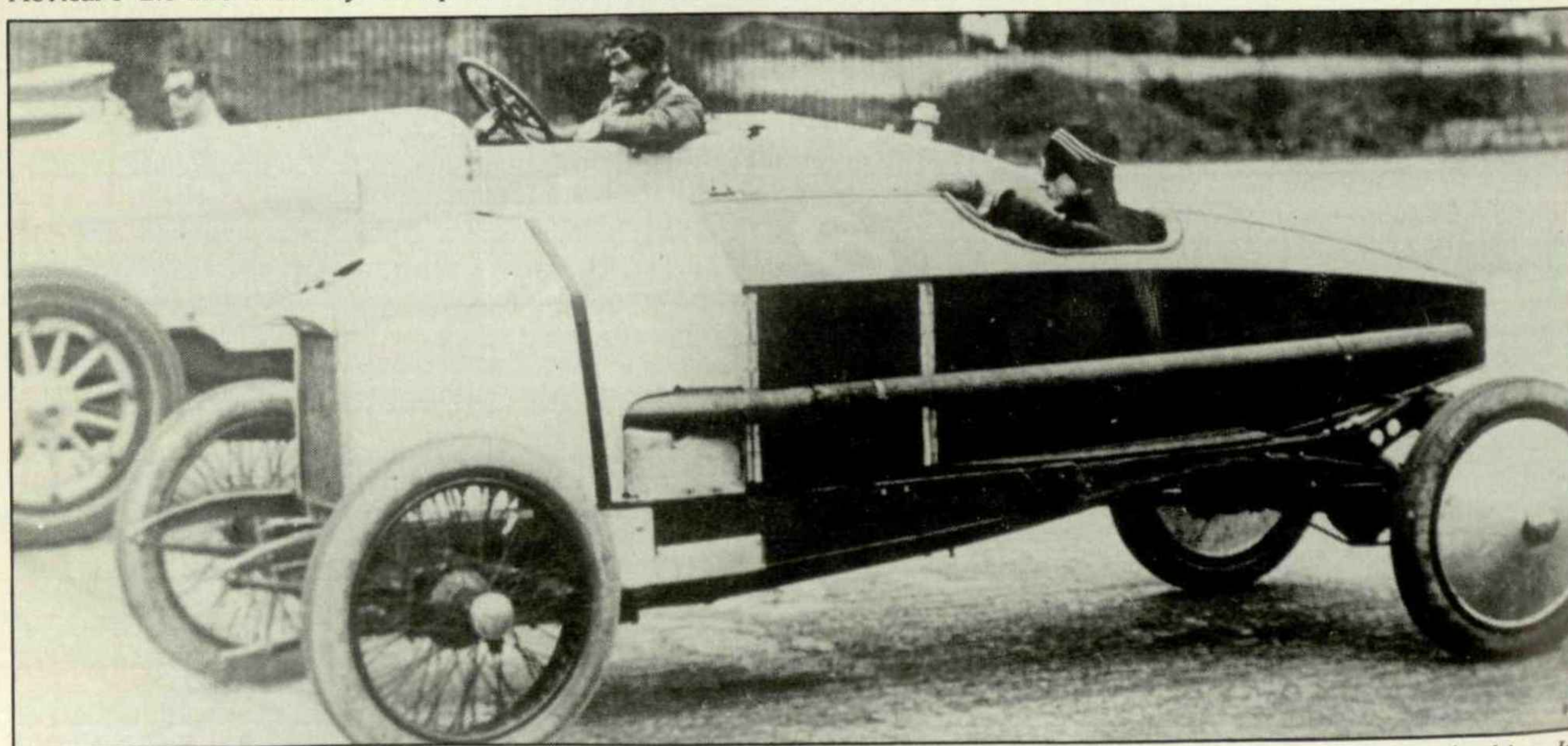
The post-war 12/40 hp DFP chassis, with disc wheels and the new long cantilever back springs.

later raced the blower 4½ cars of this make) appeared at the Easter Brooklands Meeting with a 2-litre DFP. It seems that Lt Col Clive Gallop, knowing of Birkin's desire to race, had fitted him up with the narrow peaked radiator and perhaps other components from WO's pre-war fast DFP, which were lying discarded in the New Street Mews where Gallop was a prominent personality in the building of the 3-litre Bentley. The old DFP body was presumably unusable, because the Birkin DFP had a single-seater body made for it by Vickers, on the mahogany-planked, copper-sewn 'Consuta' principle patented by Saunders-Roe. Making his motor racing debut with this car, 'HRS' was on the limit mark in the Easter 100 mph Short Handicap, starting 4 seconds ahead of Woolf Barnato's 8-litre Locomobile and McVicar's 2.3-litre Waverley. A lap at

74.55 mph was unavailing; the DFP was slower in its next race, from which it retired. This driver of such future fame then entered, but kept away from, the Whitsun races. But by the Summer Meeting his aluminium bonnetted brown DFP lapped at 76.27 mph, to take second place in the '100 Short' race, behind Lou King's tiny A7, over which Birkin had had a start of no less than 38 seconds. He then opened at 77.21 mph in his next race but a re-handicap of 12 seconds left him to run home third, beaten by Capt Shipwright's Armstrong Siddeley 30 and Swain's Vauxhall, although it was a close-run thing, for that third place. Then, the DFP's lap speed up to 80.33 mph, it netted another third place at the August Bank Holiday races, driven by Gallop. Gallop pulled out a lap at 81.51 mph later that afternoon, to come in second to a flat-twin Douglas car, which

had been released 27 seconds earlier.

Gallop took the wheel again at the BARC Autumn Meeting, his lap speed up to 81.64 mph, but neither in this nor in his next race was he placed. Although the DFP's speed was about up to that of WO Bentley's pre-war car, at 90 mph or more, Birkin apparently thought Bentleys were better, for his DFP was seen no more. . . . However, in the 1923 JCC 200 Mile Race at Brooklands which the Brooklands 'bookies' quoted at 12 to 1, against 4 to 1 on the fastest Salmson. GL Hawkins drove an ohv DFPetite in the 1100cc class. It had a neat two-seater racing body with cowled radiator but lasted for only 23 of the 72 laps, when a rocker pedestal bolt sheared and the mechanic broke a file in the hole; after a half-hour delay trying to drill it out, the retirement was posted; with a hot drill, and a hot mechanic's face, no doubt! WB



The 2-litre DFP with Vickers "Consuta" single-seater body built for HRS Birkin, who later became the famous Sir Henry Birkin, Bt., Bentley driver. It is seen at Brooklands in 1921, with Woolf Barnato's 8-litre Locomobile beside it.

A Hot Set of Wheels



The race replica Honda VFR400R – a 400cc four-stroke that can rev up to 15,000 rpm!

This little gem of oriental engineering is fun with a capital F. Manageable power from an engine that will happily rev itself stupid from here to next week, and the excellent combination of chassis, brakes, suspension and tyres all add up to a machine with a grinnability factor of 11/10.

A young pretender, the NC30, or VFR400R is the little brother of the RC30, the machine to beat (especially by Ducatis) in the 750 F1 championship, and an uncompromising wee sportster it is. Mimicking big bro' in almost every respect, it succeeds in translating many of the race winning qualities of the RC30 into a road package that is close to the right side of sanity, although that depends on just how much of an adrenalin addict you are.

On paper its 63 bhp might sound modest alongside the 100+ gee-gees of many bigger sportsters, but the combination of useable power and a chassis that is more than up to the job of containing it, has arguably more potential as a machine that can be used to the full on the open road. Even then, the argument would be entirely academic, because in truth this machine clearly isn't listening if you are about to call it anything but a racer with indicators, and other than on the Isle of Man or a race track you're not going to get ten tenths out of it for long before you meet a tractor or a cowpat. No reason for not having one of course, because even at eight tenths it will still stunt your growth and put hair on the palm of your hand.

Purring away at the heart of the

machine is a four-stroke 399cc engine that at tickover sounds more polite than a vicar's tea-party. But that tickover is 1600 rpm, and only the beginning of the story. By the time you've let out the clutch in first the engine is turning over at the sort of speed that would have your hot-hatch gasping its last. From 7000 rpm the power climbs in a straight line to 11,000 rpm, then rises more steeply to peak power at 12,500 rpm and flattens out all the way to the red line at 15,000 rpm. By then its letting out a distinctive and glorious V4 howl, and you're doing 60 mph in first. And that in itself more or less sums up where this bike is designed to go and where it isn't.

For town riding this machine is fundamentally useless. Pulling away in first you can either stall, slip the clutch up to 25 mph, or catapult very quickly into the bus in front. Bumbling from West London to our city office I rarely got out of second. The narrow steering lock, and weight on the wrists riding position only exacerbate the fact that it is a machine that can only come on song on a mimser free country road. In town it's like using a Stradivarius to play Danny Boy on a cut-price Beamish night in Kilburn.

The V4 motor uses a 360 degree crank to enhance torque. It is liquid cooled and has a compression ratio of 11.3:1. It borrows its 8mm spark plugs from the oval piston Honda NR750, to allow the largest possible valve size. But much of the superb engineering remains an unseen marvel on this machine. The engine, being

liquid cooled, has no attractive cooling fins. Moreover it is hidden behind masses of wire, plumbing and a fibreglass fairing. The four into one exhaust system is the only visibly attractive part of the set-up, as it plumbs its way under the shock and over to the left hand side of the machine.

The pentagonal alloy frame, with faultless welding around the head-stock, and at the bottom end of each beam, betrays the overall standard of craftsmanship in this bike and gives some indication of where the £6200 asking price is being used up. For that money you can get a much larger and a faster bike, a Suzuki GSXR1100 for example, but then the quality of workmanship is proportionately less; it all depends on what you want for your money.

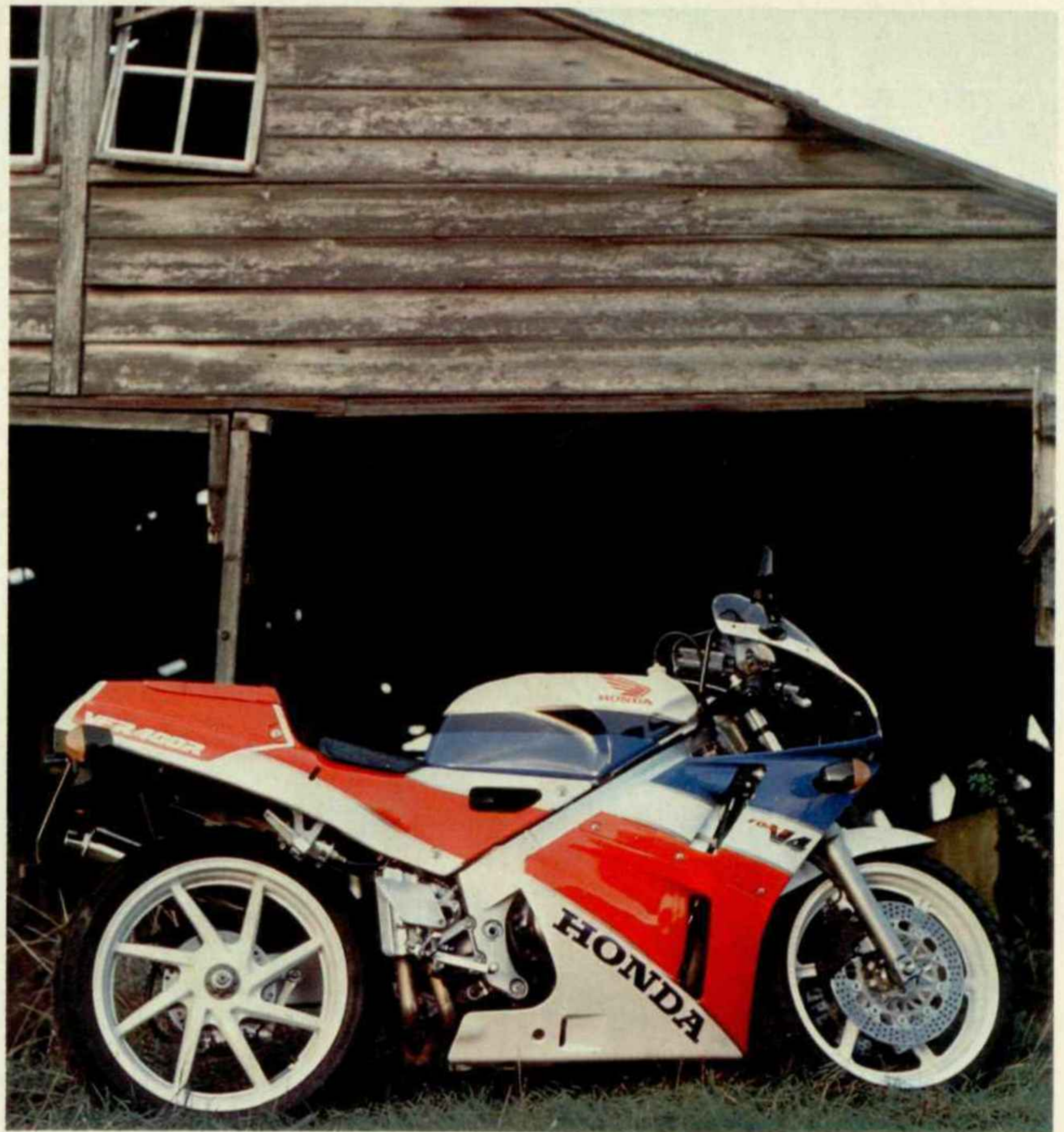
Other aspects of the VFR that ooze quality are the beautifully machined foot-pegs, gear-change and brake pedals, and the beautiful alloy Pro-Arm single sided swing arm that leaves the right hand side of the elegant eight spoked wheel completely exposed.

On the road it is even more of a revelation. The balance is good and the steering accurate. Point the machine and it follows, urging you to attack the corners, to brake later, to lean harder, and it still comes up completely unflustered. On imperfect B roads the suspension would soak up the bumps as if they weren't there, and yet still give you a firm accurate ride. Blast it through a bumpy, sweeping bend and not once will the Bridgestone Cyrox Radials let go of the tarmac. The rear

suspension is adjustable for rebound, but alteration is fiddly, and the standard setting is perfect for someone of medium weight. The front has a 13 position (best at 8/13) rebound and a spring pre-load on the superb 41mm front forks.

The front, fully floating twin discs bite with absolute confidence. They are both fierce and yet progressive. There is no high speed judder or grabbiness at low speeds, and in the wet they match the high performance of the radial tyres. The progressive nature of the power delivery and the excellent radials make the bike very manageable in the wet. Power can be fed in from the moment you start to unwind the lock and lift the bike. Despite the fact that it is a race replica it is not at all nervous or frenetic in the way it performs.

Being a small V4 the engine has a similar spread of torque and power to its big brother, and despite the fact that it can rev its socks off there is no need for the frantic cog swopping you would be doing on a two-stroke of similar performance. The power band is wide; the engine can pull hard from 8000 to 15,000 rpm, although when you're on the move 10 to 12,000 rpm is the area to keep the tacho needle. Beyond that should be written a little "lose your licence" warning. Top gear is 10 mph per 1000 rpm so even as a motorway cruiser this machine is untroubled, but again that would be using a racehorse to pull a plough. This is a machine designed to liberate the spirit for a frenzied hour or two at the weekend or on a summer's evening. It can be used for little else and that is what is so beautifully uncompromising about it. It hurts your wrists, puts a crick in your neck, and heavy braking over too many miles can be a



The single-sided rear swing-arm shows off the beautiful eight-spoked rear wheel.

fairly emasculating experience, but it sure is good for cleaning out those cobwebs

between the ears that a week of drudgery has put there. CSRW.

The Things they say and said

"Actress Liza Goddard, geared up to take part in the London to Brighton (veteran car) run. Liza donned bonnet, dress, petticoats and boots to look more or less the part in the car she will *race in*, a 1902 Mors. Expect further frills when the *vintage* cars are flagged off. Only pre-1905 cars with a speed limit of 20 mph are allowed in the race."

Some pre-veteran run publicity in the *Daily Express* showing that newspapers still do not get it quite right (our italics), and we remember when the VCC frowned on the crews dressing up.

"I rebuilt the car for the road, put a coupé body on it, and used it for fast touring, taking it over to California in 1933 and down to the South of France in 1934,

and eventually sold it in 1936. The original radiator with its inscriptions I still have somewhere. The radiator was badly damaged when the car went over the top in the 500 Miles Race of 1932 and a new 8-litre type was fitted when the car was adapted for the road; in fact, one might really say that the inscribed radiator is all that remains of old No 4" (the race number when it won Le Mans for Barnato in 1930)." Wing Commander Woolf Barnato, RAFVR in a letter he wrote to *The Autocar* in 1943, about the Speed Six Bentley known as 'Old No 1'.

"Brooklands outside the Heritage site, of course, is now unrelieved rubble – a moonscape. Utterly depressing, in fact." – Hugh Young in the *BDC Review*, after a recent visit.

Obituary

John Morgan, known to his friends as 'Johnny', died last October, at the age of 84. This quiet, almost uncommunicative, man had more of great importance to do with motor racing than is generally realised, perhaps. He became associated with it early in 1925 and for many years ran the ambitious and innovative Junior Car Club as its Secretary, before taking on the same exacting task for the British Automobile Racing Club, which the Brooklands ARC became after the war, for 25 years. Johnny had to organise their important races, negotiate starting fees with famous drivers, and generally look after the Club's affairs, which he did with unobtrusive efficiency, from his office at 55 Park Lane, W1. He also took an interest in road safety, founding the Order of the Road, and his Steering Wheel Club was racing's top social centre. He also set up the Guild of Motoring Writers Test Days at Goodwood Circuit. HJ Morgan's contribution to the sport was widespread, and widely appreciated. WB

Virtuoso



The Alfa Romeo 75 has styling that you either love or hate, but a 3.0-litre V6 engine that would make the Mona Lisa grin.

The man from Alfa, he say "Fun, or what?" In extolling the virtues of the new Alfa Romeo 75 Cloverleaf Mr Alfa did confess to me that a press-on journey in the previous model might get you sweating rather than smiling; the Cloverleaf, however, was definitely the bee's knee-caps. Well, I have to confess that the urge of this slightly hotter V6 will get you grinning so much you'll be eating bananas sideways, but while sweating is definitely not the right term, for MOTOR SPORT editorial staff at least, there was still the odd bead of perspiration; my passenger glowed. But no folks, the handling was not the culprit here, it was the two-speed (on or off) heating control.

In assessing what is good and bad about any particular car your memory provides a fairly reliable screening procedure. You definitely notice and remember those aspects of a car that are particularly good or particularly bad, whilst anything that is adequately up to the job fades into nondescript grey area. In some ways the more competent a car is the larger the grey area, and ironically the more boring it is to drive. It all depends on whether you like life to be spicy or just bland, and as any curry fanatic will tell you, if you prefer the former you have to learn to take the rough with the smooth. Italians, thank goodness, are not ones to compromise, they leave that to the makers of the cuckoo-clock, and so life with any Alfa is bound to involve a certain amount

of equal and opposite to balance those things that they do particularly well.

So, what stuck in the bad memory list after several days with the Alfa 75 Cloverleaf? Not much, I'm pleased to say: a windscreen washer light that continued to flicker on and off after I had filled the fluid reservoir, a hand-brake designed for people with short arms that are hinged half-way between the elbow and wrist, and a Gordian knot of a fuel tank cap that *did* have me sweating, and kicking, and cursing, for about ten minutes at an A1 service station.

And to balance the rough there was the smooth – the 3.0litre V6. This little beauty could make good more or less any wrong (except perhaps red wine with fish, or brown shoes with a blue suit). Even if it was powering a Sainsbury's shopping trolley, or a golf cart I'd still have an inane grin super-glued across my face. Let's put aside figures for a moment and just talk aesthetics. Engine aesthetics, it seems, is largely a thing of the past: under the bonnet of most cars is hidden a spaghetti of wires and pipes going from nowhere to somewhere else. Underneath all that is a bulging in all the wrong places power-plant. The engineers at Alfa clearly haven't cottoned on to this trend; they confine such lack of discipline to their food, and still make some of the most beautiful engines in the world. I could be happy for half an hour just staring at their V6 with its gorgeous cam covers, and six perfectly

curved inlet pipes.

As for power this V6 turns out 192 bhp compared to the standard V6's 188 bhp despite being fitted with a three-way catalytic convertor. The modifications that have enabled this consist of revised fuel injection, ignition and engine timing. The Bosch L Jetronic system has been replaced by a "Bosch Motronic ML4.1 digital ignition and injection engine management system", the same system as that fitted to the SZ Coupé, whilst altering the timing for each bank of cylinders has increased the high rev performance and tractability. Certainly it is the latter that is particularly striking. Let out the clutch quickly in the long first gear and your head will be planted very firmly to the back of the seat. Peak torque of 184 lb ft is developed at 4500 rpm, but 165 lb ft + is available from 2000 rpm upwards. The third gear overtaking acceleration really is gloat-worthy: caravans, the perennial curse of the driver in a hurry, become a meaningless and rapidly diminishing blot in the mirror, and petrol prices become a dim and distant memory, as the tacho needle spins with enthusiasm to the naughty end of the dial. But all that is only half the sensation: the ear, made almost redundant by so many hair dryer wheezes, and muffled whines, is suddenly brought to life by the vibrato purr of the V6. The noise gets even more glorious as you climb the rev scale, and occasionally I found myself holding it in gear simply

because it sounded so good.

The gear ratios are widely spaced but are well matched to the power characteristics; the engine has so much low down torque that the widely spaced ratios make it a very manageable machine. One doesn't have to worry about running out of breath coming out of a corner, or changing down to overtake. If you do feel like playing fortissimo/diminuendo games with the gearbox, cog-swopping is a matter of relative ease. Although the throw is quite long, and the box is not lightning fast, it is an accurate and sturdy unit. The two changes most manufacturers bodge; 1st to 2nd and 4th to 5th, are perfectly good and mean that both become driving gears as opposed to simply being used for starting and cruising. 5th gear is still quite lively and 1st is sufficiently long to be useful for hairpin bends.

Alfa Romeo have reduced (numerically increased) the final drive ratio in this 75 from 3.545:1 to 3.727:1, giving sharper throttle response and improved acceleration. For 0-60 mph fanatics the time taken is 7.3 secs (assuming you have a dry road, hot tyres, you rev the engine to 4500 rpm and slide your foot sideways off the clutch), for anyone else it is fast enough to dispense with bores in clapped out Allegros, sales-reps and caravans.

As for the swervery I have to admit that my first reaction was "Gordon Bennet, this car's a bit skittish." Perhaps the rain had something to do with it, but it soon transpired that my first impression was wrong. Along a 12-mile stretch of back roads in Norfolk (the record for which is held by a Mazda 323 4WD Turbo) it was certainly up with the best in terms of cornering speeds, although the car does feel a little too cumbersome to be thrown around really tight corners. This might be a product of the light power steering, with too little feel for my own taste. It feels more suitably set up for long sweeping bends and smooth roads, and on these the grip is tremendous. Modifications to the suspension over the standard 75 consist of firmer double acting dampers, and an alteration of the front wheel camber.



The independent MacPherson struts at the front, with longitudinal torsion bars, transverse links and anti-roll bar, and the coil sprung de Dion rear axle with Watts linkage, all remain unchanged. So does the neat layout of the power train with the engine mounted quite far back and the gearbox at the rear. This arrangement gives good weight distribution, and its effects can be felt in the neutral handling characteristics. I managed to induce neither oversteer, nor understeer, or any other steer for that matter. Even under heavy braking into a corner the car remained stable, and the power is so progressive and considerable that accelerating through and out of a bend the car's attitude is easily controlled on the

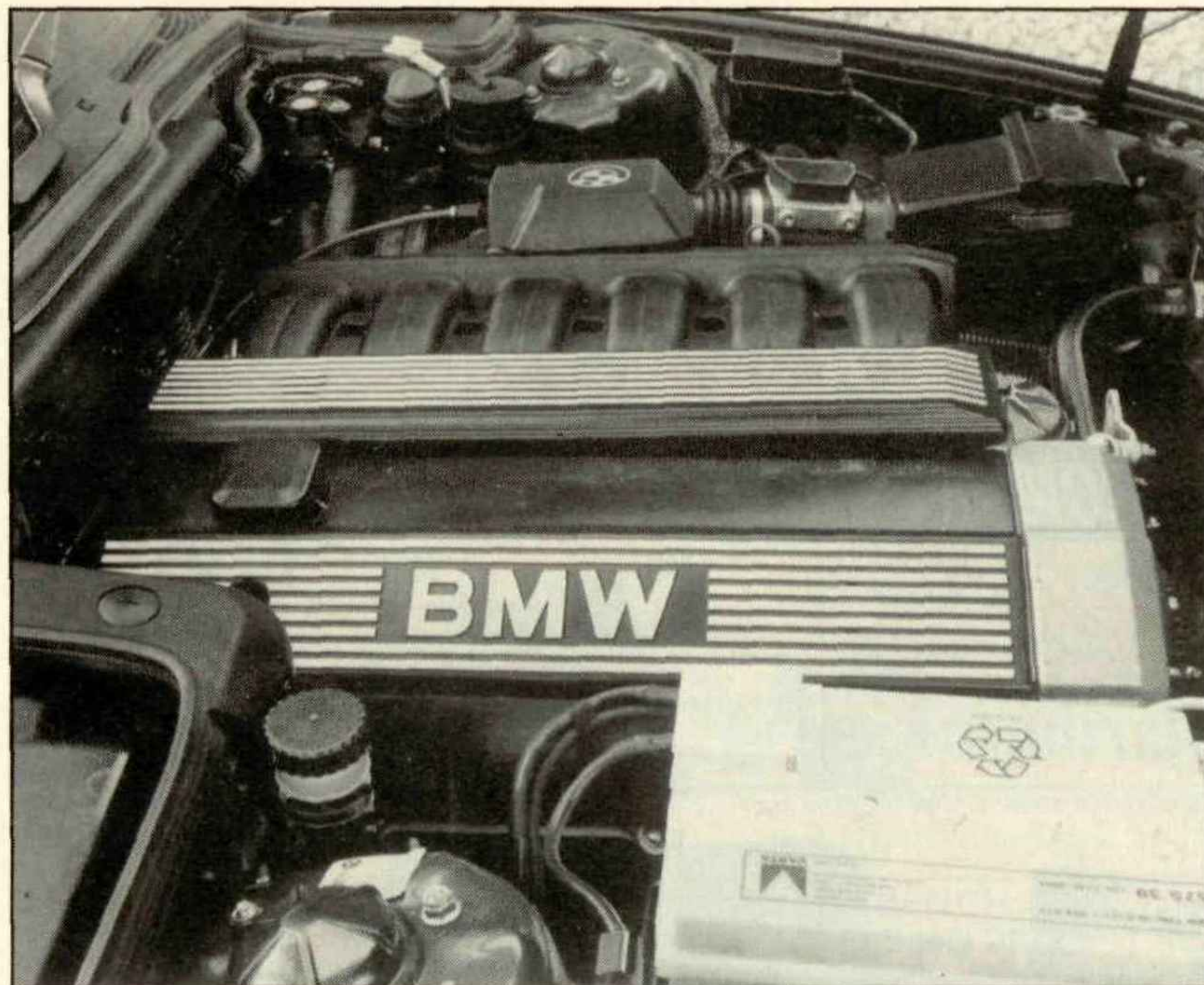
throttle (something less easy to do in a poorly set up front wheel drive turbo car).

Inside, the 75 is still of a high quality. Alfa designers continue to understand what a dashboard should look like. No wild and gimmicky experiments with graphs, and digital read-out displays, just elegant black on white chronograph dials. The buttons and stalk controls (always a give-away as to overall quality) feel good, and there are all the electronic mod-cons you'd expect of a car in this or a higher price range. The fully adjustable steering wheel meant that I didn't have the same MV back problems that had plagued me in the 33, and both the pedals and gearstick are correctly placed. The only really worrying aspect was that on several occasions, as I rested my left arm by my side, I accidentally managed to undo the seat-belt with my elbow. Sounds silly, but it could be fun if you then have to heave on anchors.

The styling of the 75 is really so distinctive that it can only bring out strong reactions in people, although that in itself is no bad thing. Personally I'm not wild about its cumbersome shape, and infinitely prefer the 164, but on the other hand I do recognise and appreciate that the 75 is definitely not conforming to the EuroShape ideal; one couldn't really mistake it for a Sierra/Cavalier/Peugeot 405 etc, and on those grounds alone I could grow to like its looks.

So, despite one or two niggles my overall impression of the 75 Cloverleaf is that it is a good value and well sorted out performance car. For £17,300 what else can you get with 192 bhp on tap and an engine that you could happily put on a plinth in your front hall? Where else can you go for that elusive and priceless quality, character? CSR-W





The new 24-valve, twin-cam engine is tilted over at an angle of 30 degrees in the engine bay.

A New Chapter

When you are a car manufacturer, it must be very difficult introducing a new engine. Everyone is interested in a new model, and so it is not difficult to spread the word about it, but when the innovation is under the skin, you can almost hear the audience yawn from the footlights. And yet the development of a new engine or gearbox will run into millions of pounds. At the Motor Show, BMW introduced two new 24-valve engines, but the announcement was somewhat muted against a background of new models. Nothing beats the arrival of bent metal beaten into a new shape.

At the moment these engines, a 2-litre and 2.5-litre, are only to be found in the 5-series, but will take a more public bow in the new 3-series arriving very soon. Their presence in both the 520i and 525i, though, is being kept very discreet for there is neither badging nor decal to give the game away. For all the owners of post June '88 (new 5 series shape's arrival in Britain) and pre-November '90 520is and 525is, this must be good news, for they will not suffer too much in the secondhand market, but for the owner of a new model with the multi-valve, it is not such good news — you've got nothing to show off about.

So what is this new engine? Is it a conversion to the head only or have BMW gone the whole hog and created a new unit? Well, to answer the latter question first, BMW have swallowed hard, considering the popularity of the 13-year old

12-valve units, and come up with a completely new engine, albeit with the same cubic capacity. Why? There was only so much further the older engines could be developed, and one has to bear in mind that with tougher American and European legislation demanding cleaner and more fuel efficient cars, BMW needed a more state of the art unit as a base from which further developments could be made.

At its most basic, BMW have presented a 24-valve, twin-cam unit which develops a little more power, and yet is more fuel efficient and had been designed from the word go to be altogether friendlier to the environment.

The 24 valves nestling in the head are driven by cup tappets with hydraulic play-compensation units while the two camshafts are driven separately by single-row, maintenance-free chains. The six spark plugs are located between the two cams and have their own individual coil. All this is done in the name of reliability and easier servicing.

Other features include a plastic intake manifold with ultra smooth intake walls, a cast cup-type flywheel on the 2-litre and a two-mass flywheel on the 2.5, and a torsional vibration damper for greater refinement. Most importantly, though, is the arrival of a new engine management system, BMW's M 3.1 Digital Motor Electronics, without which the engine could not function. In both the 520i and the 525i the engine has been tilted over at an

angle of 30 degrees to the right so that the bonnet does not have ugly and unaerodynamic lumps and bumps on the top.

Despite the extra size and extra valve gear needed to drive both camshafts and 24 valves, the new units weigh only 12 kgs (26 lbs) more than the units they replace, but both produce substantially more power. The 2-litre now develops 150 bhp and the 2.5-litre 192 bhp, 21 bhp and 22 bhp more respectively than the superseded units. This is reflected in the cars' performance figures which show that the 520i has a top speed of 131 mph and can accelerate from 0-62 mph in 10.6 secs and the 525i a top speed of 143 mph and an acceleration figure of 8.6 secs.

Torque figures are correspondingly increased with the 520i being 140 lb ft at 4700 rpm and the 525i's 181 lb ft at 4700 rpm, an availability which made an 800 mile journey from London to Salon de Provence all the more relaxing. It was the smoothness of the unit which impressed most, though, the 2.5-litre we were driving never protruding into the cabin. The new 24-valve engines have moved the 5 series even further up the executive class scale. Economical? Well, we found that we were returning an mpg figure that was between 24 and 25, the tendency being towards the lower figure. Considering that the great percentage of the journey was on the autoroutes at speeds in excess of 90 mph, in fifth gear which in the new gearbox is not an overdrive ratio, petrol consumption would not figure high on the list of buying priorities.

On the other hand, if you want the status of a 5-series BMW sitting outside your house, fuel consumption, unless awful, would not be a major consideration, but things like image, comfort and a certain amount of performance are, and in all three areas, the new small six 5-series deliver.

For those who like to take their comfort a little further so that they do not have to change gear, BMW have proudly announced their new 5-speed automatic box, the first such production unit in a saloon. We only had a short journey in a 525i with this box, and although not this reviewer's cup of tea, the benefit of such cars in urban driving is well appreciated. BMW even claim that the automatic models are more fuel efficient than the relevant manual versions.

Equipped with three options — "sport", "economy" and "winter" — I found that it was worthwhile keeping it in the less economical "sport" mode, where fifth is hardly selected, to stop the constant changing gear. After a while it becomes decidedly irritating as it hunts around for a gear.

As you would expect, the new models do cost a little more than the superseded ones, so that prices are now £18,915 for the 520i, £20,840 for the 520i Special Equipment, £22,490 for the 525i and £24,200 for the 525i Special Equipment. The automatic option costs £1315 on all models.

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The aerodynamic aids and modifications to the bodywork have enhanced the looks and made the Carlton look more aggressive in its Lotus guise.

Engineers and accountants — the two professions are at opposite ends of the spectrum; the ultimate goal may be the same, but the targets are vastly different. On the one hand you have a group of men determined to do everything to a predetermined price, while the other group have problems of a practical nature, but whose ultimate *raison d'être* is to extend the frontiers of technology. As tooling up costs in the motor industry now reach billions of pounds, the influence of the money men is far greater today than that of the engineers. Every so often, though, the management do let them have one last fling.

It is to General Motors' great credit then that they have gone ahead with the Lotus Carlton. Who would have thought that the mighty General, once so opposed to cars of this nature, would authorise such a vehicle. The work may have been carried out by one of its smaller specialist satellites, Lotus in this case, but you can rest assured that the decision could only have come from the very top in Detroit.

Some have made the cruel jibe that having acquired Lotus Cars, what on earth were GM going to do with it and that the answer was to keep them quiet developing and producing a four-seater executive rocket. It would have been much easier, less expensive and quicker to have badge-engineered the top of the range Cavalier into a Lotus Cavalier. Again, much to GM's credit, they did not do so.

So what is the Lotus Carlton? Is it a badge-engineered job, albeit of a more exclusive nature, and does it justify the criticism it has received from some quarters of the population?

It must have been a dream come true for the Lotus engineers when they were told to

develop the 3-litre Vauxhall Carlton, which was already a good car, into a class leading performance car which had to reach 0-60 mph in under six seconds, have outstanding handling and braking, have efficient aerodynamics and yet still be a comfortable four-seater. You could almost see them rubbing their hands with glee at the mouth-watering prospect.

Naturally development fell into different areas. The engine, where 100 bhp per litre was the target, came in for a lot of attention. To begin with it was enlarged, stroked out to 3615cc (95mm bore x 85mm stroke) and turbocharged, which naturally necessitated a wholesale change internally and externally. The forged aluminium pistons, for example, have been supplied by Mahle and have a specially treated graphite-impregnated surface while the crankshaft has been uprated to complement it.

Externally the cylinder block has been reinforced, there is a new induction system including manifold and throttle bodies, and an increased coolant flow to cope with the increased heat from the two relatively small Garrett T25 turbochargers. Unusually for a production car they are water, not air, cooled with its own plumbing arrangement which is not linked to the main water system, this over-design enabling the engine to be run flat out at maximum torque while at the same time eliminating turbo lag.

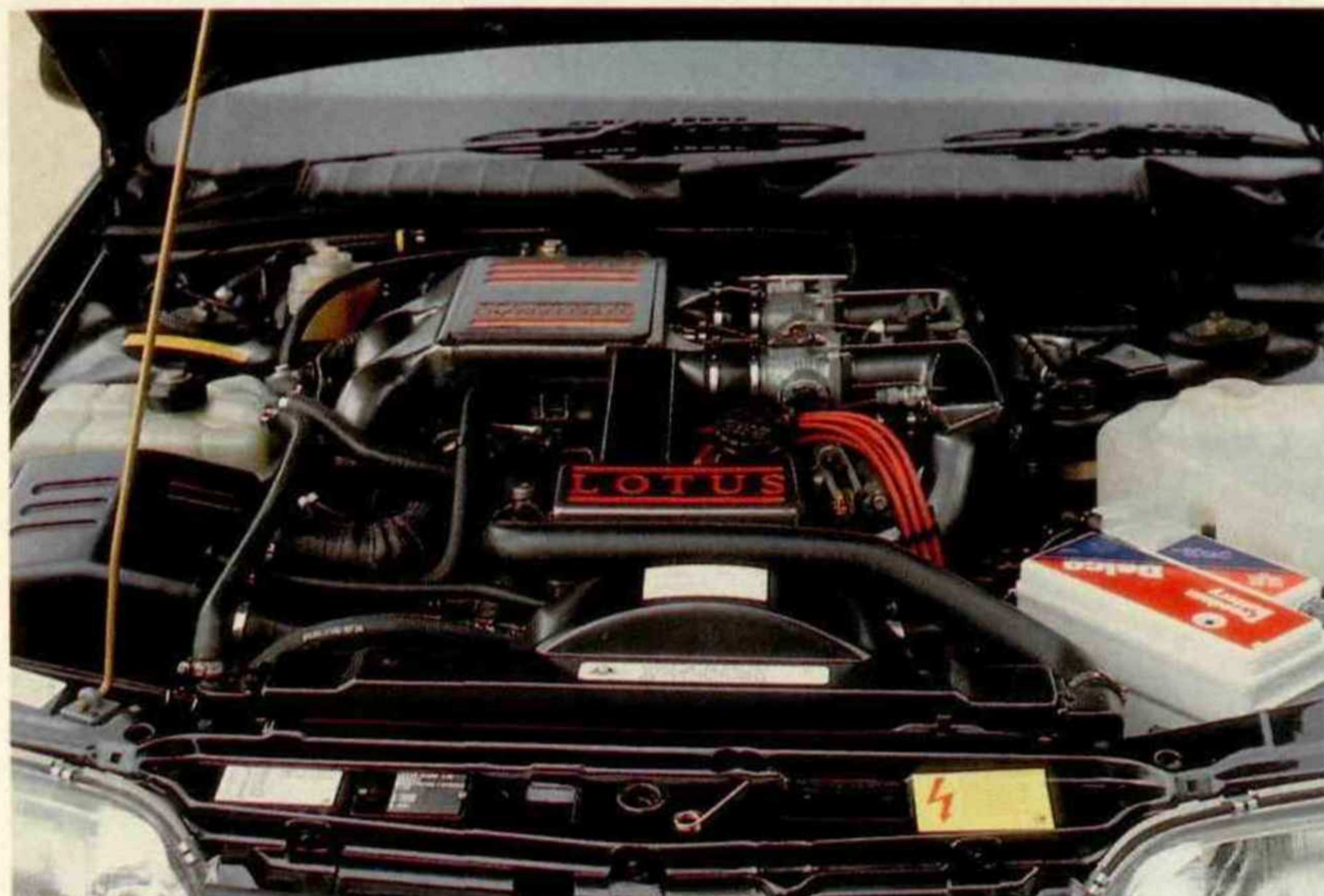
To meet the tough US 83 and Swiss emission regulations, the car has two closed-loop ceramic catalytic converters and therefore has a cleaner exhaust than that required in the rest of Europe. It will run on 92, 95 or 98 RON lead-free petrol, but runs best on the highest octane, losing, for example, 30-35 bhp on 95 RON.

The spark timing and boost are controlled by a new Delco system which, unlike the Bosch equivalent, measures the speed density air flow for a more efficient operation. Each pair of spark plugs has its own coil, a distributorless ignition system which ensures optimum efficiency at high rpm.

To accommodate the 377 bhp achieved, beating the 100 bhp per litre target, and the 419 lb ft of torque, there is a new 9½ inch Fichtel & Sachs pull-type clutch. The gearbox itself is the six-speed ZF gearbox, the central part of which has been virtually carried over complete from GM's Chevrolet Corvette. Overall transmission refinement and the reduction of gear rattle has been achieved by using a dual-mass flywheel which is interconnected by springs and hydraulic damping.

The rear axle, with a ratio of 3.45:1, is a development of the Holden unit, built in Australia and unique to the Lotus Carlton. The limited slip differential has a very low setting.

The suspension has been substantially modified with alterations to the MacPherson strut at the front and redesigned geometry at the rear. It is still semi-trailing, but there is now an extra link between the hub and the new rear axle while the whole system has been lowered by 15mm; both changes are designed to reduce the disadvantages associated with this type of suspension set-up. All the bushes have also been changed so that the springs on the Lotus Carlton are in fact softer than the base Vauxhall which means that the dampers are more in control of the ride motions. The toe-in, which is negligible when stationary, become slight toe-out when the car is on the move, a design made to reduce the chances of



The twin turbocharged 3.6-litre engine which develops over 100 bhp per litre.

sudden snap oversteer.

330mm ventilated front and 300mm ventilated rear discs are fitted to the car which comply with the basic guidelines evolved over the years at Hethel about the size of brakes required. The one-piece discs have been selected for durability and economy. The four pot calipers on the front and the twin pots on the rear have been supplied from AP and are the result of that company's Group C programme, but modified for Lotus' needs on the Carlton. Road-type asbestos-free pads are fitted as standard but are of a good enough quality to live with circuit use if necessary.

The four-channel electronic anti-lock braking system has been recalibrated for the Lotus Carlton as Vauxhall were not convinced that the standard system was up to par, although in Lotus' opinion it gave the best overall performance.

Engine torque, more than anything else, dictated that a 265 section tyre was the smallest tyre possible on the rear. At the same time, the size of the brake disc dictated that a 17" wheel on the front be used and that a 235 section was the most sensible choice. The result is specially made Goodyear Eagle 235/45 ZR17s on the front and 265/40 ZR17s on the rear fitted on one-piece wheels designed and produced by Ronal in Switzerland.

The aerodynamic additions to the car are the result of wind tunnel tests in Stuttgart. The impressive Cd figure of .307 has been achieved despite increased frontal area with the wide tyres and the addition of two very large oil coolers which have been integrated into the front of the car. At the rear is a wing which ensures zero lift and yaw and helps stability. There have also been modifications to the wheel arches — those at the rear, for example, have been cut away which transforms the look of the car — and there have been GRP additions to the lower half of the doors, rear bumpers and



A view most people will see.

side mouldings.

Much work has been done on NVH (noise, vibration, harshness) to reduce interior noise, the main source of which is the tyres. Much to the engineers' astonishment, one of the main gains in this area was by carpeting the boot.

The seat frames are a carry-over from the original car, but have been retrimmed in Connolly leather at Lotus. Each car is identified by its own limited edition number on the glovebox and you can choose any colour as long as it is GM's Empire Green pearlescent paint — a shade of black by any other name.

Altogether there have been 1000 new components which have gone into the car and the engine is totally built from parts. There are a total of five engine builders at Lotus and each one is responsible for an engine from start to finish.

A morning's run in the car was enough to appreciate that here was a car that was special. We were allowed to take it to the Proving Ground at Millbrook where we could run it round the two-mile High Speed Bowl. The automatic levelling suspension — which maintains the camber at all times for stability and tyre durability — worked here against us as it would have been fooled by the Bowl's banking and would continually try and adjust itself. We were thus restricted to a mere(!) indicated 140 mph.

I have been on this banking before at

speeds lower than this and have found even some performance cars have been a handful, but the Lotus Carlton reached this speed with such finesse and lack of fireworks that one felt "so what", it was that impressive.

Around the tight and twisty, slightly damp handling course, the car was sure-footed, although on the exits the tail could be made to go out of line by stomping down on the throttle. That the car was remarkably stable, though, was proved by the fact that when braking or lifting off while cornering, the car did not twitch.

Apart from the sheer speed of the machine, the most remarkable aspect was the tractability. Although the maximum 419 lbs ft is available at 4200 rpm, some 2000 rpm before the red line, 300 lbs ft of it is developed at just 2000 rpm. 30-50 mph takes just 3.3 secs, 40-60 mph 2.9 secs, 50-70 mph in 2.8 secs and 70-90 mph in 3.1 secs, all in third gear are the mid-range acceleration figures. Fourth gear almost becomes redundant and such is the tall gearing in sixth — over 40 mph per 1000 rpm — that it is utterly pointless. In fact it would have been better if sixth gear had been blanked off for it really serves no useful purpose, other than perhaps in Germany.

On the car we drove, number 004, the build quality was a little suspect. There was a rattling gear lever knob for example and the gear change was very notchy. It was so solid that one could well have been driving a Scammell truck.

With those great wide wheels there was a suspicion that the car might tramline, but in the test route we were given, this phenomenon was barely experienced.

Altogether it was a mean machine. Following another one, it was the wide rear wing above the fat, chunky tyres which was the most impressive sight. Should you be overtaken by one of those cars you know the driver means business.

There is no obvious rival to this car. The BMW M5 leaps to mind as does the Alpina BiTurbo, but the former is not so powerful and the other is £12,000 more expensive at £60,000 and only available in left-hand drive.

Altogether only 1100 are going to be made, at the rate of one a day, over a 36 month period, 440 of which will be staying in Britain in right-hand drive form. They are sure to be snapped up.

As a model it joins the Calibra in stretching the boundary of where Vauxhall is. GM cannot hope to amortise the cost of the operation over just 1100 cars, but that is not the intention. It is primarily an image builder, one that Vauxhall needs, for it is not the products of that company but the name which puts many people off, especially in the upmarket executive car bracket. If the everyday Vauxhall Carlton can be perceived as a junior Vauxhall Lotus Carlton, then the whole exercise, bad publicity and all, will have been worthwhile. It also kept the lads at Lotus busy as well. WPK



The short length of the car is disguised and only becomes apparent when viewed in the flesh.

A Successful Gamble

Lotus cars and high risks have always been synonymous. The December 1982 death of Colin Chapman and the 1986 acquisition of Lotus Cars by General Motors has created a different company, but one that is still prepared to risk its ultimate survival on a 35 million gamble. The innovative front-drive Lotus Elan thoroughly deserves the emotive name of the most successful Lotus production car, for it successfully challenges many traditional sports car engineering assumptions in a manner that surely would have earned the approval of founder Colin Chapman.

The turbocharged variant of the 1989 Elan debutant is coded SE and now costs £21,620 rather than the publicised launch cost of under £20,000. A normally aspirated Elan, lacking the standard power-steering of the test SE, now retails at £19,200. The 27 Lotus dealers in Britain have been inundated with orders; the waiting list stands at "about two years" in the words of Lotus sales.

Is it worth waiting for, probably leaving more than £500 as a deposit at one of the dealers for 24 months?

We have now driven four examples of the new Elan, one performing faultlessly throughout full test procedure. The 135 mph top speed and an ability to set unmatched cross country journey times (aided by 0-60 mph acceleration in 6.5 seconds) are wrapped in a compact package that demanded cheaper unleaded fuel at the modest rate of 26.6 mpg.

TECHNICAL ANALYSIS

Lotus personnel strongly deny that their GM parent forced them to pick front-drive components centred on GM-owned Isuzu 1.6-litre engine and gearbox, but it is undeniable that much of the development work utilised previous Lotus shareholder Toyota's 16-valve powertrain. To the point where that company's hatchback saloon provided a development home for the patented Lotus "compliance raft" front suspension.

The earliest Elan front-drive prototypes established the need to allow wheel fore and aft compliance without lowering Lotus standards of handling. Lotus engineers

Roger Becker, John Miles (former Grand Prix team-mate to Jochen Rindt) and Jerry Booen persisted with a layout that is now in heat-treated alloy. It provides a separate input point for front suspension loads that allowed consistent geometry; good resistance to the effects of front-drive torque steer and very stiff wishbone bushes to control wheel movement under heavy braking or acceleration forces. In the writer's opinion it is the most effective solution to the ills of powerful front-drive machinery, making the Elan a credible sporting entity.

The company conscientiously ensured that rear suspension was more than the usual hot hatchback recipe of a dead axle earning its keep by merely keeping the back wheels upright. One major consideration was providing a pitch-resistant ride on a wheelbase of 88.6 inches (similar to a Metro), so both front anti-dive (10 per cent) and "a small degree" of rear anti-lift were incorporated.

As at the front, a coaxial spring is wrapped around a twin-tube telescopic damper, one that is mounted at its upper end on the pressed steel chassis. A wide based lower



The scalloped skirts are a little more apparent at this angle.

wishbone is provided, along with upper links and diagonal linkages to control carefully back wheel movements.

Is this all too much trouble without rear drive? A Lotus engineer's eyes lit up when he said, "But it is the best system for wheel control. Should we ever power the rear wheels as well as the front, it would be excellent in that application as well."

A written description of the mixed glassfibre body and backbone chassis can tempt one to think this is a traditional reincarnation of the 1962 Elan formula, but the execution is far more complex, vastly stronger and looks daunting to manufacture. To allow design freedoms that are not available with the traditional Lotus "bath tub" mouldings, the Elan utilises multiple smaller panels that are bonded or riveted (both in the case of the floor moulding) to the steel chassis, or its outrigger extensions.

The Lotus VARI process continues to mould glassfibres, but Ashland Chemicals in the USA supplied "a unique material" to assist shrink resistant resin preparations. Quality is visibly better than in any Lotus outside the current Esprit. Lotus production tooling has been substantially replaced to suit higher production rates, anticipated at 3000 a year but running around 1750 per annum during autumn 1990. Lotus patented Fibrefoam reinforcement allows strategic strengthening and sharper panel edging than before.

Lotus are proud of the reduction in manufacturing time over the Esprit, 178 hours for Elan versus 550 for the mid-engined machine, but the Esprit ensured the survival of Lotus cars whilst the front engine rear-drive Elite/Eclat/Excel series withered.

I must confess to misgivings when I saw that Lotus were to use an Isuzu motor, rather than a Toyota unit, as obsolete

experience made me feel Isuzu were good only at rough and ready power supplies. In fact, Lotus had been extremely smart and spotted the potential of a new "squarish" (80 x 79mm) Isuzu 4XE1-MT unit which was further tailored to squeeze under the rakish Peter Stevens bonnet line. Its abbreviated iron block is topped by an aluminium head that features most of the items guaranteed to quicken the hearts of 1990 marketing men: four valves per cylinder, belt-driven DOHC and electronic management of ignition (Delco) and injection (Rochester).

Few customers presently dispense with the 30 bhp bonus that comes via IHI turbocharger and intercooling, but we are told by one of the largest Lotus dealers that the

130 bhp normally aspirated version is "a good drive, and some customers may like it better without the power-steering of the turbo."

CABIN

Lotus like to make entry into an Elan after dark something of a challenge. You have three keys in the old kit car manner: the smallest for door/boot and the others for ignition glove box. Not one key boasted the now widespread torch pencil beam light, and the Lotus locks proved progressively more obstructive throughout the week, although the central activation was faultless.

The driving mood within the cockpit is ruled by whether you have the hood up or down. We had enjoyed many sunny summer miles with that simple and unlined hood folded within its glassfibre "flip top" rear deck lid, but for our third Elan experience the initial days were spent with the hood up and plenty of soggy motorway miles to complete. Memories of the stimulating summer miles fade immediately as you catch the strong whiff of glassfibre that says "new Lotus" followed by the discovery of a distinctly damp storage area aft of the seats.

Initially screen misting occurred, but we found that directing (with a soft hiss of obedience from beneath the dash) air flow through the cabin, rather than just at the screen demist position, cleared all areas of and folding perspex with alacrity. Thereafter, driving the hooded Elan was a pleasure only spoiled by the usual lack of three-quarter and direct rear vision. Noise levels to 90 mph were commendably low, and it was only at the test track, travelling beyond 120 sustained mph, that the disturbed air gushed into noisy prominence.

Primary controls are logically arranged, although the battery of red readings from seven dials is overpowering. However we found the test seating a vast improvement in appearance over the striped leather items of



The unlined hood is easy to erect, but it does cause a certain amount of loss of rear vision.



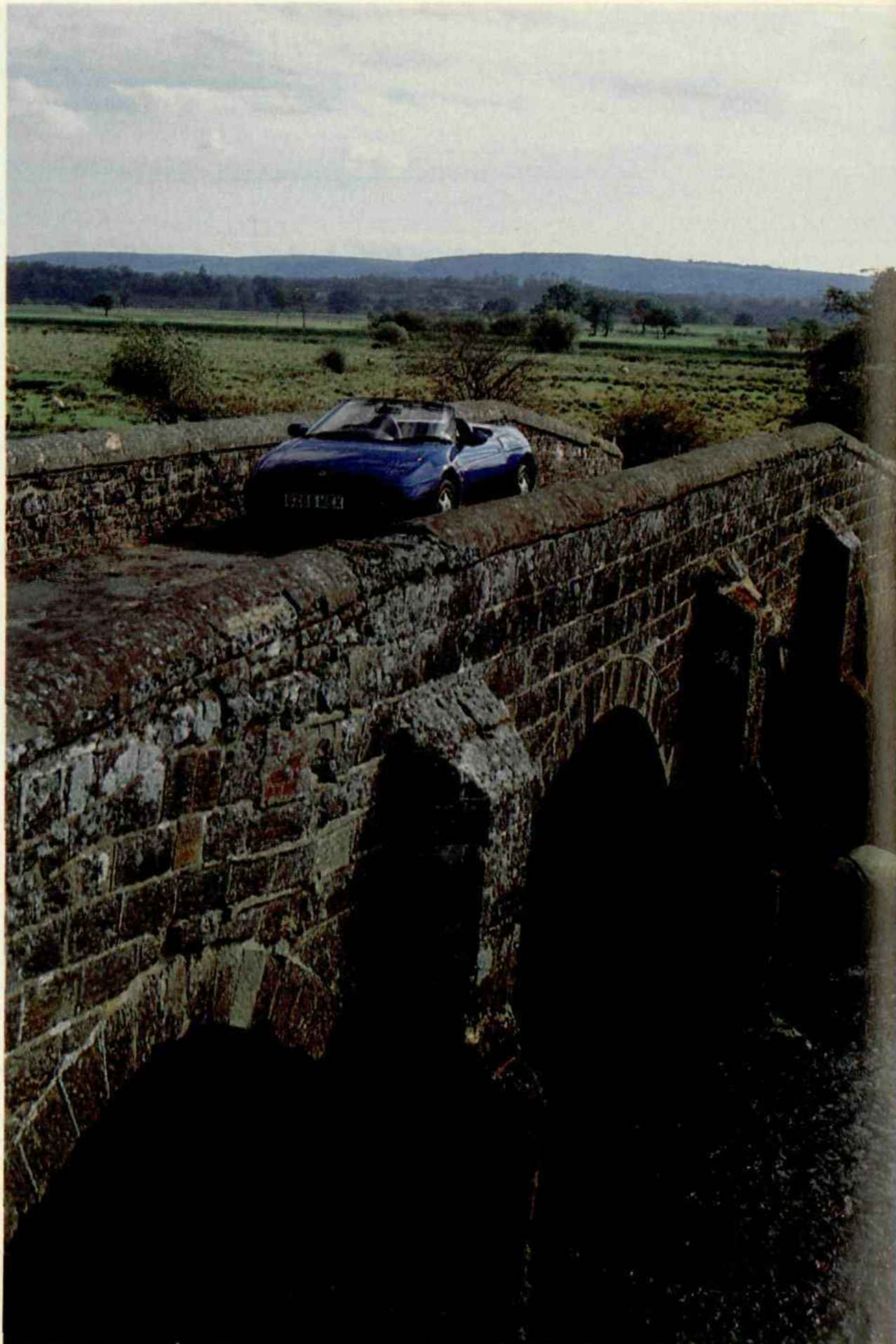
The Lotus Elan is strictly a two-seater.

earlier demonstrators, toning a modest plaid in greens and blues to exterior plastics that deserve "tried hard, but could do better," reports. There is also an enormous ridged plastic plain that fills the void between fascia and the farthest extremities of the raked screen. Matt black moulding that could be more attractive.

We did have an isolated problem with backache in the cloth seat equipped Elan, and a Lotus engineer suggested that this may have been due to the difference in backrest contour between leather and cloth when under correct trim tension. The seating admirably compromises accessibility in a low cabin with comfort and a firm grasp of the occupants. Most boastful instruments was the 170 mph speedometer, but the Elan did display a best reading of 150 mph at 7000 rpm when actually averaging 135



Partially hidden in this picture, the Isuzu name on the cam cover is the most noticeable aspect of the engine.



Whether an "Airfix kit" or a classic car in the making, the Elan evokes a reaction wherever it is.

mph. At lower speeds it became commendably close to the truth, reading 70 mph when the car was actually travelling at 67 mph. We depended on the rev counter to allow 7000 of the 7200 rpm advised as safe in the handbook and noted that boost gauge displayed 0.5 bar of the publicised 0.65 bar in three of "our" Elans.

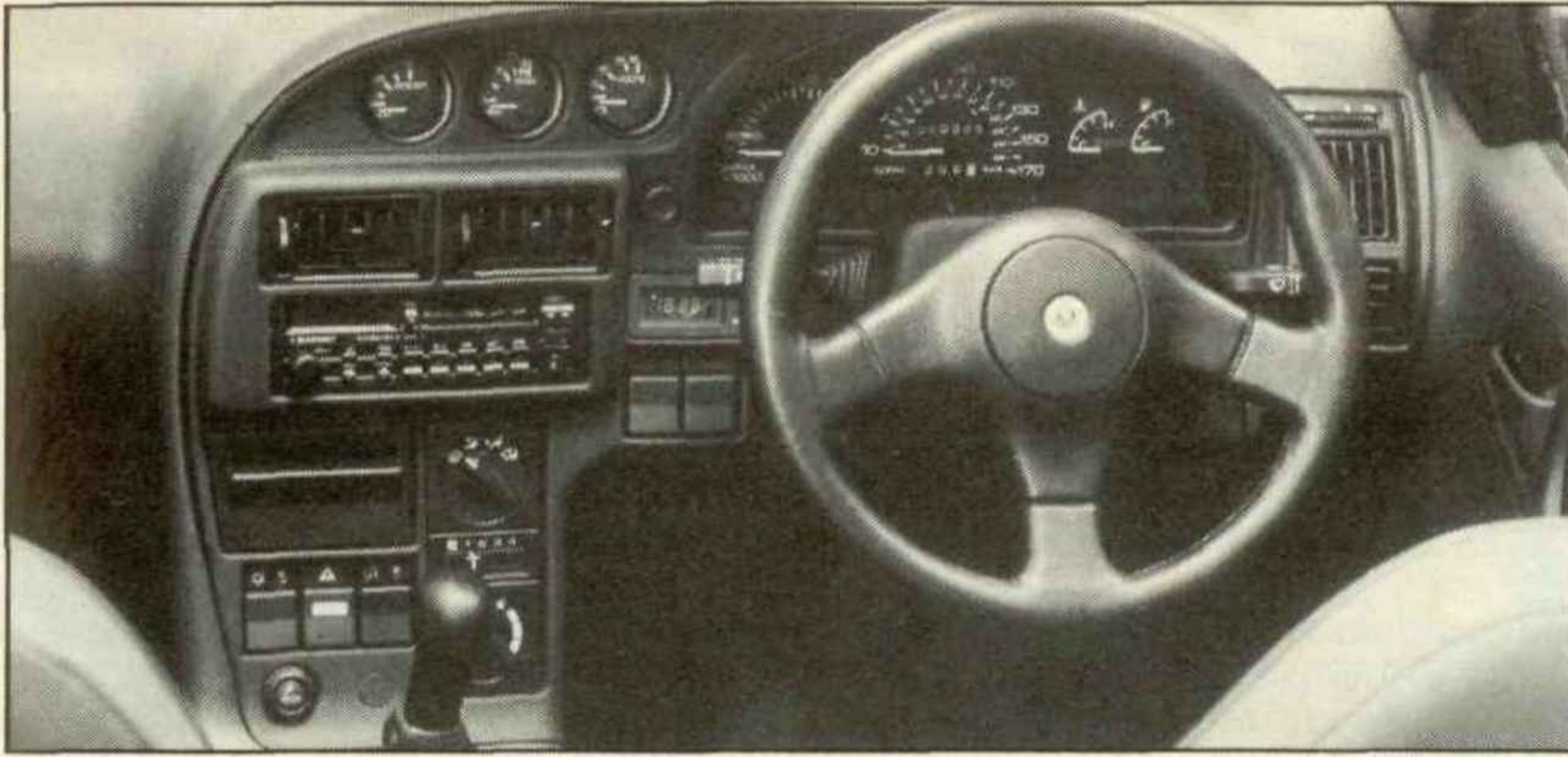
The driving position always seemed to suit shorter (under 5 ft 9 in) inhabitants, despite a lack of adjustment for column or seat height. No formal footrest is supplied, but there is plenty of space around the clutch for an idle left foot. The same cannot be said of the right hand foot controls, which are bunched together in a manner that caught out even-size sevens at play on throttle and brake. It was not a mistake to make more than once. . . .

ACTION

"It's just like driving a normal hatchback," said one surprised newcomer, and therein lies the key to the character of a new Elan generation. For it is not without flaws for the purist in pursuit of memorable miles.

Whatever the weather, that intercooled 16-valve unit started fast, displayed no temperament and went about its business just like any member of the hot hatchback generation. Now Lotus had just such ex-Peugeot/Golf GTI drivers in mind during development, but we are not convinced that the Isuzu Lotus motor does not carry the everyday theme a tad too far, its exhaust note veering toward a drone, even when happily exploring 7000 rpm.

The five-speed transmission is also a



Primary controls are logically arranged but the battery of red readings from seven dials is overpowering

reminder of the hatchback world. Not the best, but lightly cooperative and part of a powertrain that is three decades away from the Sixties Elan "doughnut wind-up" hiccups that entertained so many in urban traffic. Yet the gearbox is flawed, not by its own mechanism, but by the coincidence of a spring-loaded gate with a bias in the third-fourth plane, plus a tall transmission tunnel cubby box, all of which conspire to prevent clean fifth to fourth downchanges.

The measured performance was all that we had hoped for, particularly in damp conditions. Standing starts are a real trial for a powerful front-drive car under such circumstances. Particularly when adding the vagaries of turbocharger boost inevitably arriving in full measure, just as the front wheels are feeling the effect of weight transfer, and consequently reduced adhesion.

Unless we were too enthusiastic with the crankshaft rpm, the Elan SE took off cleanly. The provision of comfortably more than 60 mph in second gear immediately provided the six and half second times recorded in our data panel. As for the power delivery itself (with boost from little over 2000 rpm), there

is a consistent stream of acceleration. Our 0-100 mph time of less than 20 seconds emphasised this point, for conditions were most difficult at this stage. Yet the Michelin shod Elan moved away with none of the wheel scrabbling drama that would have been present in any other front-drive design of 160 bhp and low kerb weight.

There are limits to the miracles that Lotus engineers have wrought in calming the undesirable elements in powerful front-drive, but they are so well masked that it takes an outright performance session, or a provocative foot on less than perfect surfaces, to demonstrate wheelspin and the gentlest power deviation (torque steer) from course under duress.

Generally, you show the Elan a corner, it swoops around it with unmatched poise, and that is the end of the matter. Some dislike this absence of "Macho man" wheel wrestling, I admire its efficiency and gain pleasure from absorbent manner in which the Elan SE digests distance and rougher roads at improbable averages. It also gently massages driver ego by calmly carrying out even the crassest commands with a fluid

grace that I have not experienced in any other road car. Elan security over varying surfaces even takes you into a handling land where only 4x4 normally provides such equitable stability over so many diverse road conditions.

If we had to quarrel with any aspect of Elan handling character, it would be with the steering. The hissing effects from the power-steering on the extremities of lock are an unprofessional touch at £21,000+ and the miracle wrought in the transformation of front-drive handling quirks has not included providing any steering joy. The Elan goes where it is pointed, swiftly and accurately, but the steering communicates absolute conditions such as grip/no grip, rather than "I'm having fun, do you want to join in?"

A quartet of disc brakes is a match for the explosive acceleration; the pedal is weighted sensibly to avoid premature locking in the wet and retardation is excellent. This aspect of Elan motoring would receive a perfect score if it were complimented by the electronic ABS availability that has now materialised across the Esprit range.

CONCLUSION

There was not universal admiration from those that rode or drove the new Elan, one detractor describing it as "That... Airfix Kit!" We think of the new Elan as that automotive rarity, a car without a true rival. The Elan opposition offers no equivalent recipe for efficient speed in a handy package, and we would venture that none could make it work as well as Lotus. Stepping outside the Elan front-drive format and discussing new £21,000 sports cars in general, we look forward to assessing the new TVR Griffith V8 for that promises 3.9 litres of V8 entertainment.

As in 1962 the Elan remains an original high performer that will be valued more for its appearance, and enjoyable efficiency, rather than the technical triumph of its civilised front-drive formula. JW

MOTOR SPORT TEST RESULTS — LOTUS ELAN SE

Test conducted at Millbrook Proving Ground using Correvit electronic measuring gear. Weather conditions: Dry/damp patches

ACCELERATION

0-30 mph	2.8 seconds
0-40 mph	3.9 seconds
0-50 mph	5.3 seconds
0-60 mph	6.5 seconds
0-70 mph	9.4 seconds
0-80 mph	11.6 seconds
0-90 mph	14.0 seconds
0-100 mph	19.1 seconds

GEAR SPEEDS (@ 7000 rpm)

First	37 mph
Second	65 mph
Third	93 mph
Fourth	120 mph
Fifth	135 mph (@ 6462 rpm)

FLEXIBILITY

Third gear	
50-70 mph	4.4 seconds
Fourth gear	
50-70 mph	6.2 seconds
Fifth gear	
50-70 mph	8.6 seconds

Standing quarter mile/400 metres: 16.1 seconds @ 90 mph

Maximum speed: Millbrook 2 mile bowl: 134.5 mph

Overall Fuel Consumption Test: 26.6 mph

Government mpg figures Urban: 26.2 mph
@ 75 mph: 42.2 mpg
@ 56 mph: 31.8 mph

SPECIFICATION

ENGINE: Isuzu Lotus inline 4-cyl, iron block, alloy head. DOHC, 16v, IHI turbocharged to 0.6 bar/9.4 psi max. Capacity: 1588cc (80 x 79mm). Electronic fuel injection, 8.2:1 cr.

Max power: 165 bhp @ 6600 rpm. Peak torque: 148 lb ft @ 4200 rpm.

TRANSMISSION: Front drive 5-speed transaxle. No limited slip differential, final drive 3.833:1.

GEAR RATIOS:

First	3.333	5.20 mph per 1000 rpm
Second	1.916	9.04 mph per 1000 rpm
Third	1.333	12.99 mph per 1000 rpm
Fourth	1.027	16.86 mph per 1000 rpm
Fifth	0.829	20.89 mph per 1000 rpm

BODY: Multiple sections of mixed steel tube and box sections with glass reinforced fibreglass and VARI moulding floor. Separate chassis in zinc coated steel. Drag coefficient (hood up/down) 0.34/0.38 Cd.

DIMENSIONS: Wheelbase, 88.6 inches/2250mm; front track, 58.5 in/1486mm; rear track, as front; length (Europe only), 149.7 in/3803mm; height

(soft top up), 48.4 in/1230mm. Kerb weight: 2249 lb/1020 kg, distributed 66% front, 34% rear.

FRONT SUSPENSION: Patented compliance raft alloy subframes, plus double wishbones and coaxial damper/spring units. Tubular anti-roll bar with drop linkages, 22mm. **Steering:** Power assisted rack and pinion, 2.9 turns lock to lock.

REAR SUSPENSION: Coaxial spring/damper units mount to chassis "towers" at the top. Wide based lower wishbones, single upper suspension arms with separate links down to bottom wishbones. Solid 14mm anti-roll bar has chassis linkage.

BRAKES, WHEELS, TYRES: Vented 10 in/256mm front discs; solid 7.3 in/236mm rears. Lotus branded OZ Ruote 6.5J x 15 alloy wheels. Michelin MXX2 205/50 ZR 15.

PRICE: £21,620, UK taxes paid. Option on test car, Blaupunkt RDS stereo (£350) adds a total: £21,970. Other options are: air conditioning, £1,070; leather seat facings/trim panels (£850); metallic paint (£680); colour keyed carpets (£220).

CLAIMED PERFORMANCE: Max speed, 137 mph; 0-60 mph, 6.7s; standing 0.25 mile: 15.4s.

MANUFACTURER/IMPORTER: Lotus Cars Ltd., Hethel, Norwich NR14 8EZ. Tel: 0953 608000.



Fred Bennett, the one-time importer of Cadillac cars, with the 1903 model he drove in the 1903 1000-mile Trial and used for a re-enactment of that event in 1913 and again in 1953 when he was 79 years old.

Veteran Car Marathons

At this time of year the interest caused by the recent RAC/VCC Veteran Car Run from London to Brighton, an event which attracts a really large number of pre-1905 cars and an equally astonishing number of onlookers, produces a spin-off in veteran car memories. Last month we explained the origin and subsequent developments of the Brighton Run.

A much better organised and altogether more influential happening occurred in 1900, in the form of the 1000 mile Motor Vehicle Trial organised by the Automobile Club of Great Britain and Ireland. Although the Emancipation Run of 1896 had been held not only to celebrate the newfound freedoms of autocarists but in the hope of showing non-believers and the uninitiated that horseless carriages were a substitute for horses, the full aim was hardly realized. On the contrary, the 1000 Mile Trial achieved this aim far better. It took place in April and May, when more people were likely to watch the passing vehicles than on a foggy November day, and it went round much of Britain instead of just between London and Brighton. Moreover, the competing vehicles were displayed at one-day shows at the stopping places and were on view at the Agricultural Hall, Islington, on the Saturday prior to the start and for a week at the Crystal Palace on their return.

This ambitious Trial was a real attempt, albeit a brave one, to show off the new-fangled motors to anyone who was interested. One who was interested was HRH The Prince of Wales (HM King Edward VII), who soon afterwards purchased his first Daimler, a make which predominated with royalty until the Rolls-Royce found more favour in recent years. The route of this demonstration-cum-trial of 90 years ago was London-Bristol, Birmingham, Manchester, Kendal, Carlisle, Edinburgh, Newcastle, Leeds, Sheffield, Nottingham and back to London, a distance of 1060½ miles. In addition, there was an optional speed trial at the Duke of Portland's Welbeck Park, over a road which still exists, as MOTOR SPORT described some time ago, and the formidable hills on the route included the 2½-mile Taddington Hill near Buxton, Dunmail Rise near Kendal, and Birkhill near Moffat, while an ascent of Shap Fell was optional. For those who attempted the entire test the mileage rose to 1108½, a formidable distance in 1900.

Nevertheless, 83 motor vehicles were entered and 65 duly started from Hyde Park Corner. As with the Brighton Run, in 1896 and today, the 1000 Mile Trial was not a race. Indeed, strict speed limits were observed. In London the drivers were restricted to 8 mph for the initial 4½ miles, were allowed to increase this to 10

mph, if they could, for the succeeding 6½ miles, thereafter being permitted to proceed at up to the then legal limit of 12 mph, in England and 10 mph in Scotland, although Maidenhead imposed a speed of 6 mph and extracted a Bridge toll of 8d on four-wheeled cars.

After this long passage of time there is little point in trying to record all that befell those intrepid pioneer autocarists, except to say that FTD in the Welbeck speed trial was made by the Hon CS Rolls's 12hp Panhard-Levassor, at 37.63 mph averaged over the mile uphill and mile downhill course. There was a tie for second place between an 8hp Napier and an 8hp Panhard. Ascents of the aforesaid hills were also timed, FTD up Taddington being made by an Ariel motor-tricycle, at 18.9 mph, Tolls's Panhard next best, at 17.7 mph, while up Shap Fell from the three-quarter mile from the Bay Horse Inn to the summit, an Empress tricycle was quickest, at 14.48 mph, with Rolls second, at 13.29 mph. However, Rolls had his revenge up the 3000 yard, 1 in 8½/1 in 11, Dunmail Rise, beating Lord Iliffe's Enfield Quadricycle. Not bad times, surely, back in 1900? When the adventurous finally got to the finish in Whitehall, 12 had been successful, the vehicles they drove consisting of three Daimlers, two Panhards, two Ariels, a Napier, a de Dion Bouton, a Gladiator, a Wolseley and an MMC.

These days, of course, all manner of very creditable long endurance journeys are being accomplished by vintage cars, from that great marathon to Australia by a Roesch Talbot to the Pirelli Classic Marathon and similar events, etc, and next year we are to have the CAAR Nederland's Amsterdam-Moscow Rally for pre-1960 cars (entries appear to have closed with 119 teams but the organiser is Will de Hek, Frankrijklaan 3,2034 BB Haarlem, Pays-Bas). Nevertheless, it is perhaps interesting to look back to two long runs made many years ago by veteran cars.

The 1000 Mile Trial was continued and in the 1903 event Fred Bennett took part with his then new Cadillac. After an apprenticeship at the Crewe locomotive works, Bennett had been the Pall Mall Electric Company's resident engineer before joining the Anglo-American Motor Co and bringing Cadillac and Oldsmobile cars to England. The Cadillac was to become the top American car but in those early days it, and the Curved Dash Oldsmobile, were pioneers of the simple peoples' car, as it were, preceeding the Model T Ford in foolproof design, and in size being a sort of forebear of the Austin 7. The 5hp Curved Dash Oldsmobile had a horizontal single-cylinder water-cooled engine, of 4½ x 6in bore and stroke, under the floor, which drove via a two-speed and

reverse epicyclic gear, which in top speed gave a maximum of 20 mph at 760 rpm. The wheelbase was 5ft 7in, and the chassis was sprung on springs extending from axle to axle, rather as on a vintage two-stroke Trojan, providing a flexible ride. Final drive was by a long chain. Steering was by tiller and the weight was a mere 7 cwt. The Curved Dash designation was derived from the shape of the front splashboard, which provided about the only protection from dust and mud. I refer to the early model, as in 1904 a much heavier version with a larger engine was introduced.

The Cadillac of the time was similar, but the 6½hp model had a bore and stroke of 5x5in (1608cc) and a forward radiator, petrol and water tanks being hidden under the bonnet and there was a tonneau body and wheel steering. It was one of these Cadillacs that Fred Bennett used eventually for publicity sprees to publicise his agency for later models of this fine car. It was his idea to stage that Standardisation test at Brooklands in 1908, wherein three brand new single-cylinder Cadillacs were selected from stock by the Technical Committee of the RAC, filled with petrol for the very first time, accumulators installed, and then driven to the Track, where they did ten laps so that performance could be measured. They were then driven to sheds outside the Track and completely dismantled. In a fourth shed, after all the parts had been thoroughly mixed up by the RAC, two mechanics put first one and finally all three Cadillacs together again, forty new pieces being used to assemble car No 3. After which, all three Cadillacs restarted easily and were driven round the Track. (For further details of this unique test, see page 23 of my Brooklands History).

In 1913 Fred Bennett then used one of these Cadillacs to run a successful re-enactment of the 1903 1000 Mile Trial. In 1924, to celebrate its 21st birthday, the old Cadillac headed a procession through London, followed by the latest in eight-cylinder Cadillac cars in which rode high members of the motoring Press, who had, of course, first been adequately wined and dined. The veteran Cadillac produced more publicity for Fred Bennett than had been visualized, when it caught fire in Grosvenor Square. More fire engines than ever seen before, it was said, rushed to the scene, but rumour has it that they were not allowed to quell the blaze until the photographers were properly lined up!

By 1953, when this venerable one-lunger Cadillac was 50 years old, and Fred was 79, he decided to do another re-enactment of that first RAC Trial in which he had driven the car when it was new. It had clearly recovered long since from its near-fiery end; indeed, Stirling Moss had



Two single-cylinder 1903 Oldsmobiles, like those imported by Fred Bennett, during a Brighton Veteran Car Run.

driven it, with Fred beside him, in the 1952 Brighton Run. Bennett was destined to become the VCC's President in 1954 and he was the sole surviving driver from the 1903 Trial who could have repeated the run with the same car. He started at 8am each day on the eight routes and, in spite of being ill temporarily, it all went off to schedule. H Henocq, Bennett's gentleman's gentleman, prepared the Cadillac, his chauffeur followed the veteran in a modern lhd Oldsmobile Hydramatic saloon, and the RAC checked things. The VCC provided the observers, Major Broweell on the first day, G Mawer on the Eastbourne route, R Foster to Worthing and back, H Budd doing the Folkstone spell, P Bath the Southsea bit, Dennis Field went to Bexhill, Kent Karlake took the final spell to Brighton and back, while I was on the Worthing journey. The Cadillac's only trouble were a leaking water pump, dirt in the carburettor, and a loose mudguard. The route (which differed from that of the 1900 Trial) was rendered longer due to having to follow modern road changes, so it added up to 1000 miles plus a Brighton Run thrown in for good measure. On the day I was observing the Cadillac turfed along well, putting some 29 miles into an hour once clear of London and averaging 25.1 mph, running-time.

Fred Bennett had apparently found his original Cadillac again soon after the First World War, before which it had been a chemist's delivery van from around 1909. Ever one for some publicity and a

bit of fun, Fred dug it out for the first *Daily Sketch* 'Old Crocks' Brighton Run and



Stirling Moss with Fred Bennett and the well-used 1903 Cadillac in the 1952 Brighton Run.

took part with it in most of the subsequent Runs. By 1953 its only concessions to modernity for the 1000 mile adventure were a standby magneto in case the coil packed up and a new battery, but along the years it had needed a new petrol tank, water tank, radiator and one wheel, after some 250,000 miles it was claimed. In the end Fred's son lent the car to the National Motor Museum and in 1966 I was allowed to co-drive it with Eric Thompson in the Brighton Run, in which we just scraped home in time, after taking up the big-end.

Another veteran marathon of this same kind was staged in 1950, by the well known historian St John Nixon, also re-enacting the 1900 1000 Mile Trial, driving an 1899 3½hp Wolseley OWL 707, which in 1136 miles over the modern roads gave no trouble apart from a broken driving belt. I recall that at the time we were rather amused at this splendid venture, because Nixon had previously expressed the view that ancient cars were historic heirlooms which should not be used again, for fear of damaging them! However, all credit to Nixon, who undertook similar re-enactments in 1960 and 1970. He had some claim to this, as he had as a boy ridden through the original Trial on the step of the 8hp Napier driven by the famous SF Edge. Anyone who has failed to get his or her veteran car to Brighton in recent years may care to reflect on these two marathons which I have plucked out of the past. WB



As the sun spreads its first rays on the Serpentine, there is already a bustle of people in Hyde Park preparing for the start of the London-Brighton Run.

The 1990 Brighton Run

It was good that in the Diamond Jubilee Year of the Veteran Car Club of Great Britain the RAC Veteran Car Commemoration Run on November 4 went off so well. The weather was sunny but cold and the continuing interest in actually running veteran cars cannot be denied when an entry of 402 is received, with 76 reserves hoping to go off to the seaside along the historic route on the day before the fireworks! This is a unique

British event which attracts enormous numbers of spectators, once quoted in millions but now more realistically estimated by Phil Drackett of the RAC as in the region of 400,000, with a crowd of 10,000 in Hyde Park for the 8am start and one of "FA Cup Final proportions" on Brighton's Madeira Drive to see the finish. But Kenco's PR people still publicise the figure as "exceeding two millions" — and whatever happened to this coffee spon-

sor's much publicised hourly BBC2 live bulletins which Derek Jameson was to have sent out from the RAC's 1903 Albion? BBC TV coverage was also completely lacking.

That apart, no event surely can be better policed and this year's Run had the support of Councillor Mrs Christine Simpson, Mayor of Brighton, and John Quenby, Chief Executive of the RAC/MSA. It was the now expected mixture of publicity

seekers and enthusiasts who go because they enjoy driving really old motor cars, with the challenge of getting them to Brighton. Lord Montagu had the Rt Hon Cecil Parkinson MP, the Transport Secretary on his 1903 22hp Daimler, and it was good to find other cars brought out of retirement by museums. Thus the National Motor Museum put in the aforesaid Daimler, the 1896 Arnold Motor Carriage owned by Miss Arnold and actually used in the 1896 Run, and Count Labia's 1903 24hp De Dietrich, The Daimler-Benz Museum put in four cars, and the British Motor Heritage's various divisions entered two 1897 Daimlers, an 1899 Wolseley, a 1900 Daimler, a 1901 Wolseley, a 1902 Albion, a 1902 Lanchester, a 1904 Lanchester, and the 1904 Thornycroft.

Racing driver Dr Jonathan Palmer was driving Lord Montagu's little De Dion Bouton and Nick Mason was another veteran-addicted racing driver, with his 1901 Roi-des-Belges Panhard-Levassor. Vice President of the VCC went for the celebrity game, taking Liza Goddard on his 1902 Mors. Back to museums and clubs, the Science Museum nominated an 1899 Locomobile steamer and a 1903 Peugeot, the National Breakdown Recovery Club a 1900 Daimler which one hopes they did not have to recover, the VCC its own 1904 Wolseley, the RAC had two entries, the AA their well known 1904 20/30hp Renault Park Phaeton, Nottingham Industrial Museum the odd 1904 Celer, the Patrick Collection a 1904 Wolseley, and the Parkside Transport Museum their Riley tricar. Manufacturers also had entries, from Renault, Ford and Vauxhall.

To attempt to pick out all the interesting entries — although almost all are that — or



A sensation of speed and movement with Paul Sears' 1903 18hp Clement Talbot tonneau tourer.

report on their progress — is impossible in an event of this magnitude. But it was nice to see listed old friends like Flather's very early Daimler, Jeal's tiny De Dion device, Richard Nash with his late father's 1900 Peugeot on which I had my first Run in 1936, Sir F Sowery's Darracq, the Lightfoots' De Dion and Beaufort Neale's 16/20hp Aster-engined Wagonette, Banfield's De Dietrich tonneau tourer, Lord Strathcarron in his snug Georges-Richard broughham, HRH Prince Michael of Kent in a 1904 Mercedes

accompanied by Peter Ustinov, Judy Collings, her 1904 Darracq, Jane Hutton-Scott's Lanchester, EN Corner's one-cylinder Peugeot, Bendall's 10/12hp Renault, Carter's CGV and Sunbeam from Wales, Skerman's White limousine, Jack Sears on the racing 18/28hp Mercedes, Milligen's Gardner-Serpollet tulip-phaeton and Dale's 1900 car of this make on which I had my first experience of steam, last year. The oldest runner was the 1884 De Dion Bouton et Trepardoux, of Tim Moore which, although it did not receive an extra early start, leaving at 8am, nearly managed to reach the Pylons, by the official deadline of 4pm, a magnificent achievement. The foregoing, and so many others, rank among the true believers. Then there were all the overseas entries, 24 from the USA, 14 from Germany, eight from France and five each from Holland and Australia, not forgetting the 1891 Panhard-Levassor from a New Zealand Museum, etc. From Germany and Ireland came drivers who had both done the Run 19 times. The RAC is forever reminding us that the Brighton run is not a race but this does not prevent it from telling us who arrived first — this year it was Karl Smith's 1898 De Dion. Terry Cohn's 1903 18/28 Mercedes did not leave Hyde Park until about 10am, its scroll clutch having given trouble, which Roger Collings helped to rectify. Ruth Moore, mother of the driver of the oldest vehicle in the Run, was going well on her 1892 2hp Panhard-Levassor phaeton but Ron Knight was apparently having dire transmission trouble with his beautiful 1904 15hp Darracq demi-limousine and the famous 1904 GB Napier was seen progressing in fits and starts, emitting clouds of black smoke. Reid's 1902 Buyer got going after some ignition problems. At the Diamond Jubilee dinner, Lord Montagu of Beaulieu toasted the VCC and Hans Tauscher, MD of Mercedes-Benz UK, replied. WB



Four-up the single cylinder 1903 Knox Runabout finds the only bit of clear road to Brighton.

Brooklands

The Brooklands Museum Trust has been getting very good press coverage recently and the Museum itself has already opened its doors to public visits in a small way, preparatory to opening officially in April 1991. The venture centres round the 30 acre site, about all that is left of the 360 acre motor racing track and aerodrome of former times. The Brooklands Society, which originated visits to the historic site after the war, long before the Museum project was thought of, is to co-operate and if the Trust, under the patronage of HRH Prince Michael of Kent, raises the sum of money it requires, the Museum project will flourish.

The immediate aim is to raise £250,000, to facilitate the redecoration and refurnishing of the interior of the Clubhouse, which Gallahers contributed after spending a vast sum on rebuilding it, so that the place can become a commercial centre for executive lunches, conferences, etc, and for a new Brooklands social club, as it were, to be formed. This idea may not appeal to everyone, because before the war BARC members joined the Brooklands Club to see the racing and drive their cars on the Track, and while no doubt business was conducted there, that was not the primary aim of the BARC. Be

that as it may, the display of Brooklands artifacts, the unravelling of the Track's detailed history, the preservation of the famous Test Hill, and what is left of the Members' banking, albeit including a newly laid section, and some of the pre-war Paddock sheds, etc, is a worthy undertaking. The Museum is strong on historic aircraft with Brooklands' associations but less so on racing cars, of which the ex-Whitney Straight/RL Duller Duesenberg and a sprint AC were for a long time the only such exhibits. The public will probably expect to see some dozen or more cars which raced at the Track when the place is fully open. Meanwhile, the project is in full swing, and the Brooklands Society (Sec Bryan Reynolds, 38, Windmill Way, Reigate, Surrey, RH2 0JA) continues to publish its very good Gazette, edited by Rupert Prior, and to hold its annual reunion at the old Motor Course.

Congratulations to Owen Wyn Owen who has got through the first round of the Scania Transport Trust contest and is eligible for the final next year, for the restoration of the 27-litre Thomas Special 'Babs' which he dug up at Pendine in 1969, from the grave in which the car had been buried after Parry Thomas's fatal accident there when in search of another LSR.

Colin Readey still has the ex-Bob Gerard/Cuthbert Harrison Riley TT Sprite with which he raced from 1960 to 1980, taking second place in the MOTOR SPORT Brooklands Memorial Contest in 1969. It was not taxed in those years but is now to be seen on the road; the difficulty is to obtain its original AVC 20 registration number.

The Citroën 2cv, now that it has ceased production, can be regarded as a classic car and those girls who drive them may care to know that Pinitis Manufacturing of Windsor, SL4 3BR are making a run of 5000 2cv hand enamelled brooches, priced at £6.99 each.

A reader wants to trace the history of his 1931 12/60 TK Alvis beetleback, reg no JS 4061, car no 13915, eng no 9602, supplied originally by John Gott of Glasgow to EC Hounslow of Witney, who apparently passed it on to LE Baragwanath of Oxford. A new log book was issued in 1961 which lists eight owners since then, the first Baron von Maltzohn, the last D Johnson of York in 1979. Letters can be forwarded. The Alvis was originally black with green mudguards and replaced an 8/18 Talbot coupé. Letters can be forwarded. WB

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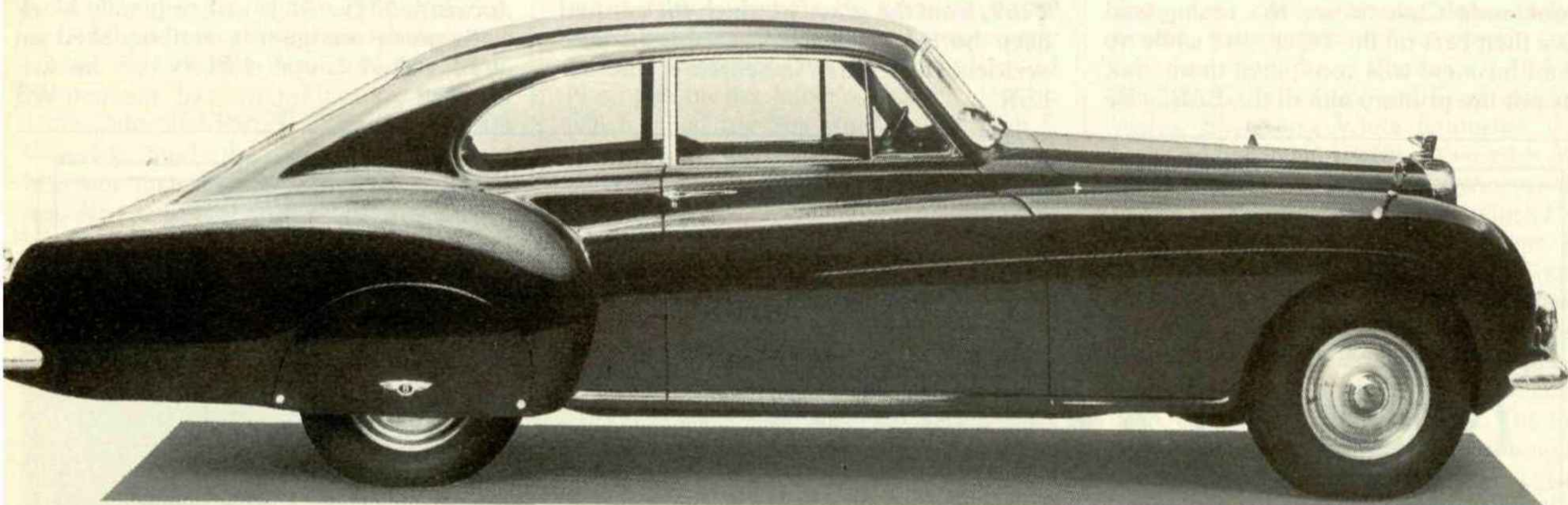


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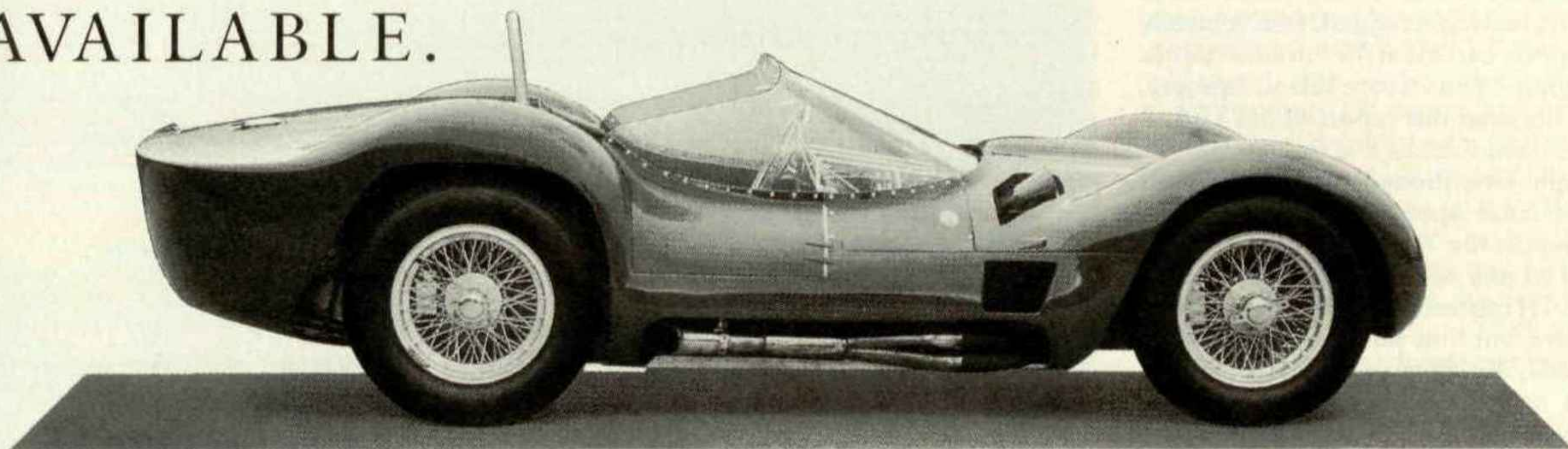
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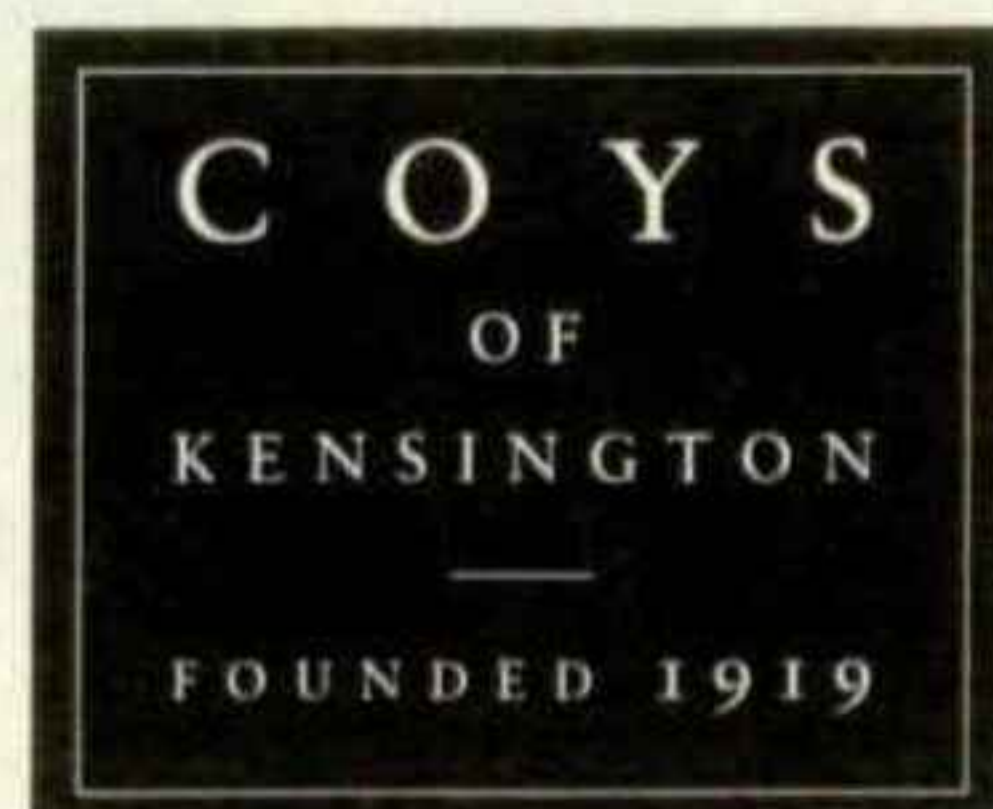
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Triumph TRs, though, have never had quite the mass appeal of the ubiquitous MGB, and yet the TR owner is every bit as fanatical as any other marque enthusiast. To me, a TR represented the best in British sports cars, but that was a view held from the outside, not from experience. My first on-hand experience with a TR came in June this year when co-driving Evan Mackenzie’s works replica TR4 in the Pirelli Classic Marathon.

The car was so superbly turned out, giving such an aura of invulnerability that I never had any doubt that it would only be human error that would see us fail to reach the end of the event. As it turned out we did finish and would have been in the top 20 had I not made a mistake.

Wonderful though the event was, the only regret I had was the fact that I had not had a spell at driving. Nine days in the life of a motoring journalist without the feel of a steering wheel in his hands is a long time. Another thing was that although I had lived in the car for this length of time, had seen parts of her no other gentleman but her owner had seen, and had heard all about her life story, I had never had the time to inspect her closely and scrutinise all the work Evan Mackenzie had undertaken.

It was thus that I quickly accepted an invitation from Mackenzie to go to Cadwell Park on a damp autumn afternoon not only to test drive his beloved car, but also a TR4A and TR5 for comparison purposes.

In fact comparison is the wrong word, for all three cars were in completely different states of tune. Whilst Evan’s car was set up as a tarmac event rally car, Phillip Hunter’s TR4A was a largely unmodified car which he had owned for years and with which he competed in an HSCC Championship whilst Chris Carter’s TR5 had already won two championships this year and had been set up from the beginning of the rebuild with track racing in mind.

Although all three cars had been in dilapidated condition before their rebuild, it was Phillip Hunter’s which needed the least attention at the time, but which, of the three had been the least modified.

Bought in 1975 for £395, it was Hunter’s sole means of transportation and was not to see track action apart from the occasional sprint for at least another four years, but even then, lumbered with house and mortgage, his activities were confined



Triumphs TR4, TR4A and TR5 line up on the track. Prior to their reinvigorated lives as competition cars, a

Triumphant T



Evan Mackenzie’s TR4 is an exact replica of the works car except that it is left-hand drive.



to the occasional outing.

"By the early Eighties," he recalls, "The car was really in a sorry state. I had been averaging over 25,000 miles a year in it for a number of years until I got a job with a company car, so that by 1981, with over 150,000 miles on the clock, the car needed a complete overhaul." Eventually he got round to having it rebuilt, "But it was a disaster. The original restorers had completely cocked it up." It was then that old friend Chris Carter came to the rescue.

A Triumph TR owner and enthusiast, Carter had established Chestnut House Sports Cars as a TR restoration business and it was to this new venture that Phillip entrusted his car. It entailed a great deal of unpicking the bad work and although the end result was a car he felt justifiably proud of, it was not until 1988 that he felt he had the spare funds necessary for a pukka rebuild.

Unfortunately his revived pride and joy was to last just six weeks. A misadventure in a race at Donington saw Phillip virtually total the car in a crash from which he was lucky to escape unhurt.

It was back to Chestnut House again, braving the curses of those who had

all three had been wrecks.

rio



Phillip Hunter's TR4A has almost 300,000 miles on the clock but still serves as a faithful workhorse.



Chris Carter's TR5 is well known in TR and historic racing circles, having won many championships.



Chris Carter's TR5 has been a front runner ever since it was rebuilt into a track car. This year alone it has won two championships.

worked on the car, especially from the painter, who had spent hours perfecting the coat of paint, for another rebuild. Again finances dictated the length and time of the rebuild, but the car has now been back on the road for a full season's racing and seems none the worse for its previous abuse.

It is not particularly quick, though, as Phillip himself is the first to admit. "I rebuilt the engine myself five years ago and it has not been taken apart since despite having endured five seasons of racing." It still has a healthy oil pressure and goes like a rocket for a TR4A, all-steel car, but in the class B of the HSCC Improved Road Sports Championship, it is being outclassed by the 195 bhp Datsun 240Zs.

Phillip's car was the first of the three TRs I tried around Cadwell Park and its handling was predictable and precise, but as the car was not particularly quick, there was more time to get the lines right all the way round. The brakes required a certain amount of stamping on to operate efficiently, but having got used to their operation, the effectiveness was never in doubt. The 205/16 Yokohama A001s on 6J Minilite lookalike wheels never lost traction with the surface, a combination of the driver not trying hard enough combined with the fact that you really need to throw

this car around to get it to misbehave. It was tame, it was safe, but it was nevertheless charming to drive. After all, where else are you going to get an everyday sports car which takes you to a race meeting, is partially stripped, according to the strict HSCC regulations, and then is your means of transportation home again for less than a £1000 for a season's racing.

Chris Carter's TR5, a racer through and through, was in complete contrast. This 1967 car was one he had purchased in 1984 as an abandoned rebuild and had intended to build as a road car, but that was before he had been bitten by the racing bug. He soon changed his mind and started to build it into a racing car. This was the period that he had just started Chestnut House Sports Cars and it struck him that it might be a useful promotional vehicle for his new enterprise as well as a test bed for any go-faster goodies he was developing.

The car took to the circuits like a duck to water and was immediately successful. Race victories led to championship wins and a series of three TR Register 6-cylinder championships, the latest being this year, was matched when Carter took the car to victory in the 1990 AI Motor Stores Championship.

So what has Carter done to make the car so competitive? "It's a straight six

Triumph engine out to a maximum rebore plus 60 thou with a nitrided crankshaft, standard stock bearing shells and piston rings, standard Hepolite pistons, a Chestnut-designed camshaft, an extractor manifold and a new head. It is the last three items in particular which probably make all the difference," states Carter.

The camshaft itself is one that has been developed over the last two seasons and is one of four different designs offered by Chestnut House. "They are primarily for performance, but not for racing. Chestnut House is after all mainly a restoration company and most of our customers want to make their cars go faster on the road. We do support motor racing, though, supporting four cars motor racingwise, and it is these cars which we use in a certain sense as test beds."

"We strip down the engine on my car as little as possible. Last season there was a mid-season bearing shell change followed by a stripdown at the end of the season. This season we haven't even undertaken the mid-season change."

The gearbox is revised and has a mixed bag of ratios ranging from early TRs to late TR6s. The rear axle ratio is 3.7 to 1, non overdrive, so one can happily pull 6250 rpm on a long straight.

Front brake pads are Ferodo DS11s operating on standard new Leyland discs

while Ferodo VG 95 linings at the back are on standard Leyland drums with Aeroquip brake hoses and Dot 5 brake fluid.

It did not even take a lap to appreciate that this car was on an altogether different plane from that of the TR4A. Carter's car was a utilitarian beast, one built for the track. From the curious shrill whine of the fuel pump "when it stops, it means you've run out of petrol," to the rasp of the exhaust note, it was a machine which meant business.

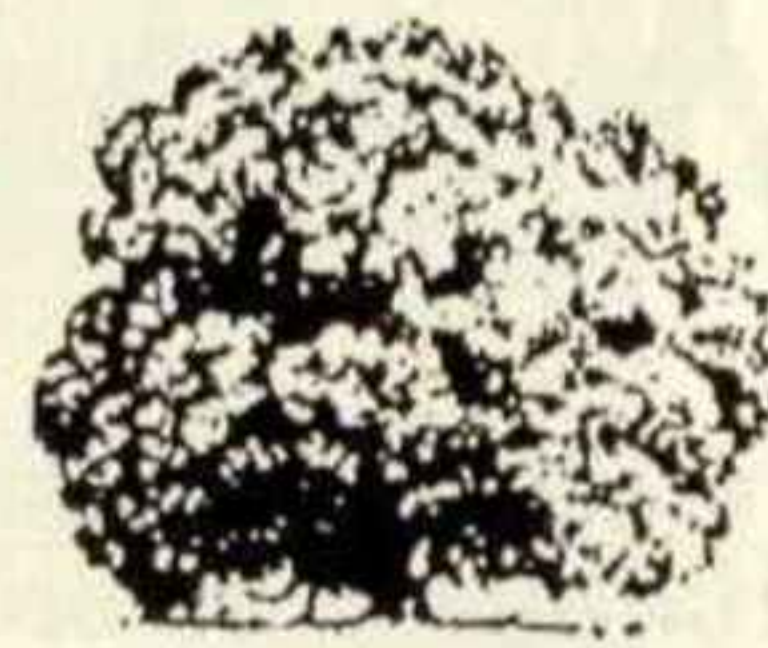
Safely strapped in and ready to take to the track, the car just vibrated on tickover, massaging the legs and the backside until the all-clear signal was given. First gear, push hard down on the accelerator, and the car screams up the hill, second gear, clean and quick, the acceleration resumes. By now the wind can be felt above the small windscreen, but it becomes an absolute roar as third and then fourth are snatched. Even at 6200 rpm, it seems that the engine will rev endlessly higher, but I am mindful of the fact that in two days time, the car will be out on its last outing hopefully clinching yet another championship.

Oversteer is the inherent characteristic, but the 205/60 x 15 Formula R Dunlops, favoured by many in the TR Register championship, cling on for all they can. A Formula Forward looms into my mirrors and slips by on my left, but by now, my confidence is in full flow. I give chase and the car is noticeably slippier through all the corners, but particularly the hairpin at the entrance to the circuit. I have been advised by Carter to change down to first for this one, and having tried it once, I realise that despite the wheelspin as you scrabble out of the corner, it saves precious tenths of a second and on each lap I hold the Formula Forwardster in my sights. It is an exhilarating feeling that you can hold onto a purpose-built single-seater in a car nearly 25 years old. No wonder this thing is winning championships!

I wondered, though, whether the sheer excitement of driving this car was going to be met by Evan's machine. It was, after all, a completely different animal and not really geared up for circuit use.

WPK

(To be continued next month)



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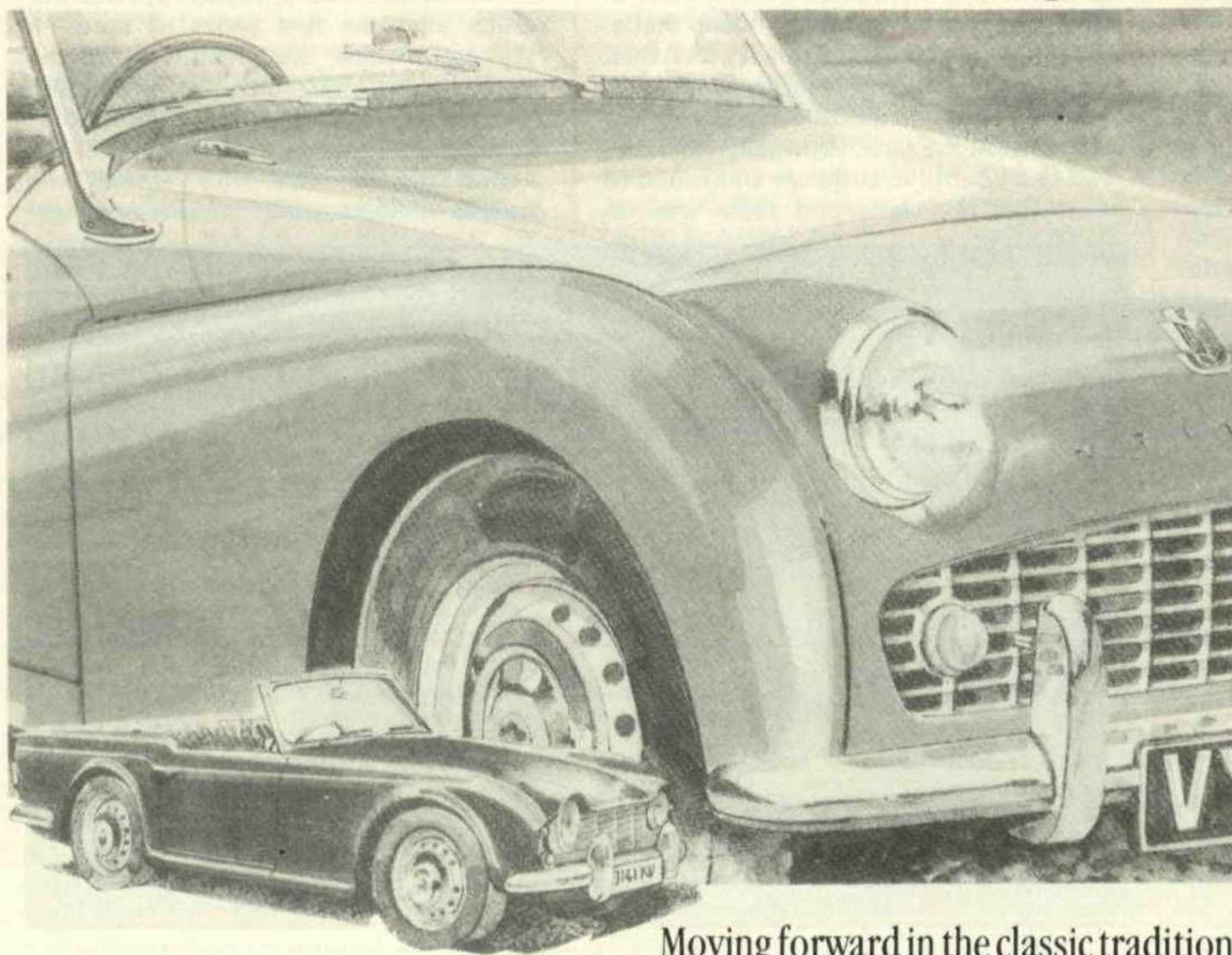
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To The Woods . . .

As this issue reaches the magazine racks the Lombard RAC Rally will be just about getting under way from Harrogate. In order to put the present event into context, GP recalls the history of the event and then goes on to explain the meaning of the Pace Notes system which has been introduced this year.

Imagine an RAC Rally without any forests! Unthinkable, isn't it — Almost like bacon without the egg! Yet for roughly the first half of its sixty or so years this is how it was. The Forestry Commission were tree planters, not road makers. In any event, when it began, the RAC Rally was intended to bring skillful motoring to public awareness, and to show its participants the splendour of the British countryside and the elegance of some of its resorts. It was not meant to be hidden away in the shadows of dark, dismal pine plantations.

Although a "Bournemouth Rally" supported by *The Motor* in 1928 could be said to have been its forerunner, the first RAC Rally as such took place in 1932 when routes of about 1000 miles led competitors from three starting points to the finish at Torquay. Average speed was either 22 mph or 25 mph, depending on engine capacity, and Time Controls were so few (one was at Harrogate) that there was ample opportunity for rest. Just to make it more interesting, a test was laid on at Torquay, but this was one of flexibility as much as fleetness; one hundred yards had to be covered as slowly as possible in top gear, then another hundred yards as fast as possible using any of the gears. Imagine the transmission slap, not to mention the clutch wear!

Until the war, the rally continued as an annual event in much the same style, its social aspect being at least as important as (some considered more than) the driving itself. If one was anybody at all in motoring fraternities, or even in other august circles, then one simply had to join in the fun of the RAC Rally. Its popularity increased, but the element of competition remained a mere token. After all, not to get to the finish would be to miss out on the merry-making, and in 1938 all except six of the 237 starters completed the route. It was indeed a huge jollification, but at least it was based on a motoring event, even if for many that was more an excuse than a reason.

After the 1939-1945 hostilities were over, thoughts at the RAC began to turn towards reviving the rally, and in 1951 it was declared an international event and attracted competitors from the continent. However, most of the visitors were not particularly happy with the navigation element, nor with the frequent traffic jams in narrow, country lanes, caused by slow cars baulking faster ones.

However, there were compensations for the tedium of map-reading. This time there were real tests, although some were based on regularity rather than sheer speed. There was a test at Silverstone, where

about half of the 229 starters collected penalties, and others at Rest-and-be-Thankful, Hardknott and Wrynose — and in June at that! There was a 2-mile test on Mynydd Epynt in which the target time was the average of all cars in the class, and a manoeuvring and pylon-negotiating test at Blackpool, the latter being repeated at the Bournemouth finish.

More tests followed throughout the Fifties, at Castle Combe, Goodwood, Turnberry, Prescott, Cadwell Park, Oulton Park and later at Crystal Palace, Aintree, Brand Hatch, Charterhall and Harleyford, not to mention the customary promenade driving tests and occasional regularity sections.

All sorts of anomalies crept in from time to time as competitors began to examine the regulations more carefully for loopholes, and found them, especially after greater efforts began in the mid-Fifties to attract foreign competitors. There was the case of one pair who realised in 1958 that the penalty for missing a control altogether was no more than that for being half an hour late. Accordingly, they spent a night in bed, cut out one control and went on to finish!

Having spent some time moving around the calendar, it went back to November in 1959 when a few changes were made, including one to the regulations which then declared a penalty of five hours for missing a control, although this rule was unpopular with some at the time, especially when the road to a control at Braemar was found to be blocked by snow and there was no

official instruction regarding a re-route. Some crews cut the control altogether; a few others took a long deviation to get there, including eventual winners Gerry Burgess and Sam Croft-Pearson in their Ford Zephyr. The incident led to an unsuccessful protest by a German team, whose driver Wolfgang Levy was desperate for European Championship points, followed by two successive appeals, both of which failed, and it was some weeks before the winners got their trophies. Nowadays, officials at rally headquarters get to know of route difficulties in plenty of time to avoid them and to issue precise instructions to competitors.

Interesting that in 1959 the route was presented to competitors in a variety of ways. One was like an RAC tourist route — R at Fork in 2.5 miles; L at Crossroads in 0.6 miles — another a find-your-own-way job between controls and another similar to the Tulip Rally system. A rather more elaborate form of the latter is universally used today, with lots of frills and pretty pictures, but as an instrument of navigation it is still basically no more than it was then; a series of accurate distances each with a diagram of a road layout and an arrow showing the direction to take.

The class improvement system, another import from Holland, was at one time employed to calculate results, overall positions depending on how much a car was ahead of its competitors within its class. Thus a one-litre car, by beating its class rivals by two minutes, would be ahead overall of a three-litre car which had beaten its own class mates by one minute. Much later, the Tour of Britain made the mistake of copying such a class improvement regulation, and when the computer spewed out results after the first series of races, a Hillman Avenger was found to be the overall leader, ahead of much faster, more powerful cars. After various discussions, the regulation was changed!

Gradually, a mere tour around the country interspersed by various tests lost



"That's not the way to do it, man!" So Paddy Hopkirk seems to be saying to Graham Hill during a training session at Bagshot prior to the 1966 RAC Rally.



The line-up of works Austin-Healey 3000s in Liège prior to the start of the famous event always called after that town. From left to right: Timo Mäkinen, Don Barrow, Rauno Aaltonen, Henry Liddon, Tony Ambrose and Paddy Hopkirk.

its ability to satisfy its customers, even if bad weather was encountered occasionally. Unlike racing drivers, rallying people liked their sport to be laced with adventure, and the organisers seemed to be running out of new ideas for the tests. Competition in the manner of the open road rallies of the time was unfair on overseas visitors, especially as regular British competitors were expert specialists at finding their way quickly and accurately around Ordnance Survey one-inch maps.

For rallying, these excellent maps were invariably modified by personal marking to show all manner of extra hazards, even which way gates opened, and especially which *white roads went* and which did not. Indeed, details of *goers* and *non-goers* were treasured possessions and no self-respecting navigator would ever be parted from his cherished marked maps, even in bed!

Something had to be done to introduce variety; to bring in a different kind of test which would satisfy even the most adventure-hungry. Ideally, average speeds on twisty, undulating, little-used public roads could be increased just to the point of impossibility, but that would be far too hazardous, questionably legal and probably in conflict with insurance requirements. Furthermore, the advantage of local knowledge would no doubt be a cause for increased complaints by overseas visitors.

What was needed was a series of roads which could be closed to all other traffic, as done by the Alpine and Monte Carlo rallies. Trouble was, the closure of public roads was impossible in mainland Britain, and most private roads were so short that they would contribute little more than some of the existing tests anyway.

And that was when Jack Kemsley had a brainwave!

Jack had been rallying for some time, even with works teams, and eventually took over leadership of the team planning the RAC Rally. His role soon became a family affair, for wife Joan, daughters Anne and Sally and son John all did their bit to stitch the route together and produce the roadbook. During the few months before the rally the Kemsley residence invariably

looked like a military operations centre, and we well recall spending the Monday evening (and most of the night) prior to the 1967 rally at the Kemsley home, lending a hand to make drastic route changes to avoid areas affected by foot and mouth disease. Alas, it came to nothing, for the affected areas became larger, and on the very eve of the start Jack had the thankless task of announcing to the assembly at Heathrow's Excelsior Hotel that the whole thing was cancelled.

But we are jumping the gun, for the brainwave in question came long before that 1967 cancellation. The story was that Jack Kemsley discovered a pine needle in his breakfast cereal, but we confess to having concocted that one ourselves some years ago. Whatever sparked it off, the result was that talks began between the RAC and the Forestry Commission.

The 1959 rally had already successfully used some *special stages* on private land, and why should they not be increased to include some of the roads of the biggest land user in the country. In order to carry out its role of tree planter and timber producer, the Forestry Commission also had to be a road builder to get machinery in and timber out. And jolly fine roads they

were, too. Although unmetalled, they were invariably well-founded, well-drained and so well-cambered that they might have been specially designed for high-speed travel by competition cars.

The talks were successful, and the 1960 RAC Rally included special stages on the lands of the Forestry Commission (in Scotland), the War Department and various private owners. There were still the usual tests, of course, at Rest-and-be-Thankful, Mallory Park, Brands Hatch and even a skid pan in Leicestershire. A test at Charterhall had to be cancelled, for there was an outbreak of foot and mouth disease in 1960, though not as serious as that of 1967.

The following year, Britain's state forests provided some 200 miles of special stages; in 1962 the figure was increased to 300, and so it went on. Forest rallying had arrived and was an immediate success, popular with everybody. But that popularity was almost its undoing. Rallying already had an immense following in lesser populated areas where tortuous roads were plentiful — Wales, for instance — but the coming of forest rallying, coupled with the increased publicity generated by the RAC, drew even greater crowds.

In many places there was just nowhere to put all the cars of the spectating public, and traffic jams and even road blockages resulted. In those days the route was always secret until the day of scrutineering, and the organisers decided that only selected stages should be made public in order to avoid having crowds in areas where neither narrow roads nor limited parking space could cope with the traffic.

Publishers of spectator guides were forbidden from mentioning the locations of these "difficult" areas, although real enthusiasts found it very easy to find them out. On one occasion, though, on the Welsh Rally, not the RAC, the presence of determined spectators in Brechfa Forest, which had been declared a no-spectator stage by the organisers, undoubtedly saved the lives of Walfridsson and Jensen, whose Stratos rolled and exploded into flames.



Newspaper backing was obvious during the 1973 RAC Rally, won outright by Timo Mäkinen and Henry Liddon in his Ford Escort.

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Rauno Aaltonen and the bespectacled Tony Ambrose sitting in the Mini which they took to victory in the 1965 RAC Rally. It was Tony's second win. He was the winning co-driver in 1956, with Lyndon Sims in an Aston Martin.

The spectators acted fast and pulled them out, but had they not been there the two competitors would have perished, for there were no marshals at the spot.

There were liaison difficulties too, and we recall the forest stages in Glamorgan being cancelled in 1965 on the very day they were supposed to be run simply because no-one had thought to tell the men on the ground in those forests. On another occasion the entire RAC Rally came to a halt in Wales at a place where competitors had to use a private farm track to get from a forest stage to a public road. No-one had bothered to ask the farmer whether the rally could use his road, and he became justifiably angry. Fortunately, one of the leading Fulvias had a Welsh-speaking co-driver who was able to appease the gentleman and persuade him to open the gate.

Such things are no longer overlooked, for whereas only a handful of people did the planning in the past, nowadays the work is divided among a whole battalion of planners.

When other rallies began to use forest roads, national as well as international, the popularity of the sport increased further. For the RAC Rally, car parks were set up, some in the fields of enterprising farmers and some by the Forestry Commission itself. However, the event seemed to be heading for strangulation by its own popularity, and the realisation of this convinced the organisers that they should start on a Sunday and confine the first day to stages in public parks, stately homes, promenades, racing circuits etc, all

with adequate parking facilities. Thus came about a full circle. We were back to the tests, and competitors were vociferous in their criticism of these unpopular, "Mickey Mouse" stages, as they were called, some with coned chicanes and routes marked by coloured plastic streamers and, occasionally, straw bales. But let not anyone think that the TV-wooing superspecials of present times are FISA inventions. They are simply revived products of the past given a modern flavour.

The feeling at the time was that spectators would be most numerous at the weekend, so the forest stages were shifted to weekdays when fewer spectators could be expected. This strategy seemed to work very well for a while, but then more and more people turned out no matter what the day of the week, knowing that a well-driven rally car at speed along a forest road is a much better spectacle than one negotiating a park water splash or a ribboned route across a field.

The Sunday tests are still with us. They are just as unpopular with competitors, but their purpose is realised and drivers accept that they are not just turnstile money-spinners but part of a plan to reduce the chances of congestion in forest areas.

Now we come to the main change for 1990, resulting from a bold but risky acceptance of the style of other rallies. Finally, after much pressure from outside, both from FISA and from some competitors, the RAC has agreed to allow, for the first time, advance reconnaissance of the forest stages. Suddenly, a secret route has become a practised one, and anyone who knows anything about the sport will appreciate what a major change that is.

Although huge, Britain's forest areas are not capable of producing new stages year after year, and sooner or later competitors, especially those regularly tackling other forest rallies, find themselves readily able to recall certain road features. Practice has always been forbidden, but familiarity was unavoidable, and overseas visitors often claimed that crews living in Britain had an unfair advantage.

Reconnaissance of the private park and stately home stages was introduced a few years ago, but not of the forest roads. Apart

from such things as cost and manpower, there was the Forestry Commission to consider. They were quite prepared to accept a once-over passage of the rally, at a cost of course, but to have competitors practising weeks ahead was a potential disruption of forest operations which they could not tolerate.

Most overseas rallies announce their route a month or so in advance, giving competitors the chance to recce and make notes, but not the RAC. Traditionally, it had a secret route, although it eventually became the practice to declare stage locations (forest entrance and forest exit) much earlier than the day of scrutineering in order that service planning could be done in good time.

But the pressure to introduce forest practice was on. More talks were held between the RAC and the Forestry Commission and eventually, appreciating both motor sporting politics and the standing which the RAC Rally had attained worldwide, the Forestry Commission agreed to allow controlled reconnaissance.

The year 1990 therefore becomes as significant in British rallying history as the memorable occasion thirty years before when forest roads were used for the first time. Pace notes have finally been given the green light, and no longer will there be veiled insinuations that "so-and-so must be using notes." Reconnaissance is for a limited period, divided into several areas and held at strictly enforced average speeds. Crews are able to make their notes, but checking and perfecting them at rally speeds is forbidden.

No words about the RAC Rally would be complete without reference to its long term sponsorship by the finance house Lombard North Central. Various other sponsors have emerged from time to time, including daily newspapers, but Lombard has been the only one with staying power, the title Lombard RAC Rally having been running since 1974 and the present contract not due to expire until after the 1993 event.

Twenty years is a long time for any sponsorship deal, but many do not realise that Lombard's association with the rally dates from long before 1974. Even in the Sixties Lombank, as it was then called, had a very close association with the rally, financing the production of the roadbook and supplying it in a very convenient, multi-pocket folder in which the various bits of other rally paperwork could also be stowed. There was also the famed "Lombank Bag", the small but adequate holdall which became the status symbol of the time, announcing quietly that its carrier had competed on the RAC Rally. We still have one, though it's now rather tattered and grease-stained, having served for some years as a tool bag!

It remains to be seen whether pace notes will be a successful innovation for the RAC Rally. Abuse of the reconnaissance rules is one of the obvious pitfalls, whilst the hidden ones include RAC Rally notes being used during other British events which forbid such use. Time will tell.

What are pace notes — that's another story!

GP



A rare moment indeed during the Liège — time for a service and a snack! Or could it have been after retirement? This was the event in which Riley and Ambrose first made proper pace notes, and convinced Marcus Chambers of their necessity.

HEARD ABOUT THE WOMAN DRIVER IN A VAUXHALL?

She put her foot down.

She skidded on a corner.

She flew off the road.

She slithered down a hillside.

She tore through a forest.

She went through a lake.

She went through 100s of tyres.

She walked off with the 1990
FIA World Rally
Championship Ladies Cup.

Her name is Louise Aitken-Walker.

Her car is the Astra GTE 16v.



Once driven, forever smitten.

RESULT SUBJECT TO RATIFICATION BY F.I.S.A.

This year for the very first time, advance reconnaissance of the RAC Rally's forest stages will be allowed, and the use of pace notes during the event itself. GP explains the origin of pace notes and how they differ from other notes

Rallyman's Radar

Listen to some people and you might be persuaded that Pace Notes is the name given to some mystic chant employed by elite navigators to squeeze an extra few mph from their drivers. But there's no mystery about pace notes. They are simply a means of describing a section of road in a way which can be committed to paper in abbreviated form, then read back at a precise rate related to the speed of the car so that the driver knows what is around the next corner, or over the next crest, before he gets there.

The only mystique about such notes is that which has been given to them by people who think they know what they are all about, but don't. To understand them, it is first necessary to appreciate lesser forms of notes, which we will call Navigation Notes and

Hazard Notes.

Lowest in the scale are navigation notes, and these are what you will find in a road-book issued by rally organisers. They are simply a means of logging which way a driver should turn at junctions, and are related to distances recorded by trip meters. They do not indicate bend severities, cambers or whether a road veers one way or another after a crest.

Hazard notes are one step up the scale of usefulness. In addition to navigational information, they also include details of such things as bad holes, extra sharp corners, steep drops and the like, so that information on danger spots can be read out to drivers with the navigation information. Like navigation notes, they are based on distances and/or fixed geographical features, and fall down when trip meters are rendered useless due to error or wheelspin, or when visibility is so poor that fixed objects cannot be identified until they are actually reached.

Pace notes provide the refinement which hazard notes cannot possibly achieve. They are based not on distances or fixed objects but on a continuous "talk-down" which covers all driver activity. They relate to all of

a road, not just the hazardous bits, and the system is rendered fail-safe by the continuity of the flow of information.

Distances and locations of identifiable features may be added for good measure, but the basis of pace notes is continuity. The navigator reads at a speed exactly related to the speed of the car, pacing himself so that when a driver is about to negotiate a particular hazard, he is told of the next following hazard at precisely the right time he wants that information. Too soon would be to clutter his mind with information he doesn't need for another split second or two; too late would be, well, too late!

On a very twisty section, a navigator may be reading quite fast; on a straighter one he would have a little more time to take breath, although even on straights there is information to impart in order that each hazard is precisely linked to the next, and the next, and so on. A very slight corner coming after a hairpin would present little danger, but a hairpin coming suddenly after a fast but blind bend is a real hazard. Both situations have to be logged, and read back.

Bends, crests and other hazards are not the only important features. Distances between them are also vital, particularly in foggy conditions. Distance is not really the correct word to use, for when describing a straight between two bends many drivers prefer to be told a figure relating to the degree of acceleration they can employ, rather than the actual distance.

Thus a 50-yard straight between a fast bend and a crest might be described as a "25", whereas the same straight coming after a hairpin would almost certainly be a "50" or even a "100". The higher the figure, the greater the amount of acceleration that can be applied before braking for the next hazard.

Continuous reading of notes provides a steady flow of information, not the jerky type associated with tripmeter-based hazard notes. Some of the data read out may be unnecessary, but the unbroken reading means that the driver is always aware of what lies ahead, whether it is tricky or otherwise, and he does not have to wait for trip readings or look out for a "split oak tree on the left"! It also helps him get to know his navigator and to have confidence in him, for mutual trust is vital if pace notes are to work.

As he reads, the navigator should also be glancing through the windscreen to relate what he sees on paper to what he sees ahead. He should also be thinking as his driver thinks, asking himself, "If I were driving, what would I want to know at this precise moment?"

Of course, personal preferences count a great deal, and what might be fine for one driver may result in total disaster for another, which is why we disagree entirely with organisers providing competitors with ready-made pace notes, no matter how good the people who made them.

The language of notes is a sub-topic in itself. Short words are better than long ones since they take less time to say, but words which sound like other words should be avoided in order to lessen the chances of

NAVIGATION NOTES		HAZARD NOTES	
3.26		17.62	
6.91		17.94	
8.32		18.62	
9.23		19.74	
10.14		22.80	

PACE NOTES	
J]C 100	VFR → FL/J]C 50 KR
50 ! HL + HR	100 L° + R° 50
↑ + L/n 50 R°	25 ! KR → HL
50 Lg FR > KR	50 OHR ! MUD
100 GRD 50	VLg FL + FR > KR

The above pace notes are read continuously at the correct pace as follows:
 "Bridge - One Hundred - Very Fast Right Into Fast Left Over Bridge Fifty - Kay Right Fifty - Caution Hairpin Left And Hairpin Right One Hundred - Flat Left And Flat Right Fifty - Sign And Flat Left Over Crest Fifty - Flat Right Twentyfive - Caution Kay Right Into Hairpin Left Fifty - Long Fast Right Tightens Into Kay Right Fifty - Open Hairpin Right Caution Mud One Hundred - Flat Over Grid Fifty - Very Long Fast Right Tightens Into Kay Right"

confusion. "Slight" is too close to "right", for instance, whereas "no" and "go" can be very easily confused.

English is rich in suitable monosyllables, and it happens to be the language used by many foreign crews. We have used notes in French, Swedish and English, and refined with ice notes those made in Italian and Finnish. Unquestionably, English versions are more punchy and definite, although again personal preference is what counts, and if a driver is so unfamiliar with English that he has to mentally translate each instruction then he would be better off using his own language, no matter how long the words. In this respect, the driver's preference should count more than his navigator's, for the man at the wheel has less time for interpretation than his partner. In any case, for the driver it should be instinctive. Some crews use English notes even though it is the native language of neither. As an example, Arne Hertz (a Swede) reads notes in English to his driver Hannu Mikkola (a Finn).

Bend descriptions are the things which probably vary the most from driver to driver. Some grade them by numbers according to severity, whilst others prefer to use descriptive words. Björn Waldegård, for instance, uses a system of numbers (in English) from one to seven, whilst our own preference, having been taught by Vic Elford, was always for words.

How did these pace notes begin. They were really the product of professionalism among works teams eager to gather as much advantage as possible in the quest for publicity-catching victories. And if rally routes were announced in advance, why not drive over them and note the difficult spots? But they did not appear overnight. They evolved gradually, and we are happy to record that, like many other things, they were a British invention.

A system of notes was used on the famous "toilet roll" of Denis Jenkinson when he partnered Stirling Moss to victory in the 1955 Mille Miglia. But he did not read his notes; he converted them into hand signals. The car was too noisy for reading, and they did not have the refinement of an intercom. In any case, Jenks maintains (but we disagree) that a driver concentrating at 100% is oblivious to everything else and would not react to notes being read to him. Hence the arrangement whereby he stuck his hand in front of Moss' face whenever necessary, and made the appropriate gestures.

But Jenks' notes were more hazard notes than pace notes, for there was no continuous flow of information, which would have been impossible to pass on using hand signals. Pace notes came some years later, and the man we have to thank for developing them and coining the expression is Tony Ambrose.

Having been a club competitor for some years, and a member of the Oxford University Motor Drivers Club, the young Ambrose was so surprised in 1959 to learn that all three works Austin-Healey 3000s

in the Liège-Rome-Liège Rally had been time-barred after wrong-slotting that he wrote to Marcus Chambers offering his services. To his equal surprise, he was invited to join Chambers and Peter Riley (whom he had known since 1953) for lunch at the Motor Show, after which he was invited to join the team as a co-driver as often as he could make himself available, sharing his services between Peter Riley and Alick Pitts.

In November that year, Riley and Ambrose drove an 850cc Mini in the Portuguese Rally, but just went in blind, without a recce, and came nowhere. After the rally, with Pat Moss, Ann Wisdom, Nancy Mitchell and Pat Ailson, they drove from Lisbon to Chambery where they met John Gott, Tommy Wisdom, John Sprinzel and others who had flown from Britain. Erik Carlsson was also there, and Ambrose recounts with a grin the tale that he (Carlsson) and Sprinzel fought on the first floor landing of their hotel for the favours of Pat Moss!

Recce commenced in the morning, but this was only to make navigation notes. In any case, a day starting at 10am, finishing at 6pm and divided by a three hour lunch didn't leave much time for thorough note making. In the January, the team performance in the event was indifferent, and on their return John Gott wrote that "recceing is an expensive waste of time." Marcus Chambers agreed, circulated a document to that effect to all crews, whereupon Ambrose protested bitterly that good results would never be achieved without a recce.

Riley and Ambrose were together in an Austin A105 for the Tulip Rally of 1960. They made no recce but were given some sort of notes, supposedly exclusive to BP users, to supplement the roadbook. They considered them useless, and during the night ferry crossing from the Hook of Holland sat down and produced an embryo of what they considered should form the basis of special stage notes. As a direct result of the discussion during that sea crossing, the face of rallying was soon to change.

Their next rally was the Acropolis, which they again tackled without a recce. They were going reasonably well when their AH 3000 shot off the road on a tightening right-hander and fell off what appeared to be the edge of the world. Fortunately, both Riley and Ambrose were thrown out as the car went over. Later, Ambrose joined Pitts for the Alpine Rally in a Mini, again with no recce and again with indifferent results.

In July of that year, Ambrose wrote a long letter to Marcus Chambers expressing the futility of entering cars in the forthcoming Liège Rally unless someone did a thorough navigational recce. This was particularly important, for the event of that year was breaking new ground in Yugoslavia, where the best available map scale was one to half a million.

Ambrose also suggested that they should try to make PACE NOTES, distinct from navigation notes, and enclosed a précis of the understanding which he and Riley had reached during that May sea crossing from

Holland. After their Acropolis accident, Riley and Ambrose felt very strongly that the tightening right-hander which caught them out was just the sort of thing which should be recorded in pace notes. Thus the expression originated.

A recce was grudgingly sanctioned, and they were given seven days and an elderly Austin to make navigation notes for the whole team. This they did, also choosing the section from Novi to Ogulin, in northern Yugoslavia, to make the first pace notes. The road swept through a pine forest where there were precious few geographical features, so the constant narrative method was used to ensure continuity and to pin-point the bends which tightened and those which opened.

Due to lack of time, they were only able to make three passes over the stage, but were more than satisfied during the rally itself and were holding fifth place through northern Italy when the engine blew up.

Two days of recceing prior to the German Rally was not enough, although they managed "once-over" notes for some sections and subsequently won their class, beating several of the fancied Porsches.

By this time, both Riley and Ambrose had developed a degree of confidence in their note system, and Riley's response to the instructions convinced them both that the system was sound, and would improve. In January, 1961, the Riley/Ambrose partnership was to tackle the Monte in an Austin A40, and they were given a similar car for their first real recce, spanning about ten days in the December.

By that time, Chambers had begun to take an interest in pace notes and was suggesting that Riley and Ambrose should pass them on to the rest of the team. Their reluctance to do so was interpreted as selfishness, which was quite unfair. Having perfected their notes, they knew that they were very personal and could be highly dangerous if used by someone to whom they were unfamiliar. They also felt that, even if the system could be modified so that it could be passed on to others, that stage of development had not been reached.

Over the next few months a great evolution took place. There were arguments over which words to use, discussions on symbols, timing, reading and all manner of other things. It is to their credit that they made the system work, that it rapidly caught on and that, thirty years later, it has become a fundamental requirement for anyone who aims for success in rallying.

The question whether pace notes make you faster is easy to answer. Of course they do. Whether they make you safer is another matter. On a road unaffected by sudden storms or landslides, and avoided by wandering goats and ox-carts, all things that can never be shown in pace notes, the theory is that safety will go hand-in-hand with speed. However, think of it this way. Make an error of judgement without notes and you will go off the road. Make a small error with notes and you may still go off the road — but faster! GP

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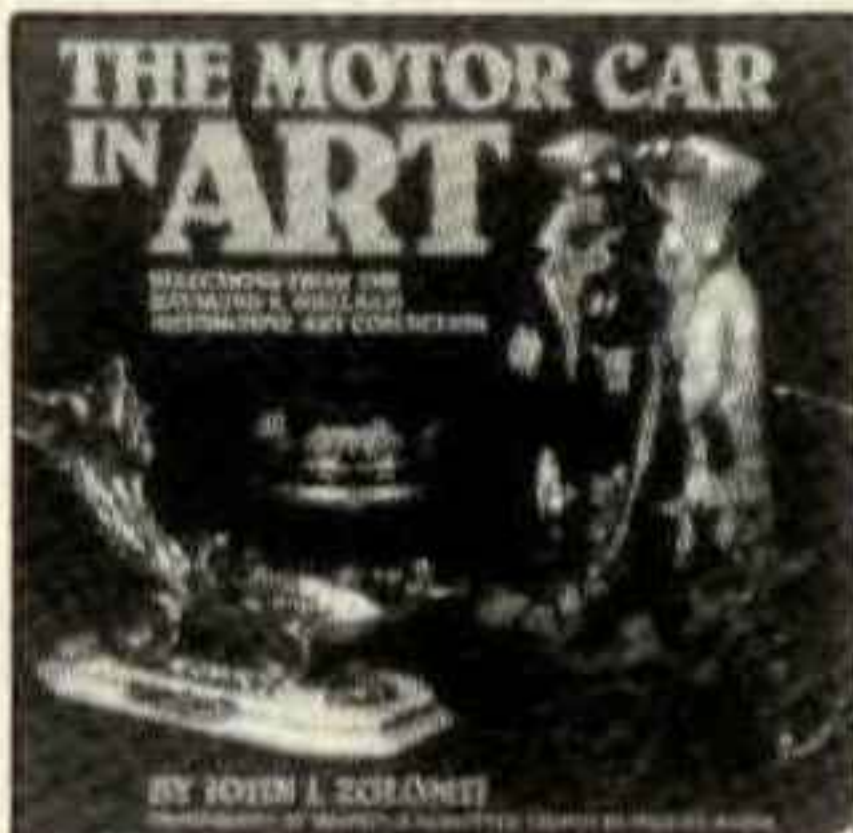
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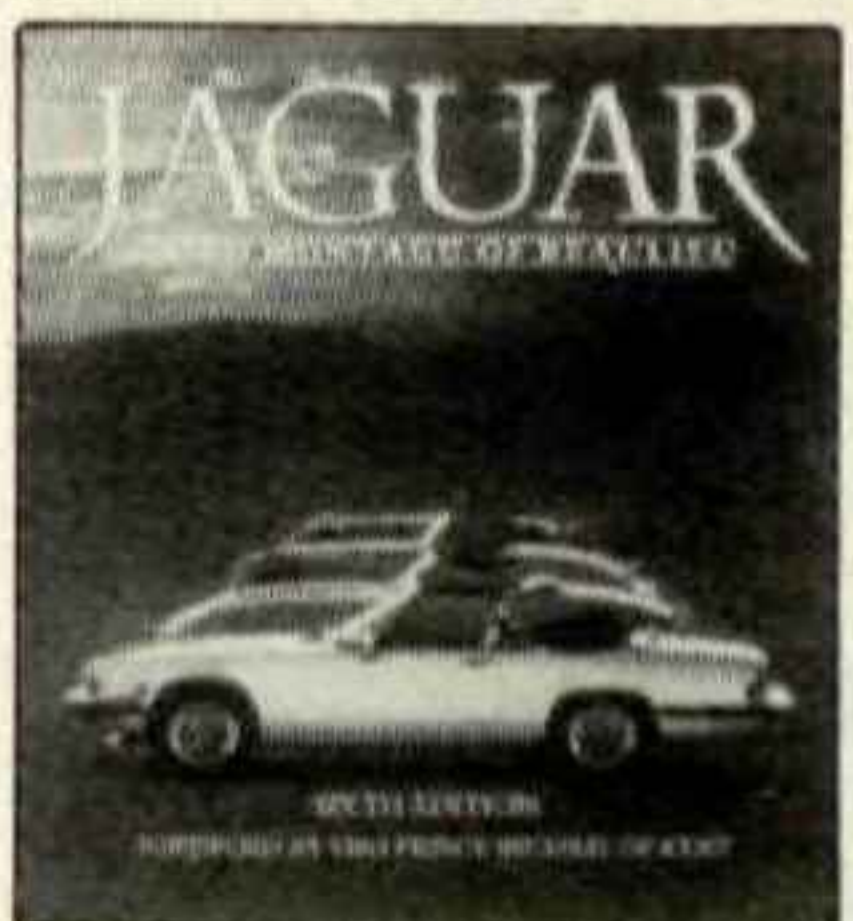
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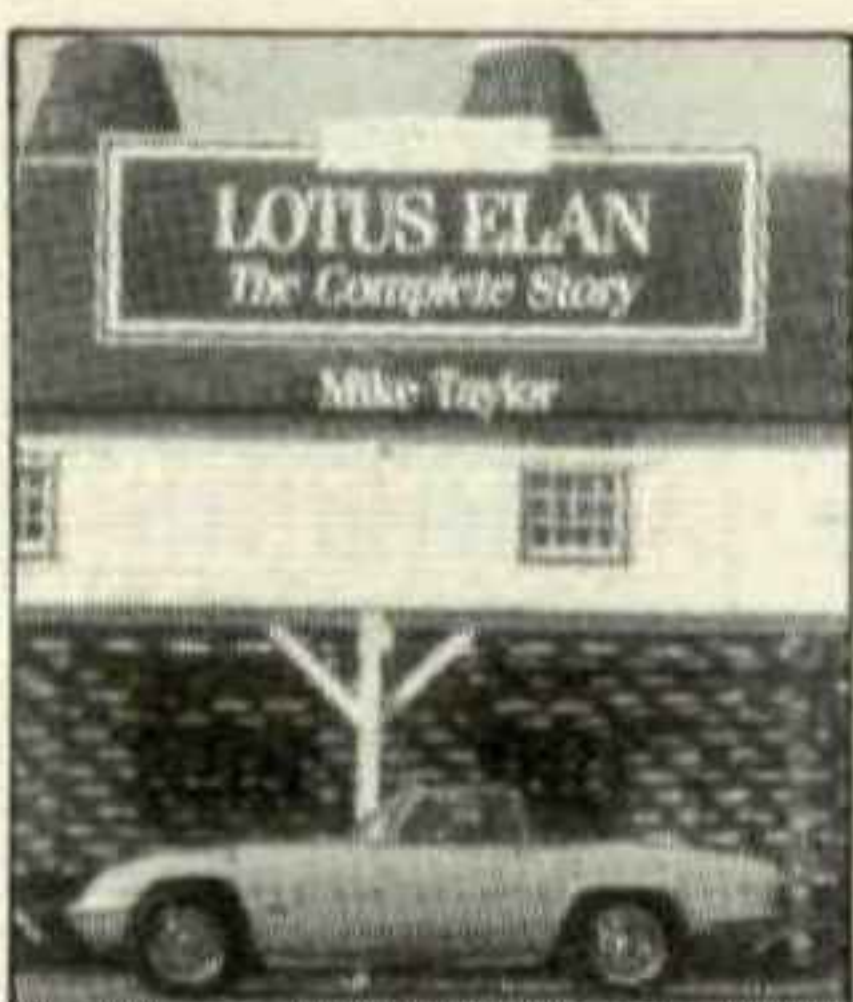
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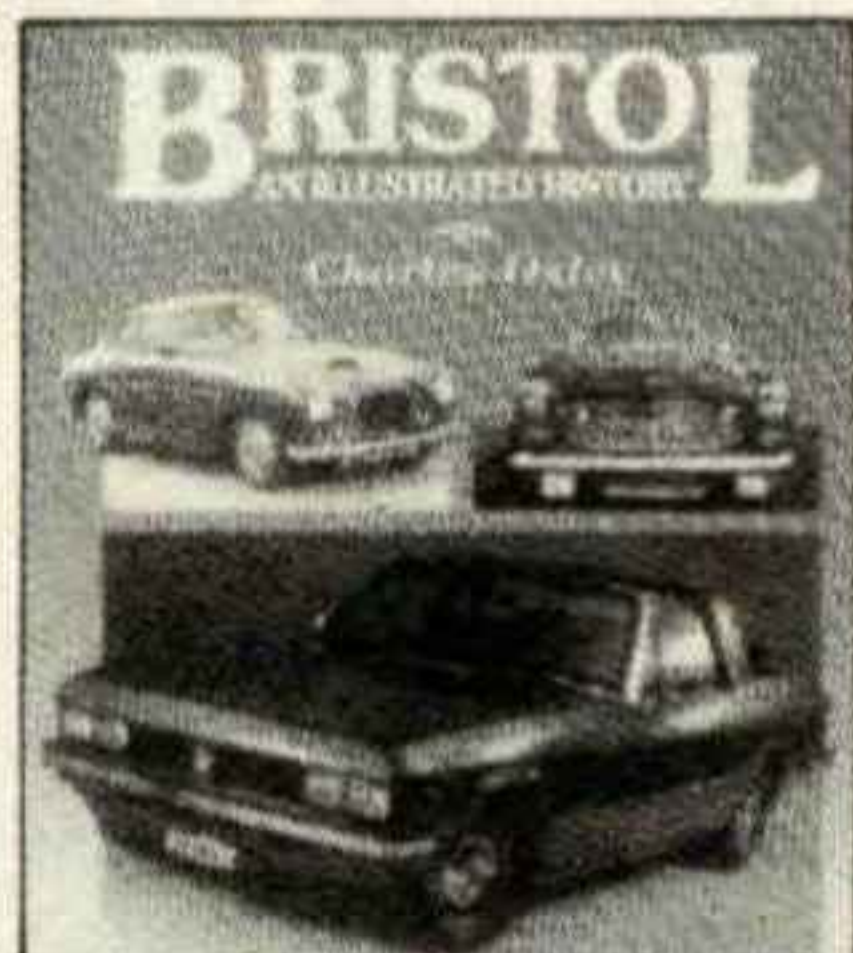
This is the 6th Edition of this standard work of reference with its newly added colour pictures. Revised, updated and expanded to take into account privatisation, the rise of Sir John Egan, and the very successful re-entry into racing, the enormous success in America, the launch of the new range and the problems following the dollar crash and the eventual takeover by Ford. 282 x 254mm. 288 pages. 12 colour and 160 b/w ills £25.00



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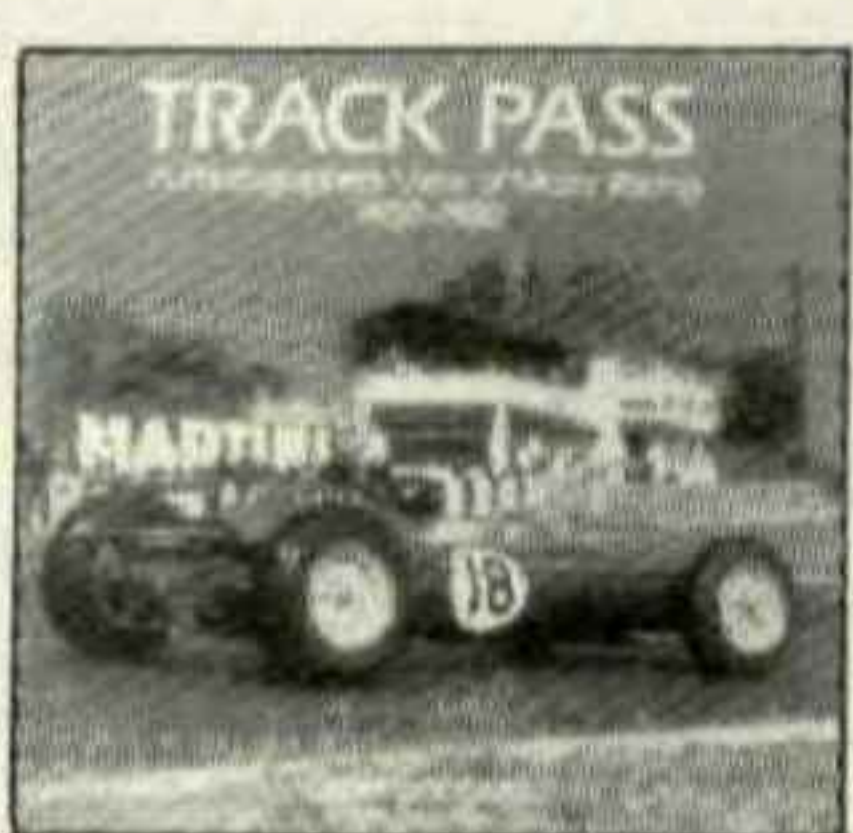
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TRACK PASS
A Photographer's View of Motor Racing
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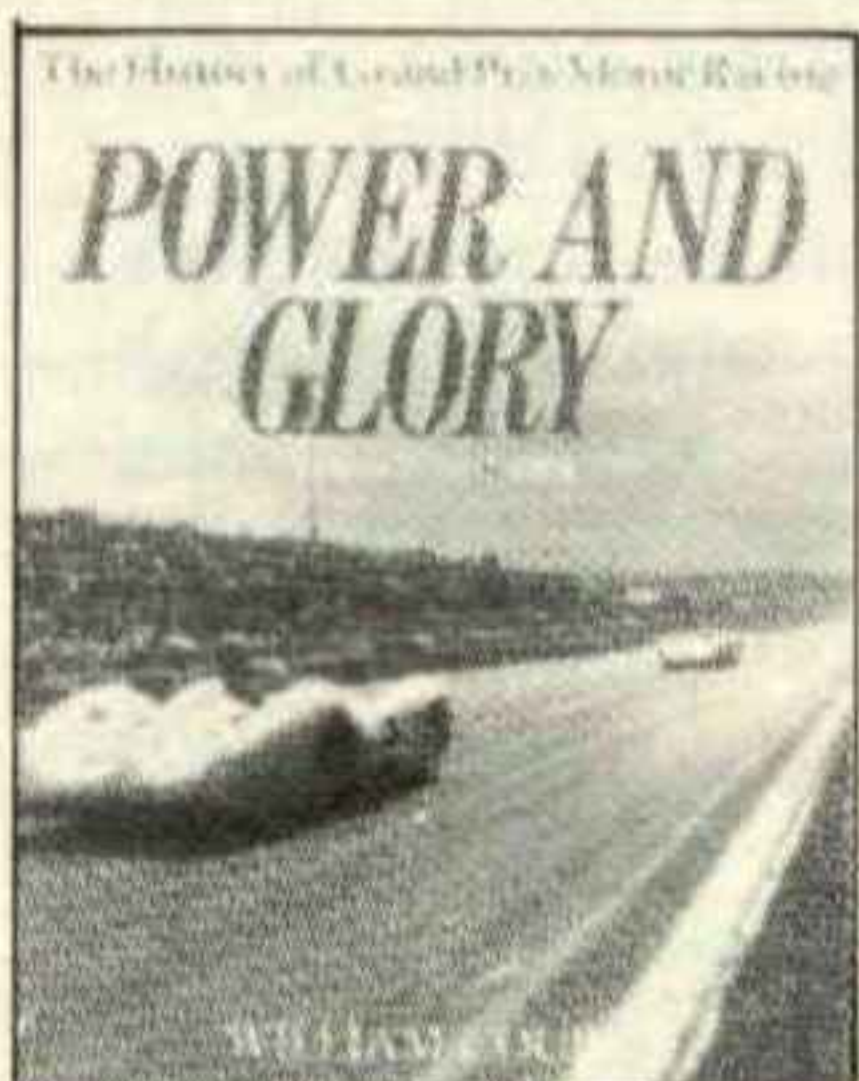
Motor racing is perhaps the most visually exciting of all sports but recent safety

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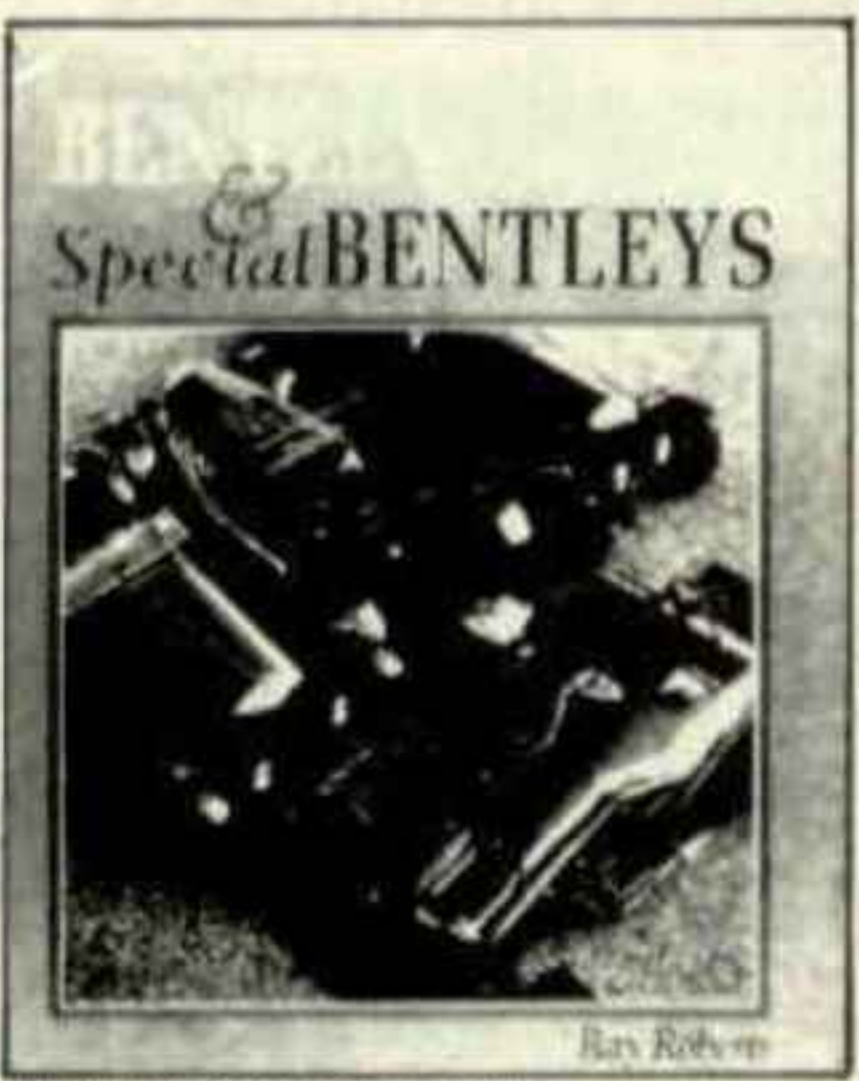
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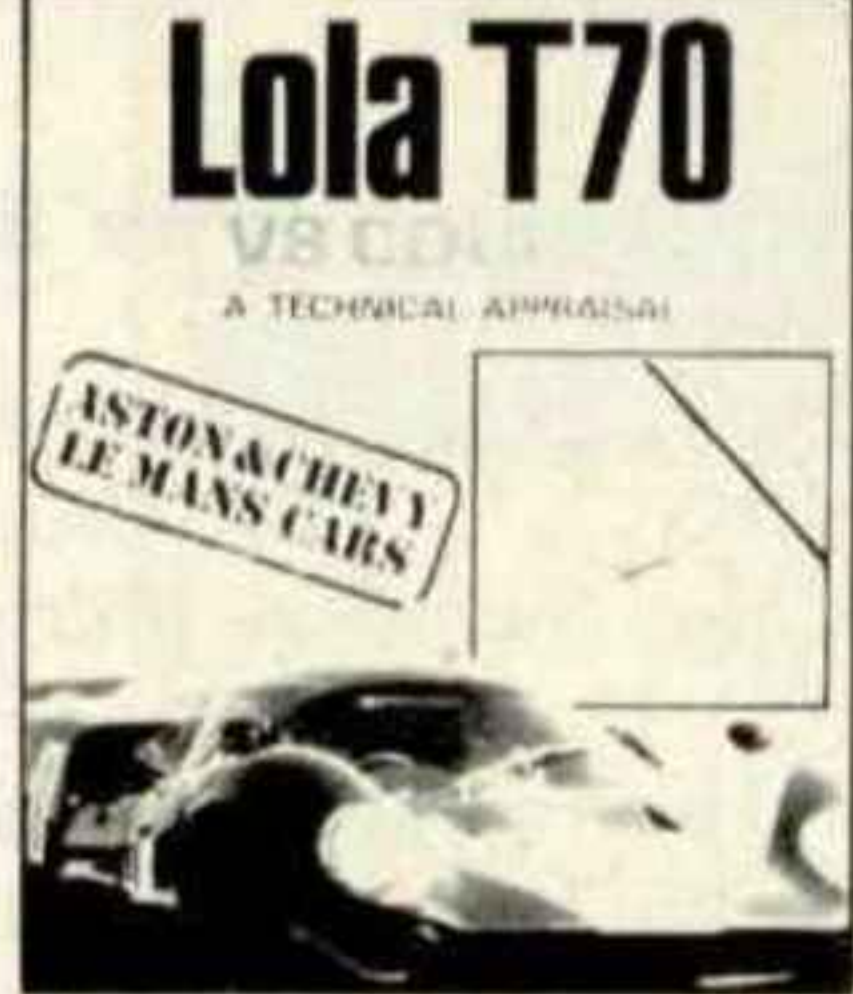
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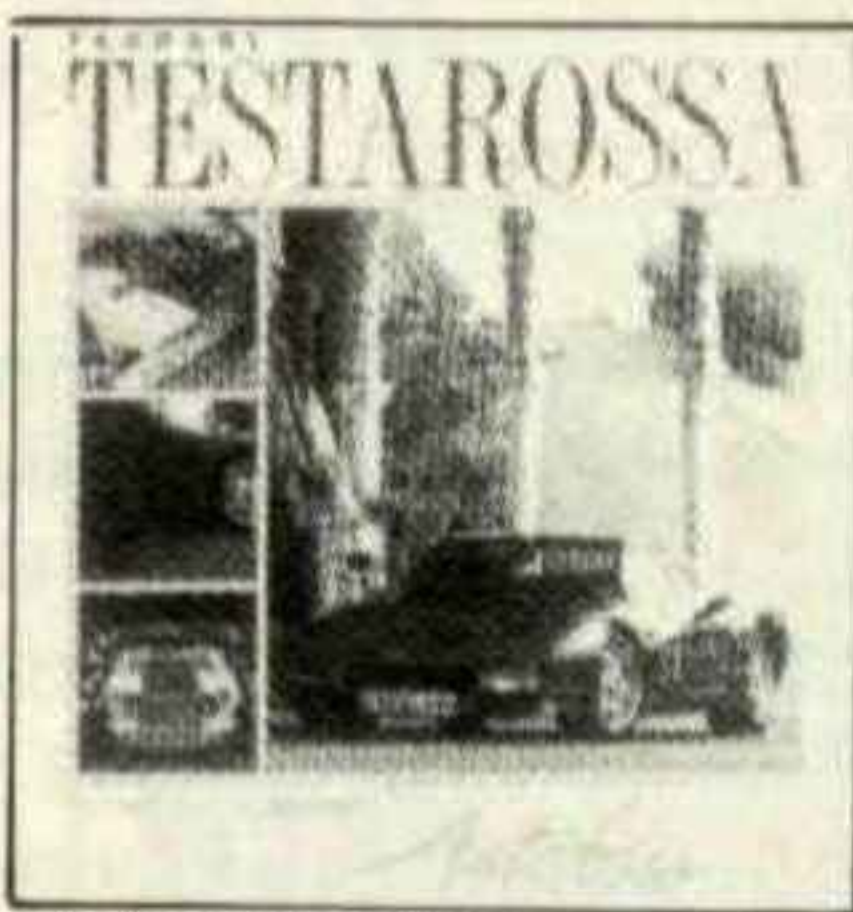
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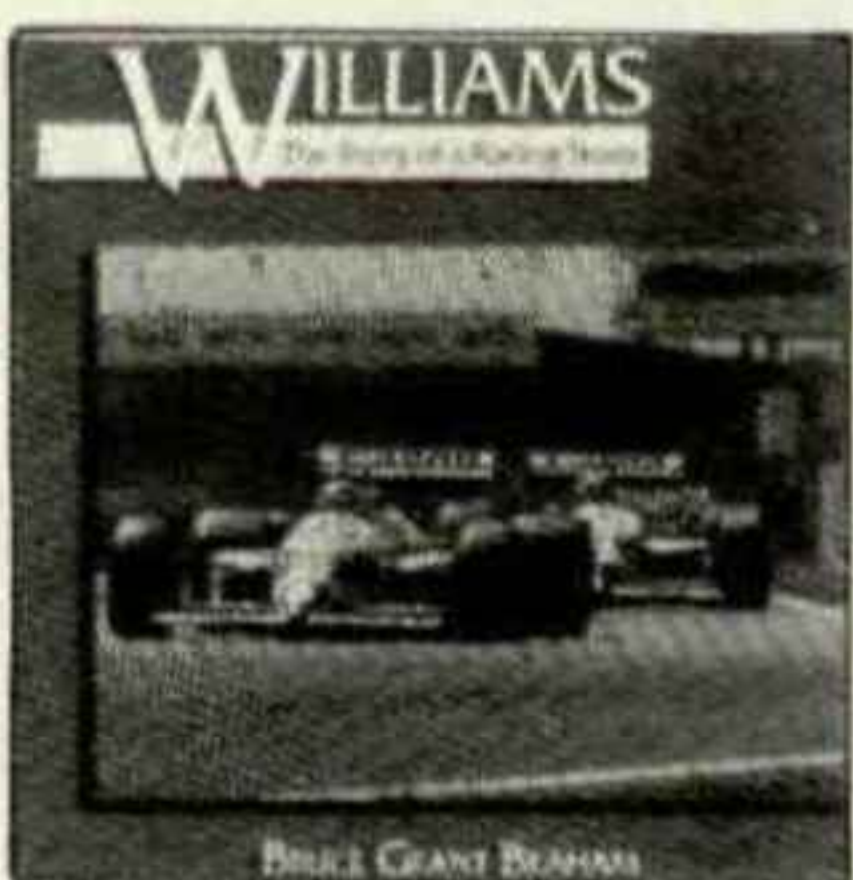
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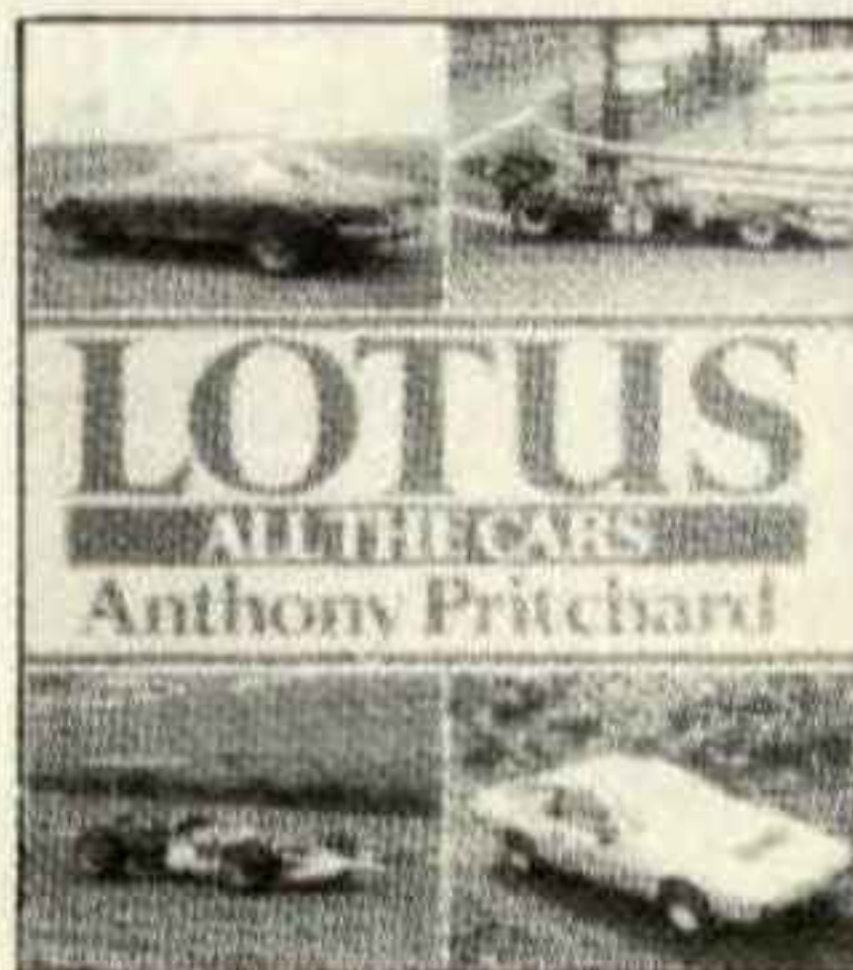
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The Story of a Racing Team
by Bruce Grant-Braham

This book charts the growth of Frank Williams' team from the early days in the sixties – when the organisation that was to become Williams Grand Prix Engineering was established through to considerable Formula 1 success. Every race including F2 is covered and Grant-Braham looks behind the scenes and at the men who shaped the team. 246 x 189mm. 352 pages. 177 b/w and 36 colour photos £19.95



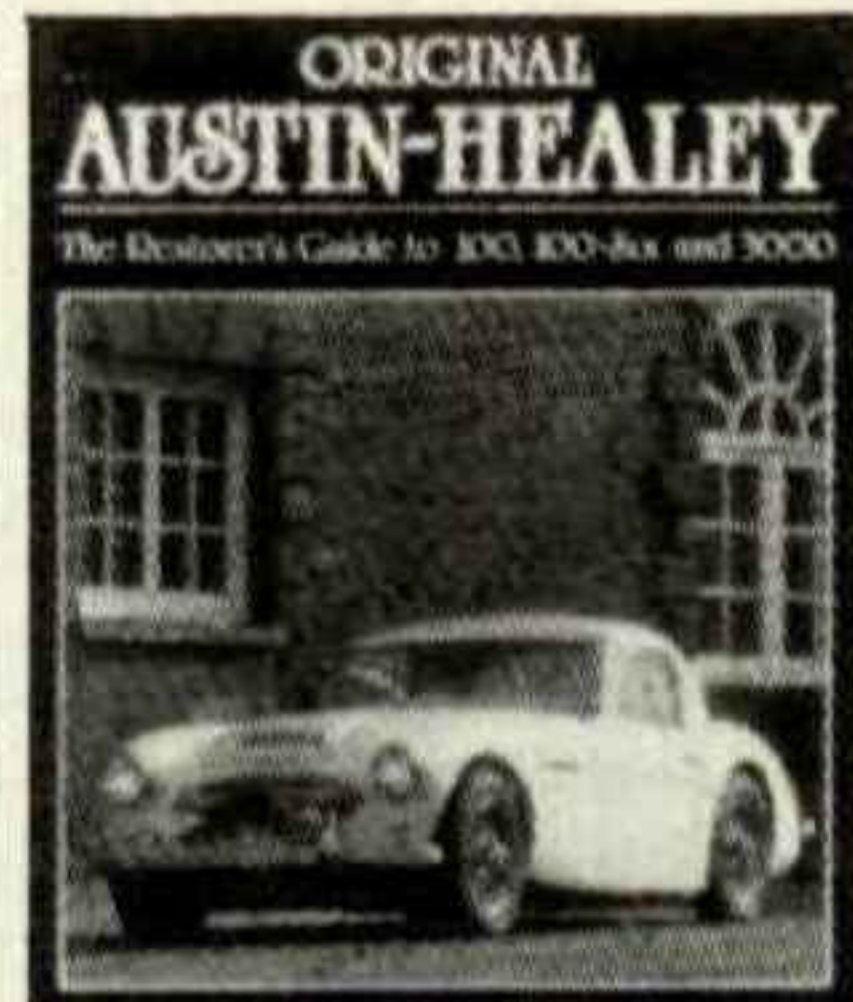
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by Eric Dymock

BMW has its origins in the aircraft engines and motorcycles of the first quarter of the 20th Century. In 1928 the Eisenach Dixie works, making Austin Sevens under licence, brought BMW into car manufacture starting a dynasty which included the remarkable 328. Its a story of ups and downs until the early 1960's when BMW at last got into its stride. 254 x 258mm. 150 colour and 150 b/w ills £20.00



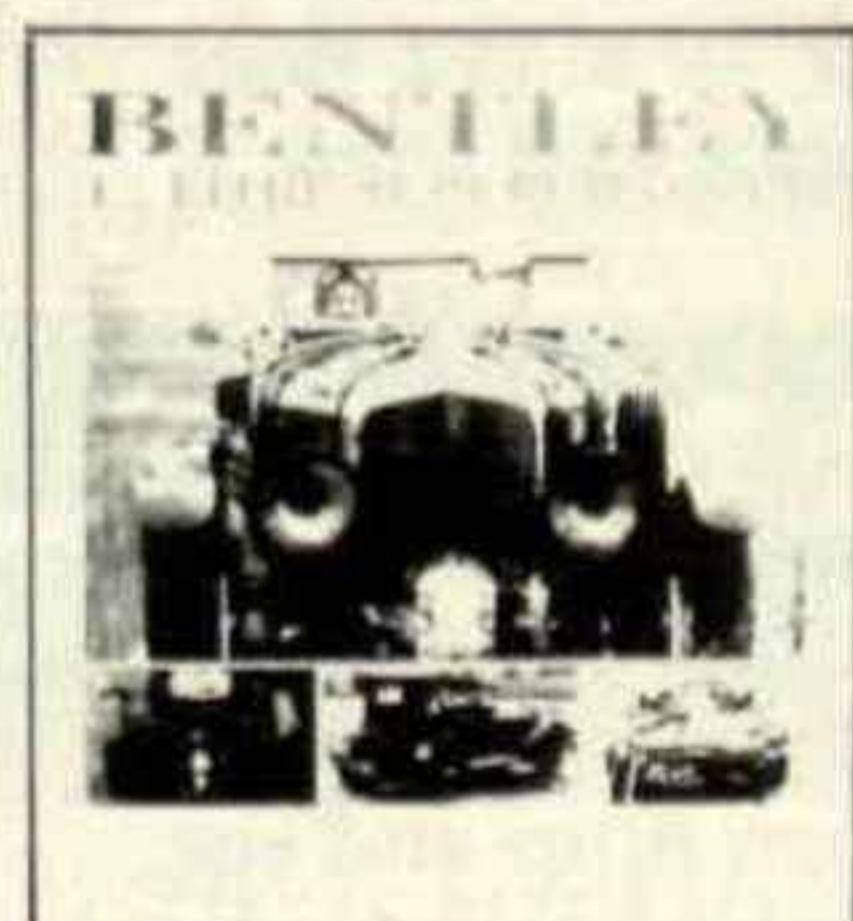
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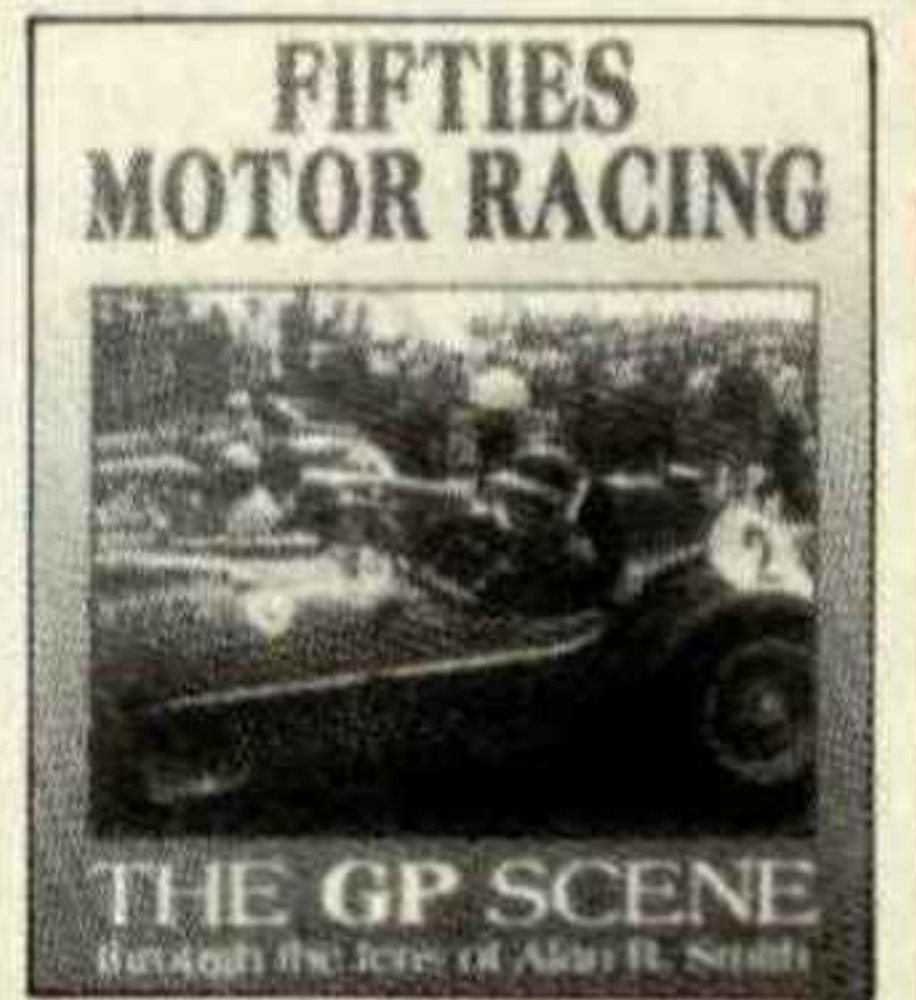
One of the new Autofolio Series combining a witty yet authoritative text with specially

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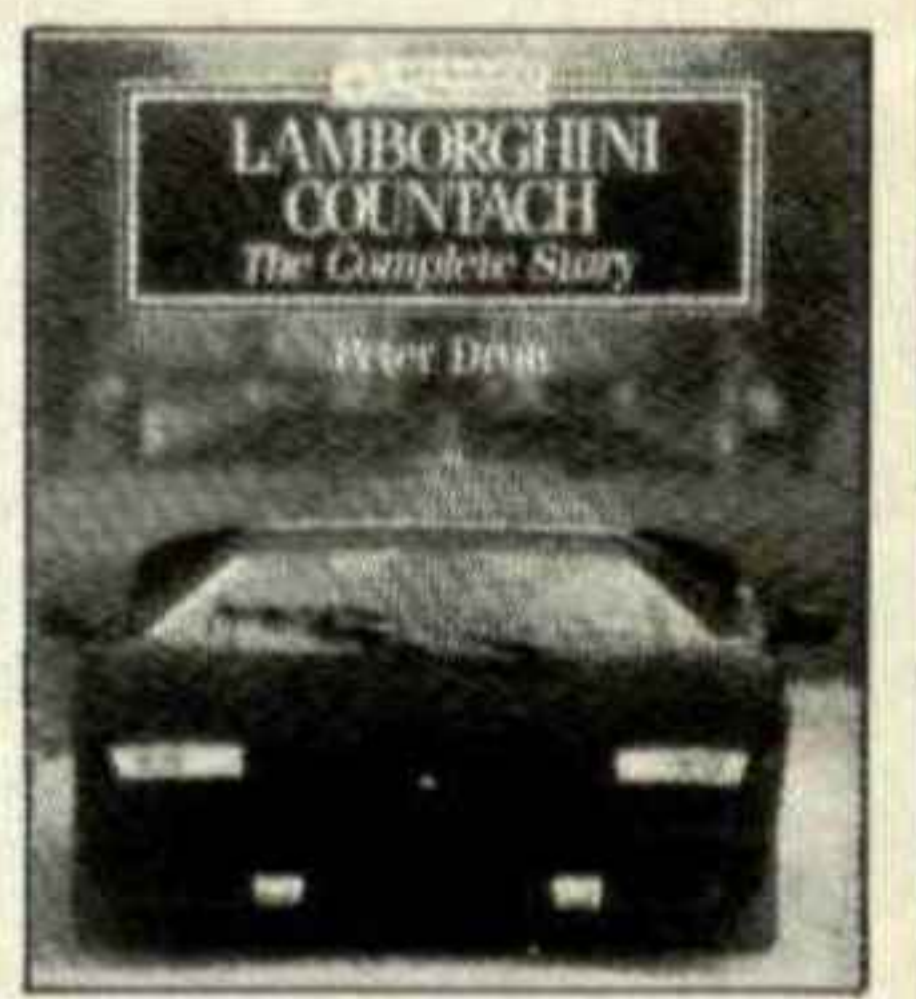
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From Abart to Zimmerman the author deals individually with every car entered in international formula racing since the late 1940's – F1, 2, 3, 3000, Intercontinental and Junior. Brief histories of constructors are given and the salient points of design, with summaries of their racing records and drivers. 295 x 225mm. 256 pages. 50 colour and 700 b/w photos £24.95



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THE GP SCENE

through the lens of Alan R Smith Alan Smith presents glimpses of his youthful pre-war motor racing photography at Brooklands and Donington before lifting the curtain on the first post war British Grand Prix at Silverstone. We see previously unpublished photographs of ERA, Maserati, Alfa Romeo and Lago-Talbot before continuing into the mid-Fifties and the 2.5 Litre unsupercharged period. For the camera enthusiast photographic notes are included. 270 x 210mm. 144 pages. 150 b/w photos £9.95



LAMBORGHINI COUNTACH
The Complete Story
by Peter Dron

In this book Peter Dron seeks to examine coolly and dispassionately the reality of what is undoubtedly one of the most legendary cars of all time – from its birth as the LP4200 through its evolution into the 5000 quattrovalvole and, fresh from its launch, the Diablo. With specially commissioned photography, numerous driving impressions, road test details and model specifications. 258 x 195mm. 192 pages. 104 colour and 46 b/w photos £15.95

The Cobra-Ferrari Wars 1963-1965
by Michael L Schoen. 368pp. 11" X 8½".
CFW, 8202 NW 16th Avenue, Vancouver,
Washington 98665, USA. £55.00

"368 pages, 85,000 words, based on interviews with 51 of the original participants, conducted over 18 years," so says the accompanying blurb accompanying this book, and for once the product lives up to the hype. This is a book that the true motor racing historian will only put down because it becomes too heavy.

We are now truly into the era when sports car racing of the Sixties is being dissected and analysed in minute detail. American author Michael Schoen has taken just three years of this era, 1963 to 1965, and come up with a peach of a book.

As Schoen has been involved with the production of the book as well, the result is more of an enthusiast's than a businessman's. In other words, he has let no expense be spared on his baby. One of the truly great assets of this book is the fact that original photographs have been used throughout and that where he has a colour photograph, he has located it next to or near the relevant text rather than go for the cheaper 16 page colour section somewhere in the centre. He will never make any money out of this book, that's for sure, but he will long be remembered in posterity for such a fine piece of work.

The text itself is a little too chronological when an analytical approach would have been favourable, but the original source material adds authority. It has to be the photographs, though, that are the real reason for buying the book. One can look for hours at pages of Cobras, GTOs, racing shots and drivers again and again.

Even if you buy only one book this year, treat yourself to this one. \$100 (or £55.00) is a lot of money, but just think of it as an amount you might have blown on an evening out. WPK

A-Z of Formula Racing Cars

by David Hodges. 312pp. 11½" x 8¾".
Bay View Books, 13a Bridgeland Street,
Bideford, Devon EX39 2QE. £24.95

This book is the result of some quite prodigious research by David Hodges, assisted in part by Mike Lawrence. It is quite irresistible.

It was only when work got underway in 1986 that the extent of the job David Hodges had embarked on truly registered. What started out as another book soon began to develop into the book that has been published this year — a 312 page tome with 800 photographs and some ¼ million words.

As a reference book, it is outstanding in its contents, but if you were to buy it for that reason, you would be missing out on a treat, for it is the sort of book you can dip into at random. Stick your finger in between some pages, open it up and see what you find. Pages 116/117, for example, have Hesketh, HH, Hill, Hill Special and Honda. Everything is clearly laid out and

all the entries are complemented by period photographs.

Naturally Hodges has had to be selective to some degree, but those cars built for Formulae 1, 2, 3, 3000 and Junior are automatically included while CART/USAC, Formulae 5000, Ford and Renault are at the author's discretion. Each of the 500 or so manufacturers is also given a brief summary. WPK

Williams — The Story of a Racing Team

by Bruce Grant-Braham. 350pp.
10"x7¼". The Crowood Press, Gypsy
Lane, Swindon, Wilts, SN2 6DQ. £19.95

Here would seem to be the definite work on the popular and successful Williams F1 team, also covering the F2 racing. It opens with biographies of Frank Williams, CBE, and the book then runs through the entire Williams' racing endeavours, with race results and driver biographies boxed for easy reference. The Williams-Brabhams start the story and Part 2 is called 'The Wilderness Years', after which the FW07, the second World Championship, the Honda years and the Judd and Renault periods carry the account to present day racing.

We are reminded by one of the many photographs that HRH Princess Ann and Capt Mark Phillips not only spent three and a half hours at the Didcot factory in 1983 but that the Princess drove a Williams at Silverstone and linked Williams to the Save the Children Fund — another link between motor racing and the British Royal Family. There are the usual appendices for those who need instant history and some good colour plates. Good, this one. WB

Hazleton Publishing have recently brought out another four of their 112 page driver profiles but, lacking the dearth of present day personalities, have discovered heroes from the past. Thus we have *Gilles Villeneuve* by Alan Henry, *Emerson Fittipaldi* by Gordon Kirby and *Jochen Rindt* by Alan Henry. The only contemporary driver represented in this latest batch is *Alain Prost* by Nigel Roebuck.

Each follows the same format, which is basically a pictorial treatise with the very briefest of narrative, so you can whizz through them very quickly, by which time you will have learnt the basic details of the drivers covered. These are not an in-depth study, but they do not pretend to be. *Alain Prost* and *Gilles Villeneuve* are £11.95, but *Emerson Fittipaldi* and *Jochen Rindt*, the two latest, are £12.95 each. WPK

If your coffee table looks bare and you have £24.95 to spare, GT Foulis & Co of Yeovil can provide *The Great Book of Muscle Cars* which should adequately fill it! It is concerned with American jobs propelled by things like near 7-litre V power packs. Fans of motors from AMC to Plymouth and Pontiac are catered for by

254 pages, 600 colour pictures and specifications provided by the Editors of *Consumer Guide*. In all, 70 of the muscle cars that are on the prowl again are featured and the booksize is 14in x 10in. It takes quite a lot of muscle to handle it. WB.

Sunday Times motoring journalist Eric Dymock has written *BMW A Celebration*, a lavish and colourful, 191 page book on the marque. It is not a serious history and lacks credibility. In the chapter on racing history, for example, there are no contemporary photographs of the fabulous racing saloons of the Seventies except for a couple of tame stationary shots taken in a studio. I wouldn't waste my £20.00 on this book, a book I would expect to find in the cubbyhole of my new BMW. WPK

Peter Dron tells the story of the fabulous Lamborghini Countach in his book of that title, by The Crowood Press, another book very well illustrated, in colour as well as with black and white pictures. One of the colour plates shows lots of Lamborghinis gathered outside the factory for their anniversary party, another Lee Iacocca with the last Countach, a car named to mark the make's 25th birthday. Road test figures, diagrams, company politics and dates on the new Diablo are there and the book's subtitle claims that it tells the complete story of the Countach. The price of this 192 page 10½in x 7½in book is £15.95. WB

Ferrari Concours by photographer Richard Newton is the latest in Osprey's Colour Series. I must confess I did not think I was going to like this book. As much as I respect the work of Newton, his little book looked lightweight and ephemeral, a sort of collection of colour plates without any fixed reference points other than that they were "Ferraris". In fact, it wasn't quite so bad. True, one would only buy it for the photographs, but at least the introduction to each chapter is informative.

Probably the worst thing about it is the undistinguished front cover photograph. Get past that and you will find you'll have a decent half hour's read ahead of you for £8.95. WPK

Now is the time to buy MOTOR SPORT's 1991 calendar. Measuring a large 16½" x 17½" and spiral bound for ease of turning over each succeeding month, this beautifully produced calendar is now available from our offices.

The calendar is now devoted solely to Formula One, each of the 12 photographs representing the major runners this year plus some which warrant inclusion simply through being such an outstanding composition. Each one is complemented by a long and informative caption.

The calendar is now available from MOTOR SPORT Magazine, Standard House, Bonhill Street, London, EC2A 4DA for £9.95, which includes VAT and postage, a very reasonable amount for this large format calendar. WPK



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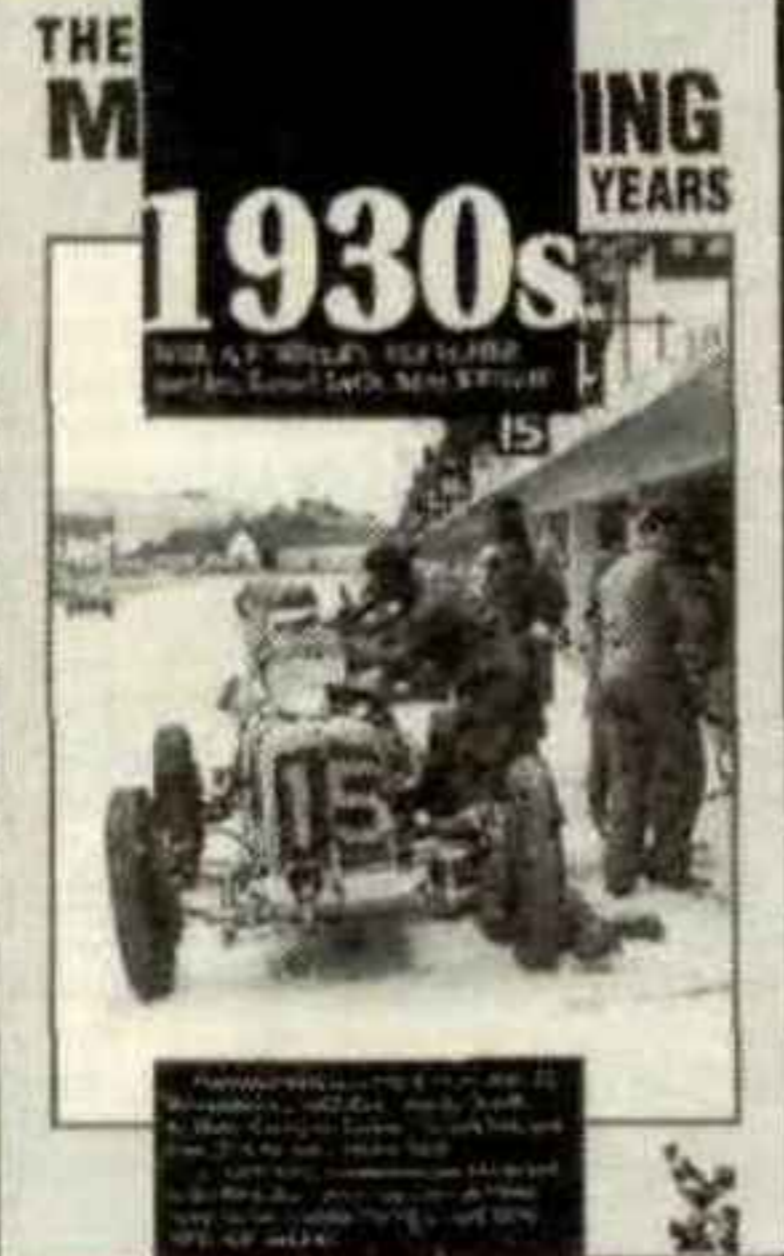
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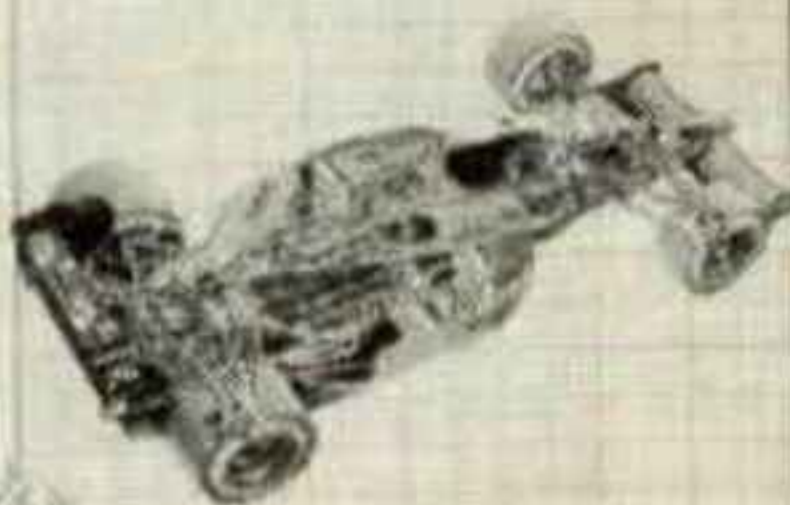
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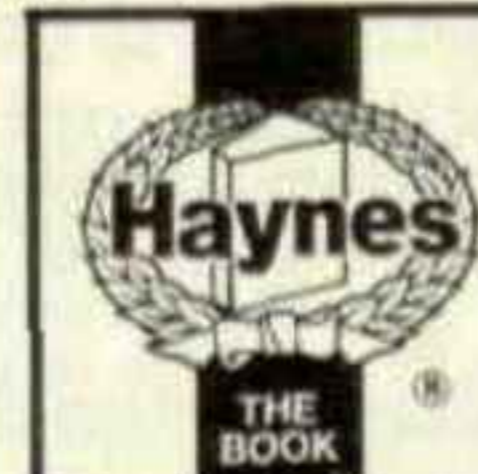


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Weslake v Cosworth

Sir

I was saddened to see from your 'Valve Angles' piece in the October issue that you are perpetuating an untruth: Keith Duckworth was not 'the first engineer to use a narrow-angle, four-valve cylinder head with the valves operated by twin overhead camshafts'. You are following unwittingly in Graham Robson's footsteps in failing to give credit where it is due to the late great Harry Weslake!

Back in May I put the record straight in a lengthy letter to Graham, following his 'Autocar & Motor' article which in effect was an abridgement of his book and repeated the same untruth. I realise, though, that he was serving only as Keith's mouthpiece and naturally would expect to be told the truth.

In ascribing the invention to Weslake I am talking at first hand. I saw an experimental engine with the subject configuration (and its dynamometer results) about two years before the Cosworth FVA was announced. The engine was a Shell research project with which BRM were involved, and moreover it was not the first Weslake unit with four narrow-angle valves.

While Keith was undoubtedly the man who put the narrow-angle four-valve DOHC layout 'on the map' thus making a very praiseworthy and major contribution to engine technology, it should now be clear to you that he was certainly not first in the field. Hence he should not have made his rather boastful claim to be the inventor and he should have given credit to the Weslake company for having antedated him, not least as some posthumous kudos for Harry. Honesty and magnanimity would have done his reputation more good, with me anyway, than dubious ego-boosting.

Alan Baker
Ripley, Surrey

While anxious to give full credit to Weslake Developments Ltd, I was thinking in terms of racing car engines rather than experimental test-bed engines and the Cosworth FVA was in use before the Eagle Weslake had been raced, although as Graham Robson, whose book 'Cosworth' I was quoting from says, 'I don't think one was a copy of the other'. He was also quoting throughout the book what Keith Duckworth told him. ED.

Group C Rules

Sir

I cannot let Michael Cotton's comments on the fuel consumption formula in Group

C in his piece 'Controversy in East Midlands' (MS Oct.90) pass unnoticed.

When the formula was decided on, I was part of FISA's Technical Committee and I may be accused of being biased, because I was really the man who boxed it through, against considerable resistance from most manufacturers involved or to be involved, except Porsche and Mercedes. Help came only from Committee President Curt Schild whom I had managed to convince and, if I remember well Committee members Eberhard Morr from Germany and Nigel Eason Gibson from Great Britain. Once the principle was accepted, which was the most important thing, the amount of the original fuel allocation was set at a much too high level 60 litres/100km because otherwise several manufacturers refused to endorse it. It was later reduced to 51 litres which, I feel, was still too high. Both Schild and myself, aware that most Cosworth DFV and DFL engined cars use less than 30 litres per 100km at Le Mans, thought that an allocation of 30 or 35 l/100km would have been more realistic.

One thing I want to stress is that the plan to adopt a fuel consumption formula did not originate from any consideration of fuel shortage, but rather from the fact that it is the only non-arbitrary way to give atmospheric and forced induction, as well as any other type of engine, equal chances. In contrast to a capacity limit formula, as will be used again from next year on, which imperatively requires the use of specific racing engines running at 13,000rpm and maybe more, a fuel consumption formula can be met with basically production engines because the high mechanical losses associated with very high rpm are detrimental to specific fuel consumption. From 1982 on, all major Group C races have been won with basically production engines, whether they come from Porsche, Jaguar or Mercedes-Benz.

When the formula was being discussed, rather than limiting the fuel allocation for the entire race, it was envisaged to use a fuel flow restrictor, but this was finally rejected because of possible reliability and accuracy problems. We also envisaged the possibility of an air flow restrictor, as advocated by Michael Cotton, but this was rejected on two grounds: a) the public easily understands the reason for limiting the fuel consumption, but limiting the consumption of air, which is free for all, is difficult for the layman to understand. (I believe Joe Lowrey put forward this possible solution, for F1 racing, years ago. ED).

b) though limiting the air flow automatically limits the quantity of fuel going with it, it does not promote fuel efficiency. An air formula contains no incentive to undertake all the developments made under the fuel consumption formula to improve the fuel efficiency, which were also undertaken in Formula One when the fuel tank capacity rule was introduced.

I maintain that the fuel consumption formula was a very interesting one and this

is confirmed by all the manufacturers who took part in Group C events. It brought with it many useful developments which have since been adopted in production cars and will be in the near future. It also was a remarkable development exercise from which production engines have benefited and will benefit in the future, especially those on which the racing engines were based.

As to the sporting side and the problem of drivers having to drive on an economy basis or cars running out of fuel in sight of the finishing line, there is a very simple solution which I have often advocated: take a 1000km race and limit the fuel allowance to the first 500 kilometres only and make the consumption free for the remaining half of the race, making sure that on turbocharged cars, the wastegate setting cannot be altered. Nobody will be foolish enough to risk running out of fuel before the first 500km are covered, and if a car had to be driven carefully to reach half distance, the second half of the race will give it a good chance to catch up with the others. This would often result in exciting finishes while retaining the fuel consumption principle and the useful developments it encourages.

Whatever the future of Group C, which adequate promotion could make more popular, my opinion is that it is wrong to set the same technical targets in Formula One and Group C which now almost double up since future Group C races will be only marginally longer than Formula One Grands Prix.

Thank God we still have Le Mans, but the exclusion of turbo and supercharged engines which are to be found in many standard production cars all over the world, is a major error.

Paul Frere
Venze, France.

Unleaded Petrol

Sir,

I feel that I must reply to the letter from Mr Garnet W Wrapson (MS Oct. 90) concerning unleaded petrol. The Federation of British Historic Vehicle Clubs is well aware of the problems that have arisen from the loss of two-star petrol and that we may have to face up to a situation where no leaded petrol is available.

Through our news sheet we have been keeping clubs informed of what efforts are being made and we have set up a liaison between various clubs that are conducting research into the use of unleaded fuel in older engines. Certain clubs have already started to carry out research into the areas suggested by Mr Wrapson and we have learned of tests that will be undertaken to carry out hardening processes to existing cylinder heads. At this stage much of the research has yet to be proved but we in the Federation are anxious to hear from anyone who can contribute with knowledge that can be usefully pooled together. We already know of engines where valve seats have been suitably inserted although



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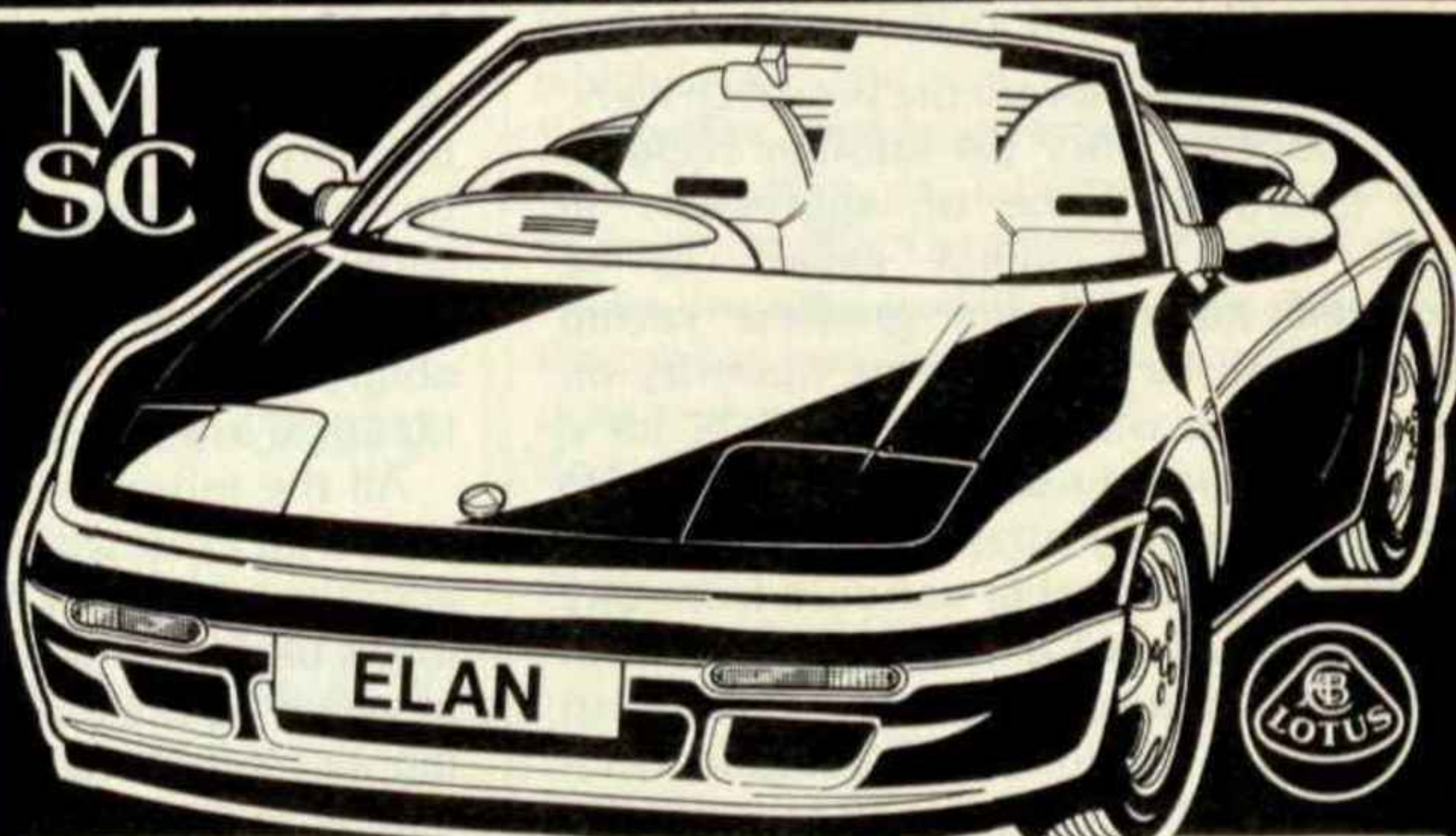
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we are aware of a large number of engine types where valve seats are impossible to insert with present day technology.

There are a number of additives which are being marketed and research is also being encouraged as to whether these are effective. We would very much like to hear from anyone who has run on unleaded petrol with such additives for a long period of time. We are also aware of additives apart from lead, some of which are as dangerous if not more so than lead.

Those who have expressed an interest in dealing with this research have already made good contact with the petrol companies and we sincerely hope that some benefit will result from this.

I must point out to your readers that there is no policy of non-involvement by the Federation as indicated by Mr Wrapson. We are as interested as anyone in seeing that suitable fuel is available but we have to accept in the end that if there is only a very small demand for leaded petrol, then the market itself will govern what fuel is available at the pumps. We therefore wish to support the efforts being made by the Clubs trying to research the problem.

P.L. Glover
Federation of British Historic Vehicle Clubs,
Stanmore, Middlesex.

An Unworthy Champion

Sir

Senna may have won the World Drivers' Championship after yet another reckless and pointless piece of aggression in Japan, but he cannot expect to be accepted amongst the greatest racing drivers until he shows some maturity on the occasions when he has to fight for a win. To win you must finish and sidelining the opposition by attempting the impossible is not acceptable conduct from any driver in Formula 1 and certainly not from a World Champion. If the sport is to maintain any credibility FISA should discipline him as it has happened too often to be called 'bad luck'. Prost wins my vote for 1990 whatever the points may say.

A.G. Duncan
Alfrick, Worcester

Sir

In recent months MOTOR SPORT seems to have made a serious attempt to become the official Ayrton Senna 'fan mag'. Following this driver's success in winning the 1990 World Championship, I believe that the average reader will require to clarify his or her thoughts. I offer the following explanations for the events in the Japanese Grand Prix. Readers may choose the explanation that they consider to be most appropriate.

1. The result was a consequence of fine driving by the 1990 World Champion.

2. Prost caused the crash by not taking the wide slow line and allowing Senna to take the lead, that is his by right.

3. Prost caused the crash by not taking avoiding action, that is necessary when Senna is behind. Thus Prost has not learnt from his own past experience and that of others (eg Nannini in Hungary). This seems to be the BBC commentators' opinion.

4. These skilled professionals had some bad luck, rapidly followed by good fortune in that they did not cause a multiple accident.

5. Senna is the fastest driver in the world today but is inconsiderate of others and dangerously flawed when racing others in equivalent machinery.

6. The 1990 World Championship was won with a cynical manoeuvre.

The choice is yours.

P.J. Huston
Boston, Lincs.

Bumping and Boring

Sir

I watched with more than a trace of sadness the debacle at the Japanese Grand Prix, which resulted in perhaps the most boring motor race I have seen in years.

Having, along with DSJ, felt for a long time that Senna was THE man to watch in any Grand Prix, I have now begun to harbour rather more than slight suspicions about his driving techniques.

As DSJ mentioned in his recent profile of Senna, he is undoubtedly the brightest driver on the GP scene. His abilities are well documented, and there is no question that his car control and fast thinking leave him streets ahead of the opposition. Indeed his ability to put in successive laps within hundredths of a second of each other is proof positive that he has the ability to place his car within inches of an identical line, lap after lap.

All the more reason then why his accident with Prost within a few hundred of the start line somehow fails to ring true. If one looks back at the 3 or 4 similar accidents in which Senna has been involved, including an almost exact replica last year, one begins to feel that the word accident is being misused. Following the race I spoke to one or two contacts I have in the stunt driving field, and we all concluded that given the behaviour of a car at the limit in a corner, the effect of placing a front wheel, quite gently, just to the rear of centre of an adjacent car would have the effect of sending the adjacent car off in a spin, in all probability leaving the 'attacking' car on the track. A simple manoeuvre for a skilled driver.

Now far be it from me to say that Senna engineered this accident deliberately, but I feel that a close examination of the relevant video tapes would show that in each case the front wheel of Senna's car was within a couple of inches of the vital spot each time.

So one must conclude that either there was more to the situation than a mere accident, or that Senna is losing his judgement. I leave your readers to draw their

own conclusions.

Perhaps the old adage that 'to finish first one first has to finish', should be rewritten as 'To finish first one first has to punt the opposition off the track'.

I think that in future I shall stick to VSCC races. The protagonists may be older and slower, but their judgement seems infinitely better.

S.N. Cookson
Kingston upon Thames,
Surrey.

A modest man

Sir

My son has brought to my attention DSJ's article on Ayrton Senna (MS Oct. 90). With all due respect DSJ is not completely correct in his statement that Ayrton and himself were completely uninterrupted during the plane flight from Lisbon to London. As I recall it, Ayrton was seated near the front of the economy class. I was seated near the back of the Business Class. The steward mentioned to an Australian girl, who had been to the Grand Prix, that Ayrton Senna was just behind us. At the moment he said that, I happened to be reading a report in the *Times* which was praiseworthy of Senna's performance, and very presciently described as having the 'exceptional hands of a true driving genius'. I then asked Ayrton if he would be good enough to autograph the piece for me - he asked 'may I be allowed to read it?' (What courtesy, what modesty!)

On leaving the plane I had to wait for my luggage, as did he. It was interesting watching this very young slight figure pushing his own trolley in totally unfussed manner through customs etc, to be met on the other side by two other youngsters. They went off happily together, no star billing, no razzmatazz.

John Gibbons
London.

Senna & Co.

Sir

Jenks is always being accused of having a blind spot where Ayrton Senna is concerned but I very much enjoyed his appreciation of this great driver in the October issue and was fascinated by his list of requirements to make a good Grand Prix driver. I should love to see Jenks's list of those Grand Prix drivers who, having been 'born', went on to fill all (if possible) of those qualities.

I am sure that one of the many requirements to make (although again I imagine they are 'born') a great motor correspondent is having the courage to express controversial views which stimulate argument and debate.

So come on Jenks, place your neck on the block with your list of the postwar 'greats' and thank you all for giving us, unarguably, the greatest motor sport magazine.

T.G. Wakeley, Thursley, Surrey.

A 50/50 Situation

Sir

Alain Prost after his latest encounter with Ayrton Senna at Suzuka states that losing the Championship does not bother him, and that Senna is a crazy driver with no respect for human life. May I suggest the reverse is true.

The Suzuka incident I see as a fifty-fifty situation. Prost expected Senna to brake (he obviously saw him); he didn't. Senna expected Prost to move over. He did not.

Under the circumstances of the World Championship, and knowing Senna's nature, the blame for Prost's demise lies at his own door. After all did he not claim in the aftermath that the Ferrari was so superior that he would have won? Why then did he not back off and let through the inferior McLaren? Senna goes for the opening - Prost above all others knows that!

Prost the 'Professor' is portrayed as the nice man of Formula One. His outburst after the race can only be described as disgusting and stinking of sour grapes. Contrary to his press statement he really is hurting bad.

I leave it up to the individual as to whose fault Suzuka 1990 was, but the guilty party of Suzuka 1989 is more clear cut. Indisputable evidence shows Prost turning into the chicane too early in order to end Senna's Championship hopes, never mind the unjust and summary execution of Ayrton afterwards. Sweet revenge as far as all dedicated Senna fans are concerned has been achieved. Finally, if Senna is arrogant then Prost is more so. His Suzuka 1990 comments (he kept quiet in 1989) contained nothing but arrogance and complete scorn for the man, judging by his comments of the past two seasons, he knows very little about and most probably understands even less. Not to mention his attacks on Nigel Mansell, claiming that he did all the Ferrari development while Mansell played golf. By the way where was Alain at the Goodyear tests at Silverstone and Estoril?

Alain Prost has cried wolf (or more appropriately Senna, McLaren, Ferrari, Mansell etc; the list is endless) once too often. This time there is no one to bail him out, dare I say not even FISA.

P.S. It is nice to finally have found an unbiased magazine as far as Ayrton Senna is concerned!

Oliver King
Nottingham, Notts.

A man of concern

Sir

As probably the only English speaking witness to the Suzuki/Caffi incident at Estoril I offer one observation that following the stoppage of the race as the leading bunch passed by the scene it was Ayrton Senna alone who slowed right down to enquire from the marshals as to Caffi's condition. He was indeed the only driver to do so.

Surely a most interesting and illuminat-

ing observation of the man as well as the driver.

Peter Hughes,
Hanley,
Staffs.

Data wanted

Sir

Norman Cole and Partners sold a 1912 Métallurgique Cabriolet at the sale at Alexandra Palace 28th April 1971. The registration number was TM4148. I have not come across it in any rallies since it was sold and I wonder if any of your readers know its current whereabouts, or owner. I nearly bought the car at the sale, and now wish I had done so!

David Wordley,
Bury St Edmunds,
Suffolk.

Stirring Sight

Sir

We have just witnessed the second 'Willaston Circuit Pursuit Sprint' as part of the annual Manx Classic event. What an incredible sight to see so many famous racing cars from the past competing on the old Willaston Circuit once graced by such notable drivers as Moss, Hawthorn and Hamilton.

The organisers and the RAC are to be congratulated on providing such a marvellous spectacle which was so thoroughly enjoyed by the many spectators who would otherwise have to travel far and wide to see such a gathering of 'nostalgia'.

DG Alcock
Port of St Mary,
Isle of Man.

If Only

Sir

I was fascinated to read DSJ's account of his Serendipity Championship for cars that never were as I am President of the 'If Only' Motor Club which caters for drivers who might have been.

My members, now numbering many thousands, are some of the finest, if not the finest, racing and rally drivers in the world. Their only problem is that no one has given them the chance to prove it. If only team managers, even from pre-war days could have seen the obvious and contacted me, they could have dispensed with the services of such people as Moss, Clark, Stewart, Prost and Senna for I could have provided them with far superior replacements.

One qualification to join my club is that you must drive a company owned Sierra or Cavalier. Should you actually own a car then it must be a Golf GTI and it must be driven as though it were a company car. We meet at the local pub for a lager on the Tuesday following the TV showing of any Grand Prix, rally or sports car race. Over a few pints we analyse all the obvious mistakes by the current pathetic incumbents of the No 1 spots and decide

which of us would have won if only we had been in the driving seat.

Out of season we have talks and film shows of famous races and rallies that our members would have won if only they had had the opportunity. Our most senior member, Albert Pratt - now in his eighties, regularly entertains us with stories of how he would easily have seen off that upstart Seaman as well as Carraciola, Nuvolari and the rest of them if only someone had realised what they were missing. His son, Ashley, vividly illustrates on film how we would never have heard of Clark, Hill and Surtees, nor Makinen or Hopkirk either - if only! The grandson who is another one of the same name is now one of our most successful active members. But then, he should be since his car has the magic GLX2.0i on the back as well as an 'H' registration.

If my members can get their hands on some of these cars that were never built then I would suggest to Messrs Senna and Prost that a dignified retirement now must be better than the inevitable humiliation to come.

Robert Soper
Tadcaster,
N. Yorkshire.

Sir

Having just recently received my October copy of MOTOR SPORT, I write with reference to DM Landers' letter 'Unique or Very Unique'. My recollection is that there is at least one other Ghia Cobra in existence, in which case the car advertised in the September issue is not unique, it is just very rare. However on looking at the advertisement in the October issue, I see that whilst the 'very unique' has been dropped, the car has now become RDH which maybe does make it unique after all!

Jonathan R Mackie
Muttrah,
Muscat,
Sultanate of Oman

Tatra

Sir

I was fascinated to read the article on the Oldtimer Grand Prix at Nürburgring and see the photograph of the white Tatra sports car captioned as being sedately driven but pictured as being on three wheels and enjoying some, what might be termed, desert racing. I am fortunate to own a T87 Tatra which has received some publicity over the last couple of years or so and in John Henry's recently published book I was surprised to see how much pre-war racing history Tatra had.

Does any reader have any information on the Tatra pictured on page 993, such as its current owner and any known history.

Interestingly enough, with the opening up of Czechoslovakia, we are learning more and more about Tatras. There is now even a Tatra Club in Canada. The good word spreads.

ET Commander
Leek Wootton,
Warwicks.

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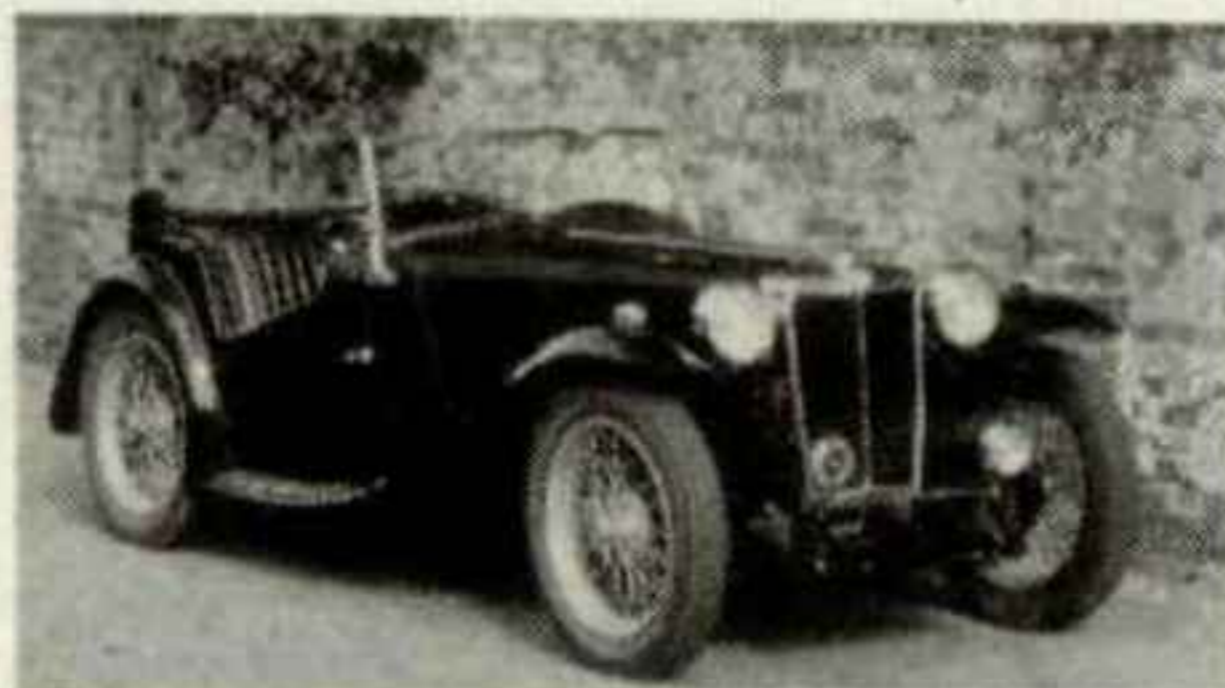
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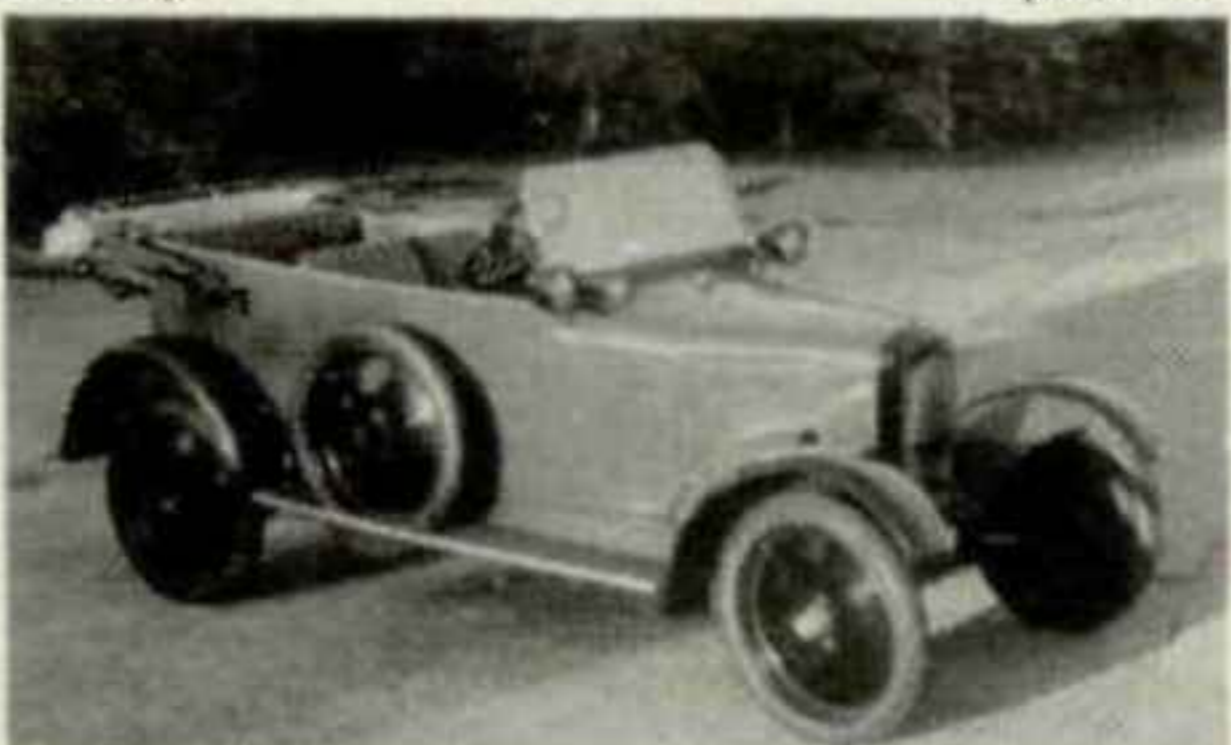
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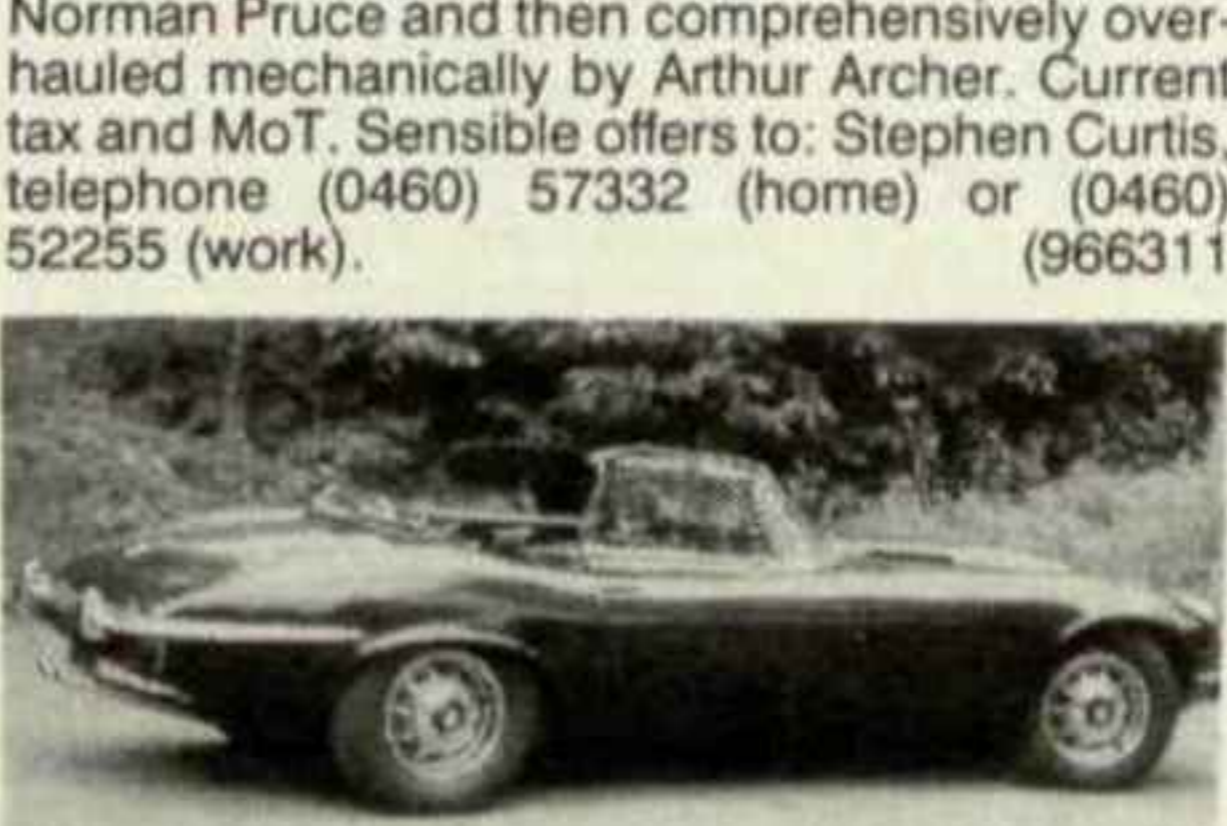


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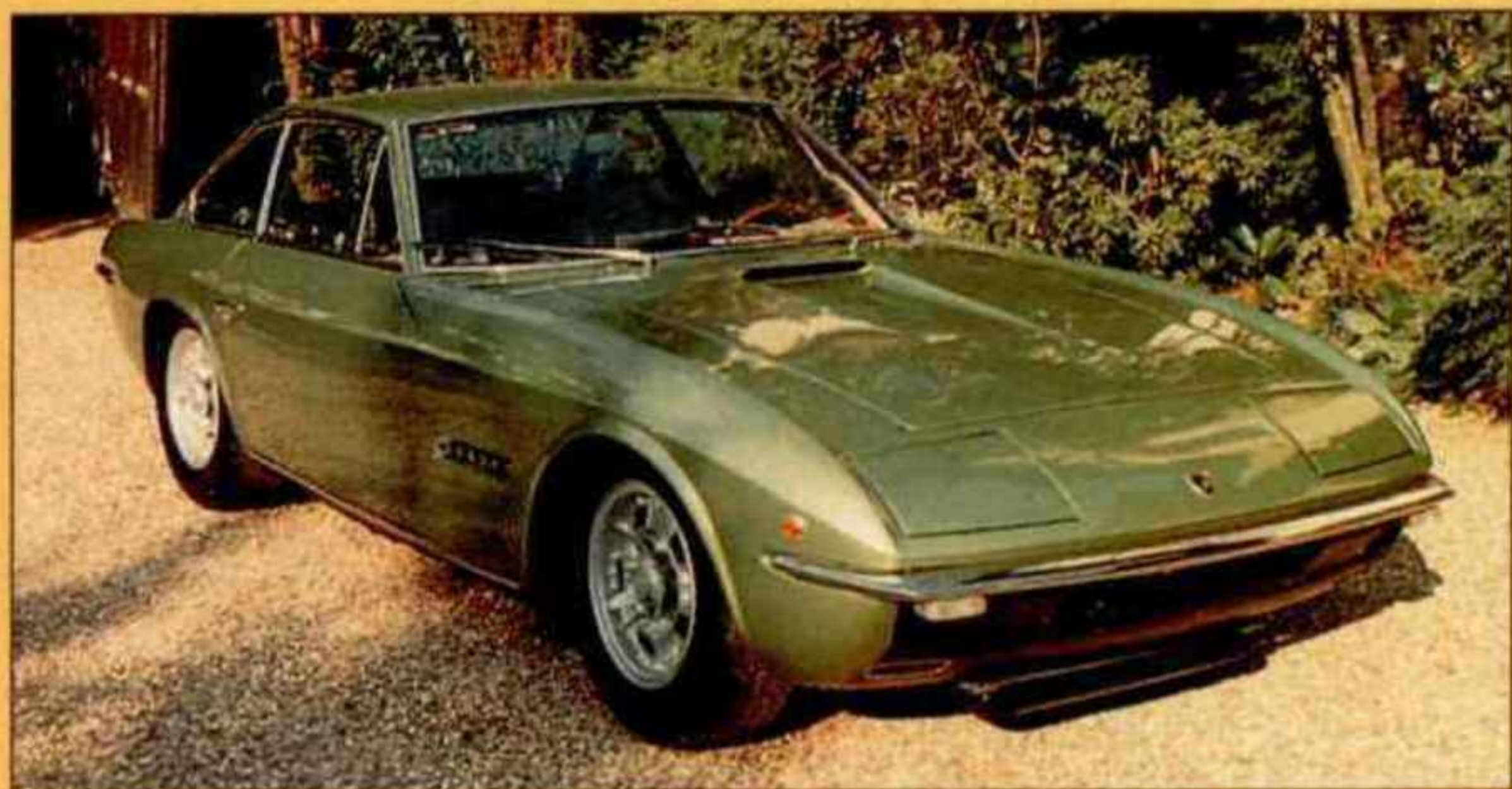
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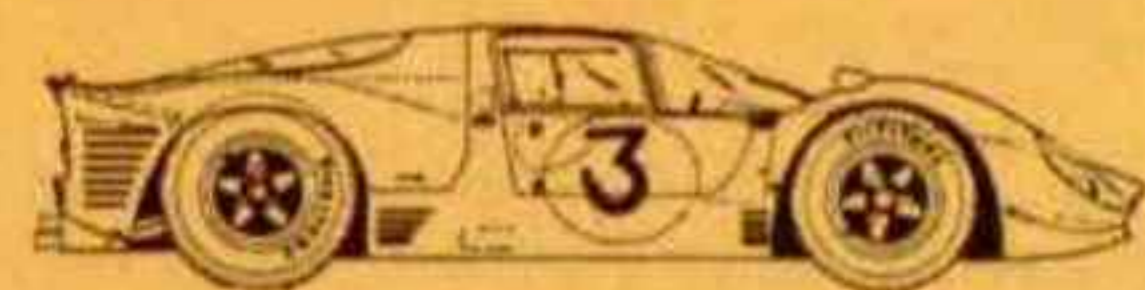
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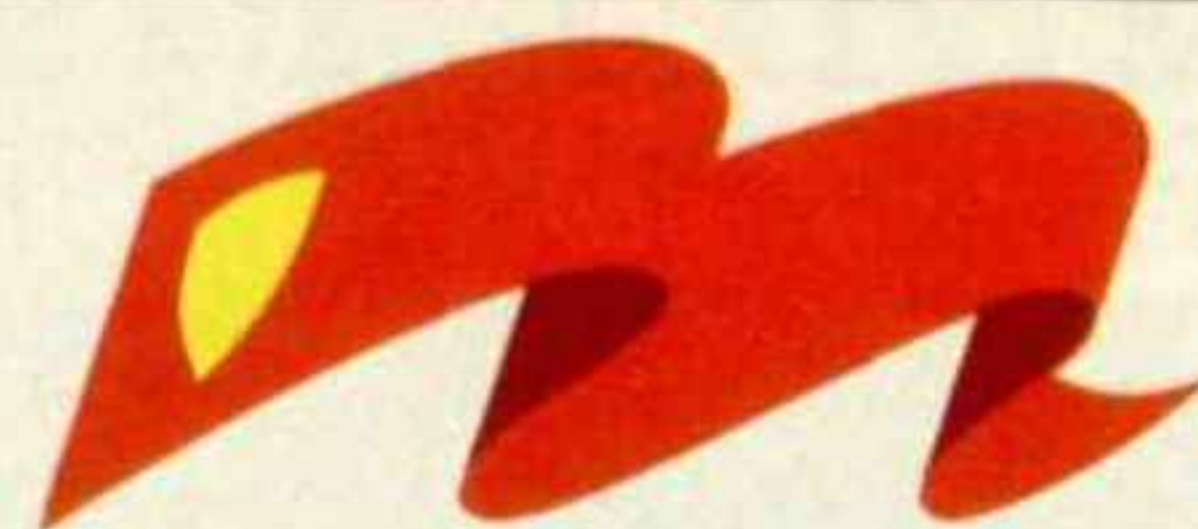
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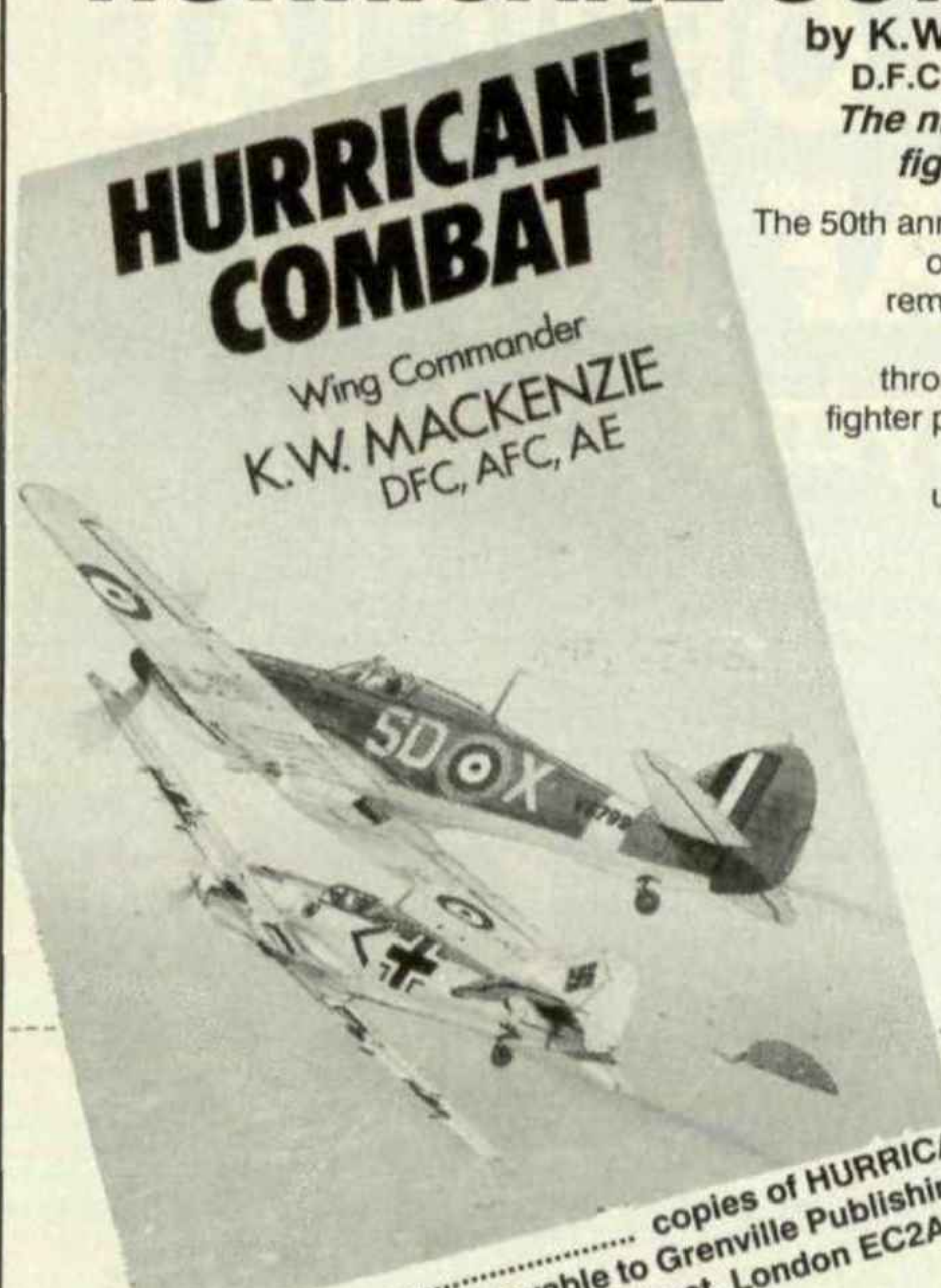
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FOR SALE — continued



1922 TALBOT DARRACQ Type A 6-seater Open Tourer. This rare, impressive car has an 8 cylinder V8 4½ litre engine, 4-wheel braking, 4-speed box, Stephen Grabel dipping lights, black button leather interior, side mounted spare, £34,950. (0252) 702909 Surrey (Trade).
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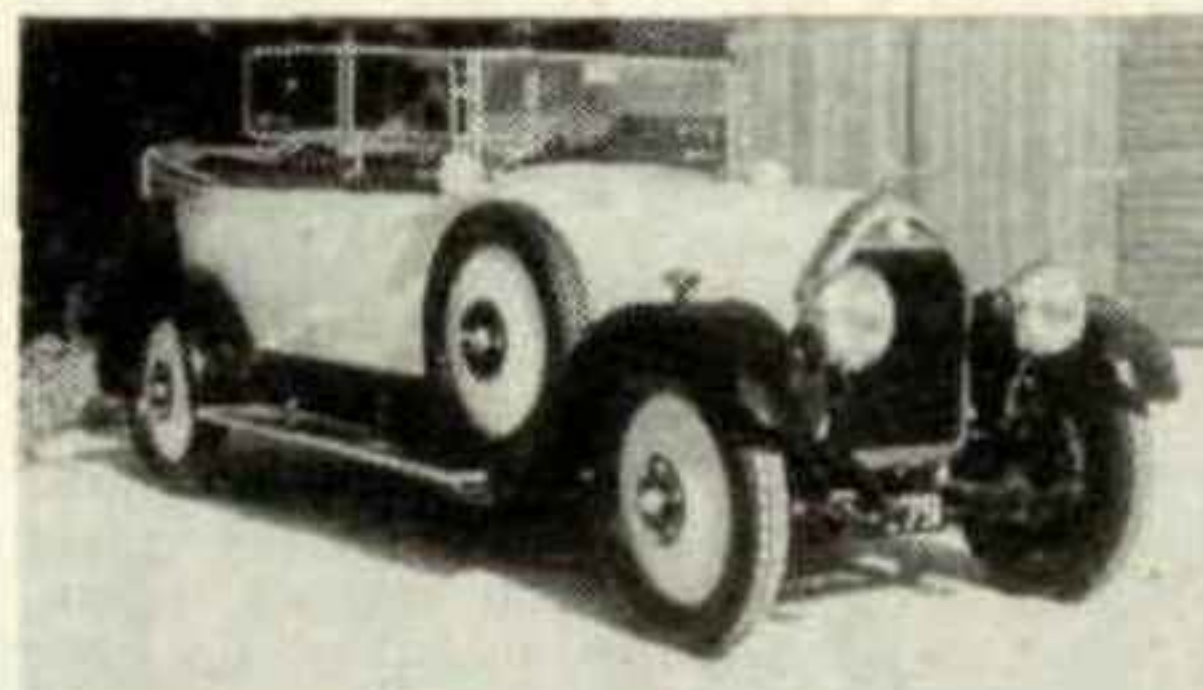
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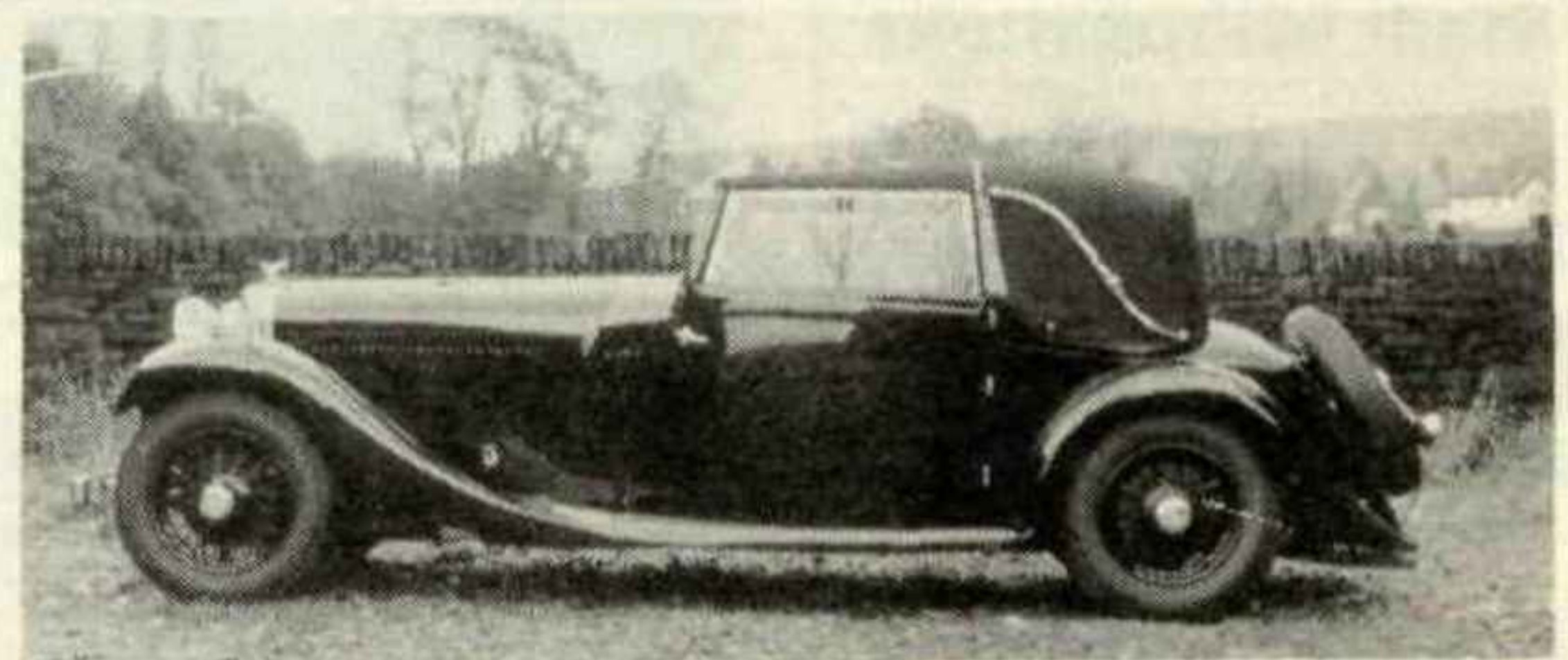
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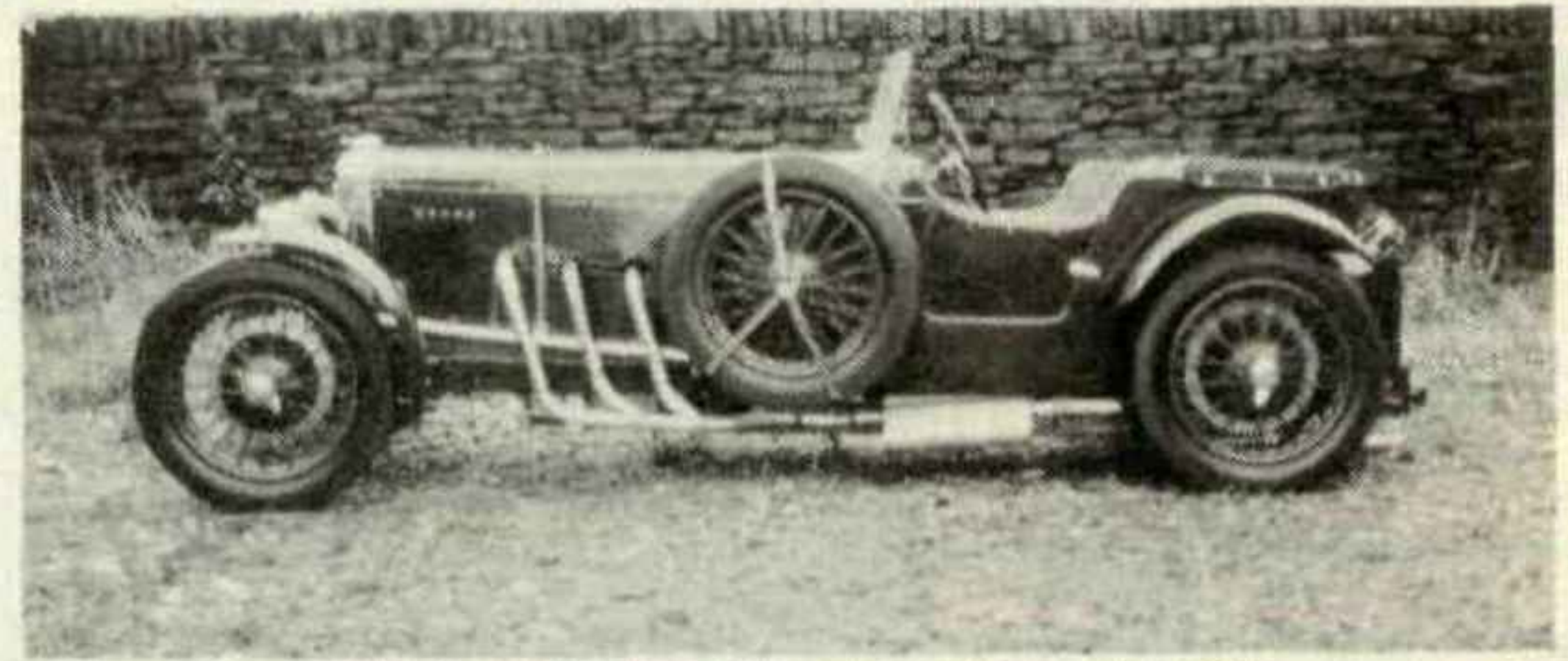
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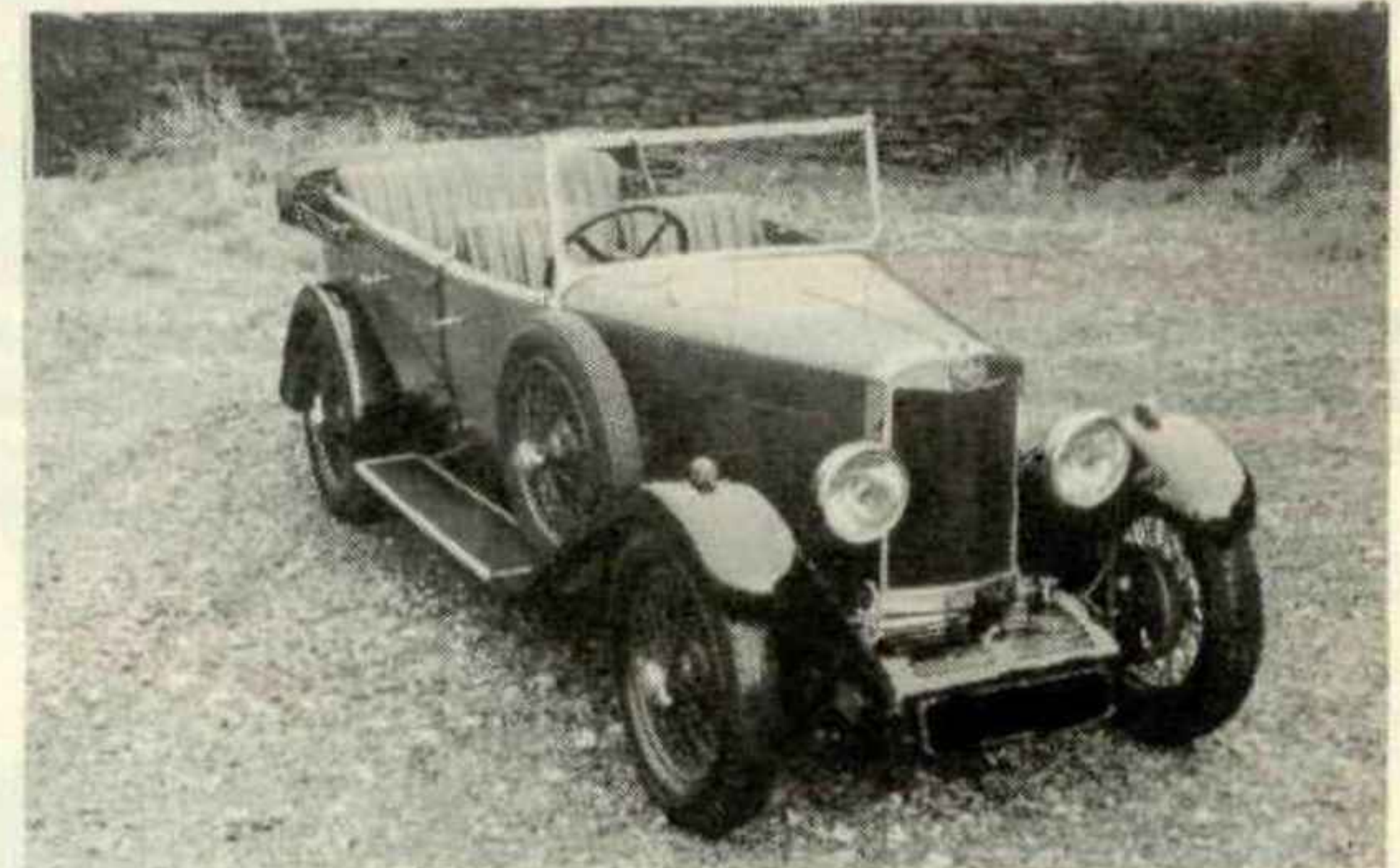
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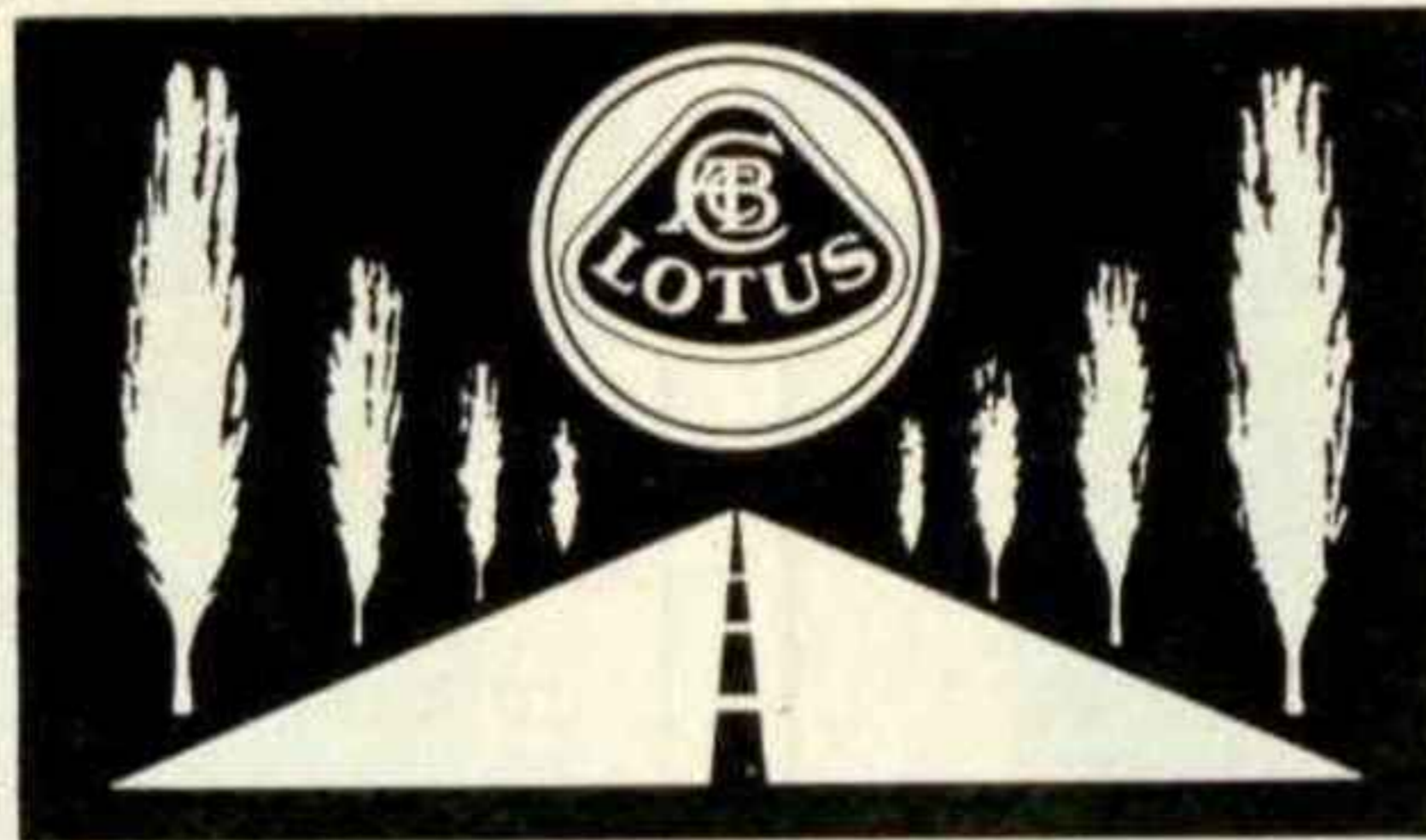
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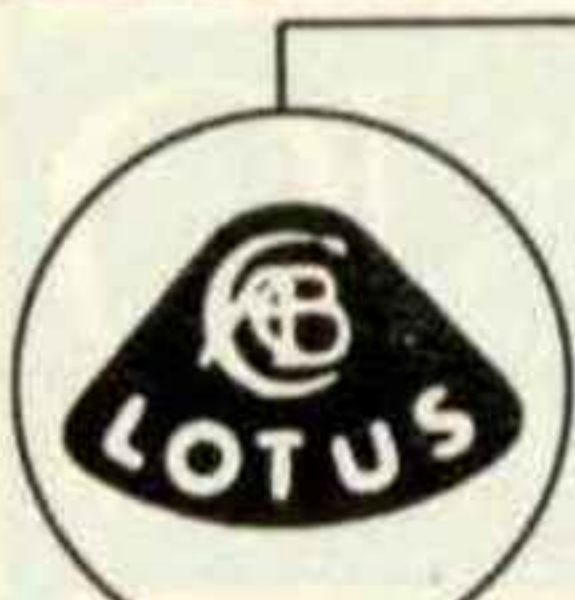
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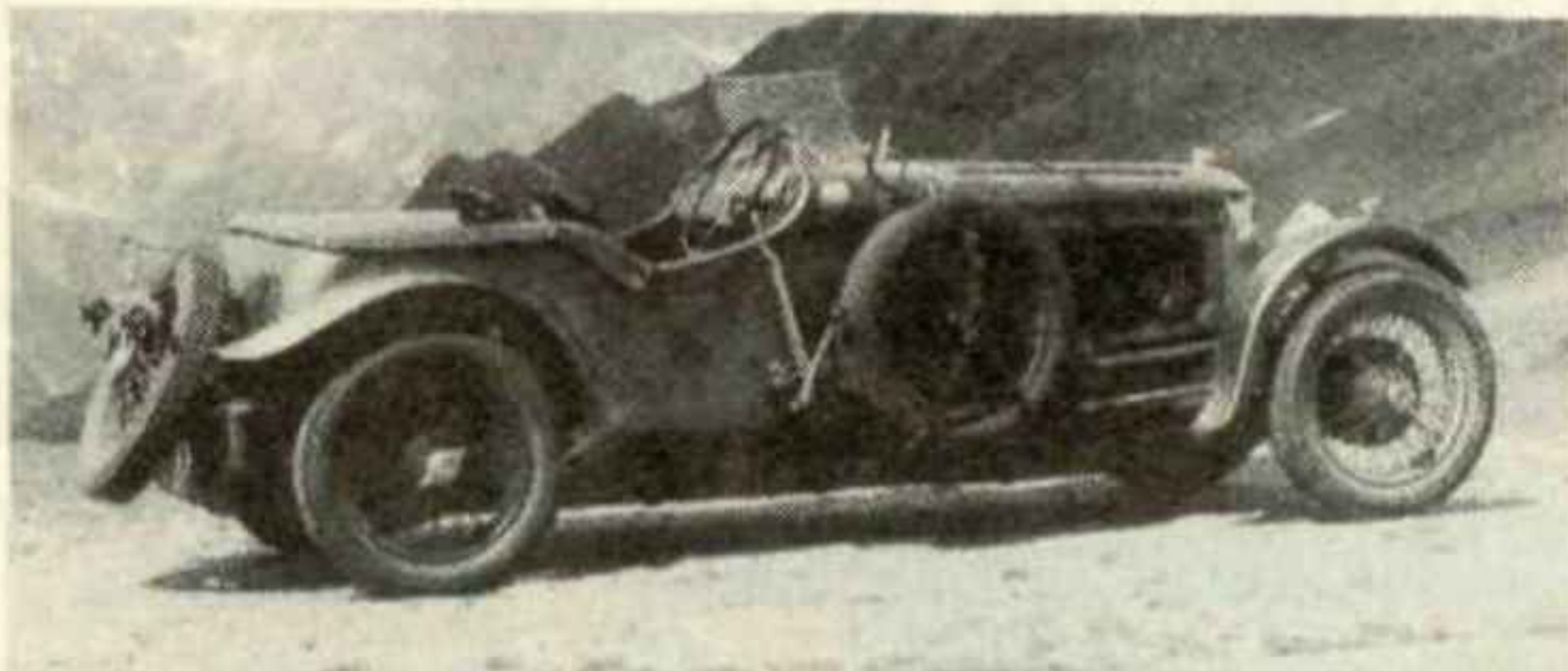
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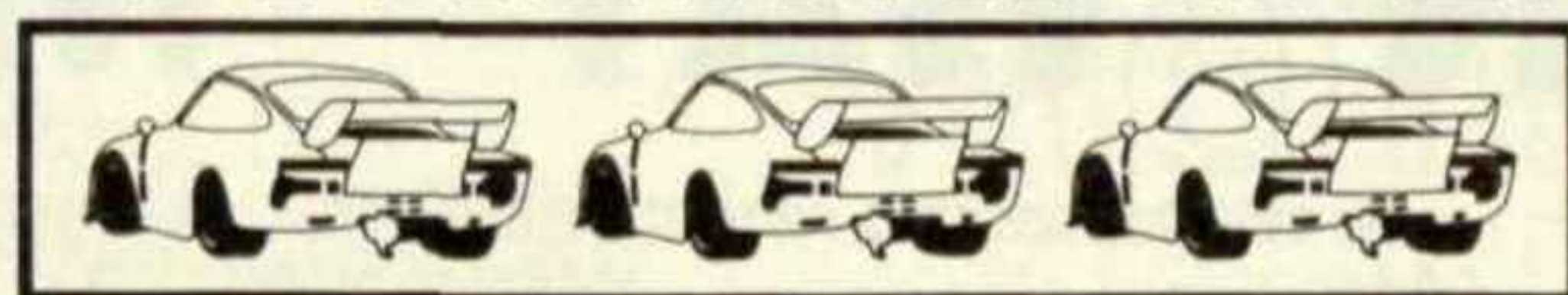
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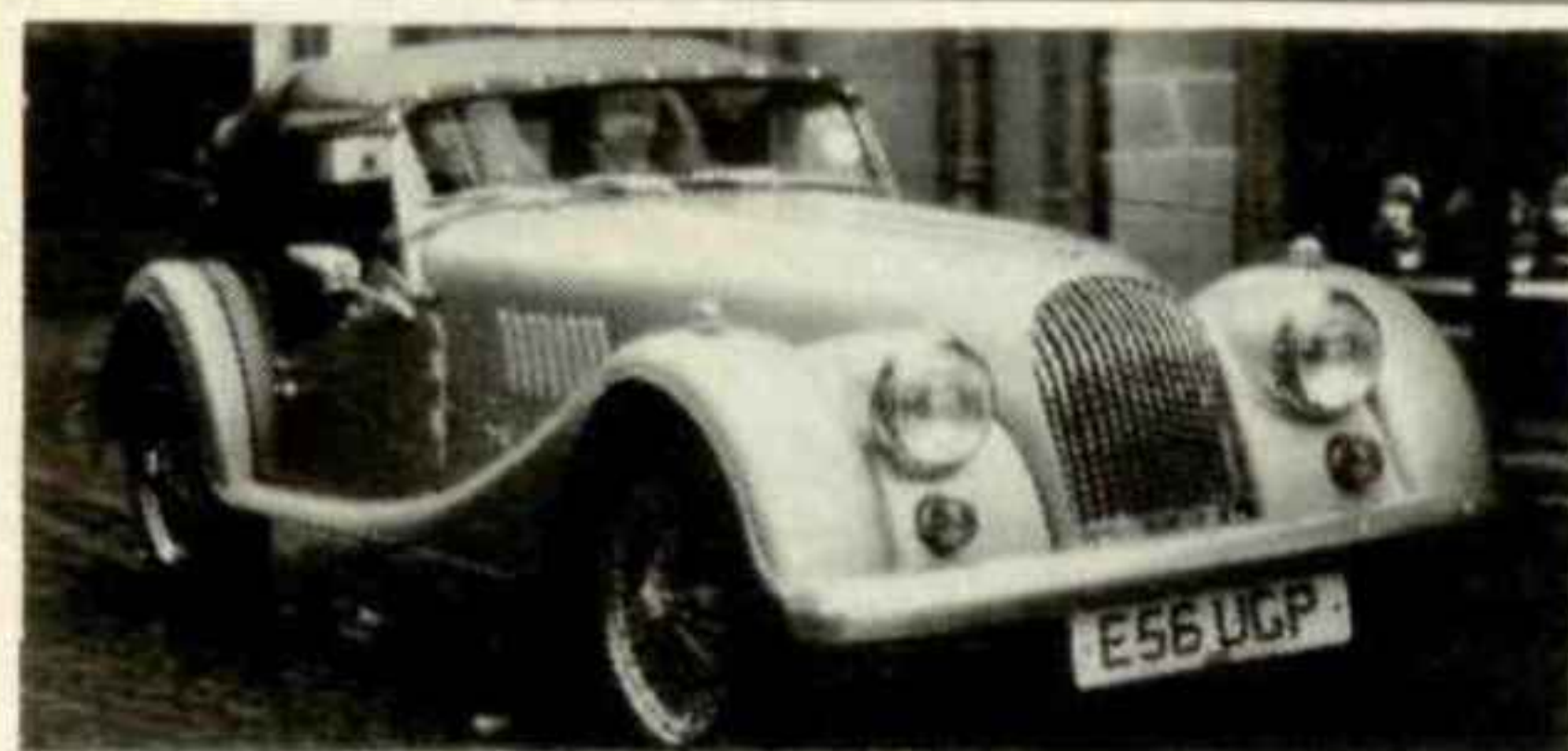
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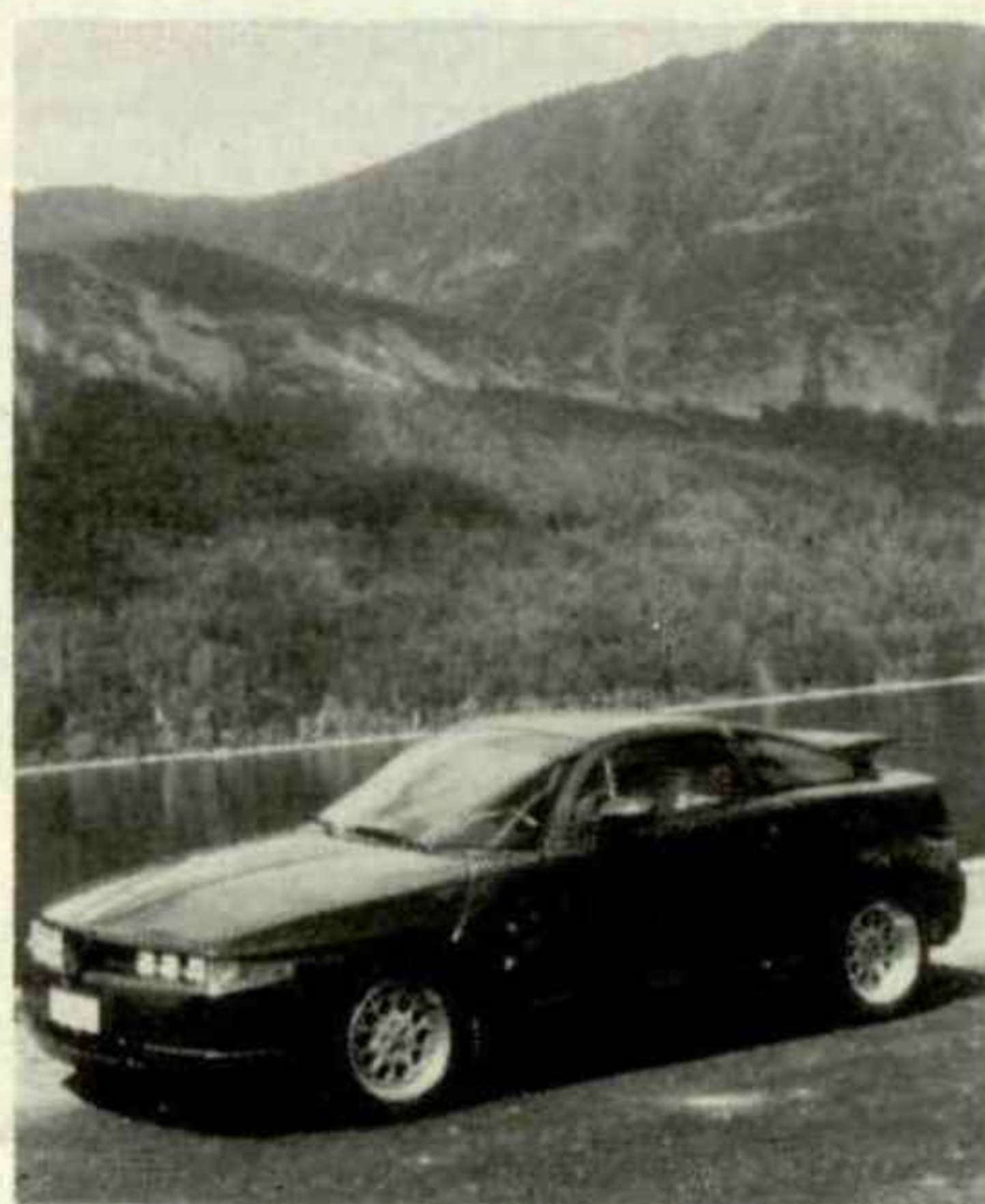
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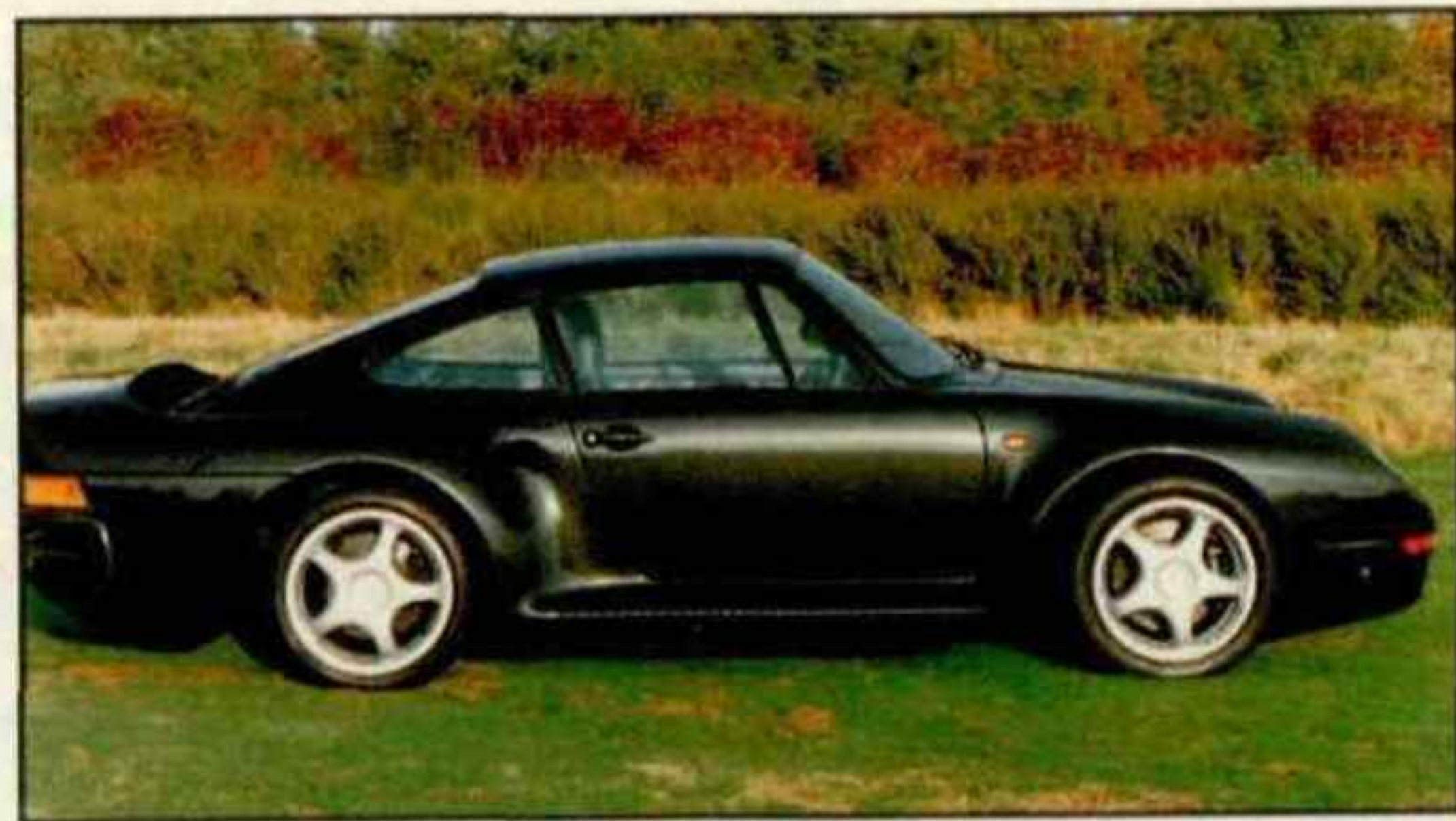
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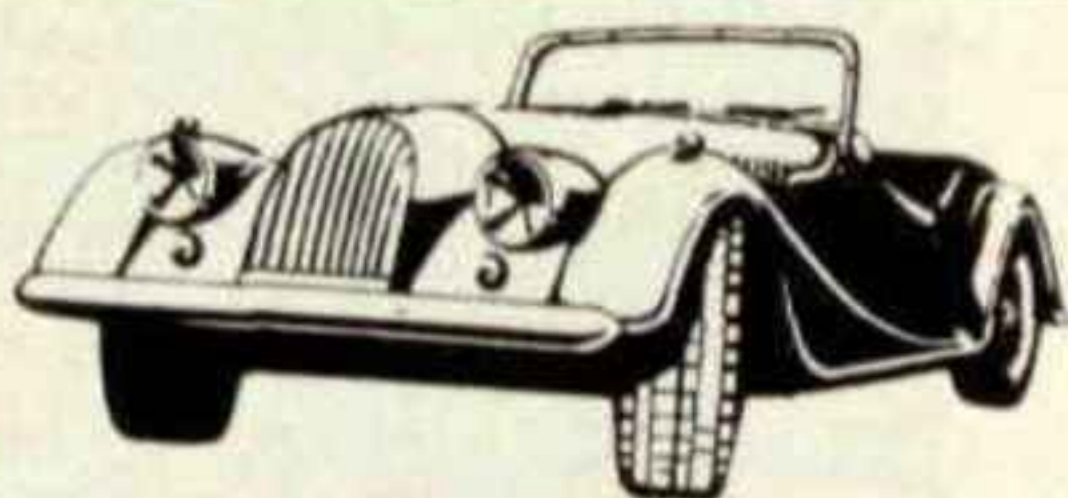
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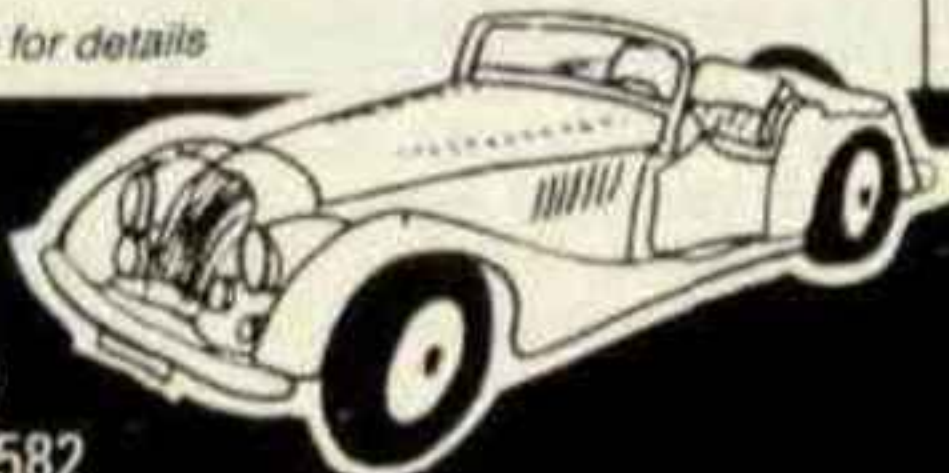
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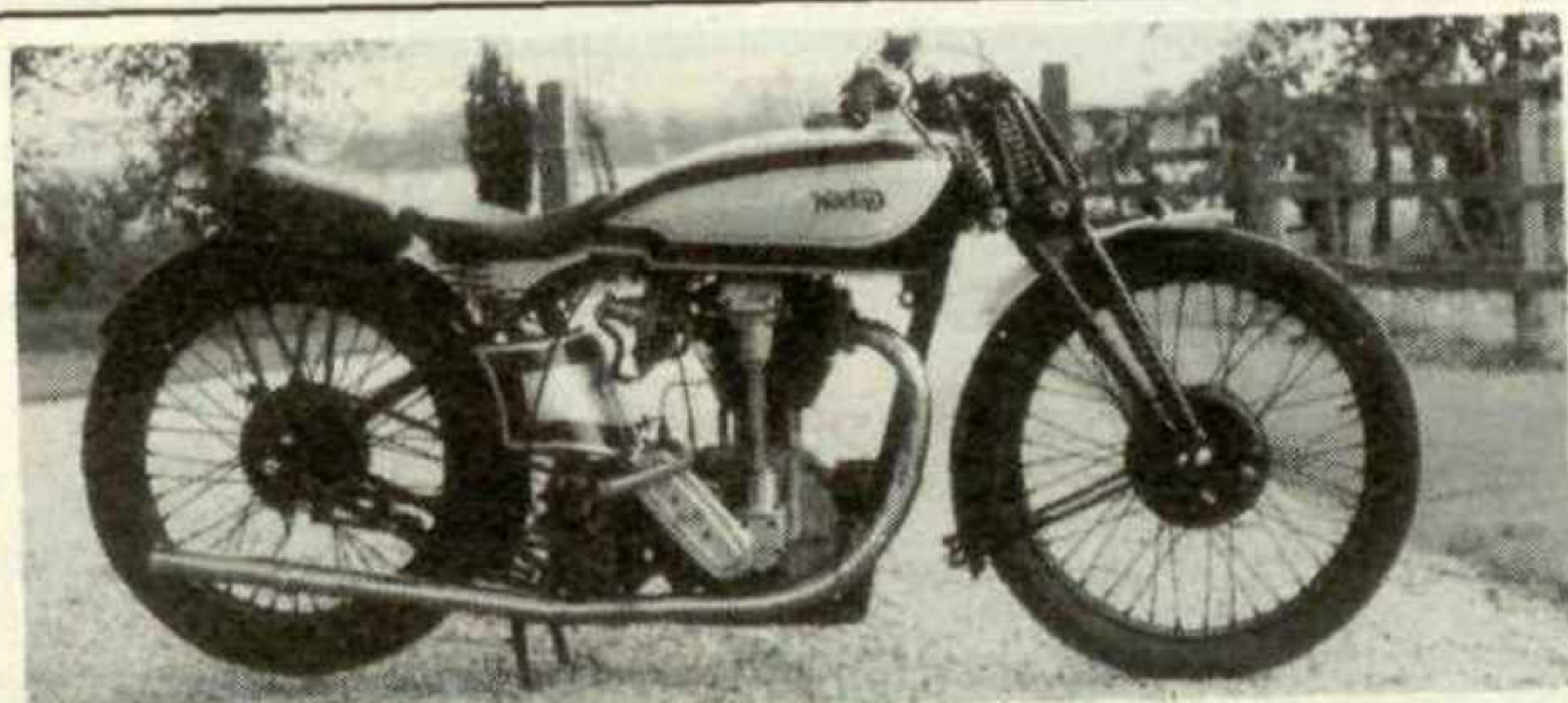
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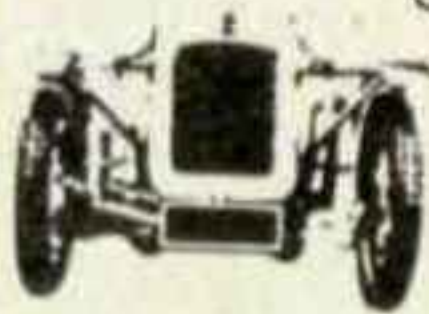
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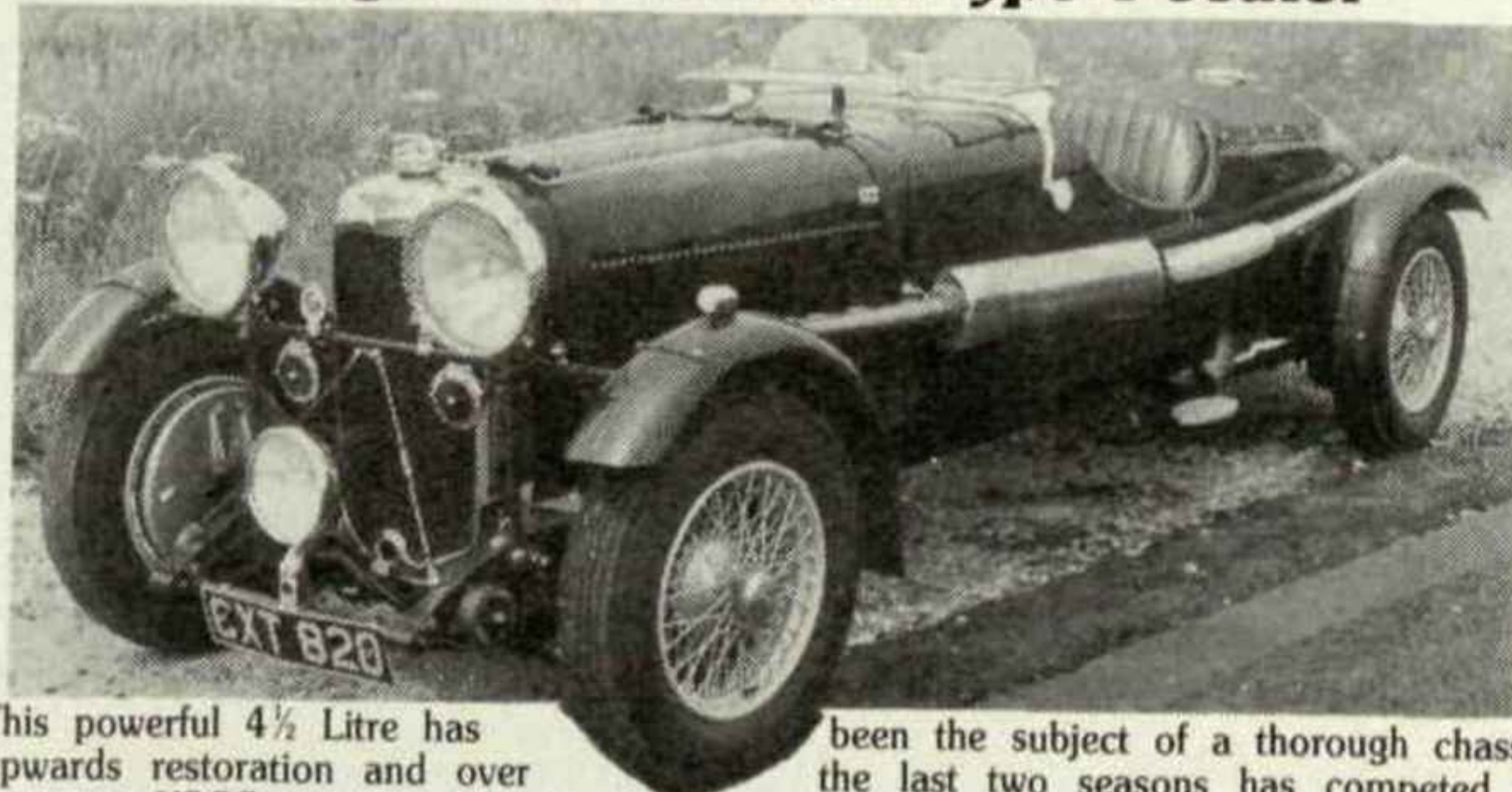
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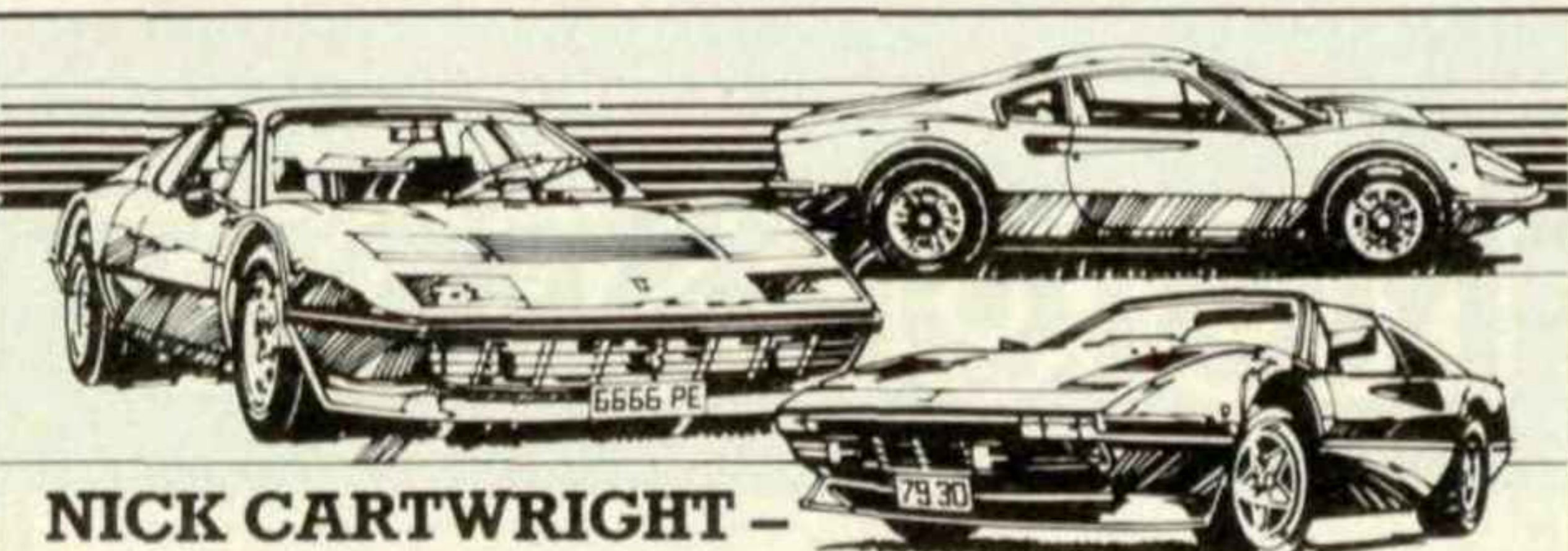
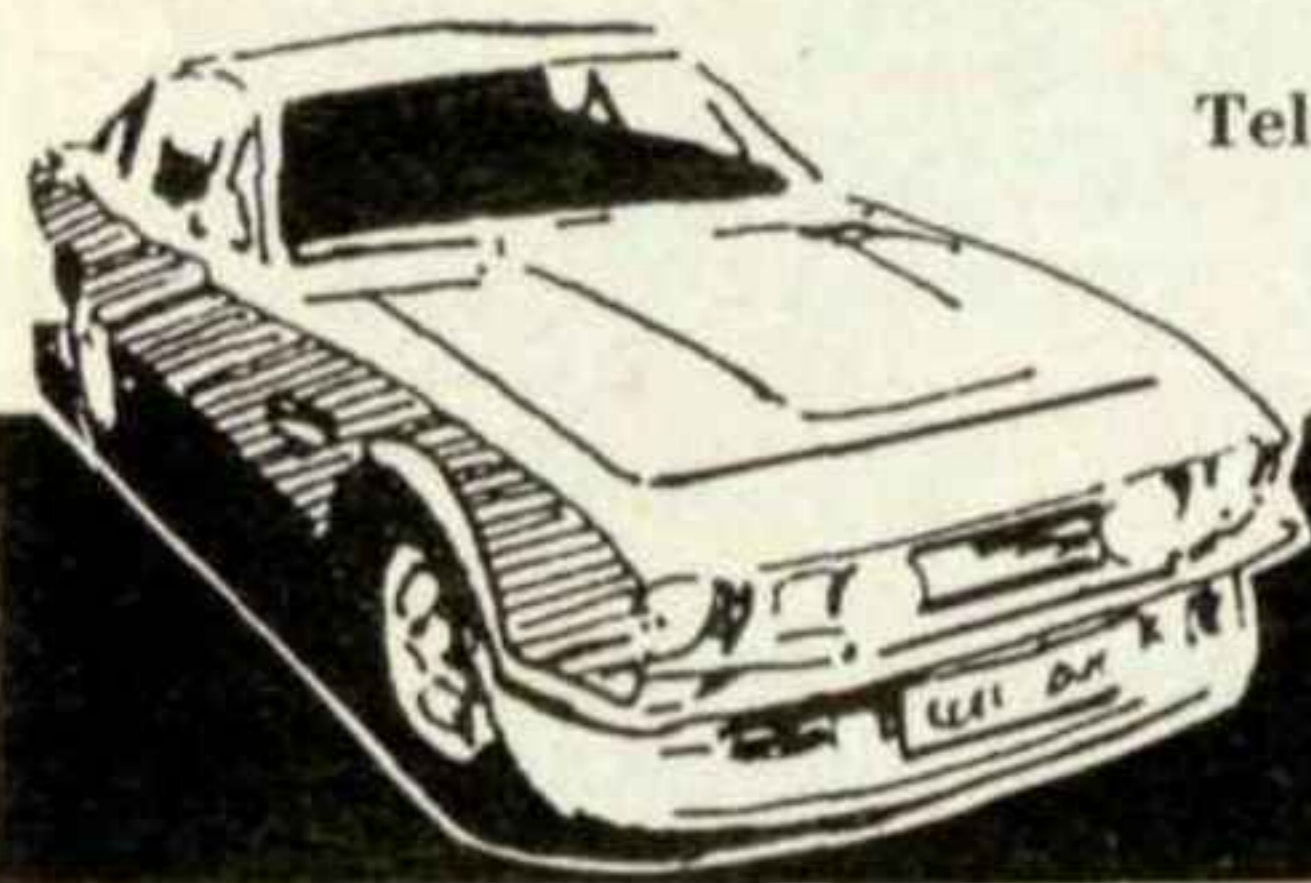
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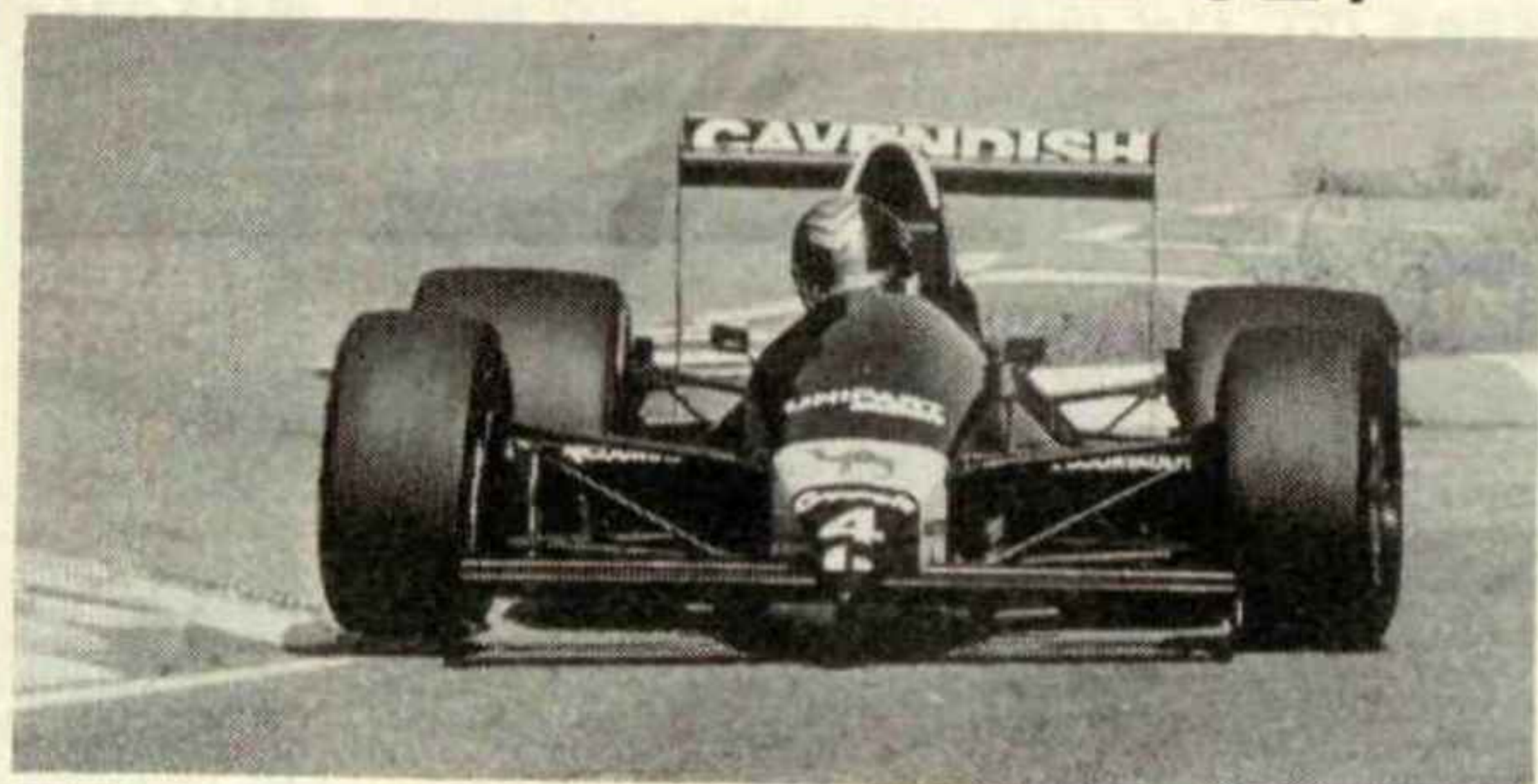
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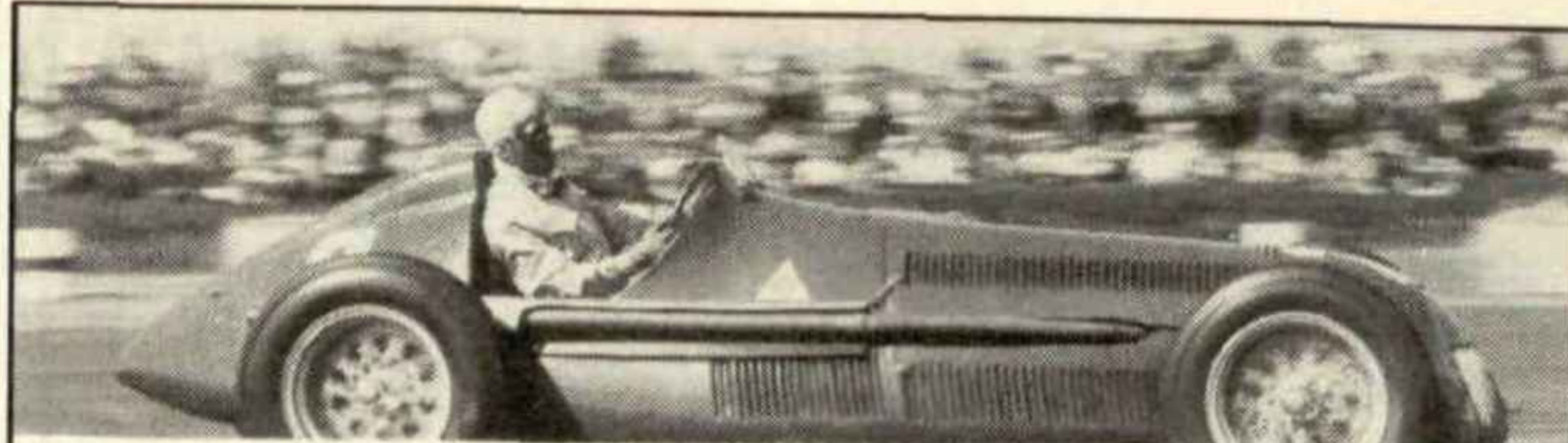


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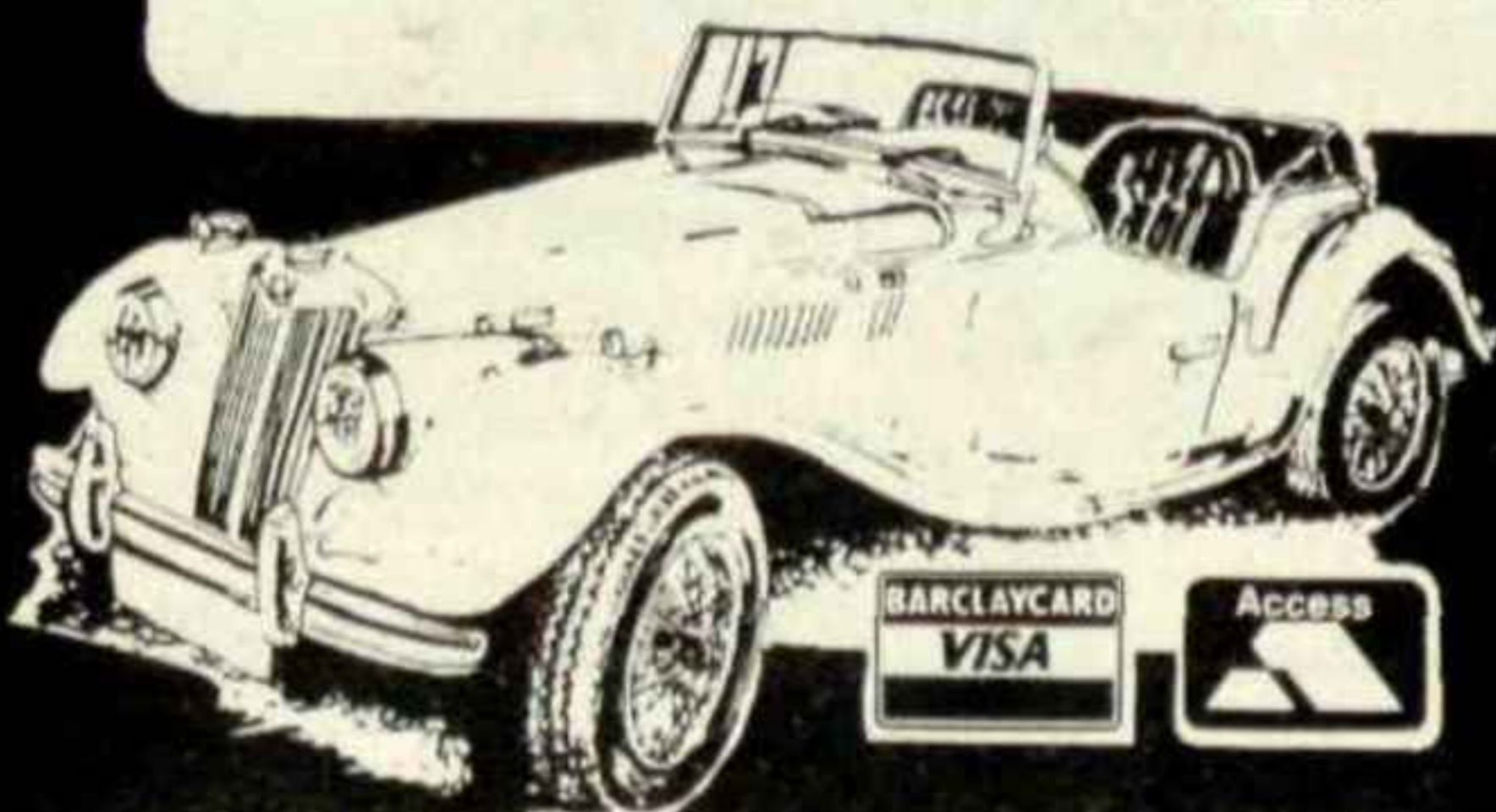
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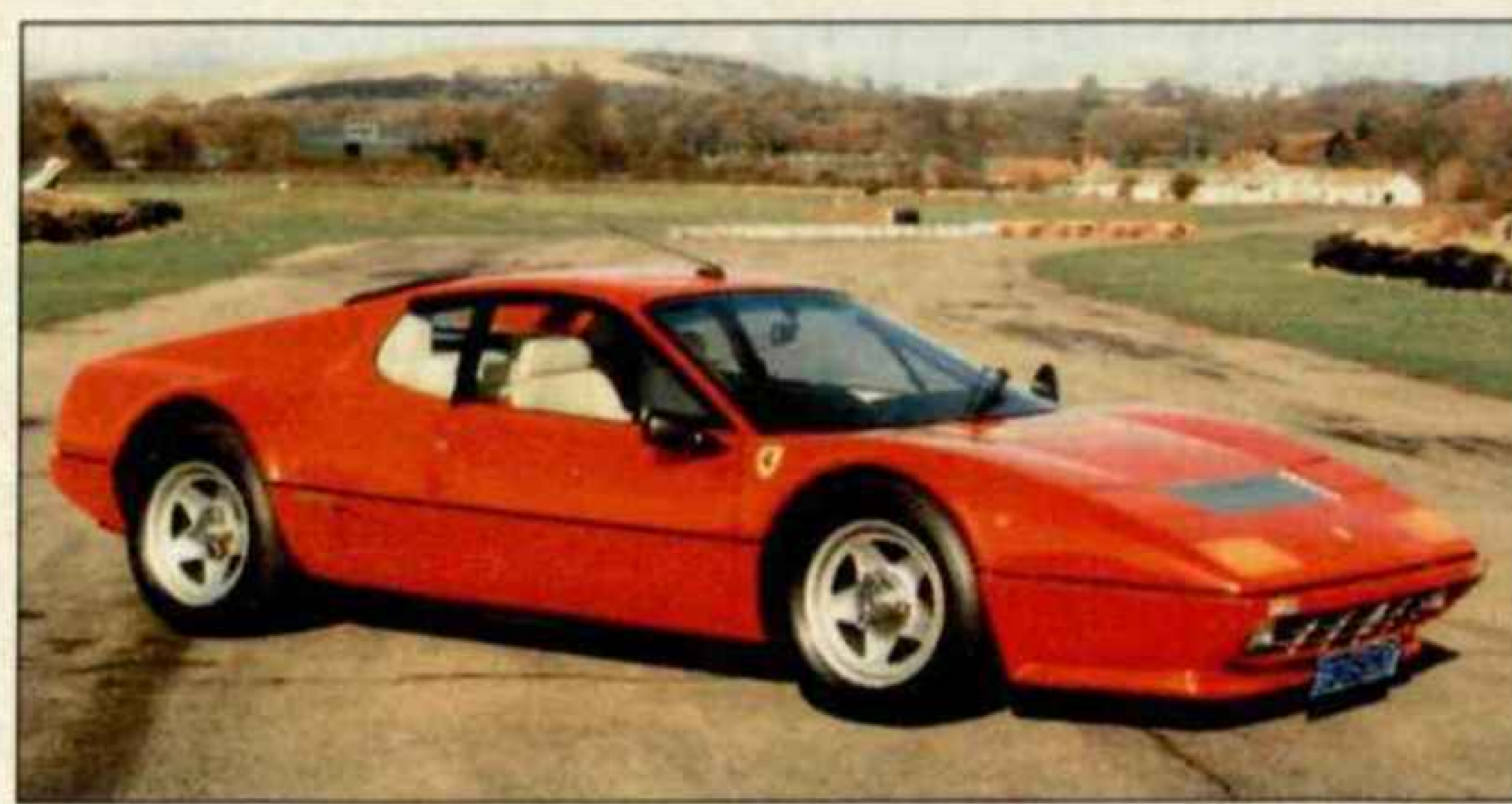
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250 PF COUPE. 1959, maroon/black hide interior, inside plug engine, original, LHD.

275 GTB/2. 1965, red/black hide. Borrani wire wheels, six carburettor, shortnose, RHD.

330 GTC. 1967, silver grey metallic, black hide, cast alloy wheels, RHD.

206 GT. 1970, yellow/black leatherette, original aluminium body, one of one hundred and fifty cars, LHD.

365 GTC/4. 1972, silver grey metallic, black hide, air conditioned, power steering, RHD.

246 GT. 1971, red/beige hide, wind up windows, ten years of MOTs, original books, 41,900 miles, RHD.

246 GTS. 1973, red/black hide, renovated and beautiful, 45,200 miles, RHD.

512 BB. 1978, red/tan hide, air conditioned, sports exhaust, two owners, 41,400 miles, RHD.

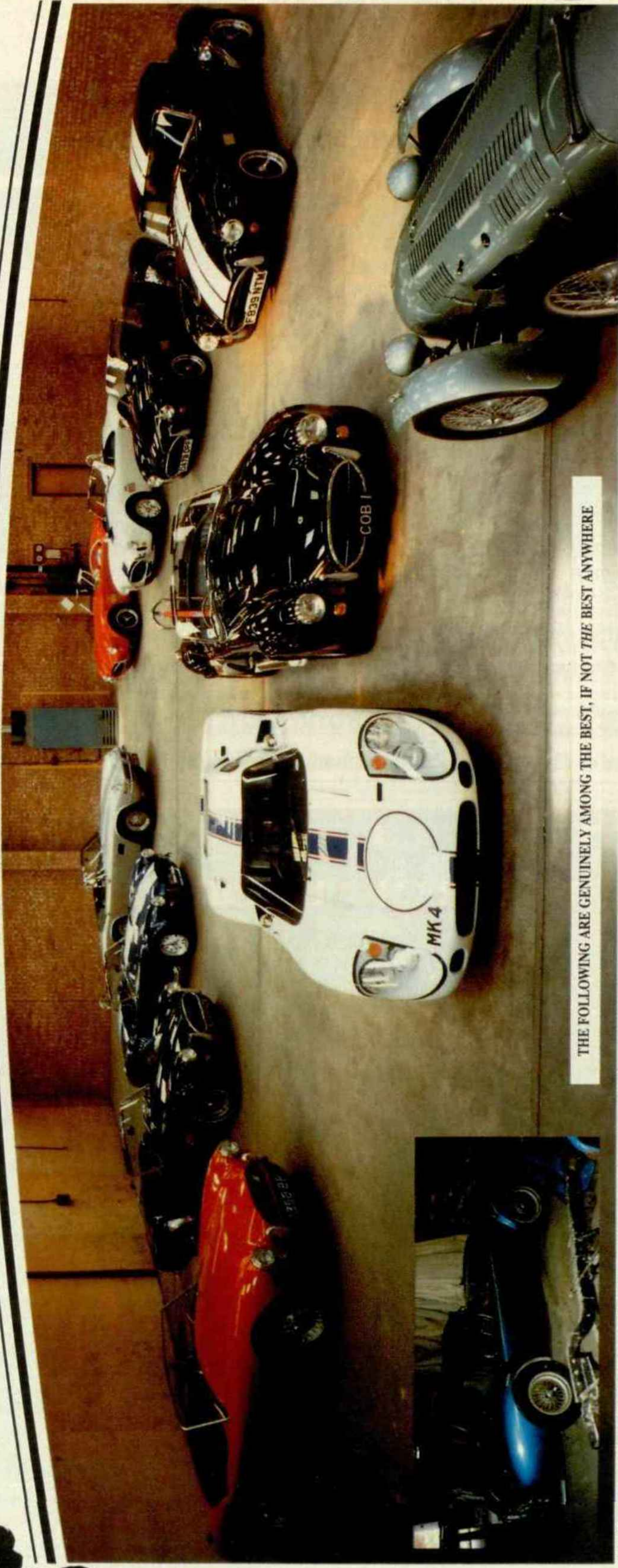
400i AUTO. 1980, dark blue/magnolia hide piped blue, blue carpets, air conditioned, TRX wheels and tyres, £47,000 spent on renovation at Maranello Concessionaries, RHD.

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NOSTALGIA

ONCE IN A LIFETIME!

The big news this month is the arrival of the remarkable one-owner-from-new 1966 AC COBRA 289 Mk3, which has just surfaced after being 'lost' (as far as the Cobra Register was concerned) since 1970. Total mileage from new (warranted, of course!) is just 31,994, and all the paintwork (Guardsman Blue), trim, weather equipment, engine, gearbox and so on are still completely original and in first-rate order. Understandably, twenty years' hibernation in a Norfolk barn had taken some toll on suspension bushes etc., which is why a lengthy check-over and thorough service (including a new MoT) have just been completed at the AC/Autokraft factory. The splendid documented history includes the Sales Invoice (for £2402-4s-9d!), the original 1966 log book (one owner till the present day) and the last tax disc (September 1970) before storage). This is a unique opportunity to purchase what is certainly one of the most original AC Cobras in the world. (Insert photo shows car 'as discovered')



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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. Stirling Moss' first GP racing car, also ex-Abecassis. etc. Many famous international successes. Fully documented history. (Photo as sports-racer - conversion to its original 1950 Grand Prix mode takes 10 minutes).
 1958 AC ACE-FORD RUDDSPEED 2.6. Coupe des Alpes entries 1958/9; ex-Ken Rudd, 170 h.p. Stage V Mays engine, 45,000 miles. (Photo)
 1963 AC ACE-FORD RUDDSPEED 2.6. One owner since 1968. 180 h.p. Stage V + Rew engine. O/drive. Bare chassis restoration. (Not shown)
 1964 (Model) AC COBRA 289 Mk2. Total Autokraft reconstruction, with Mathwall 300 + b.h.p. engine. Totally 'Concours'. (Photo)
 1965 AUSTIN-HEALEY 3000 Mk3 V8 - LEFT HAND DRIVE. Fitted with Cobra 5 litre V8 engine & T10 gearbox, otherwise totally standard in appearance. Amazing performance! Ice blue, black trim. Conversion to right-hand drive possible. Extremely well presented. (Not shown)
 1966 AC COBRA 289 Mk3. 1 owner, 31,994 miles. Totally original, including paint! Full description above. (Photo 'as discovered', before servicing)

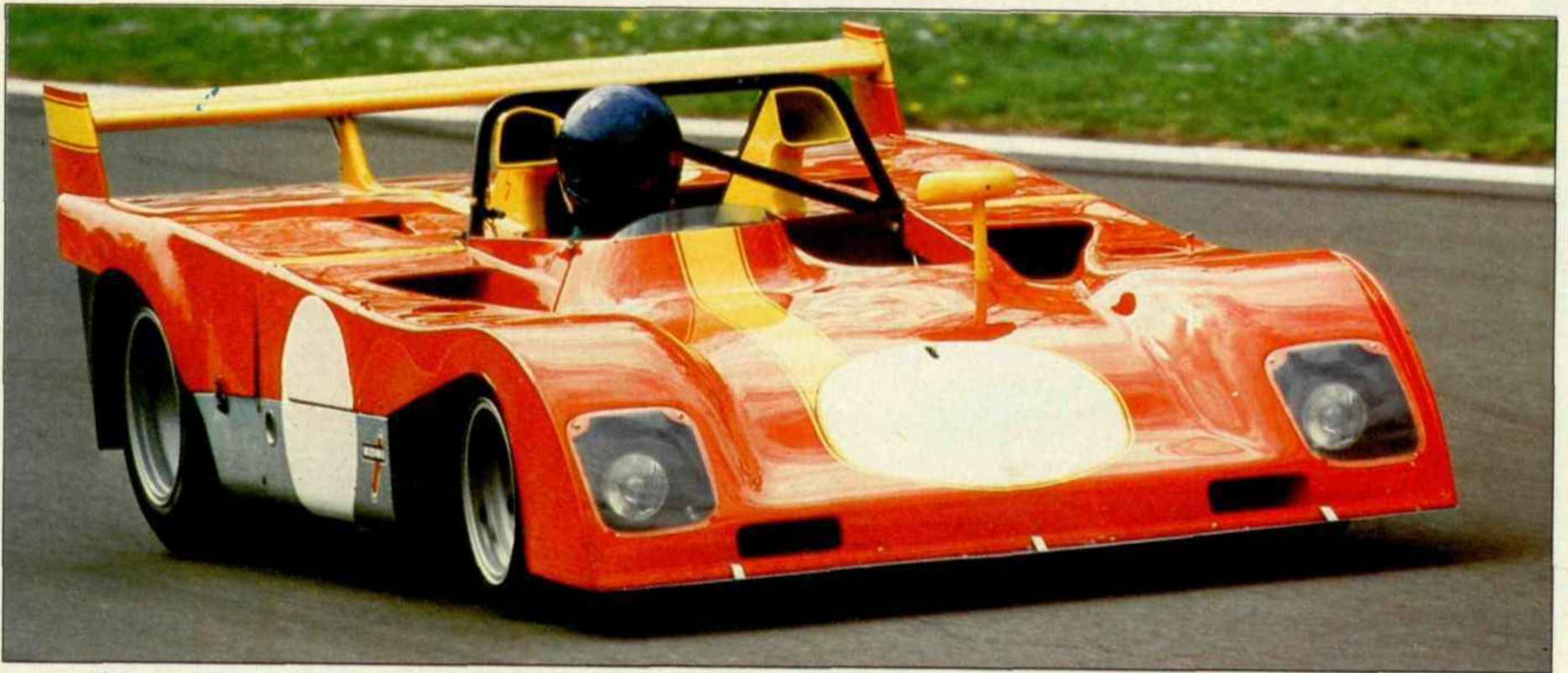
1972 AC 428 FRUA D.H.C. Only 26 built, this the last of 5 with manual gearbox, 32,000 miles. Simply the best, bar none! (Photo)
 1985 AC COBRA 302 Mk4 - 'STANDARD' 230 b.h.p. - LEFT HAND DRIVE - U.S./EUROPEAN SPEC./TYPE APPROVED.
 0 to 100mph (160kph) in 13 secs. 73 miles/117km from new. Stored for 5 years in Arizona. Unique! R/hand conversion possible. (Photo)
 1988 (F) AC COBRA 302 Mk4 - 'STANDARD' 240 b.h.p. - U.K. 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. - U.K. 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. - U.K. 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 - 'LT. WT. COMPETITION/STREET' 340 b.h.p. - U.K. SPEC. Metallic maroon, black trim. (Not shown)
 1990 (Unregd.) AC COBRA 302 Mk4 - 'LT. WT. COMPETITION/STREET' 340 b.h.p. - U.K. SPEC. Silver, burgundy trim. (Not shown)

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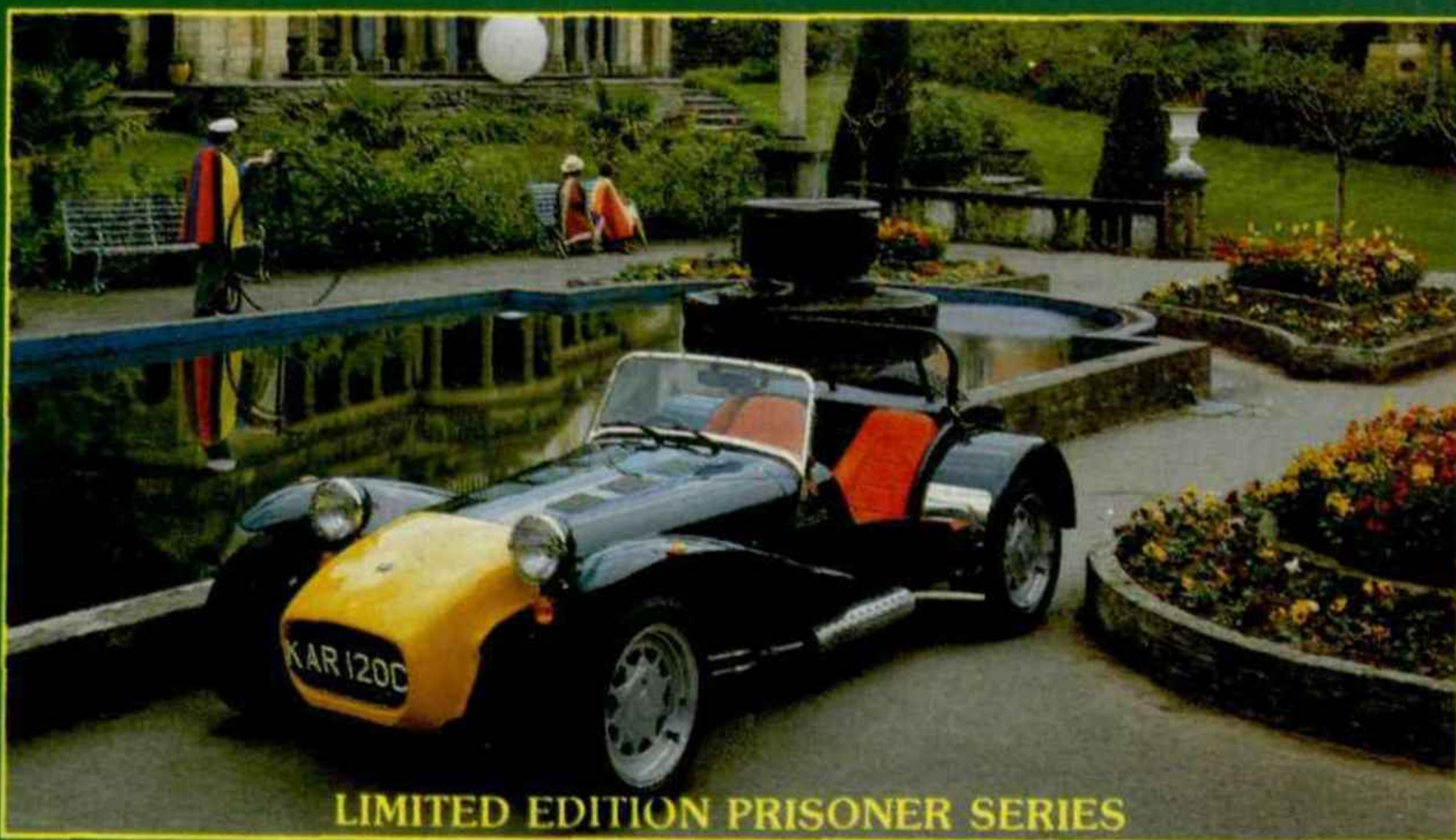
1972: 6 Hours of Daytona, Ickx-Andretti, 1st
Practice day at Le Mans, Regazzoni
1000km of Brands Hatch, Ickx-Andretti, 1st
1000km of Spa, Ickx-Regazzoni, 2nd
1000km of Zeltweg, Ickx-Redman, 1st

1973: 6 Hours of Vallelunga, Ickx-Redman, 3rd
1000km of Monza, Ickx-Redman, 1st
1000km of Spa, Ickx-Redman, Retired
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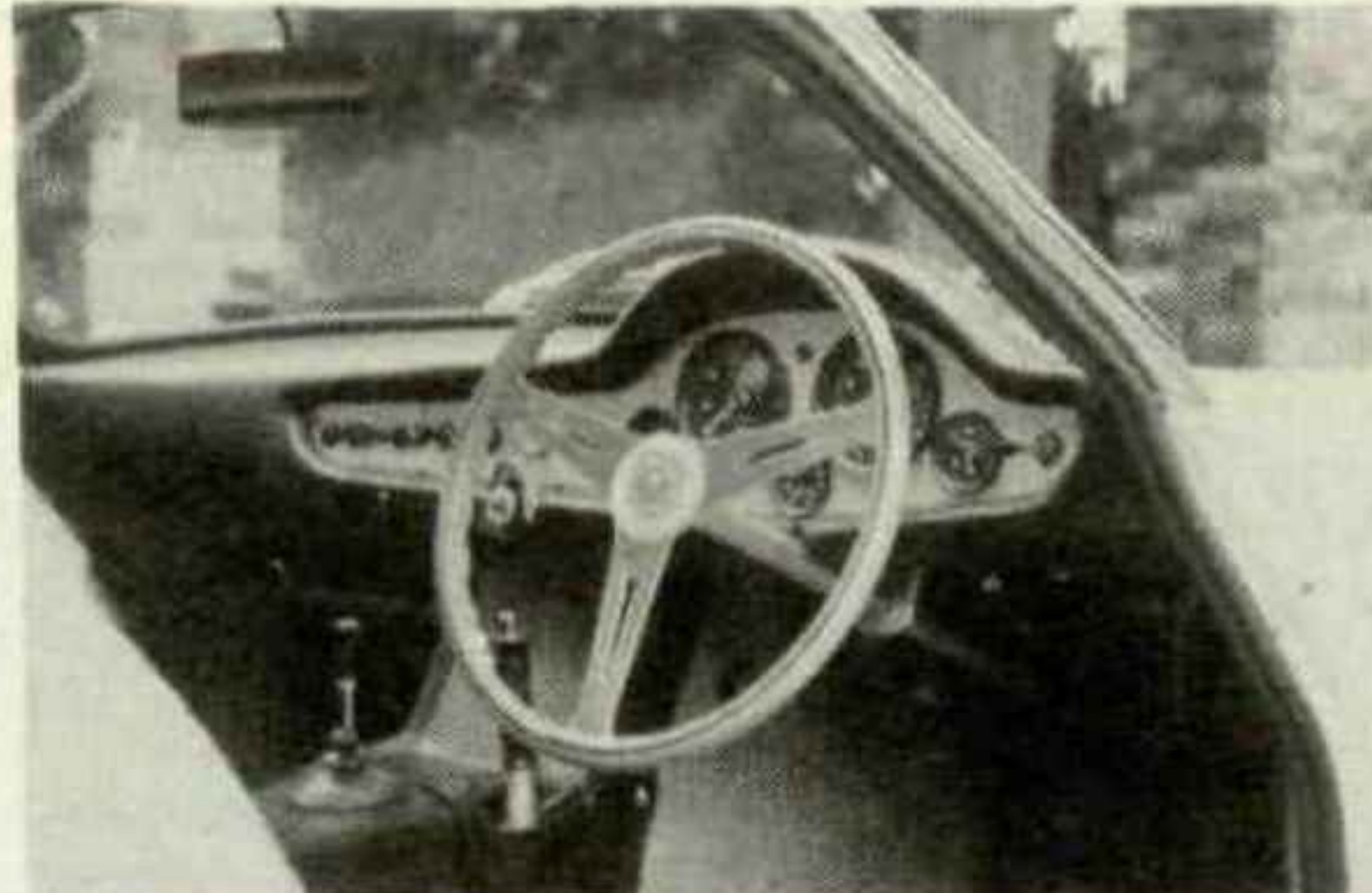
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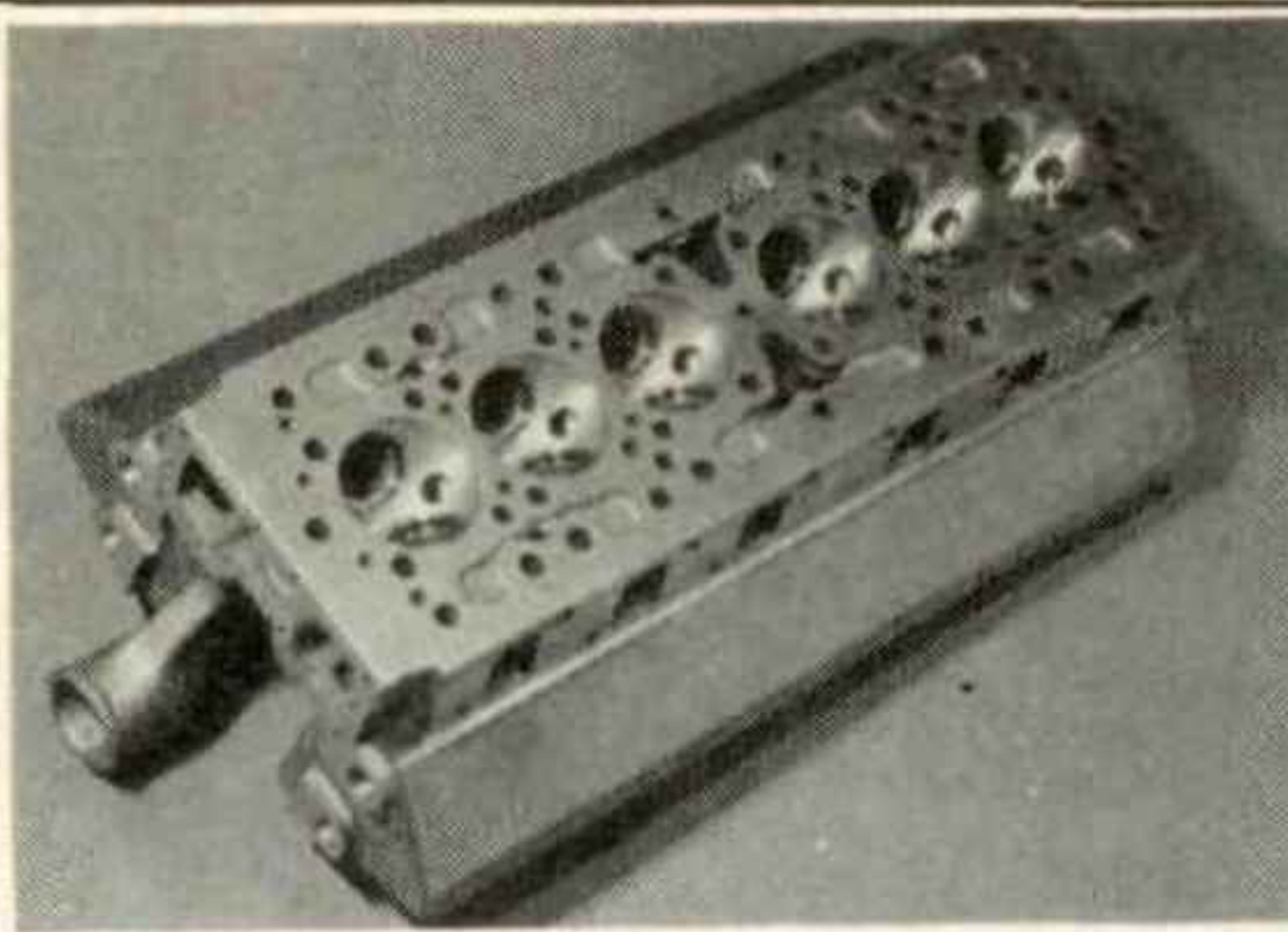
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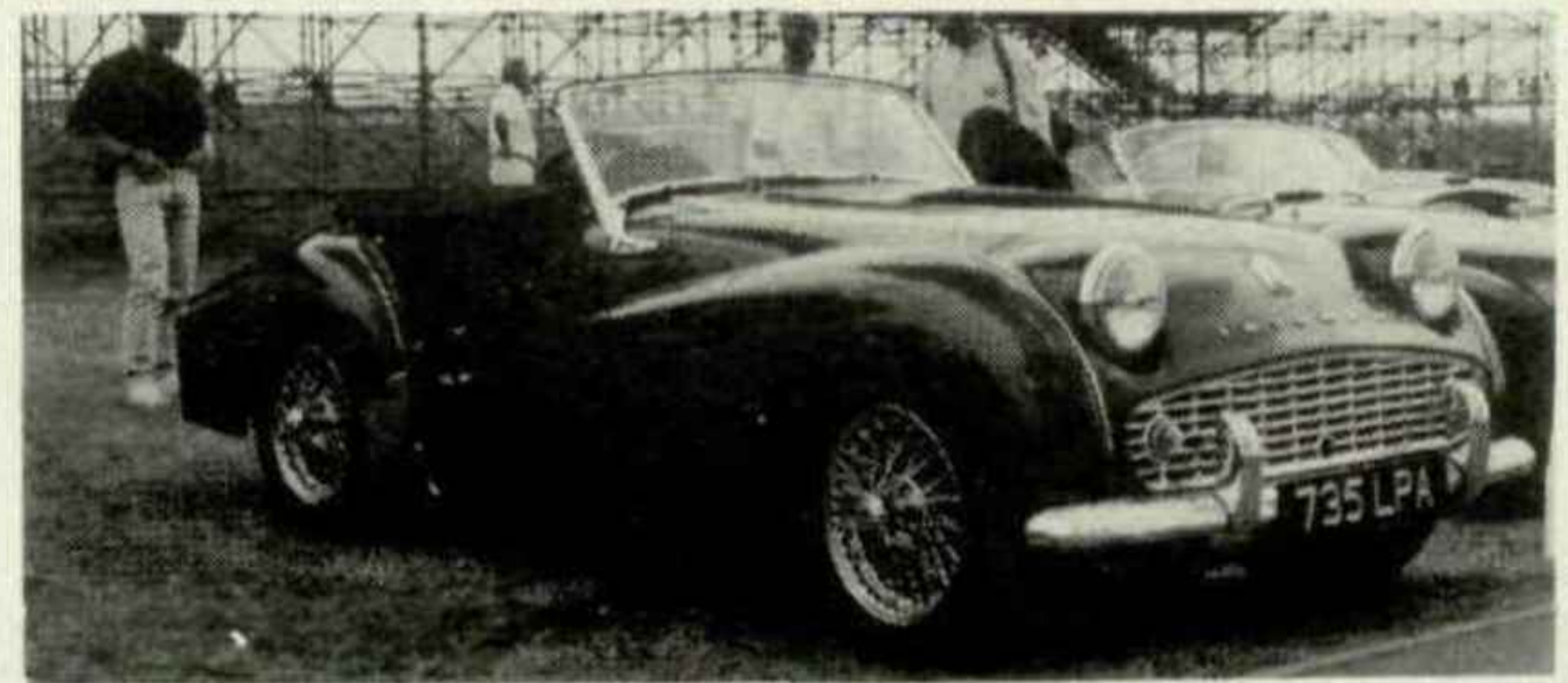
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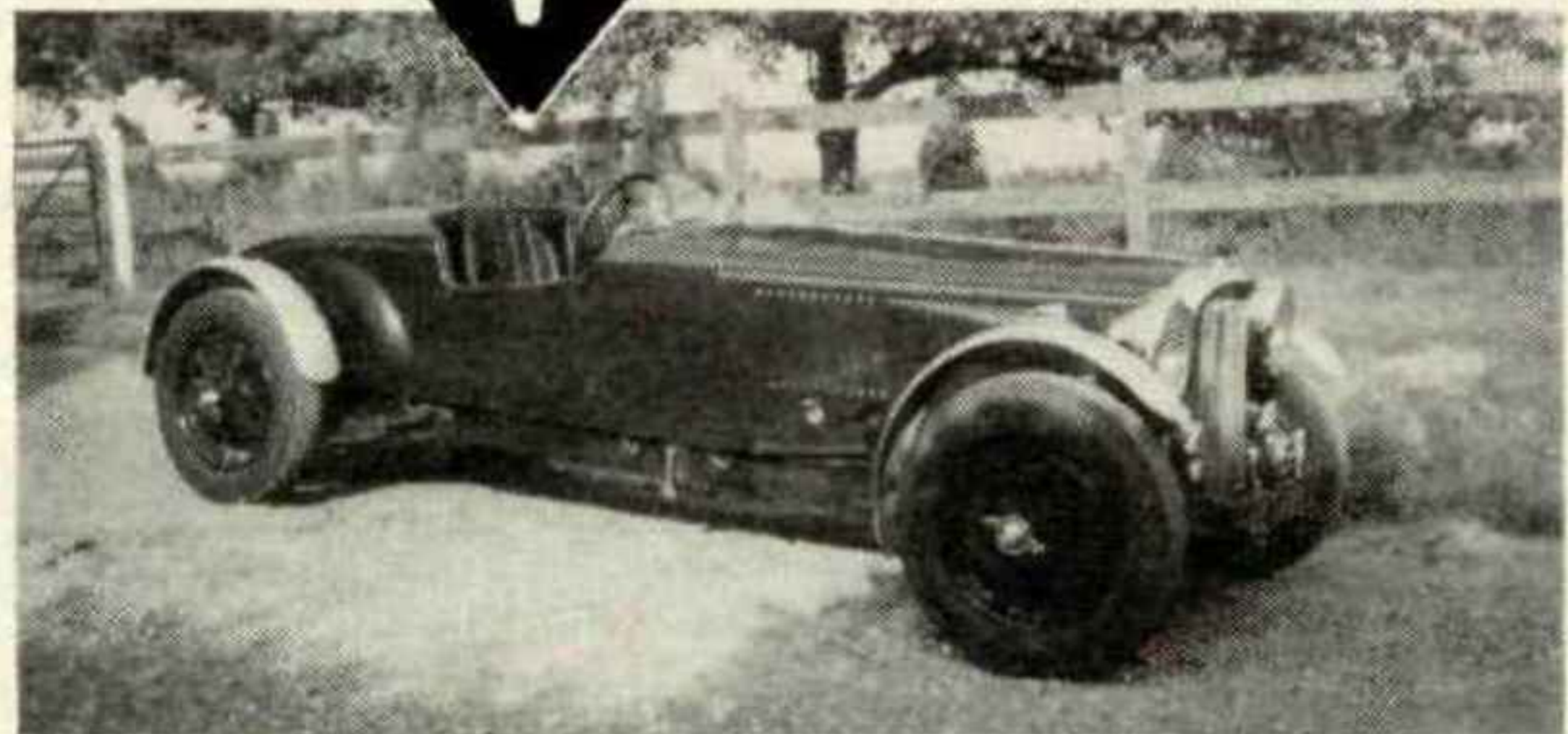
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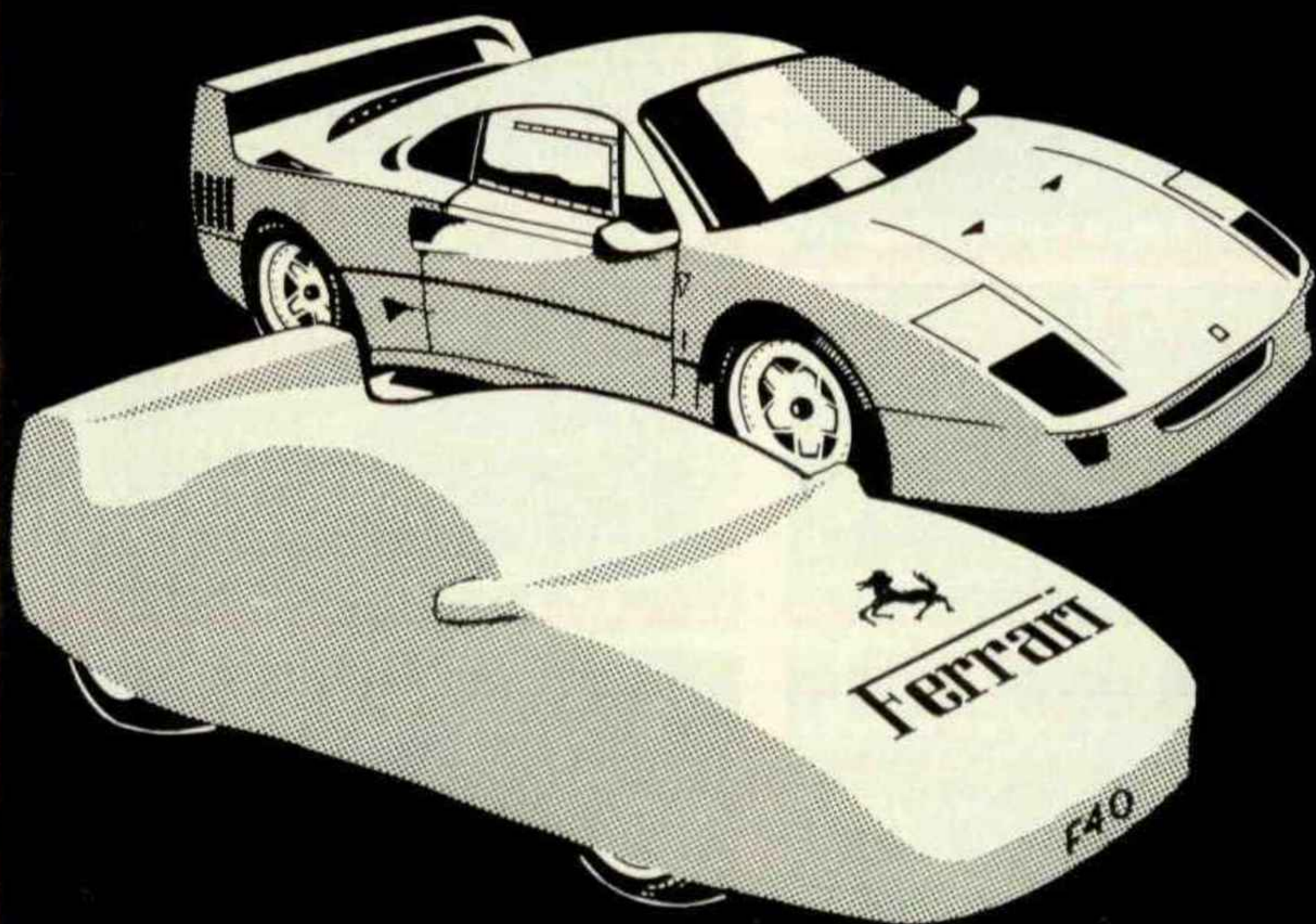
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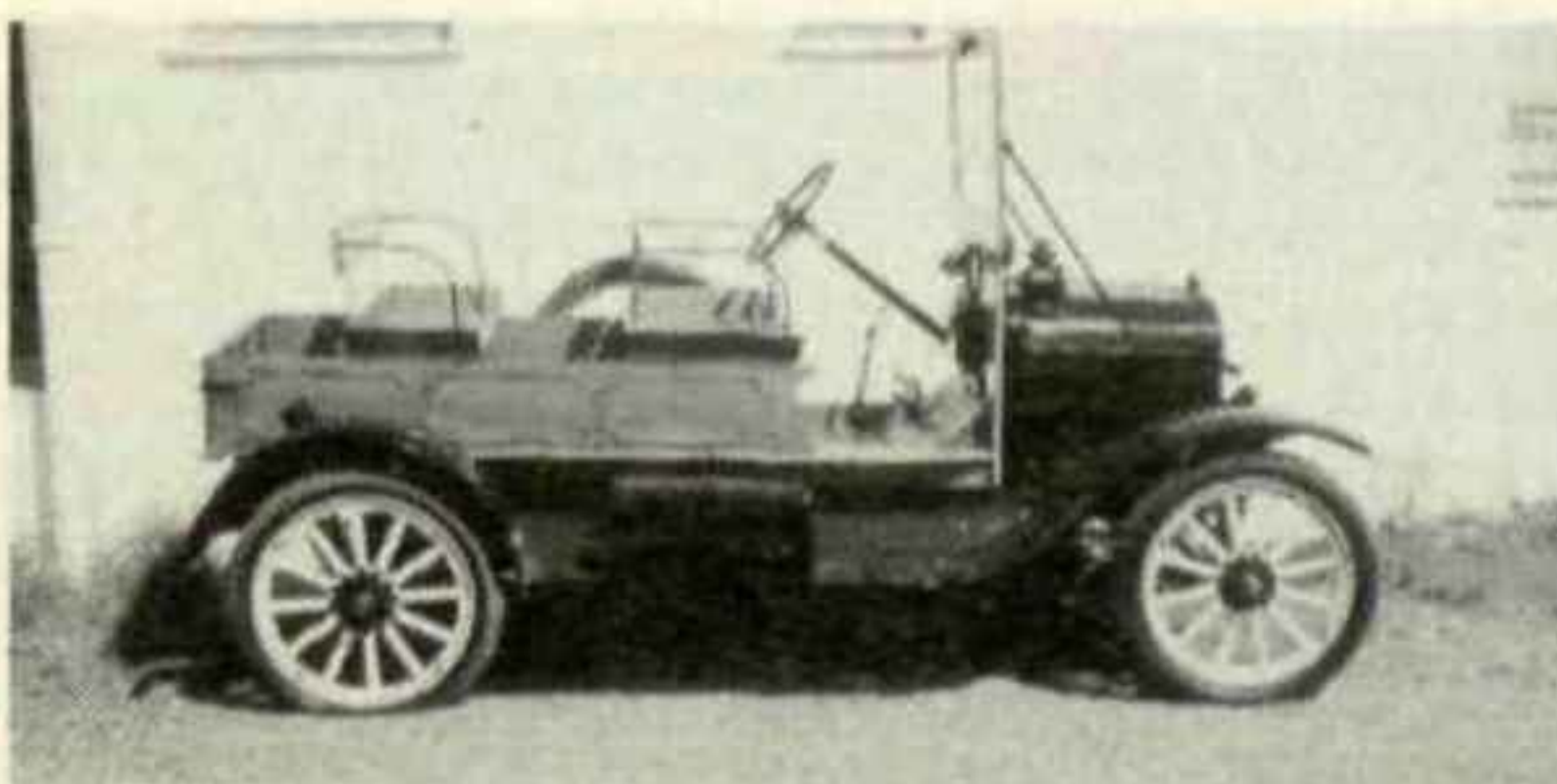
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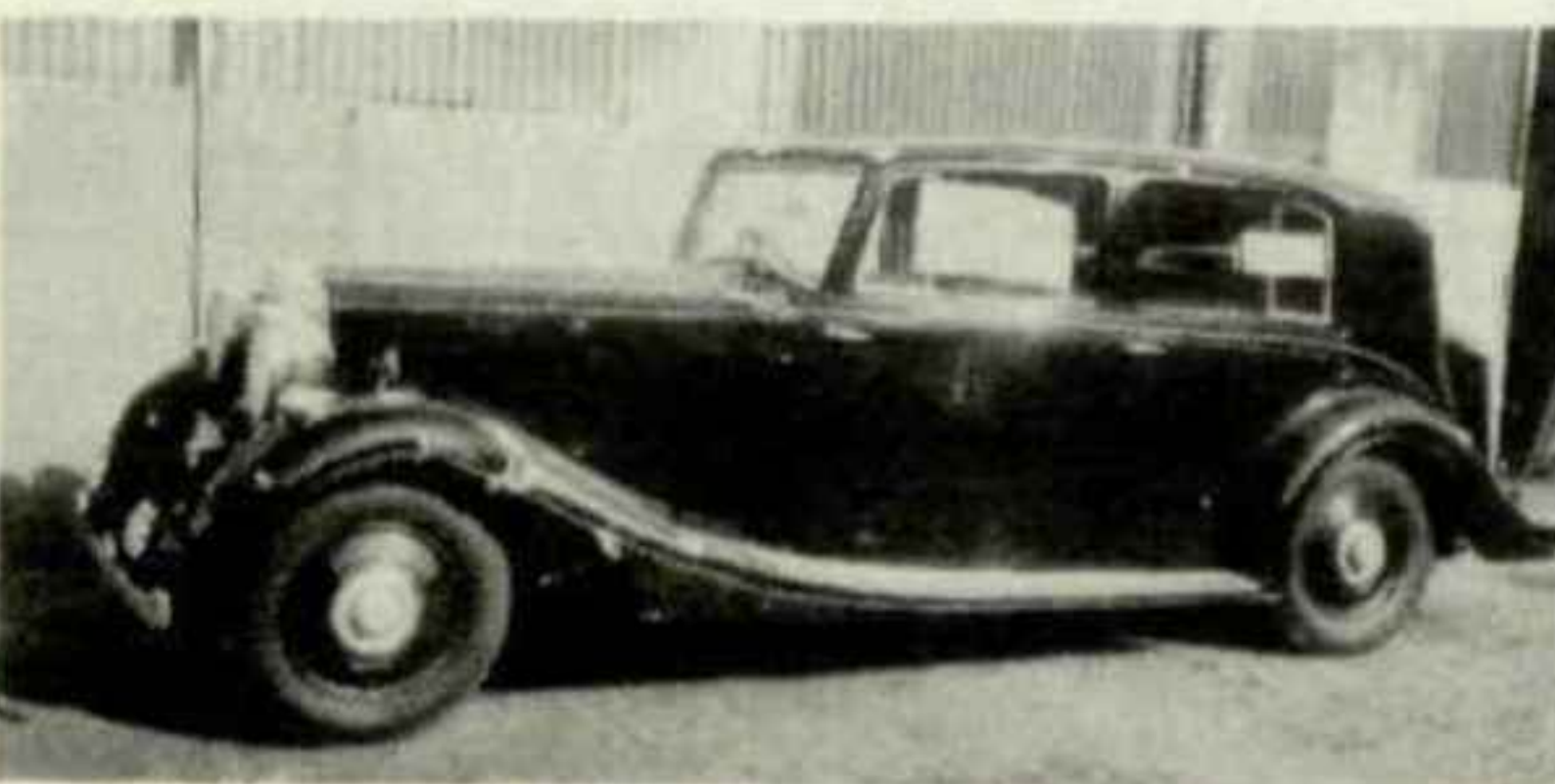
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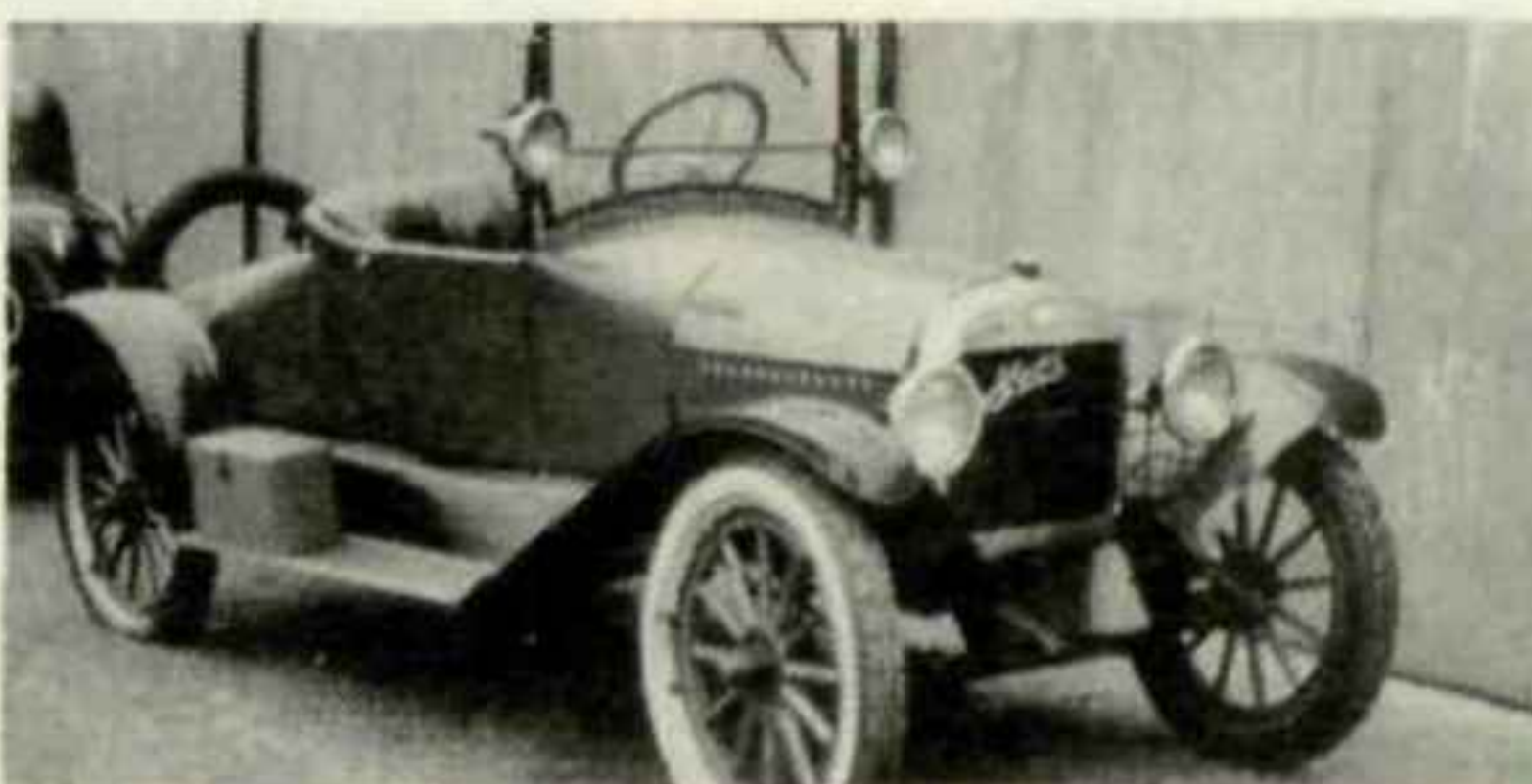
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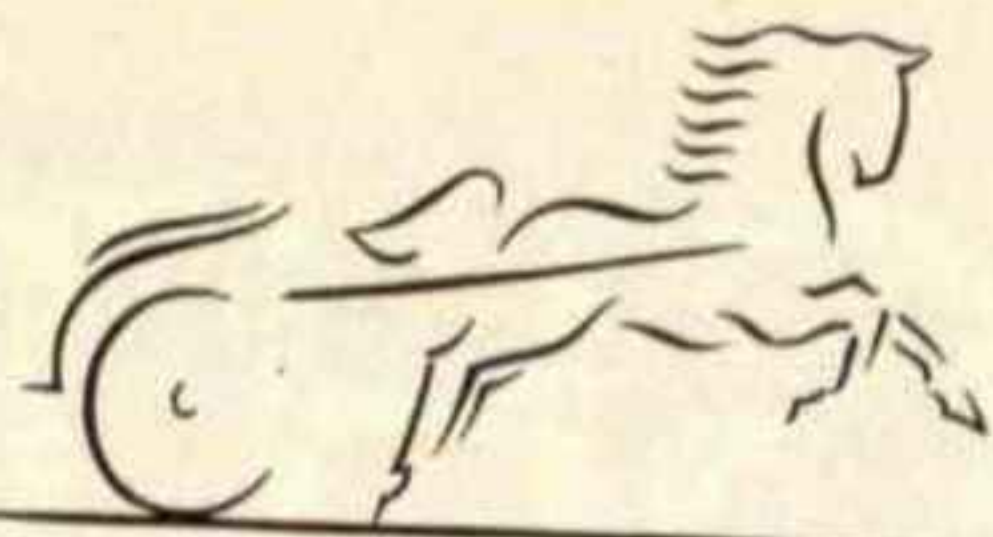
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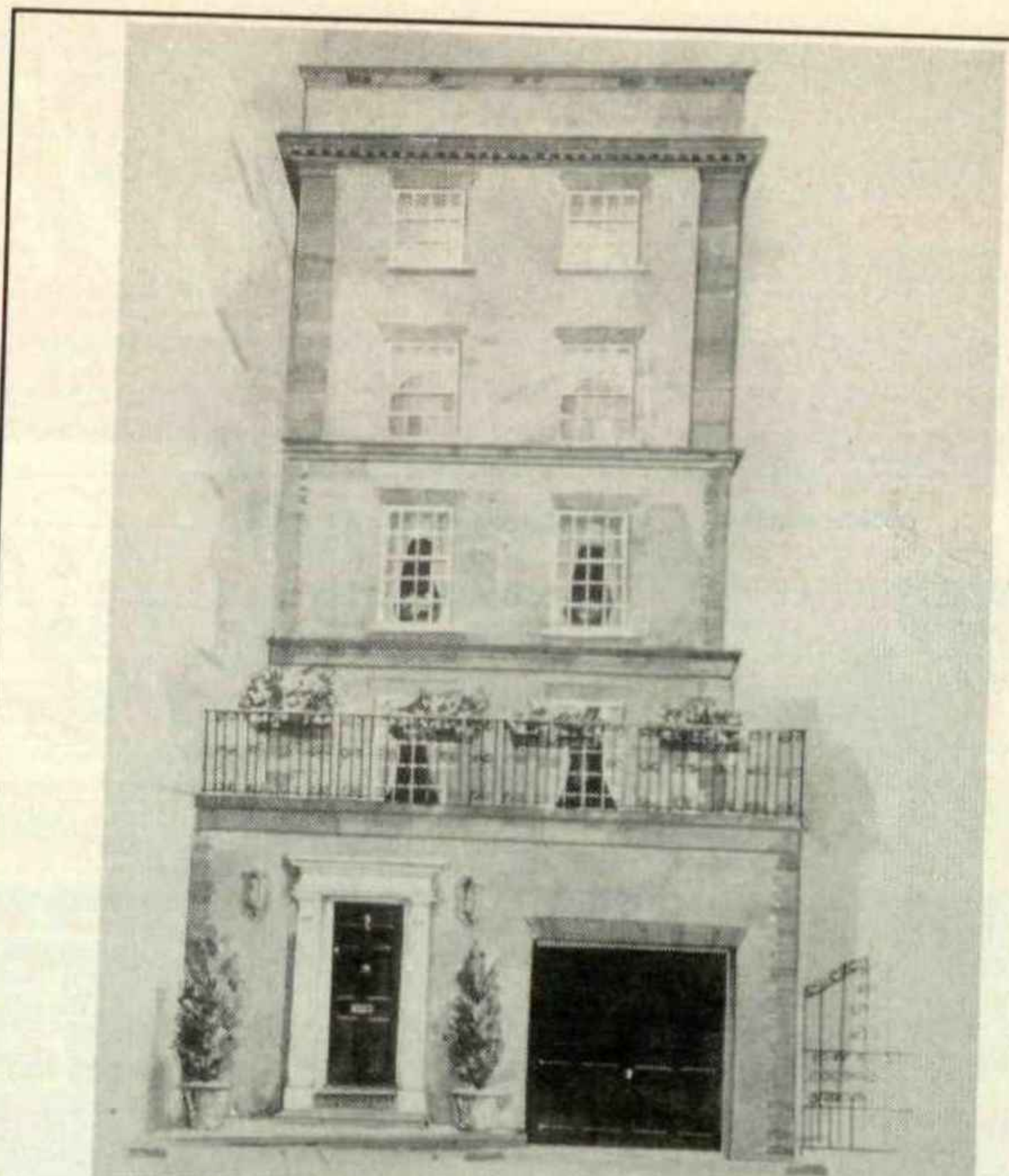
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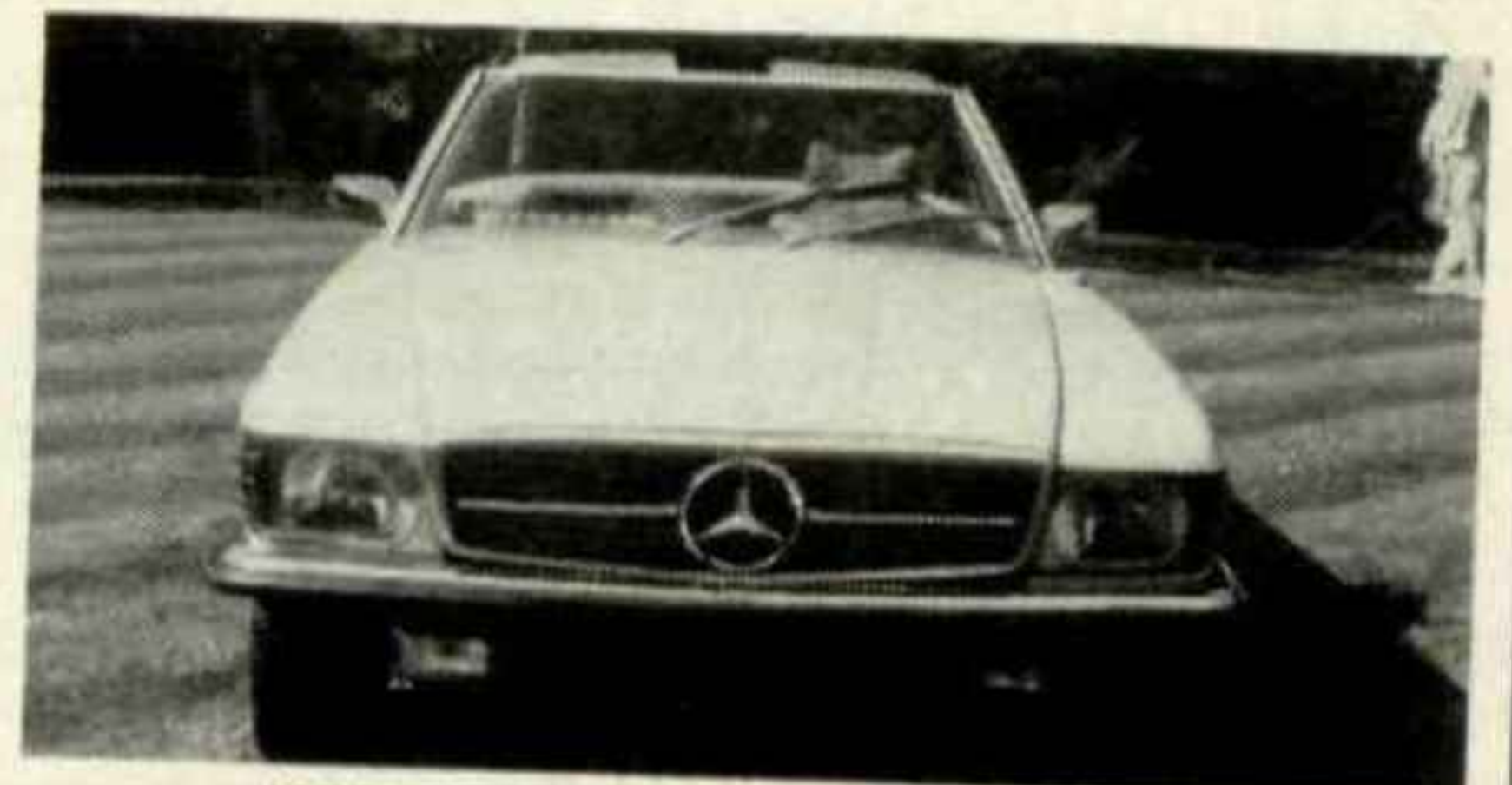
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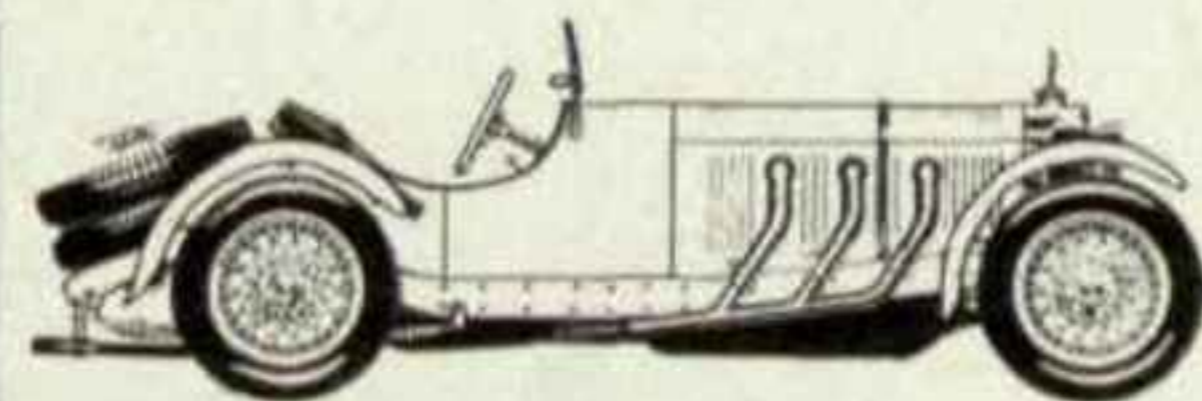
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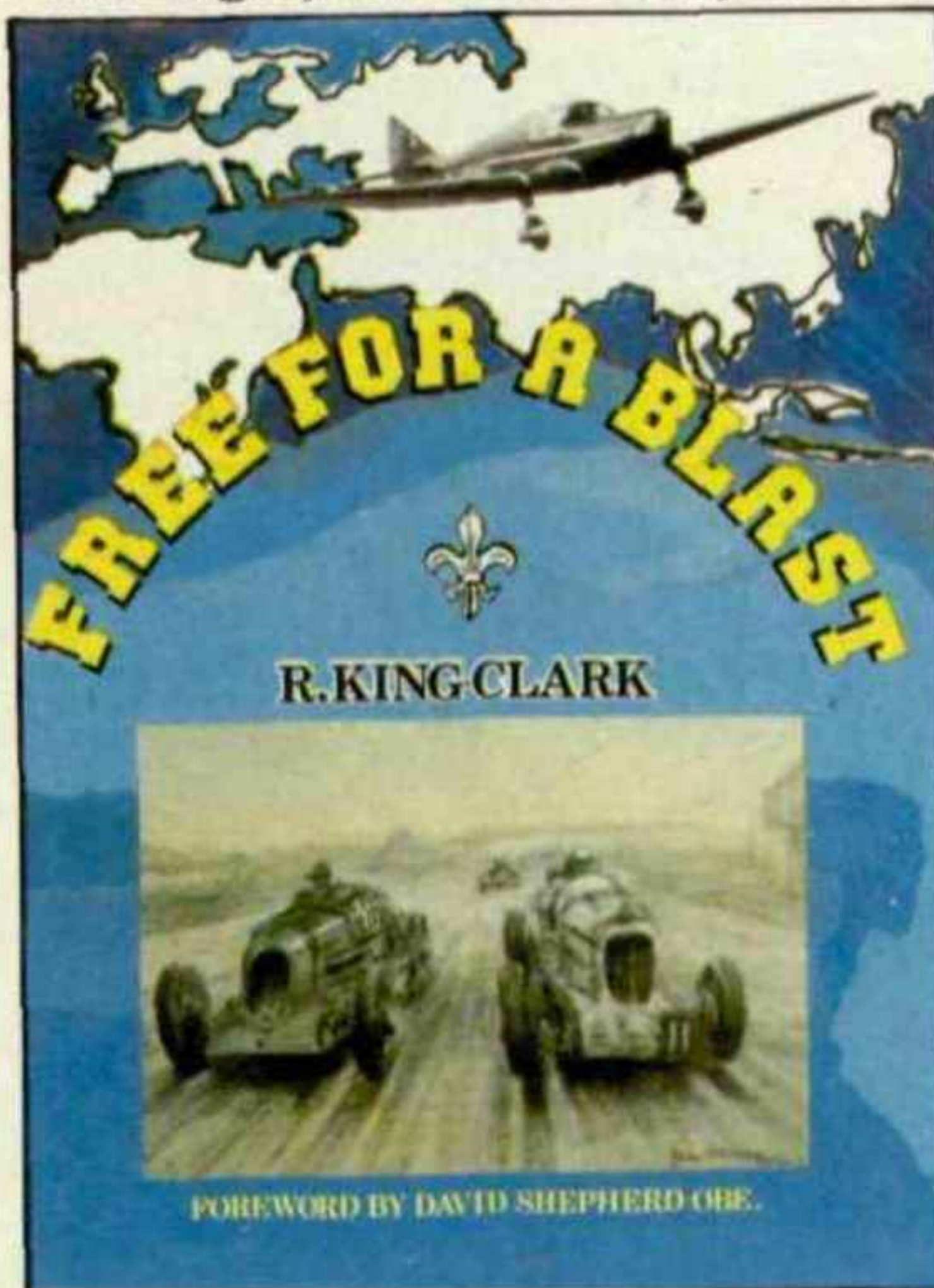
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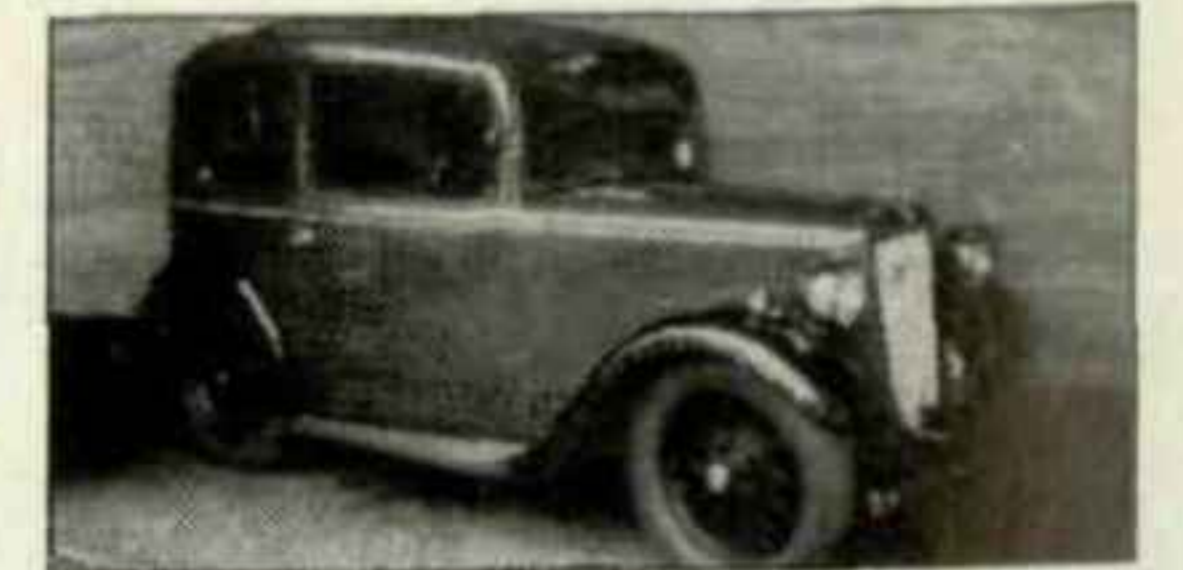
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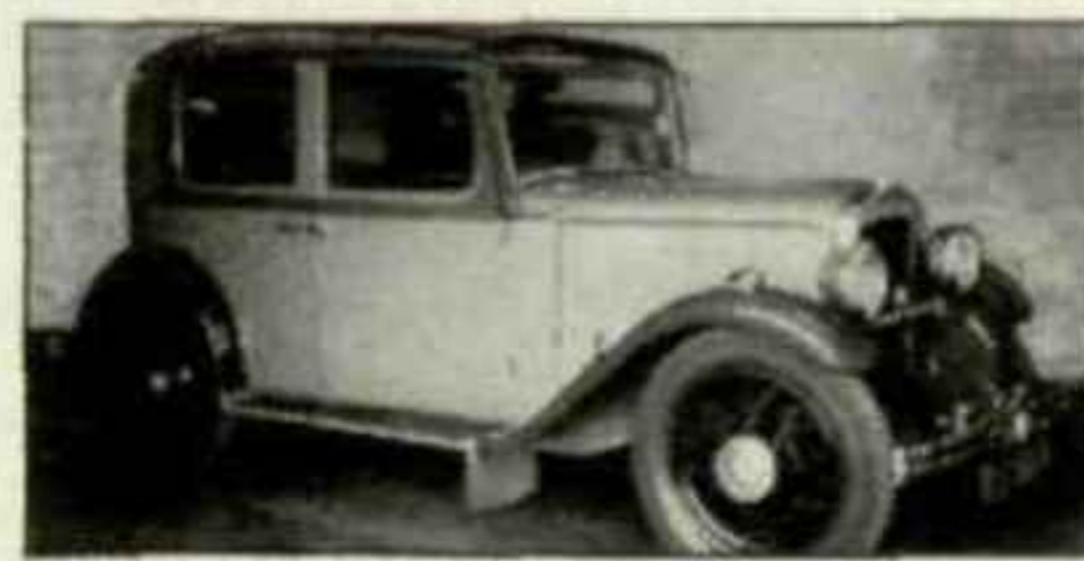
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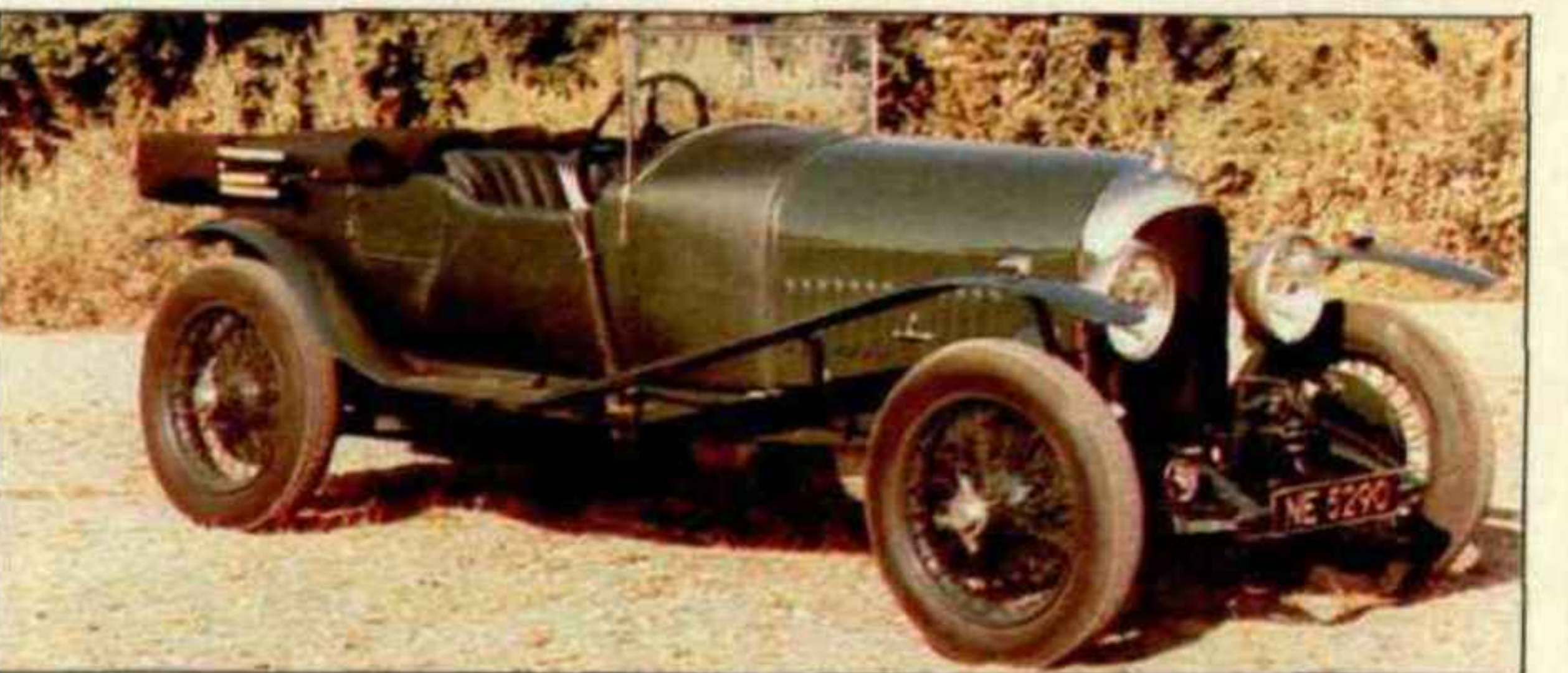
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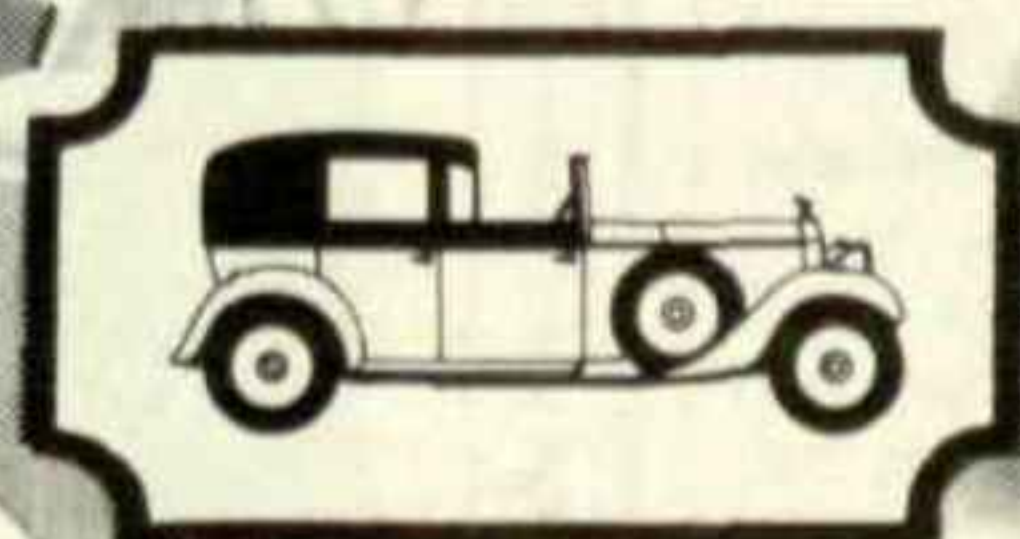
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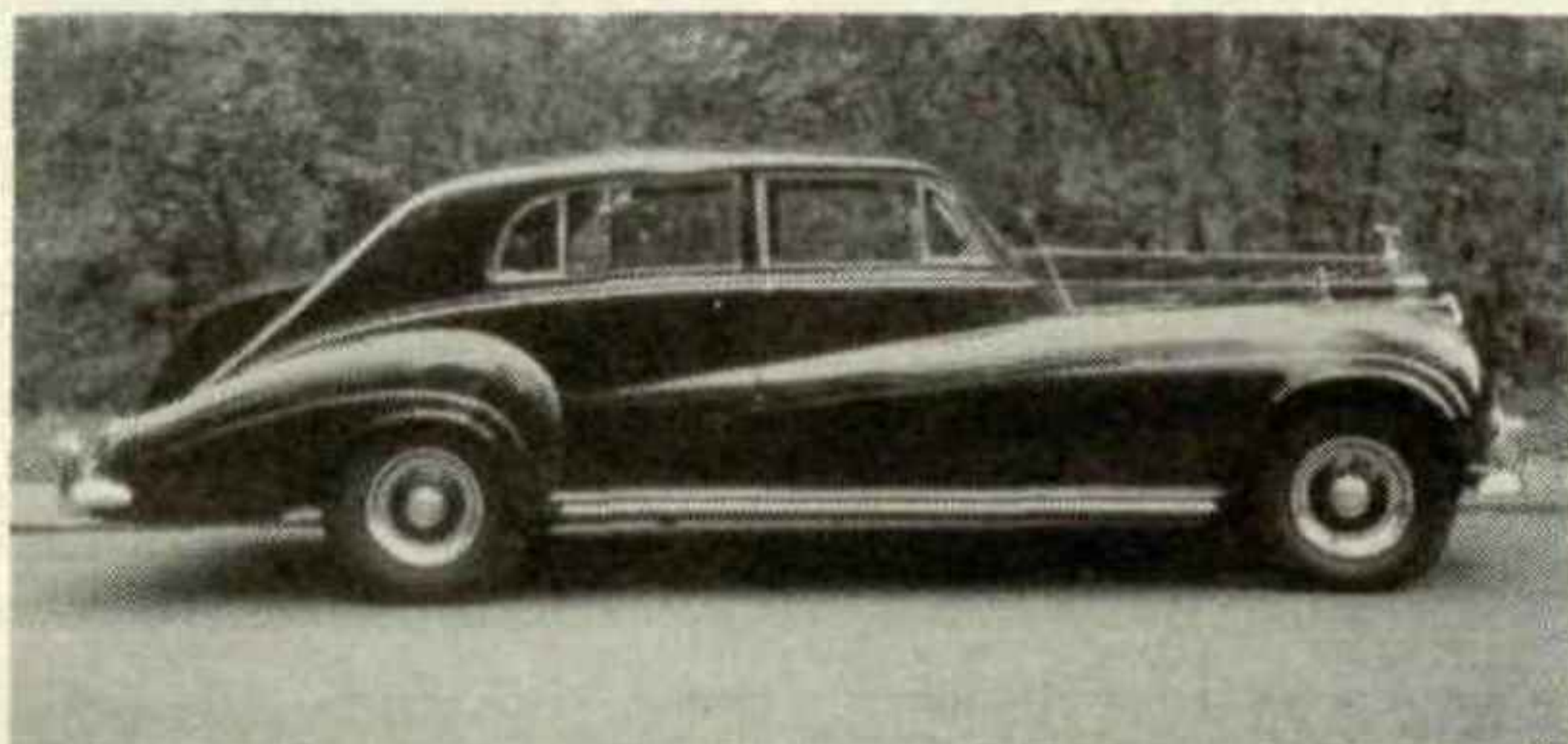
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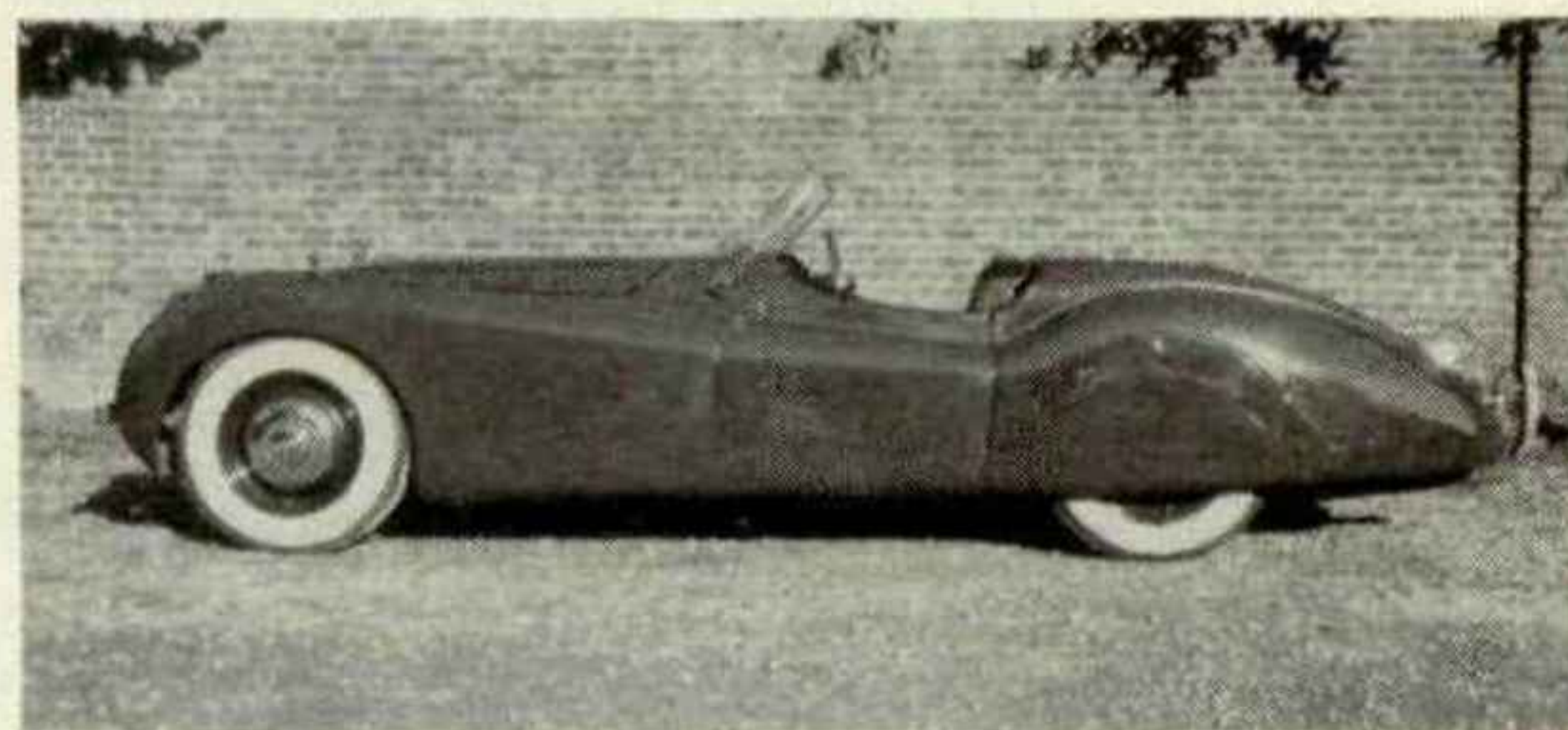
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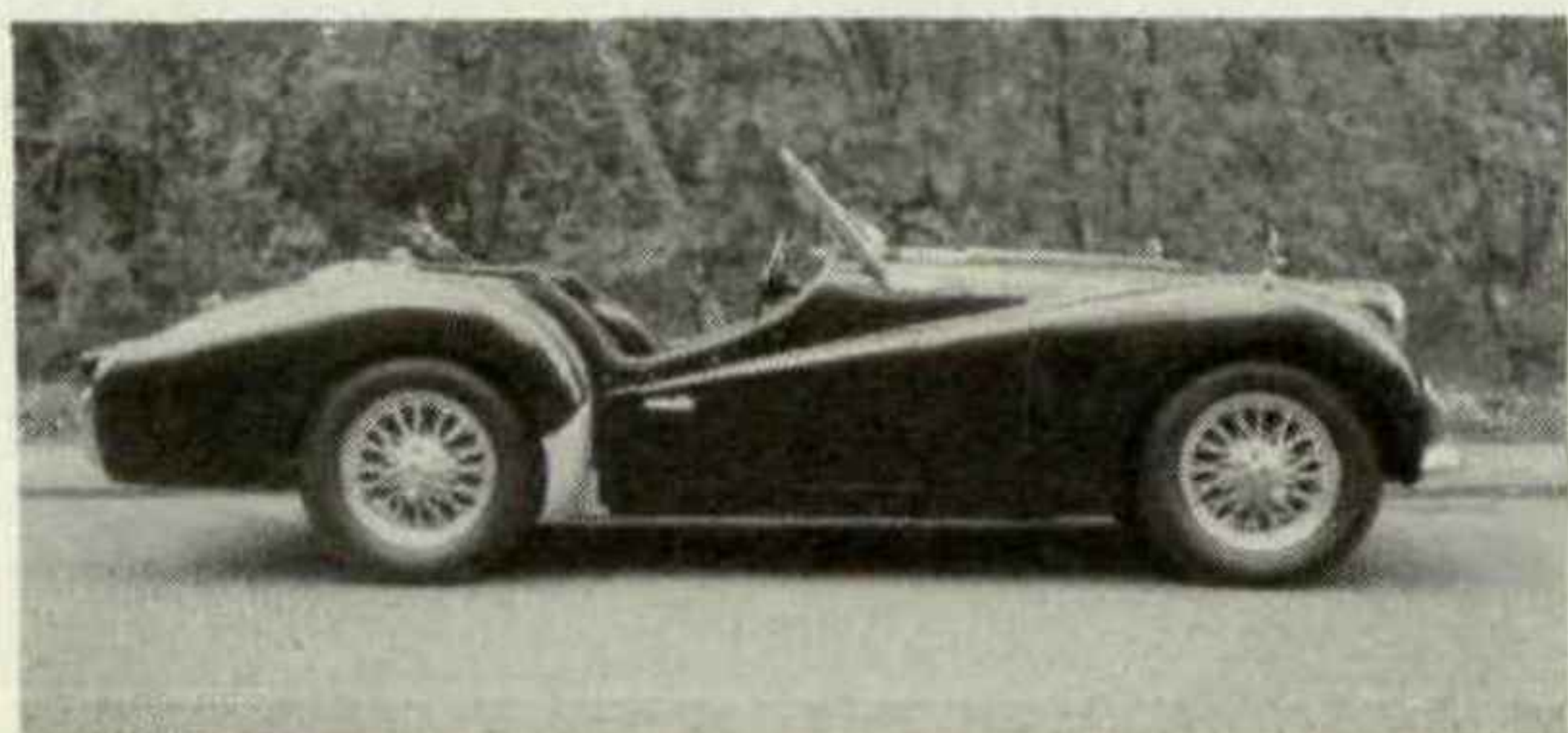
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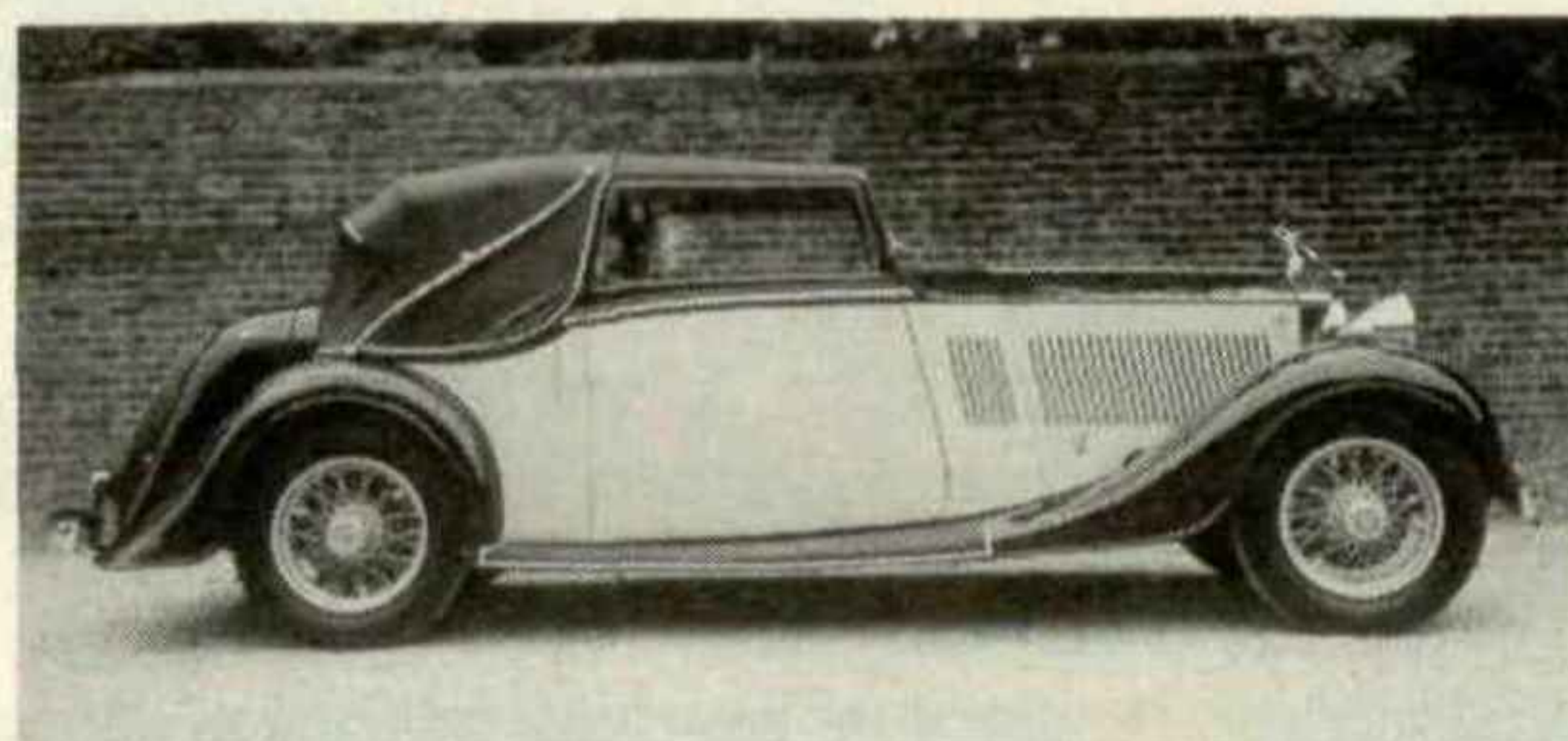
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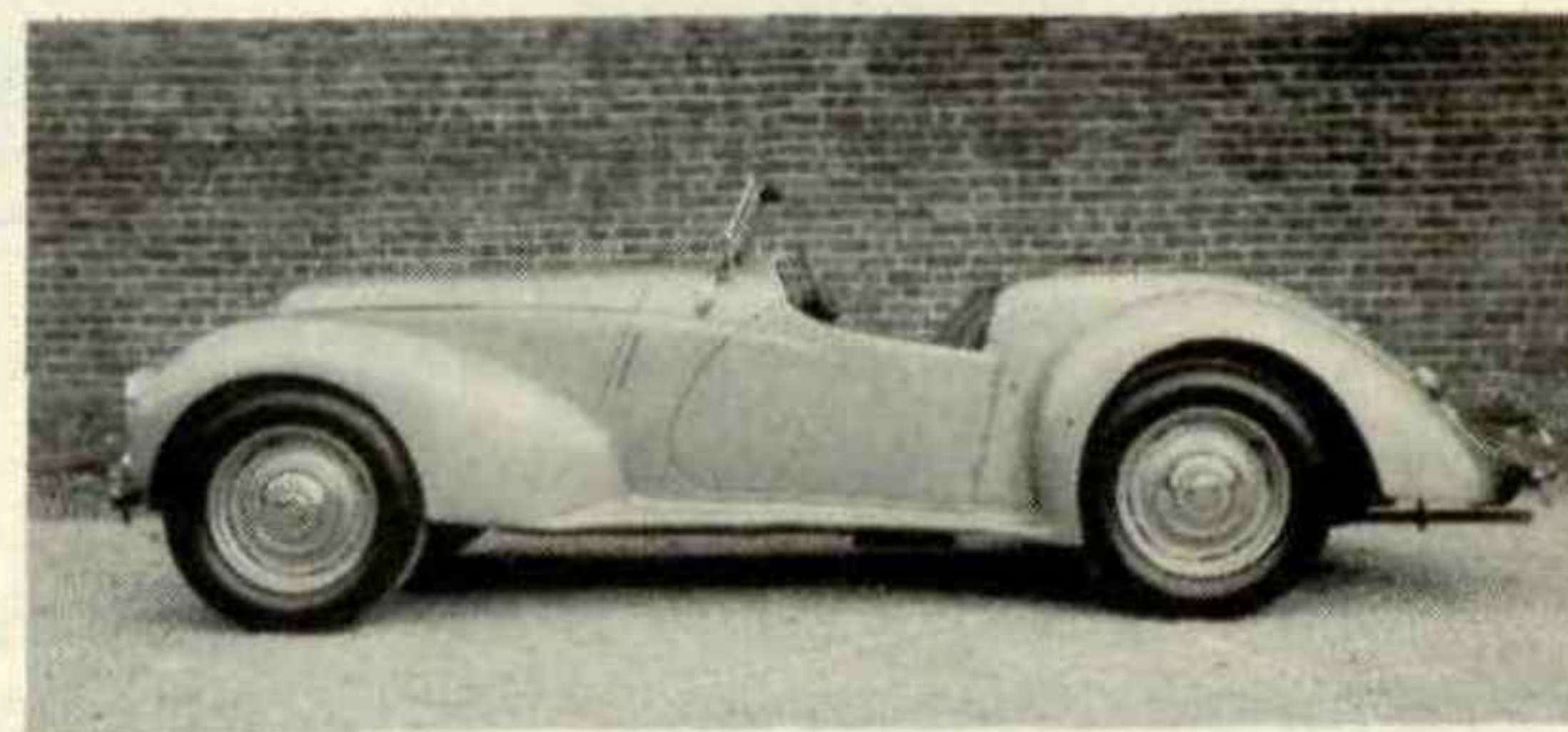
1957 TRIUMPH TR3A in red with black interior. LHD, CWW, very pretty.



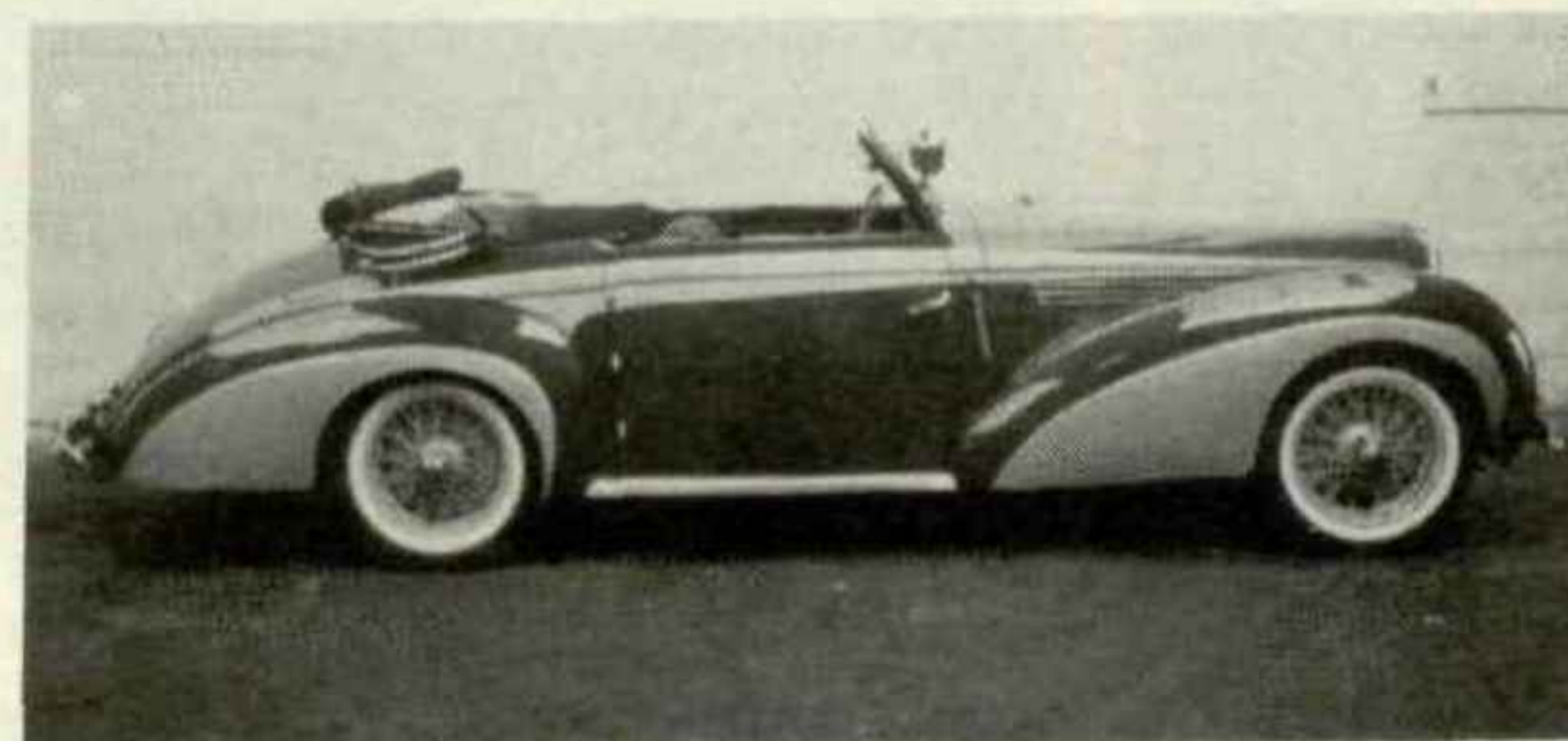
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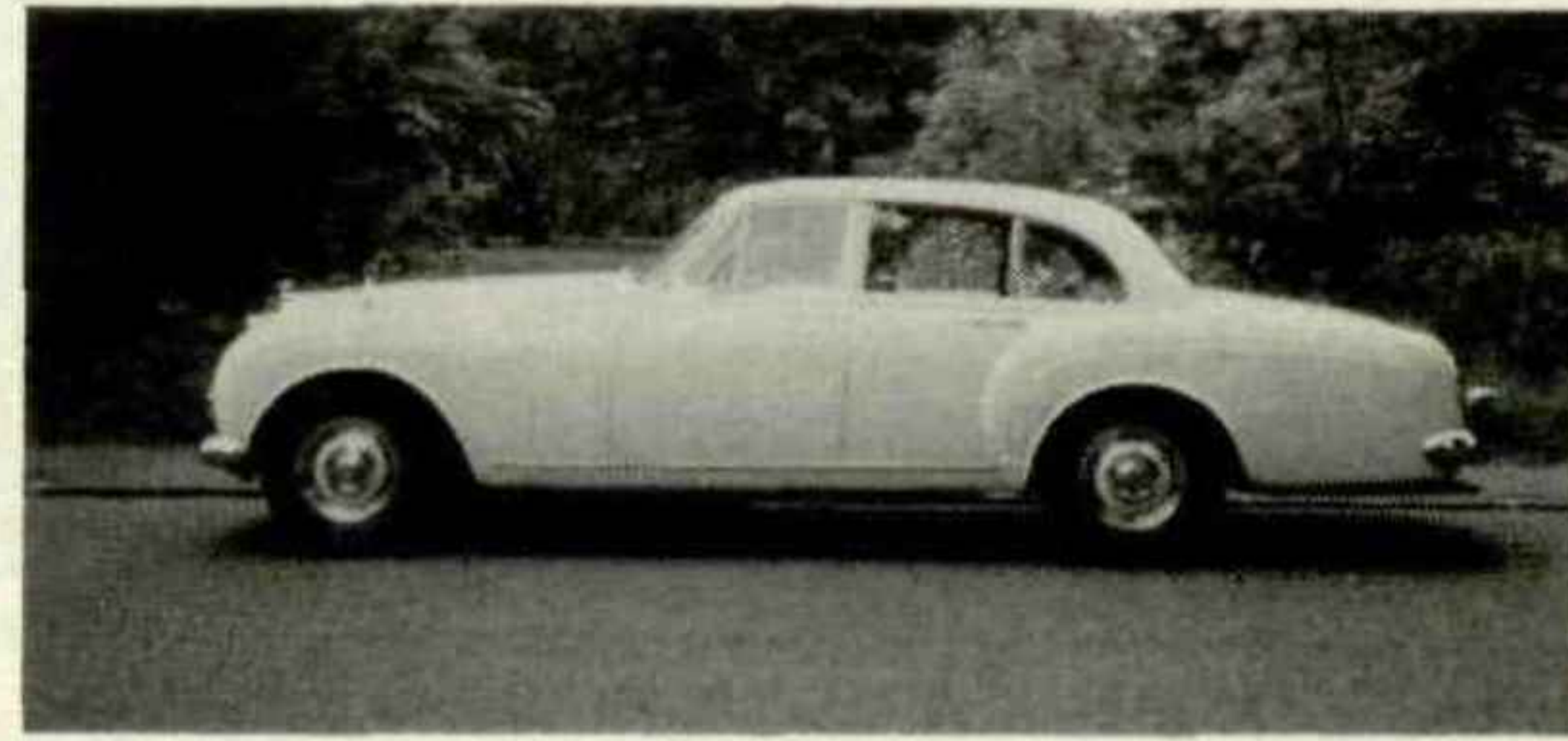
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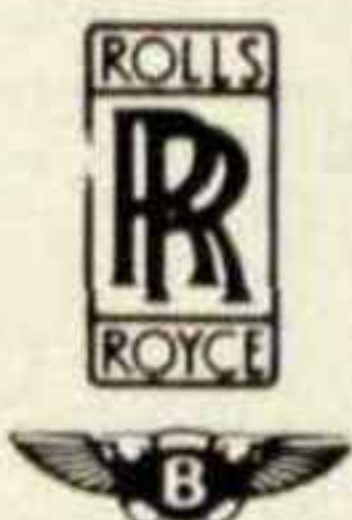
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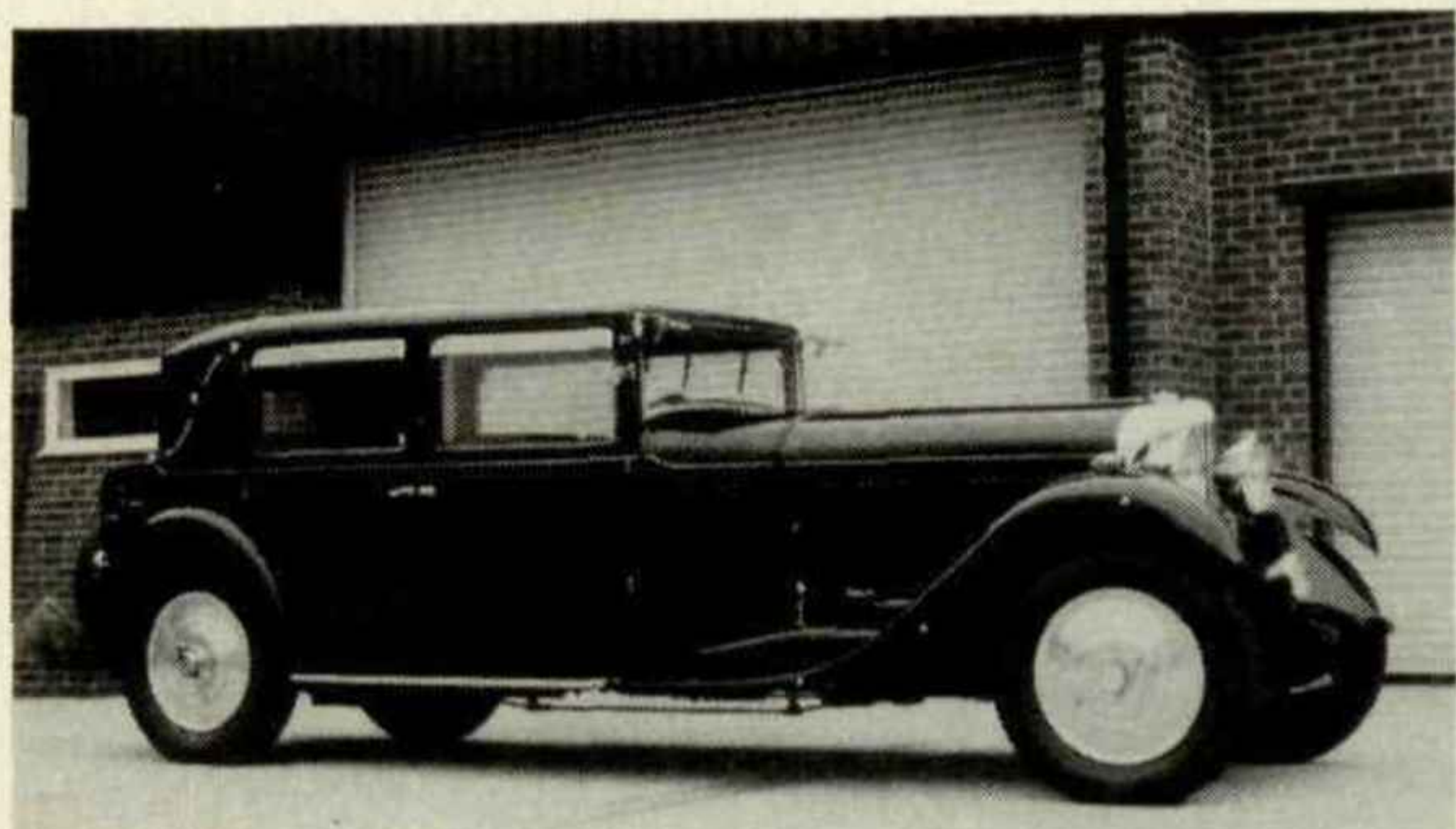
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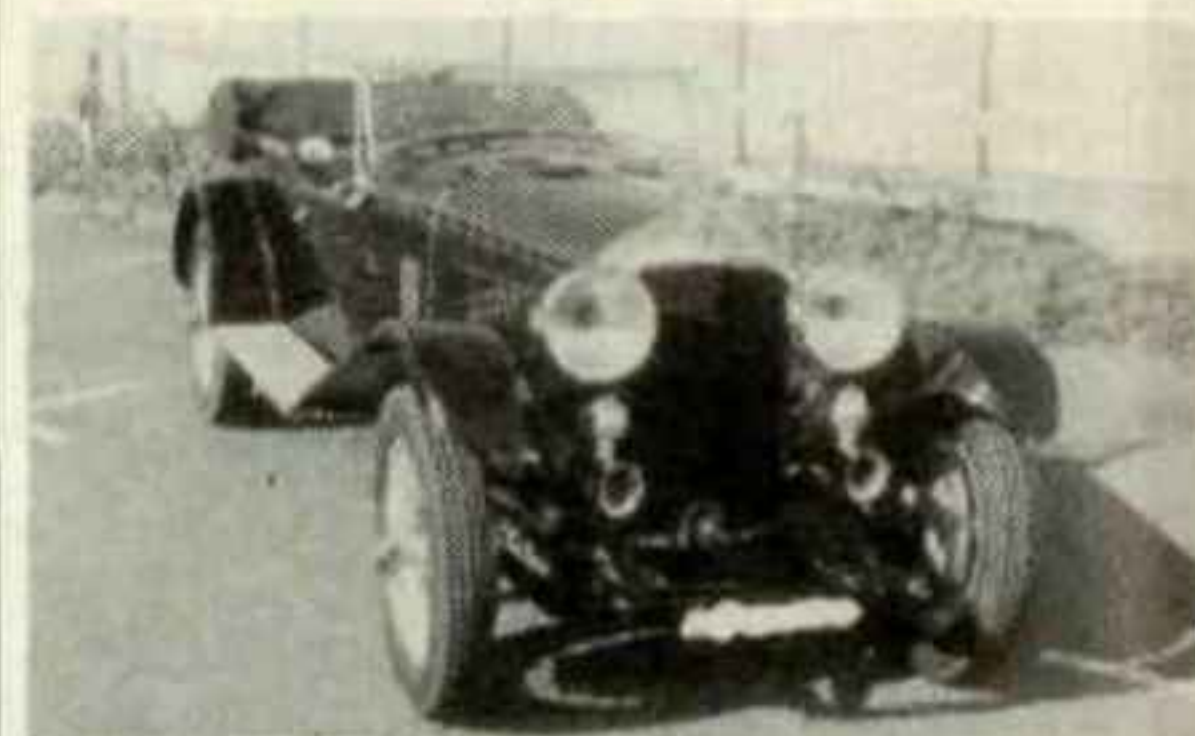


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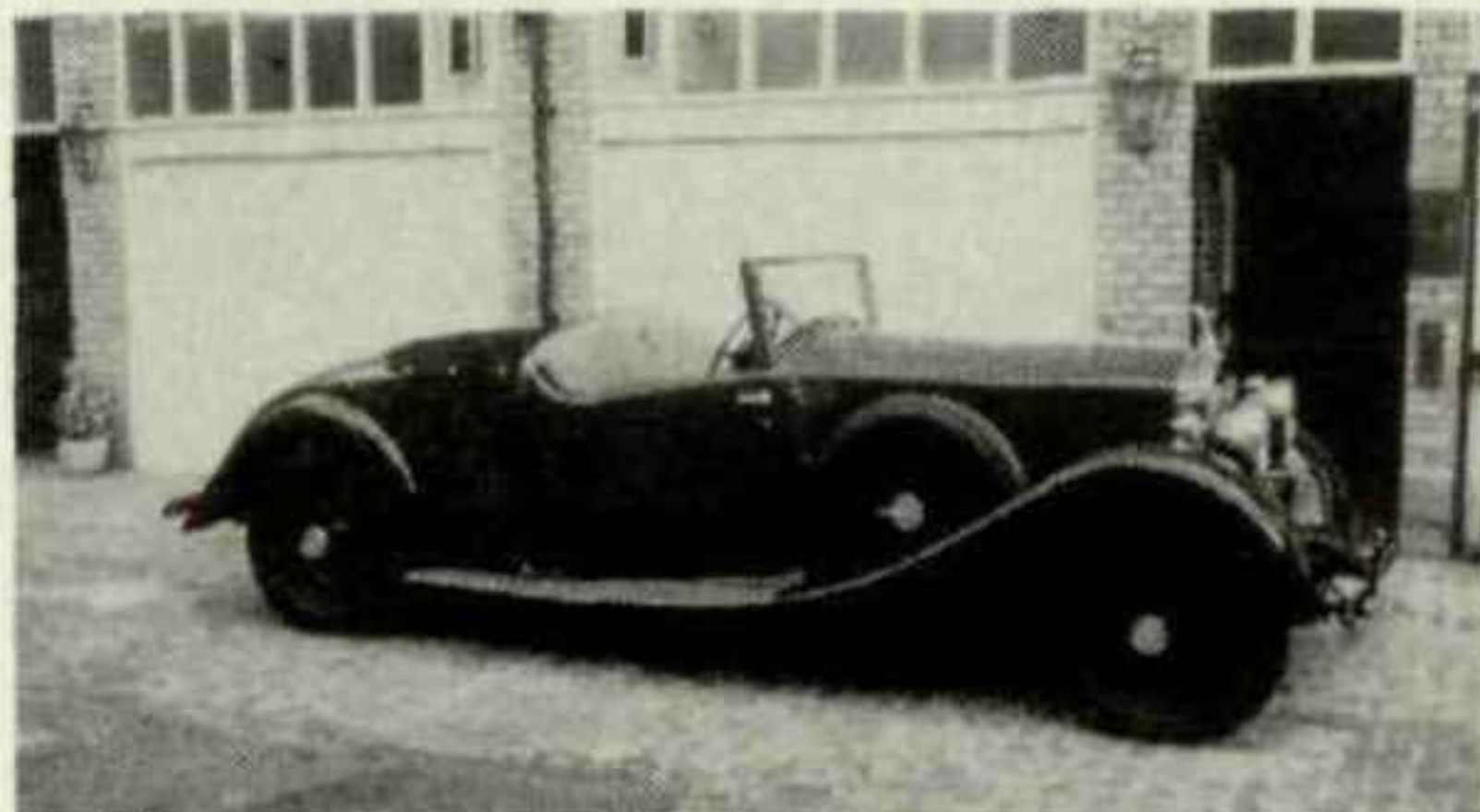
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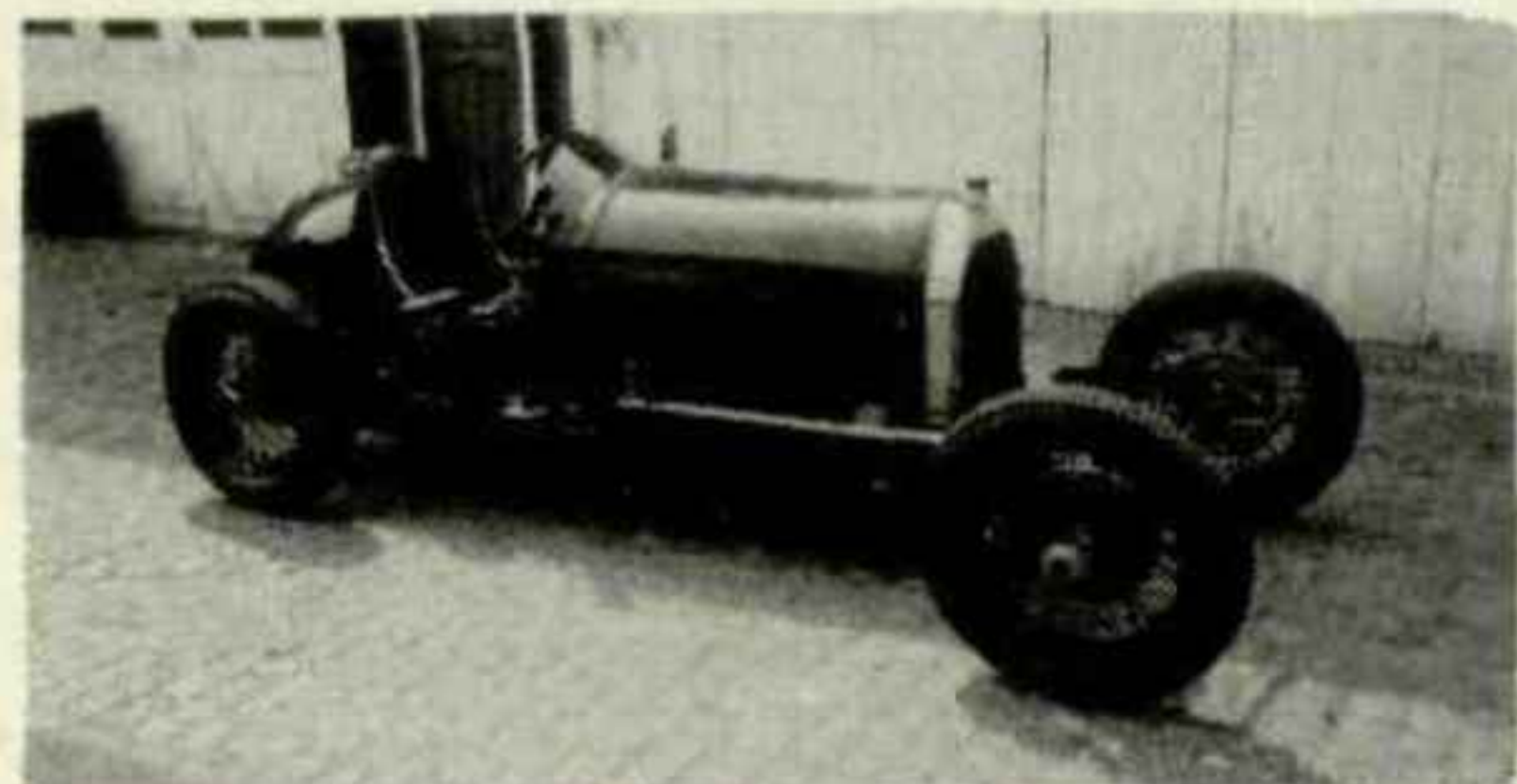
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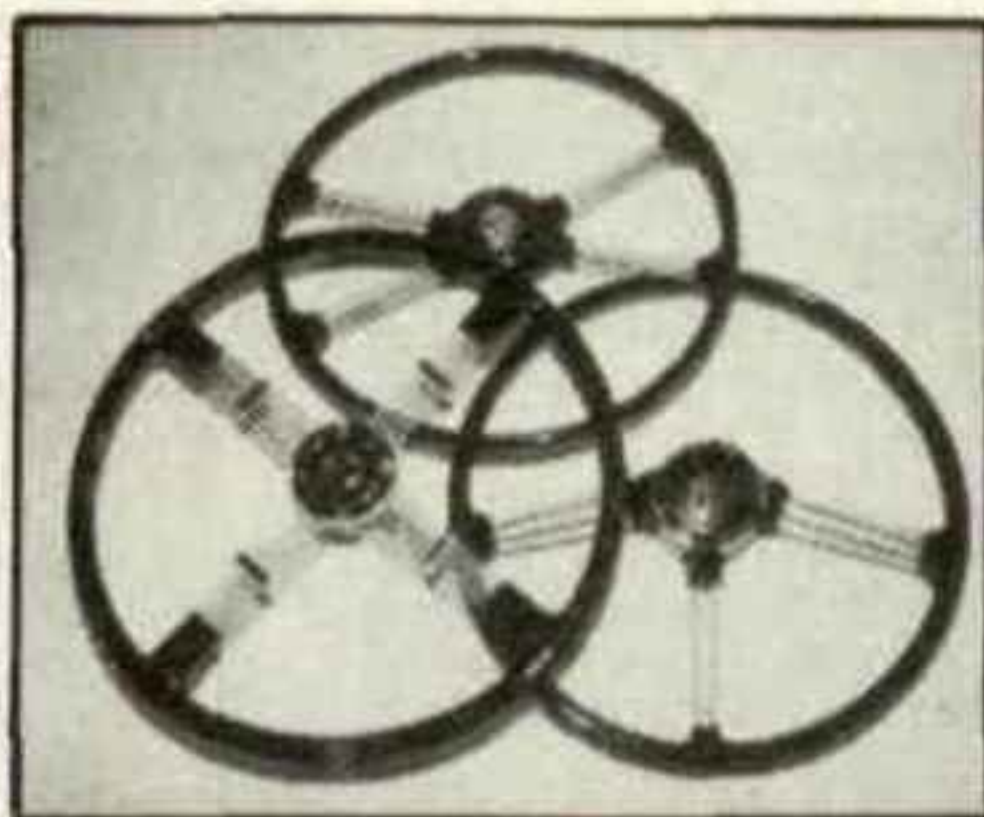
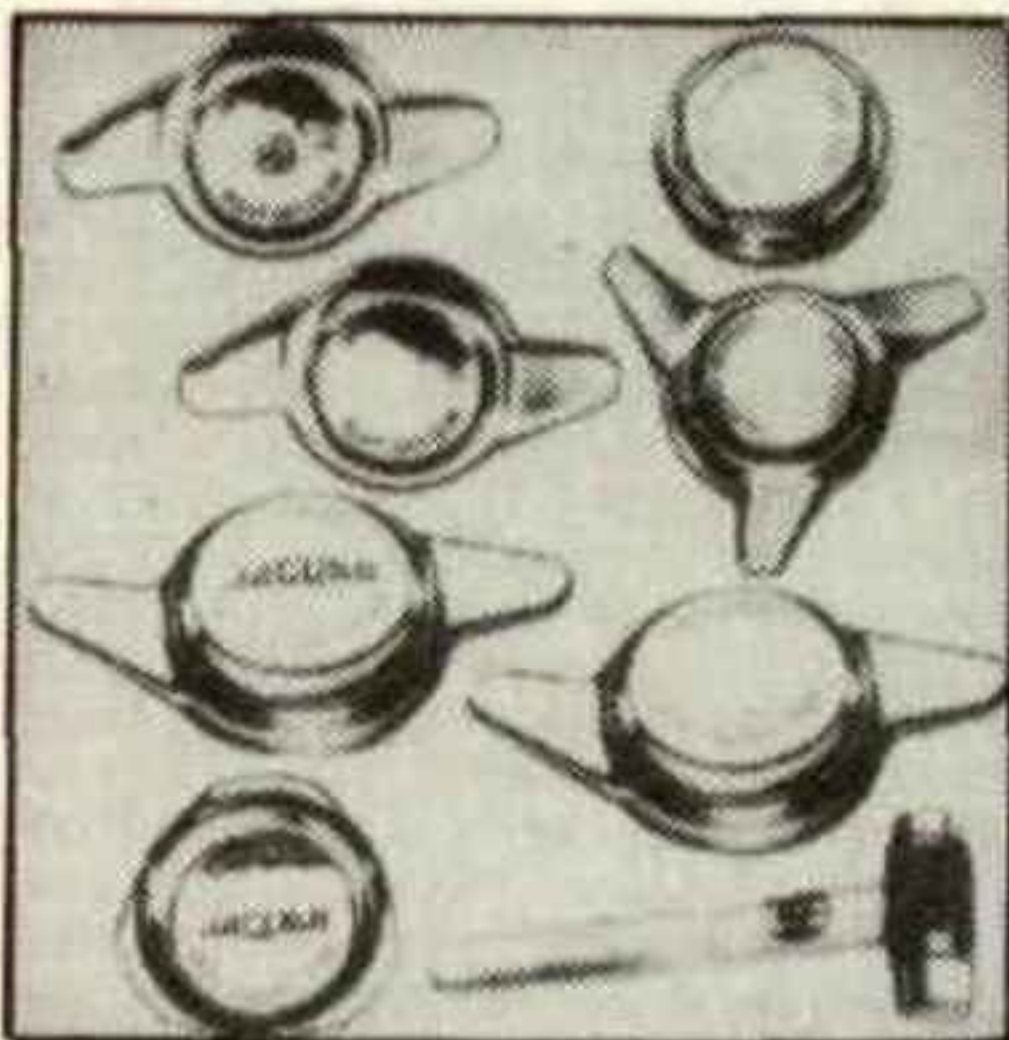
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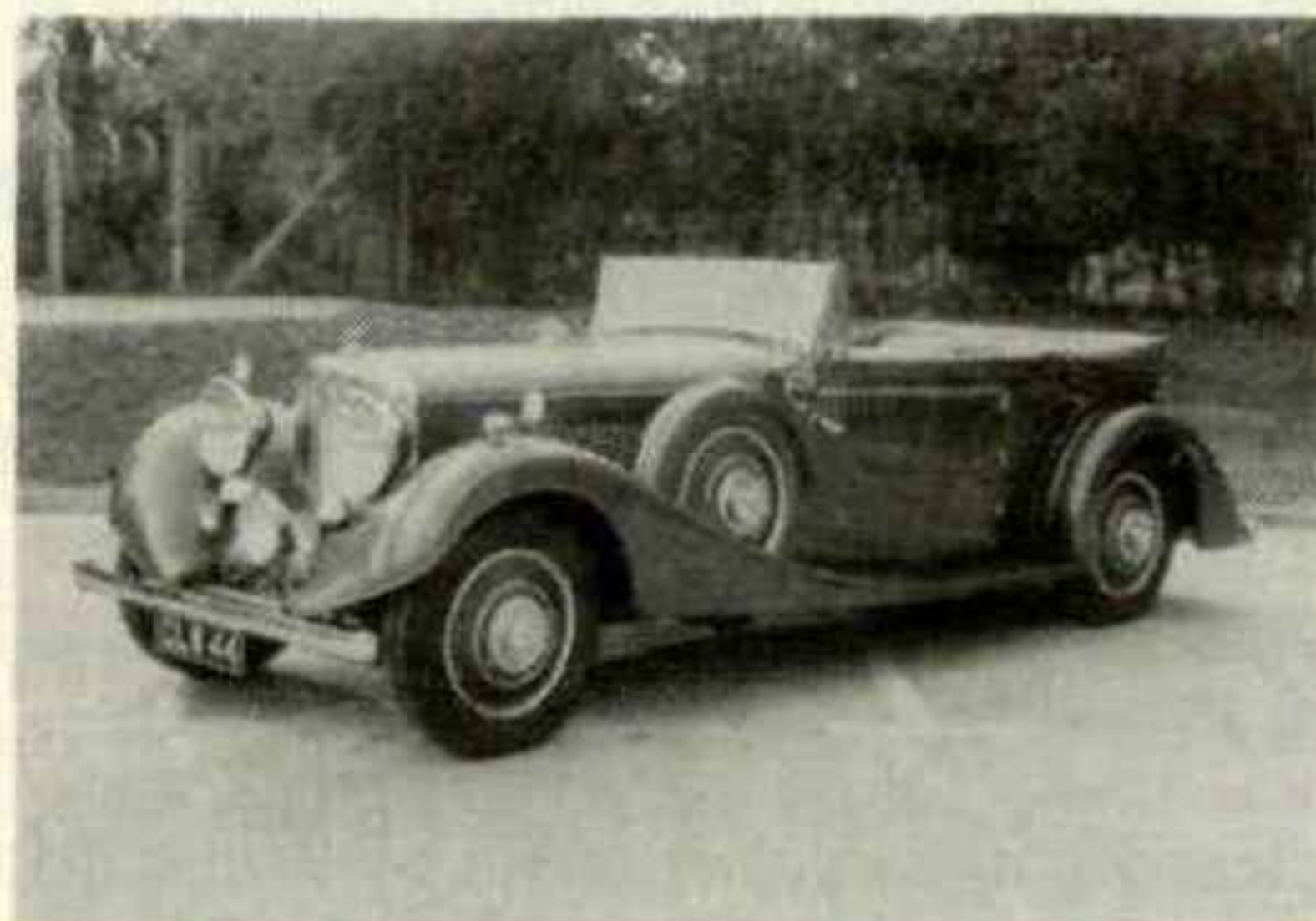


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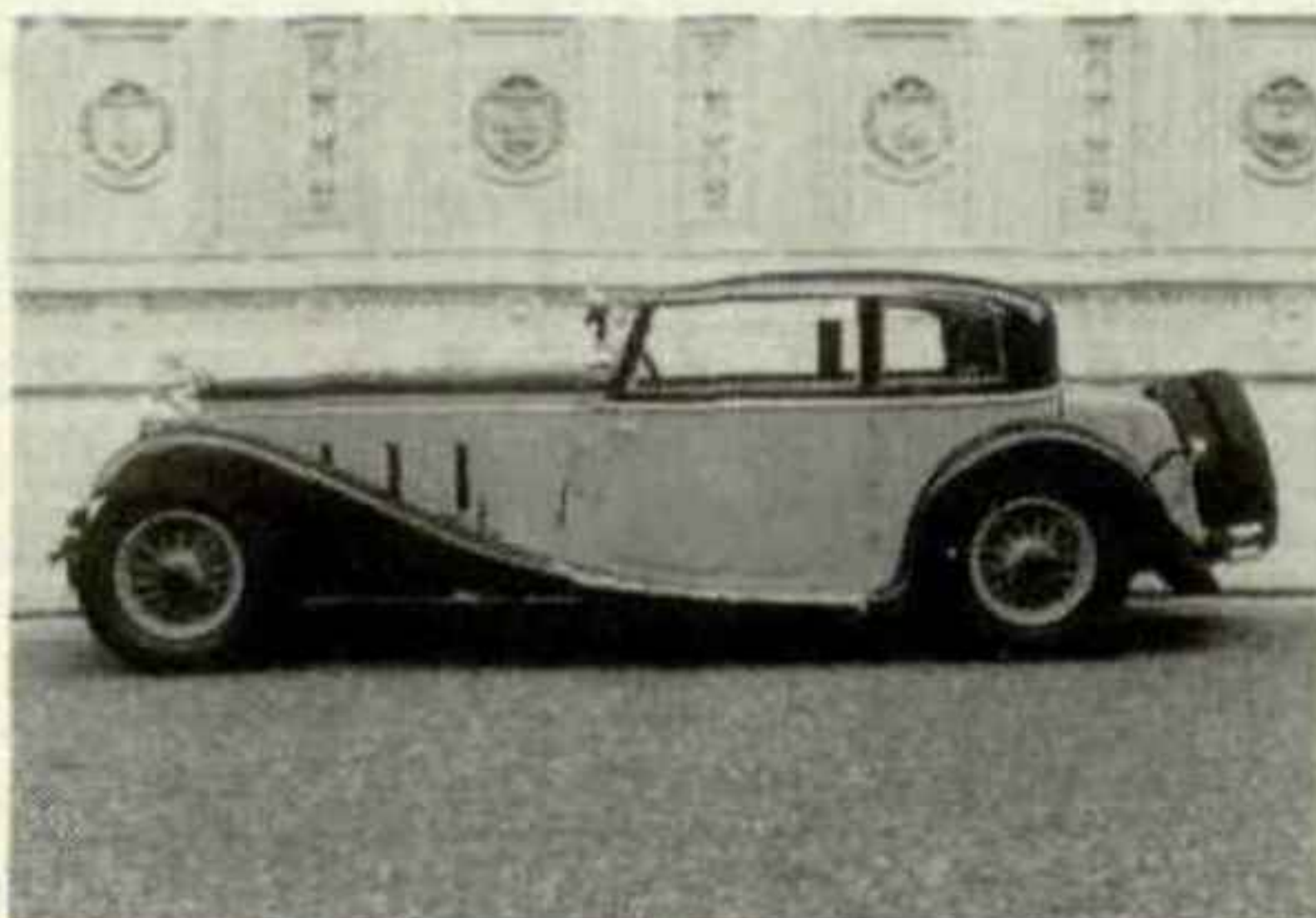
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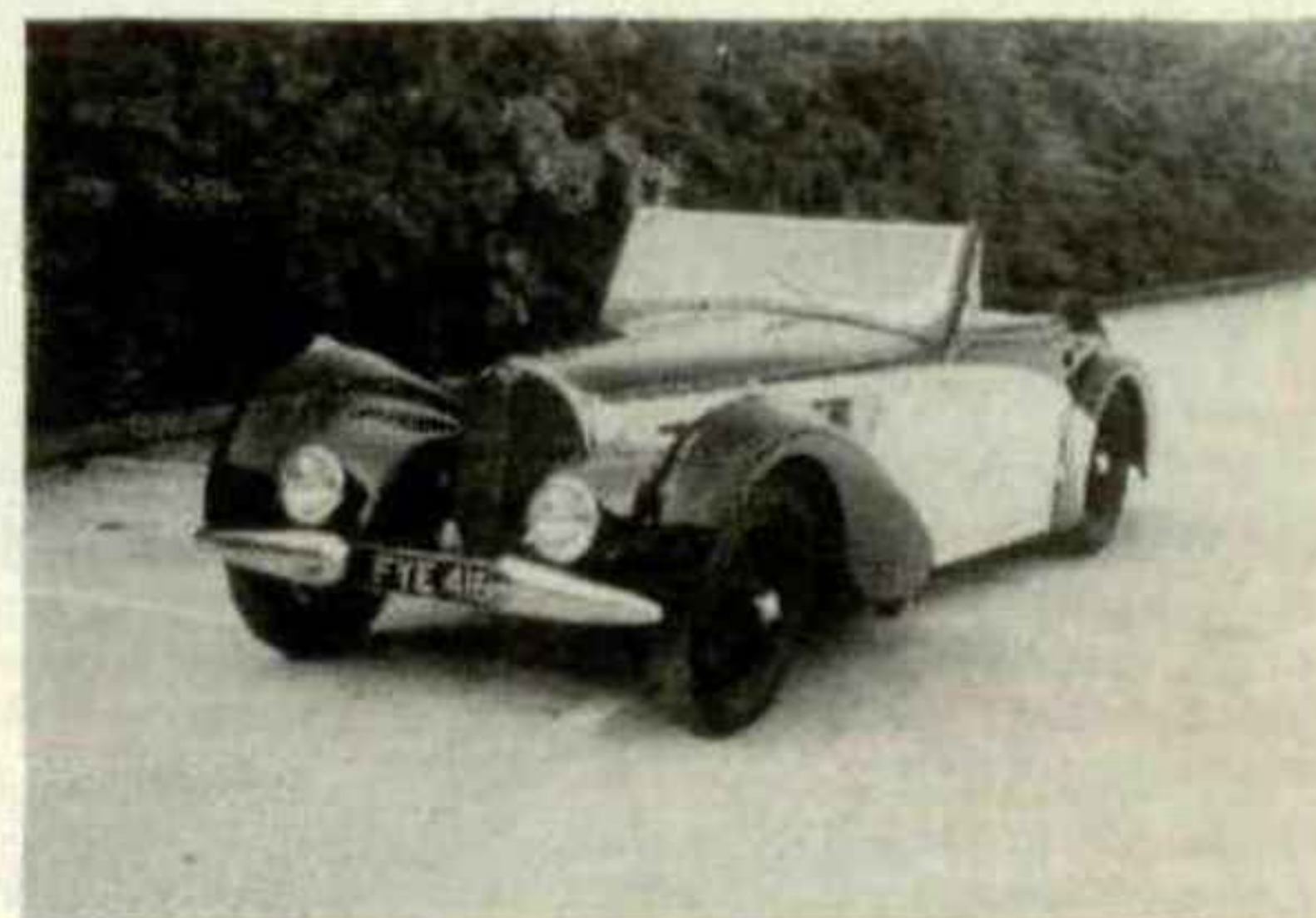
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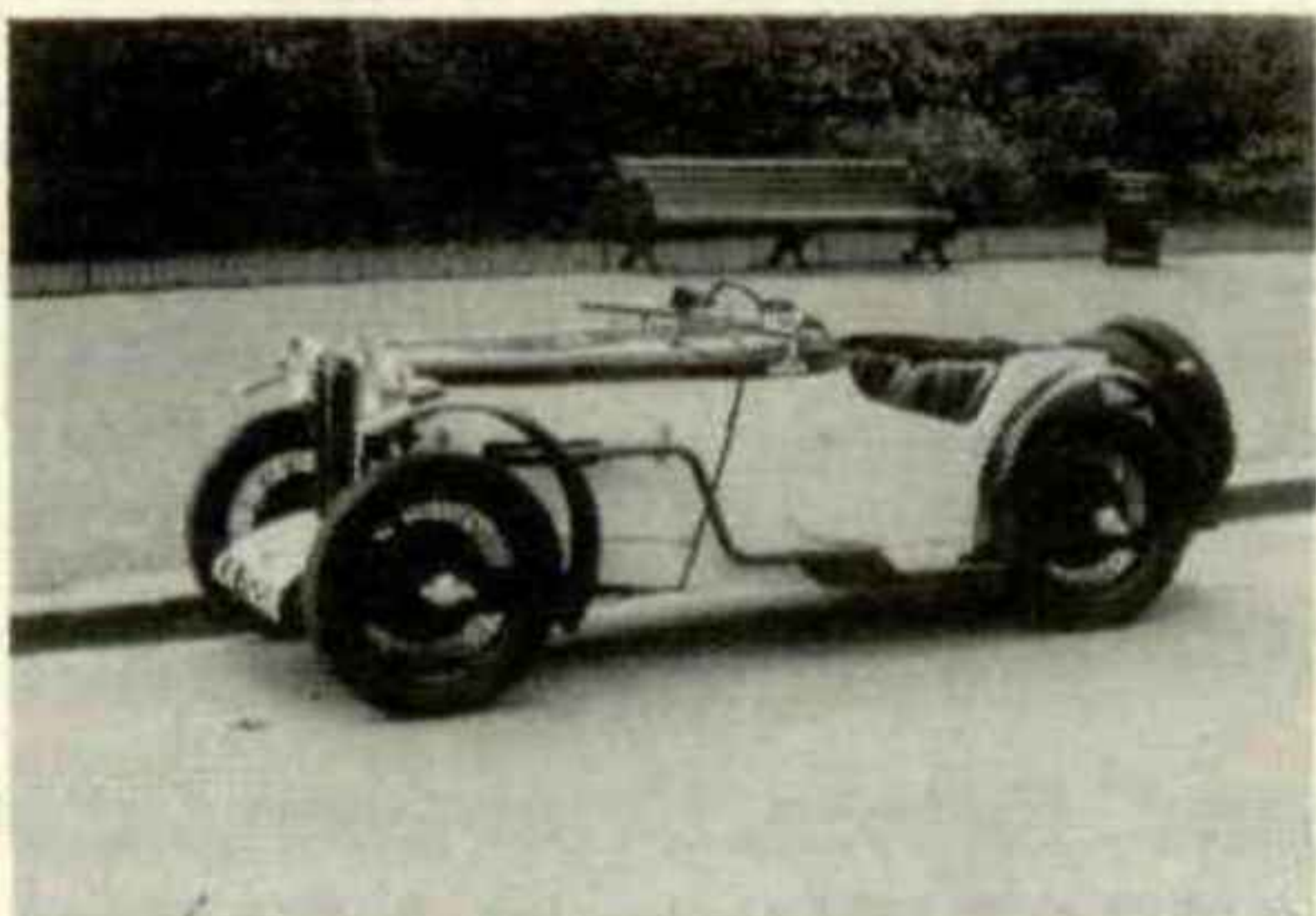
1936 Bentley 3 1/2 Litre Tourer by Oxborrow & Fuller.



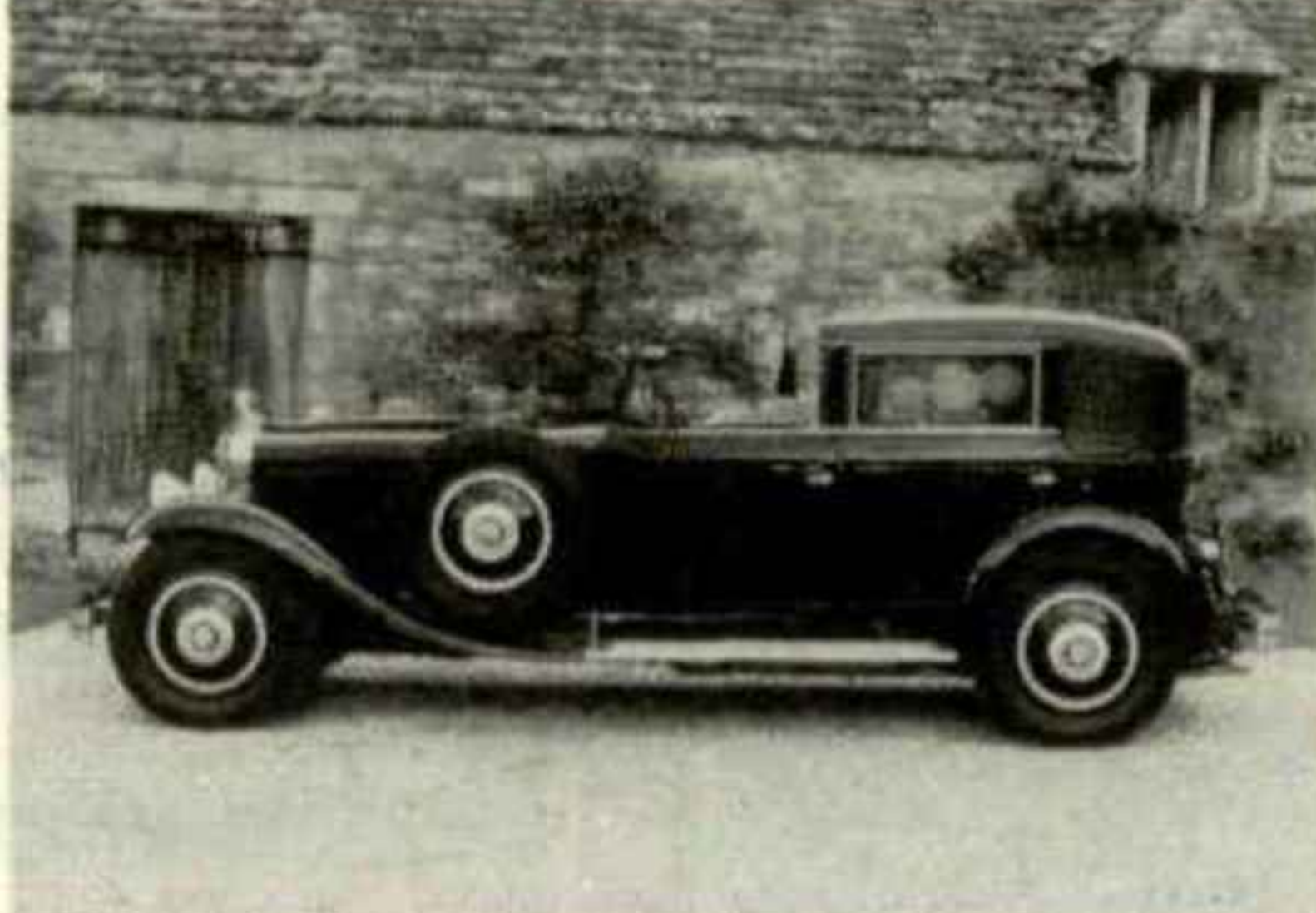
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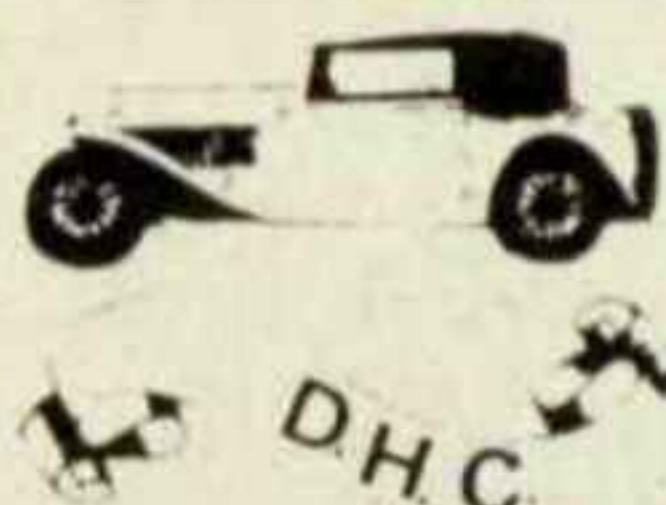
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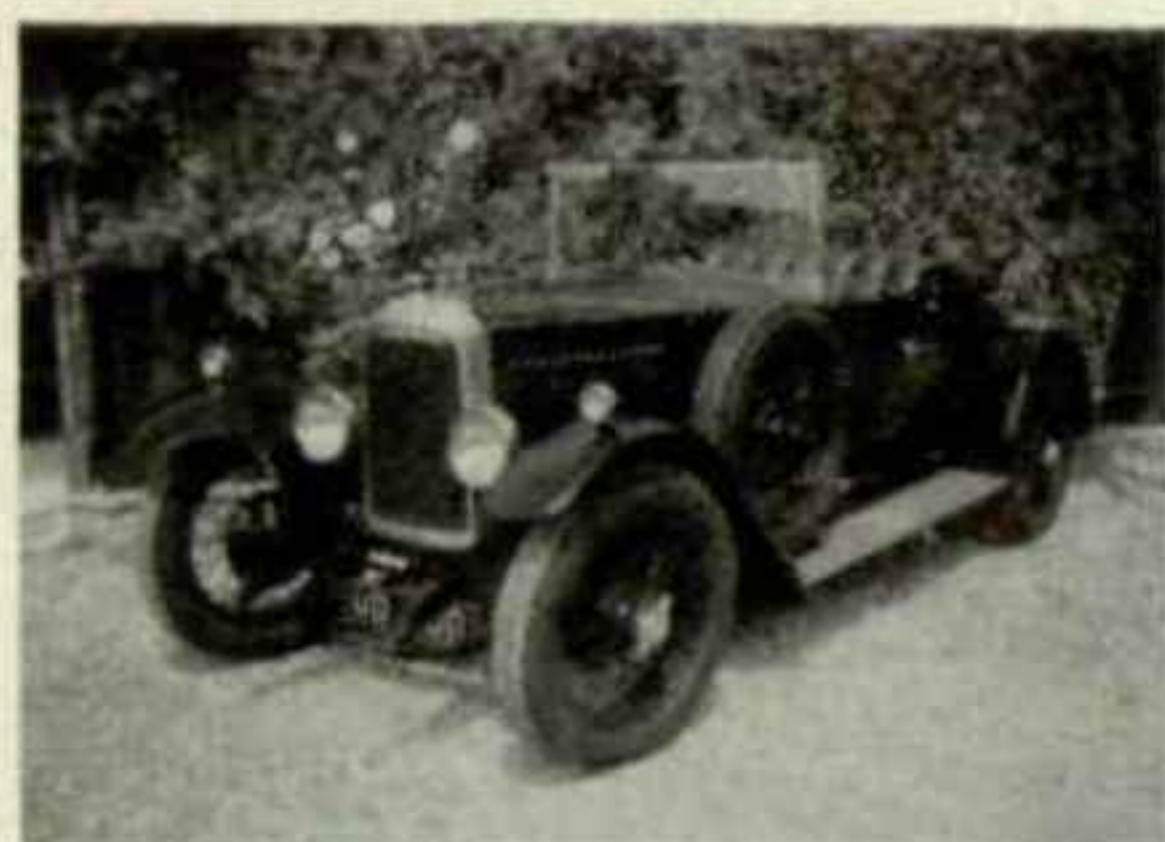


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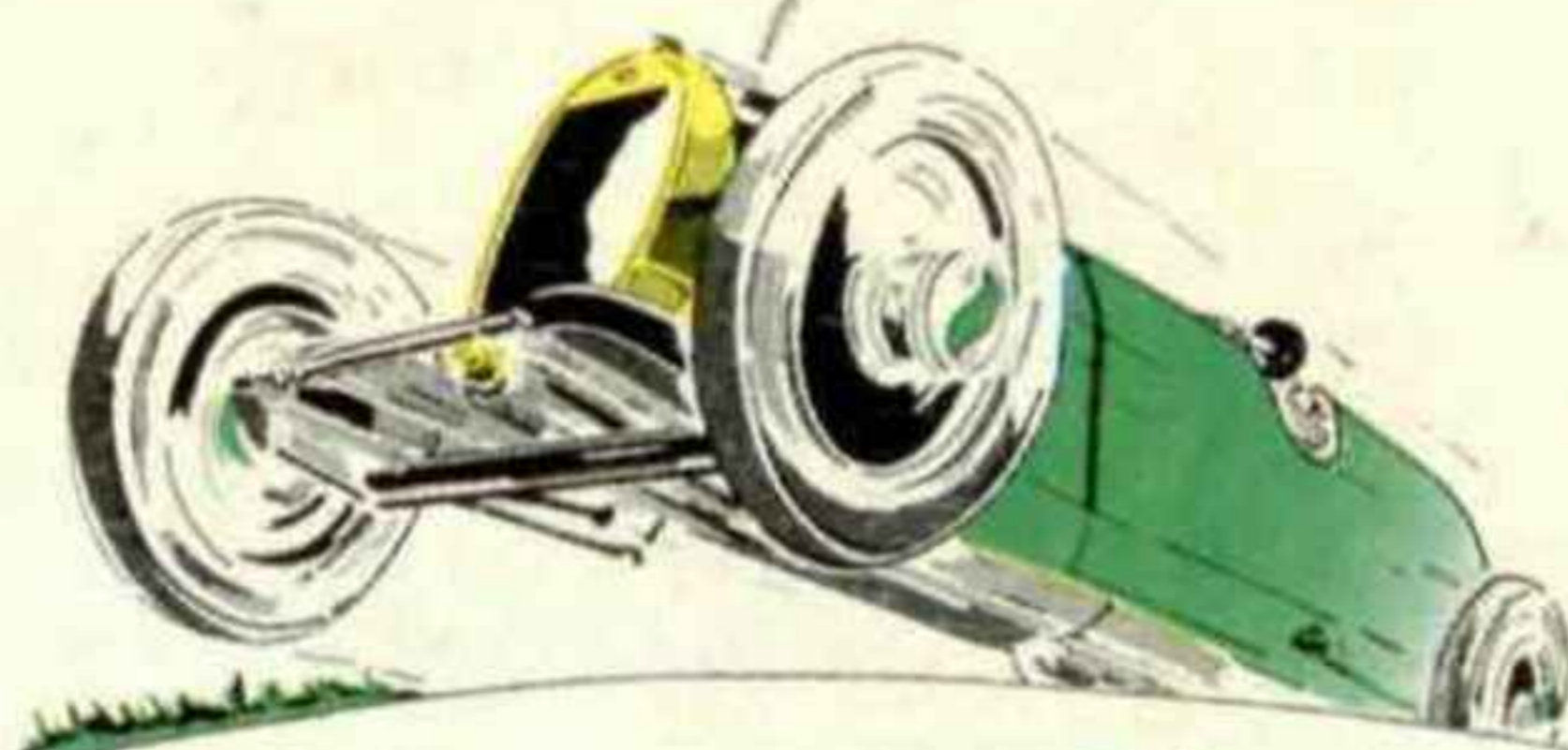
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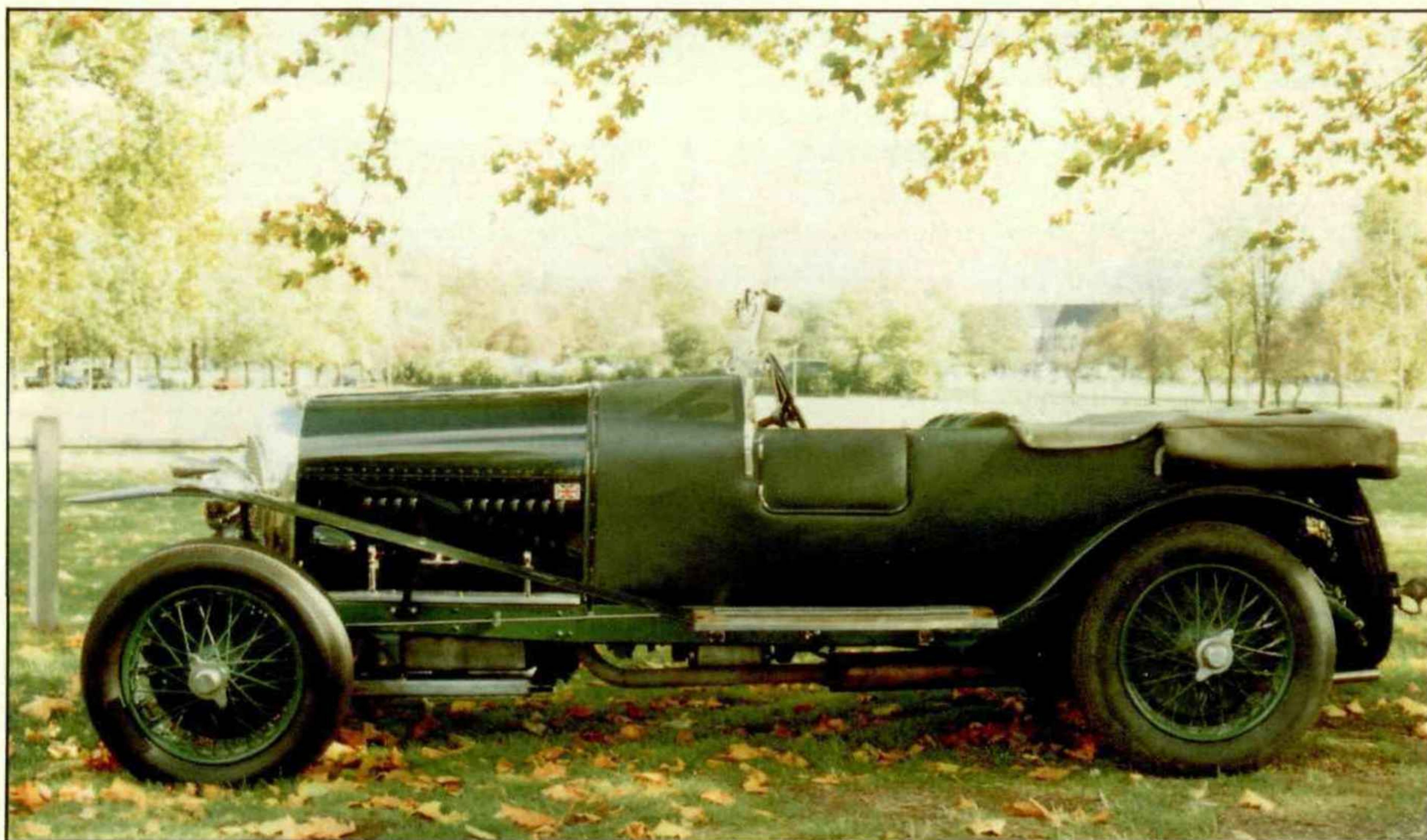
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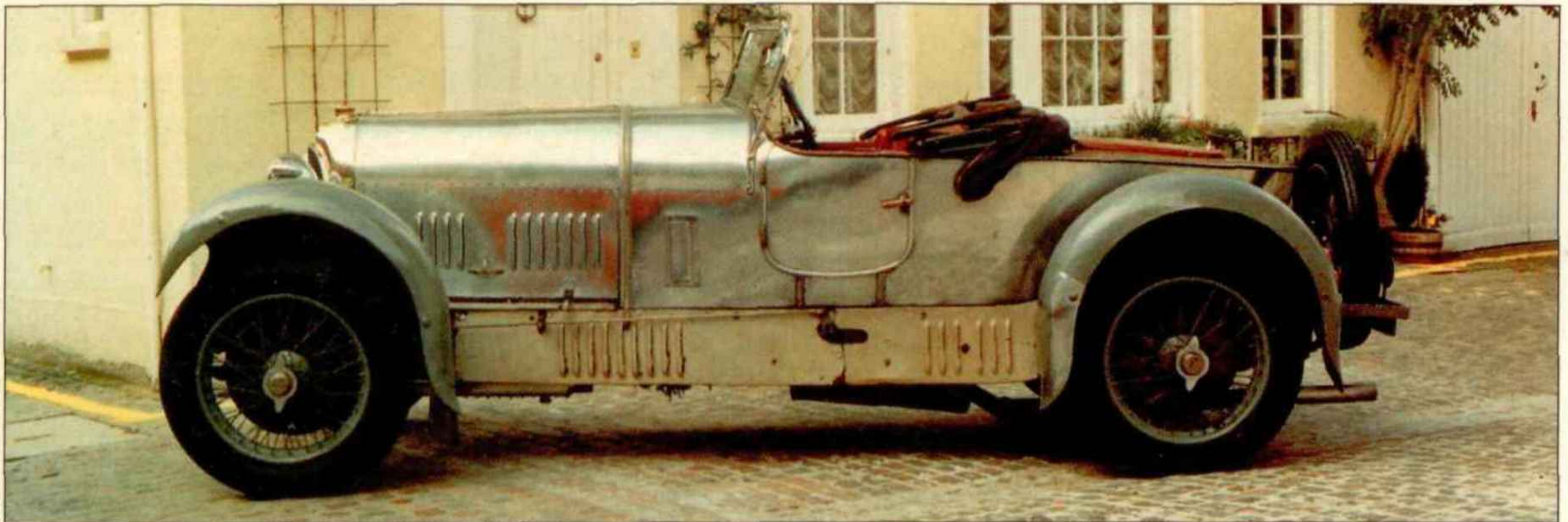
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