

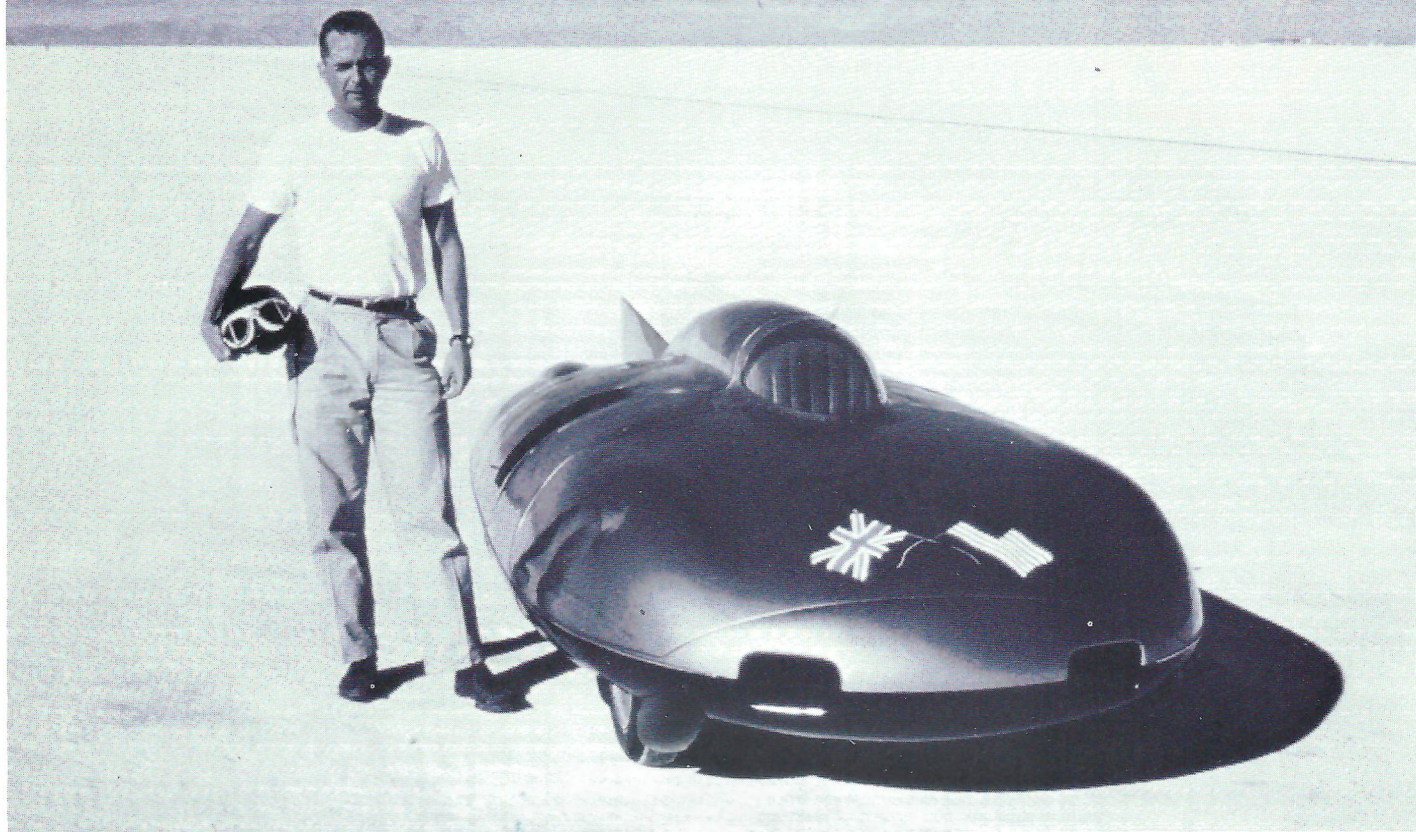
Official Publication for MG Owners



*The World's Fastest Small Car*  
**MG/EX181**



# MG—The World's Fastest Small Car



MG Magazine brings you the inside story of American Phil Hill's astonishing 254mph world's records, established 20 years ago and never beaten . . .

Using the fastest, most powerful (300bhp), and most unorthodox MG car ever built. . .

It was following those astonishing 1959 record runs of over 250mph on the salt in Utah that the MG company retired from record breaking. Thus a history of achievement which goes back half a century came to an end. Therefore, it is fitting in this the first issue of our new MG publication that such a significant event should be fully chronicled, especially for those who may not recall the great occasion. After all that means just about anyone up to the age of 30 or so. In other words most American owners of MG cars today!

There is another aspect. When the first records were established in 1957 with this extraordinary car named EX181, it was Stirling Moss, the English champion, who set 1½ litre class records at 247mph. Two years later when Phil Hill, the American who was to become world champion, took the MG over the magic 250mph (in the 2 litre class), the publicity and the novelty were somewhat less. But as one looks back, this was the peak, the more so in that Phil's record has never been beaten. So we welcome the opportunity to bring the record up to date—as it were!—with some exclusive new material provided by the main protagonists—Phil Hill himself, record manager George Eyston and then-MG boss John Thornley.

## Interview with Phil Hill

**MG Magazine:** "Weren't you driving for Ferrari when you returned home to America for the MG record attempts?"

**Phil Hill:** "Yes. It must have been 1959. I still have some of the letters. First John Thornley of MG wrote to Ferrari himself asking for the okay for me to drive. Then the Commendatore wrote back in flowery phrases that he would have the pleasure to release me. When we came to the Salt, I'm not sure I got the best of the bargain because Moss was to drive as well. Somehow or other, when they were playing with the car—and there were quite a few problems—it was always me who went out first to see how things were.

"I don't forget one run. When I got up to over 200 mph with this amazing thing—1½ litre, mid-engined—I took my foot off to slow down and the cockpit, with the deceleration forces, filled with the fumes from that nitro-glycerine-methanol-liquid dynamite-special fuel. I took two breaths and thought this was it. Then I could scarcely breathe and waited for the car to slow down. Of course it took forever with its perfect streamline form.

"After that they played with the air entry and emission, conjecturing that build-up within the wheel arches was forcing fumes into the cockpit. Whatever it was, they fixed it fast enough by adding vents here and sealing the cockpit there and Moss was okay. But anyway, on the later runs, I took the car faster



## Technical Description of EX 181 Successful Streamlining

Among MG racing and record cars produced by the factory, EX181 is unique in that it positions the driver ahead of the engine. In fact, his feet are ahead of the front wheels. It should be remembered that at that time—1959—Grand Prix cars had not yet abandoned the front engine layout. The MG owed something of its concept to the success of Reid Railton's land speed record car which Railton had designed for John Cobb in 1938 and which held the LSR from 1939 to 1963. This also had the driver actually ahead of the front axle line and the wheels had a marked crab track. The main difference was in the use of very small wheels on the MG. This enabled the wheels to come within the very "pure" form of the body shell. This shape, developed by Syd Enever of MG, was arrived at after wind tunnel

testing at the Armstrong Whitworth factory at Coventry. So efficient did it prove that there was a 30 percent improvement in air resistance over Goldie Gardner's earlier car, the 200mph EX135, although there was no alteration in rolling resistance.

EX181 was ahead of its time in many details of its layout and design. The body was considered of nearly ideal streamline form (although several widely differing configurations had been considered). A completely smooth body was achieved because with the driver up front and the engine amidships, the crab track effect gave an extremely narrow (30-3/4 in.) rear wheel track, compared to 42 in. in front, allowing the efficient 'tear drop' shape.

### Aerodynamics of the Body

Great care was taken that the radiator intake and exit interfered as little as possible

to 254mph, an amazing speed with just over 1½ litres which stands on the record books today.

"There were a lot of hazards on that high speed run. I guess it cannot have been long after Donald Campbell had that enormous crash at 300mph and flew hundreds of yards. The theoreticians considered that if the car started to skid, it would build up a cushion of air in front of it and cause the whole car to jump sideways out of control. Anyway we were all right but there was much discussion and experimentation with directional stability. Finally we did not use a fin like Campbell.

**MGM:** "What was the highest speed you had previously driven?"

**PH:** "181 mph at LeMans in 1955 with the Ferrari 121LM six-cylinder." (That was the year Hawthorn's Jaguar D-type won and is said to have been timed at 175+mph).

**MGM:** "It seems pretty good that the record MG came straight out of the crate to achieve 250mph. How stable was this tiny, light car at such speeds?"

**PH:** "Very stable, as I recall. It really was a super car. Carefully thought out in every way. There was tail wag at the start where the surface of the Salt was wet. And sitting right out in front like that, it was difficult to judge what was happening at the rear."

**MGM:** "Much of the success must have been due to the body design then?"

**PH:** "The car was so well streamlined, so slippery that it just ran on and on. So the one small disc brake was scarcely adequate and it was cooled automatically by a flap which rose like an air brake. Of course it was a No-No to touch the brake before getting up to high speed or no record could be attained with this flap open. I'm not sure if Sid Enever takes all the credit for designing the body. I thought Railton had something to do with

it. Its shape was so good it needed only 29 horsepower to sustain 100mph."

**MGM:** "Presumably also the tires were another critical factor?"

**PH:** "Yes, I believe the tires—special by Dunlop—were on 15 in. wheels and with only about 1 mm of rubber. At high speed they were like inner tubes—spun by centrifugal force into an ellipse—so that the car rode on the tip only. I believe the tire pressures could be taken up to 80 lb.

COPY: MR. PHIL HILL,  
Albergo Reale,  
Modena, Italy.

Commendatore Enzo Ferrari,  
Dear Commendatore,

We have approached Mr. Phil Hill to ask him whether he would drive one of our cars in a record-breaking attempt on the Salt Flats in Utah in September. He has advised us that he is willing and anxious to undertake this, but that through his contractual obligations to you it is necessary for him to secure your permission before he can accept.

I am writing therefore to explain that we are adjusting our affairs so that we shall not in any way

interfere with your World Championship commitments as we understand them. With the Italian Grand Prix due to take place at Monza on September 13th, we should like Mr. Hill to be available to us after that date and not beyond the end of September.

It may be that you have commitments for him of which I am unaware, but if not I would be most grateful if you could release him for the period of 14th to, say, 30th September.

Yours sincerely,  
THE M.G. CAR COMPANY LTD.

(Sgd.) J.W. THORNLEY,  
Director & General Manager.

COPY,  
FERRARI AUTOMOBILI  
MODENA,  
li 21 Maggio 1959.

Ns.rif: DGI/cl.  
Vs.rif: JWT/CEVC.

Gent.mo Signor  
Director & General Manager  
of  
The M.G. Car Company Ltd.,  
Abingdon-on-Thames,  
England

Gentile Direttore,  
ho ricevuto la Vostra 12 maggio e da parte mia non vi è nessuna inibizione affinché Phil Hill accetti il vostro invito.

Osservo soltanto che la data da Voi citata non si concilia con i no stri impagni dato che dopo il Gran Premio do'Italia del 13 settembre egli dovrà correre in ottobre il Gran Premio del Marocco, in novembre quello del Venezuela ed a dicembre il Gran Premio d' America.

Coi migliori saluti,  
(Sgd.) FERRARI.



with the airflow. The radiator ducting exits were placed to give some local boundary layer control of the air stream over the body. Total drag of the radiator system at full speed was about 14 lb. Similarly it was arranged that four separate fish tail exhausts are fitted flush with the body top. The pipe lengths were graded to equalize extractor effect on the four ports and this also exercises the same

boundary layer control. The body aerofoil as a whole was set at a negative angle of incidence to the road to give stability, minimum drag and to exert downward pressure on the front.

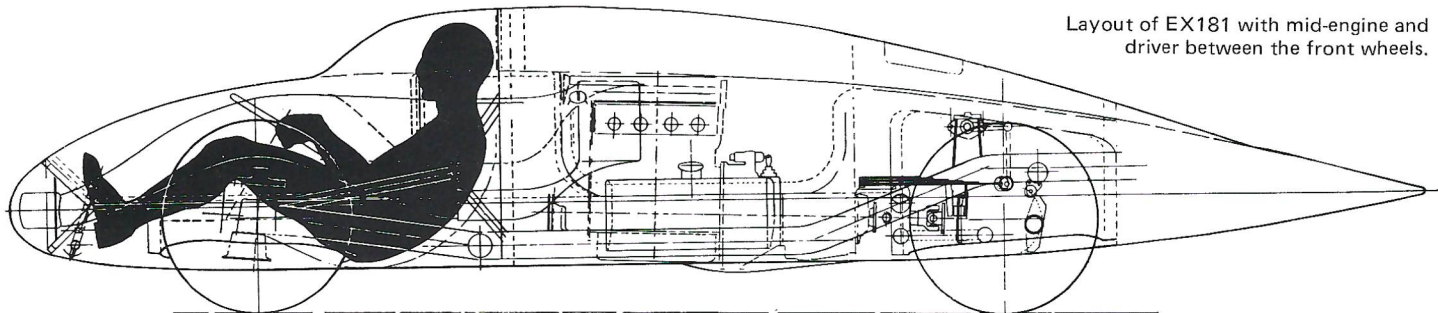
The body is constructed of aluminum alloy (18-gauge Hiduminium 33) sheeting, on alloy bulkheads and some square steel tube framing; the panels are welded and

rivetted integrally with the tubular chassis frame.

### 300 Horsepower Engine

Basically the engine is the BMC B-Series 4-cylinder unit developed from the MGA, but with an aluminum twin camshaft cylinder head. Also a huge supercharger is used, this being a Shorrocks of the eccentric vane type giving a boost of no less

Layout of EX181 with mid-engine and driver between the front wheels.



## Comments from John Thornley

John Thornley (in 1959 Director and General Manager of the MG Car Company Ltd.) contributes his comments on the famous record in his own special style. . .

"EX181 went to Bonneville twice, in '57 and again in '59. On the first occasion it was to be driven by Moss but, as he was racing at Syracuse, I think it was, the week before the record attempt and as I figured that there was always a risk that he might clout a straw bale there rather harder than was healthy, I thought we ought to have a second string. After all, when you start with a plain sheet of drawing paper in Abingdon and aim at going inordinately fast for rather less than thirty seconds, 3,500 miles and eighteen months away, the investment is not measured in peanuts. So we engaged Phil Hill as long-stop (a cricketing term which Americans are unlikely to understand).

During the time we were waiting for Moss, everything stood ready, the weather and the salt were perfect, so George decided that we should send Phil out. He broke the record but, as the publicity was geared to Moss, we kept quiet about it. Moss came, the weather held, and Moss broke the record some more—at 245.

He didn't get 250 because, before he got to the car, it had lost second gear. Now, the importance of second gear was that you needed it to stop with. The car had one disc brake on the transmission which was not to be applied above 100 mph. In the event, on the return run, Moss could see he was running short of space, applied the brake rather early and burnt it out. He finished among the rough salt.

Two years later, having done our old trick and bored out the engine from 1498 to 1506cc—to bring it into Class E (2 litres)—we concentrated on Hill—because we felt we owed it to him!—and he made no mistake about the 250.

The engine, on both occasions, was the prototype twin cam which had taken Class F records, in unsupercharged form, in the hands of Ken Miles and Johnny Lockett, at Bonneville in 1956."

### BRITISH MOTOR CORPORATION LTD. COMPETITION DEPARTMENT

CONFIDENTIAL.

Bulletin No. 5. 5.10.1959.

UTAH—1959.

The news over the week-end referred to the M.G. EX.181 fitted with the spare engine of 1506 cc. and therefore the records listed below, are in International Class E (1501-2000 cc.).

1 Kilometer	254.91	(185.41)
1 Mile	254.53	(180.5)
5 Kilometers	232.97	(170.52)
5 Miles	238.36	(140.17)
10 Kilometers	234.49	(140.07)
10 Miles	191.03	(138.34)

Figures in brackets represent previous records. American National records not yet available.

The driver was Phil Hill.

There is an element of doubt about the 5 Kilo. figure. This does not seem to be fast enough in relation to the other speeds and is being queried. On the other hand, the measured distances on the course were not symmetrical about the centre line, so this figure could be right.

This concludes the attempts for this year. Conditions were not absolutely ideal and there was considerable wheel-spin. The Class F records will not therefore be attacked.

#### DISTRIBUTION:

Sir Leonard Lord.  
Mr. G.W. Harriman.  
Mr. J.R. Woodcock.  
Mr. J. Bramley.  
Mr. D. Harrison.  
Mr. J.W. Malone.  
Mr. S.V. Smith.  
Mr. R.A. Bishop.  
Mr. J.J. Field.  
Mr. G.B. Ashton.  
Mr. S.V. Haddleton.  
Mr. M. Chambers.

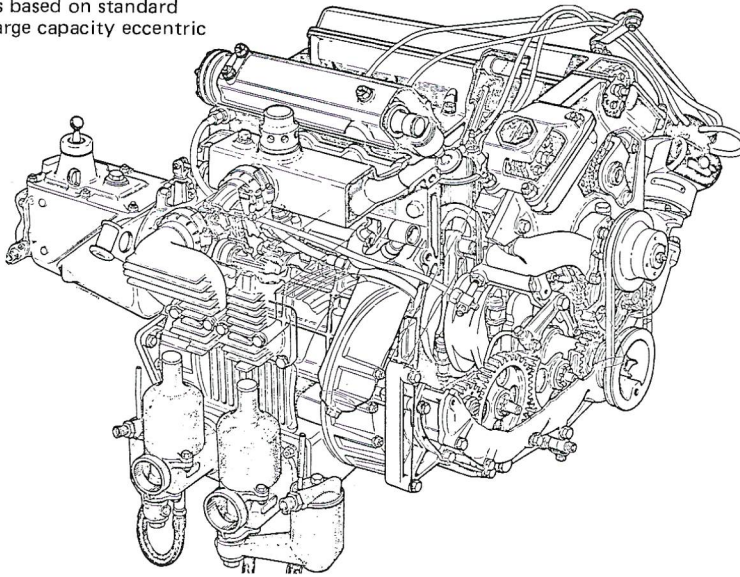
Capt. G.E.T. Eyston.  
Mr. Donald Healey.  
Mr. B. Turle.  
Mr. R.A.B. Learoyd.  
Mr. H.J. L. Suffield.  
M. A.E. Birt. (Hambro)

Mr. S. Moss.  
Mr. P. Hill.  
Mr. T. Wisdom.  
Mr. E. Leavens.  
Mr. G. Ehrman.  
Mr. G. Holmes.

Mr. W.V. Appleby.  
Mr. J.R. Thompson.  
Mr. J.E. Atkins. (N.E.L.)  
Mr. A.S. Enever.



290bhp from a 1½-litre twin cam 4 cyl. engine represented a pinnacle of development for MG. Yet this power unit was based on standard components, plus the large capacity eccentric vane-type blower.



than 32 lb. per sq. in. to the two 2-3/16 in. SU carburetors. The engine is mounted in line with the tubular frame (basically two 3½ in. steel tubes in ladder form) and drives through a Riley RM-series gearbox. The gearbox is orthodox with 4-speed synchromesh but without reverse and is mounted in unit with the engine, incorporating a powerful 3-plate clutch. In initial 1957 form, this four-cylinder engine of 73.025 by 89mm bore/stroke (1,489cc) developed 290bhp and more than 300bhp in 1959 (in 1,506cc form for the 1,500 to 2,000cc class records).

#### Chassis Details

Suspension at the front follows MGA coil spring layout but at the rear is entirely special with quarter-elliptic leaf springs. The rear axle layout is of De Dion tube type, with light alloy axle center mounted on the chassis frame, with parallel control

## Comments from George Eyston

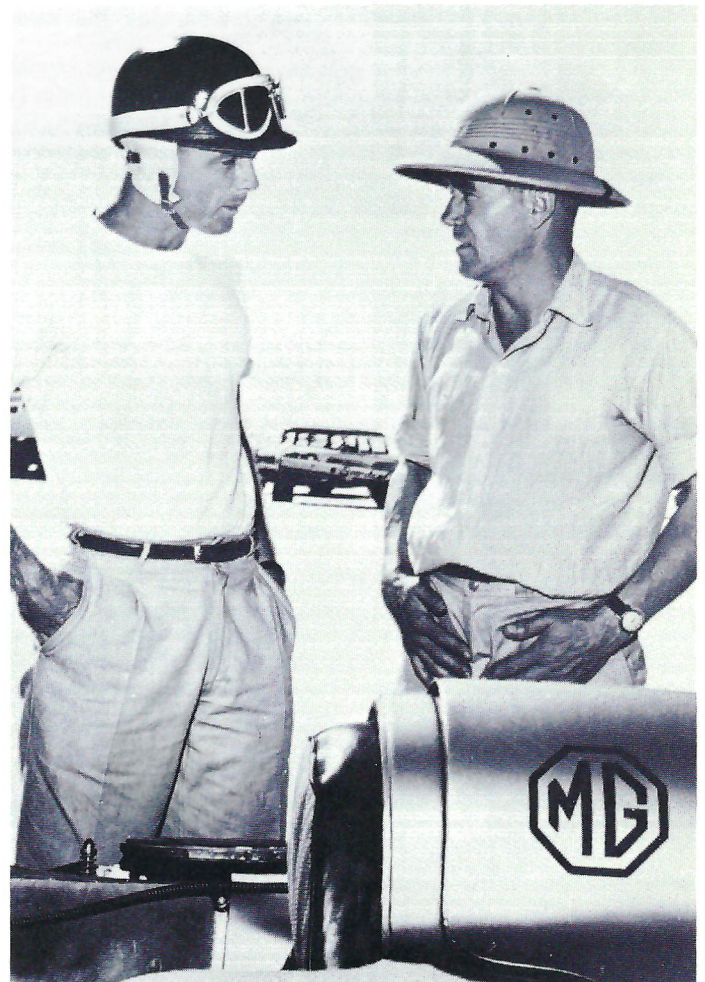


Reunion with team manager George Eyston (center) at New York's Chowder Society last November, with Gus Ehrman (left) and Dave Ash (right), both of whom have also set MG records on the salt.

George Eyston (former holder of the land speed record) manager for the 254mph record, interviewed by MG Magazine.

After World War II George Eyston, who had been breaking international records with MG cars since 1927 (and who once held the land speed record at 357 mph), made a comeback. He had EX179 built for him, which was an MGA special chassis with streamlined body and 1½-litre engine somewhat similar to the TF. With Ken Miles he drove this to average over 120mph for 12 hours. That was in 1954 and he returned to the Salt again with different engines, different drivers and eventually a supreme new car, the EX181, with which Stirling Moss reached 245mph (1½ litre) and Phil Hill 254 mph (2 litre) in 1957 and 1959 respectively.

He says that this team had many vicissitudes before achieving



Driver Phil Hill (left) with the king-pin of the record bid Syd Enever, MG's chief engineer.



by radius arms, and with drive to the rear wheels through very short double-jointed drive shafts. It has no differential.

Each road wheel—with a detachable cover—runs in a separate wheelbox to reduce pumping losses of the wheel. This and the fact that apart from the carburetor intake, the air in the engine compartment is stagnant, may have led to the driver cockpit ventilation problems encountered.

There is only one brake, a single disc mounted inboard at the rear, which proved rather inadequate.

All in all, considering that MG record cars, after being constructed in Abingdon, England, had to go straight "out of the box" and attack their records, the achievement in successfully meeting the target speed of 250mph was extraordinary.

#### Technical Specifications

##### EX181

##### ENGINE

Type  
No. of cylinders  
Bore/Stroke  
Supercharger/boost

BMC (B Series)  
4, OHV, twin cam  
73.025/89mm, supercharged  
Shorrock eccentric vane, 32 lb./sq. in. max. pressure  
1,489cc  
2 SU, 2-3/16 in. diam.  
1 Lucas  
290bhp/7,300rpm  
2 aluminum aircraft type

Displacement  
Carburetors  
Magneto  
Horsepower/RPM  
Radiators

##### CHASSIS

Transmission  
Rear Axle Ratio  
Clutch  
Suspension Front/Rear  
Wheels & Tires

4 spd. synchro (no reverse)  
De Dion type, 1.825 or 1.94 to 1  
Triple plate 7-3/4 in. diam. Borg & Beck  
Ind coil 1/4 E leaf  
15 in. steel disc. bolt on, Special  
Dunlop 15x4.5x24 in.  
55 lb. per sq. in.  
Single disc inboard on rear wheels only  
Rack and pinion

Tire Pressure  
Braking System  
Steering

##### DIMENSIONS & CAPACITIES

Dry Weight (lb.)  
All up weight with driver (lb.)  
Front/Rear Weight distribution  
Wheelbase (in.)  
Track, Front/Rear (in.)

1,655	Overall length (in.)	181½
1,910	Overall width (in.)	64¼
51½/48½	Overall height (in.)	38¼
96 in.	Fuel tank capacity (gal.)	7.9
42/30 3/4	Fuel consumption (mpg)	4 approx.

these extremely high speeds, "But we were much encouraged and supported by Castrol Oil," he explained, "who had suggested we go for the magic 250mph figure."

The car EX181 is of course owned by British Leyland," says George, "and we showed it at the Castrol 75th Year Anniversary exhibition at Olympia in London a few years ago. Also it has appeared at several MG club meetings. It was repainted at Abingdon and looked very nice, quite small, only about 16 ft. overall. It has even been out to Australia and now I hear is having a complete restoration for America in 1979.

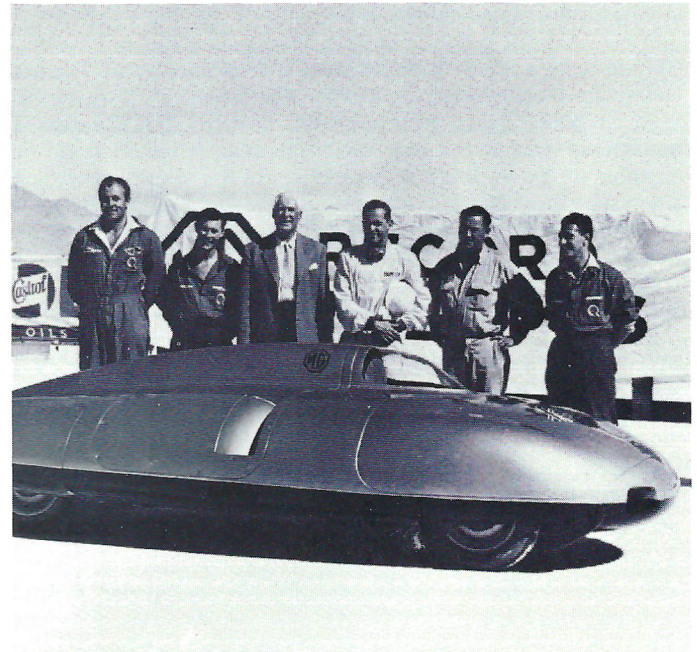
"Stirling didn't like it very much," he remembered. "Sitting out in front, in that tiny thing. But he turned up as arranged. Then there was water on the Salt and it was three weeks before we could run. He complained a bit with all his engagements at the height of his career."

We reminded George that Phil Hill recalled how on the first test runs he undertook before Moss, that the cockpit filled with fumes.

"Yes, we did the tuning up prior to Moss arriving and everything was ready. But Moss could only spare us a week and he had to go because the course got flooded. So Phil drove. I remember meeting Hill at the airport at Salt Lake City. We rented a car to drive the 100 miles or so out to the Salt. Phil Hill got impatient. "Let me drive," he said. "He was a fast driver all right!" commented George with a smile.

"The records didn't go too well," he continued. "Phil got flu and both the end and the beginning of the track were wet. But there was a long enough section in between. So I said to him, "Take it from me Phil, it's all right," and off he went. "But it certainly was slippery in that very fast little car!"

"Phil was really excellent. He took my word and he kept his foot down although the car went all over the place.



With his successful team George Eyston (third from left) and Phil Hill (third from right). The car in profile has simple lines which scarcely reflect the great care and study that went into its layout and design.

"The engine had a lot of power," he continued, "with 32 lb. supercharge boost. Morris Engines at Birmingham did the first job. Then there were two new engines giving the same power, one in Class E—for 2 litres—the second time.

"Sid Enever was really the king pin for the design as a whole. But Railton put me up to the small wheels to give lower drag. Dunlop took quite a time to develop tires small enough and found it difficult, but they proved satisfactory and their temperature never exceeded 80 degrees."