

Roaring Raindrop

It's 40 years since MG's EX181 record-breaking car first sped across the Bonneville Salt Flats at over 240mph, piloted by Stirling Moss

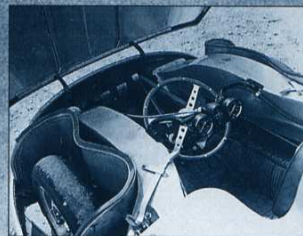
Imagine the scene, some 40 years ago, in August 1957, when MG took its last record-breaker to the desolate Bonneville Salt Flats in Utah, USA, in the hope of achieving 240mph from a tiny teardrop-shaped car fitted with a prototype 1489cc MGA twin-cam engine.

The Salt Flats – a vast shallow lake with a surface likened to a cross between desiccated coconut and concrete – had long been the venue for flatout racing endeavours. The enormous space and firm surface had obvious advantages over the alternative race circuits and beaches. Marked out over 14 miles by a perfectly straight line of black oil, the sight and sound of the teardrop-shaped projectile hurtling at high speed through the shimmering heat-haze across the white wilderness must have been surreal.

This wasn't the first such MG expedition, and nor would it be the last, but it would be the first time that a driver from outside the close coterie of MG associates would be the star attraction. The preliminary shakedown testing on the Flats was to be done by local hero Phil Hill, but the record-breaking proper was to be at the hands of Stirling Moss, the sensational British racing driver who was arguably at the height of his career.

In the wake of the successes with EX179 – MG's first new post-war record-breaker – MG's General Manager John Thornley got the go ahead to develop an all-new record-breaker. Whereas EX179 had relied upon a spare prototype chassis, and a body shape which was clearly inspired by the old EX135, for the new record-breaker, Chief Engineer Syd Enever and his team were determined to take a clean sheet of paper.

Most of the design work on the earlier EX179 had been carried out by Terry Mitchell (later to become MG's Chief Chassis Engineer), so it was hardly surprising that Enever should turn to his trusty assistant once more for the new project. Taking a number from the famous 'EX' or Experimental Register, work on EX181 began in the spring of 1955 (EX180 had been taken for rather less glamorous work on Morris Minor tuning).



EX181's cramped cockpit had just enough room for the driver, or should that be pilot?

For a while, the project went on the back-burner, in all probability because the launch of the MGA was so near. "Syd came to me and said that we'd have to get on with it", Mitchell recalls, "but nothing happened. So I asked him when we were going to do something, and he suggested that we come in one Saturday and have a look. I got together some aerofoil sections and had to decide what to do with them". Unbeknown to Mitchell, it transpired that Enever –

whose inventive mind never rested – had up some eighth scale models of a number of his own ideas for record-breakers – and even though Mitchell was working on the design for some ten months, Enever's models bore no relationship to what he was doing. "To be frank, I got the impression that Syd didn't seem all that interested in what I was doing on EX181!" concludes Mitchell.

Once the basic packaging was settled – with the engine mid-mounted for compactness and stability – work began on the basic frame. The chassis for EX181 included two massive 3.5 inch diameter 14-gauge tubular steel side-members, which were made by Thompsons Chassis of Wolverhampton. The rest of the frame was constructed of mainly 1-inch square section steel tubing which was drilled for lightness. "I remember MG Developments' Deputy Foreman Henry Stone doing the drilling," says Mitchell. "He'd have a short drill bit in a 'windy' [air-powered drill] and spend hours and hours making all these holes everywhere. In fact, we tried to lighten the normal MGA in this way but we only saved about 7lbs!"

When it came to the sleek 18-gauge Hiduminium 33 alloy-panelled body, the work was entrusted to Midland Sheet Metal of Nuneaton, recalls Mitchell. "I remember

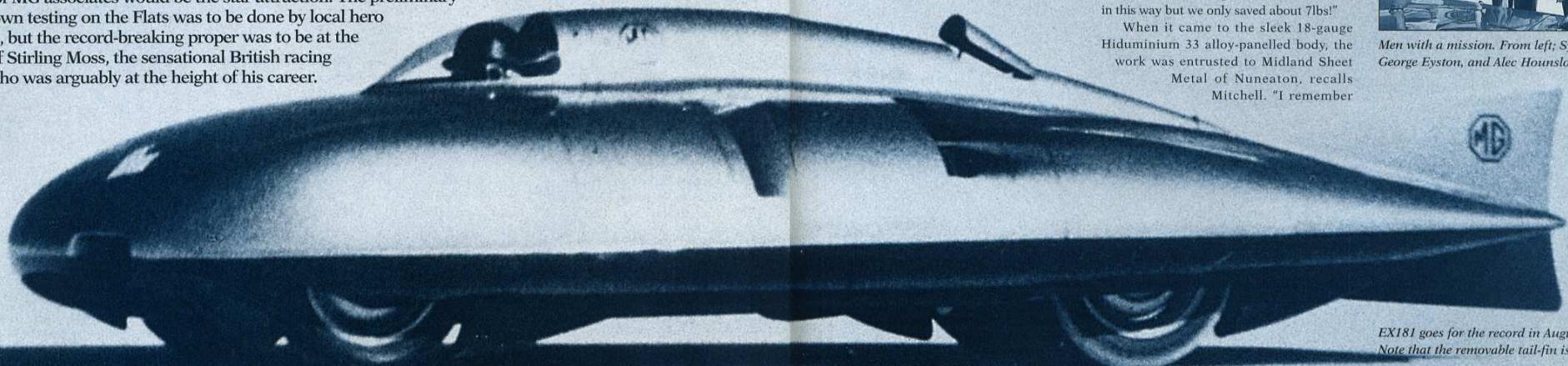
going there once – you had to go down a very muddy lane to get there – and I was amazed at the sight of the Morris Minor Traveller roofs they were producing. They took flat pieces of aluminium and just bent out the double-curved shapes with wooden mallets, making the whole thing look so easy.

The body for EX181 was more complex than a Moggy roof, and included carefully refined air intakes and outlets, which were developed to avoid drag or lift at high speed. The drag coefficient was said to be less than a tenth of that of a normal contemporary road car.

When it came to stability at high speed, driver George Eyston clearly had his own quite strong views, according to Mitchell. "George wanted a fin for stability, but I knew quite well that a fin could cause even more problems with a light car coupled with side winds." With doubts still in the engineers' minds, the fin was fitted as a separate piece which could be unbolted if



Men with a mission. From left; Syd Enever, George Eyston, and Alec Hounslow.



EX181 goes for the record in August 1957. Note that the removable tail-fin is in place.

40th anniversary of a **record-breaker**

it proved to be a problem. In fact, when EX181 made its second visit to the Salt Flats in 1959, the fin was removed.

An important consideration on a 200mph plus car is making it stop. Because the primary purpose of a braking system in a record car is simply to bring the car safely to a halt, conventional four-wheel brakes are something of an unnecessary luxury with a considerable weight penalty. In EX181, braking was confined to a single 10 inch diameter disc brake, and an air brake. The latter was designed to pop up during braking, admitting cooling air to the brake and providing a welcome degree of retardation into the bargain.

When it came to the engine, the services of former Riley man and ace engine builder Eddie Maher – of BMC's Coventry-based Morris Engines facility – were called for: It was Morris Engines which had developed the twin-cam version of the B-series engine from the basis of Gerald Palmer's original concept of 1953, and they had also been charged with making the unit production-ready for the new MGA Twin-Cam (to be launched in July 1958).

For record-breaking purposes, a rather special powerplant was called for, and so a large-capacity eccentric-vane Shorrock supercharger was employed, drawing fuel through twin 2 3/16 inch SU carburetors, while the engine block and internal components were suitably beefed-up to cope with the enormous stresses.

Even so, the process was not without problems, according to Mitchell. "Eddie Maher produced the engine following the receipt of Syd Enever's typically detailed brief. ▶

Roaring Raindrop breaks cover

By the summer of 1957, EX181 was revealed to the eager motoring press and the car was soon dubbed the 'Roaring Raindrop' on account of its distinctive teardrop shape.

In July, it was announced that the car would be tested on the Bonneville Salt Flats by US Formula One driver Phil Hill, and driven for the 'proper' runs by Stirling Moss. In the same month, Moss took time out of his busy schedule to visit Abingdon for a fitting, following which some minor adjustments were made to the seating and instrument positions. Soon after EX181 – until this point still in unfinished Aluminium – was painted in striking metallic silver blue over dark blue, rather than the metallic green which is more commonly associated with MG record-breakers.

On Thursday 11 July, the liner Queen Mary set sail from Southampton, with EX181 safely packed in its hold inside a large timber crate. Unfortunately, the crate moved during the crossing, causing the tail of EX181 to be damaged. Luckily, the detachable fin had been stored separately and was unharmed. The damage was relatively minor and was soon rectified in the States.

Following arrival in New York, EX181 was met by the local BMC and Castrol contingents, and the entourage made its way across country by train and truck to the Bonneville Salt Flats, some 110 miles from

Salt Lake City and 69 miles from Wendover. The party was based at the imaginatively titled State Line Hotel – situated on the border between Utah and Nevada – and by all accounts there were one or two night-time forays into gambling country between days on the Salt Flats!

Along with EX181, a re-worked EX179 was also taken to the Salt Flats, fitted with a 948cc A-series engine and liveried as a 'BMC Development Project'. Although the Austin-Healey Sprite was well under development at this stage, its launch would not be until 1958, and so for the benefit of the press, the engine in EX179 was described as a 'Morris Minor unit'. Run in both supercharged and unsupercharged form by Tommy Wisdom and American MG racer David Ash, EX179 took a number of Class G (751cc – 1100cc) endurance records between 13 and 16 August, including the remarkable figure of 120.1mph over 2,000 kilometres. Then, on 17 August, Phil Hill was given his first record-breaking moment of glory in EX179, breaking some of the remaining International Class G records.

By Sunday 18 August, it was obvious that EX181 – the main attraction at Utah – had great promise, as Phil Hill was able to take the car to within sight of shattering the Class F record which had stood since before the war, when Goldie Gardner had raised the stakes in EX135.

However, there were problems. Phil Hill found that inadequate ventilation allowed a heady mixture of fumes to invade the cockpit on the over-run, with very obvious safety implications for the unfortunate driver. Clearly it would not do for Stirling Moss's first record-breaking run to also be his last, and so the radiator duct was cut to allow more fresh air into the cockpit.

The problem with using such a distinguished driver as Moss to pilot the car was the heavy demand upon his

The legendary Stirling Moss checks out the cockpit of EX181 in 1957. He later went on to pilot the car into the record books.

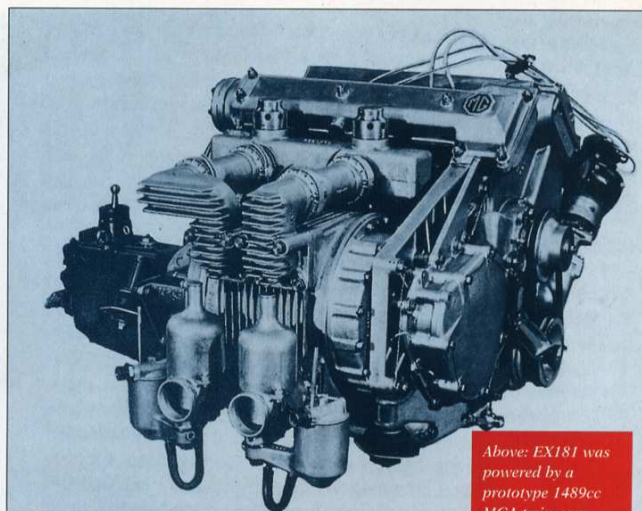
time from his other commitments – which at the time mainly comprised racing in Formula One – and so all eyes were on Moss's race at Pescara. Moss won the race in his Vanwall and flew straight out to Utah on Tuesday 20 August, the intention being to have a crack at the record the very next day. However, Moss's arrival was met by heavy rain – rumbles of thunder echoing across the eerie wilderness during the preceding days having given the team an ominous warning.

Thursday brought an improvement, with sunshine and a light wind slowly drying out the surface of the salt. But it was not until 5pm on the Friday that Moss could begin his runs over the 14 mile course, carefully marked out with a narrow slick of black engine oil. Official scrutineers stood by with their 'Electromatic' timing equipment to ensure pinpoint accuracy. Moss set out northwards, only to find at the end of the run that the speed was below the target. The return run was better, so the plugs were changed and EX181 was turned round for another northward run.

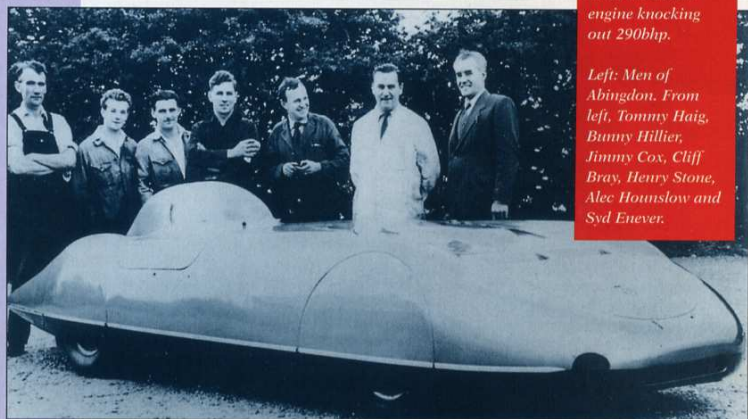
This run proved eventful, as the eye-witness reporter from *Road & Track* subsequently related "As the car pulled away, the peculiar flat note of its exhaust dominated the salt. First and second gear acceleration were clean as Moss feathered the throttle, avoiding wheel spin. The first indication of trouble came as the car, now almost a mile away, was seen to waver slightly off-course. The sound of a free-revving engine followed. After a split-second search for a third speed that was no longer there, Moss found he still had fourth and kept going." The consequence of this hiccup was that the northward run and the subsequent return south were under par, and so another run was called for.

Here, as *Road & Track* went on to report, Moss proved his mettle: "With the sun disappearing behind the mountains, and the runs apparently over for the day, he insisted that the plugs be changed and something done about the final drive gears that were being cooked in their own oil from the overheated single disc brake. He then called Captain Eyston for permission to take one more run. Permission was granted, and this last run was successful – a new record had been established at 245mph."

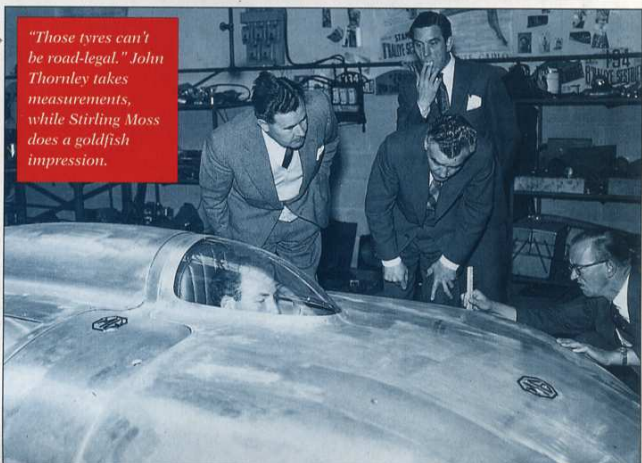
EX181's debut had been a resounding success, and a further visit to the Salt Flats would take place in October 1959, in pursuit of 250mph – but that's another story.



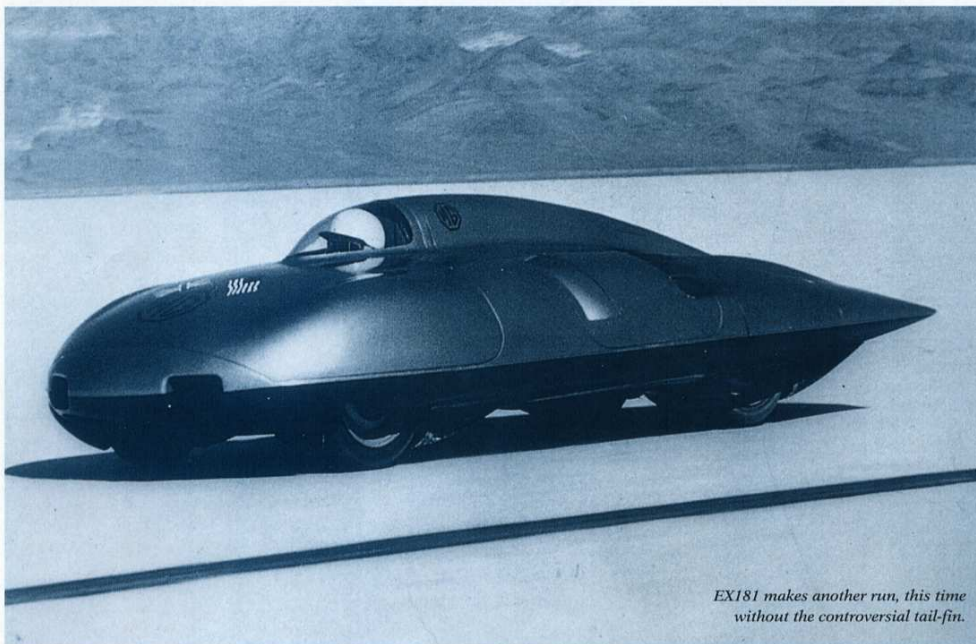
Above: EX181 was powered by a prototype 1489cc MGA twin-cam engine knocking out 290bhp.



Left: Men of Abingdon. From left, Tommy Haig, Bunny Hillier, Jimmy Cox, Cliff Bray, Henry Stone, Alec Hounslow and Syd Enever.



"Those tyres can't be road-legal." John Thornley takes measurements, while Stirling Moss does a goldfish impression.



EX181 makes another run, this time without the controversial tail-fin.

They had one on the test-bed at Coventry and they couldn't get more than 190bhp. So Syd went up to Morris Engines, where they stripped down the unit, and sure enough not all the items that Syd had specified were in there. They put in all the bits he wanted and straight away they

got 290bhp at 7300rpm – an extra 100bhp. In fact, to our surprise, the spare engine gave 303bhp!"

Terry Mitchell has always been a proponent of the De Dion suspension system, which he believes provides all of the advantages inherent in a fully-

independent set-up but with none of the disadvantages, and so it is perhaps no surprise that EX181 featured a special De Dion rear set-up, with ingenious splayed quarter-elliptic springs cantilevered off the chassis tubes. At the front, a modified MGA suspension unit was used. **MG**

An MG record-breaker for the millennium?

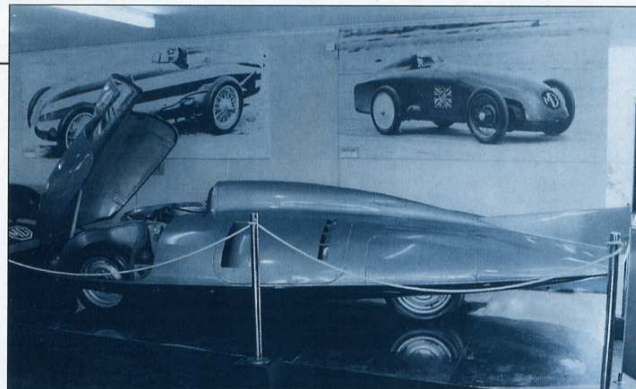
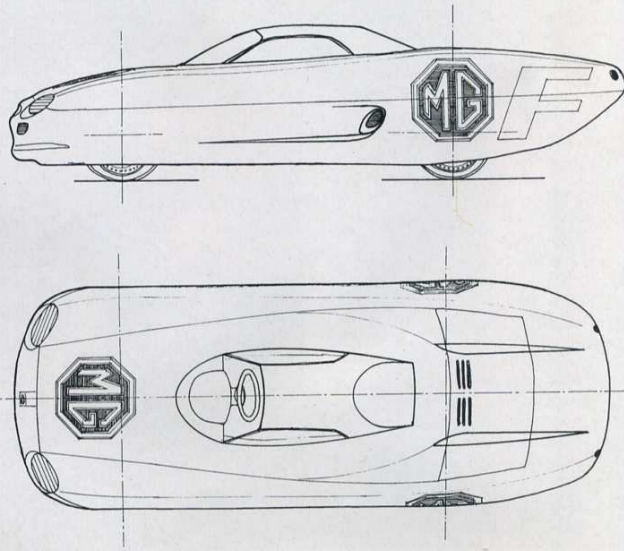
October 1999 will mark the 40th anniversary of the MG factory's last record-breaking exercise, when the reworked EX181 (minus tail-fin) returned to the Salt Flats and broke through the magical 250mph barrier.

It would be fun to contemplate a new record-breaker, based upon the mid-engined MGF and perhaps with a 1500cc engine derived from the 1.4-litre K-series engine.

With the benefit of 40 years of advances in material technology, 300mph might well be within the grasp of a new generation of talented BMW/Rover/MG engineers.

The car's name? EX254 of course – the next number on the EX Register.

David Knowles' sketches suggest what an MGF-based record-breaker might look like. How about it Rover?



Speedy history lesson MG has an enviable history of record-breaking cars

From the early days, the men at MG were determined to maintain the marque's pre-eminence in the arena of record-breaking. These efforts began with EX120 in 1930 at the hands of Captain George Eyston, who took this diminutive car to speeds of 100mph plus, which at the time seemed unbelievable for a 750cc engine.

EX120 was followed by a new car – EX127 – known as the 'Magic Midget' which took more records in the early 1930s – and the larger EX135 – or 'Magic Magnette' – which was intended to take the battle into larger engine classes.

The record-breaking antics reached fever pitch during the late 1930s, when the baton was effectively passed to Major 'Goldie' Gardner, who bought Eyston's car and had it rebodied to a design by Reid Railton. After the war, Gardner returned to record breaking, adopting the Bonneville Salt Flats as the venue for his runs from August 1951 onwards, until an accident forced his retirement at the age of 67 in 1952.

That might well have been the end of MG's forays into the record books. However, George Eyston was by now a director of Castrol, and still maintained a keen interest in the affairs of his old friends at Abingdon. So when it became apparent that sales of the TF Midget were flagging in the USA, Eyston put forward the idea of building a new record-breaker which could use a derivative of the TF's classic XPAG engine.

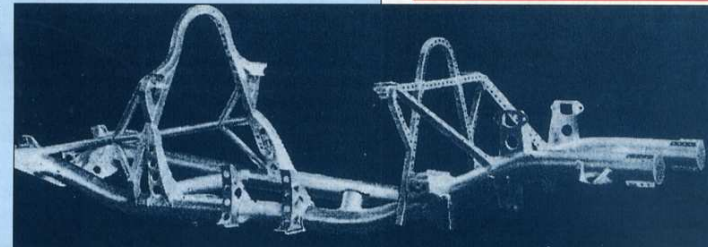
Also part of the equation was MG's own proposal for a replacement for the T-series. EX175 – which would eventually lead on to the MGA – was the design of Syd Enever, who had arranged for two chassis to be made up, one of which was clothed by Morris Bodies in what would, with subtle changes, become the definitive MGA of 1955. The second chassis was seized upon as a suitable basis for a new record-breaker, and so the process of its creation began. The body was inspired by the EX135, and the engine was prepared to Syd Enever's brief by Morris Engines.

Success with EX179, taken to nearly 154mph at Bonneville in the hands of George Eyston and Ken Miles in August 1954, appeared to vindicate the agreement of BMC to sanction the production of the enlarged XPEG engine for an improved version of the TF. This slipped quietly into production in July 1954 as the TF 1500 (the Midget name having been dropped), gradually displacing the TF 1250 which continued in production until September. By now, though, BMC were listening to their dealers and MG too, and only 3400 examples of the TF 1500 were built before the MGA took its place.

In the meantime, as we have seen, with affairs more under its own control, MG decided to return to the Salt Flats with a totally new record-breaker – EX181, or the Roaring Raindrop.

Top: EX181 on display in 1981. In the background are posters of EX135 (left) and EX127 (right).

Right: Unlike some earlier MG record-breakers, EX181 had its own purpose-built chassis.



EX181 facts

BODY

18 gauge aluminium alloy over tubular steel frame

ENGINE

Twin-cam based on BMC B-series, with Shorrock supercharger and twin SU carburettors. Sodium cooled exhaust valves

Capacity

1489cc

Bore/Stroke

73.025mm/89mm

Maximum power 290bhp at 7300rpm

TRANSMISSION

TC Midget-based four-speed without reverse gear

SUSPENSION

Front: Modified MGA independent coil and parallel wishbone with lever-arm dampers and rack-and-pinion steering
Rear: Splayed quarter-elliptic springs and radius arms with lever-arm dampers. De Dion rear axle

BRAKES

Single 10 inch diameter disc acting on rear halfshaft

WHEELS

15 inch diameter

TYRES

114mm wide Dunlops inflated to 60-65psi. 24in rolling diameter

DIMENSIONS

Length: 4610mm

Width: 1632mm

Height: 972mm

Wheelbase: 2438mm

Weight: 867kg

Fuel tank: 7.9 gallons

PERFORMANCE

Maximum Speed: 245.64mph

(maximum officially recorded speed in 1957)

Fuel Consumption: 61 gallons per hour – about 4mpg

Thanks to Castrol for their help with photography