

Reprinted from "The Motor," April 8, 1959

SPORTS CARS  
*by the*  
THOUSAND

---

THE NUFFIELD ORGANIZATION · COWLEY · OXFORD

Tel: OXFORD 7777

# SPORTS CARS *by the* THOUSAND

**A**LL big car factories are very much alike these days, especially their assembly plants, for however much they may differ in the amount and the variety of the automation they have applied to their manufacturing processes, it is taken for granted that the only way in which cars can be built in quantity is to assemble them on a moving conveyor line. Most of the major components are also fed to the assembly lines by overhead conveyors crawling across the ceiling with their loads of engines, wheels or other items.

But the M.G. works at Abingdon-on-Thames are not in the least like this, despite the fact that they are now producing well over a thousand cars a week; in fact, the record total of 1,103 was built during the week ending March 7, 1959. Not all were M.G.s, for in addition to the 468 M.G. As, the works also built 480 Austin-Healey Sprites and 155 Austin-Healey 100-Sixes, for production of all the sports cars marketed by the British Motor Corporation is now concentrated at Abingdon. To make room for the Austin-Healeys, the production of the M.G. Magnette has been transferred to Cowley and the Riley 1.5 to Longbridge.

There are two reasons why there should be only two mechanized conveyors in the whole of the Abingdon works, and these performing only minor operations. In the first place, the success of the M.G. and the Austin-Healey models in world markets, and especially in America, has meant that production has had to be increased far beyond the wildest dreams of the Old Guard at Abingdon who, before the war, saw the number of cars built in any one year rise from six in 1926 to an average of around 2,500 a year in the 1930s. It is true that during the war the Ministry of Supply obligingly erected an additional factory building at Abingdon for the production of tanks, thereby adding valuable floor space to what was originally a leather factory.

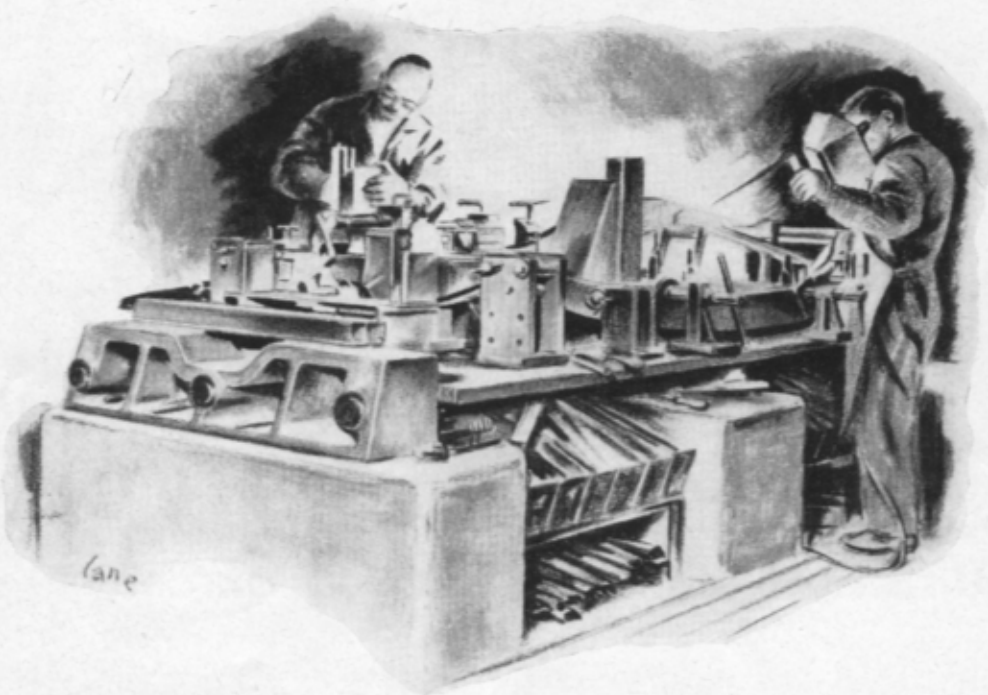
When the production of cars began again in 1946, 20 T.C. M.G.s were exported to the United States that year. By 1953 9,000 a year of the later T.D. model were being shipped across the Atlantic and production at Abingdon was running at the

Part of the vast delivery park at Abingdon with hundreds of Austin-Healey Sprites awaiting dispatch to export markets.



rate of over 10,000 a year, which seemed staggering by comparison with pre-war days. But with the introduction of the M.G. A model in 1956 production soared to 22,272 in that year and it has gone on soaring ever since, so that now it is running at the rate of around 50,000 cars a year. This tremendous increase in production has been accomplished with no additions of any significance to the factory floor space since the end of the war, and the M.G. production staff were therefore fully aware of the Space Problem long before the first Sputnik bleep-bleeped its way into the headlines.

It is this space problem that has made it impossible to install the normal conveyor assembly lines at Abingdon together with their overhead feeder conveyors, for there just isn't room for them. Perhaps it should be pointed out that conveyors are governed by simple mathematics. A conveyor moving at so many feet a minute carrying cars of a certain fixed overall length will have to be of a certain stated length in order to build a fixed number of cars a day. If it is required to build more than that fixed number of cars a day, the conveyor may be speeded up—but only slightly if the rectification department is not to be swamped with work. Or the conveyor can be lengthened, or it can be duplicated by laying down a brand new conveyor line alongside it.



The M.G. A chassis is first put together in this tacking jig which ensures that all the members are correctly positioned with regard to each other. After being tack welded together, the frame is then transferred to another welding jig.



## Producing Cars of Quality in Quantity



All M.G.s begin in the drawing office which was established at Abingdon in 1954, having previously been located at Cowley for a considerable number of years.

In any case, however, the conveyor system is very inflexible. Moreover, it is inflexible not only in the number of cars a day which can be built on it but also in the time it allows to be spent on a car at each stage of its production. In spite of the fantastic number of cars now being produced at Abingdon, the people responsible for their production still think of their cars as individual sports cars and not as quantity-production models. To have a car snatched from the hands of the men working on it by a remorseless conveyor before they have had time to finish an operation is not Abingdon's idea of how a car should be built. The fact that there is just no room for conveyor assembly is therefore felt to be no great misfortune, for the cars benefit thereby.

Throughout its entire life as M.G. headquarters, Abingdon has been a design and assembly factory, rather than a manufacturing works. Before the war, the engines came from the Morris Engines Branch at Coventry, the transmissions from the Transmissions Branch in Birmingham and the bodies from the Morris Bodies Branch in Coventry. Today, the Abingdon works is similarly dependent on the various B.M.C. specialized factories

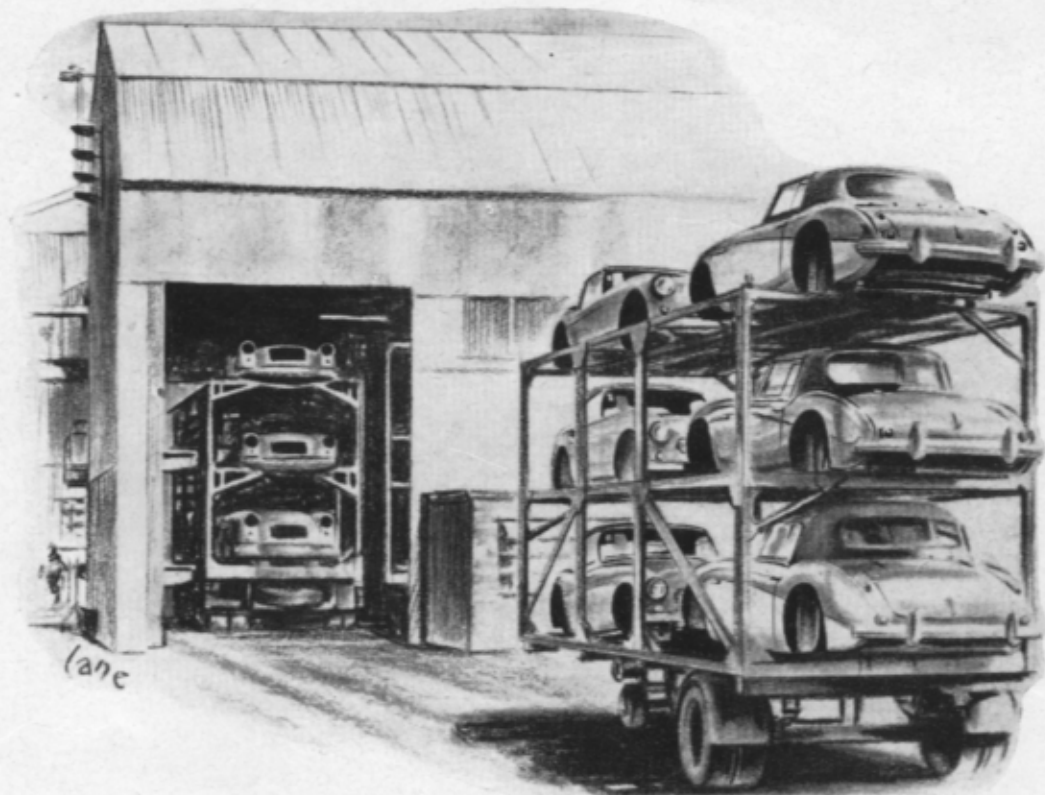
for its components and bodies, and the vast increase in complete cars is only possible by dint of the fact that the individual components are all to the required standard and give no trouble.

Nonetheless, the assembling of these complete units into a motorcar is no mean task, nor is it made easier by the fact that sports cars are sold to individualists, who therefore demand the choice of a wide variety of optional features. This means that in any one week only two of the 460 or so M.G. As produced will be exactly alike in every particular, all the rest will differ from each other in some respect or other. It can therefore be seen that the Planning Department under Charles Martin leads a very busy life deciding, on the basis of orders received from all over the world, how many red M.G. As with wire wheels, radio and windscreen washers will need to be built in any one week.

Although most of the major components for the cars arrive at Abingdon more or less in their finished state, this is not true of the sturdy chassis frame which plays so big a part in making the M.G. A one of the safest sports cars on the road—a driver in an international rally swerved off the road at 80 m.p.h. and struck one of those solid stone markers to be found lining Continental roads such a shrewd blow with the front of his M.G. A it was uprooted from the ground. He stepped out of the battered car with a slight cut over one eye.

The box-section side-members, the tubular cross-members and the box-section members forming the very rigid scuttle structure are mounted in a tacking jig which ensures that the complete frame is accurately assembled before its members are welded together. The frame is then transferred to one of a series of welding rigs in which it can be rotated to any angle to enable the welders to complete their work on it. Finally, the chassis frames are dipped in a bath of stove enamel, the dipping method having been found to be much more effective in ensuring complete treatment of every part of the frame than any spray method. After dipping, they are allowed to drip for a time and then spend six minutes in a gas-fired infra-red oven.

As powered assembly lines are not used at Abingdon, the M.G. A chassis is given its front and rear suspension, to which the wheels are then attached, at a station at the very beginning of one of the two assembly tracks. Thereafter, it rolls along a pair of raised tracks constructed from breeze blocks, the left-hand front and rear wheels running in a channel which guides the chassis on its way while the right-hand wheels run on a flat surface. By this means chassis with differing wheel tracks can be passed down the line, and in fact one of the advantages of the system is that the complete assembly line does not have to be



Austin-Healey 100-Six bodies arriving by transporter from the Jensen factory at West Bromwich. The coloured lights for summoning transporters carrying the required type of body will be noted on the end of the building.

turned up and relaid when a new model is introduced. For instance, the last of the ZA Magnettes passed down one assembly line on December 20, 1958, and the first of the Austin-Healey Sprites rolled off the same line early in January.

The engines for the M.G. A come from two different sources, the normal push rod engine arriving from the big engine plant at Longbridge and the Twin Cam unit from the Engines Branch at Coventry. The gearbox and rear axle for all the models produced at Abingdon come from the Tractors and Transmission Branch at Ward End, Birmingham.

The M.G. A bodies arrive fully trimmed and painted from the Bodies Branch at Coventry in big double-decker transporters which carry six at a time, three up and three down. The transporters on arrival laager up in a big transporter park from which they are summoned to the body unloading bay by coloured light signals, with a different colour for each body make, so that the incoming flow of bodies is matched to the requirements of the body lines.

The bodies are unloaded on to a floor running above the assembly lines and are mounted on four-wheeled trolleys which carry them to the M.G. A body lines where the electrical equipment and other items are installed. Meanwhile, each M.G. A chassis when it leaves the end of the chassis assembly line is wheeled round to the head of one or other of the final assembly lines and a body is lowered on to it by a hoist from the M.G. A body lines on the floor above. Once body and chassis have been united, the final assembly of the car proceeds apace until it reaches the end of the assembly line, where the track is checked on a most ingenious Weaver machine by means of two steel plates which are free to move sideways and are let into the floor. As the front wheels roll on to the two plates they will displace them either outwards or inwards according to whether the wheels are toed in or toed out, and the amount of toe-in can then swiftly be adjusted until the correct reading is registered by the pointer on the large dial of the machine. Toe-in is measured by the number of feet the front wheels would depart from a straight line in the course of covering one mile.

After leaving the final assembly line, the car is taken on a seven-mile road test, for at Abingdon they still hold that no static test under cover can compare with driving a car on the

road to reveal its faults, if any. The tester then takes the car, together with his list of items requiring attention, to the rectification department where they are dealt with by a team of highly-skilled men. Should the cellulose finish of the body have suffered during production or testing, the car is passed to the rectification paint shop where any blemishes are re-sprayed, then, after a final wash and polish, the car is ready to be delivered.

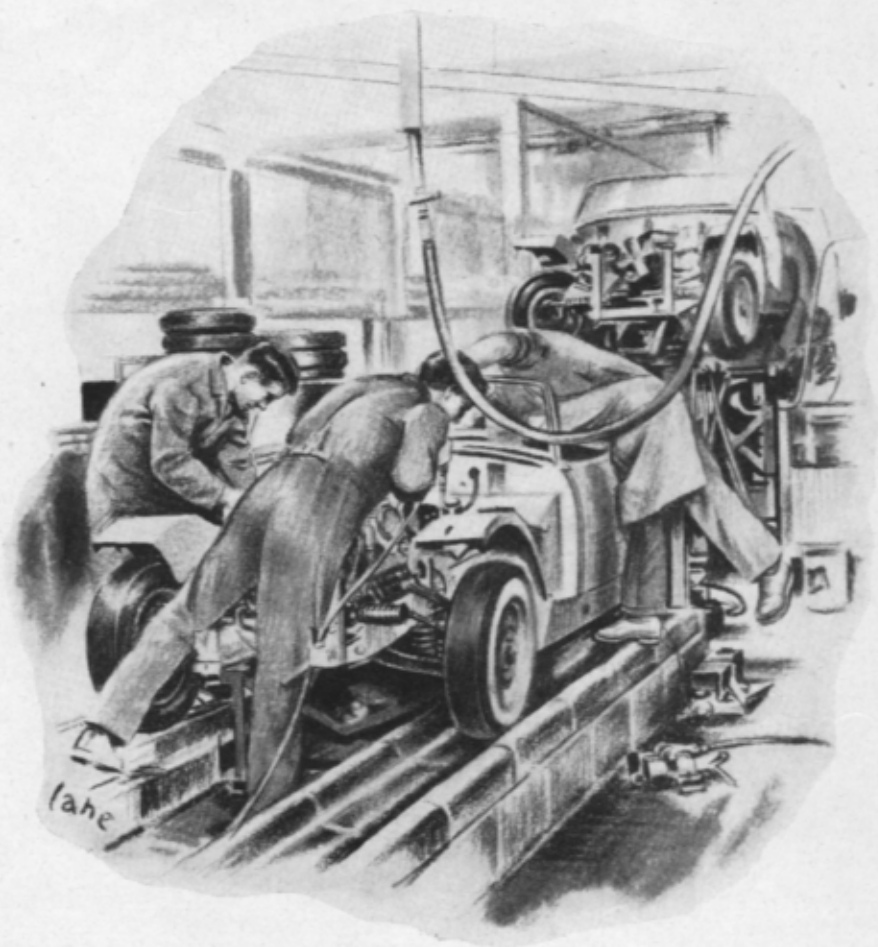
Assembly of the two Austin-Healey cars, the Sprite and the 100-Six, is complicated by the fact that neither has a separate chassis. In the case of the Sprite, the body shell is produced by the Pressed Steel Co. Ltd. at their Swindon works, transported to the magnificent new paint plant at Cowley to receive its coats of synthetic enamel and is then sent to Abingdon, where as much work as possible is completed on the two Sprite body lines on the first floor while access to the shell is still fairly simple.

The final assembly of the Sprite is carried out on two lines and begins with the placing of the front and rear axle assemblies in little four-wheeled trolleys running on rails mounted at shoulder height. The completely trimmed and equipped body is lowered from above and mated to the front and rear axles, then the engine and gearbox are installed and the road wheels fitted, after which the car is lifted off its two four-wheeled trolleys by a hoist and lowered to the ground level assembly line along which it runs on its road wheels, as in the case of the M.G. A. Each Sprite also receives its seven-mile road test.

The combined body-chassis shell for the Austin-Healey 100-Six is received from Jensen Motors Ltd. at West Bromwich, fully wired, with all the instruments in place, and partially trimmed. Not much has to be done to it, therefore, before it is lowered on to its assembly line. Initial assembly of the 100-Six is carried out on tall trolleys running on ground level tracks until the road wheels have been fitted, after which the assembly is completed on a pair of ground-level breeze block tracks in the usual Abingdon manner.

Although Abingdon has become the home of the British Motor Corporation Sports Car Division, rather than just the M.G. works, there is no doubt that all the types and makes of sports car built there have benefited greatly from inheriting the M.G. tradition and know-how. This tradition has been maintained at Abingdon and is jealously guarded by the men

Preliminary assembly of the Austin-Healey Sprite begins on two trolleys at shoulder level, at which stage the front and rear axle are added and the road wheels. The cars are then lowered by hoist on to a normal Abingdon breeze block track along which they travel on their own wheels.



Every car produced at Abingdon receives a seven-mile road test round a circuit of minor country roads conveniently adjacent to the factory; this enables any small defects and deficiencies to be spotted before a car is delivered to the customer.



there who have been building M.G.s in some cases since the first M.G. of all.

It is unusual, for instance, that the general manager of a company should have begun his association with the concern as a keen owner of one of its cars, for John Thornley's first contacts with Abingdon were in his role of a founder member of the M.G. Car Club. In 1931, he abandoned accountancy for a post in the M.G. service department, which was as good a place as any for finding out what owners think of their cars, and was appointed general manager of the M.G. Car Co. Ltd. in 1952. The chief designer and engineer, A. S. Enever, joined the M.G. concern in 1928 and as chief of the experimental department in the years before the war was associated with many M.G. racing and record-breaking attempts, and he is still very much interested in both these fields of activity.

Veteran of them all, however, is the works manager, H. E. C. Cousins, who helped Cecil Kimber build the first M.G. and was responsible for the design of some of the earlier models. Apart from these activities, he has ridden as racing mechanic, acted as team manager and, just for a change, was responsible for the production of all the aircraft items ranging from wings to fuselage sections which were built at Abingdon during the war. After grappling with the complications of an Albemarle nose section, the production of motorcars, even in considerable numbers, must seem a fairly simple matter.

It is men such as these, and there are many others in the team, who ensure that the cars pouring from Abingdon day by day will uphold the reputation of the concern wherever they may be shipped, whether they carry the M.G. octagon or the Austin-Healey badges.