



# ASSEMBLY AT COWLEY

We hope this book will be useful in helping you to recall your visit. It is intended also to fill in the gaps in what must have been a slightly overwhelming tour—especially if it was your first. We hope you enjoyed it. And we hope this account of the making of a car will interest you all over again in what went on at Cowley.

*A SOUVENIR BROCHURE  
COMMEMORATING  
YOUR VISIT  
TO THE WORLD-FAMOUS  
MORRIS MOTORS LTD.*



Issued by:  
**MORRIS MOTORS LTD. COWLEY, OXFORD**

## OXFORD 1912



When William Richard Morris began to make motor-cars he was already successful in one field of business. The bicycle-manufacturing company he had begun in 1893 (with only £4 in capital) had grown considerably. He himself was nationally well known as a racing cyclist on his own machines. And he had already come to grips with the internal combustion engine when, in 1902, he designed and put into production the first Morris motor-cycle.

*(Above) The Longwall Garage Oxford. (right) the Factory today. It now has a covered-in floor area of 4,167,559 sq. ft.*

In 1910 William Morris began to plan a moderately priced motor-car, and two years later was ready to market it. He began well; those who saw the blueprint were so impressed that 400 of the cars were ordered immediately.

The First World War checked the success that seemed inevitable, but in 1919 the Factory was able to return from war work to making cars again. Then came the shrewd business stroke that really began the era of family motoring, and gave Morris cars a leading position which they have never relinquished. On the eve of the 1921 Motor Show, at the height of the post-war depression, William Morris reduced the price of all his models. The four-seater Morris Cowley was cut by £100 to £425 and the two-seater by £90 to £375. These were the widest-selling models. In the following 12 months 65,000 Morris cars were sold!

Since then, there has been continuous expansion, both by the addition of Service Departments and the formation or acquisition of companies such as M.G., Morris Commercial, Riley, Wolseley, and finally the merger in 1952 with the great Austin Motor Company to form the British Motor Corporation. BMC produces two out of every five vehicles on the road today, and production at the Cowley Factory alone averages 7,500 cars a week.

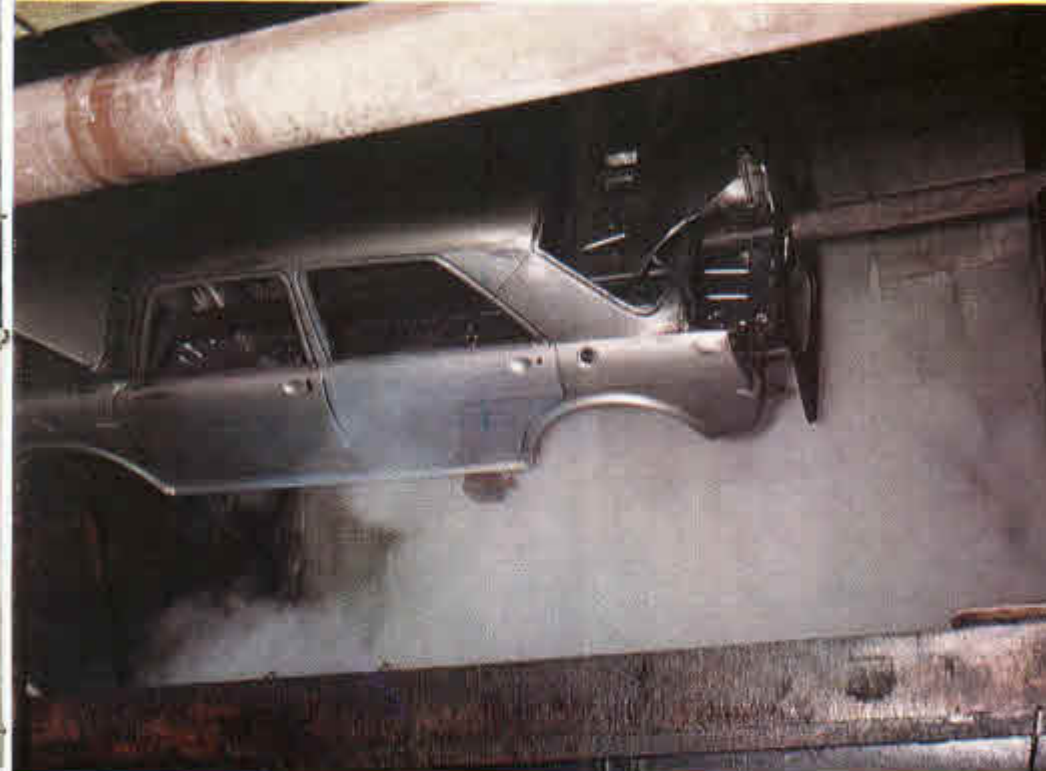
## THE ASSEMBLY OF A CAR



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1 3



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### INTO THE ROTODIP

The assembly of a car is a staggering feat of timing. All work and movement—even the rate of delivery of the bare metal bodies from outside the Factory—is related to the speed of the production line. Everything moves in, along, and out at the speed of one car's length every three minutes.

Beginning as an unpainted metal shell, the car moves steadily through the plant, at a constant speed, to the machines and men that clean it, paint it, add to it, trim it, wire it, and check it; meeting the engine that was numbered and marked for it at the very beginning of its journey, until it emerges some hours later, under its own power—ready for the road.

1 The body shell arrives

2 Lifting the body into the storage racks

3 A huge spit transfixes it

But to start at the beginning. The bare metal body shells are hoisted from the transporters into a rack and immediately begin to move towards the first process. The protective grease has to be removed before painting. After a hand rub to take off most of the grease, the body is transfixed on a huge spit and taken into the Rotodip, where it rotates through baths and sprays which clean it and make it rust-proof, delivering it dry to the primer paint dip tank, after which it is baked, still on its spit, and received by men who are waiting to hoist it onto the first line. This is now known as a 'black body'. Even at this stage, before painting, no time is lost. Men are fitting door locks and window winders.

1 The car is made ready for painting

## 3,000 GALLONS A WEEK



Adjacent to the Paint Shop, which is the car's next destination, is the room where the exact colours are prepared and piped down to the automatic spraying booths. After a busy rub down the car body goes through a series of five sprayings interspersed with wet and dry rubs to smooth out each coat before the next is added. Following each application of paint the body is baked in an oven and cooled to the shop temperature before it is handled by the men at the next stage. It takes about six hours to complete the painting process.

1. Paint is piped down from tanks in the paint room
2. Inspection for blemishes begins early
3. Topping up

**Things to marvel at.** Each body coming through the booths may have a different colour planned for it. The automatic sprayers can change their colours almost at once, without mixing one with the other. The photo-electric cell that causes the arms to spray so accurately. The 32 different colours on hand to the hand sprayers.

It is said that the spraying booths have the cleanest air in the Factory. The men who deftly hand-spray the under-wings and doors have no need to wear masks as electronically controlled arms pass over the car bodies and mist them with a complete coat of paint. Washed air is continuously pushed in from the ceiling forcing the paint down through gratings into moving water extractors.

After painting, as at every stage, there is a fastidious inspection. Any deficiencies are marked. The blemished cars are sent off on a kind of loop line—called appropriately 'the hospital line', where the whole marred section is rubbed down and sprayed again by hand. All the duotone cars get their second colour in this line. When everybody is satisfied with the paint job the car carries on to the main assembly line, now carrying a comprehensive checklist card which stays with it until completion.

1. Every car has six coats of paint
2. The paint booths are astonishingly clean
3. The painting is electronically efficient

## MILES AND MILES OF COMFORT

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1 2



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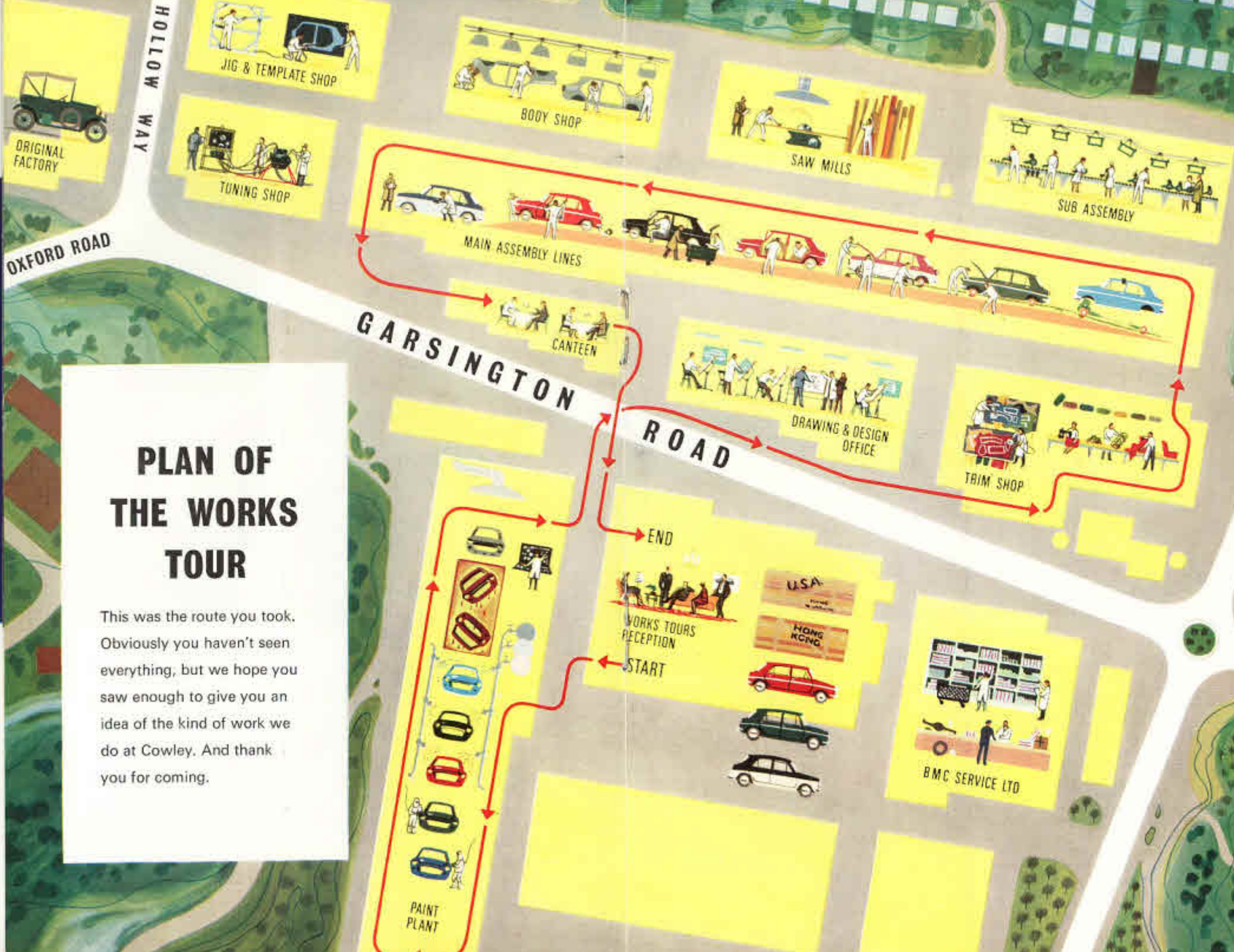


The main Assembly Line (where we leave our car for a few pages) is served by various Sub-assembly Shops, where components such as seats, lining panels, some electrical equipment, fascias, springs, and back axles are made ready. To come into one of these shops, where some people are actually sitting down, makes you realize how much the main part of the Factory is subject to the restless production line. It is interesting to remember that over 5 per cent. of the staff employed at Cowley are Disabled Persons. Many of them are fully productive in the assembly of instrument panels.

- 1 It takes a skilled upholsterer 20 minutes to assemble a seat.
- 2 Seamstresses at work.

One of the largest pre-assembly tasks carried out at Cowley is the making of seats (it takes 20 minutes to assemble one). Mass-production techniques have been applied very successfully to the job, and you will see template cutters that deal with anything from 10 to 15 thicknesses of leathercloth at a time. But it may still surprise you to see how much depends on the craftsman's or seamstress's eye. The Trim Shop uses about 2,500 cow-hides a week, 14 miles of leathercloth, and 12 miles of felt. 10 miles of carpet go out every week, and 6 million miles of nylon thread.

- 1 Cutting-out is carefully planned to avoid waste
- 2 Assembling a 'Princess' fascia in the 'disabled' section
- 3 Electrical gear sub-assembly
- 4 There are still many hand operations



## PLAN OF THE WORKS TOUR

This was the route you took. Obviously you haven't seen everything, but we hope you saw enough to give you an idea of the kind of work we do at Cowley. And thank you for coming.

## THE MAIN ASSEMBLY LINE



1 2



This is by far the most spectacular stage of car building. On this line—a quarter of a mile long—with its hundreds of men, you can see the car grow from a painted metal body to a highly sophisticated piece of engineering. All the parts, from the petrol pipes which go on first to the big engine and axle pre-assembled unit, are brought to the hands of the men riding the line. Groups of four to six men do their allotted jobs every few minutes, and then go back to begin those jobs all over again on the next car. Another group pounces, and more of the car appears as if conjured out of the air. Swarming men, shoulder to shoulder, over and under the car, work fast and carefully hurrying but never rushed. All along, checklists are scanned and initials added.

The most characteristic sound is the hooting of air-operated mechanical spanners.

At a certain point the body and the engine are united, to complete a 'marriage' that was made long before the units reached the Main Line. For the sake of precise production control, it would not be feasible to put the first engine that came to hand into the first body that came along the line. In fact, if a body is held up for re-spraying, the engine destined for that body is also held up automatically somewhere else in the Factory. Then they both move inevitably together.

1 The engines come . . .

2 . . . to meet the bodies, according to plan



3

To the visitor, the most astonishing moment is when petrol and oil are added before the car is completed, and it starts! A few minutes before it was an assembly of metal pieces. Now it is a motor-car.

1 The wheels are dipped and dried

2 Cars near completion

3 Even spanners are mechanized

2

## MAKING SURE



Now come a series of tests to make sure that everything works properly. An inspector drives the car off the line on to a set of rollers on which he drives the car at a speed of 45 m.p.h. During the run he switches on the lights, flicks the trafficator, works the windscreen wipers, and carries out a complete schedule of tests. All the time he is listening. This man is an expert. He can hear and feel if something is wrong. If anything *is* wrong at this stage, the car goes back for rectification. Then there are the final touches to be made on the 'finishing line'. The lights are accurately focused with the aid of an electronic machine. Another electrical instrument is used to align the wheels.

1 A final inspection



1 3

Some of the cars are spot-checked to see how well they stand up to weather conditions. They are driven slowly into a booth, and there, for 2 minutes, are pounded with jets of water at a pressure of 50 lb. to the square inch. There are 3,000 jets! Meanwhile, somebody has switched on a 40-m.p.h. gale. On this final stage white-coated inspectors are almost as numerous as the production line workers at an earlier stage. In their hands is the reputation of BMC. The cars are checked and cross-checked. The identity card that accompanied the car all along the line is signed and sent away for filing. It is kept for one year after the car has left the Factory. Thus when a new car is delivered, it already has a history. The hub caps are fitted last of all, and the car is all set for dispatch.

- 1 Balancing the wheels
- 2 Adjusting the beams
- 3 Testing for watertightness



**BMC  
SERVICE  
LTD.**



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It isn't all over, even after the car has been delivered. The British Motor Corporation, in 1955, formed BMC Service Ltd., to undertake responsibility for giving owners of BMC cars an after-sales service. 2,500 people are employed in the company, all but 450 of them being based at Cowley.

BMC Service Ltd. gives regular technical courses to engineers from Great Britain and all over the world.

Mechanics and engineers are kept up to date with developments on all the latest models.

1 The production control computers

2 3

The Company has a warehouse covering 1,000,000 square feet to hold centralized stocks of spare parts. Over 1,000 tons of replacement parts are issued to the 400 Distributors in this country, and the 500 Distributors overseas, every week. A thousand orders for parts are received daily, a hundred thousand items sent out every week.

Priority orders that reach BMC Service before 9.30 in the morning are sent out the same day if to a U.K. Distributor. Air Freight orders from overseas Distributors are cleared within 48 hours.

To index this vast operation 7½ million punched cards are used annually.

1 The stores have millions of parts

2 Stores Control . . . modern style

3 But the storekeeper knows where everything is

## EXPORTS



1

A large proportion of the output is destined for overseas markets. These vehicles are all dispatched through BMC Export Sales Ltd., Shipping Dept., at Cowley. It involves a most complicated process covering shipping documents, Customs declarations, pro-forma invoices, and a lot of other paperwork to accompany their transportation by road, rail, sea, and air to all parts of the world.

A tremendous amount of staff work is necessary to dispose of the huge volume of vehicles pouring from the production lines every day.

↑ A car on its way to one of the 500 overseas Distributors

The map opposite shows the country-wide ramifications of the British Motor Corporation. It shows the sources of the many components that converge at the Cowley factory to feed the production lines here, and also the main export routes through which the cars, trucks, vans, and tractors pass overseas.

