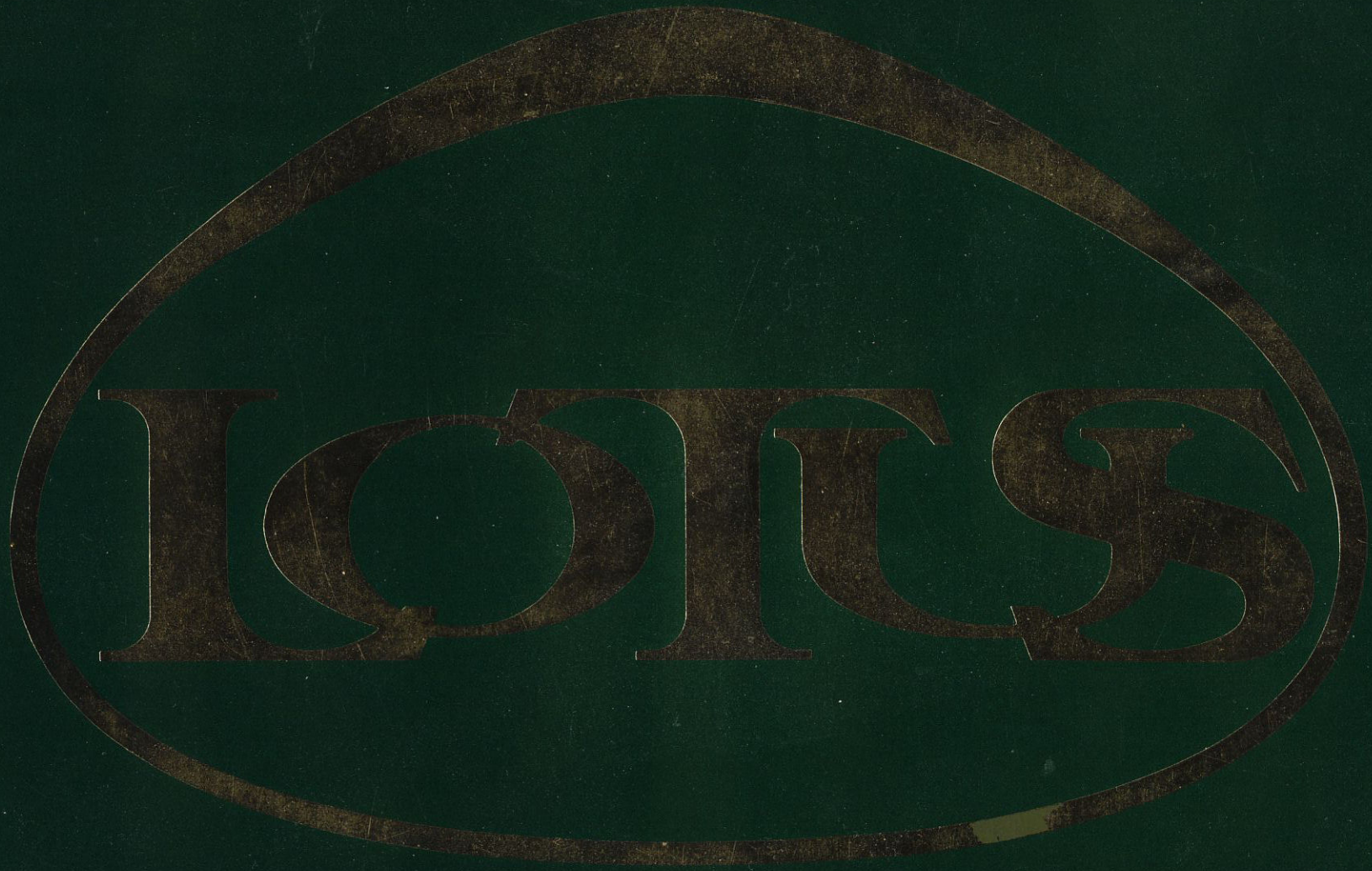




VISITOR

Name _____
Date 12 JUN 1965





***This is the home of Lotus –
where, besides creating the
world's most exciting cars,
we provide a unique
technological service to
industry.***

Here at our operating headquarters in Hethel, near Norwich, Lotus research and development teams provide a technical consultancy service for worldwide industries ranging from advanced combustion research through to 'turnkey' operations on behalf of other manufacturers.

The bold engineering concepts and exciting technological advances which have originated under the Lotus roof during the past quarter-century have resulted in much more than the creation of superb Lotus performance cars.

Lotus have amassed a vast accumulation of knowledge in many fields of research, design and technology which is used to advantage by many differing types of industry – worldwide.

The following pages give some indication of the scope and magnitude of the Lotus operation today.



RESEARCH —

Lotus has sought the ultimate in efficient design through research, an aim which we have pursued with single-minded vigour and determination.

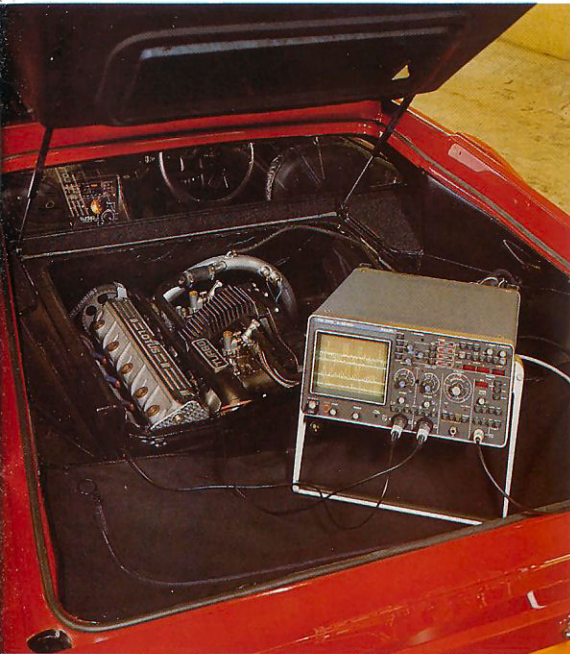
Endorsed by the Grand Prix success of Team Lotus with its seven World Champion Car Constructors titles, Lotus technology has been fuelled by an impressive list of achievements — and the international acclaim for performance, style and safety.

Lotus experts have produced pioneering concepts in chassis and suspension design, aerodynamics, combustion and fuel efficiency. In addition our development work on reinforced composites has produced dramatic changes in the way industry now regards a wide range of products. The frontiers of knowledge in materials, techniques and processes have been significantly advanced as a direct result.

With such a history of international success Lotus research into engine performance is, understandably, no less advanced. The Lotus Emission Laboratory and evaporative emission test facility — fundamental to our engine development research programmes, is one of the few in the world recognised by the U.S. Environmental Protection Agency and the California Air Resources Board.

from cars to space age technology

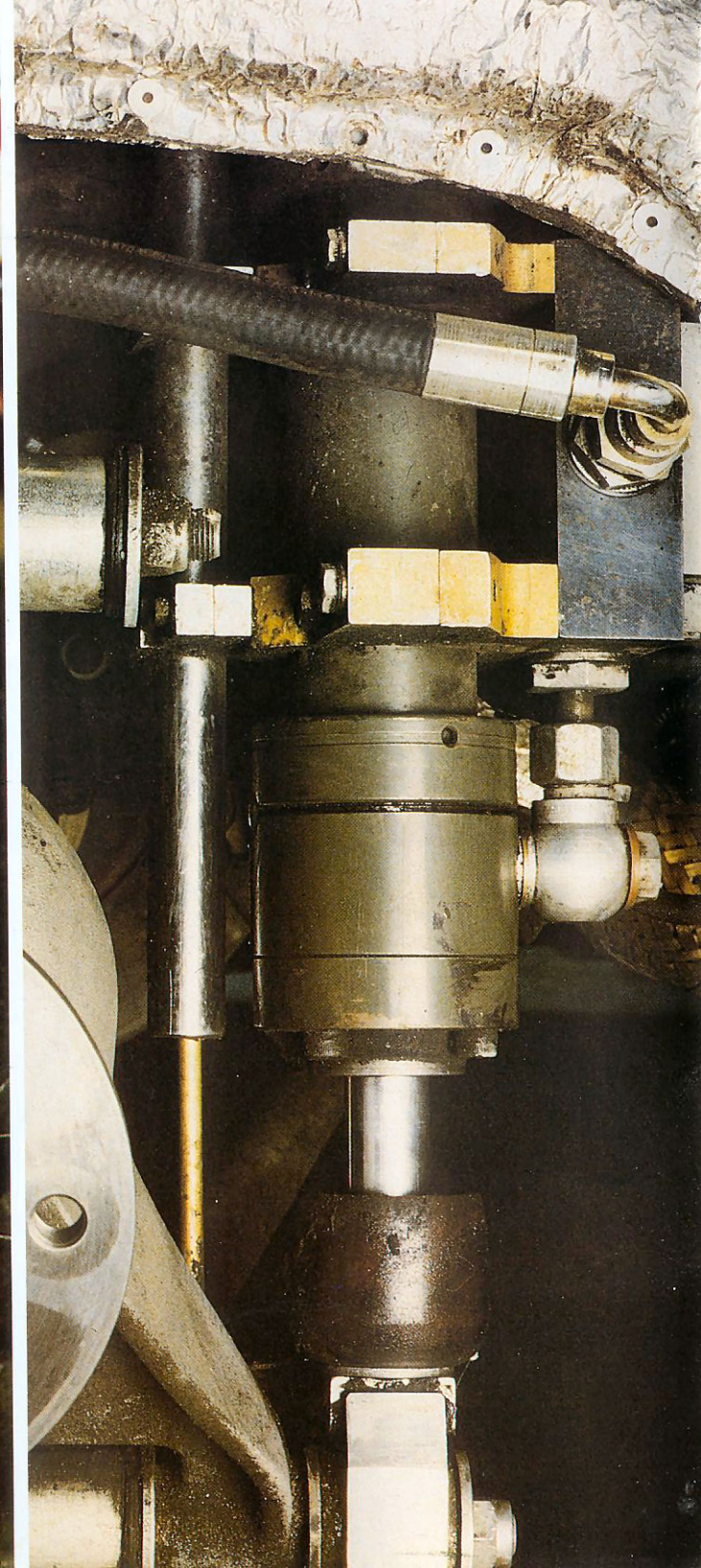
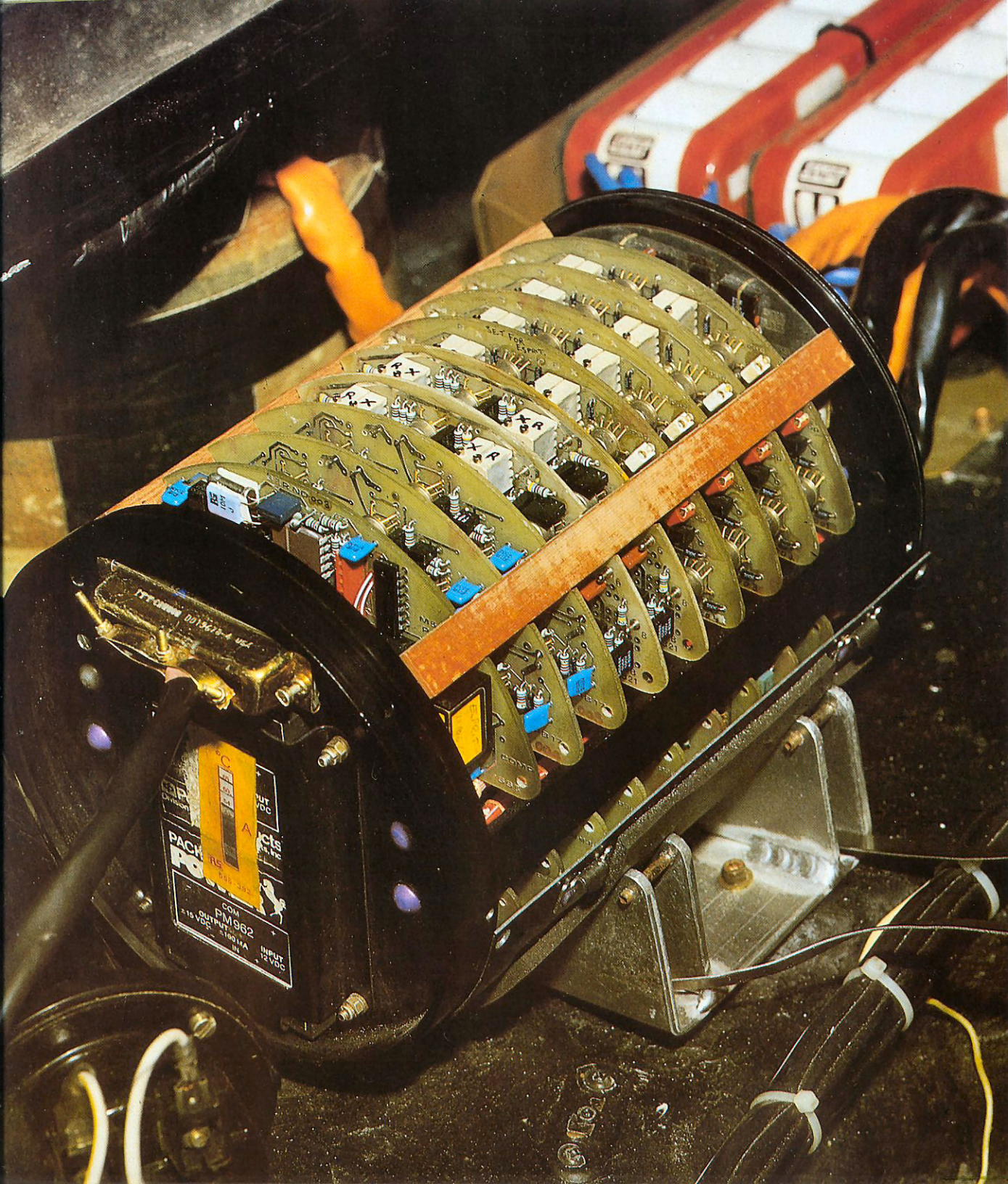
N.V.H. (Noise, Vibration, Harshness) Laboratory.



Test equipment monitoring carburetor performance and efficiency.

Material testing in chemical laboratory.





The demanding world of Formula One racing has also generated many technological innovations which can be applied in other fields, including production cars

“ACTIVE SUSPENSION”

One of the most exciting concepts for many years is that of Active Suspension, currently being developed and applied to many types of transport vehicles. Just as a skier rides bumps by moving his legs in response to signals from his nerves, so the springs and dampers in a vehicle's suspension are replaced by hydraulic actuators ('muscles'). These

actuators are controlled by a computer ('the brain') reacting to signals from transducers ('the nerves') sensing the car's attitude. The computer can be programmed to react to the inputs in any desired way, significantly enhancing the vehicle's ride, handling, performance and safety. Active Suspension is just one example of the many ways in which Lotus will continue to develop.

ACHIEVEMENT BY DESIGN

Lotus achievements in motorsport are legendary – from trial cars in 1947 to turbocharged Formula One cars today. Lotus has won titles in saloon cars

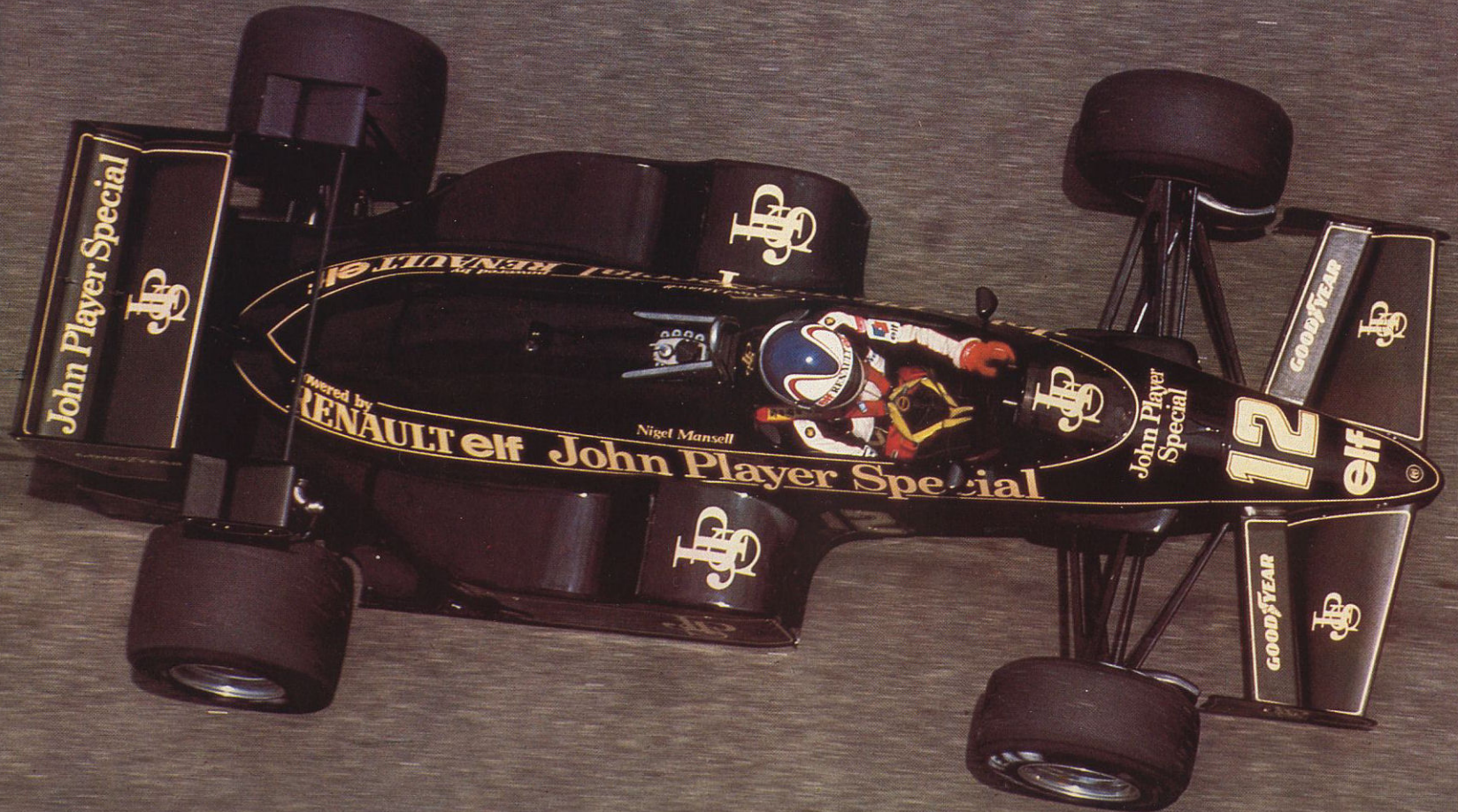
at Le Mans and Indianapolis, and achieved seventy-two victories in Formula One, including six World Championships.

The continual search for improved performance in all areas, now a hallmark of the Lotus organisation, has led to several firsts in racing car design, such as the use of aerodynamic ground effect, the first use of the engine as part of the structure (monocoque), all composite construction – and the previously mentioned Active Suspension.

Lessons learned in competition are applied directly or indirectly to road cars – both those produced by other manufacturers and ourselves.

Far left: Active suspension — on board hybrid computer Left: Hydraulic actuator suspension unit.

Below: Nigel Mansell in his John Player Special 95T competing in the 1984 Formula One World Championship. (Photo: Charles Knight)



DESIGN & DEVELOPMENT

Part of the extensive Lotus design facility.



for everything automotive

As well as the comprehensive facilities Lotus have for engine design, development and testing, their work on composite body structures and interior fittings for both cars and marine craft is acknowledged throughout the world.

In addition, Lotus actively participate in a diversity of product and process developments for companies across a broad spectrum of industry. The Lotus 54 acre site includes an engineering 'Think Tank' and nine engine development test beds to aid research into emissions, fuel economy and performance. As a result the combustion process in a Lotus designed production engine is probably one of the most advanced anywhere – and the aerodynamic efficiency of the Lotus Excel 4 seater gives it one of the lowest co-efficients of drag of any production car in the world today.

Lotus design, test and development facilities range from equipped noise and vibration laboratories to test cells, structures testing rigs and our own vehicle test track. Through these Lotus have set new standards of achievement in all automotive fields.



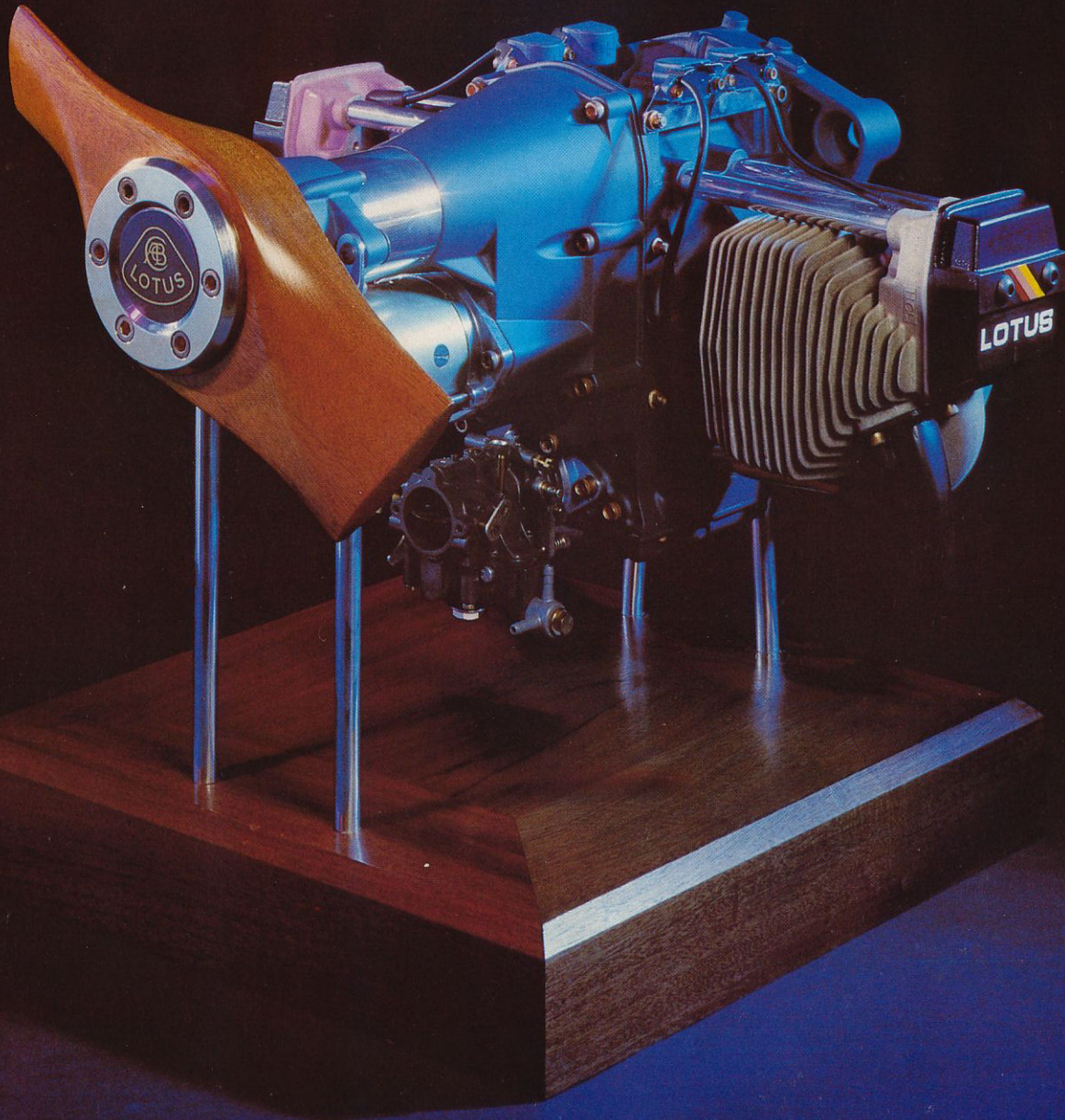
The most sophisticated computer controlled engine test cell suite in Europe.

Wiring loom design and manufacture.

LIGHTWEIGHT AIR COOLED ENGINES

Cars are not the only machines in which Lotus has involvement – the company has recently moved into the aviation world with an exciting new concept in lightweight engines.

The all-alloy modular design is based around a monobloc casting which incorporates a cylinder head, barrel and crankcase-half in one unit. The propeller drive is taken from the camshaft to optimise efficiency and performance – bywords in Lotus design.



Above: Engineering consultancy – design analysis
Airport fire tender Forestry vehicle.

MANUFACTURING TECHNOLOGY

NUMERICALLY CONTROLLED MACHINING CENTRES

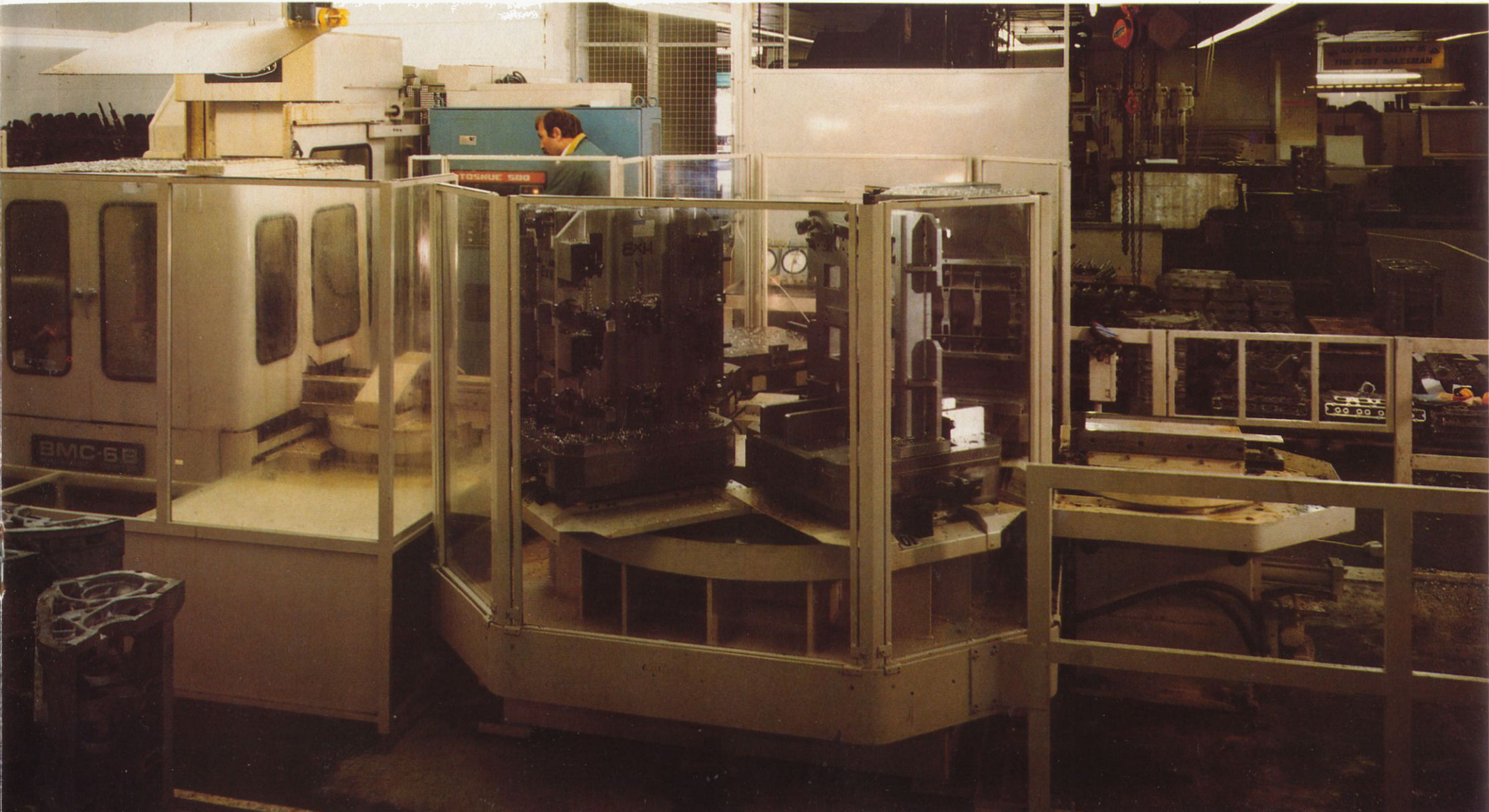
Lotus is continuously investing in the most up to date manufacturing technology to ensure maximum efficiency in production. A new multi-

pallet CNC horizontal machining centre, which can handle solid volumes up to $800 \times 630 \times 630$ mm, brings even greater versatility to the existing advanced NC machining facilities.

The light alloy steel and fabrication facilities are built around a CNC punch/nibbler which can

blank up to 8 mm plate. The advanced flexible numerically controlled manufacturing operation further emphasises the integrity, efficiency and individuality of Lotus products.

CNC Horizontal Machining Centre in operation.





Pioneers in COMPOSITE TECHNOLOGY

Lotus have used fibre reinforced materials for over a quarter of a century and during that time have been constantly developing and improving manufacturing techniques culminating in the high quality products and structures embodied in every Lotus car today. The Lotus body structure is of superb quality and easily meets worldwide crash load and safety requirements – winning the DON Safety Trophy is ample evidence of this.

The knowledge and skill which has gone into

Lotus Cars has been supplied, through licencing agreements, to many industries and products outside the Lotus Group, both in the U.K. and abroad, ranging from cars to heavy commercial vehicles.

Besides the Motor Industry, many companies in the Marine Industry use Lotus tooling and process methods in the manufacture of power boat hulls, sailing boats and other water sport leisure items.

As mentioned on a previous page, the

aerospace industry also draws upon Lotus expertise and manufactured parts. So, indeed, do many commercial companies who ask Lotus to develop and produce a wide selection of other products including safety helmets, building panels, bathroom and kitchen units. In fact, wherever a moulded composite structure is needed to replace a conventional fabrication with something better and more cost effective, Lotus are the people to ask.

Left: General view of composite tooling facility.

Middle right: DON Safety Trophy.

Right: Moulded Composite Reinforced Plastics domestic fittings.



LOTUS – the cars hand finished by craftsmen in an age of mass production

The precise control, the exhilarating surge of power, and the safe, predictable handling which epitomise Lotus cars did not come about by chance. They are the product of three vital factors:

Innovation, from top engineers, who are encouraged to have imaginative ideas and to develop them. *Experience*, which comes from three decades of pushing cars to their limits on the world's race tracks. And *craftsmanship*, from skilled workers who take pride in building in quality and are fully committed to their quality objectives.

As ideas for improving performance, handling, safety, comfort and longevity are developed, tested and perfected, they are incorporated into production models. The Lotus car you buy today represents the ultimate blend of modern technology and superb craftsmanship.

HETHEL – THE HEART OF ENGINEERING QUALITY

Since Lotus moved to Hethel, Norfolk in 1966, bringing many of its craftsmen with it, the factory has been increasingly regarded as a centre for creating automotive technology.

High value has always been placed on technological excellence: the engineering department employs some of the best talents in the industry: research projects are continually carried out for large and small companies, both here and abroad. Joint ventures with other manufacturers have produced remarkable cars. The Lotus

Cortina, for example, and the Talbot Sunbeam Lotus. More recently it has seen the development, with British Leyland, of the Metro Turbo engine and composite mouldings for other product lines. All this activity increases the fund of knowledge and experience within Lotus, with obvious benefits to the buyer of the Lotus car.

HAND FINISHED BY CRAFTSMEN

While much of the motor industry switches to robot assembly, Lotus craftsmen continue to give personal attention to many stages of production.

Every Lotus car takes up to four weeks to complete. The first process, a lengthy one, involves the production of the immensely important composite body, formed initially in two sections by a vacuum-assisted resin injection process. This process, exclusive to Lotus and covered by world patents, is marketed by the company worldwide.

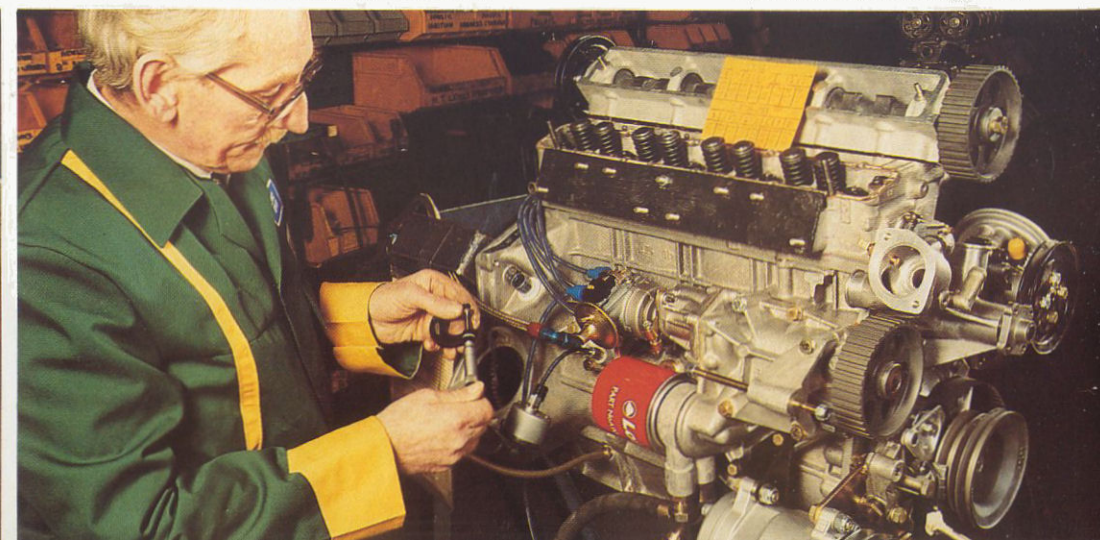
When the two sections are bonded together they form an immensely strong totally corrosion proof body shell. Seven coats of primer and colour are applied and baked on for durability. The final coat is hand rubbed back to ensure a perfect surface then polished to the Lotus standard.

Strict quality control is observed at every stage in the production of a Lotus car, the craftsmen themselves being responsible for maintaining the high standard of their work. As a personal assurance of that standard, each operator signs the build book that accompanies every car at each individual stage.

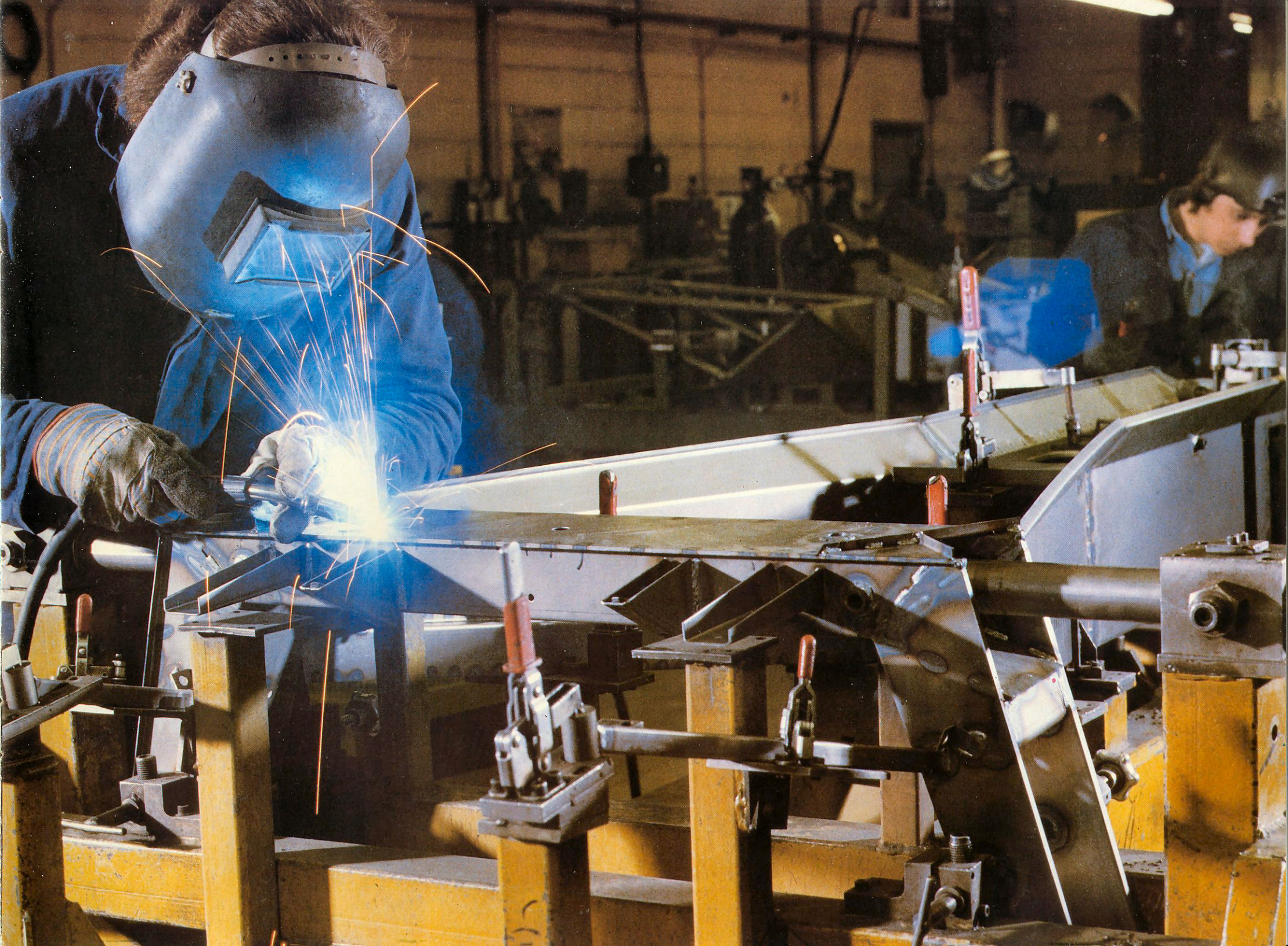
The hand lapping of cylinder head valves.

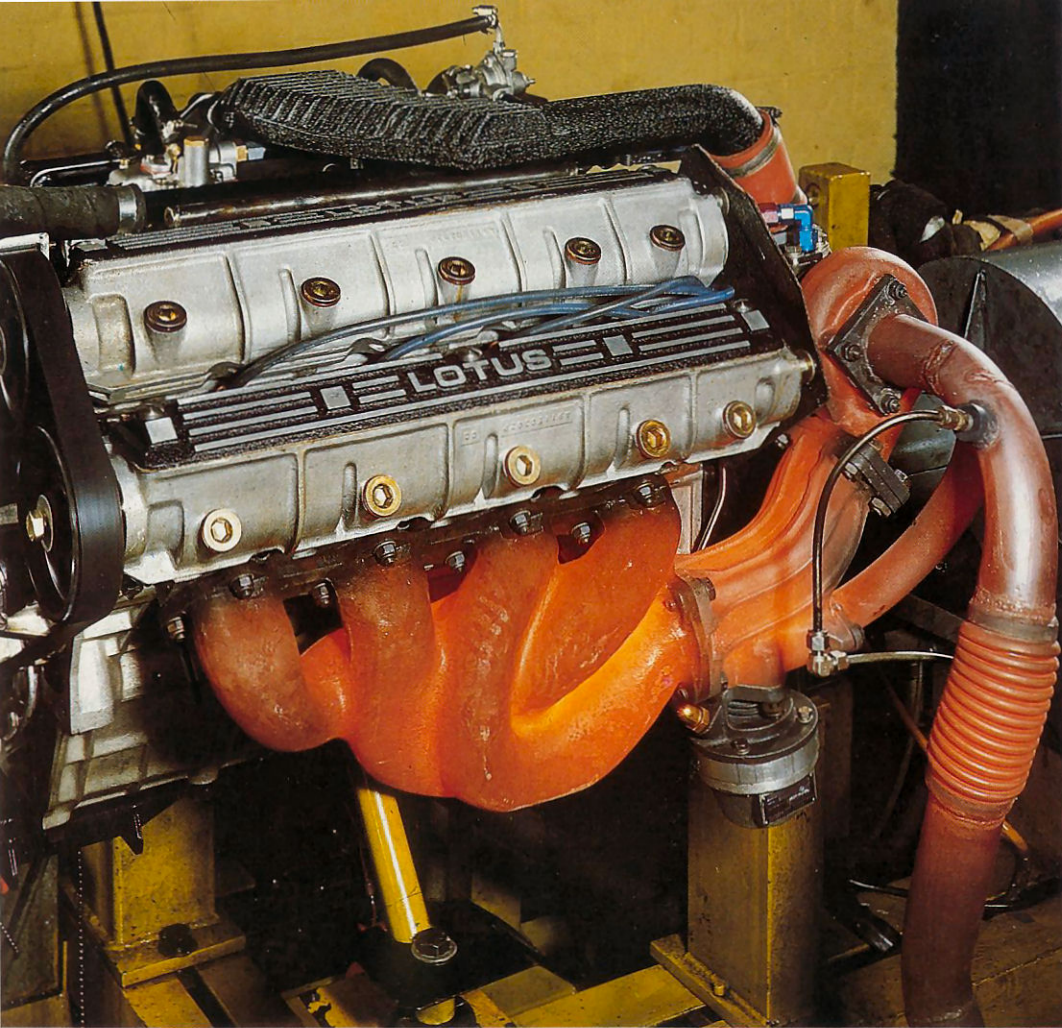


Selective fit of tappet shims during engine assembly.



Right hand page: Welding chassis.





A CAR WITH BACKBONE

At the centre of every Lotus there is a rigid steel chassis to support the engine and the suspension components. Accurately cut and shaped by numerically controlled machine tools, the chassis is hand assembled on a massive jig which ensures perfect alignment.

With typical Lotus thoroughness, the entire backbone chassis is hot-dip galvanised – probably the most effective anti corrosion process known.

POWER WITH PRECISION

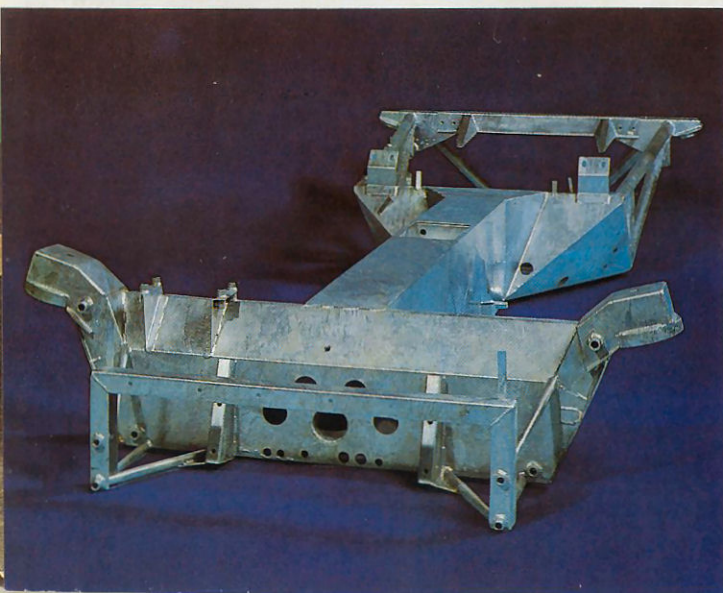
Lotus engines, designed by the company's own engineers, are assembled from components precision machined in the company's own works. The methods used have been perfected over many years' experience in the construction and preparation of high performance engines (of which over 30,000 have been built at Lotus).

The main aluminium castings for the 2.2 litre 16 valve engines are machined to a high degree of precision in numerically controlled machining centres. To ensure smoothness, the crankshaft/connecting rod and piston assemblies are matched for weight and balanced before assembly, and the four valves in each pentroof combustion chamber are individually ground and lapped to achieve perfect seals.

Engine testing is carried out using the latest electronic equipment, but as at every step in the construction of a Lotus car, the most valuable tools are the eyes and ears of an expert.

BEAUTY INSIDE AND OUT

Distinctive beauty is designed into a Lotus body. But it is practical beauty too. The



final shape is determined by comprehensive aerodynamic studies and by exacting wind tunnel tests. The resulting low drag coefficient with exceptional stability, even after accessories such as exterior mirrors are fitted, gives a remarkably high performance with excellent fuel economy.

Inside, a Lotus car can be trimmed to the customer's own requirements, selected from a range of materials which includes leather and cloth options. A dedicated team of men and women, skilled in leathercraft, cover the seats and interior surfaces with accurately cut and fitted quality hide, to give an atmosphere of comfort and luxury.

THE FINAL TEST

Careful analysis of the results of crash and stress testing at the Motor Industry Research Association have produced cars which are immensely strong and safe. This constant research allows improvements in safety standards to be made in all parts of the car.

But however safe, fast and exciting a car is designed to be, the customer's concern is whether it actually lives up to its promise. And that is where Lotus inspectors come in. Working independently of the production department, they are ruthless in their aim for perfection. Every part of the car is rigorously checked, from mechanicals to paintwork.

Finally it is taken onto the company's own 2.4 mile test track for at least three road tests to ensure perfection in working conditions.

Only when the Lotus inspectors are completely satisfied is the car passed on to the dealer and subsequently to the discerning buyer.



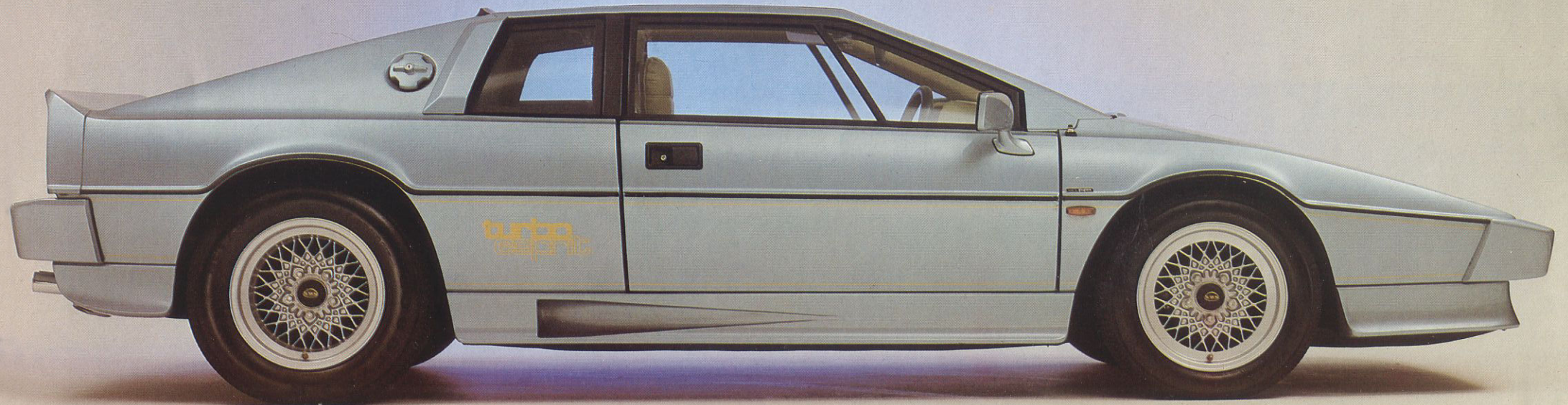
THE PERFECT COMBINATION

This brochure has demonstrated that Lotus combine the latest technology with traditional craftsmanship in perfect blend. Products built by

people who take pride in the excellence of their work.

The superb Lotus Turbo Esprit featured on this page epitomises the engineering design and manufacturing skills of the Lotus Group.

If you require specific or more detailed information on Lotus design, research and engineering services – or our exciting range of cars, telephone: Wymondham (0953) 608000.





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