

SPORTS CAR

GRAPHIC

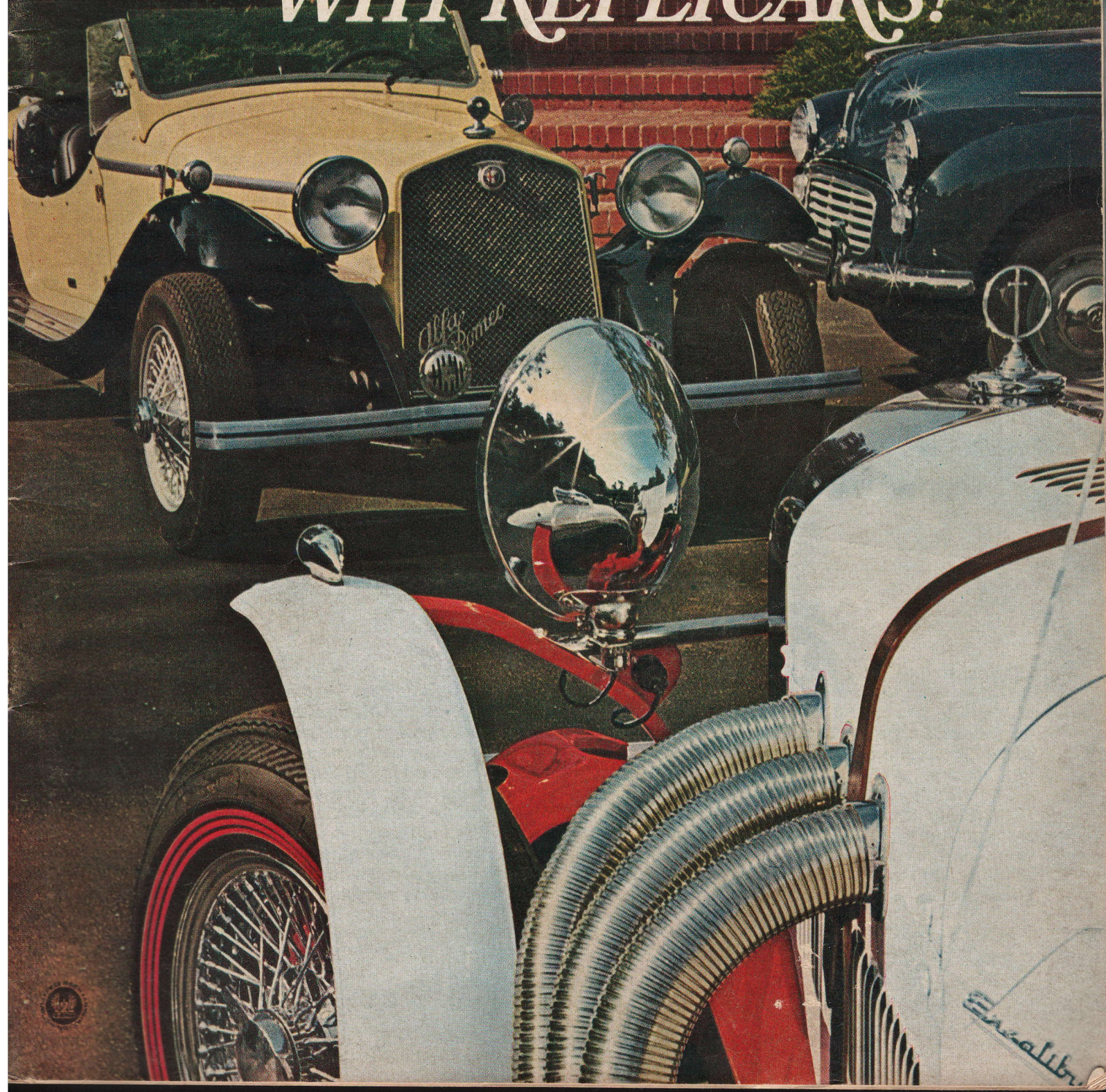
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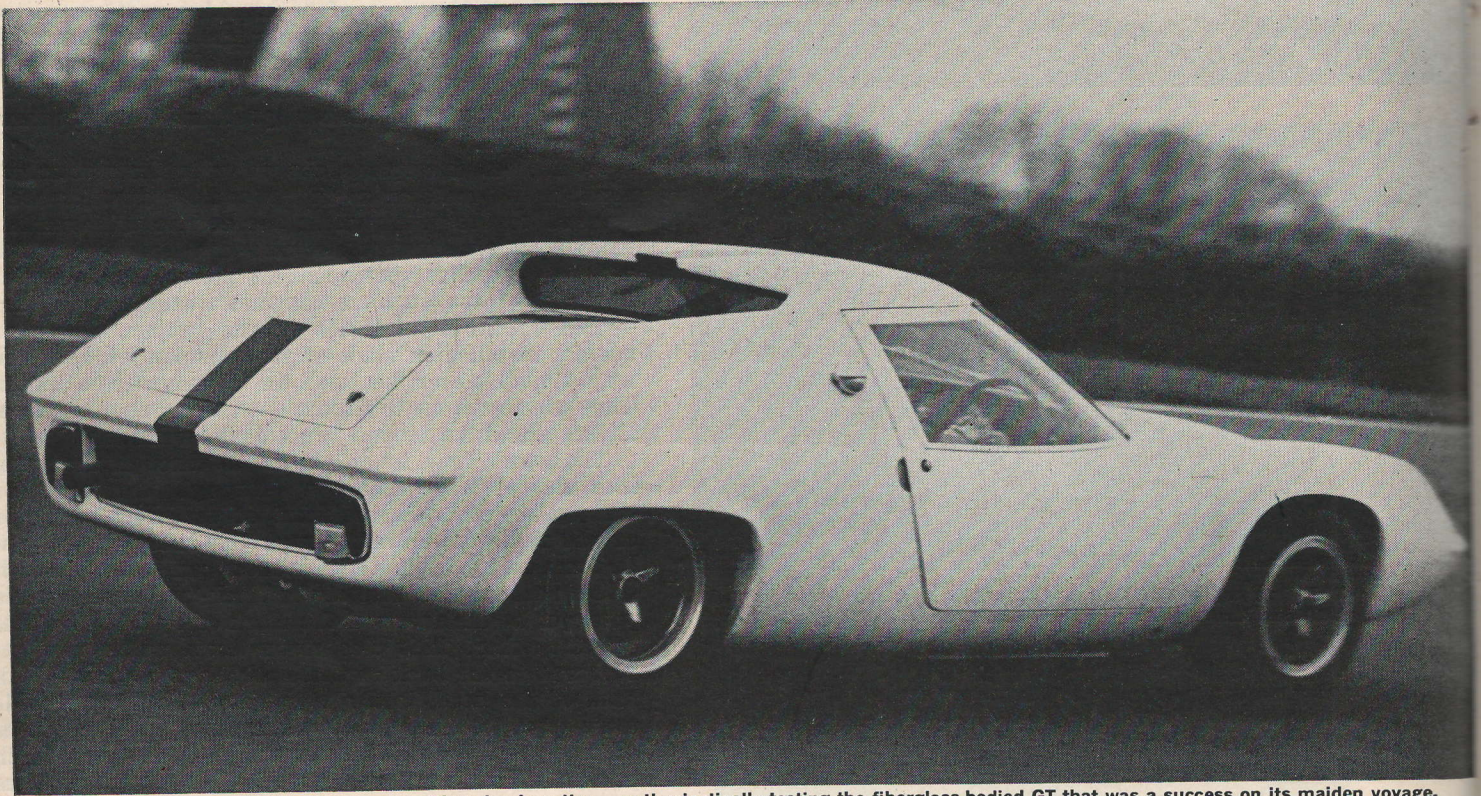
COMPLETE TESTS:
LOTUS 47 • VOLVO 144

WHY REPLICARS?

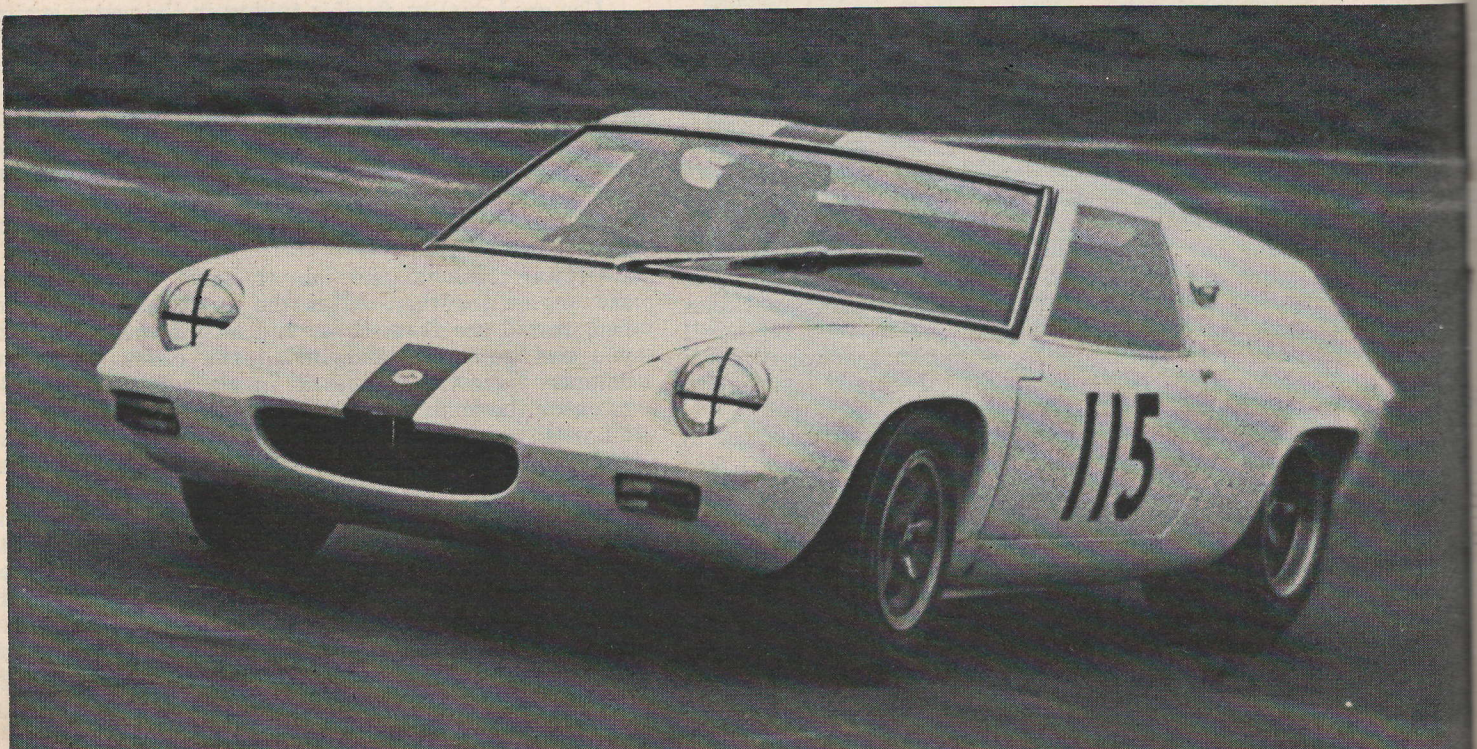


TRACK TEST LOTUS 47

It is one of those rare models that is a winner right from the start!



Blunsden in action — enthusiastically testing the fiberglass-bodied GT that was a success on its maiden voyage.



COLIN CHAPMAN WASN'T EXACTLY LAVISHED WITH GLORY LAST YEAR. And, when anyone wished him a "Happy New Year" on January 1, he no doubt thought: Well, it can't help being better than the last one.

Last year was filled with disappointments for Chapman and Lotus. Repco-Brabham and Matra did most of the winning in Formula 2 and Formula 3. The Lotus Types 30 and 40 were dead ducks in Group 7. Everything seemed to go wrong at Indy. And, when Clark finally won a Formula 1 race, at Watkins Glen, no one was more surprised than the "Guvnor." 1966?...Yech!

But this year's calendar started off with a lucky six—the number of races in the Tasman Championship—and the fortunes of Chapman and Lotus appear to be on the upswing. Okay, so the South African Grand Prix was a bust for the team; otherwise, this year has started well.

During the first few months of 1967, things have brightened considerably. The checkered flag has been waved at Lotus several times in the Tasman series. The Lotus Group has completed its big move to Norwich, which has larger facilities and a test track outside the back door. More customers are showing interest in the Lotus single-seaters (partly because Ron Tauranac has closed his Repco-Brabham order book). A Duckworth-designed, Formula 1 V-8 engine is on the way from Ford of Britain. The French have gone gooey-eyed over the Renault-powered Europa (Lotus 46). And the Europa race version (Lotus 47) looks like it might be the hottest thing in small-capacity, Group 6 racing—which brings us to the point of this article.

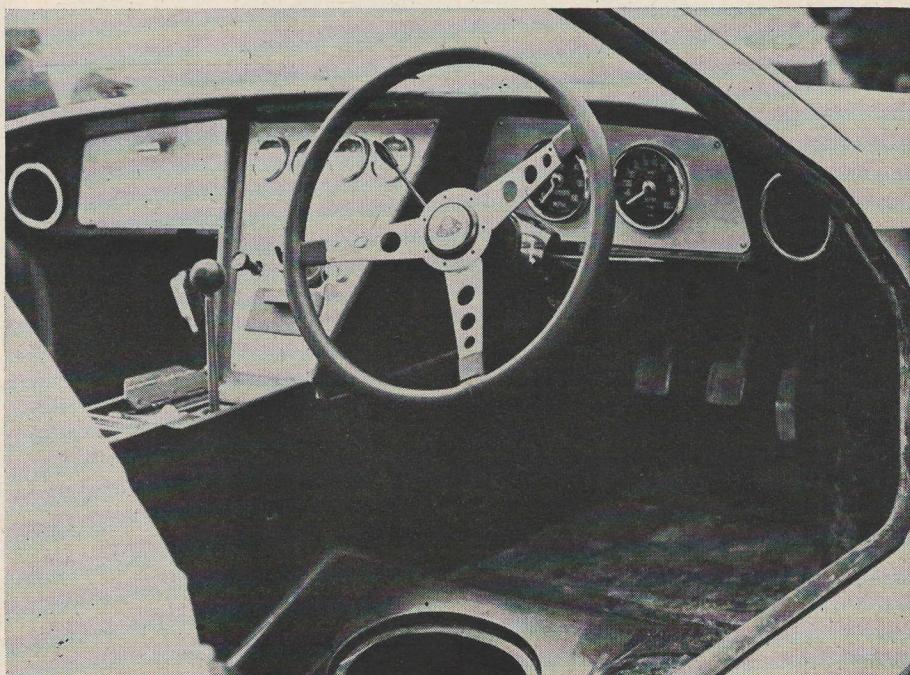
The Lotus 47 won its first race at Britain's traditional Christmas-holiday race meeting at Brands Hatch. The opposition there was modest enough, but a start-line drama helped focus attention on the car's potential.

Jack Oliver, whose car—the first of the production 47s—sat on pole, was left behind with a jammed starter. This left John Miles, in the original and rather tired prototype (it had also served as the prototype for the 46), to lead the race all the way and win comfortably, easing up. Oliver was push-started, which cost him a 60-second penalty, and then roared through the field on the wet track to slip tidily into second place behind Miles. A neat enough result.

The expected customer interest was awakened, and sales manager Gordon Palmer has been kept busy ever since. So, too, has the development section of



A head-on view reveals how really small the coupe is. Cockpit, below, is Elan-like.



LOTUS 47

Lotus, Components, Ltd., whose job it has been to carry out further circuit testing of the production car and give potential factory drivers and customers the chance to try it. It was at one of these test sessions at Brands Hatch that we were able to join the queue and, with Chapman's blessing, carry out the first track test of the car.

Though similar in line and concept to the Europa, the 47 is a very

different car beneath the skin. Customers' cars will be delivered with the Cosworth Mark 13C, 1.6-liter, Lotus-Ford twin-cam engine which, with Tecalemit-Jackson fuel injection, delivers 160 bhp at 7000 rpm (and there's another 500 rpm there if you really have to use it). The test car, however, had an experimental cylinder-head, which may become standard, and was probably turning out an extra 10 bhp at the same revs. A new 7½-inch, Borg and Beck, diaphragm-springs clutch is carried in an extended bell-housing and takes the drive through to the new Hewland FT200 five-speed transaxle.

The center steel-backbone of the

47 is a more elaborate structure than on the 46. It ends in a full hoop at the rear to provide suspension and gearbox supports; the engine fits into the triangle formed by the division of the backbone into two diverging arms. A boxed crossmember at the front end of the backbone carries the front suspension supports, the upper and lower wishbone arms being pinned to the frame structure by means of rubber bushings. The lower wishbones are fabricated in two parts, to facilitate assembly, but each top wishbone is a one-piece, tubular member, bell-jointed to the top of the wheel upright (the ubiquitous Standard-Triumph component), with screw-in camber adjustment. Adjustable coil-spring shocks are located immediately forward of the rear arm of the top wishbones. Lower spring-plat-forms are also adjustable. A 5⁄8-inch, non-adjustable, anti-sway bar is coupled to the base of the uprights, with location from the top wishbone pins.

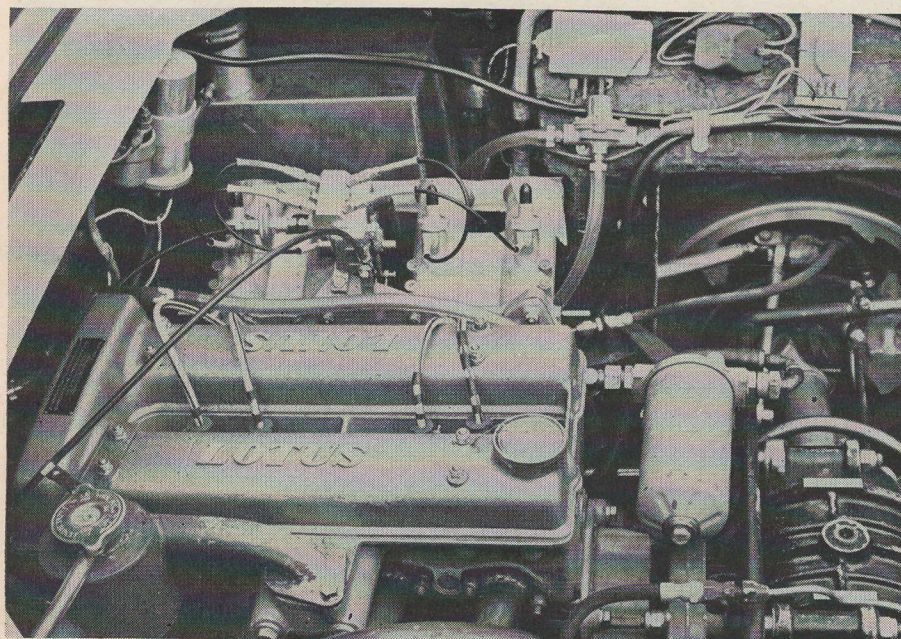
The rear suspension follows the classic form of reversed lower wishbones — single top transverse links and double radius arms, with adjustable coil-shock units, are fully ball-jointed and supported at the wheels by special magnesium castings. A high-mounted 1½-inch anti-sway bar runs immediately behind the rear-frame hoop, with vertical links tying it to the lower suspension-arms.

The Lotus 47 is set up with zero front camber, three degrees of castor, and ¼-inch toe-in for each front wheel. Rear-wheel camber is half a degree negative, and there's ⅛-inch toe-in per wheel.

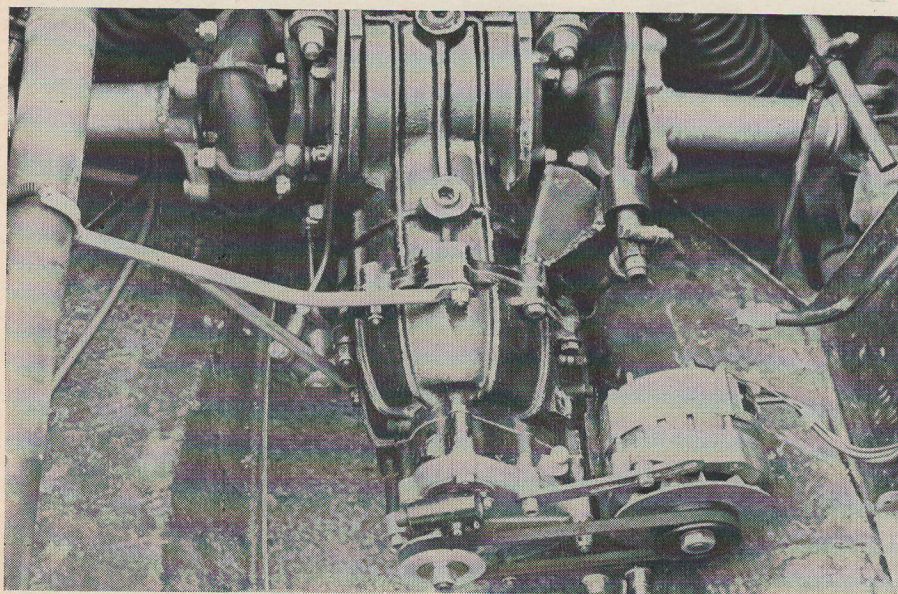
Brake discs are 9½-inch diameter all around and outboard-mounted; those at the rear are inboard of the magnesium hub-castings. Girling 16P calipers are used at the front and 12SPs at the rear, with Ferodo DS11 pads. Master-cylinder bores are 0.7-inch and 5⁄8-inch, respectively, for front and rear systems.

Lotus has had new 13-inch, four-spoke, magnesium, knock-off wheels cast for the 47, based on those used last year on the works Group 5 Lotus Cortinas. Rim widths are 7½J and 10J. The team is contracted to Firestone, so the test car was fitted with 5.50/8.10 and 6.00/10.50 Super Sport GP tubeless tires for Brands Hatch, running at 26 psi all around.

In terms of cockpit comfort, I would rate the Lotus 47 second only to the Ford GT40, and any claustrophobic effect which might have been expected because of the non-opening windows is more than offset by the fresh-air vents mounted in the cor-



Ford-based twin-cam, above, is port-injected, delivers 100 horsepower per liter in production form.



Hewland's FT200 transaxle is modified to pick up a drive through the layshaft to turn the alternator.

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LOTUS 47

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ners of the dash, which, at a twist of the flaps, give you anything from a light breeze to a full force-ten gale at racing speeds. Cockpit air is extracted through ducts along the edge of the vertical rear window, the shallowness of which is no real impediment to rearward visibility because of its close proximity to the rear-view mirror.

Driving position is strictly GP, with the inclined seat very well padded and shaped to give just the right sort of support where it is most needed. A full harness is provided, and this, too, is well-located behind the seat to give firm and comfortable support. The seats are fixtures, but the steering column and pedal assembly are mounted on a movable bridge structure—a sensible enough arrangement, except that some people might think the steering wheel and pedals are just a little too close to each other. Those who need it, of course, could always have a longer steering column. It would also be useful to have a footrest to the left of the clutch, not that there is much space for one on right-hand-drive cars.

The lateral location of the pedals is good, as is the instrument layout. Speedometer and tachometer are directly ahead of the driver. Oil temperature, oil pressure, water temperature, and ammeter gauges are lined high enough on a central panel to be read at a glance. There was nothing to indicate how much gas was left in the two ten-gallon tanks mounted in the front corners of the engine bay, which feed through one-way valves into a common collector tank.

One of the nicest surprises of the Lotus 47 was that it takes very little learning. Within a few laps you get close to your best times. The chassis rides fairly softly, and, in fact, the test car could have done with slightly stronger rear springs—over a series of undulations, I was able to get through to the bump stops. Also, there is a certain deadness in the steering, suggesting that maybe three degrees of castor is not quite enough. Otherwise, the steering is very good indeed—positive, accurate, and light—so you tend to get used to the deadness, until occasionally it forgets to tell you that the back end is coming around! Understeer predominates through slow corners, but handling is almost neutral through the faster curves. A momentary back-off will kill any understeer and can be made to induce an immediate oversteer; because you may get this message a fraction later than expected, you need to be fairly sharp with your responses if you are to put the car's changing attitude to advantage.

Fortunately, the concentration of weight towards the center of the car (distribution front-to-rear is 45/55 percent with half fuel-load and a 165-pound driver) aids stability a lot. The chassis

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LOTUS 47

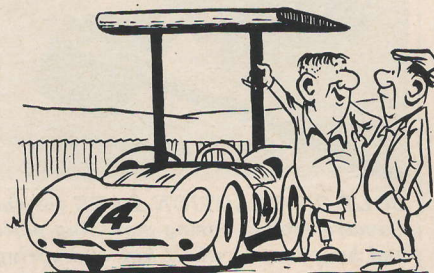
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reacts so well to correction that you can give it a mild oversteer at the end of the braking area going into a fairly fast curve, but neutralize it as soon as you have tightened your line and get the power on earlier because you have taken more road coming out. All this would be impossible if it were not for the car's outstanding traction. The power really gets through to the road with this one, and this, as much as anything, accounts for the 47's competitiveness in the up-to-two-liter class against opposition pushing out more horsepower at the flywheel.

The effective rev range of the 1.6 twin-cam is from 5000 to 7000 rpm (maximum torque of approximately 130 pounds/feet occurs mid-way through this band), which is quite adequate for a five-speed transmission when it is working properly. Unfortunately, this was not the case on the day of the test. The gearbox was the very first FT200 to be produced. When first installed in the car, it had been reluctant to select any gears, but gradually the Lotus mechanics got it working like a dream in time for the December 27 race. After that, it went back to the factory for an alternator drive to be fitted on the back face. It was returned to Lotus just in time for the track test.

Possibly because a tortuously routed linkage was to be fitted between the center shift and the right side of the gearbox (a straight run has since been provided), the box would operate properly only when it was set up a fraction loose, calling for minimum leverage from the linkage. While it was back at Hewland, the whole unit was given the once-over and, obviously, everything had been tightened to 'factory' tolerances. As a result, the Lotus 47 was once again gearless!

There was no time for a complete strip-down at the circuits, but by improving the linkage leverage, we eventually found all five gears, though third usually disappeared again after the first three or four laps following a cooling-off period in the pits. There was also a lack of feel in the clutch, accentuating the remoteness of the pedal from the plates — it was sometimes difficult to judge the withdrawal accurately.



"Originally it was to give us a little shade while we worked on the engine... then one day we forgot to take it off."

Had we not been so tied by circuit availability and could have waited one more day before testing the car, there would have been time to completely sort-out the transmission, and possibly to have incorporated the new linkage.

The braking performance on this comparatively low-speed circuit was excellent. I liked the firmness of the pedal, although the effort required for maximum, high-speed braking might have been just a little too high on a fast circuit — I am thinking of slow corners after 160 mph straights. Once you have learned not to move the steering wheel unnecessarily, the 47 becomes very stable under braking and the slowing-down process can be carried really deep into a corner.

With the 931 crownwheel and pinion (an 8/32 is also available and a 10/28 will be shortly), Brands Hatch became a three-gear circuit — third, fourth, and fifth. Though Cosworth recommends a 7000-rpm limit, everything runs so smoothly at that speed that there is a real temptation to make use of a few hundred more revs, and 7400 in fourth brought no ill effects at all.

Relating performance to lap times, on a perfect day the then-current official class record of 57 seconds would have sounded rather out-of-date, even before the Lotus 47 came along, and 56 seconds would have been a more fitting target time. By putting three top F3 drivers into the works Lotus 41 on the day of the 47 test, we established, through their identical fastest time of 54.9 seconds, that the circuit was at least one second slow as a result of two damp patches (F3 record is 53.2 seconds). Against this background, the Lotus 47's times were revealing.

John Miles recorded a best time of 56.3 seconds (and remember, apart from the second off for the circuit, you have to take a few tenths for the earlier braking necessitated by the gearbox trouble and the time lost in finding third). After a handful of 'warm-up' laps with nearly empty tanks, I came in for gas, having only just bettered the minute. I then went out for eight more. My third was in 57.9 seconds, which, according to the stopwatch, was my best. But from then on I was losing a lot of time chasing gears twice a lap, so two subsequent laps in 58.0 seconds probably represented a genuine 57.0 seconds.

In other words, you can jump into a Lotus 47 'cold,' and within a few laps can be driving it at what, up to now, has been fast enough to win any Group 6 race. And that's before you really get to know it. Jack Oliver, who has driven the car more than anyone else, and will be campaigning a factory entry this year, reckons that 54.5 seconds will be seen in ideal circuit conditions if he is pressed really hard. Only argument about that is that at 54.5 seconds, he's not likely to have many people around to do the pressing!

(Footnote: The Lotus 47 has been built to 'Group 4 Sports Cars' specifications with a view to re-homologation as soon as the required fifty have been built and sold.)