



IF YOU WANT AN INEXPENSIVE
SEMI-RACER THAT CAN RUN
FIGURE-EIGHTS IN A TWO-CAR
GARAGE AND YOU CAN SUFFER THE
SMALL AGGRAVATIONS OF IT ALL...

Lotus Europa S2



Chapman is Group Lotus Car Companies Limited, and a lot of authorities will tell you he is also the world's greatest engineer/designer of high-performance automobiles. For those who aren't aware of his specific esoteric engineering accomplishments, the fact that he has won three World F1 Manufacturers Cups without government subsidy, with a mainline production of only about 4500 cars per year, ought to mean something. Production is fairly evenly divided among three models, the old Elan, the new Elan +2, and the newest to the U.S. after four years of hesitation and federal compliance work, the Lotus Europa S2. (The Lotus 7 remains a limited-production model.)

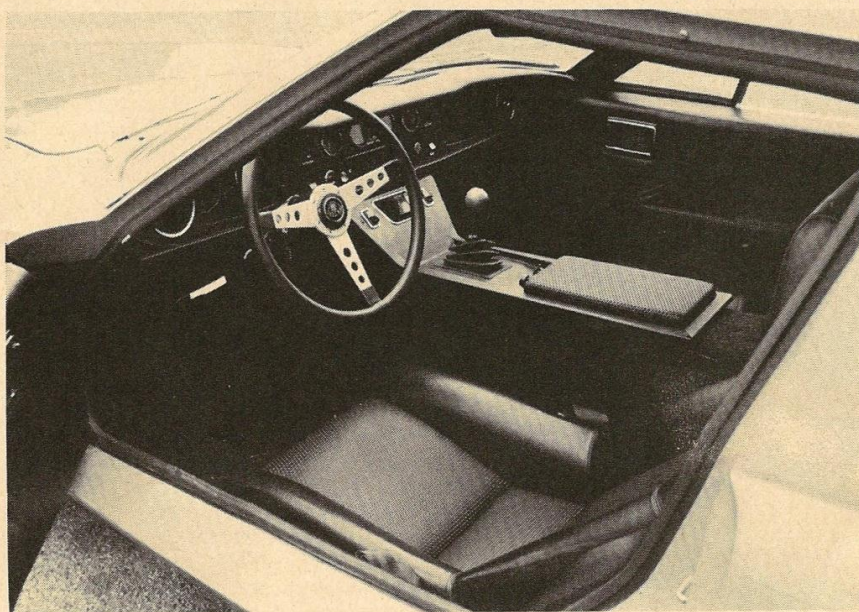
Only a very few race cars are built or sold each year, and yet that is probably where about 90 percent of all the mental horsepower is expended. In fact, the Europa is a street GT version of a car built for European FIA Group 6 racing. It took some persuasion by Kjell Qvale of BMCD over here to get the car Americanized for import, and even now it is somewhat lacking in the detail refinements and comfort expected in a GT coupe. Generally speaking, the car is a masterpiece of simple functional design, but when it came to the finishing touches and detail development, the boss should have stuck around. There is a limit to the amount of brilliance that can be hired by such a small manufacturer, and no one man can oversee every point on each car in so wide a line. If every race mechanic's dream is to work for Chapman, and every designer's dream is to work with Chapman, then the aficionado's dream ought to be having a car produced by him with the resources of, perhaps, General Motors. It can't happen of course, as every corporate design

is a committee design, and innovative genius just doesn't flourish in the great machine of engineering-by-mob.

After careful consideration by our staff mob, however, we feel that — if a cat may look at a king — we could offer some helpful suggestions on making the Europa more fit for human habitation. We try to keep in mind that the car was not originally intended for languorous daily transport, but still, you the public are interested in whether a potential purchase can be safely driven through city traffic. In this case, we can state with qualified reservations that probably you might be able to count on it, usually.

out anyhow. We did find the same tendency to be short-fused as before, and for no discernible reason. You just discover that on random excursions in it, nothing electrical works except the starter and sparkers. Putting everything from gauges to power winders on the same 35-amp fuse is just asking for nuisance. Get used to changing them in the dark.

At first, while testing, we also ran into serious overheating problems (Mr. Chapman — how *could* you?), and suspected the rather novel radiator ducting arrangement. The spare is placed foremost forward in the nose, ahead of the radiator, which is offset to the right, just ahead of



BELA LUKACS PHOTOS

Based on the experience we had with the Elan +2 a year ago (it came with a terminal case of self-disassembly) we considered equipping the Europa with an optional net underneath, to recover loose pieces. Not so, though . . . the only part that came loose was the rear luggage bin above the transaxle, and it couldn't drop

the wheel well, into which the air exits. Clear? But in spite of the auxiliary electric fan, and careful though complex air bleeding of the system, and ethylene glycol, the temp needle would hit boil at the drop of a pedal. Photography saved the day. Phantom numbers behind the grille, which appeared in our photo proof

sheets, turned out to be a dealers' license plate, which very effectively blocked about one-half of the air inlet. (BMCD, how *could* you?) Thenceforth it cooperated fully.

The rest of our objections are primarily about interior compatibility, like just getting in and out. Even though the door is farther forward than on the Elans, the seat is more so, from having an engine in the back, and this really is one of your more difficult cars to swing into. It definitely requires the "butt first — knees up — two in atta time" approach. Just helping ladies in and out could become a very popular avocation, but for yourself, the gymnastics are a dreaded chore. Especially since the doors have no hold-opens of any sort.

The seat and seating position are quite proper — after all, this is a race-bred machine — for race drivers 5'10" and under, with short legs. For larger sizes, the right knee prevents use of the right turn signal. Actually, the signal can be rotated out of harm's way by locking the column with the ignition key and applying a little stress to the steering wheel. You can rotate the column, and turn indicators, and dimmer stalk, to wherever you choose. Really though, for long straights or hard corners, it has an extremely suitable seat.

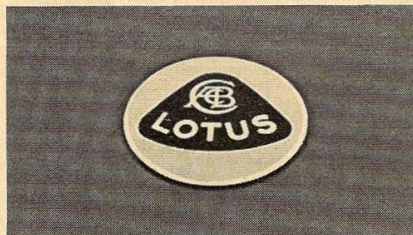
The view is not so hot. The British don't seem to be able to curve glass without kinking it, and most of the limited production limeys we get are vision benders. In this instance, the ripple was *directly* in the line of sight, but by crouching, it could be relegated to tall signs and traffic signals. On the other side, the right side (the "proper" side over there), vision seemed flatter, but, you know, "grass is greener...." There's plenty of glass, and you sit close enough for a broad field, and in spite of the low-down seats you can see well ahead... *ahead* ... 180° ahead, but not behind. As you can imagine from appearances, the rear quarters are *blind*. It really needs a good outside mirror on the passenger side to detect sem-eye trucks hiding there.

All the previous stuff is just aggravation, whereas the pedal situation is tragic. We admit that on the original British right-hand drive version the pedal placement is probably far more agreeable, since the footbox on that side is just a little bit wider, but land sakes, man, the pedals on our car were unfit for foot. In the first place, they have to be the smallest, daintiest ever, with a brake pad like a postage stamp (more precisely, it can be covered with *four* postage stamps), and there is barely room for a 5/8-inch-wide accelerator pedal. Unknowing observers were confounded during our acceleration runs when the brake light kept coming on, and during the brake stops when the engine ran up in the rpms. It's nice to have them close for heel-and-toeing, but even barefoot we couldn't isolate either one from the other. Finally, in apprehension

and desperation, we climbed down into the well and bent them apart — by hand, mind you — for a more equitable spatial distribution. The folks upstairs recognize there's a problem, though, and have promised a factory fix. Then the accelerator cable started sticking in its housing. And there's so much mickey-motion in the tortuous shifter system that the fastest way to find reverse gear is to disassemble the transaxle.

With all this indignant bitching, you think we don't like the car don't you? Well you're wrong... we don't like *ourselves* for not getting along with such a marvelous machine. Basically it really is — as a second or third or fourth car that is kept like a mistress and just used only for the sheer pleasure of driving quickly where the road is twisty and empty. Lotus handling is very unlike any other sports car you can license. Light weight has to have a lot to do with it, and 1450 wet pounds is an all-time record around here. With such a light load, very fast steering can be used with little effort, and the feel is quite reminiscent of a go-kart. Total lock-to-lock travel is only slightly greater than the freeplay in a two-ton Detroit hog.

Credit for the lightness comes largely from the semi-monocoque fiberglass body with steel backbone stiffener. All the im-



portant loads go into brackets on the backbone, while the body supports only you, your baggage, and the fuel tank. For some odd reason there is more room for baggage (fore and aft) than the driver, and at that, there is lots of wasted space behind the passenger seat and around the spare up front.


Light empty space does great deeds for performance, though. So much so that the only fair comparison is to the also-ohv, rear-engined, 1600-pound Abarth Scorpion, a similar car in many ways, especially price and performance. With a little less weight and a little less power from a larger engine, the Lotus takes a little less time through the quarter. At 16.9 seconds, it's one of the quickest cars for its size. When you can get away without riding the brakes.

The brakes: *extraordinaire*. When you can get stopped without riding the accelerator. On one well-planned and executed stop, the driver was able to hit just one pedal, and drew the car up without lockup in 133 feet from sixty. Very good, for the tiny 155x13 Dunlops, and just one foot farther than Porsche's 914 with the same size tires. Conversely, on one stop when the driver's foot became wedged against the steering shaft, the

distance was over 180 feet. Averages don't count when you really need your brakes in a true emergency. Like with the steering, though, light vehicle weight means a favorable force ratio and therefore good feel. It was so good that at the limit of right front lockup, the pedal could be modulated well enough to maintain some tire rotation to prevent flat-spotting. (The test recorder showed an average 30 mph for that wheel while the car was going from 50 to 40.) Stability and fade resistance are also exceedingly great, as befitting a car of such heritage.

In our standardized handling test, this particular car didn't burn-in any fantastic new records, in spite of its feel of absolute superiority. The maximum lateral cornering power was limited by some sort of chassis asymmetry, giving an undesirable understeer limit in right turns and a neutral-steer that was too close to oversteer in left turns. The performance data tells the story, with right turn g's down about 8 percent because of the excessive plowing in that direction, but careful tip-toeing on the edge of oversteer the other way produces a better figure. It just may be that the addition of 50 pounds of fuel and a 160-pound driver on the left side of a 1400-pound car, is too much imbalance to correct with anything but varied suspension alignment. At any rate, the low mass and low polar moment of inertia means it can be pulled out of almost any near tragedy with little more than body english.

Speaking of bodies, this is really a good one for close examination. Besides its technically brilliant design, with the integration of components and simplicity of construction, it is aerodynamically superior to anything we've ever tested. Small frontal area helps a lot, but we suspect wind tunnel and road tests helped get the total drag down to 185 pounds at 100 mph, barely above, but within experimental error of, that of the Scorpion. You could practically pedal it along at freeway speeds. Just as impressive is the air lift, at a low 95 pounds on the nose, and 55 pounds *down* at the rear. Obviously there is a high pressure area in that full tray on the rear deck, which spills through the screened openings to the carb inlets. If it's really that functional it can't be ugly.

We confess: 90 percent of the objections we have against the American Europa are simply because it doesn't come in our *size*. Functionally, esthetically and subjectively it is a seventeen-jewel watch-stopper, they just didn't take time to knock the sharp edges off, that's all. If you want an inexpensive semi-racer that is nimble enough to run figure-eights in a two-car garage, *and* you are astigmatic, under five-ten, and wear a size three shoe, *or* you are skillful with a hammer and saw, you just can't find a more exciting car for the dollar. To borrow an analogy from our last Lotus test: this may be the closest a person could ever come to riding in a slot car. 

LOTUS EUROPA S2

PRICE

Base\$4645 (POE West Coast)
As tested\$4645
With optionsNone

ENGINE

Type4-cylinder, in-line, water-cooled,
aluminum block, aluminum head
Displacement95.5 cu. in. (1565 cc)
Horsepower82 hp @ 6000 rpm
Torque79 lbs.-ft. @ 4000 rpm
Bore & stroke2.99 in. x 3.19 in.
(76 mm x 81 mm)

Compression ratio10.25 to 1
Valve actuationPushrod/rocker arm
Induction systemSingle 2V Solex
Exhaust systemCast-iron headers, 4 into 1
Electrical system12-volt alternator,
point distributor
FuelPremium
Recommend redline6500

DRIVE TRAIN

ClutchSingle dry disc
Transmission Gear Ratio Overall Ratio
1st Synchro3.6112.86
2nd Synchro2.258.01
3rd Synchro1.485.27
4th Synchro1.033.67
Differentialhypoid, 3.56 ratio

CHASSIS

FrameSteel backbone,
mid-engine, rear drive
Front suspensionDouble A-arms,
concentric spring/shock units,
anti-roll bar
Rear suspensionIndependent, trailing arm
with axle-and-strut lateral location,
concentric spring/shocks
SteeringRack and pinion,
2.2 turns,
turning circle 44.0 feet
BrakesFront disc, rear drum, dual systems,
9.75-in. dia. front,
8.0-in. dia. rear
Wheels13-in. dia.; 4.5-in. wide
TiresDunlop 155 HR 13
pressure F/R: 18/28 (rec.), 22/32 (test)

BODY

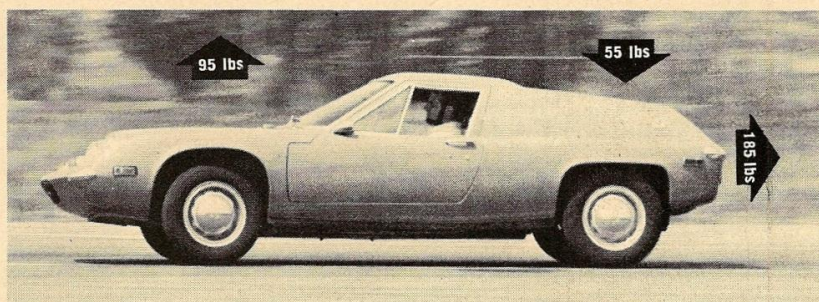
TypeReinforced fiberglass, 2-door,
2-passenger
SeatsFront bucket
Windows2 power, no vents
Luggage spaceFront and rear trunk,
7.0 cu. ft.
Instruments140 mph speedo, 8000 rpm tach
Gauges:amp, oil pressure, temp, fuel
Lights:ignition, brake-fail

WEIGHTS AND MEASURES

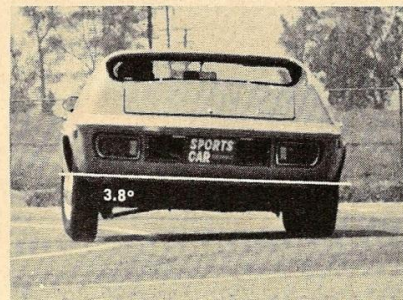
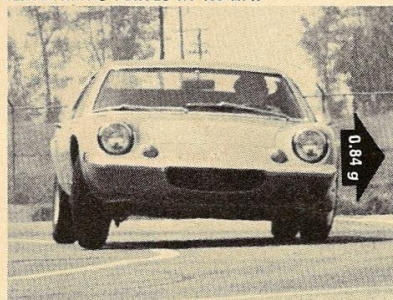
Weight1455 lbs. (curb), 1680 lbs. (test)
Weight distribution F/R46%/54%
Wheelbase91.0 in.
Track F/R53 in./53 in.
Height42.5 in.
Width64.5 in.
Length157 in.
Ground clearance6.5 in.
Oil capacity4.5 qt.
Fuel capacity7.2 gal.
Coolant capacity10.8 qt.

MISCELLANEOUS

Weight/power ratio17.8
(curb/advertised)lbs. per hp
Advertised hp/cu. in.0.86
Speed per 1000 rpm (top gear)18.2 mph
Warranty6 months/6000 miles



AERODYNAMIC FORCES AT 100 MPH



CORNERING CONDITIONS

PERFORMANCE

Acceleration0-30 (3.1 sec.), 0-60 (10.2 sec.),
0-quarter mile (16.9 sec., 80.5 mph)
Top speed118 mph (est.) at 6500 rpm (rpm limited)

Braking.....Distance from 60 mph: 133 ft. (0.91 g av.)
Number of stops to fade: Not attainable
Stability: Excellent
Maximum pitch angle: 1.8°

HandlingMaximum lateral: 0.78 g right, 0.84 g left
Skidpad understeer: 6.5° right, 0° left
Maximum roll angle: 3.8°
Reaction to throttle, full: More understeer; off: Less understeer

Speedometer	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
Actual mph	28.0	37.5	47.0	56.5	65.5	75.0	84.0	93.5

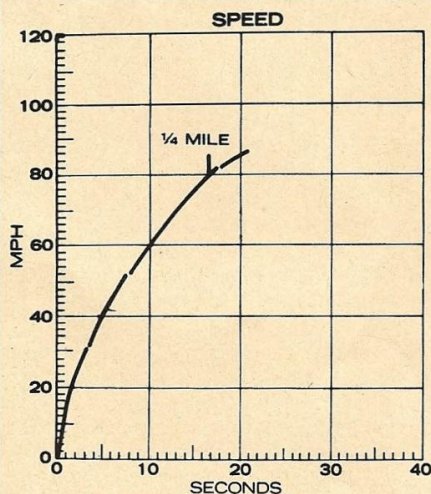
MileageAverage: 30 mpg
Miles on car: 1700-2300

Aerodynamic forces at 100 mph:

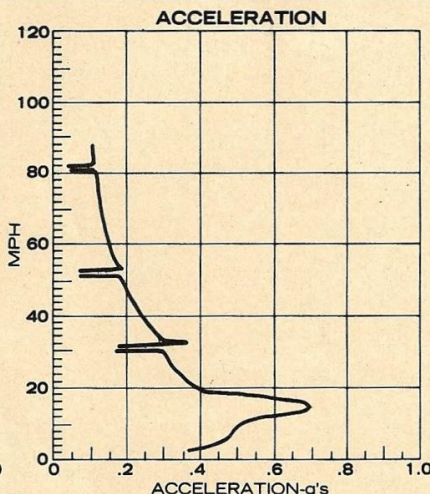
Drag185 lbs. (includes tire drag)
Lift F/R95 lbs. / -55 lbs.

TEST EXPLANATIONS

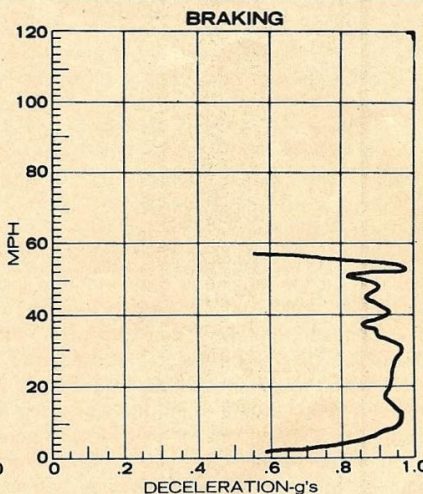
Fade test is successive maximum g stops from 60 mph each minute until wheels cannot be locked. Understeer is front minus rear tire slip angle at maximum lateral on 200-ft. dia. Digitek skidpad.



Speed measured from standing start thru 1/4 mile to maximum shown. Shift points indicated by line breaks.



Acceleration measured in "g's" from standing start to speed shown. Shift points indicated by "spikes" on graph.



Brakes applied at 60 mph with maximum force, but using pedal "feathering" technique to prevent wheel lockup.