

MOTOR ROAD TEST No. 29/67 • Lotus Elan + 2



Even under vicious cornering, the car remains on an even keel.

PUNCH HERE TO FILE



Elan plus a lot

"... the uncanny cornering powers of this remarkable machine equal or exceed those of any other production car we have driven..."

THIS report is something of a landmark in the history of *Motor* road tests. Ignoring the fact that it is the first and only comprehensive one you can read about the new Lotus Elan today, it is significant as one of those rare and memorable tests that have dictated a re-appraisal of some of the standards by which we must judge and assess all future cars. Of course it would be absurd always to wear our expensive sporting caps while compiling a report on, for example, a cheap family saloon. Nevertheless, we cannot graduate our standards for comparison without being guided by upper and lower limits and it is some of these absolute standards—the upper ones, we need hardly point out—for which the exciting Elan + 2 has made such a successful take-over bid.

Let's be specific. The uncanny cornering powers of this remarkable machine equal and probably exceed those of any production car we have driven before: similarly the handling and brakes are certainly not bettered. Greater performance can be bought elsewhere but according to our records no other four-seater is capable of reaching 60 m.p.h. in only 8.2 seconds or a

maximum of 125 m.p.h. on a mere 1,600 c.c. And how many family saloons can do 63 miles to the gallon while trundling through town in top gear, or even 35 m.p.g. at 60 m.p.h.? Even better figures than these could be recorded with the optional higher final drive ratio. At 17 cwt. the Elan + 2 is not a particularly light car so the credit for these remarkable figures must go to the magnificent engine and the efficiency of the streamlining.

Not many people are going to contradict us, either, if we suggest that this is one of the finest looking cars to be designed and built in Britain, confirming that aerodynamics and fashion are not incompatible. A close examination of the glass fibre body reveals a higher standard of finish, inside and out, than Lotus have achieved before, accentuating that this car is not merely an exciting driving machine but a refined and civilized grand tourer offering sumptuous comfort for two adults and perfectly acceptable accommodation for two teenage children.

It feels (and is) a much bigger car than the two-seater Elan and possibly loses some of the exceptional agility of the smaller car—especially as you can't see quite so well over the high sills. But better streamlining and more power compensate for the extra weight.

PRICE: £1,672 in component form; £1,923 ready made including £369 tax.

Continued on the next page

Lotus Elan +2 *continued*



The bolstered bucket seats and extended-arm driving position are among the most comfortable we can recall. The metal-reinforced fibre-glass sill offers more protection to the passengers in a side crash than the unstrengthened two-seater Elan's.



With the front seat well forward, there is quite generous legroom behind. As this six footer demonstrates, it is possible for a large adult to ride in the back.



Our test car certainly had a few detail faults. There was a rattle in both doors, a slight smell of petrol whenever the windows were open and the clutch was absurdly heavy (it has since been re-designed). But as the chassis number was 0001, these odd minor ailments were forgivable. The only things we didn't like were the gear ratios and the excessive and disturbing surging (caused by wind-up in the rubber joints of the drive shafts) which could only be suppressed by extreme delicacy on the throttle.

Performance and economy

To compensate for the additional weight—an extra $3\frac{1}{2}$ cwt. on top of the ordinary Elan—all +2s have the 118 b.h.p. (net) Special Equipment engine, similar to that of the latest Cortina Lotus. (Lotus plan eventually to standardize on this engine which has new piston crowns for better combustion, bigger exhaust valves, a new distributor and larger jets for the Weber carburettors.) As the performance figures show, the gains and losses have cancelled out so that 100 m.p.h. can be reached through the gears in exactly the same time (24.2 seconds) as the last two-seater Elan that we tested.

This magnificent engine which starts promptly without any choke punches out its power in a smooth even flow from 1,000 r.p.m. to 7,000 r.p.m. so if you are feeling lazy top gear will pull away evenly from 25 m.p.h. Normally we would regard 6,500 r.p.m. as a generous limit (one seldom holds the lower gears above 5,500 r.p.m.) but since there was no ignition cut-out on our test car we were able to let it go during the maximum speed runs. In fact the maximum is too high to be honestly recorded on MIRA's banked circuit, our 122.5 m.p.h. (6,860 r.p.m.) being the mean speed over the three short straights. Taking into account the considerable tyre drag on the banked turns at this sort of pace, the true flat road maximum must be at least 125 m.p.h. if you are ready to let the revs build up that high. This astonishing performance supports the makers' claim that the drag coefficient of the body is one of the lowest ever achieved on a production car. If the long, drooping nose bears more than a passing resemblance to the Le Mans Rover-BRM it is probably because the parent companies were working in collaboration during wind tunnel experiments. It goes without saying that the car is just ambling along at 90 m.p.h. (5,050 r.p.m.)—a speed it could maintain effortlessly all day on a motorway if the Law allowed. High-speed cruising would be even less of an effort with the higher final drive. It seems so absurd to potter along a three lane dual carriageway at 70 m.p.h. that we preferred to take the alternative cross-country routes and enjoy the car's formidable acceleration and roadholding instead.

The brakes are also superb. Like the Cortina Lotus, the Elan +2 has been given a servo—the first real production Lotus to have one if you regard the Cortina as wholly Ford. Whether the imperfect feel of a servo-system is worth sacrificing for lighter pedal pressures is a matter of personal taste but, objectively, the brakes' performance cannot be faulted—except on the 1 in 3 hill where the handbrake failed to secure the car. It just coped on

Lotus Elan +2

£1,672 or £1,923

Austin Healey 3000

£1,207 with a/d

Alfa Romeo GT1300

£1,649

Gilbern 1800

£1,129 or £1,414 with a/d

MG B GT

£1,126 with a/d

Porsche 912

£2,428

Reliant Scimitar

£1,516

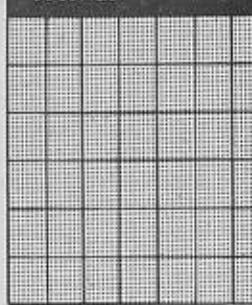
MAXIMUM SPEED

80 85 90 95 100 105 110 115 120 125 130 135 140
m.p.h.



ACCELERATION

26 24 22
seconds



a 1 in 4 slope. Such is the astonishing adhesion that you can actually dive into a corner with the brakes hard on without skidding.

Comfort and controls

The exceptional roadholding has not been achieved by sacrificing any riding comfort. The relatively soft, resilient suspension not only keeps the wheels firmly on the ground (and prevents the under-tray from grounding) on bumpy corners but also carries the car very smoothly on secondary roads so it is seldom necessary to slow down because of a poor surface. Roll, pitch and sway are almost completely absent and what little vertical movement there is feels well damped. This riding comfort is enhanced by firm seats and an outstanding driving position. There is

considerably more elbow room than in the ordinary Elan so that, although you are still equally well located against cornering forces, you don't feel so tightly hemmed in. The fixed-back seats (adjustable squabs do not seem necessary) are well bolstered round the edges and slide well back so a six footer can stretch out comfortably behind the leather-rimmed steering wheel, which is ideally placed for an extended arm driving position. Some of us would have liked to raise the seat slightly because the scuttle is quite high and the top rim of the steering wheel protrudes well above it. The hanging pedals are slightly off-set to the right but ideal for heel and toe operation and there is sufficient room on the left of the clutch to rest your idle foot.

The separate back seats—divided, like the front ones, by the

Continued on the next page

Performance

Performance tests carried out by Motor's staff at the Motor Industry Research Association proving ground, Lindley.

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Conditions

Weather: Dry, light wind 0-18 m.p.h.
Temperature 65°-70°F. Barometer 29.42-29.48 in. Hg.
Surface: Dry tarmac and concrete
Fuel Super 101 octane (RM), 5-star rating.

Maximum speeds

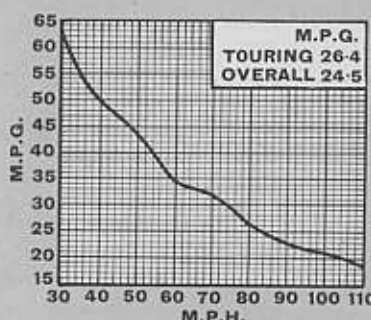
	m.p.h.
Mean of three MIRA straights (see text)	122.5
Best one-way $\frac{1}{4}$ mile	125.0
3rd gear	82.5
2nd gear	58.0
1st gear	39.0
"Maximile" speed: (Timed quarter mile after 1 mile accelerating from rest)	
Mean	118.2
Best	120.0

Acceleration times

m.p.h.	sec.
0-30	3.3
0-40	4.5
0-50	6.2
0-60	8.2
0-70	11.3
0-80	14.4
0-90	18.5
0-100	24.2
0-110	32.9
Standing quarter mile	16.6
	Top 3rd
m.p.h.	sec.
10-30	7.3
20-40	9.9
30-50	9.1
40-60	8.5
50-70	8.5
60-80	8.5
70-90	8.9
80-100	10.3

Hill climbing

At steady speed		lb./ton
Top	1 in 7.8	(Tapley 285)
3rd	1 in 4.9	(Tapley 445)
2nd	1 in 3.5	(Tapley 640)



Fuel consumption

Touring (consumption midway between 30 m.p.h. and maximum less 5% allowance for acceleration)	26.4 m.p.g.
Overall	24.5 m.p.g.
	(= 11.5 litres/100 km.)
Total test mileage	1,300 miles
Tank capacity (maker's figure)	13 gal.

Brakes

Pedal pressure, deceleration and equivalent stopping distance from 30 m.p.h.		
lb.	g	ft.
25	0.35	86
50	0.63	47.5
75	0.92	32.5
95	0.98	30.5
Handbrake	0.36	83

Fade test

20 stops at $\frac{1}{2}$ g deceleration at 1 min. intervals from a speed midway between 30 m.p.h. and maximum speed (= 77 m.p.h.)

	lb.
Pedal force at beginning	30
Pedal force at 10th stop	30
Pedal force at 20th stop	30

Steering

Turning circle between kerbs:	ft.
Left	28
Right	28
Turns of steering wheel from lock to lock	2.7
Steering wheel deflection for 50 ft. diameter circle	0.9 turns

Clutch

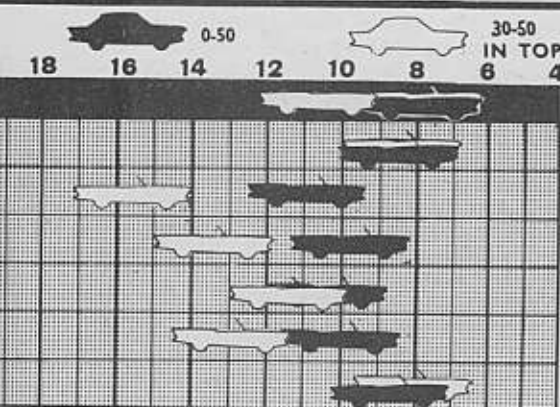
Free pedal movement	$\frac{1}{2}$ in.
Additional movement to disengage clutch completely	1 in.
Maximum pedal load	55 lb.

Speedometer

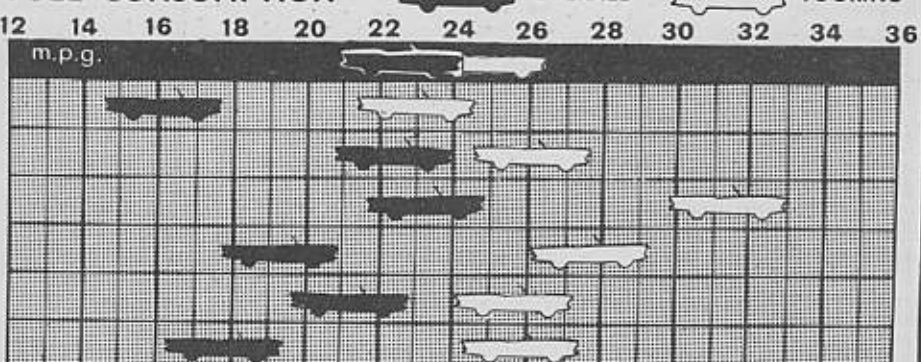
Indicated	20 30 40 50 60 70 80 90
True	22 32 41 51 61 70 80 90
Indicated	100 110
True	102 113
Distance recorder	0.05% fast

Weight

Kerb weight (unladen with fuel for approximately 50 miles)	16.8 cwt.
Front/rear distribution	48/52
Weight laden as tested	20.5 cwt.



FUEL CONSUMPTION





The exceptional width of the track and tyres contribute to the car's outstanding cornering powers.

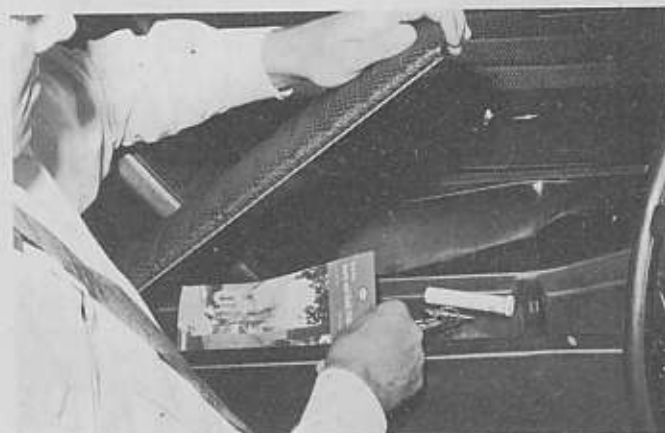
The bug-eyes of the 2-seater Elan (furthest from camera) are a little more attractive than the +2's.



Lotus Elan +2 *continued*

high upholstered backbone—are a lot more generous than those of some GT cars. Anyone over 5 ft. 6 in. tall will find leg room cramped (unless the front seats are pushed well forward) and their head touching the roof. Nevertheless, for short journeys, the accommodation here is tolerable for adults. Smaller children, though perfectly comfortable in the back, found it difficult to see out of the high-silled windows without kneeling. Because of the very low seat and wider body, the driver's view out is less commanding than in the smaller Elan, though there are no bad blind spots. The lights of our test car were very disappointing. Apart from the fact that they needed readjustment, the raised pods wobbled enough to flicker the beams which seemed unusually dim anyway.

In contrast, the heating and ventilation—often dismally neglected in closed sports cars—are excellent. In fact the swivelling side vents are a little more efficient than those of the Hillman Hunter (from which they were borrowed) because your hands do not get in the way of the airstream. The heater is very powerful but stiff horizontal levers on our car made it difficult to control. The



The central arm-rest conceals a shallow tray for small oddments.

Safety Check List

Steering assembly

Steering box position	Rack and pinion ahead of engine
Steering column collapsible	No
Steering wheel boss padded	No
Steering wheel dished	Slightly

Instrument Panel

Projecting switches	Yes, lots
Sharp cowls	No—but hard rim to dials and vents
Padding	Thick eyelid over facia

Windscreen and Visibility

Screen type	Triplex laminated
Pillars padded	No
Standard driving mirrors	One inside
Interior mirror framed	Yes
Interior mirror collapsible	Yes
Sun visors	Two—thick and squashy

Seats and Harness

Attachment to floor	By two bolts to fixed floor runners
Do they tip forward?	Yes
Head rest attachment points	None
Back of front seats	Hard frame, soft in middle
Safety harness	Lap and diagonal, 3-point mounting
Harness anchors at back	No

Doors

Projecting handles	Yes
Anti-burst latches	No
Child proof locks	No—but only 2 doors



The inertia reel belts disappear neatly into a slot behind your shoulder.



Through-flow ventilation can be finely adjusted by turning this central knob.

The boot is wide but shallow, best suited to slim (or fitted) suit cases—or better still none at all, packing luggage in individually instead. Our test boxes total 4.2 cu. ft.



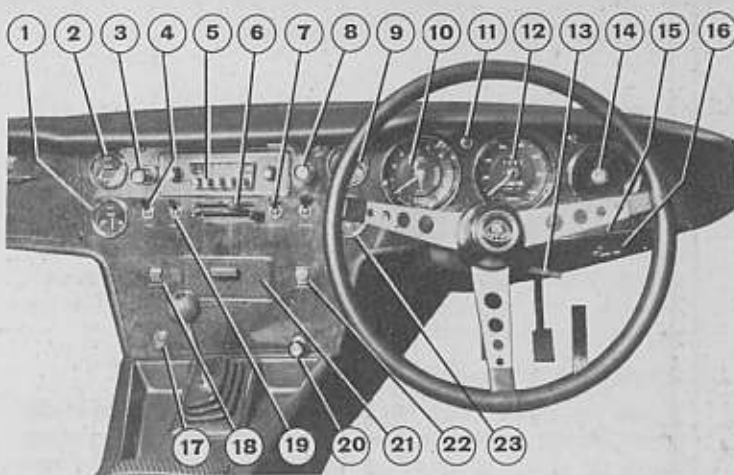
multi-curved side windows slide swiftly into the doors at the touch of a button on the fascia. Moreover, they can be left open even when driving fast without admitting much wind (or noise). With the windows up, the + 2 is really quite a quiet car so long as the engine is not revving hard. Suspension, transmission and tyre noise have all been efficiently isolated.

Fittings and furniture

The polished walnut fascia is heavily loaded with dials and switches, with the rev counter and speedometer prominently displayed ahead of the driver. The most often used switches—wipers and lights and the horn/indicator/dip stalk—are all close to the wheel, the latter a bit too close in the dipped position.

There is an ash tray in both doors (as well as one on the fascia) just beneath the fixed quarter lights so there is no need to flick your cigarette ends out of the window. Three interior lamps—all of which come on when a door is open—light up the inside quite brightly at night though the sun visors, because of the low seating, do not provide much protection against glare at dawn or dusk. The central divide has a useful oddments tray around the gear-lever gaiter, and a very shallow compartment, suitable only for cigarette packets, maps, etc., under the padded armrest. There are two more usable indents in the divide at the back. Small valuables can be kept in the lockable fascia cubby or the boot—provided you can remember which key works what lock: three different keys for one car can be an awful nuisance.

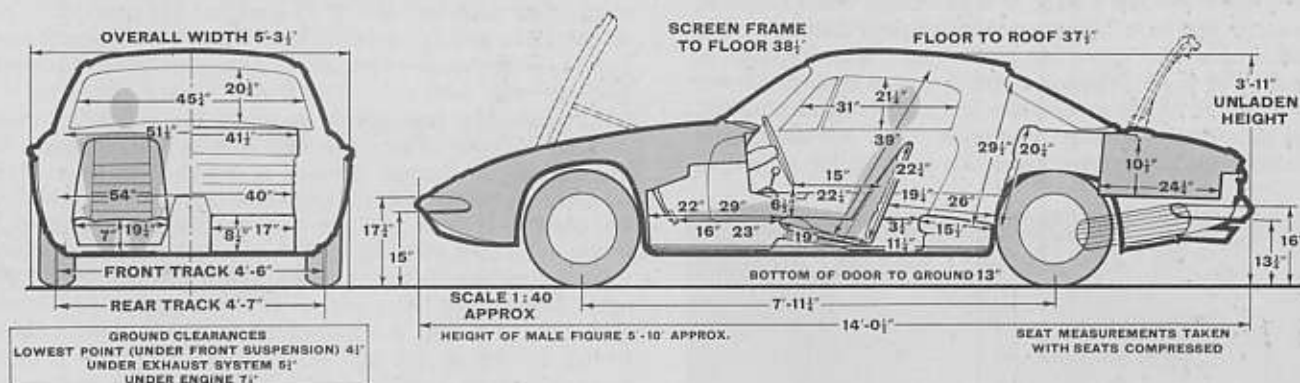
Both inside and out, the finish is very good. The appearance and texture of the trim and pile carpet emphasize that this is a luxuriously appointed car: only one ragged seam and some chunks of glued-on felt under the scuttle spoil it.



1, ammeter. 2, petrol gauge. 3, cigarette lighter. 4, interior lights. 5, radio. 6, heater controls. 7, lights. 8, wipers/washer. 9, oil pressure. 10, rev counter (with main beam and ignition lights). 11, handbrake on warning light. 12, speedometer and mileage recorder (with low fuel and indicator warning lights). 13, handbrake. 14, air vent. 15, horn and indicators. 16, bonnet release. 17, ignition/starter. 18, window control. 19, heater fan. 20, light pods control. 21, ash tray. 22, window control. 23, engine temperature.

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Specification



Engine

Cylinders	4
Bore and stroke	82.55 mm. x 72.7 mm.
Cubic capacity	1,558 c.c.
Valves	twin o.h.c.
Compression ratio	9.5:1
Carburettor(s)	Twin Weber 40 DCOE
Fuel pump	AC mechanical
Oil filter	AC full flow
Max. power (net)	118 b.h.p. at 6250 r.p.m.
Max. torque (net)	112 lb.ft. at 4600 r.p.m.

Transmission

Clutch	Borg and Beck 8 in. diaphragm spring
Top gear (s/m)	1.0:1
3rd gear (s/m)	1.4:1
2nd gear (s/m)	2.01:1
1st gear (s/m)	2.97:1
Reverse	3.324:1
Final drive	3.77:1
M.p.h. at 1,000 r.p.m. in—	
Top gear	17.8
3rd gear	12.7
2nd gear	8.9
1st gear	6.0

Chassis

Construction	Backbone chassis with reinforced fibreglass body
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Brakes

Type	Servo assisted Girling discs all round
Dimensions	10 in. diameter
Friction areas:	
Front	20.00 sq. in. pad on 159 sq. in. disc
Rear	10.48 sq. in. pad on 159 sq. in. disc

Suspension and Steering

Front	Independent by coil springs and wishbones
Rear	Independent by wishbones and coil springs (Chapman strut)
Shock absorbers:	
Front	Telescopic
Rear	Telescopic
Steering gear	Rack and pinion
Tyres	Dunlop SP41 165 x 13 radial ply (Firestone F100 or Goodyear G800 also available)
Rim size	5 1/2 J

Coackwork and equipment

Starting handle	No
Jack	Scissor screw
Jacking points	4 under body sill
Battery	12-volt positive earth, 57 amp hrs capacity
Number of electrical fuses	2
Indicators	Self-cancelling flashers
Screen wipers	2-speed electric, self parking
Screen washers	Manual plunger
Sun visors	2
Locks:	
With ignition key	Door
With other keys	Boot, glove locker
Interior heater	Fresh air heater fitted as standard
Extras	Close ratio gearbox, higher final drive

Upholstery	Leathercloth seats, Royalite padding
Floor covering	Carpet
Alternative body styles	None

Maintenance

Sump	7.5 pints SAE 20W/50
Gearbox	1.75 pints SAE 80 EP
Rear axle	2 pints SAE 90 + 10% Anglaml 99 by weight
Steering gear	SAE 90
Cooling system	14 pints (2 drain taps)
Chassis lubrication	Every 3,000 miles to 2 points
Minimum service interval	3,000 miles
Ignition timing	10° b.t.d.c.
Contact breaker gap	0.014-0.016 in.
Spark plug gap	0.023-0.028 in.
Spark plug type	Autolite AG22
Valve clearances (cold)	Inlet 0.006 in.; Exhaust 0.007 in.
Valve timing:	
Inlet opens	26° b.t.d.c.
Inlet closes	66° a.b.d.c.
Exhaust opens	66° b.b.d.c.
Exhaust closes	26° a.t.d.c.
Front wheel toe-in	3/8 in. to zero
Camber angle	0° to +1°
Castor angle	3° ± 30'
King pin inclination	9° ± 30'
Tyre pressures:	
Front	22 p.s.i.
Rear	22 p.s.i. (higher for speeds above 90 m.p.h.)

Lotus Elan +2 *continued*

Jerk-sensitive inertia-reel belts coil neatly away into a slot behind your shoulder though the shorter buckle end invariably got lost whenever the seat was tilted forward to let someone in the back. Like the belts, the radio (a rather crackly one on our car) is standard equipment.

Servicing and accessibility

A firm tug on the single bonnet release sends the spring-loaded bonnet curling upwards to lock itself in position before you are out of the car. It is one of the best bonnet mechanisms we have seen and a vast improvement on the ordinary Elan's. The dipstick, screen washer bottle, hydraulic reservoirs, carburetter, coil and starter solenoid are all within easy reach but the fuel pump, distributor and air cleaner are well buried.

The distance between servicing has been doubled from an intolerable 1,500 miles to every 3,000 miles. There are only two greasing points. With nearly 40 Lotus specialists in the country servicing should not be too much of a problem. The spare wheel, jack and battery live under a carpeted false floor in the boot.

With the windows up, the very smooth engine is fairly quiet, and very little mechanical noise penetrates the glass fibre skin until the revs exceed 5,000 r.p.m. Only with an open window can you detect that there is actually a sharp, crisp buzz of quite considerable volume coming from the exhaust, emphasizing the efficiency of the body sound insulation.

The best 101 octane petrol was needed to avoid pinking—and even then there was still a trace of it sometimes which suggested advanced ignition or a higher compression ratio than 9.5:1. The top gear consumption curve falls quite sharply from a prodigious 63 m.p.g. at 30 m.p.h. (a practical pottering pace in towns) to over 21 m.p.g. at 100 m.p.h. so, considering the performance potential, the fuel consumption is really remarkably frugal. It is largely hard and plentiful use of the lower gears that accounts for our overall

consumption of 24.5 m.p.g. (still not a bad figure). Clearly, it would be possible to do better than this.

Transmission

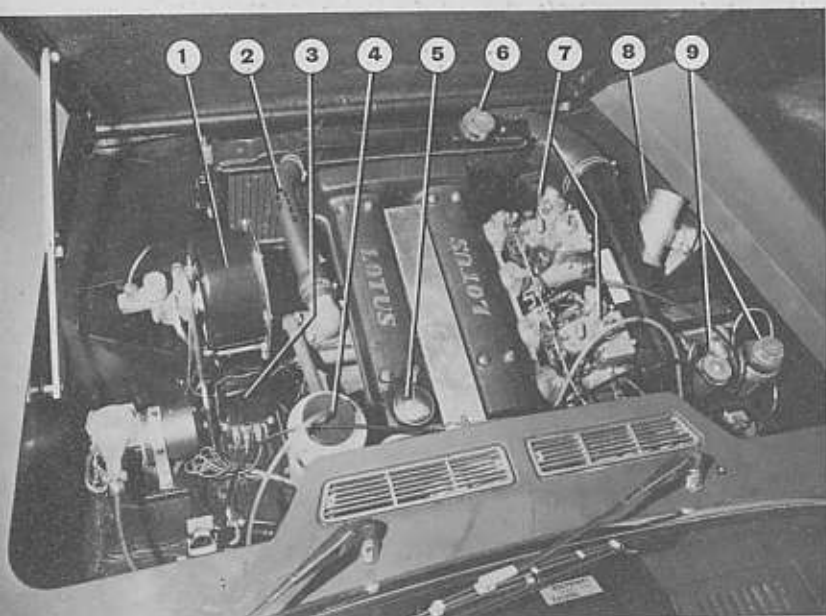
If our test Elan had a weakness—and we use the word in a relative, rather than an absolute, sense—it was in the transmission department. The gearchange itself is splendid—the stubby, smooth-knobbed lever can be flicked about with little effort—but the standard set of ratios, though perfectly all right in the Corsair 2000E from which they came, feel too widely spaced in a sports car of this calibre. Or perhaps we have been spoiled by the close-ratio box (available at extra cost on the +2 incidentally) on our own staff Elan. The 3.77:1 final drive provides reasonably relaxed top gear cruising (17.8 m.p.h. per 1,000 r.p.m.) without spoiling the flexibility at low speeds, while first gear would just drag the car away from rest on a 1 in 3 hill if the clutch was violently slipped. Some of our drivers thought that the overall gearing would be much better with the higher 3.55:1 final drive. Lotus tell us that the clutch linkage has been redesigned since our test car was made so that you no longer need the strength of an elephant or the delicacy of a surgeon to engage it smoothly. On our car it was not at all easy and probably accentuated the uncomfortable to and fro surging as the rubber joints in the drive shafts twist and unwind—familiar behaviour to any Elan owner but one that can be completely suppressed by smooth engagement of the clutch and by feathering the throttle movement, particularly when lifting off from a burst of acceleration in one of the lower gears.

Apart from a little sizzling at high speeds on the overrun, the gearbox was inaudible.

Handling and brakes

Here we can talk only in superlatives. The roadholding of the ordinary Elan is remarkable enough but the bigger +2, with its much wider track and 165 x 13 tyres (on 5J rims) which plant an enormous area of rubber on the road, is even better. The usual pattern of behaviour—tyre scrub, strong understeer, body roll, lurching—just don't exist to the driver of this Lotus. Were it not for the absurdly high speeds at which the +2 will go round corners, it would all be rather dull. A twist of the steering wheel and the car just changes direction as though it has been deflected by some invisible barrier on to another path. The familiar S bend for which experience tells you to brake hard can be taken, you discover, without even lifting off. And on one of those treacherous corners that goes on getting tighter and tighter, the car just glides round without any effort or fuss, as secure as a model aeroplane on the end of a wire. You cannot fail to be thrilled and enthralled by the novelty of this sort of cornering. Invariably it is your nerve that gives way long before the impressive adhesion of the Dunlop SP41 tyres so that even a habitually fast driver has a good safety margin for emergencies. If you do reach the limit, all is by no means lost. Instead of the sudden total breakaway that we feared might occur, the tail eases itself into the gentlest of slides which needs no special skills or reflexes to control. In fact during the course of duty-bound experiment, we had the steering on acute opposite lock at well over 80 m.p.h. without the driver feeling unduly concerned. Even the most insensitive hands could detect the strong messages about road feel through the high-gear rack and pinion steering even though there is not very much castor action. The only penalty is that on rough roads there is quite a lot of kick back, too, which demands a much firmer grip on the steering wheel than is necessary, for example, when cruising on a motorway. All you need here is a light, relaxed hold because even in a side wind, the car stays on an arrow-straight course. We can recall some sloppy cars that felt less stable on the MIRA banking at 90 m.p.h. than the +2 did at 125 m.p.h.—a speed, incidentally, that we are prepared to reach here only in the most select of cars.

M



1, brake servo. 2, oil dipstick. 3, voltage regulator. 4, screen washer bottle. 5, oil filler cap. 6, radiator filler. 7, Weber carburetters. 8, coil. 9, hydraulic reservoirs.

MAKE: Lotus. MODEL: Elan +2. MAKERS: Lotus Cars Ltd., Hethel Aerodrome, Norwich, Norfolk.

Insurance

AOA group rating 7
Lloyd's on application to the underwriters