

ELAN

THE STORY

In 1962 the Elan made history. Lotus rewrote the book on sports car design. Lotus created a car for the age, a leader for a generation. A car which, in handling and performance, took a quantum leap.

In 1986 Lotus took the decision once again to design a compact, open two-seater sports car, one that would set new standards for the 1990's.

In establishing the design philosophy, again Lotus rewrote the rule books.

For the 1990's the challenge is more complex. Sporting saloons have built on the advances made by Lotus and others, and reached high levels of performance, grip and cornering power. A new generation of drivers has grown up with front wheel drive as their main experience. People now expect much higher levels of creature comfort, space and practicality, which can no longer be compromised for performance or driving pleasure.

To take a new quantum leap in this environment was the challenge for Lotus.

The Elan was reborn, a stunningly proportioned, agile two-seater sports car - high performance coupled with exceptional handling balance.

A world beater for the 1990's.

The following pages examine the Lotus engineers' response to this challenge, the challenge of creating new standards in handling, performance and style.



Handling performance and style.

DESIGN OBJECTIVES - Chassis and Suspension

To design a sports car which delivers world beating handling and agility, a compact and practical two seater which must offer the highest levels of refinement, ride, comfort and driveability.

SOLUTION

As any suspension engineer will tell you, a stiff structure is essential if the true potential of a suspension system is to be realised. The Lotus Elan has an immensely rigid structure combining a steel backbone with composite, steel and aluminium elements, giving the strength which allows the suspension, already a Lotus patent, to function so effectively.

Front wheel drive was selected for its inherent stability and ease of control. To complement it, a totally new front suspension system was conceived and designed to ensure upmost driving pleasure for the real enthusiast.

SPECIFICATION

Front Suspension:	Independent by unequal length wishbones. <ul style="list-style-type: none">- coaxial coil springs and dampers.- tubular anti-roll bar via drop links from chassis.- longitudinal compliance by Lotus patented, alloy subframes.
Rear Suspension:	Independent by upper link and wide-based lower wishbone. <ul style="list-style-type: none">- coaxial coil springs and dampers.- solid anti-roll bar via drop links from chassis.

Brakes:

Front:	Ventilated discs 256mm dia. Single cylinder floating calipers.
Rear:	Solid discs 236mm dia. with integral hubs. Single cylinder floating calipers with integral mechanical parking brake.
Brake Actuation:	Dual circuit tandem master cylinder with direct acting vacuum servo. Diagonal split fluid circuit. In-line rear brake pressure compensating valve for each circuit. Centrally mounted handbrake lever with push-button release, operating on rear wheels via twin cables.

Steering:

Type:	Constant ratio, rack and pinion type with hydraulic power assistance on Elan SE - (optional on Elan.)
Turning Circle:	10.7m (35 feet) nominal between kerbs.
Column:	Height adjustable.
Steering Wheel:	Unique Lotus 3 spoke design (leather rim on SE) with soft-feel centre pad and Lotus badge in centre.

Wheels and Tyres:

Standard Road Wheel:	Lotus design 6½ x 15 cast aluminium alloy.
Tyres:	
Elan:	205/50 VR 15. Michelin MXV2
Elan SE:	205/50 ZR 15. Michelin MXX2
Spare Wheel:	Compact space-saver: 3.5 J x 14 (for temporary use only.)

Chassis:

Steel fabrication with full corrosion protection by zinc coating, chip resistant polyurethane coating and wax injection into closed box sections.

Backbone chassis extends rearwards from front bulkhead, and incorporates rear suspension pick-up points, bolting rigidly to bodyshell structure.

Front longeron/underframe assembly bolts onto front of backbone frame, incorporating front suspension pick-up points, engine mountings and front energy absorbing structure. Complete subframe assembly, including powertrain, is detachable.

Handling

DESIGN OBJECTIVES - Powertrain

Ask a Formula 1 designer to explain his objectives and he'll tell you that maximum power is only one element. He must also select an engine which performs as a critical part of an overall concept, with important roles to play in handling characteristics, driveability, aerodynamics, compactness and economy.

That was precisely the aim with the engine for Elan. Of course, outright power was important, but low speed torque and mid-range response were equally desirable. The engine had to be compact, to allow the designers to keep the overall car within exceptionally tight dimensions, and to keep the frontal area low to promote the desired aerodynamics. And, most important, the engine had to exude the character which has always been part of a Lotus.

SOLUTION

The chassis and body designers had already determined a radical frontal treatment which would give excellent drag figures, and this pre-determined that the engine compartment would have limited space available. Front wheel drive had been selected, and therefore the engine would have to be a compact unit, in this case to be mounted transversely. Sixteen valves were required to deliver the sort of power which the chassis demanded, and the latest engine management systems, developed with the Lotus engineers, to ensure docility and economy. Two versions were decided upon - a turbocharged version for the SE, and a normally aspirated engine for the standard car.

Engine:

Type:	4 cylinder in line (turbocharged and intercooled - SE only).
Capacity:	1588 cc.
Bore:	80.0mm.
Stroke:	79.0mm.
Block:	Cast iron.
Head:	16 valve aluminium alloy, double overhead camshaft.
Valve Actuation:	Belt driven camshafts with direct acting hydraulic tappets.
Fuel Injection:	Electronic multi-point fuel injection.

Elan

Power (Din 70020)	130 bhp / 97kW @ 7200 rpm
Torque	105 lb ft / 142Nm @ 4200 rpm

Transmission:

Type:	5 speed transaxle driving the front wheels. Synchromesh on all forward gears.
Gear Ratios:	1st : 3.333 2nd : 1.916 3rd : 1.333 4th : 1.027 5th : 0.829 Reverse : 3.583
Final Drive Ratio:	4.117 (3.833 - SE)
Driveshafts:	Equal length constant velocity shafts.
Clutch :	Single plate dry disc diaphragm type, 215mm (225mm - SE). Non asbestos friction lining.

Elan SE

Power (Din 70020)	165 bhp / 123kW @ 6600 rpm
Torque	148 lb ft / 200Nm @ 4200 rpm

Fuel Requirement:

95 RON Premium unleaded or 97 RON leaded (4 star)

Fuel Consumption :

	ELAN		ELAN SE	
	mpg	Litres / 100 km	mpg	Litres / 100 km
Urban Cycle	25.9	10.9	26.2	10.8
56 mph / 90 km/h	40.8	6.9	42.2	6.7
75 mph / 120 km/h	35.2	8.0	31.8	8.9

Performance :

	ELAN	ELAN SE
0 - 60 mph	7.6 secs	6.7 secs
0 - 100 mph	23.2 secs	18.4 secs
Standing ¼ mile/400m	16.1 secs	15.4 secs
0 - 100 km/h	8.2 secs	7.2 secs
0 - 150 km/h	19.1 secs	15.8 secs
Max Speed mph	122 mph	137 mph
Max Speed km/h	196 km/h	220 km/h

Performance

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