

Elise Sport 160

The Sport 160 model is a high performance derivative of the Elise, aimed at customers requiring an increased level of dynamic specification for use on road or track.

The first 50 Sport 160 cars have undergone Single Vehicle type Approval (SVA) testing, and are factory built with catalytic converters and 'Sport' exhaust mufflers to produce 160 PS. Subsequent cars are Whole Vehicle Type Approved (WVTA) and are factory built with catalytic converters, 111S exhaust mufflers and dual intake air cleaner/muffler assemblies to produce approx. 150 PS. These cars may be readily converted to 160 PS specification at customer expense (see below). Prior to July '00, all cars were fitted with sport suspension and upgraded seats, both of which became factory fit options after this time.

Vehicle specification is based on the 111S, with the following differences:

INTRODUCTION & IDENTIFICATION

Sport 160 models were introduced at V.I.N.:

SVA: Y 0601 (February '00)

WVTA: Y 0651 (April '00)

Sport suspension and seat upgrade option (previously std. fit) introduced at V.I.N.:

Y 1645 (July '00)

Character 4 of the V.I.N. identifies the engine type: G = Std; J = 111S; K = 160.

160 spec. engines are identified by 'N00001' stamped on the right hand front of the cylinder block alongside the dipstick tube.

ENGINE

Power Characteristics as described by Dave Minter - Chief Engineer, Lotus Cars

The engine torque, power characteristics and transmission ratios have been selected to provide the performance of a 111S but with a more relaxed motorway cruising ability. This requirement has been achieved by utilising the higher 5th gear and final drive ratios of the standard transmission resulting in reduced engine speed and noise. The engine power curve is different from the 111S, which uses a variable valve control (VVC) system to achieve outstanding torque figures at low engine speeds. The 160 engine relies on a more traditional route to high power, resulting in a typically "peaky" power delivery which requires the driver to make full use of the engine's upper rev range to extract the maximum performance. Although this results in smaller gains over the 111S in commonly recognised performance tests such as 0-60 mph time than might be expected, the true benefits become apparent on the race track, where a skilled driver can really make full use of the extra power.

Comparison lap times around the Hethel track;

<i>Model</i>	<i>Time</i>
111S	1 min 39.64 sec
Sport 160	1 min 38.12 sec

The Sport 160 engine is based on the standard (non-VVC) 1.8 litre K16 Rover version, with the following *Lotus Performance* modifications:

- Modified inlet and exhaust ports;
- Optimised compression ratio;
- New inlet and exhaust camshafts;
- VVC type cast alloy inlet manifold/plenum assembly;
- Modified airbox with enlarged intake aperture and fresh air trunking;
- WVTA cars only: Second intake airbox connected in series for noise suppression;
- Manifold Air Temperature (MAT) sensor moved from inlet manifold to airbox;
- 45mm diameter, fabricated tubular 4-2-1 exhaust manifold (as 340R);
- SVA cars: Motorsport catalytic converter;
- WVTA cars: Standard catalytic converter;
- SVA cars: Sport exhaust muffler;
- WVTA cars: 111S exhaust muffler;

- New electronic controller:
SVA cars: 'GEMS' controller incorporates MAP sensor, and uses other existing Rover sensors and management components.
WVTA cars: 'EFI' controller uses VVC type MAP sensor on intake plenum and other existing Rover sensors and management components.
- WVTA cars: Oil cooler.

Max. power - WVTA delivery spec.	150 PS (110 kW) @ 7,000 rpm (DIN)
- WVTA upgrade spec. & all SVA	160 PS (118 kW) @ 7,000 rpm (DIN)
Max. torque - WVTA delivery spec.	168 Nm @ 5,000 rpm (DIN)
- WVTA upgrade spec. & all SVA	174 Nm @ 5,000 rpm (DIN)
Max. engine speed	7,200 rpm (fuel cut off)
Idle speed	1300 ± 200 rpm
Fuel requirement	Premium Unleaded (95 RON)

Engine Diagnostics

SVA cars:

Engine diagnostic 'flash codes' are available using a special LED lamp tool T000T1414S plugged onto the 'GEMS' engine controller at the back of the engine bay:

If there are no stored fault codes, the test lamp will light when the ignition is turned on, and then go out when the engine is started.

If an fault code has been set, the code will flash when the ignition is turned on:

Each fault code consists of two numbers, counted out in flashes; For code 23, the lamp will flash twice, then be on for one second, then flash three times. If there is more than one fault, each code will be flashed in sequence with a 5 second pause between codes.

Code Fault

11	Throttle position sensor incorrectly adjusted, not connected, or circuit problem.
12	MAP sensor faulty, not connected, or circuit problem.
13	MAT sensor faulty, not connected, or circuit problem.
14	Coolant temperature sensor faulty, not connected, or circuit problem.
21	Baro sensor faulty, not connected, or circuit problem.
23	Oxygen sensor has failed to switch when enabled.
24	Checksum error - ECM fault.

WVTA cars:

Engine diagnostic 'flash codes' are available using a special LED lamp tool T000T1417S plugged into the Diagnostic Link Connector (DLC) socket behind a grommet at the LH side of the rear luggage compartment. A limited range of flash codes are available:

To access the codes, cycle the ignition switch (without running the engine) 4 times. After the final switch on, the diagnostic light will illuminate for approx. 3 seconds, then go out for 3 seconds, then flash a number of times corresponding to any fault code. If more than one fault is recorded, codes will be flashed in sequence, with a 2 second pause between codes. On completion, the light will remain on. To view the fault code sequence again, cycle the ignition off and on once more, without starting the engine. Non-current fault codes will be automatically erased after a certain number of warm up cycles.

Code Fault

1	Crankshaft sensor or circuit fault.
2	MAP sensor or circuit fault.
3	Throttle position sensor or circuit fault.
4	Manifold air temperature sensor or circuit fault.
5	Coolant temperature sensor or circuit fault.
6	Battery voltage fault.
7	Failure of O2 sensor to switch either rich or lean.
8	O2 sensor reading lean for too long.
9	O2 sensor reading rich for too long.

MAINTENANCE & LUBRICATION

Engine Lubricant

The engine is factory filled with Castrol GTX 15W/50 to be used for running-in until the After Sales Service. At this service it is recommended that a fully synthetic oil is used, with the following products specifically recommended:

Mobil 1 Motorsport	15W/50
Castrol Formula RS	10W/60

Maintenance

The recently updated Elise Maintenance Schedule (LSL348C) should be used at **6,000 mile (10,000 km)** intervals.

TRANSMISSION

The standard (wide ratio) Elise transmission is used, with standard 3.94:1 final drive ratio.

WHEELS & TYRES

The Lotus Accessory 'Race' wheels (6J front, 8J rear) are used, in either silver or grey, fitted with the standard 111S specification Pirelli P Zero tyres, 185/55 R15 front, 225/45 R16 rear.

BODY

- The 111S rear aerofoil is mounted using wedge shaped plinths, to increase both its height and angle of incidence, and enhance high speed stability.
- Sport 160 standard body colours are either Scandal Green (lime green) or Metallic Black. Other colours from the standard colour range are optional, with metallic paint surcharge if applicable.
- '160' (standard suspension) or 'Sport 160' (Sport suspension) decals positioned low down and ahead of each rear wheelarch. All decal sets are silver, except for New Aluminium body colour, which uses Titanium decals.
- Cloth soft top included, hard top option.

Factory fit options:

Sport Suspension (standard fit prior to July '00)

The Sport Suspension package includes adjustable spring platform Koni dampers with shorter and stiffer springs, and an uprated front anti-roll bar in Nylon chassis mounting blocks. Standard 'integral stud' type rear toe links are used. The steering rack is repositioned to suit the lowered ride height of 100/110 front/rear. For full suspension geometry details, refer to Service Notes sub-section XA.8.

Interior (standard fit prior to July '00)

Seats are upholstered in black brushed Nylon, with either red or blue Alcantara centre panels, and matching Alcantara steering wheel centre pad.

UPGRADING OF WVTA CARS TO 160 PS SPECIFICATION

In order to liberate the full performance potential of the 160 engine specification, the following modifications should be carried out:

1. Substitute the factory build 111S type exhaust muffler with the 'Sport' exhaust muffler and tailpipes (A111S0037S).
2. Remove the left hand rear wheelarch liner.
3. From the standard mounting position, remove and discard the secondary air intake box.
4. Remove the primary intake box from its new bracket outboard of the roll over bar stay, and remove and discard the bracket.
5. Fit the primary intake box with its enlarged intake aperture to the standard mounting bracket and connect the plenum hose. Push the MAT sensor into the airbox grommet.
6. Fit the new air intake trunking supplied with the car, into the enlarged airbox intake, and route to the cold air intake in the left hand body side.
7. Refit wheelarch liner.