



CHASSIS

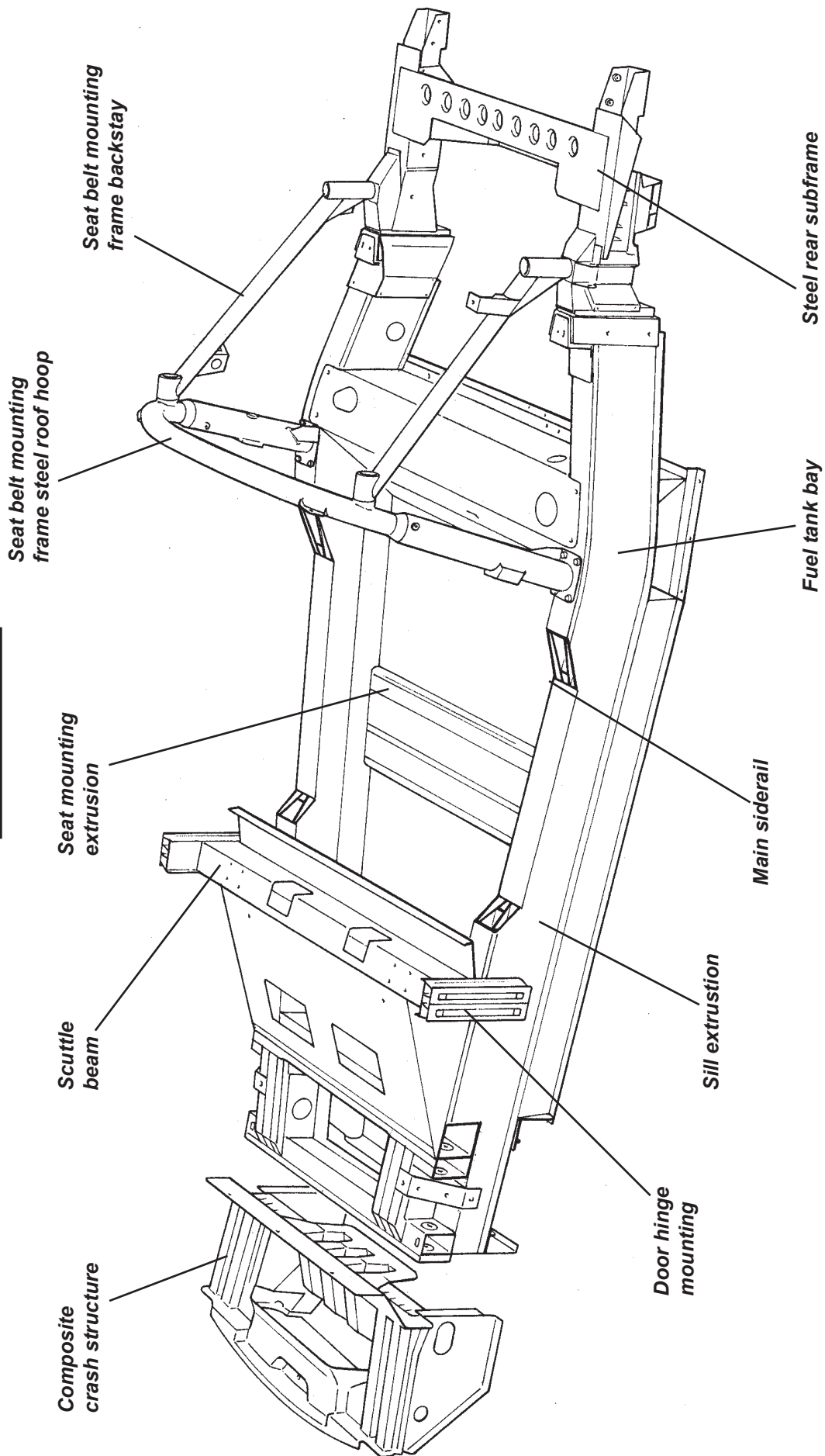
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229D

**ELISE CHASSIS UNIT**





### AH.1 - GENERAL DESCRIPTION

The chassis frame of the Lotus Elise is constructed primarily from aluminium alloy extrusions and formed alloy sheet, with the various sections bonded together using an epoxy adhesive with secondary drive-in fasteners. The basic chassis unit includes the passenger cell, front suspension mountings, fuel tank housing, and mid mounted engine bay, with a fabricated sheet steel rear subframe bolting to the rear of the engine bay to provide rear suspension mountings and rear body support. A tubular steel seat belt mounting frame is bolted to the top of the chassis structure and incorporates a roof hoop for additional occupant protection. The cabin rear bulkhead, body sills (inc. 'B' posts), front energy absorbing crash structure and scuttle/windscreen mounting frame, are all constructed from glass fibre composite and are bonded to the chassis structure using an elastomeric adhesive. The front and rear outer body clamshells are each constructed from glass fibre composite mouldings, fixed to the body and chassis structure with threaded fasteners to facilitate service access and economic repair.

Two main chassis siderail extrusions, 210mm deep and 100mm wide, run along each side of the passenger compartment between the front and rear suspension mountings, splaying outwards towards the rear before curving inwards around the fuel tank bay and terminating at each side of the engine bay in a vertical section to provide engine mounting platforms and a flange to which the rear subframe is attached. To enhance cockpit access, the height of the siderails is reduced in the door area, and internal reinforcement added in order to maintain beam strength and torsional rigidity.

Running along the underside of the siderails from the front suspension crossmember to the fuel tank bay are sill extrusions which carry the cockpit floor panel. The single skin floor panel is swaged for stiffness, and is reinforced by a ribbed transverse extrusion running across the inside of the tub, which also provides for the seat mountings. Behind the passenger cell, the siderails are linked by a pair of transverse crossmembers which are used in conjunction with a folded sheet upper panel to form an open bottomed fuel tank cell with a detachable, screw fixed, closing panel with swaged lightening holes. Note that this lower panel contributes to the structural integrity of the chassis, such that the vehicle should not be operated without it fitted.

The rear ends of the siderails are joined behind the engine bay by a galvanised sheet steel fabricated subframe which provides mountings for the rear suspension pivots and damper abutment, engine rear stabiliser and exhaust muffler.

At the front of the passenger compartment, four transverse extrusion beams are used to provide mountings for the front suspension pivots, and house the steering rack, with an upright section used each side to anchor the top of the spring/damper unit. Five interlinked extruded floor sections together with additional extrusions, connect the transverse beams to form an open topped space to house the heater/a.c. unit. An extruded scuttle beam links the tops of the siderails at the front of the cockpit, and is reinforced by a panel extending to the steering rack crossmember. These elements are used to mount the steering column and pedal box, with a vertical extrusion fixed to each end of the scuttle beam to carry the door hinge pillar.

To the front end of the chassis is bonded a glass fibre composite 'crash structure' which incorporates tubular sections designed to dissipate collision energy and control the rate of deceleration sustained by the occupants. Ducting and mountings for the horizontally positioned engine cooling radiator are also incorporated in this structure.

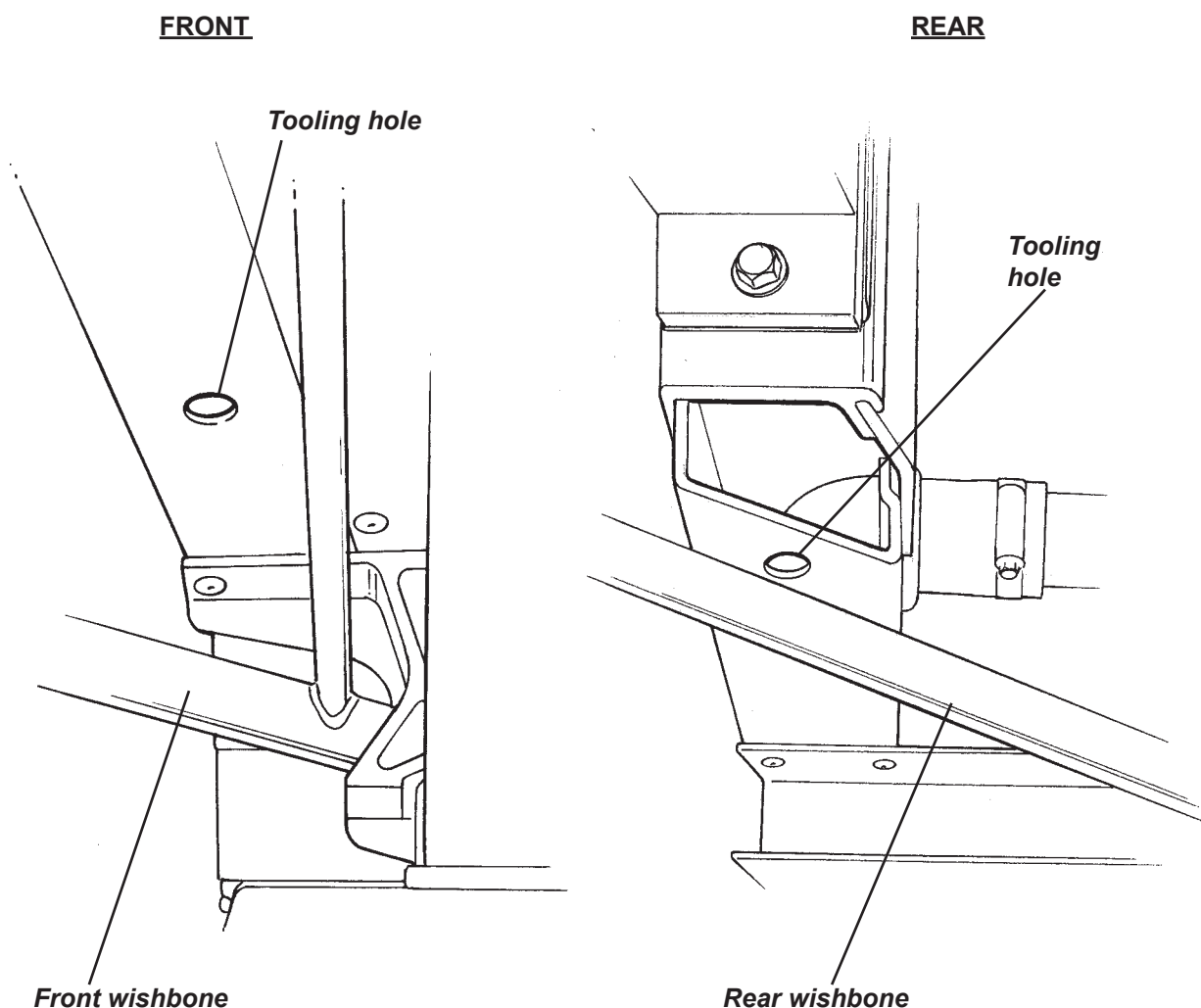
The bonded and rivetted alloy chassis structure described above is considered a non-serviceable single unit, jig built to fine tolerances, to which no structural repairs are approved. Superficial, cosmetic, or non-structural localised damage may be cosmetically repaired as necessary, but in the case of accident damage resulting in significant bending, tearing or distortion of the aluminium chassis, such that the specified suspension geometry cannot be achieved by the standard range of suspension adjustment provided, the recommended repair is to renew the partial body assembly, which comprises the chassis, rear subframe and the seat belt mounting frame together with jig bonded composite rear bulkhead, body sills, windscreen frame and crash structure. Also included are the radiator feed and return pipes in the chassis siderails, and those pipes and cables routed through the sills, including the heater and a.c. pipes, battery cable, clutch and brake pipes, and brake servo and oil cooler hoses.



## AH.2 - CHASSIS STRAIGHTNESS CHECK

In the absence of visual damage, the chassis may be checked for twist or distortion by utilising the tooling holes in the underside of the main side rails. If computer processed laser measuring equipment is not available, manual checks can be made with reference to an accurately level ground plane, e.g. an accurately set and maintained suspension geometry ramp/lift. Position the car on the lift, and proceed as follows:

1. Identify the tooling holes in the lower surface of each chassis main side rail. At the front end, between the suspension wishbone pivots, and at the extreme rear end of each rail.
2. Measure the height of each tooling hole above the reference plane and use jacks to adjust the height of the chassis in order to equalise any three of these dimensions.
3. Measure the deviation of the fourth dimension from the other three. Maximum service deviation =  $\pm 2.0$  mm.
4. Repeat operations (2) and (3) for each combination of corners to result in four values for the 'fourth' dimension deviation. If any one of these exceeds the service specification, the chassis should be considered damaged and replaced by a partial body assembly.



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**AH.3 - REAR SUBFRAME**

The rear ends of the chassis siderails are linked by a fabricated sheet steel subframe which provides mountings for the rear body section, rear suspension pivots, engine rear stabiliser, exhaust muffler and seat belt mounting frame struts. The subframe is secured to the siderails by two M12 bolts at each side, with an anti-corrosion shim plate interposed.

To remove rear subframe

1. Remove the rear clamshell (see section BR).
2. Remove exhaust heatshields, catalytic converter and muffler.
3. Disconnect the parking brake cables, wheel speed sensor harnesses and rear brake hydraulics. Release the driveshafts from the hubs, and remove both rear suspension assemblies complete, providing alternative support for the driveshafts.
4. Disconnect the inertia switch, and release from the subframe the oxygen sensor harness, wheel speed sensor harnesses and brake pipes.
5. Release the engine rear stabiliser mounting from either the subframe or transmission.
6. Release the roof hoop backstays from the subframe. Remove the two bolts each side securing the subframe to the chassis flange and withdraw the subframe from the car.

Fitting rear subframe

When bolting the subframe at each side to the chassis rail rear flange, ensure that the anti-corrosion shim plate is interposed. The lower fixing bolts should be inserted from the rear, using a washer and Nyloc nut inside the chassis extrusion. Apply PermaBond A130 (A912E7033V) to the threads of the upper bolts before fitting from the front into the weldnuts in the subframe. Tighten all four bolts to 86 Nm. Continue re-assembly in reverse order to disassembly.

