



Mercedes-Benz



# Technical Assistance for proper Casualty Rescue from the Mercedes SLR McLaren (Model 199)

**Training information**

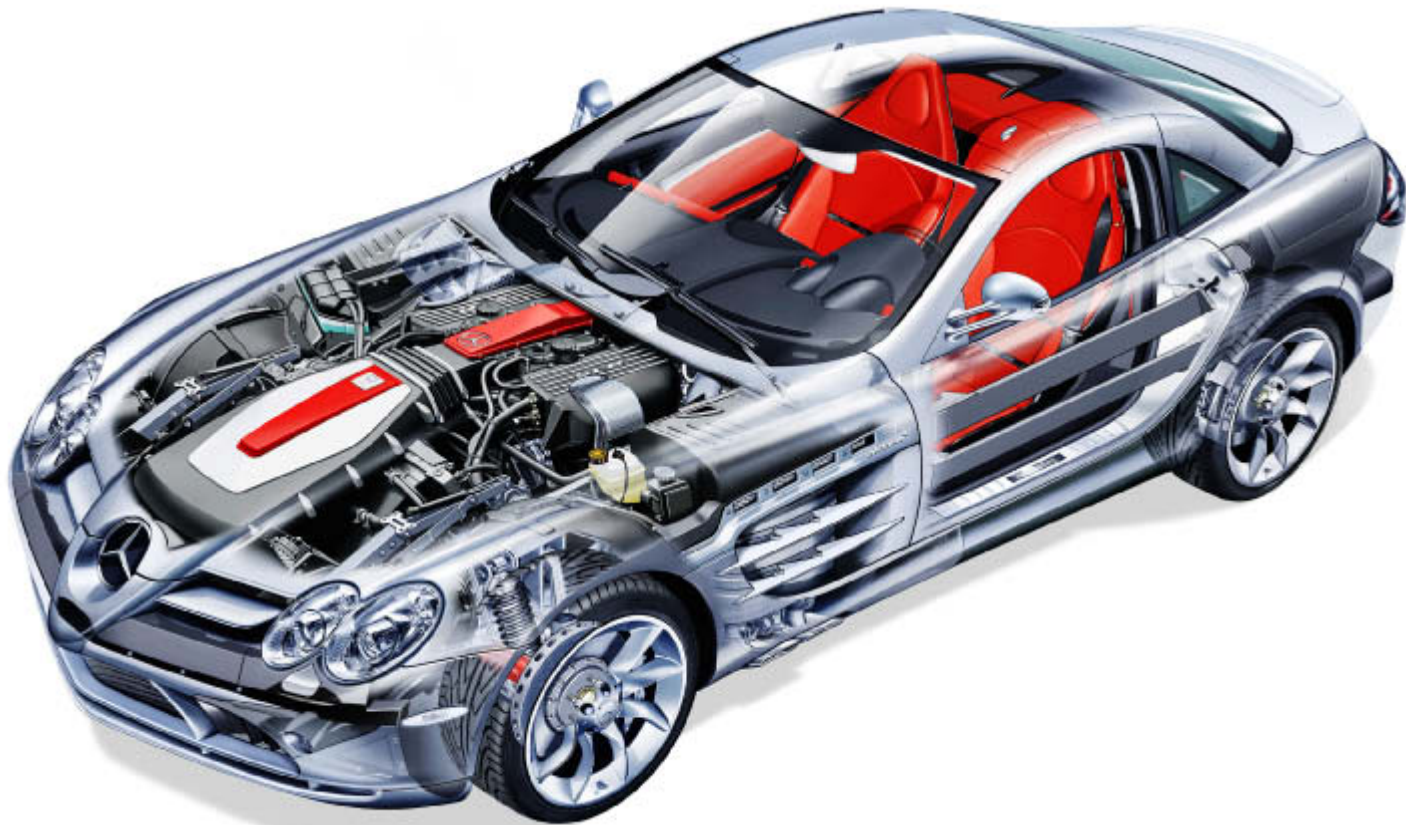
**DaimlerChrysler AG  
May 2005**



Mercedes-Benz

Proper Casualty Rescue  
Mercedes SLR McLaren (Model 199)

# Vehicle overview





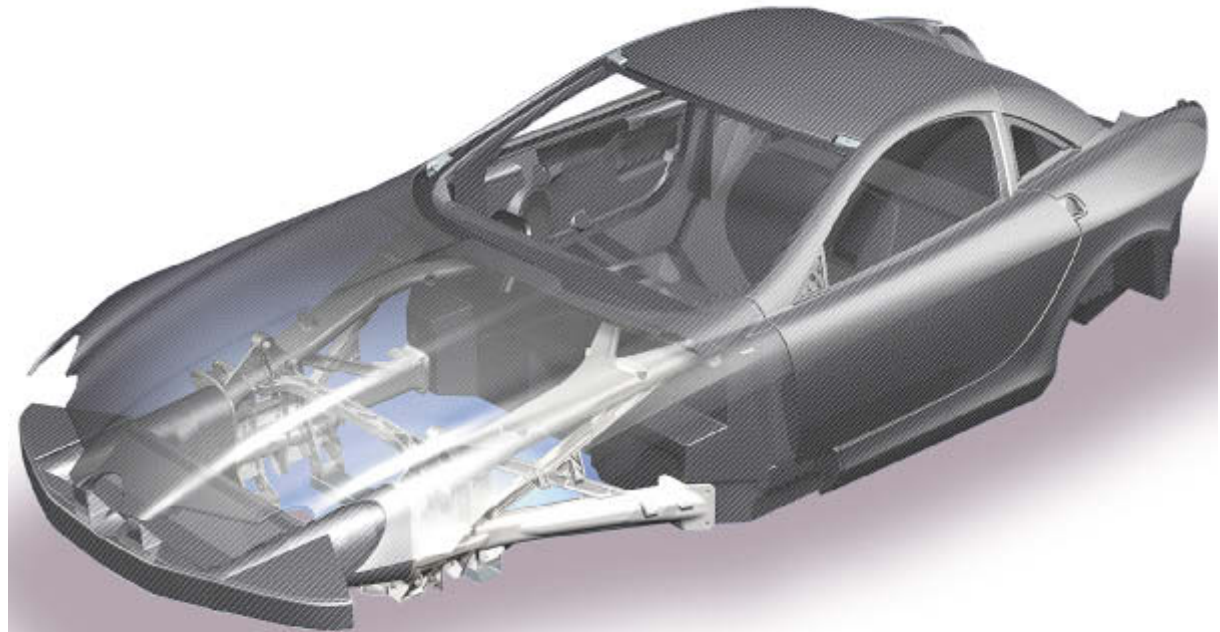
# Vehicle design

## ◆ Body

The structure of the SLR is subdivided into four main sections:

- Front crash structure
- Front frame
- Monocoque
- Trunk cell

The entire bodyshell and the doors, hoods and chassis are made of carbon fiber reinforced plastic (CRP)



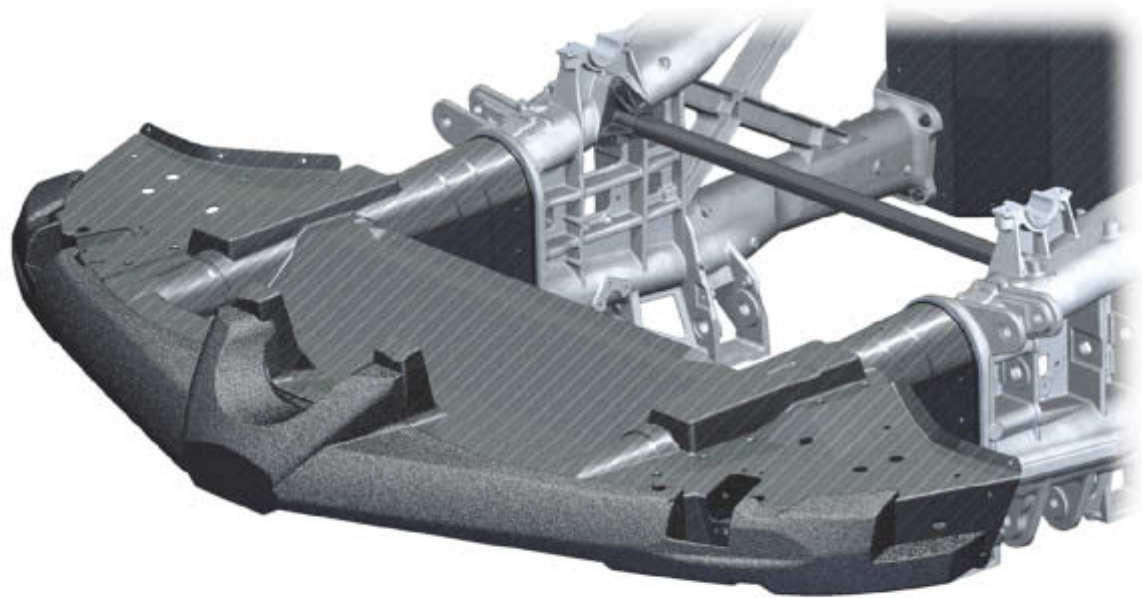


# Vehicle design

## ◆ Body Front crash structure

The front crash structure made of carbon fiber composite material is bolted onto the front frame by way of the two tubular-shaped energy-absorbing elements.

The crash absorbers are designed to transform the impact energy by ensuring that the disintegration of the fiber composite structure into smaller particles progresses uniformly from front to rear, thereby producing a controlled and largely constant rate of deceleration.







# Vehicle design

## ◆ Body Front frame

The front frame consists of two separate high-strength aluminum box profiles, bolted on to each side of the monocoque, to which the engine is mounted.

The following components are also mounted to the front frame along with the engine:

- Radiator
- Front suspension
- Stabilizer bar
- Exhaust muffler
- Steering
- Front crash structure





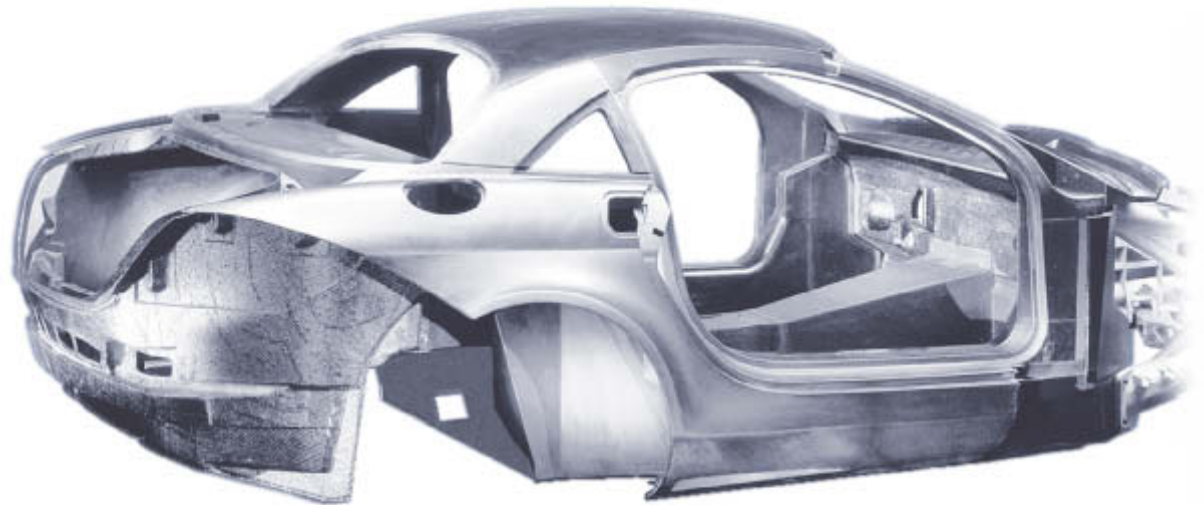
# Vehicle design

## ◆ Body Monocoque

The passenger compartment and fuel tank are surrounded by a safety cell made of carbon fiber composite material.

The monocoque consists of several components:

- Pan with integral engine/transmission tunnel
- Differential supporting frame
- Door sills
- One-piece roof frame with roll-over protection





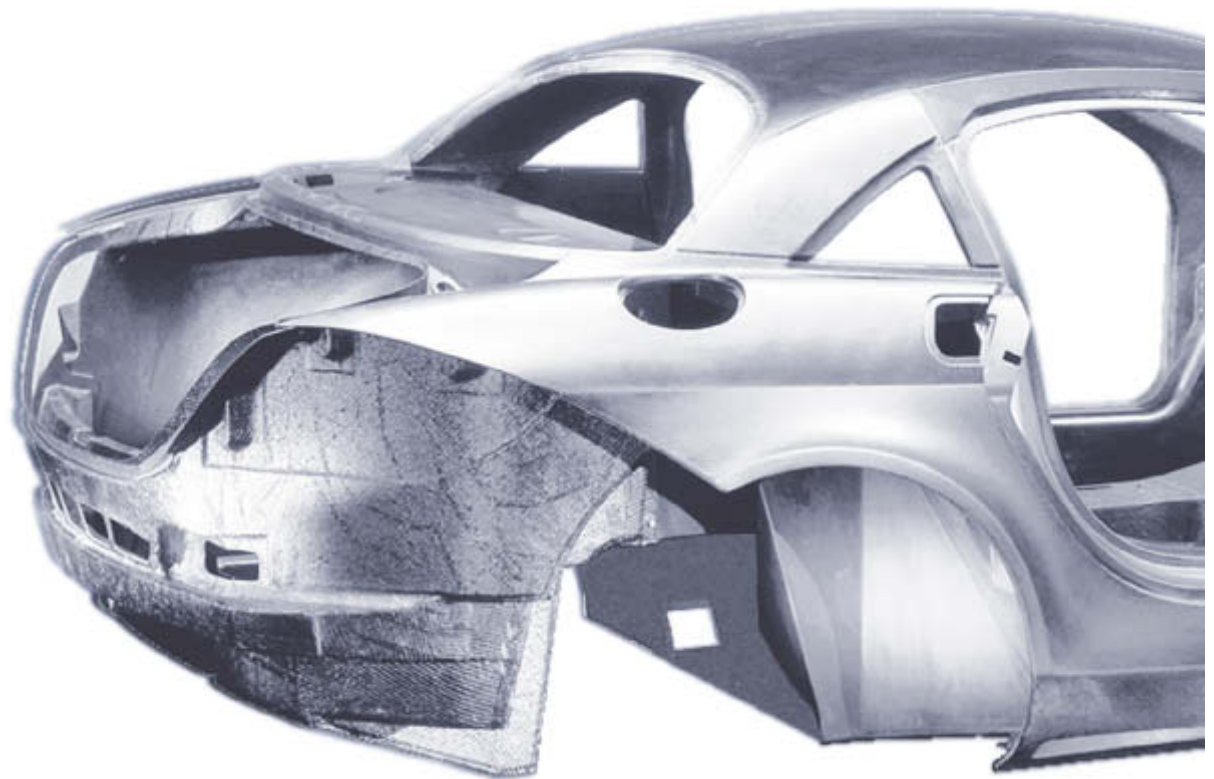
# Vehicle design

## ◆ Body Trunk cell

The trunk cell is bolted onto the monocoque and contains the following components:

- Battery mounting
- Interior vents
- Cooler for rear axle gear
- Luggage compartment
- Rear suspension

The trunk cell is designed to absorb the vast majority of the energy in a rear end collision.





# Vehicle design

## ◆ Driver seat

**A specially shaped carbon fiber composite bucket seat has been developed for the SLR. The one-piece CRP shell is connected to an electric seat adjustment mechanism at four points.**







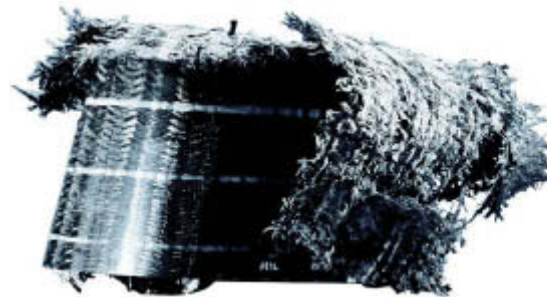
# Materials

## ◆ Material structure

The vehicle's extremely high rigidity comes from the use of carbon fiber reinforced composite plastics (CRP) for the body components and the monocoque.

During manufacture the parts are first soaked with epoxy resin and then sealed in a vacuum in order to extract the remaining moisture. After shaping in a special process, the components are "baked" at high temperatures until they are fully cured.

**i** CRP components can be cut using conventional rescue equipment.





# Materials

## ◆ Windows

- Laminated safety glass in all windows
- Windshield and rear window are bonded in
- The type of glass can be identified from the inscription printed on the window





# Safety systems

## ◆ Airbags

- Driver/front passenger airbag
- Head/thorax sidebags in the doors
- Knee airbags under the instrument panel





# Fire brigade procedure

- The "6 phases" of proper casualty rescue

- 1 Securing the area**
- 2 Assessing the situation**
- 3 Initial opening**
- 4 Treatment opening**
- 5 Rescue opening**
- 6 All necessary follow-up work**



# Fire brigade procedure

- Further rescue principles
- The interior rescuer checks the interior compartment for airbags (SRS/SPS) and reports which airbags have deployed and which have not
- Know the safe distances (30-60-90); 30 cm from sidebags/kneebags, 60 cm from the driver's and 90 cm from the front passenger's front airbags
- According to the manufacturer there is no longer any danger of an airbag deploying after the battery is disconnected, because the time until which the entire system is without power is significantly less than 1 minute.
- The vehicle is left standing or lying where it is.
- The interior rescuer (person reporting the accident or rescue crewman) is responsible for tending to any casualties until they are rescued from the veh.
- Rescue tools: Kendrick Extrication Device or spineboard; scoop stretcher/ vacuum mattress





# Fire brigade procedure

## 1. Securing of the area by the fire brigade or the police





# Fire brigade procedure

## 2. Assessment/securing the vehicle

### ◆ Wedging the vehicle





# Fire brigade procedure

## 2. Assessment/condition and location of casualties







# Fire brigade procedure

## 3. Initial opening/glass handling





# Fire brigade procedure

## 3. Initial opening/initial access

 **Maintaining the casualty's vital functions**



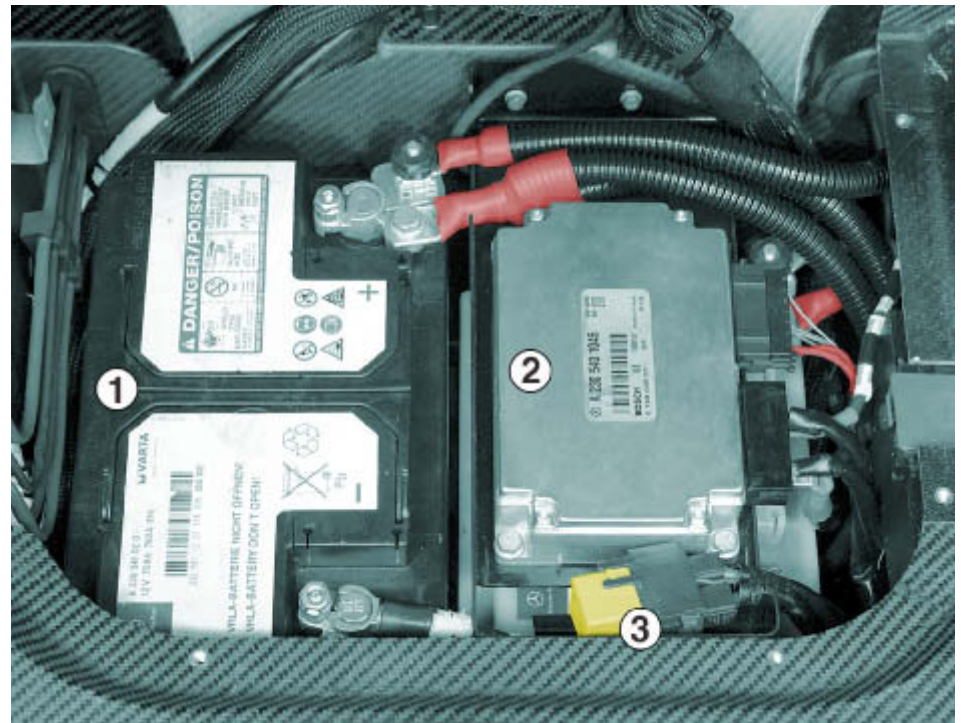




# Fire brigade procedure

## 3. Initial opening/battery handling

- The hazard warning system is switched on
- Electrical systems are used as necessary to aid the rescue
- The seat belts are cut
- The ignition is switched off
- The ignition key is placed on the dashboard
- The batteries are disconnected (if possible and necessary), keeping both poles together (to dissipate the voltage)



**i** The SLR McLaren is equipped with a power supply battery (1) and a starter battery (2) which are connected by an electronic control unit with relay (3). Both batteries are located in the luggage compartment under a floor flap



# Fire brigade procedure

## 3. Initial opening/scanning for airbags



1 Driver airbag



2 Front passenger airbag



# Fire brigade procedure

## 3. Initial opening/scanning for airbags



4 Head/thorax airbag



5 Kneebag



# Fire brigade procedure

## 3. Initial opening/scanning for airbags

### ◆ Deployed airbags





# Fire brigade procedure

## 4. Treatment opening/door removed

- ◆ **Clear access to the casualties**







# Fire brigade procedure

## 4. Treatment opening

- ◆ **Wedge-shaped cut from wheelhouse to door lock**





# Fire brigade procedure

## 4. Treatment opening

### ◆ Cut in the door lock

**Three well-known manufacturers of rescue equipment were present at this rescue rehearsal.**

**The door lock on this vehicle can be cut safely.**





# Fire brigade procedure

## 4. Treatment opening

- ◆ Cut at the upper door hinge on the left and right window frames







# Fire brigade procedure

## 4. Treatment opening

- ◆ Force the door hinge out of the A-pillar







Mercedes-Benz

Proper Casualty Rescue  
Mercedes SLR McLaren (Model 199)

# Fire brigade procedure

## 4. Treatment opening

- ◆ Remove the gas-operated struts





# Fire brigade procedure

## 4. Treatment opening for vehicle on its roof/door not jammed

Once the vehicle has been stabilized sufficiently (see picture), it is raised just enough to allow adequate access to the casualties so that they can be rescued from the vehicle.

- The vehicle must be wedged sufficiently to prevent it from slipping forward as it is raised.
- The vehicle was raised using two low pressure cushions with reinforced outer walls at the rear and two high pressure cushions at the front.





# Fire brigade procedure

## 4. Treatment opening for vehicle on its roof/door jammed

**After being sufficiently stabilized the vehicle must be raised until the upper door hinge on the roof can be cut with the rescue shears.**

- **The vehicle must be wedged sufficiently to prevent it from slipping forward as it is raised.**
- **The vehicle was raised using two low pressure cushions with reinforced outer walls at the rear and two high pressure cushions at the front.**
- **The rest of the procedure is the same as for the standard position**







# Fire brigade procedure

## 5. Rescue opening/stabilizing the casualty







# Fire brigade procedure

## 5. Rescue opening/removing the roof

- ◆ Remove the windows
- ◆ Cut the A- and C-pillars





# Fire brigade procedure

## 5. Rescue opening/rescuing the casualty





# Fire brigade procedure

## 6. All necessary follow-up work

- Clean the site of any leaked operating fluids
- Render assistance to the vehicle recovery crew
- Hand over the accident site to the police
- Remove the equipment used to secure the accident site





# Epilogue

The information above is based on the current state of the art.

The photographs were taken during rescue rehearsals by the DaimlerChrysler Sindelfingen Works Fire Brigade.

**i** The door locks and all the carbon fiber reinforced plastic (CRP) materials installed in this vehicle can be cut using conventional rescue equipment.

©DaimlerChrysler AG

This document, including all its parts, is protected under the laws of copyright. Any further processing or use is prohibited without prior written consent. This applies in particular to reproduction, distribution, alteration, translation, microfilming and storage and/or processing in electronic systems, including databases and online services.