SUSTAINABLE DEVELOPMENT

Active and Passive Safety in Škoda Cars

The safety of all road users is a priority for Škoda Auto. In the development of vehicles, we devote great attention, not only to the safety of the driver and passengers, but also pedestrians and other road users. Škoda cars comply with stringent safety requirements and rank among the safest in their class. This positive course of development can be appreciated most e.g. by comparing an 18-year-old vehicle with one of the recent models. The difference is demonstrated best in an extreme situation, such as a crash.

Crash test with Skoda New Octavia

Crash test with Skoda 105
(Magazine "Svet Motoru" 12/2005)

While the driver of a new Octavia would withstand a crash at a speed of approx. 64 km/h practically unharmed, the chance of survival of the driver of a Skoda 105 would be highly uncertain at a speed as low as 48 km/h.

Vehicle safety can be assessed along the following two criteria:

- active safety (prevention of accidents)
- passive safety (minimisation of the risk of injury for all the parties involved in an accident)

Active safety

The following factors significantly help reduce accident risks:

- Construction measures, which improve driving characteristics and enhance vehicle safety (steering, chassis, brakes, powertrain)
- Pleasant driving climate, which increases the driver's concentration and comfort (seats, which do not cause tiredness, optimal field of vision out of the vehicle, good air-conditioning, well-arranged controls and indicators, lighting)

In situations where the driver is substantially limited in his possibilities to influence the behaviour of the vehicle, he is helped by electronic systems:

EBV - electronic distribution of braking power between the axles, secures optimal distribution of brake power between the front and rear axles.

ABS - anti-lock brake system, which prevents blocking of the wheels during intensive braking and thus maintain steering control of the vehicle.

SUSTAINABLE DEVELOPMENT

EDS - electronic differential locking system, prevents slipping of one of the traction wheels when running over a road with varying adhesion conditions under the left and right traction wheel.

ASR - transmission-slip control system that prevents slip of the traction wheels when the vehicle is taking off, when driving on a road surface with reduced adhesion and the like. Active ASR is indicated by a warning light and it may be switched off manually.

HBA - hydraulic brake assistant makes possible optimal build-up of brake power. It ensures complete use of the brake system potential, thus shortening the braking distance.

MBA - mechanical brake assistant, accelerates the build-up of braking power during intensive braking.

MSR - regulation of torque when braking with the engine; it prevents slip of the traction wheels during intensive braking with the engine.

TPM - Tyre Pressure Monitoring system using the ABS sensors compares the revolutions i.e. perimeters i.e. tyre pressures of individual wheels. In case a wheel differs from the others a warning lamp goes on in the instrument cluster and thereby the defekt eventually lower tyre pressure is indicated.

HHC - hill holder control makes hill start easier. The system assists the driver by maintaining the brake pressure for 2 sec more after the brake pedal is released. The driver has time to remove their foot from the brake pedal and step on the gas without having to use the handbrake to prevent the car from rolling back on a hill.

ESP - electronic stability program, offsets the tendency of the vehicle to skid. ESP for the new Škoda Octavia includes AFM (Adaptives Fahrzeug Modell). AFM reads and evaluates all the available driving data and optimises the reaction of ESP according to this data. ESP may thus adapt to every driving style and actual load of the vehicle.

Passive safety

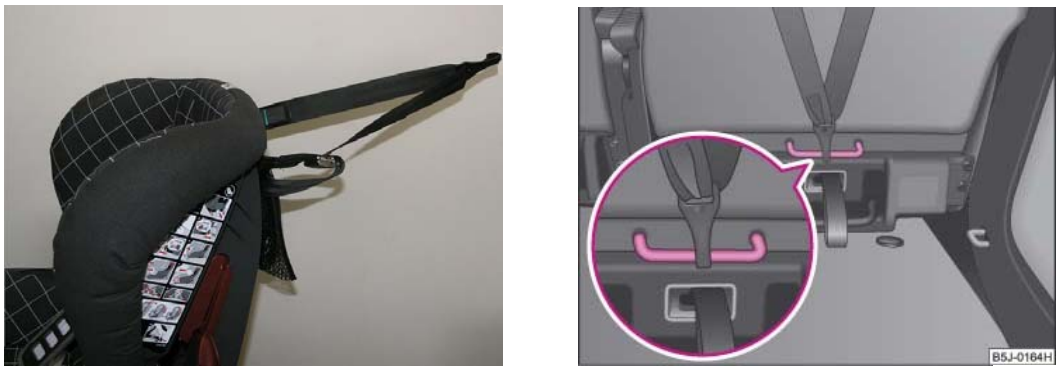
In case of an accident, passenger safety is increased by retention systems and the car body that absorbs the greater share of the impact energy without deformation of the crew cabin. The retention systems include, in addition to driver and front passenger airbags, side and head (curtain) airbags, and safety seat belts with pretensioners and limiters, also a child seat. Many a time, the journeys are short, for instance, to school, nursery, sports or shopping, where the parents take their children along with them. But many accidents with serious consequences happen during such short journeys. Škoda offers, in all its models, retention systems that provide a high standard of safety and user comfort at the same time, e.g. ISOFIX.

SUSTAINABLE DEVELOPMENT

Examples of Octavia passive safety elements:
Seat belts, driver and front passenger airbags, side and head airbags

Child seat with "ISOFIX" system

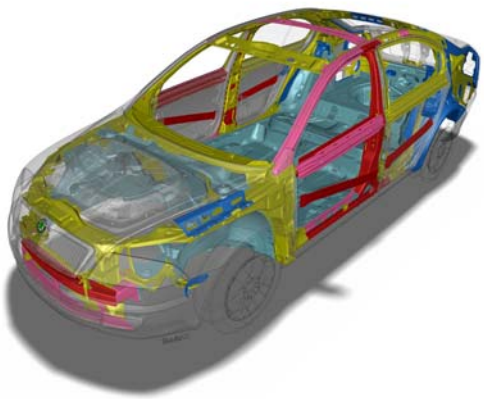
In the brand new car Roomster offers Škoda for the Child seats also the "Top Tether". Top Tether (consists of the additional belt on the Child seat and the fixing eye on the back side of the Rear Car seat) helps to minimise forward motion of the Child seat and the risk of injury as well.



Child seat with "Top Tether" system

SUSTAINABLE DEVELOPMENT

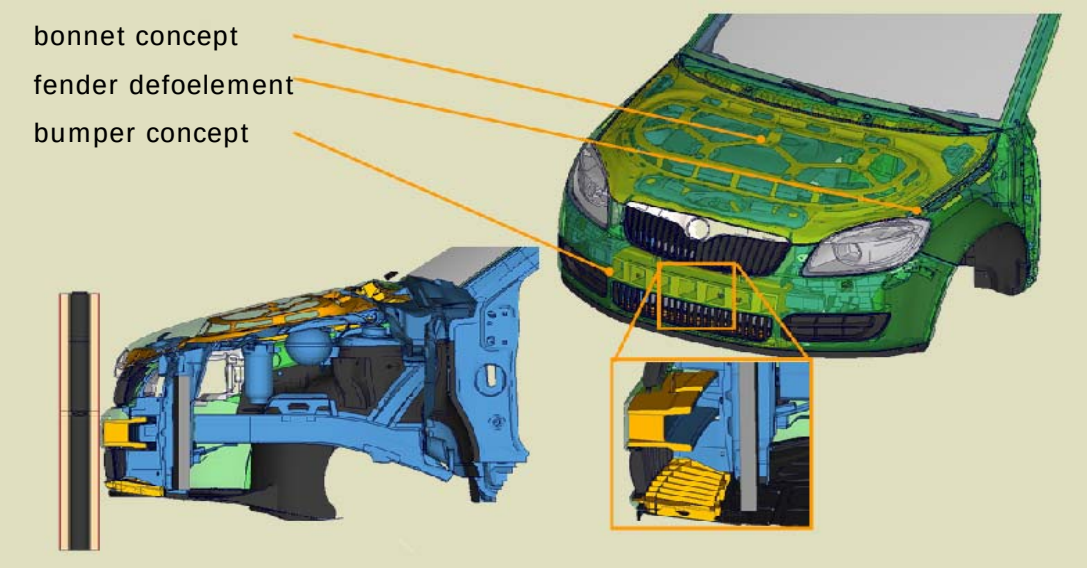
Optimal construction of high-strength materials and deformation elements ensures that the larger portion of the impact energy is absorbed thus preventing deformation of the crew cabin.



High-strength sheet metals have been applied to the body of the Octavia to a larger extent, thus increasing the rigidity of the body and vehicle safety. The colours indicate the difference in the strength of sheet metal elements.

- $R_{p0,2}$ <180 MPa
- $R_{p0,2}$ 180-300 MPa
- $R_{p0,2}$ 300-500 MPa
- $R_{p0,2}$ >500 MPa

To minimise the risk of injury to pedestrians, the New Octavia and Roomster are designed in such a way that in case of collision, they absorb the largest share of the impact energy. The major construction measures were realised in the bonnet and bumper areas.



Pedestrian guard – designer's key focal point

The Roomster fulfils phase I. pedestrian protection requirements and is thus the first vehicle in the VW group, which is to date already homologated according to the new legal requirements.

We test the results of our activities in the area of safety by means of simulation using virtual models and prototype impact tests like

- Front impact
- Side impact
- Rear impact
- Pedestrian impact
- Pole test

SUSTAINABLE DEVELOPMENT

The vehicles are tested and evaluated among others by the independent international organisation NCAP (**N**ew **C**ar **A**ssessment **P**rogramme). For more information on test procedures and requirements, as well as test results, see www.euroncap.com.

Škoda offers its customers not only comfort and quality. Our unceasing endeavour in the area of research and development enables us to build ever safer automobiles - this can save lives in extreme situations. Although the driver's capability of adjusting his style of driving to the given road and traffic conditions is still most important, vehicle design, too, helps minimize the risk of injury to passengers and pedestrians, and increase safety on the road.

Continuous increase of the safety of Škoda vehicles is an integral part of the company's approach in the area of sustainable development.

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