

Further improvements made to the body structure and restraint systems

Further improvements made to the body structure and restraint systems - The new Mercedes-Benz A-Class boasts an intelligent package of safety features offering comprehensive occupant safety

Mercedes-Benz has further developed the intelligent sandwich concept for the new A-Class due to come onto the market this autumn and made improvements to details. This construction allows the A-Class to offer its passengers the occupant safety you would expect of a Mercedes, despite its compact exterior dimensions. The development programme for the new A-Class included car-to-car impact tests with larger saloons. Mercedes-Benz is one of only a small number of car makers to regularly conduct this type of test, which enables the brand to adapt models of varying sizes as effectively as possible to each other's characteristics. The results of these sophisticated vehicle-to-vehicle crash tests demonstrate that passengers inside the A-Class enjoy effective impact protection.

The patented safety concept allows the engine and transmission to slide downwards in the event of a serious head-on impact, rather than penetrating the interior. And the sandwich concept also has benefits in side collisions, with the passengers sitting higher than they would do in a conventional passenger car.

Other features on board the new A-Class which help to deliver a comprehensive level of occupant safety are adaptive front airbags, which are deployed in two stages according to the severity of the impact, and newly developed head/thorax bags. These protect the driver and front passenger's head and chest area in the event of a side collision.

Introduced in the A-Class in 1997, the sandwich concept developed and registered as a patent by Mercedes engineers has proven its capabilities time and again and makes an important contribution to minimising the severity of occupant injury in a frontal collision. For the new A-Class, the Sindelfingen-based experts have made further advances in the compact car's safety concept and optimised a series of details. The even more extensive use of high-strength and ultra-high-strength steel alloys, plus the introduction of high-strength glued joints and additional support sections, increases the deformation resistance of the car's frontend and side structure, ensuring that the vehicle occupants are well protected in the event of a serious accident. In a front-on impact, the forces generated are dispersed on two levels and over a large area via robust side members. The passenger compartment therefore remains largely free of damage. And because the sandwich concept enables the drive unit to slide downwards rather than backwards as a rigid block, a larger effective crumple zone is created at the front end than in conventional passenger cars in this size class.

The floor structure of the new A-Class differs from the outgoing model with its lateral side members, rigid cross sections and a reinforced transmission tunnel. This new development forms a highly durable structure, which gives the passenger compartment additional solidity. The rear compartment also benefits from larger impact zones. Here, the side members are connected with each other by a flexible profile, whose heat-moulded, high-strength steel construction makes it extremely sturdy.

Further improvements to the belt and airbag system

Mercedes-Benz has also improved the highly efficient seat belt and airbag system in the A-Class. The smallest model in the Mercedes range is fitted with the innovative protection systems normally only found in the Stuttgart-based manufacturer's executive and luxury-class saloons. These include adaptive two-stage front airbags, belt tensioners for the front and outer rear seats, adaptive belt force limiters and newly developed head/thorax side airbags in place of the outgoing model's sidebags. The belt status display in the instrument cluster is another new feature, alerting the driver if the rear passengers are not strapped in.

A-Class passes S-Class crash test with flying colours

For a number of years now, the development of the safety technology in Mercedes passenger cars has been based on the principle of compatibility – that is, how the different cars involved in a crash react to the impact with one another. This approach ensures that the deformation pressure generated by a collision of two passenger cars is distributed equally between the two vehicles – regardless of whether one is smaller than the other.

The new A-Class has emerged with flying colours from this kind of vehicle-to-vehicle crash tests, which were conducted at a relative impact speed of 100 km/h. In a frontal offset collision with a Mercedes-Benz S-Class Saloon, the compatible deformation zones of both vehicles are activated as required. In so doing, the front-end structure of the S-Class also absorbs some of the impact energy normally exerted on the A-Class and thus reduces the forces experienced by the occupants of the compact car.

Whilst the front-end structure is designed to absorb impact energy, all Mercedes passenger cars are built with passenger compartments boasting impressive structural stiffness. The occupants' survival space thus remains largely intact in any type of collision. Finding the right balance between this inherent level of protection and the equally important duty to protect other road users, demands particularly sophisticated construction methods. The latest test results for the new A-Class underline the effectiveness of the compatibility strategy developed by Mercedes-Benz.

The new Mercedes-Benz A-Class completed around 110 crash tests with various impact configurations over the course of its safety development programme.

```
function openWindow(uri,wtitle,x_percent,y_percent)
{
if(window.screen)
{
var x=window.screen.availWidth;
var y=window.screen.availHeight;
x*=x_percent/100;
y*=y_percent/100;
}
else
{
var x=600;
var y=400;
}
newwin=window.open(uri,wtitle,"scrollbars=1,toolbar=1,menubar=1,personalbar=1,location=1,resizable=1,width="+x+",height="+y+",status=1, top=0, left=0");
newwin.focus();
}
```

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