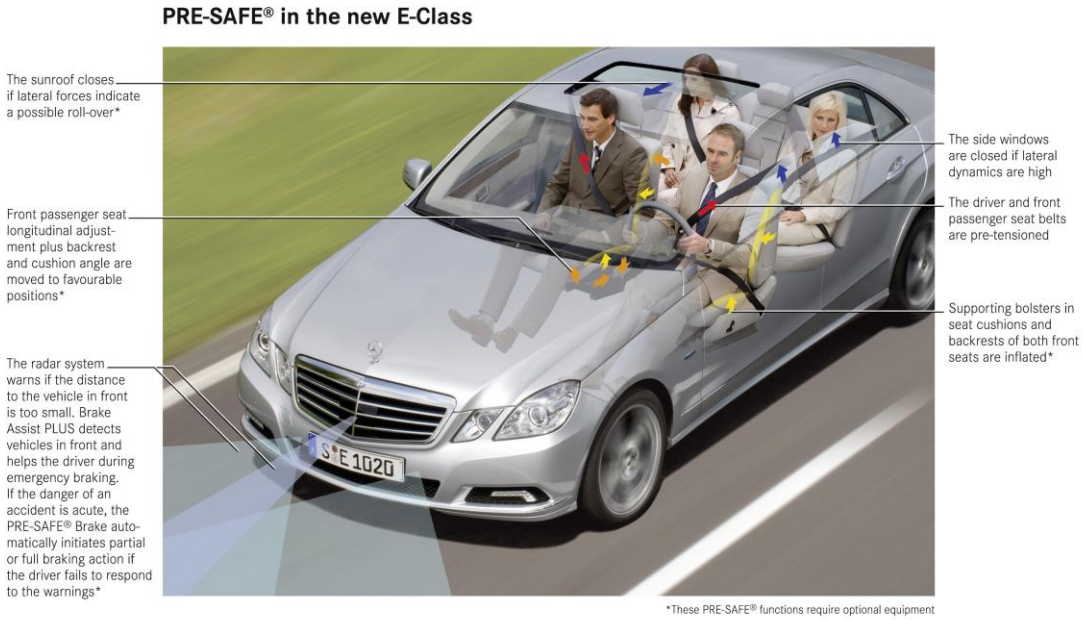
EURO NCAP advanced

Reward 2010

Mercedes-Benz PRE-SAFE®



Mercedes-Benz's PRE-SAFE® is a system intended to bridge the gap between primary safety, which aims to prevent a car from being involved in an accident, and secondary safety, which is the protection provided during a collision. At speeds above 30km/h, PRE-SAFE® monitors the dynamic state of the vehicle (speed, rotation etc.) and the driver's inputs to steering, accelerator and brake, to determine whether or not emergency action is being taken. If so, the system deems that a collision is imminent: among other measures, it takes the slack out of the seat belts using reversible tensioners; it optimises the occupants' seating position if electrically adjustable seats are fitted; and, if there is much rotation or side slip and a side impact or roll-over is considered likely, it closes the electric windows and sunroof. PRE-SAFE® is always on; it cannot be switched off by the driver and provides protection at all speeds above 30km/h.

All of the actions taken by PRE-SAFE® are reversible: if the collision is avoided, tension is removed from the seat belts and the occupants can readjust their seats.

What is the safety benefit?

PRE-SAFE® is designed to provide protection in a broad range of accident types. However, the actions it takes (e.g. tensioning seatbelts, adjusting seat position) are likely to be most effective in frontal collisions and in side impacts.

PRE-SAFE® operates at speeds above 30km/h and is focussed at providing protection in accidents which are more severe than those typical of urban driving. The anticipated benefit is biased towards severe and fatal injuries. It is estimated that nearly five percent of all casualties in accidents involving a passenger vehicle could be addressed by PRE-SAFE®. If all cars were equipped with PRE-SAFE®, this would be equivalent to the system being activated, and providing some measure of protection, in some 55,000 injuries in EU 27 each year.

How has the system been assessed?

Analysis was done of the forward movement of occupants during heavy braking and the effect of removing slack from the seatbelt was established. By looking at crash tests using different dummy positions, the effect of optimising occupants' seating position before the start of the impact could then be determined. Finally, Mercedes-Benz's accident research group carefully monitors the real-world crash performance of its vehicles and has extensive data on the performance and effectiveness of its advanced safety features.

What are the limitations?

PRE-SAFE® does not work autonomously; it depends on some action by the driver in order to identify when an accident is likely. In this regard, the system offers no benefit in accidents which the driver has not himself predicted. The system has to achieve a balance between sensitive triggering, offering a high safety benefit, and the irritation caused to drivers if e.g. seatbelts were regularly tightened, when there was no real danger. Daimler has optimised the system to achieve this balance.

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