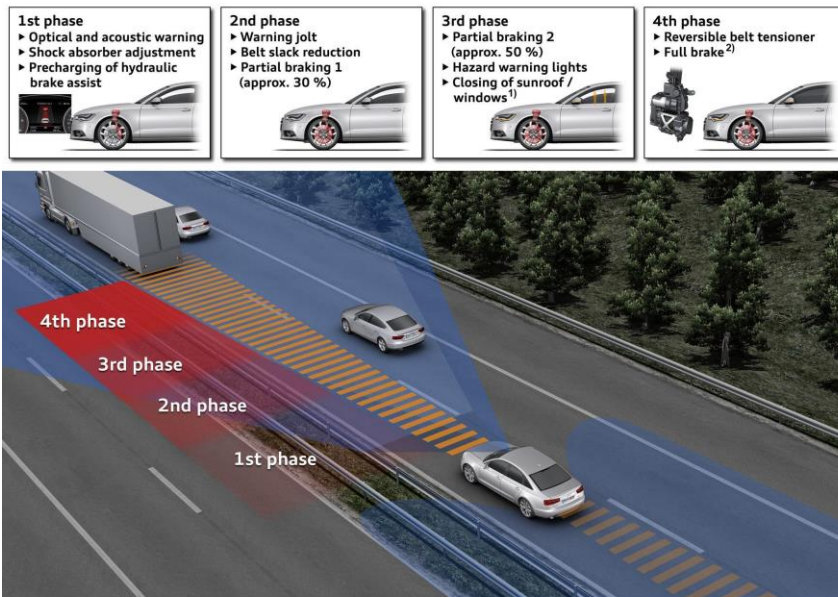


Reward 2012

Audi Pre Sense Front Plus



Audi pre sense front plus is designed to help avoid or to mitigate accidents into the rear of preceding traffic, either moving or stationary. Two long range radars, positioned at the front of the car, can detect vehicles ahead which the car is likely to hit unless action is taken. The information from the front radars is combined with data from a windscreen-mounted camera to calculate the likelihood of an impact. The system uses escalating measures at certain critical points to try to help the driver avoid an accident. Firstly, when the system calculates that a collision is likely, it issues an optical and an acoustic warning and pre-fills the braking system in preparation for an avoidance manoeuvre by the driver. If the driver does not react and the criticality increases a further warning is given: a small braking jolt serves as a ‘haptic’ warning, encouraging a driver reaction. At the same time, the brakes are prepared so that if the driver does brake, to whatever extent, pre sense front plus will automatically apply the appropriate braking force to avoid or mitigate the collision. Slack is removed from the seat belts. If there is still no reaction from the driver, the system applies partial braking to try to mitigate a collision. Finally, when an accident can no longer be prevented, the system autonomously applies maximum braking to reduce the severity. The hazard warning lights are automatically turned on to warn other road users. Audi pre sense front plus works at speeds up to 200km/h. Optical, acoustic and ‘haptic’ warnings are also active for speeds higher than 200km/h.

What is the safety benefit?

Analysis of accident databases reveals that some 19 percent of people injured in passenger cars are involved in longitudinal accidents. The main causes of such accidents are driver distraction or inattentiveness, and driver misperception where a driving situation is misjudged. Audi pre sense front plus operates at speeds between

0km/h and 200km/h. Below 30km/h, complete avoidance of the accident may not be possible but the system will provide significant speed reduction. However, the anticipated benefit is biased towards higher speeds and severe and fatal injuries. If all cars on the road were equipped with such a system, this would be equivalent to pre sense front plus providing some measure of protection in accidents where, currently, around 5,000 people are severely or fatally injured in EU 27.

How was pre sense front plus assessed?

Laboratory HiL (hardware in the loop) tests were performed to validate system functionality. External organisations conducted work for Audi to examine the influence of different warning strategies on driver reaction. Such work was complemented by extensive track testing to ensure that Audi pre sense front plus met targets for when warnings were given to the driver, and the points at which partial and full braking were applied. In addition, Audi drivers covered several millions of kilometres of real-world driving to ensure system reliability and performance.

What are the limitations?

Audi pre sense front plus can be switched off by the driver. If it is switched off, this mode is stored on the ignition key used at that time and remains off for the user of that key until it is turned back on again. It does not default to 'on' at the beginning of a new journey.

Audi pre sense front plus requires a sufficient radar reflectance of the objects which the car is approaching. Also, the radar sensor needs a clear 'view' of the road in front and its efficiency is compromised by contamination such as snow, heavy spray, ice or dirt.



Euro NCAP

2 Place du Luxembourg

B-1050 Brussels, Belgium

Tel: +32 2 400 77 40 Fax: +32 2 400 77 41