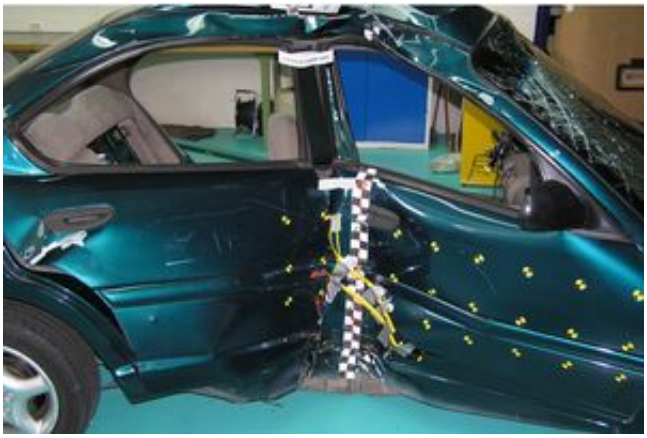
All-round safety in car

March 6 2008



Things can get tight after a lateral collision – intelligent side-impact protection prevents the worst. © Faurecia

A car body that thinks intelligently and protects its occupants at the crucial moment has been every driver's dream for a long time. Research scientists in an EU project have developed an intelligent side-impact protection system that dramatically reduces the risk of injury.

One more second until collision. The cameras integrated in the doors have long identified the car that will cause the accident. Radar sensors in the car wings measure how far away the other car still is. 200 milliseconds before the crash, the new side-impact protection system is activated. The occupants are reliably protected at the crucial moment.

The intelligent side-impact protection system is a product of the EU

project APROSYS – short for Advanced Protection Systems. The technology was developed by Fraunhofer researchers in cooperation with various universities, car manufacturers and suppliers.

“Our goal was to improve the active crash safety of motor vehicles – that is, to adapt the technical properties of the car body in such a way that it absorbs energy at the crucial moment and thus protects the occupants,” says project manager Björn Seipel of the Fraunhofer Institute for Structural Durability and System Reliability LBF.

But how do you get the car body to change its properties? And how does the car know when its occupants need protection? The researchers have devised a kind of sixth sense for cars that anticipates accidents and emits the necessary impulse to activate the side-impact protection system.

Stereo cameras and radar sensors continually scan the environment, and a central computer analyzes the data. “During the journey, the system has to distinguish moving objects – meaning other cars that could potentially cause an accident – from stationary objects such as houses or trees,” explains Dr. Dieter Willersinn of the Fraunhofer Institute for Information and Data Processing IITB.

His team has developed a software program capable of predicting a lateral collision just in time – about 200 milliseconds before the crash. The impulse from the central computer releases a surge of electricity that heats a wire made of a shape memory alloy. This wire is the actual trigger.

“We opted for this solution because it is faster than any conventional solenoid switch,” says Seipel. The heat bends the wire, which then releases a spring. The spring slackens and pushes a steel bolt, which is integrated in the seat, towards the door. At the same time a stable metal body in the door is brought into position to support the steel bolt.

“The system of the bolt and the metal box stabilizes the car door and absorbs energy on collision,” explains Seipel. To prove that the new side-impact protection system actually works in a real crash situation, he will carry out a crash test in Spain on March 7. The passenger cell will be on display at the Hannover trade fair on April 21 through 25.

Source: Fraunhofer-Gesellschaft