



Airbags

› Airbags are responsible for the **final deadening of an impact**, after the safety belts have absorbed most of the energy released by the occupant. A pyrotechnic gas generator managed by a computer ensures their inflation.



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› BASIC FACTS

Today, all vehicles are equipped with 2 frontal airbags. The first, integrated in the steering wheel, protects the driver; the second, in the instrument panel, protects the passenger. Their volume can vary from one model of car to another but, on average, it is around 60 litres for the driver airbag and approximately 150 litres for the passenger airbag. This variation of volume is explained by the presence of the steering wheel,

which reduces the distance separating the driver from the cockpit elements. It has been shown that in the event of a frontal impact, the action of the airbags, combined with that of the safety belts, decreases the number of drivers killed by 25% and of passengers by 15%. In the same way, in both cases, it decreases the number of serious thoracic injuries by 65% and that of head injuries by 75%.

IN SHORT ›››

The airbags inflate in 30 thousandths of a second to supplement the action of the safety belt during the final phase of impact deadening. They reduce the risk of serious head injuries by 75%.



› HOW DOES IT WORK?

1 HIGH PROTECTION

A computer, also known as an ECU, for Electronic Control Unit, permanently measures vehicle accelerations – an impact is in fact read as a very violent acceleration. To do this the ECU, which is generally installed in the middle of the vehicle at the front of the cabin, analyses information delivered by the accelerometers. These sensors provide the ECU microprocessor with data on the car's acceleration and deceleration, both longitudinal and latitudinal. When an impact is detected, specifically because a value of the acceleration parameters is exceeded, the ECU determines its direction and intensity. As soon as these are above a threshold considered critical, the ECU triggers inflation of the airbags. It does this by sending a pulse to a pyrotechnic air pump. This firing causes a strong, almost instantaneous release of gas, obtained by a chemical reaction based on solid fuels, which inflates the airbag in

30 thousandths of a second. Vents – calibrated slits made in the fabric of the bag – allow it to deflate rapidly (in 0.2 seconds) following the impact, to control the amount of pressure applied to the occupant.

In addition, as the ECU can compute the direction of the impact, it can selectively trigger either the frontal airbags or the side airbags, or both jointly. It should be noted that, to ensure correct deployment of the airbags even in the event of destruction of the battery at the time of the impact, the computer is equipped with condensers. Those give it enough “back up” electrical power, even when it ceases being powered normally by the battery.

2 BEYOND TECHNIQUE A correct driving position helps the action of the airbags



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So that the airbag can fully play its part, the driving position must be correct. If the driver is too close to the steering-wheel, the deployment of the airbag can cause burns; too far away and it loses efficiency. To check that the driving position is correct, the driver should be able to touch the steering wheel with his wrists when stretching out his arms.

Lastly, and most importantly, a child safety seat must never be installed on the front passenger seat unless the passenger airbag has first been disabled.