



The 3rd generation System for Restraint and Protection (SRP3)

❖ The 3rd generation Renault System for Restraint and Protection (SRP3) takes account of the violence of the impact and the position of the occupants of the vehicle so as to **optimise the effectiveness of protection**.



❖ BASIC FACTS

The idea of the 3rd generation Renault System for Restraint and Protection is to prepare the vehicle and its occupants for an impact once it becomes inevitable. The level of protection, and therefore of safety, varies greatly depending on the position of the car's occupants at the moment of impact. The system aims to take account of these differences. In the first place, it acts on the safety belt pretensioners to clamp the driver and passengers to their seats. It is important for there to be space between the body and the cabin so that the energy is absorbed progressively, so limiting the risk of traumas. This situation can be likened to a sharp deceleration: the greater the distance available to slow down from a given speed to a halt, the less violent the deceleration will be. It is the same phenomenon in braking – stopping a vehicle travelling at 60 kph in just a few metres is much more brutal than

stopping it over, say, a hundred metres. Thus, the greater the space separating a person from the stiff elements of the cabin, the more the impact will be deadened. In the second place, the system adapts the response of the airbags (see sheet) to the violence of the impact because of double volume and the controlled vent with which they are now fitted.

IN SHORT ❖❖❖

By analysing the violence of the impact, SRP3 adapts the response of safety devices such as safety belt pretensioners and airbags, to deaden the impact as much as possible.

› HOW DOES IT WORK?

1 SRP3 SYSTEM

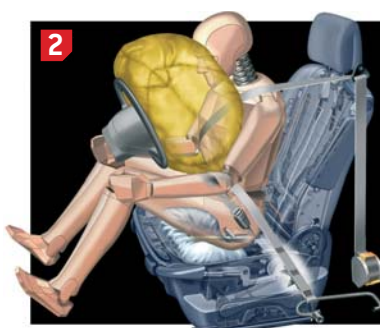
An accelerometer detects the impact and measures its intensity. The SRP3 system computer evaluates the severity of the impact in less than 10 ms (ten thousandths of second). It immediately commands the release of the safety belt pretensioners integrated into the buckles of the front seat safety belts, in order to clamp the occupants of the car hard against their seats. If it is a severe impact, the computer triggers other safety belt pretensioners, this time placed at the side of the belt buckles, to hold the occupants against their seats even more firmly which, by keeping the pelvis in position, avoids the phenomenon of submarining (the body slipping under the belt lap-strap). However, the belt must not retain an occupant with a force greater than 400 kg to protect the thorax of occupants, even when it is fragile. For this reason, a load limiter device allows

“controlled slip” of the belt and delivers “slackness” so as not to exceed the outside value limit. Under the action of the load limiter, the belt strap is slackened gradually. As a result, the body of the occupant plunges forwards. It is here that the airbag takes over. There is a similar graduation at the level of airbag management. If the impact is of average violence, the computer begins only partial inflation of the airbags. On the other hand, if the impact is violent, the computer commands maximum inflation of the airbags by triggering a complementary gas generator. In order to supplement impact deadening, the controlled vents of the airbags open to decrease the internal pressure and are therefore unlikely to themselves be the source of injuries.

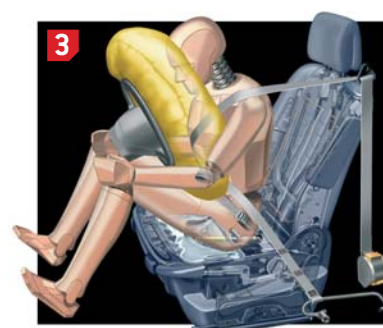
2 OPERATION Three devices act jointly to ensure safety



1 | The pretensioner linked to the belt buckle limits the forwards displacement of the body by tightening the belt straps across the pelvis and thorax.



2 | The load limiter reduces pressure exerted by the belt on the thorax, to avoid causing injury during violent impacts.



3 | Controlled vent airbags, housed in the steering wheel for the driver and in the dashboard for the front passenger, provide further deadening of the impact.