Northern Territory Government

Why are seatbelts effective?

Seatbelts in modern vehicles are designed to extend and retract, enabling occupants to lean forward. In a crash, the belt reel immediately locks, holding the occupant securely in place. There are various technologies being used to further improve the protection offered by seatbelts, such pre-tensioners that reduce slack in the belt and load limiters that reduce the forces exerted by the belt on the body.

A seatbelt generally comprises a lap belt, which extends over the pelvis, and a shoulder belt, which straps across the chest. These two sections of the belt are fixed firmly to the chassis of the vehicle. If a crash occurs, the belt will apply most of the force to the shoulder, sternum and pelvis, which are relatively less vulnerable parts of the body. The webbing material used in seatbelts has some flexibility and reduces the sudden impact of the crash by allowing just a little stretching.

If a car travelling at 60 kilometres per hour hits a solid object like a large tree, the tree will bring the car to a sudden stop, but the speed of the occupants of the car will still be 60 kilometres per hour. In the absence of a seatbelt, the occupants of the car will keep moving forward at that speed until they hit an object in front of them, such as the steering wheel or dashboard (or until they are ejected through the windscreen and hit the tree). This tendency of a moving object to keep moving, or of a stationary object to remain at rest, is called inertia.

The force generated by the crash is also reduced by the vehicle's crumple zones, which are areas in the front and rear of the vehicle that are designed to collapse on impact. Thereby reducing the energy transmitted to the occupant department. However, the protection afforded by crumple zones will only be fully effective if the occupants are securely fastened to the passenger compartment, so that they decelerate with the vehicle.

The air bag is a supplemental restraint system (SRS) and is not a substitute for a seatbelt. Air bags are meant to be used in combination with seatbelts. If a crash occurs, the air bag is meant to reduce the vehicle occupants' speed to zero, while minimising injury.

Safety tips:

- Always use seatbelts and child restraints, even if your vehicle is equipped with air bags.
- Replace frayed and damaged seatbelts promptly.
- The rear seat is the safest seating position for children.
- Read the owner's manual to understand the operation of the vehicle's air bag system.
- If the steering wheel can be tilted, position it so that the air bag will deploy towards the chest and not the head.
- Drivers should be positioned at least 30 centimetres (1 foot) from the air bag by adjusting the seat. Front passenger seat occupants should move the seat as far back as possible.

Source:
Road Safety in Australia: A Publication Commemorating World Health Day 2004, ATSB, Canberra ACT

For more information on road safety, refer to our website at www.roadsafety.nt.gov.au or contact the Department of Planning and Infrastructure's Road Safety Branch by email at roadsafety@nt.gov.au. Alternatively, you can also contact one of our offices:

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