

How Safety Features Work

(Section 16.1 pgs. 288 - 291)



...recall, individuals in vehicles experience different forces and changes of momentum...

Safety features on vehicles work to reduce the force of a collision.

Basic Idea:

have the change in momentum happen over a longer period of time



Safety engineers use **Crash Test Dummies** to determine the effects of a collision on a person.

They are as human-like as possible (the best technology can make).

Crumple Zone



- dummies help to determine how crumple zones work

- Crumple Zones: parts of the car that are made of crushable metal or fibreglass (hood, doors, and trunk).
- crumple when hit and SLOW the collision felt by occupants and INCREASE THE TIME of collision of passengers and the vehicle interior
- reduces the force felt by passengers and, therefore, the DAMAGE and INJURY is decreased



Which explains this thought... ==>



COFFIN CAR

Slightly larger than a
double-wide coffin.
Coincidence? I think not.

Types of Safety Features

1. Restraining Features

- hold occupants in one place
- prevent hitting the inside of the vehicle
- prevent being thrown out of the vehicle
- include: seatbelts, air bags, headrests and child seats



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2. Operational Features

- operate all the time to keep you safe while driving



ex) rear and side mirrors -



ex) headlights -



ex) tail and signal lights -



ex) brakes -

3. Structural Features

a) Rigid Features

- include the heavy frame, a roll cage, and side-impact beams in doors
- built from material that will NOT crumple or break under extreme pressure

b) Crumple Zones

- include hood, trunk and fenders
- may crumple or be crushed completely



If the rigid frame stays intact, the cabin of the vehicle will keep the occupants safe.

Road Safety Features

built in features of the road to reduce the force of a collision by slowing the impulse



Crash Barrier or Crash Cushion

barrels filled with water or sand that crush or burst on impact



Guardrails

bend (but not break) to lower the momentum of a vehicle and absorb the force of collision



Light poles with shear pins
designed to snap off under the force of collision