AUTO SAFETY: CRUMPLE ZONE TECHNOLOGY

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Auto safety has come a long way! Some of the first automobile designs were rigid and resistant during an accident.

That meant the vehicle did not sustain as much damage, but the occupants did. The force from a collision was usually fatal.

While the problem was well known in the auto industry, a solution had yet to present itself. That is, until 1953, when a Mercedes-Benz engineer, Bela Barenyi, who had studied the problem for a long time, came up with an idea.

He invented the "Ponton" or three-box body for Mercedes, the model series W120, a pre-cursor to the crumple zone technology.

It wasn't until 1967, though, that the Mercedes Heckflosse, or Fintail, featured the first crumple zone technology, which included a safety cage and a trunk that was almost 50% bigger.

The Science Behind Crumple Zones

Isaac Newton's first law of physics says that an object in motion will stay in motion with the same amount of speed and in the same direction unless intervened by an unbalanced force.

And that's exactly what happens with an automobile accident. Passengers continue to move unless stopped by a seat, dashboard, etc. Internal organs continue to move even if the body stops, causing severe injuries.

Newton's second law states that force equals the mass multiplied by acceleration. So, in an automobile accident, the force of the automobile and its occupants decreases if the time required by the vehicle to stop increases.

Newton's Laws and Crumple Zone Technology

Basically, crumple zones work according to Newton's two laws. Placed at the front and rear of the vehicle, they absorb the impact of a head-on collision and help to delay collision impact.

Instead of very rigid vehicles colliding causing a high likelihood of human casualties, crumple zones take the hit, increasing the time before the vehicle comes to a stop.

Additionally, the passenger cabin is reinforced using high strength steel and more beams. And with the invention of seatbelts and airbags, they, too, perform this life-saving task.

How Crumple Zone Technology Works in An Auto Crash

Have you ever seen a car accident and wondered how the victims survived? You can thank crumple zone technology for this miracle.

The outer body of the car is weaker while the passenger area is structurally reinforced. This design allows for the absorption of the impact while preserving the integrity of the passenger cabin.

Today, crumple zone technology is outfitted on the rear and sides of vehicles, especially small cars.