

Ralph's Accident Reconstruction Newsletter—Volume 5, Number 2—April 2006

“Seat belts save lives.” That well-aged statement is obvious to anyone who is involved in investigating motor-vehicle collisions. According to an article which appeared in Volume 15, Number 4, of Accident Reconstruction Journal (PO Box 234, Waldorf, MD 20604), the National Highway Traffic Safety Administration (NHTSA) has analyzed accident data to evaluate the number of lives saved by the safety improvements installed in cars and light trucks since the early 1960s. In 1960, 4.6 people were killed for every 100 million passenger-vehicle miles driven in America; the current rate is 1.25 deaths per 100 million passenger-vehicle miles.

According to the NHTSA analysis, the winner in the life-saving competition is the safety belt. Of the 325,551 lives claimed to have been saved by the safety upgrades, 168,524 are attributable to the use of safety belts. In the 1960s, only ten percent of drivers used safety belts; currently, eighty percent of drivers use safety belts.

Perhaps there are many of my readers who do not remember when the steering column of a car was a solid steel shaft from the steering wheel to the input shaft of the steering gear, typically with one U-joint and/or a flexible coupling at the input shaft. In many serious frontal collisions, the driver was impaled on that column as collision forces pushed it back. Also, steering wheels were made of materials which were often more brittle. Today, steering columns collapse like a telescope in a severe crash. Steering wheels are designed to bend rather than break when impacted by a driver. These safety improvements have saved an estimated 53,017 lives.

As many of us know, the safest place to be in most crashes is inside the car. Better door locks and hinges which more securely resist impact-induced failure are attributed for saving 28,902 lives.

Instrument panels and dashboards in 1960s vintage cars were typically of steel construction, and knobs were often constructed such that they became points of serious injury in a collision. Manufacturers switched to padded materials for dashboards and redesigned them to keep passengers upright during crashes. Knobs and handles were designed to be more crash-friendly. These changes have

saved an estimated 21,043 lives.

In 1973, standards were created to improve side-impact safety, and additional improvements became effective in 1993. These improvements in crashworthiness are attributed with saving 14,703 lives.

Perhaps there are many of you who also remember when hydraulic brakes had one reservoir and one piston. A failure anywhere in the brake hydraulics meant that there were no service brakes, period. Also, brakes on virtually every car and light truck used drums at all four wheel positions. Now, virtually every passenger vehicle has front-disc brakes, and many are now coming with four-wheel disc brakes. And all have dual-piston master cylinders with dual reservoirs; a failure of the hydraulics now results in partial brake failure, not complete loss of service brakes. Braking-system improvements have saved 13,053 lives.

Airbags! With a few rare exceptions, these were newly installed in vehicles in the 1990s. They ranked third among vehicle lifesaving devices in 2002, the last year tallied. Airbags help for all front seat passengers 13 years old and older; they have saved an estimated 12,074 people.

Windshield design. Back in the “good old days,” windshields were made of ordinary glass. When a person was ejected through that glass, the sharp fragments would often inflict fatal injuries. Sometimes, the entire windshield would simply pop out of the frame. Now, all glass in cars and light trucks is tempered (to break into small pieces incapable of inflicting deep wounds) glass, and windshields are laminated: a flexible layer is placed between two layers of tempered glass, and that flexible layer reduces the likelihood of ejection for those persons who still refuse to wear their safety belts. And those laminated windshields are securely attached and adhesively bonded to their frames, allowing the laminated glass to work as it was designed to function. An estimated 6,710 lives have been saved by these improvements.

Child safety seats have saved an estimated 5,954 young lives. This seems like a disproportionately small number, but most fatalities in crashes are adults. When an unrestrained child is involved in a crash, however, even those injuries which are not fatal can have life-altering consequences. The safest place for a young