

Interior padding reduces head injuries in crashes



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A crash test of the Toyota Prius showed how upper interior padding helps protect occupants. In the test, the dummy's head struck the roof rail and grab handle during rebound, but sensors in the dummy suggested a low risk of head injury due to improved energy absorption in these components.

Padding that automakers added to the upper interiors of vehicles beginning in the late 1990s cuts life-threatening head injuries by 24 percent, a recent government analysis shows.

The study by the National Highway Traffic Safety Administration (NHTSA) looks at the effectiveness of energy-absorbing materials used without head-protecting side airbags to meet a NHTSA occupant protection standard upgraded in 1995. The more stringent standard was phased in from 1998 to 2002.

Since then, other factors, including a new side-impact pole test required by the agency, have made head-protecting side airbags practically universal in new models, so the role of interior padding is less prominent. However, it is still important for protecting people whose heads collide with vehicle parts that aren't covered by airbags and for minimizing injuries in less severe crashes that don't trigger airbags.

The energy-absorbing materials manufacturers use to meet the standard include composite plastic foam, egg-crate-like ribs, and crushable tubes. These materials are used around a vehicle's pillars and in the ceiling, plus any other part that a person's head might hit. The agency estimates the cost of the improvements adds about \$26 to the lifetime cost of purchasing and operating a vehicle.

For the study, NHTSA researchers looked at severe head injuries in general and specifically head injuries that contributed to fatalities. They then compared these with a control group of injuries not involving occupants' heads

and head injuries not involving upper interior components. Only vehicles without head-protecting side airbags were included in the analysis.

They concluded that complying with the standard without adding head-protecting side airbags reduces life-threatening head injuries from hitting upper interior components by 24 percent and cuts fatalities by 4 percent. That would translate into more than 1,300 lives saved per year if all vehicles on the road met the standard.

The updated regulation replaced a rule that dated back to 1968. NHTSA proposed adding force-distributing materials to door pillars, roof interiors, and windshield headers in 1970 but ended the effort 9 years later without issuing new requirements. The agency made the change in 1995 following research NHTSA initiated during the mid-1980s.