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Safety agency puts motorists at risk

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## Seatback strength



The Detroit News

**In rear-impact crashes, weak seatbacks can fail, sending their occupants flying backward. In NHTSA tests of high-speed crashes, seats frequently failed.**

## Better science can improve dated designs

### Technical issues delay new standards

By Jeff Plungis / *Detroit News* Washington Bureau

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**WASHINGTON** — Anitra Fuller, a 38-year-old social worker, was on her way to work at the Wake County Courthouse in Raleigh, N.C., on a rainy morning in 1997.

She was driving a Jeep Wrangler, which she had bought partly because

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of its rugged appearance. “They look safe,” Fuller said later in a court deposition.

Fuller was wearing a seat belt, but that didn’t protect her when her Jeep was rear-ended. The seatback collapsed, and the force of the crash ejected Fuller through the back window.

The next thing she recalls is waking up in an intensive-care unit. She couldn’t feel her legs, so she asked her brother if they had been cut off. He told her she had hit her head and suffered a spinal cord injury. She would never again be able to feel her legs.

Fuller had been a successful professional studying for a doctorate. Now she is a paraplegic, unemployed and dependent on her mother.

Fuller’s Jeep met the NHTSA safety standard for seatback strength established in 1971, based on a 1963 recommendation by the Society of Automotive Engineers. It requires a seat to withstand 200 to 300 pounds of force.

In a typical rear-impact crash, seats are subjected to forces four or five times that, according to Kenneth Saczalski, an engineering consultant who specializes in seat design.

Saczalski said he is seeing more cases of children being injured and even killed when front seats go flat in rear-impact crashes and hit them. Children are being placed in the back seat because of the dangers of front-seat air bags.

Seatbacks regularly fail during NHTSA’s 30-mph rear-impact crash tests to evaluate fuel-tank integrity.

In 1974, NHTSA announced a plan to upgrade the seat standard. In 1979, the effort was abandoned in the face of auto industry opposition.

In 1980, NHTSA wrote to manufacturers, noting a disturbing pattern of seat failures in its new-car tests. But the issue faded into the background. Diane Steed, who was NHTSA administrator for most of the Reagan years, said she doesn’t recall seat strength ever coming up in a discussion of things the agency should be doing.

In 1989, Saczalski petitioned NHTSA to increase the seatback standard 17-fold, arguing that such a standard was achievable using state-of-the-art materials and designs.

NHTSA granted Saczalski’s petition, saying his proposal that seatbacks be stiffened “warranted further consideration.” The agency asked for comments from the auto industry and other interested parties. It received a flurry of negative responses from automakers. General Motors Corp.

wrote that stiffening vehicle seats would “significantly increase costs and mass.” The agency backed off rulemaking and launched more research.

In 1992, NHTSA concluded that improving seating systems was more complex than simply increasing seatback strength. Seats had to be better integrated with head restraints and seat belts for the best results. It said it would undertake more research instead of proposing a new standard. A proposed new standard is expected this year.

“There are some tremendous technical issues to resolve,” said NHTSA spokesman Tim Hurd. “If it were easy, it would have been done by now.”

In a 1994 internal GM study, David C. Viano of GM’s Automotive Safety and Health Research Department estimated that better seatback designs across the entire U.S. fleet could save more than 400 lives a year. He also estimated the improvements would prevent 1,000 serious injuries each year. GM subsequently strengthened its seatbacks.

Robert Lange, GM’s executive director for structure and safety integration, said the additional research changed the company’s mind. “We are always willing to look at new science. Additional data can change our points of view about things,” he said.

Most automakers already exceed the federal seatback strength requirement. In a trial last year involving a Ford Explorer, Philip Majka, a consultant hired by Ford, testified that most Ford seats are two to three times stiffer than the federal requirement. In responding to the Saczalski petition in 1989, Mercedes-Benz wrote that its seats were designed to remain upright in NHTSA’s much-tougher 30 mph fuel-tank crash test.

Many automakers objected to the stiffness suggested by Saczalski in 1989. They argued that too strong a seatback could actually injure people. The potential for whiplash for a person out of position would be especially great — a body bending backward as it travels over a stiff seat. Collapsing seats also absorb some energy in a crash.

One possibility is a seat that doesn’t collapse yet has more energy-absorbing materials. NHTSA has contracted with the University of Virginia to develop a prototype.

“We know a lot more now than we did when we wrote that standard,” said Ron Huston, an engineering professor at the University of Cincinnati who specializes in crash dynamics. Huston added that manufacturers in certain cases designed weaker seats after the government rule went into effect in 1968.

A new regulation is on NHTSA’s agenda for this year.

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