COLLAPSING SEATBACKS AND INJURY CAUSATION: A TIMELINE OF KNOWLEDGE

1966

The National Highway Safety Bureau, predecessor agency to the National Highway Traffic Safety Administration (NHTSA), issues Federal Motor Vehicle Safety Standard (FMVSS) No. 207, Anchorage of Seats – Passenger Cars, to become effective 1/1/68. The purpose and scope of the standard is described as follows: "This standard establishes requirements for seats, their attachment assemblies, and their installation to prevent failure and dislocation by forces acting on the seat as a result of vehicle impact." The standard specifies test loadings and permits the use of static, i.e., non-dynamic compliance tests. (31 FR 15219, 3/12/66)

1967

Before FMVSS No. 207 can take effect, the agency issues a modification effective January 1, 1968, of its terms weakening the test loadings requirements and modifying the purpose of the standard to state that its intention is to "minimize the possibility of failure by forces etc..." rather than to "prevent failure and dislocation by forces acting on the seat as a result of vehicle impact." (32 FR 2415, 2/3/67)

1967

Society of Automotive Engineers (SAE) papers note that "a car seat which does not act as a motorist's inner protective shield against collision forces is failing its most vital role," and "a poorly designed seat and seat anchorage system becomes an injury-producing agency during collision." (Severy and co-authors, "Collision Performance, LM Safety Car," SAE 670458; "Preliminary Findings of Head Support Designs," SAE 670921)

1968

SAE papers note the importance of strong seatback design and the injurious consequences of weak designs. "An adequately designed full support system should be provided with an exceptionally rigid seat back and head support structure to restrain the motors in his normal seating position so that adequate accelerative support can be provided throughout the collision," and "...a weak seatback is not recognized as an acceptable solution for motorist protection from rear end collisions." (Severy and coauthors, "Vehicle Design for Passenger Protection from High-Speed Rear-End Collisions," SAE 680774; "Backrest and Head Restraint Design for Rear-End Collision Protection," SAE 680079)

1969

SAE papers by Snyder, Severy and co-authors point out the injury-causing outcomes of weak seat and seatback systems. ("A Survey of Automotive Restraint Systems," SAE 690243; "Safer Seat Designs," SAE 690812; "Rigid Seats with 28-in. Seatback Effectively Reduce Injuries in 30+ mph Rear Impacts," SAE Journal, April, 1969.

1973

The Insurance Institute for Highway Safety notifies NHTSA that in a series of rear-end moving barrier impact tests run in connection with a fuel tank integrity investigation, front seat backs of the impacted vehicles "failed in all tests." ("Report of Six Rear Moving Barrier Crash Tests") It invites NHTSA to inspect the vehicles. (IIHS letter of 11/6/73 to NHTSA Docket No. 70-20-NO2-019)

1974

The Public Interest Research Group (PIRG) petitions NHTSA to upgrade its seat strength standard (FMVSS 207). Although the standard is "intended to protect occupants (particularly in the front, outboard seating positions) from injury in low to moderate speed rear and frontal impact," recent studies of "contemporary vehicles subjected to rear impacts (both experimentally and in accidents on public roads)" have shown the standard to be inadequate. The petition seeks an upgraded standard that would include a dynamic rear-end impact test requirement with dummies present in the vehicles. (2/21/74, PIRG Letter and Petition to Amend FMVSS 208 To Include Passive Occupant Protection in Impacts from the Rear of the Vehicle)

1974

NHTSA proposes a new Federal Motor Vehicle Safety Standard "covering the total seating system." The new standard would combine two previous standards covering aspects of seating system performance, and would specify crash test parameters and frontal crash performance for front seats. It would require a dynamic rear impact test identical to that required for testing fuel tank integrity. No mention is made of hazards to rear seat occupants from front seat back collapse in rear-end impact. (FMVSS 207, 301)

1976

In an article in Automotive Engineering, an SAE publication, Severy and Kerkhoff assert that although seat designs are meeting the current, weak federal performance standard, no current design provides adequate protection under more than moderate collision induced forces. ("Designing Safer Seats," Automotive Engineering, Vol. 84, No. 10, October 1976.

1989

Researcher Kenneth Saczalski petitions NHTSA to require stronger front seatbacks in future cars. The agency accepts the petition but to date has not moved toward issuing the requirement. (Saczalski, Kenneth J: Petition to Improve FMVSS 207. April 18, 1989)

1989

In a notice, NHTSA invites comments on the Saczalski petition, which it characterizes as follows: "Mr. Saczalski ... has uncovered what he perceives to be a safety problem related to inadequate seat strength and seat back failure in rear impacts. ... he has investigated in the last two years four cases in which occupants suffered serious or fatal injuries as a result of rear impacts. The petitioner attributed this problem to the fact that during rear impact, the seat backs are loaded by the inertia of the occupant's upper body, a factor that the current seat back requirements do not consider. As a result, the petitioner stated that the seat back collapses, allowing the occupants to slide out from under the lap safety belt. This makes it more likely for the occupants to impact against the vehicle's interior or to be ejected.

"Mr. Saczalski requested that NHTSA amend Standard No 207 as follows. First, he petitioned that the agency reexamine the general performance requirements in Standard No. 207. Second, he requested that Standard No. 207 specify that the load must be both 20 times the weight of the seat back and 20 times the weight of the occupant. Sections S4.2 (a) and (b) of Standard No. 207 currently only require that the seat withstand 20 times the weight of the seat back. Third, he requested that Section S4.2(d)'s seat back moment criterion be increased to 56,000 inch-pounds. Section S4.2(d) currently requires a seat back to resist a moment of 3,300 inch pounds." (4/10/89, 54 FR 40896-02, Docket No. 89-20; Notice 1, Federal Motor Vehicle Safety Standards; Seating Systems; Occupant Crash Protection; Seat Belt Assemblies)

1989

The incoming NHTSA administrator, Jerry Curry, in a statement to a Senate committee, says the agency has been too slow in issuing new or upgraded safety standards. He pledges to set a goal of 18 months for approval or rejection of new regulations, one of which addresses the problem of inadequate seatback strength. (10/25/89, Associated Press, "Curry to Speed Safety Standards," by John Flesher.

1989

Mercedes-Benz, in comments to NHTSA, indicates support for stronger seatbacks and regulations requiring them. Seatback performance, it says, should "reduce the danger to front and rear occupants during rear impacts through excessive rearward seat back deformation and the resultant interaction between occupants." Mercedes says its vehicles meet this performance criterion "through a high stiffness of the seatback rails and energy absorbing seat back crossmember as well as an optimum match between belt, seat, and vehicle body structure." No other manufacturer offers similar comments to the agency. (12/7/89, Mercedes-Benz "Comments to Docket 8-20, Notice 1 Concerning Standards 207, 208 and 209")

1989

Researcher Alan Cantor petitions NHTSA to require stronger front seatbacks in future cars. The agency accepts the petition but to date has not moved toward issuing the requirement. (Cantor, Alan: Petition for Rulemaking to Amend FMVSS 207 to Prohibit Ramping up the Seat Back of and Occupant During a Collision. December 28, 1989)

1989

A contractor's report to Transport Canada, "Accidents Involving Seat Back Failures," documents twenty-three case studies – "individual, real-world incidents" illustrating "a variety of injury mechanisms arising out of seat back failure." The report is meant to "enable persons examining seat back strength requirements to better understand the consequences of failure to the subject component." It points out that, "The passenger seat and restraint system in a vehicle act together to retain the occupant during the accelerations a vehicle experiences in the course of an accident. When one of them fails, it is not always possible for the other to fully restrain the occupant." The report says:

"For a number of years it has been observed that the existing seat back strength requirement [FMVSS 207 as adopted by Canada] does not prevent seat back collapse. Seat back failure during a crash can not only result in injury to rear seat occupants but provides an avenue for ejection even when the occupant is using the restraint system. It has also been observed that during Canadian Motor Vehicle Safety Standard 301 rear impact tests, virtually all bucket seat backs and split bench seat backs fail." All of the involved seats, the report added, "met the standards currently in place for new motor vehicles" – standards identical to U.S standards. (Report No. C1322/2, "Accidents Involving Seat Back Failures," report by TES Ltd., 12/89)

1990

One Child Fatality in Rear Impact: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1991

Because of the "increasing number of vehicles with passenger-side air bags," NHTSA issues a warning to parents "about child safety seat use in cars with air bags." The "safest position for any type of child seat is in the rear seat," it says. Over the ensuing 25 years the warning is reiterated countless times in NHTSA publications and website materials. (NHTSA Press Release 60-91, "NHTSA Warns Parents About Child Safety Seat Use In Cars With Airbags")

1991

Three Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1992

A February 16 segment of CBS "60 Minutes" questions the adequacy of seatback strength and NHTSA seatback performance regulations. Reporting on the segment, *Automotive News* quotes its anchorman, Ed Bradley, as stating: "What keeps you from being seriously injured when you're hit from the rear is the backs of your seat. If that breaks – and in crashes at 30 miles an hour in both American and Japanese cars it almost always does – chances are you're going to be catapulted backward." Bradley also says the major car companies and NHTSA declined to discuss seat backs, according to *Automotive News*.("60 Minutes Report Evokes Debate on Seatback Safety," *Automotive News*, February 24, 1992)

1992

At a press conference on May 14, two consumer groups criticize NHTSA for breaking a 1989 pledge to "move quickly toward regulations preventing seat and seatback collapse in rear-end crashes" so that "occupants in rear-end crashes will be protected against ejection, loss of control and other injury-causing results of flimsy seats." They note the contrast between NHTSA's 30 mph frontal crash protection requirements and those for rear crashes, which allow seat components to "fail at impact speeds as low as 12 miles per hour." Films of General Motors rear impact tests confirm the lethal discrepancy.

During the press conference a 1968 General Motors internal memorandum is described: it "concluded that when a car is equipped with seat backs which are ""designed to yield under rear impact," there is "highly probable interference with the rear seat occupants. This condition has the potential of severe injury to either one or both of the occupants." Also, the results of a series of drop tests are released, showing that "the levels of protection provided in higher-speed front crashes by belted restraint systems are completely absent even in low-level rear impacts – even though the seat and seat back restraint systems, given their potential for energy distributing structures and materials, should provide even better protection at higher loadings than belts can provide."

The two consumer groups release a letter to the NHTSA administrator noting that frontal dynamic crash tests are already required by the agency's standards for the integrity of fuel systems and other components. "It is inexcusable that rear crash performance of seats, seatbacks and head restraint protection should be exempted from such standards." For testing seat performance, "30 mph fixed barrier rear impacts in longitudinal and angled configurations should be required..." Further, there should be "defect investigation and recall of vehicles whose seats and seatbacks are found to be needlessly failing in

real-world rear-end crashes." ("Safety Groups Upbraid NHTSA for Breaking Promise to Move on Seat Collapse in Rear-Enders," Institute for Injury Reduction and Public Citizen press conference, 5/14/92)

1992

Four Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1993

Nine Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1994

NHTSA issues a requirement that infant restraints carry a label stating, "Warning: Place this restraint in a vehicle seat that does not have an air bag," which for most cars means a rear seat. (Federal Motor Vehicle Safety Standards; Child Restraint Systems, 59 FR 7643-01, 2/16/94)

1994

Fourteen Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1995

Fifteen Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1996

NHTSA publishes rulemaking that modifies warning labels in automobiles to address "the adverse effects on children" of being placed in front seating positions equipped with air bags. In an extensive discussion of labelling effectiveness, the agency mandates that future labels should include the following language: "The BACK SEAT is the SAFEST place for children." No mention is made of the threat to child safety involved in the collapse of front seat backs. [Docket No. 74-14; Notice 103, 11/27/96)

1996

In *Zuern v Ford Motor Co*., the Arizona Court of Appeals reviews a case in which a Lincoln Continental rear-ended a stopped Ford Aerostar van at approximately 36-39 mph. "Plaintiff Frank Zuern was driving and his then five year-old son, Blake, was seated in the chair directly behind him. Both were wearing seat

belts. During the collision, Mr. Zuern's seat back collapsed rearward into the space that Blake occupied. Blake sustained a fractured left femur and severe head injuries," according to the Appeals Court. A lower court jury had found that Mr. Zuern's seatback was defective, a finding that was not challenged in the appeal. (*Zuern By and Through Zuern v. Ford Motor Co.*, Court of Appeals of Arizona, Division 2, Department A. December 19, 1996 188 Ariz. 486 937 P.2d 676)

1996

Twenty-Five Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1997

Twenty-Five Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1998

Thirty-One Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

1999

Thirty-Four Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2000

In a study entitled, *"Effects Of Front Seat Performance Failure On Rear Seat Occupant Injuries In Rear Impacts,"* researcher Keith Friedman and co-authors report on the results of an analysis of serious injury in "rear end accidents involving rear seat occupants seated behind a front seat occupant" in order to determine the role of front seat performance failure.

"Seat performance failure is when some element of the seat fails to do what it is designed to do... The results suggest that the risk of serious injury is greater in the 6.7-11.2 m/s Delta-V crash severity range when the seat in front of the occupant suffers a performance failure." (*Effects Of Front Seat Performance Failure On Rear Seat Occupant Injuries In Rear Impacts*, BED, Vol. 48, 2000, Advances In Bioengineering, ASME 2000)

2000

Forty-One Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat*

Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)

2001

In a letter to attorney James Sillery, NHTSA's acting Chief Counsel, John Womack, says the agency is "very concerned about seatback strength and performance." He notes various petitions have been filed seeking rulemaking to upgrade the seatback standard, and that NHTSA now "anticipates a Notice of Proposed Rulemaking to upgrade of this standard" in the near future. His letter responds to Mr. Sillery reporting front seat back collapse in a Toyota Camry rear impact.

2001

Forty-Five Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2002

In a paper entitled, *"Study Of Seat System Performance Related To Injury Of Rear Seated Children and Infants In Rear Impacts,"* Kenneth Saczalski and coauthors note that although NHTSA warns parents to place children in the rear seat due to front-seat airbag deployment injury risks, it has failed to act on a related injury risk to children. "...during most rear impacts the adult occupied front seats will collapse into the rear occupant area and, as such, pose another potentially serious injury risk to the rear seated children and infants who are located on rear seats... Also, in the case of higher speed rear impacts, intrusion of the occupant compartment may cause the child to be shoved forward into the rearward collapsing front seat occupant thereby increasing impact forces to the trapped child."

The paper reports on "more than a dozen actual accident cases involving over 2-dozen rear-seated children, where 7 children received fatal injuries, and the others received injuries ranging from severely disabling to minor injury... The results indicate that children and infants seated behind a collapsing driver seat, even in low severity rear impacts of less than 25 kph, encounter a high risk of serious or fatal injury, whether or not rear intrusion takes place." (*Study Of Seat System Performance Related To Injury Of Rear Seated Children & Infants In Rear Impacts,* Proceedings of IMECE2002, ASME International Mechanical Engineering Congress & Exposition, November 17-22, 2002, New Orleans, Louisiana, IMECE2002-33517)

2002

Fifty-Eight Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2003

In a paper presented at the 18th ESV Conference, a group of NHTSA researchers notes concern with the problem of front seat back collapse in rear impacts:

"Even though current production seats exceed the FMVSS No. 207 requirements, there are still anecdotal cases of front and rear occupant injuries and fatalities due to seat back collapse (Saczalski 1993 and Cantor 1989). These researchers believe that the potential hazards from a seat back that deforms too much in a rear impact include: the inability to control the vehicle in the event of a second impact, ejection of the occupant from the seat and injury to the rear seat occupant when struck by the front seat. Further, fatalities and injuries to rear child occupants due to seat back collapse of the front seat in rear impacts have also been reported. This is especially of concern since NHTSA recommends to the public that children of age 12 and under should be placed in the rear seat." ("*Performance Of Seating Systems In A FMVSS No. 301 Rear Impact Crash Test*," Saunders and coauthors, 18th International Technical Conference on the Enhanced Safety of Vehicles, May 2003, Tokyo, Japan)

2003

Fifty Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2004

TRIAL publishes, "Conspiracy of Silence," documenting manufacturer knowledge that "collapsing seat backs were a dangerous and outdated design" based on evidence produced in lawsuits involving injuries sustained due to inadequate seatback strength. (American Association for Justice, 1/3/04)

2004

NHTSA terminates its decade-long rulemaking in FMVSS 207, Seating Systems, which was intended to "improve motor vehicle seat performance in rear impacts." It says that "additional research and data analyses are needed to allow an informed decision on a rulemaking action in this area... Research into this area will continue as time and resources allow..." (69 Federal Register 67068-69, Nov. 16, 2004)

2004

Sixty-Six Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2005

In *Jeremy Flax et al. v. DaimlerChrysler Corp. et al.*, a Tennessee trial court awarded punitive damages against Chrysler for the death of a rear-seated child caused by a front seat back collapse. The Tennessee Supreme Court upheld the verdict against the manufacturer in 2008. According to the Court:
"On June 30, 2001, Rachel Sparkman and her eight-month-old son, Joshua Flax, were passengers in a 1998 Dodge Grand Caravan operated by Ms. Sparkman's father, Jim Sparkman. Ms. Sparkman was seated in a captain's chair directly behind the driver's seat. Joshua Flax was restrained in a child safety seat in the captain's chair directly behind the front passenger's seat, which Joe McNeil occupied. As Mr. Sparkman turned left from a private drive onto a public road, the Caravan was rear-ended by a pickup truck...

"Upon impact, the backs of the seats containing Mr. Sparkman, Ms. Sparkman, and Mr. McNeil yielded rearward into a reclining position. Tragically, the front passenger's seatback collapsed far enough to allow the back of Mr. McNeil's head to collide with Joshua Flax's forehead. The collision fractured Joshua Flax's skull and caused severe brain damage. None of the other passengers in the Caravan suffered serious injuries. Experts for both parties acknowledged that Joshua Flax would not have been seriously injured if the seat in front of him had not yielded rearward." *Flax v. Daimler-Chrysler Corp.*, 272 S.W.3d 521 (Tenn. 2008).

2005

A Detroit News article reporting on the Flax cases states that "Safety advocates say collapsing seats in rear-end collisions are a common and dangerous problem." It adds that recently, "NHTSA declined to establish stronger seatback strength requirements, saying it wants to do additional research and has higher priorities at the moment. The seat-strength regulation, safety standard 207, has remained essentially unchanged since it was adopted in 1971.

"But Clarence Ditlow, director of the Center for Auto Safety, a Washington group that tracks accident data, said he has seen an increase in accidents where children in the back seat are injured by collapsing front seats in otherwise survivable crashes. 'People in these crashes whose seats don't collapse walk away,' he said." A spokesperson for NHTSA, asked to comment on the Flax crash, is quoted as saying, "These seats did exactly what they were designed to do." (Detroit News, March 30, 2005)

2005

Fifty-Seven Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2006

Fifty-Eight Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2007

Forty-Seven Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2008

Fifty-Four Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2009

Forty-Two Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2010

Forty Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2011

Thirty-Nine Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2012

Fifty-Six Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2013

Forty-Four Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2014

Forty Child Fatalities in Rear Impacts: *(Children Seated in Second Row of 1990 and Later Model Year Passenger Vehicles (FARS 1990-2014) – Unejected, Non-rollover, Seated Behind a Front Seat Occupant or in the Center Rear Seat. Analysis by Friedman Research Corp. Data Source: NHTSA Fatal Accident Reporting System)*

2015

In *Kingsley v. Fiat Chrysler*, a suit filed in the North Carolina courts, the death of 13-month-old Weston Kingsley is described as follows:

"On the morning of February 2, 2014, the Kingsleys were on their way to Sunday school in the Caravan. Jonathon drove; Kelsey was in the front passenger seat; their son Teague sat in the second row behind Kelsey; and Weston, properly restrained in a child car seat, sat in the left seat in the second row, behind his father. Jonathon and Kelsey were properly belted with their seats in an upright position.
At 13 months old, at least 26 pounds, and 30.5 inches tall, Weston was in a forward-facing child car seat. That position complies with the child seat's instructions, North Carolina law, and the Caravan's owner's

manual. He was properly restrained in five-point harness in a child car seat affixed to the second row seat behind the driver's seat.

“As the Kingsleys waited on US 70 to turn into the church parking lot, Hoover rear-ended them. During the crash, both of the Caravan's front seats failed, collapsing rearward. Because the driver's seat failed, the seatback, headrest, and/or Jonathon's head struck Weston's head. Restrained in the child car seat, Weston had nowhere to go. He was a direct, fixed target for the defective driver's seat as it failed rearward, sending his father rearward in the impact.

“As a direct and proximate result of the Caravan's driver seat failure, Weston suffered severe blunt force trauma, fracturing his skull. He had no other significant injuries and no significant soft tissue injuries. Surviving for nearly three hours, Weston spent the last of his life with a badly fractured skull. He died that afternoon. No one else in the car had any significant physical injuries, including Kelsey's unborn child, who was delivered later, at term, and in good health then and now.” (*Jonathon Kingsley, Plaintiff, V FCA US LC*, filed May 14, 2015, State Of North Carolina, General Court Of Justice, Wake County Superior Court Division)

2015

Researcher Alan Cantor again petitions NHTSA to upgrade its strength requirements for front-seat seatbacks, noting that “seats designed with insufficient rearward seatback strength essentially force parents to unknowingly place children behind a seat whose seatback can collapse rearward during a collision and cause extensive harm to the child in an otherwise protectable collision. Furthermore, there is no warning, for example, to ‘Place the child behind the unoccupied seat, if possible’ or to ‘Place the child behind the lightest weight front occupant, if possible’ (since the propensity of a seat to fail in a given rear-end collision is directly proportional to the weight of the occupant).” (9/28/15, ARCCA Petition to Amend 49 CFR 571.207, FMVSS 207-Seating Systems)

2015

In a detailed report on the collapsing seatback hazard, CBS News warns consumers that, “Even if you bought a car with a five-star safety rating, if you're hit from behind, your seat may not protect you or the children sitting behind you.” It notes that, “Experts say in certain crashes, some car seats can break and collapse, leading to paralysis or death.”

For the report, CBS hired Alan Cantor, who has filed petitions with NHTSA for upgraded seatback strength, to “test the strength of seats and the standard that regulates them, using a banquet chair. ‘What we're trying to do is show how absolutely ridiculous the federal standard is,’ said Cantor.” With standards so low, “Cantor finds all the vehicle seats - and even that banquet chair - meet or exceed the federal requirements...” The report notes that, “Auto safety regulator NHTSA's own researchers also warned of the issue in 1992, citing examples of ‘major or fatal injuries’ when seat backs collapse.”

The report cites a number of cases in which collapsing front seat backs in rear end crashes killed or injured a child in the rears seat. Among them is the 2010 crash of a new Honda Odyssey rear ended at 55 mph. Sixteen-month-old Taylor Warner was in a car seat behind her father. His seatback collapsed in the impact, striking Taylor in the head and killing her.

In statements to CBS, NHTSA is quoted as justifying its discontinuance of seat strength rulemaking in 2004 as follows: “...the kind of high-impact rear-end crashes that are generally cited as justifying a change are relatively uncommon.” It criticizes the 60 Minutes report for contrasting the agency’s delay of

action to upgrade seat strength rule with its more timely action to recall faulty Takata airbags. It calls the comparison “apples and hand grenades” which could “discourage” people from “addressing a safety defect that could cost their lives or the life of someone in their family...the Takata comparison is specious and misleading.” It does not identify which of the hazard issues, weak seat backs or Takata air bags, it believes is “apples” and which is “hand grenades”. (CBS News, October 28, 2015: http://www.cbsnews.com/news/nhtsa-requirements-for-car-crash-tests-inadequate-for-testing-fatalities-from-car-seats/#article)

2016

In an analysis of data for 1990-2014 from NHTSA’s Fatal Accident Reporting System, Friedman Research Corp. finds that a total of 898 children ages 0-12 died in rear impacts of 1990 and later model-year cars during that period. The data exclude crashes in which a rollover or ejection occurred. The involved children were seated behind a front-seat occupant or in a center rear seat.