

## Glossary of Abbreviations Used

AHOF	- Average Height of Force
ANPRM	- Advanced Notice of Proposed Rulemaking
CAFE	- Corporate Average Fuel Economy
DOT	- Department of Transportation
FMCSA	- Federal Motor Carrier Safety Administration
FR	- Final Rule
IIHS	- Insurance Institute for Highway Safety
NAS	- National Academy of Sciences
NHTSA	- National Highway Traffic Safety Administration
NPRM	- Notice of Proposed Rulemaking
TREAD Act	- Transportation Recall Enhancement, Accountability and Documentation Act

## End Notes

<sup>1</sup> Plungis, Jeff. "Lax auto safety rules cost thousands of lives." *Detroit News* 3 March 2002.

<sup>2</sup> *Id.*

<sup>3</sup> CDC "Injuries and Deaths among Children Left Unattended in or Around Motor Vehicles," *Morbidity and Mortality Report* Vol. 51. No. 26. July 5, 2002.

<sup>4</sup> *Referring to* Hans C. Joksch, "Vehicle Design versus Aggressivity," (April 2000), DOT HS 809 194. p. 40-42

<sup>5</sup> *Id.*

<sup>6</sup> Insurance Institute for Highway Safety Status Report, 6-28-2002.

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## Chapter Two: The Chronologies

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<p><b>THE SAD HISTORY OF ROLLOVER PREVENTION:</b> 30 Years, Thousand of Deaths and Injuries, and Still No Safety Performance Standard</p>
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*Rollover crashes are responsible for a full one-third of all vehicle occupant fatalities, yet meaningful federal action to reduce these crashes has been delayed for more than three decades.*

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Apr. 1973	The National Highway Traffic Safety Administration (NHTSA) issues an Advanced Notice of Proposed Rulemaking (ANPRM) on a rollover resistance standard “that would specify minimum performance requirements for the resistance of vehicles to rollover in simulations of extreme driving conditions encountered in attempting to avoid accidents.” No safety standard has ever been issued.
1986	NHTSA analysis shows that rollover crashes are the most dangerous collision type for passenger vehicles.
Sept. 1986	Rep. Tim Wirth, Chairman of the House Commerce Committee, petitions NHTSA to issue a rollover standard based on Static Stability Factor (SSF) – a geometric measurement concerning the relationship between vehicle height and track width.
Dec.1987	Rep. Tim Wirth petition denied by NHTSA on the basis that SSF does not accurately predict rollover propensity. SSF was later adopted in the year 2000 as the basis for the agency’s rollover resistance consumer information program, but not as a minimum safety standard.
Feb./July 1988	The Center for Auto Safety (CAS) and the Safety First Coalition (SFC) petition NHTSA to initiate a defect investigation on the highly rollover-prone Suzuki Samurai.
June1988	Consumers Union petitions NHTSA to protect occupants against “unreasonable risk of rollover.”
Sept. 1988	NHTSA grants Consumers Union petition and states that it is already undertaking research into rollover safety and that the petition is consistent

with the agency's "steps to address the rollover problem." NHTSA simultaneously denies the CAS and SFC petitions to investigate the Samurai

- 1988 -1993 NHTSA conducts an investigation and data analysis of more than 100,000 single-vehicle rollover crashes.
- Oct. 1991 Congress requests report from NHTSA regarding rollover and roof crush standards (FY'92 DOT Appropriations Act, Pub. L. 102-143, S. Rept. 102-148).
- Dec.1991 Congress requires NHTSA rulemaking to prevent unreasonable risk of rollover. An ANPRM or Notice of Proposed Rulemaking (NPRM) was required no later than May 31, 1992 and completion of a rulemaking action on rollover within 26 months of publication of the ANPRM. Yet Congress allowed the rulemaking to be considered completed when NHTSA either published a final rule or announced that the agency would not promulgate a rule.
- Jan. 1992 NHTSA publishes an ANPRM proposing multiple options for establishing a reasonable metric baseline for acceptable rollover propensity. The ANPRM states that NHTSA is considering regulatory action to reduce the frequency of rollovers and/or the number and severity of injuries resulting from vehicle rollovers. A Technical Assessment Paper is also published discussing testing activities, results, crash data collection and data analysis (NHTSA-1996-1683-4).
- Apr. 1992 NHTSA issues Report to Congress, *Rollover Prevention and Roof Crush*, highlighting the research and its plans to address rollover prevention and survival.
- Sept. 1992 NHTSA delivers the agency's planning document, *Planning Document for Rollover Prevention and Injury Mitigation*,<sup>1</sup> at Society of Automotive Engineers Conference, giving an overview of the rollover problem and the action NHTSA was examining to address it, including vehicle measures for rollover resistance, improved roof crush resistance to prevent head and spinal injury and improved side window glazing and door latches to prevent occupant ejection.
- June 1994 Rollover standard rulemaking terminated following a cost-benefit analysis that used outdated late 1980s data regarding the prevalence of light trucks in the vehicle population and ignored the significant trend of increasing rollover-prone vehicles, namely SUVs, as a percentage of new vehicle sales and an increasing presence on the highway.
- June 1994 Secretary of Transportation, Federico Peña, announces NHTSA's plans to

substitute a “comprehensive regulatory and information strategy” for the rollover propensity standard. This strategy included 1) a safety sticker to be placed on all vehicles that includes their rollover likelihood rating (watered down following industry complaint, it now only mentions a generic likelihood of rollover); 2) the consideration of new standards for side windows and door latches (yet to be promulgated); and 3) examination of an upgraded roof crush standard (yet to be promulgated).

- July 1994 NHTSA issues a notice of rulemaking on a vehicle safety consumer information label for rollover stability.
- July 1994 Advocates for Highway and Auto Safety (Advocates) and Insurance Institute for Highway Safety (IIHS) petition NHTSA to reconsider decision to terminate rulemaking on rollover standard.
- Sept. 1994 Congress requires National Academy of Sciences (NAS) study of vehicle safety consumer information (FY’95 DOT Appropriations Act, Pub. L. 103-331, *see* H. Rept. 103-543, Part 1); NHTSA suspends rulemaking on vehicle rollover safety consumer information labeling until study is completed.
- Aug. 1995 Responding to a 1991 ISTEA requirement that NHTSA initiate and complete a rulemaking to address “improved head impact protection from interior components of passenger cars (i.e., roof rails, pillars, and front headers),” the agency issues a final rule amending FMVSS 201 to require passenger cars and light trucks with a GVWR of 10,000 pounds or less to provide greater protection when an occupant’s head hits upper interior components (such as A-pillars and side rails) during a crash.
- March 1996 NAS issues study of vehicle safety information, *Shopping for Safety*<sup>2</sup>, on NHTSA’s proposed consumer information program, stating that consumers need more information than they are currently provided and that a safety label, like the one currently used for displaying fuel economy, should be displayed on all new passenger vehicles sold at U.S. dealerships listing standardized safety ratings.
- May 1996 NHTSA issues *Status Report for Rollover Prevention and Injury Mitigation*, with a description of NHTSA’s planned development of a dynamic rollover propensity test.
- June 1996 NHTSA re-opens 1994 rulemaking docket on a rollover consumer warning label.
- June 1996 NHTSA denies Advocates/IIHS July 1994 petition for reconsideration of decision to terminate rulemaking on rollover prevention standard, stating that a standard based on static vehicle measurements would eliminate a

“very popular vehicle type” – the compact SUV and was not justified on cost-benefit grounds.

- Aug. 1996 Consumers Union (CU) petitions NHTSA to develop a standard that would produce meaningful, comparative data on the emergency-handling characteristics of various SUVs and to provide test results to the public as consumer information.
- May 1997 NHTSA grants CU petition, stating: “NHTSA will initially focus on exploring whether it can develop a practicable, repeatable and appropriate dynamic emergency handling test that assesses, among other issues, a vehicle’s propensity for involvement in an on-road, untripped rollover crash.”
- Apr. 1998 NHTSA issues an NPRM on a SUV rollover warning label for the vehicle visor.
- Mar. 1999 NHTSA issues final rule on revised SUV rollover warning label, requiring a rollover warning sticker on the vehicle’s visor or window that says “Warning: Higher Rollover Risk” and instructions to avoid abrupt maneuvers and excessive speed, and to buckle up, are written beneath the heading.
- June 2000 NHTSA proposes rollover consumer information program based on static stability factor (SSF) measurements as part of the agency’s New Car Assessment Program (NCAP) that provides comparative vehicle performance information on the agency’s Web site, but declines to require that the information be placed on the window sticker at the point-of-sale.
- Oct. 23, 2000 Congress funds NAS study of NHTSA proposed rollover information rating based on SSF.
- Nov. 2000 Following the Ford Explorer/ Firestone tire tragedy, Congress requires dynamic testing of vehicle rollover be added to NHTSA’s consumer information rating program with testing to begin by November 2002 (TREAD Act, Sec. 12, Pub.L. 106-414).
- Jan. 2001 NHTSA begins publishing rollover ratings based on a vehicle’s static stability factor (SSF) on the agency’s Web site.
- July 2001 NHTSA issues request for comments on developing dynamic test as basis for rollover rating consumer information program beginning in 2003.
- Sept. 2001 According to a Louis Harris poll commissioned by Advocates for Highway and Auto Safety, 85 percent of Americans support a federal rollover prevention minimum standard.

Feb. 2002	NAS study, <i>Rating System for Rollover Resistance, An Assessment</i> , issued. The report recommends that NHTSA expand the scope of its program, consider metrics other than stars, and develop an overall measure of vehicle safety to be integrated into the vehicle label. The NAS also points out that NHTSA should evaluate the appropriateness of a rollover rating program in the absence of a minimum standard (the other consumer information ratings, for frontal and side impact crashes, reward performance above a minimum compliance standard).
Oct. 2002	NHTSA issues NPRM on dynamic test procedure for rollover consumer information.
Feb. 26, 2003	Senate Commerce Committee holds a hearing on SUV safety where senators, auto industry representatives, the administrator of NHTSA and spokespeople from consumer safety groups speak about the rollover prevention and survivability.
Apr. 2003	NHTSA publishes <i>Characteristics of Fatal Rollover Crashes</i> <sup>3</sup> and reports the following: <ul style="list-style-type: none"> <li>- Rollovers are more likely to result in fatality than other crashes;</li> <li>- Rollovers constitute about one-fifth of all fatal crashes;</li> <li>- SUVs have the highest rollover fatality rate at 11.06 per 100,000 registered SUVs, followed by pickups at 7.52, vans at 4.09 and cars at 3.48 (for 1999).</li> </ul>
June 2003	NHTSA issues <i>Initiatives to Address the Mitigation of Vehicle Rollover</i> <sup>4</sup> – reporting that rollover mitigation is one of its four major priority areas, but proposing few concrete actions or deadlines. The other three priority areas include vehicle compatibility, safety belt use and impaired driving.
July 2003	NHTSA issues <i>Motor Vehicle Traffic Crash Injury and Fatality Estimates: 2002 Annual Report</i> <sup>5</sup> , finding that rollover crashes accounted for 82 percent of the total fatality increase between 2001 and 2002. The report also reveals that in 2002, 10,666 occupants were killed in rollovers – one-third of all occupant deaths.
Oct. 2003	In accordance with the TREAD mandate, NHTSA adopts a “fishhook” maneuver as the dynamic test procedure to be combined with SSF in rollover consumer information ratings and to be used beginning with its 2004 model year tests.
Feb. 4, 2004	NHTSA issues first round of rollover ratings for 14 vehicle models and their corporate twins, based on a new dynamic test/SSF measurement. While the dynamic test provides an indication of on-road performance, the absence of a standard, or performance “floor” means that every vehicle starts with at least one star, and inflates the performance results on the

tests (*i.e.*, with a two-star “floor,” vehicles now earning three stars would receive substantially lower ratings).

Feb. 12, 2004

Senate passes S.1072, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA 2003), which includes safety provisions concerning rollover that would:

- Mandate a rollover prevention standard that would assure the improvement of the basic design characteristics of vehicles under 10,000 lbs. to increase their resistance to rollover (NPRM 6-30-04, final rule not later than 18 months following NPRM);
- Require the consideration of additional technologies that would increase handling and reduce the likelihood of instability (NPRM 6-30-04, final rule not later than 18 months following NPRM); and
- Assign NHTSA to study Electronic Stability Control systems and report to Congress on their findings (due 12-31-05).

## **1971 ROOF STRENGTH STANDARD:**

### **33-Year Old Standard Does Not Provide Basic Rollover Crashworthiness Protections**

*The auto industry and government have known about the deadly consequences of vehicle roof crush since 1960s, yet have never upgraded the 1971 standard nor extended it to vehicles weighing more than 6,000 lbs.*

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- July 13, 1965      Both General Motors (GM) and Ford highlight the importance of roof strength in rollovers in testimony before Congress.
- Apr. 13, 1966      GM Engineering Staff memo describes the company's plans to develop a dynamic roof strength drop test from 5 ½ feet.
- Aug. 1, 1966      Ford test report describes dynamic roof crush "roof drop test."
- Sept. 9, 1966      President signs National Traffic and Motor Vehicle Safety Act.
- Oct. 11, 1967      Federal Highway Administration (FHA) of the National Traffic Safety Bureau (NTSB) issues an Advanced Notice of Proposed Rulemaking (ANPRM) on 47 issues, including roof intrusion, seeking public comment.
- Jan. 6, 1971      The National Highway Traffic Safety Administration (NHTSA, formerly NTSB), issues a Notice of Proposed Rulemaking on roof intrusion protection for passenger cars that would statically test both front corners of the roof on passenger vehicles.
- Apr. 1971      General Motors Corporation (GM) and the Automobile Manufacturers Association (which later became the Alliance of Automobile Manufacturers) argue in comments to the docket that testing both sides of the roof is unnecessary. It was later revealed in litigation that GM had used NHTSA's two-corner test on six of its production model vehicles and that only one vehicle tested had passed. GM nevertheless argued to NHTSA that only one side should be tested because the roof was "symmetrical," in addition to pushing for other changes to weaken the test. Moreover, GM withheld its testing results from the agency.
- Dec. 8, 1971      NHTSA issues final rule establishing a roof crush standard for passenger cars to take effect in 1973. This standard, which today is virtually the same as in 1973, measure the result of pressure to only one side of a vehicle's roof.
- Mar. 22, 1973      The Center for Auto Safety petitions NHTSA to apply federal motor

vehicle safety standards, including the roof crush standard, to light trucks and multipurpose passenger vehicles with gross vehicle weight rating (GVWR) of 10,000 pounds or less.

- Sept. 1, 1973      Roof Crush Resistance standard, FMVSS No. 216, takes effect for passenger cars.
- 1974                NHTSA contracts with Minicars for development of a research safety vehicle that protects occupants in serious rollover crashes at 50 mph.
- Apr. 30, 1976     Engineer killed during accidental rollover at GM proving grounds during a tire evaluation test. GM institutes a new policy requiring roll cages on all test vehicles and all test drivers and test occupants to wear helmets.
- Apr. 17, 1991     NHTSA issues a final rule, effective Sept. 1, 1993, extending the application of FMVSS 216, the existing car roof crush resistance standard to light trucks, vans, buses and multipurpose passenger vehicles (MPVs) with GVWR of 6,000 lbs. or less, specifically declining to extend the standard to light trucks, vans, buses and MPVs with a GVWR of up to 10,000 lbs.
- Dec. 18, 1991     Intermodal Surface Transportation Efficiency Act (ISTEA) requires application of passenger car safety standards to light trucks, vans, buses and MPVs with GVWR of 6,000 lbs or less. ISTEA also requires issuance of a standard to improve head impact protection from interior components (roof rails, pillars, and front headers) of passenger cars. ISTEA additionally directs NHTSA to commence a rulemaking proceeding on a standard to prevent rollover crashes.
- Jan. 3, 1992       NHTSA issues an advanced notice of proposed rulemaking (ANPRM) to establish a rollover prevention standard, as required by ISTEA.
- Sept. 23, 1992     NHTSA releases *Planning Document for Rollover Prevention and Injury Mitigation* listing alternative actions agency could take to address rollover problem, including research into improved roof crush resistance to prevent head and spinal injury.
- Jan. 22, 1993      NHTSA delays by one year, until Sept. 1, 1994, effective date for application of FMVSS 216, the roof crush standard to light trucks, vans, buses and MPVs with gross vehicle weight rating of 6,000 lbs. or less.
- June 23, 1994      NHTSA terminates rulemaking on rollover prevention and stability standard. In the notice of termination, the agency promises that it will instead address factors involved in preventing rollover casualties, including roof strength requirements.

May 6, 1996	R. Ben Hogan, Smith and Alspaugh, PC, a law firm, petitions NHTSA for rulemaking, and requests that the agency require “roll cages” as standard equipment on passenger cars.
Jan. 8, 1997	NHTSA grants petition requesting rulemaking to require “roll cages.”
Apr. 27, 1999	FMVSS 216, the roof crush standard procedure clarified for placement of the test device to accommodate certain vehicles that have raised and/or highly sloped roofs. This change in the standard does not address or upgrade underlying roof crush testing and strength requirements.
Sept. 2000	In wake of the exposé of Firestone tire/Ford Explorer rollover fatalities, NHTSA Administrator states that agency needs to improve roof crush safety standard for rollover protection in testimony before Congress.
Oct. 22, 2001	NHTSA publishes notice and request for comments on roof crush resistance, describing agency roof crush research and testing as a part of its rollover protection program over the past 30 years.
2002	Herbst, B., Forrest, S., Meyer, S., Hock, D. publish their “Alternative Roof Crush Resistance Testing with Production and Reinforced Roof Structures,” <sup>6</sup> that discusses the feasibility of a dynamic roof crush test, stating that “[t]he automotive industry and researchers have used drop testing for years to evaluate roof strength. In the late 1960s’s, Society of Automotive Engineers (SAE) developed a standardized procedure to perform full vehicle inverted drop testing. Many domestic and import auto manufacturers have utilized the inverted drop test technique as far back as the 1960s and 1970s to evaluate roof strength.
Apr. 2002	NHTSA publishes its report <i>Characteristics of Fatal Rollover Crashes</i> <sup>7</sup> and notes that rollover crashes are more likely to be fatal than other crashes.
Sept. 17, 2002	NHTSA Administrator Dr. Jeffrey Runge states that roof crush intrusion potentially contributes to serious or fatal injury in 26 percent of rollover crashes. <sup>8</sup>
Feb. 26, 2003	Senate Commerce Committee holds a hearing SUV safety where senators, auto industry representatives, the administrator of NHTSA and spokespeople from consumer safety groups speak about the problems of roof crush in SUV rollovers.
March 3, 2003	<i>Detroit News</i> series “Deadly Driving” highlights the failure of NHTSA to upgrade its roof strength standard and cites NHTSA data indicating that 1,400 deaths and 2,300 serious injuries could be prevented if the standard were more rigorous.
July 15, 2003	National Transportation Safety Board (NTSB) concludes roof crush

contributed to severity of driver injuries and diminished passenger survivable space in Henrietta, Texas crash of 15-passenger van that killed four occupants and seriously injured eight others.

- July 2003 NHTSA issues *Motor Vehicle Traffic Crash Injury and Fatality Estimates: 2002 Annual Report*, finding that rollover crashes accounted for 82 percent of the total fatality increase between 2001 and 2002. The report also reveals that in 2002, 10,666 occupants were killed in rollovers – one-third of all occupant deaths.
- July, 2003 NHTSA estimates that 1,339 serious or fatal injuries caused by roof crush intrusion are suffered by belted occupants each year. NHTSA lists a proposed rule to upgrade roof crush resistance as a possible 2004 action, and final rule as a possible 2005 action, in *Vehicle Safety Rulemaking Priorities and Supporting Research 2003-2006*, with little description of a rule's possible contents. No proposal for rulemaking or an upgraded standard has yet been issued.
- Nov. 25, 2003 S.1978 reported out of Senate Commerce, Science and Transportation Committee containing a mandate for NHTSA to issue a dynamic roof crush standard and upgrade of rollover crashworthiness in vehicles up to 10,000 lbs.
- 2003 - Jan. 2004 Safety researchers at Xprts, Inc., conduct roof crush dynamic tests using the Jordan Rollover System (JRS) on Chevrolet Blazers, Chevrolet Suburbans and Ford Explorers. During the JRS tests, the roadway surface moves forward along a track, contacting the roof of the vehicle as it rotates on the spit. The test surface impacts *both sides of the roof a single time*, imitating the first roll of a vehicle in a rollover crash. The results show that while the current static test measures only the weakness of the roof, dynamic tests measure occupant injury, safety belt performance, window glazing, side impact air bags, seatback strength, and door locks and latches, as well as roof strength.
- Feb. 12, 2003 Senate passes S.1072, the Highway Funding Bill, which includes safety provisions from S.1978 that would:
- Require NHTSA to issue a rollover crashworthiness standard by June 30, 2006, for passenger vehicles under 10,000 lbs. that will consider the prescription of a dynamic roof strength standard that realistically duplicates actual forces;
  - Require NHTSA consideration of improved seat structure and safety belt design (including seat belt pretensioners), side impact head protection air bags and roof injury protection measures.

## **GOVERNMENT STALLS ON REDUCING EJECTIONS:**

**No Standard for Windows that Reduce Ejection Door Lock Retention;  
Standard Remains Unchanged for over 30 Years**

*Each year 7,300 people are killed each and nearly 8,000 are severely injured when partially or fully ejected through vehicle doors, windows and moon roofs. An estimated 1,300 lives could be saved each year by improving the strength of side and rear windows enough to retain occupants. And many of the 2,500 annual door ejection deaths could be prevented with upgraded locks and retention components that keep doors from flying open during crashes.*

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- Jan. 1, 1968      Standard 206 - Door Locks and Door Retention Components – takes effect and is aimed at “minimizing, the likelihood of occupants being thrown from the vehicle as a result of impact.”
- Jan. 26, 1981      NHTSA seeks public comment on the safety advantages of advanced window glazing (the addition of materials, such as plastic, to side and rear windows to increase elasticity of windows and decrease complete breakage of window upon impact).
- Aug. 1988      NHTSA issues two advanced notices of proposed rulemakings (ANPRMs) on side impact protection, seeking comment on increasing resistance to occupant ejection through side windows – one for both cars and another for light trucks (SUVs, pickups and vans). NHTSA conducts testing on improved glazing materials between 1988 and 1995.
- Jan. 3 1992      NHTSA publishes an ANPRM on rollover protection which includes discussion of preventing ejection through glazing during rollovers.
- June 1994      NHTSA cancels its proposed rule to establish a vehicle stability standard to reduce rollover crashes and promises to pursue multiple strategies to reduce occupant injury and its severity when vehicles do suffer rollovers. One of the initiatives is anti-ejection countermeasures including improved door locks and latches and window glazing.
- July 1995      NHTSA holds public meeting on improvements in door latch and lock standards and asks for public comments on the issue.
- Sept. 1995      NHTSA publishes final rule extending the requirements of the 1968 door lock standard to the back doors of passenger cars and multi-purpose vehicles (hatchbacks, station wagons, SUVs, and passenger vans) after finding that weak locks are often the cause of rear doors popping open in rear crashes and killing children.

- Nov. 1995 NHTSA issues “Ejection Mitigation Using Advanced Glazings: A Status Report”<sup>9</sup> on positive safety effects of anti-ejection glazing.
- Feb. 1, 1996 NHTSA holds public meeting on glazing and occupant ejection and to discuss the findings of the ejection mitigation status report released the previous November.
- Sept. 1999 NHTSA proposes that no doors open in frontal crash testing, but at least one door should be able to be opened following the test.
- Nov. 1999 NHTSA deletes proposed door retention/opening requirements.
- Nov. 1999 NHTSA issues “Ejection Mitigation Using Advanced Glazing, Status Report II.”<sup>10</sup> Findings in both the 1995 and 1999 status reports show that advanced glazing is capable of preventing approximately 1,300 fatalities per year and that feasible and practical prototypes exist.
- Nov. 2000 NHTSA issues an ANPRM on safety benefits of anti-ejection glazing.
- Nov. 2001 NHTSA issues a report, “Ejection Mitigation Using Advanced Glazing” to Congress, reversing its previous decision that the safety benefits of advanced glazing are very high.
- March 3-6, 2003 *Detroit News* series “Deadly Driving” highlights window strength and door locks/hinges as primary ways NHTSA could enhance safety. The report cites government statistics to show that between 537 and 1,305 fatalities could be prevented annually from improved side windows and that updated door latch standards could prevent hundreds of the 2,500 door-related ejection deaths each year.<sup>11</sup>
- Apr. 2002 NHTSA publishes its report “Characteristics of Fatal Rollover Crashes” and notes that 62 percent of occupants killed in vehicle rollovers were ejected during the crash and that only 23 percent of survivors of rollovers were ejected.
- June 18, 2002 NHTSA withdraws its side glazing rulemaking notices and closes the two dockets established in 1988. The chief decision to terminate was based on the finding of an increased risk of neck injury, yet the test used to measure neck injury was problematic and non-repeatable, and only one of a number of vehicles tested had these negative results.
- Feb. 2003 NHTSA proposes development of global technical regulation governing the design and performance of door locks, latches, and retention components pursuant to the 1998 U.N. Economic Commission for Europe Global Agreement.

- Feb. 26, 2003      Senate Commerce Committee holds a hearing on SUV safety where senators, auto industry representatives, the administrator of NHTSA and spokespeople from consumer safety groups speak about the problems of ejection in SUV rollovers.
- Dec. 2003      In NHTSA's 2003-2007 Priority plan, the agency promises to propose a rule upgrading door lock and latch design and performance by Apr. 2004 and a final rule by 2005.
- Feb. 12, 2004      Senate passes S.1072, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA 2003), which includes safety provisions concerning ejection that would:
- Mandate a standard be set to reduce occupant ejection including the consideration of advanced side glazing, side curtain airbags and side impact airbags; and (Notice of Proposed Rulemaking (NPRM) 6-30-2006, Final Rule not later than 18 months following NPRM);
  - Assure the creation of a standard that would require manufacturers to strengthen door locks, latches and retention components of doors to prevent occupant ejection (NPRM 6-30-2006, Final Rule not later than 18 months following NPRM).

## **AGGRESSIVITY AND VEHICLE COMPATIBILITY:**

### **Three Decades of Research: Growing Knowledge Requires Government Action**

*The dangerous design of SUVs and pickups has been responsible for thousands of unnecessary deaths on U.S. highways.*

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- June 1974 National Highway Traffic Safety Administration (NHTSA) researcher Jerome Kossar presents “Big and Little Car Compatibility”<sup>12</sup> calling for safer bumpers for heavy cars.
- March 1978 NHTSA begins evaluating structural parameters that contribute to vehicle aggressiveness in frontal crashes in its “Five Year Plan.”<sup>13</sup>
- 1979 The American Automobile Association (AAA) commissions a University of Michigan study on aggressivity.
- 1982 The University of Michigan analysis is completed and highlights the growing violence of crashes involving cars, pickups and vans (SUVs are not yet numerous enough to warrant analysis).<sup>14</sup>
- 1984 The Motor Vehicle Manufacturer’s Association (an industry trade association now called the Alliance of Automobile Manufacturers) presents findings of a report on the impact of the weight of light trucks in fatal crashes at the American Association of Automotive Medicine conference, showing that both weight and design are determining factors of aggressivity.<sup>15</sup>
- Jan. 1986 NHTSA examines incompatibility and aggressivity during its Volkswagen Rabbit testing and finds that increasing the design compatibility of a crash barrier reduces injuries and deaths better than reinforcing the side of the Rabbit.<sup>16</sup>
- 1996 - 2000 Numerous papers are published by researchers through the Society of Automotive Engineers and various scientific journals that analyze the contribution of specific aspects of vehicle performance to aggressivity. The consensus is that light truck design and mass pose profound risks to occupants in collisions, and that an aggressivity “metric” is achievable.<sup>17</sup>
- May 1996 A vehicle compatibility working group of regulators and researchers formed at the Fifteenth International Conference on the Enhanced Safety of Vehicles in Melbourne, Australia to explore methodologies to assess aggressivity.

- Feb. 1998 Prompted by the growth in trucks, vans and SUVs (collectively Light Truck Vehicles – LTVs) on the highway, NHTSA publishes an overview of the considerable body of research regarding vehicle compatibility and LTV issues.
- Jan. 12, 1998 NHTSA Administrator Dr. Ricardo Martinez infuriates Detroit automakers by mentioning publicly that they should address the problem of compatibility. One of Detroit’s CEOs responded to Martinez, “My God, don’t touch my cash cow.”<sup>18</sup>
- June 1998 Martinez announces at the International Technical Conference on the Enhanced Safety of Vehicles, a gathering every two years of the world’s top safety regulators and researchers, that NHTSA research and crash tests show that vehicle mismatch between cars and light trucks is causing as many as 2,000 extra deaths each year on American roads.<sup>19</sup> Ford Explorers are tested and found to inflict twice the risk of chest and head injury to the other driver as a car. In response, the auto industry, including Ford Motor Company, promises Dr. Martinez that it will make modifications to achieve safer designs, mainly by adjusting vehicle suspension, but refuses to provide any details of their plans. It is unclear whether any design changes were made to any vehicles.
- Apr. 1998 Insurance Institute for Highway Safety (IIHS) publishes a report on vehicle compatibility research, and its president urges that the “principal focus for incompatibility improvements needs to be on pickups and utility vehicles and the sides of passenger cars.”<sup>20</sup>
- Oct. 1999 IIHS finds that for every million registered vehicles weighing between 3,500 and 3,900 pounds, 45 deaths occur in vehicles struck by these cars while 76 deaths occur in vehicles struck by SUVs in the same weight class. While occupants of a car hit in the side by another car are seven times more likely to die than people inside the striking car, the fatality rate of car occupants is *twenty-six* times higher when the car is broadsided by an SUV or pickup truck.<sup>21</sup> IIHS concludes that changing vehicle geometry and design can improve compatibility.
- Apr. 2000 In a NHTSA report, researcher Hans Joksch examines federal crash data on collisions from 1991-97 and formulates an aggressivity ratio capable of measuring the aggressivity of different vehicle types in crashes.
- June 2001 NHTSA researchers Stephen Summers, Alope Prasad, William T. Hollowell, Alexandra C. Kuchar present a series of papers at the Seventeenth International Conference on Enhanced Safety of Vehicles, Paper No. 354, Amsterdam, Netherlands, concluding that the steady increase in light trucks is leading to a steady increase in fatalities in cars struck by light trucks, even as overall fatalities are in decline. Other

findings were that SUVs inflict twice the number the of fatalities as large cars and that pickup trucks *weighing the same as large cars* still inflict nearly twice the level of fatalities that the large cars do.

- March 2002 Aggressivity research done by Marc Ross, of the University of Michigan, and Tom Wenzel, of Lawrence Berkeley National Laboratory, for the Department of Energy, shows that vehicle design plays an enormous role in the amount of risk a vehicle imposes on other vehicles on the road and charts make/model differences using real-world crash data.<sup>22</sup>
- Apr. 2002 NHTSA research contractor Hans Joksch publishes a report, *Vehicle Design versus Aggressivity*, showing that aggressive design kills: more than 445 people died in 1996 alone in collisions with light trucks who would not have died if the other vehicle in the collision was a car *of the same weight*.<sup>23</sup>
- Fall 2002 NHTSA renews a bilateral agreement with Canada and signs a bilateral agreement with Japan to exchange data and research on vehicle compatibility;
- Feb. 26, 2003 Senate Commerce Committee holds a hearing on SUV safety where senators, the administrator of NHTSA, auto industry representatives and spokespeople from consumer safety groups speak about the incompatibility of SUVs and cars.
- June 2003 NHTSA releases its report, “Initiatives to Address Vehicle Compatibility,”<sup>24</sup> outlining the strategies NHTSA plans to pursue to improve vehicle compatibility. Contrary to the recommendations of the IIHS, the agency focuses upon improvements in side impact protection, and does not address any consideration of changes in the design of light trucks to reduce their aggressiveness in multiple-vehicle crashes.
- July 17, 2003 NHTSA releases its “2002 Annual Assessment of Motor Vehicle Crashes”<sup>25</sup> and notes that between 2001 and 2002, the number of car occupants who died in two-vehicle crashes with a light truck (SUV, van or pickup) increased 1.4 percent (from 4,405 to 4,465) while the number of occupant fatalities in the light trucks decreased 3 percent (from 1,160 to 1,125). NHTSA also found that in two-vehicle crashes between cars and light trucks the car occupants were 3.3 times more likely to be killed in a head-on collision and 20.8 times more likely to die in a side impact crash (with the LTV hitting the side of the car).
- Fall 2003 The Insurance Services Office recalculated its adjustment factors, used voluntarily by hundreds of auto insurers, to account for the growing mismatch on the road. Owners of vehicles that produce the greatest

liability claims will pay up to an additional 25 percent and owners of least aggressive vehicles will be discounted up to 25 percent.

- Dec. 2003 Alliance of Automobile Manufacturers announces a “voluntary program” to address SUV aggressivity issues. The program proposes to phase in side air bags that shield the head and torso by 2007, as well as phasing in lower light truck bumper heights and perhaps lower frame-rail heights for the tallest pickups and sport-utility vehicles. The plan, however, fails to address crucial light truck design problems, such as the steel bars and frame-on-rail construction, which make these vehicles so aggressive. It does not require that all vehicles become compliant with the plan, and no outside body will verify vehicle compliance. Moreover, the plan offers no procedural or judicial oversight, no mechanisms for accountability, no baseline for safety, and no opportunity for public participation or review.
- Feb. 2004 Nissan begins nine-city tour of its first full-size SUV, the Armada, passing on traditional billboard advertisement because, according to Jon Cooper, Nissan’s senior manager of youth and urban communications, “This truck is so aggressive, we didn’t want to show it in a traditional setting.”<sup>26</sup>
- Feb. 12, 2004 Senate passes S.1072, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA 2003), which includes provisions addressing aggressivity and incompatibility that would:
- A standard that would reduce vehicle incompatibility and aggressivity for vehicles under 10,000 lbs. that addresses bumper height, weight and additional design characteristics (Notice of Proposed Rulemaking (NPRM) 1-31-07, Final Rule not later than 18 months following NPRM); and
  - Development of a standard rating metric to evaluate compatibility and aggressivity and make it public(NPRM 1-31-07, Final Rule not later than 18 months following NPRM).

## **SIDE IMPACT PROTECTION**

**Decades of Inaction and Thousands of Unnecessary Deaths;  
Still No Standard for Side Impact Airbags and  
Other Major Safety Improvements**

*About 10,000 people die each year in both single- and multiple-vehicle collisions involving side impacts, even though many of these deaths could be prevented by improved side impact safety standards. Side impact crashes have increased in both severity and the number of deaths over the past decade due primarily to the explosive growth in the number of aggressively designed sport utility vehicles in the nation's fleet. Purchases of SUVs, pickup trucks, and large vans now comprise one-half of annual sales of new passenger vehicles.*

*Not only has the federal government dragged its feet to prevent terribly destructive truck designs, but the National Highway Traffic Safety Administration (NHTSA) has made little progress toward improving side impact occupant protection, despite proven technologies such as side air bags.*

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### **Lower Interior Side Impact Protection (FMVSS No. 214):**

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|--------------|--|
| Jan. 1, 1973 | NHTSA's quasi static side impact test takes effect for passenger cars. The test relies on pressing a cylinder against passenger vehicle doors and results in moderate improvements in vehicles resisting intrusion, particularly from poles. |
| Dec. 6, 1979 | NHTSA issues an advanced notice of proposed rulemaking (ANPRM) on upgrading the side impact standard and broadening its scope to include all passenger carrying vehicles.  |
| 1980s        | NHTSA begins testing passenger vehicle side impact strength and occupant protection when vehicles strike poles in side impact crashes.   |
| Jan. 1988    | NHTSA proposes adding a more demanding dynamic test procedure that uses a moving barrier simulating another car to test car side impact safety performance.  |
| Aug. 1988    | NHTSA proposes updating lower interior side impact protection, including the use of dynamic tests and the need to address the problems of deep intrusion from narrow, fixed roadside objects, such as telephone poles.                       |
| Dec. 1989    | NHTSA proposes to extend the cylinder test requirements introduced in 1971-1980 to light trucks, buses, and multipurpose passenger vehicles (MPVs).  |

- Oct. 30, 1990 NHTSA adopts a dynamic side impact protection requirement, but only applies it to passenger cars. It also establishes requirements for a special side impact dummy and a moveable barrier similar to a medium-sized car to be used in dynamic side impact compliance testing. Most vehicles already comply with the meager occupant protection requirements for pelvis and thorax injury, and the other actions primarily comprise the use of special padding. The standard was phased in, with partial compliance necessary by 1994 and full compliance required by 1998.
- Nov. 1991 Congress requires NHTSA to conduct rulemaking for the purpose of extending dynamic side impact protection requirements beyond passenger cars to include light trucks, vans, and SUVs with gross vehicle weight ratings (GVWRs) of 8,500 lbs. or less.
- June 1992 NHTSA opens to public comment the proposal for extending the dynamic side impact standard to larger passenger vehicles.
- Sept. 1, 1993 The quasi static test, made applicable to passenger cars in 1973, is extended to other passenger vehicles.
- June 1994 NHTSA proposes to apply the dynamic side impact protection requirements to light trucks, vans, and SUVs weighing 8,500 lbs. GVWR or less.
- July 1995 NHTSA extends its dynamic side impact test requirements beyond cars to include light trucks, vans, and sport utility vehicles (LTVs). However, the agency restricts compliance only to such vehicles 6,000 pounds GVWR or less. NHTSA rejects safety community arguments that the moveable barrier used for testing is too low and too light to show the side impact dangers of light trucks, especially smaller makes and models being struck by other large, tall, heavy LTVs. Full compliance not required until 1999.
- July 1998 Safety organizations petition NHTSA to strengthen in specific ways the side impact standards for both lower interior and upper interior occupant protection, asking that the agency more closely coordinate the standards.
- Mar. 1999 NHTSA holds public meeting on benefits of side impact air bags.
- Oct. 1999 NHTSA grants a petition from Advocates for Highway and Auto Safety the Center for Auto Safety to improve the standard, but no rulemaking has occurred to date.
- Dec. 1999 NHTSA opens to public comment a technical report authored by the agency on the relationship between the two injury measures (pelvic acceleration and Thoracic Trauma Index) used to determine compliance with the standard.

- May 2000 NHTSA partially grants a petition from American Automobile Manufacturers Association (AAMA), Association of International Automobile Manufacturers (AIAM), and the IIHS asking the agency to use European side impact test criteria and crash dummies.
- Feb. 12, 2004 Senate passes S.1072, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA 2003), which includes provisions addressing side impact protection that would:
- Require the evaluation of additional barriers and measurements of head and neck injuries, consider the need for new dummies for full range of occupants, and review IIHS side impact test criteria (NPRM 6-30-04, not later than 18 months following NPRM).

**Upper Interior Side Impact Head Protection (FMVSS No. 201):**

- 1970s GM begins to improve head impact performance in its vehicles with such technologies as air gap head impact padding (overlapping semicircles of thin aluminum) in critical roof areas.
- 1980s By the 1980s, GM discontinues including such protections as air gap padding in most of its vehicles.
- 1981-1982 NHTSA and automakers begin cooperative research effort into upper interior head protection. The agency conducts its own research after the settlement of a lawsuit regarding conflicts with joint industry-agency research for government standards.
- 1988 NHTSA gives long-delayed regulatory notice of its interest in upgrading the interior impact protection safety standard to require head protection.
- Dec. 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) requires application of passenger car safety standards to light trucks, vans, buses, and MPVs 6,000 lbs. GVWR or less. ISTEA also requires issuance of a standard to prevent head injury, specifically mentioning the front header and roof.
- Feb 1993 NHTSA proposes requiring both front and side impact upper interior head protection, but excludes roofs above their pillars, rails and headers.
- Nov 1993 NHTSA conducts public meeting on the issues in the February 1993 proposed safety standard.
- Aug 1995 Responding to a 1991 ISTEA requirement that NHTSA initiate and complete a rulemaking to address “improved head impact protection from interior components of passenger cars (i.e., roof rails, pillars and front

headers),” the agency establishes minimum head protection requirements for both frontal and side impact with upper interior vehicle components. The changes apply to both passenger cars and light trucks 10,000 lbs. GVWR or less. The updated standard requires some manufacturers to soften head impacts with these interior features by adding foam padding and other countermeasures, but does not address roof strength.

- Mar. 1996 NHTSA issues an ANPRM to evaluate public responses to issues involving the use of dynamic upper interior head impact systems.
- Aug. 1997 NHTSA proposes amendment to FMVSS No. 201 for both frontal and side impact upper interior head protection, adding two test procedures to accommodate development of dynamic upper interior head impact protection systems, such as side-head air bags. However, the criteria must be used only if manufacturers choose to use dynamic rather than static systems for head protection. The proposed standard is weak and undemanding, requiring few safety improvements by vehicle manufacturers.
- Dec. 1997 NHTSA proposes a new upper interior head impact test dummy composed of parts of two existing test dummies, the Hybrid III (torso) and the Side Impact Dummy (head).
- Aug. 1998 NHTSA issues requirements for passenger cars, trucks, buses, and MPVs 10,000 lbs. GVWR or less to provide optional dynamic protection when an occupant’s head strikes the vehicle upper interior components such as roof pillars, roof side rails and headers, and the roof itself. However, the rule permits but does not require the use of dynamic protection, such as air bags.
- Aug. 1998 NHTSA also adopts specifications for a new composite test dummy to be used for compliance tests. The dummy is a composite of the existing Hybrid III dummy torso with a new Free Motion Headform taken from the Side Impact Dummy.
- May. 1999 In a letter to the Alliance of Automobile Manufacturers dated May 9, NHTSA Administrator Dr. Ricardo Martinez expresses interest in the development of industry-generated, voluntary testing procedures to ensure side and head protection air bag safety, and “avoid the need for Federal standards in this area.”
- Aug. 1999 The Alliance of Automobile Manufacturers, in response to Administrator Martinez’s letter, establishes a “Technical Working Group” (TWG) to develop side air bag occupant crash protection test procedures. TWG is comprised of representatives from the Alliance, Association of International Automobile Manufacturers, Automotive Occupant Restraints

Council (a trade group of restraint manufacturers), NHTSA, Transport Canada, the insurance industry and academia. Significantly, the goal of TWG is not to achieve the actual installation of side air bags in vehicles, but only to develop a test. Contrary to Dr. Martinez's request, consumer representatives are excluded.

- Apr. 2000 NHTSA proposes to amend technical features of Standard No. 201 with respect to the minimum distance between compliance test target points. However, no final rule has been issued to date.
- Aug. 2000 The TWG releases its recommended procedures for evaluating occupant injury risk from deploying side air bags. The test procedures are the result of closed deliberations and, because they are voluntary, offer no procedural oversight by third parties, no outside verification of test compliance, no mechanism for accountability should an air bag system turn out to be a clear safety danger, and no assurance they will be used by all companies.
- 2002 More than 20 years after NHTSA's research began — and more than 30 years after GM began installing head impact protection in its vehicles — the upgrade of the upper interior protection safety standard is completely phased-in.
- Meanwhile, FM, in cost-cutting measures, makes side-air bags — as well as anti-lock brakes — optional equipment in a number of models where they had been standard.
- Aug. 2003 The IIHS finds that only 24 percent of 2003 vehicle models offer head-protection side air bags as standard equipment. Moreover, these vehicles tend to be more expensive foreign vehicles.
- Nov. 2003 A national household survey by the Insurance Research Council finds that 85 percent of respondents were aware that automakers had begun to equip some vehicles with side impact air bags, and six in ten respondents stated that the availability of side air bags would be an important consideration in the selection of their next vehicle.
- Dec. 2003 The Alliance of Automobile Manufacturers announces a voluntary plan to test side air bags for most new vehicles by 2009. The plan, however, does not make any specific commitment to redesigning vehicles to improve side impact safety. Moreover, there is no requirement that all vehicles comply with the plan, and no outside body will verify vehicle compliance. The voluntary “standard” is developed in closed, secret deliberations, involves no procedural or judicial oversight, and provides no mechanisms for accountability.

Feb. 12, 2004

Senate passes S.1072, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA 2003), which includes provisions addressing side impact protection that would:

- Require the evaluation of additional barriers and measurements of head and neck injuries, consider the need for new dummies for full range of occupants, and review Insurance Institute for Highway and Safety side impact test criteria (NPRM 6-30-04, not later than 18 months following NPRM).

# 15-PASSENGER VAN SAFETY HAZARDS

## Thirty Years of Faulty Design and Agency Inaction

*The dangerous design of 15-passenger vans has been responsible for the deaths of too many Americans, yet the vans continue to carry families, church and school groups on outings.*

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- 1971 The full-size Dodge Ram Wagon passenger van, one of the oldest 15-passenger vans, hits the showroom.
- 1972 During the development of the Ford E-series 15-passenger van, Ford recognizes the feasibility of using dual rear wheels to enhance load capacity, better traction and handling characteristics, but decides against this design for cost reasons.
- 1979 Ford introduces its E-series 15-passenger van, with the same wheelbase of their traditional van and an added 18-inch overhang in the rear to seat additional passengers.
- 1992 The National Highway Traffic Safety Administration (NHTSA) publishes “A Statistical Analysis of Vehicle Rollover Propensity and Vehicle Stability”<sup>27</sup> and shows that loading additional passengers into a vehicle has a negative effect on both the static stability factor and the tilt table performance of a variety of vehicles. Fifteen-passenger vans were not included in this original study.
- Nov. 4 1993 Value Rent-A-Car sends a letter to Ford, following a rash of rollovers involving Value’s Ford Aerostar 15-passenger vans, asking Ford to send them additional safety information relating to the vehicle. Ford responds by asking that Value “not put things like this in writing,” and did nothing. Value places its own warning sticker on the vans.
- 1993 NHTSA sends its first set of letters to the National Automobile Dealers Association, state directors of pupil transportation and independent education groups outlining the Federal requirements for school bus safety and NHTSA’s policy that pre-school and school aged children not be transported in 15-passenger vans due to safety concerns. Similar letters are sent in 1997 and 2001.
- Jan. 2000 The National Association of State Directors of Pupil Transportation issues a report and statement suggesting that educational institutions should transport students in school busses, which are held to strict safety standards, not in 15-passenger or other high-occupancy vans, that are not held to these standards.

- Apr. 2001 NHTSA releases a Research Note<sup>28</sup> on the rollover propensity of 15-passenger vans finding that, for example, a fully loaded 15-passenger van has 6 times the rollover risk, in a single vehicle accident, of the same van with only 5 passengers. NHTSA also issues a Consumer Advisory warning consumers about the risks of 15-passenger vans.
- Apr. 2002 NHTSA issues a second Consumer Advisory warning of 15-passenger van hazards.
- Apr. 2002 GuideOne, a leading insurer of churches and their vehicles, stops selling new policies to owners of 15-passenger vans. Numerous smaller insurers follow suit.
- June 2002 DaimlerChrysler discontinues production of 15-passenger vans.
- Nov. 1 2002 The National Transportation Safety Board issues a safety report on 15-passenger vans which includes recommendations to address the safety hazards of the vans, directed to General Motors, Ford and NHTSA.
- Nov. 21, 2002 Public Citizen releases “Stopping Rollovers: The Dual-Wheel Solution for 15-Passenger Vans,” detailing the danger of 15-passenger vans, suggesting a dual-wheel solution to the vans’ stability problems and calling on NHTSA and manufacturers to make the vans safer.
- Nov. 2002 NHTSA, partnering with the Health Resources and Services Administration and the American Academy of Pediatrics, announces a training program for child care providers to educate them on the benefits of transporting children in school busses versus 15-passenger vans.
- March 2003 Sen. Olympia Snowe (R-Maine) introduces S.717, the Passenger Van Safety Act of 2003, to address 15-passenger van safety. Rep. Mark Udall (D-Colo.) introduces a similar bill, H.R. 1641, in the House of Representatives.
- July 15, 2003 An National Transportation Safety Board investigation into two different 15-passenger van crashes concludes that “contributing to the severity of the injuries was the lack of appropriate Federal Motor Vehicle Safety Standards applicable to 15-passenger vans in the areas of restraints and occupant protection,” and makes recommendations to improve 15-passenger van classification, driver training, occupant protection, and tire condition, inspection and maintenance.
- Sept. 25, 2003 California Assembly Member Carol Liu’s 15-Passenger Van Safety bill, AB 626 becomes law, restricting the use of these vans in the state;

- Sept. 2003
- NHTSA issues an Action Plan for 15-passenger Van Safety that calls for:
- additional research;
  - evaluation of a rollover-hazard label for the vans;
  - passage of a rule requiring lap and shoulder belts in all seating positions for all vehicles, including 15-passenger vans, up to 10,000 lbs. GVWR;
  - inclusion of 15-passenger vans in the upgrade of the as-yet un-issued and long delayed side impact protection rule; and
  - inclusion of 15-passenger vans in the upgrade of the as-yet un-issued and long-delayed roof crush rule.
- Feb. 12, 2004
- Senate passes S.1072, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA 2003), which includes provisions addressing 15-passenger vans that would:
- Include all 15-passenger vans in NHTSA's dynamic rollover testing program (Final Rule by 9-31-05);
  - Require 15-passenger vans to comply with all existing and prospective FMVSS Safety Standards for occupant protection and vehicle crash avoidance that are relevant to them (Final Rule by 9-31-05);
  - Include 15-passenger vans in NHTSA's New Car Assessment testing and rating program (Final Rule by 9-31-05); and
  - Require an evaluation of technologies, like electronic stability control systems, that could assist 15-passenger van operators in controlling the vehicles.
- Today
- 15-Passenger vans continue to be exempt from numerous federal safety standards including the following:
- FMVSS 201: Occupant Protection in Interior Impact (15-passenger vans exempted from upper interior head protection). This standard specifies requirements to afford impact protection for occupants.<sup>29</sup>
  - FMVSS 202: Head Restraints (15-passenger vans exempted from placing head restraints in rear seating positions). This standard specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions.<sup>30</sup>
  - FMVSS 206: Door Locks and Door Retention Components. This standard specifies requirements for side door locks and side door retention components including latches, hinges and other supporting means, to minimize the likelihood of occupants being thrown from the vehicle as a result of impact.<sup>31</sup>
  - FMVSS 214: Side Impact Protection (15-passenger vans exempted from dynamic test). This standard specifies performance requirements for protection of occupants in side impact crashes. Its purpose is to reduce the risk to vehicle occupants in side impact crashes by specifying vehicle crashworthiness requirements in terms of

accelerations measured on anthropomorphic dummies in test crashes, by specifying strength requirements for side doors, and by other means.<sup>32</sup>

- FMVSS 216: Roof Crush Resistance. This standard establishes strength requirements for the passenger compartment roof. Its purpose is to reduce the crushing of the roof into the passenger compartment in rollover accidents.<sup>33</sup>
- 49 CFR 575.105: Rollover Warning Label. This section requires manufacturers of utility vehicles to alert the drivers of those vehicles that they have a higher possibility of rollover than other vehicle types and to advise them of steps that can be taken to reduce the possibility of rollover and/or to reduce the likelihood of injury in a rollover.<sup>34</sup>

# **POWER-OPERATED WINDOWS AND POWER SWITCHES:**

Over a Decade of Needless Child Injuries and Deaths

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- Apr. 1991 NHTSA issues rule adopting Federal Motor Vehicle Safety Standard No. 118 to minimize the likelihood of death or injury from accidental operation of power windows, partitions and roof panels.
- 1991-1996 Evidence increases that power windows are nevertheless entrapping and injury small children, in particular, resulting either in deaths or serious injuries.
- Sept. 1995 NHTSA receives a petition to open rulemaking to adopt power window automatic reversal safety features and to amend the existing standard to prevent inadvertent power window closings.
- Aug. 1996 NHTSA proposes amending Standard No. 118 to permit, but not to require, infrared detection systems to stop power windows, partitions and roof panels from closing when there is an intervening object. NHTSA also asks if “express-up” power function should be allowed for power windows. Safety groups argue that prevention of power window and other panel entrapments should be required, not just permitted, and express doubts about the safety of “express-up” power window operation. No further rulemaking is conducted by NHTSA to date.
- Nov. 1996 NHTSA proposes a rule for controlling the ease with which a child can inadvertently trigger a power window switch. However, safety organizations point out in docket comments that the design restriction is not sufficient to stop children from activating switches with their elbows and therefore is inadequate. No further rulemaking is conducted by NHTSA.
- Jan. 2003 The Zoie Foundation petitions NHTSA to change the power switches on passenger vehicles to prevent children from being crushed by power windows. No reply has been received from the agency to date.
- Sept. 2003 Several major safety organizations petition NHTSA to change the standard to prevent dangerous power window closings by changing the power switch operation and also to require automatic reversal systems to prevent deaths and injuries. To date, no action has been taken on the merits of the petition.

## **TIRE SAFETY STANDARDS**

### **Tire Safety Performance Requirements Still Not Comprehensive**

In the 1966 law, the National Traffic and Motor Vehicle Safety Act, the U.S. Secretary of Transportation was required to prescribe a uniform quality grading system for motor vehicle tires that applied only to passenger car tires. This rating program, the Uniform Tire Quality Grading Standards (UTQGS), is for consumer information purposes only and does not establish any safety performance requirements for tire manufacturers to meet. Subsequently, tire safety performance standards were issued but were inadequate in many areas, yet were left essentially unchanged by the agency for decades.

In 2000, Congress passed the Transportation Recall Enhancement, Accountability, and Documentation Act (TREAD) that directed NHTSA to adopt a new regulation improving the safety performance of passenger vehicle tires in several critical areas. Congress found that the existing tire standards were not sufficiently stringent to prevent tire failure, especially when tires are underinflated. However, the agency final rule adopted in response to the TREAD Act did not establish standards in all the areas necessary to have comprehensive federal regulations governing in-service tire safety performance, although they did apply to light trucks up to 10,000 lbs. gross vehicle weight.

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Nov. 1970	NHTSA adopts basic tire standards. Criteria for bead unseating and other requirements are based on bias-ply tires.
July 1978	NHTSA adopts a revised and improved UTQGS.
June 1994	NHTSA issues notice with request for comments on potential substitution of a rolling resistance rating in lieu of the current temperature rating, and the adoption of a super-traction rating of "AA." Safety organizations oppose these tentative proposals.
July 1995	NHTSA publishes notice of proposed rulemaking to adopt a "super-traction" rating of "AA" and to replace the current temperature resistance grading system with a rolling resistance/fuel economy grade. Safety organizations strongly oppose both proposals, pointing out that the agency was not requiring a uniform improvement in the actual grading criteria for traction and that a rolling resistance standard could produce tires prone to skidding in wet weather and having poor high temperature resistance. The agency does not respond to safety community objections and arguments that the agency is changing the UTQGS without actually improving the safety performance of tires.

- July 1995 NHTSA holds a public meeting on the regulatory proposal. Safety representatives make a presentation strongly opposing the UTQGS changes.
- Sept. 1996 NHTSA issues a final rule adopting a super-traction grade of “AA,” despite safety organization arguments that the regulatory change does not actually require tire manufacturers to change the current traction quality of their products.
- 1998-1999 Rubber and tire manufacturers approach NHTSA with proposal for a globally harmonized tire standard to simplify testing and compliance for certifying tires sold in the U.S.
- Nov. 1999 NHTSA expresses concerns at a public meeting of the European Economic Community Working Group on brakes and running gears that the proposed criteria for the “Global Tire Standard 2000” (GRS 2000) are too weak and inadequate. NHTSA also acknowledges at the meeting that all the agency’s tire standards are outdated and in need of basic changes. Although radial tires have displaced bias ply tires, the existing standards were written for the bias ply tires.
- 1995-2000 Tread separations and resulting crashes increase among Bridgestone/Firestone tires mounted on Ford Explorers, causing hundreds of deaths and injuries in rollover crashes that are unknown to the public and not evaluated by NHTSA.
- Aug. 2000 Following a NHTSA investigation — sparked by two stories by KHOU TV in Houston, TX — and the disclosure that Ford recalled some tires in Saudi Arabia, Ford and Firestone conduct a “voluntary” recall of 6.5 million tires used on Explorers for tread separation.
- Nov. 2000 Congress enacts the Tire Recall Enhancement, Accountability, and Documentation (TREAD) Act that requires NHTSA to upgrade tire performance standards and tire consumer information programs, among other issues.
- Nov. 2002 NHTSA establishes a standard for light vehicle tires, FMVSS No. 139, *New Pneumatic Tires for Light Vehicles*, to improve the information readily available to consumers about their vehicles’ tires, particularly tire labeling, effective Sept. 2003.
- Mar. 2002 NHTSA publishes a notice of proposed rulemaking to upgrade several existing standards and also to establish new standards in critical tire safety areas not previously addressed in the agency’s tire safety requirements.

June 2003

NHTSA issues final rule to improve tire safety, concentrating particularly on tire endurance and speed performance to reduce failure and extends the standard to tires used by light trucks and vans. However, the agency leaves major areas of the proposed standard unfinished including reducing failure from tire impacts with road hazards, improving tire resistance to unbeading, and controlling tire failure because of gradual deterioration during tire service life. The agency also has not addressed the issue of tire wet weather anti-skidding performance, an issue specifically directed by Congress in separate legislation.

# SEAT BELT REMINDER TECHNOLOGY

## Thirty-Year-Old 8-Second Minder is Insufficient

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- 1968 Federal occupant protection standard requiring front outboard lap and shoulder belts takes effect, lap belts at other seating positions.
- 1972 Because of low seat belt use rates (12-15 percent) passenger vehicles are required to have reminder systems using a combined flashing warning light and audible buzzing sound of at least 60-seconds in duration to remind front seat occupants to buckle their seat belts.
- Aug. 1973 All new vehicles are required to be equipped with either passive restraints (air bags) or a seat belt-ignition interlock, to prevent engine from starting unless driver and passenger seat belts are buckled. The audible buzzer-visual light system would engage if the seat belt was unbuckled after the engine was started. Belt use in model year (MY) 1973 vehicles was reported at 28 percent.
- 1974 Other than 10,000 air bag equipped vehicles sold by General Motors, all new MY 1974 vehicles are equipped with seat belt-ignition interlocks.
- Oct. 1974 Despite fact that seat belt-ignition interlocks increase seat belt use rate to as high as 60 percent, Congress enacts legislation to prohibit use of seat belt-ignition interlock and to limit any audible reminder (buzzer) for seat belt use to not longer than 8 seconds in duration after engine ignition. *See* 49 USC § 30124.
- Oct. 1975 NHTSA issues rule rescinding seat belt-ignition interlock option and adopts a 4-8 second audible reminder.
- 1990s European vehicle manufacturers develop seat belt use reminder systems using chimes and other audible sounds, which become more insistent based on increasing vehicle speed or distance driven.
- 2000 Ford Motor Company begins voluntarily installing belt minder system in certain makes and models.
- 2001 Congress requests NHTSA to study seat belt reminder technologies in the conference report accompanying the DOT Appropriations Act for FY 2002.
- 2002 NHTSA Chief Counsel issues interpretive ruling that voluntary seat belt use reminder systems must be readily distinguishable in either sound or

timing from the required 4-8 second audible buzzer required by federal law.

2003

National Academy of Sciences conducts study of new seat belt reminder technologies for NHTSA, recommending, among other actions, that all new light-duty vehicles be equipped with an enhanced belt reminder system that includes an audible warning and a visual indicator for front seat occupants and that the current 4-8 second limitation on audible warnings be amended to increase the time limit. *See Buckling Up: Technologies to Increase Seat Belt Use*, Transportation Research Board Special Report No. 278 (prepublication copy available online at <http://trb.org/publications/sr/sr278.pdf>).

Feb. 12, 2004

Senate passes S.1072, the Highway Trust Fund Bill, that includes safety provisions concerning seat belt minders that would:

- Require NHTSA to pass a rule addressing alternate means to encourage increased belt usage in vehicles under 10,000 GVWR that considers alternative means to encourage increased usage including intermittent or continuous audible or visual reminders and features to prevent operation of convenience or entertainment features.

## Endnotes: Chapter Two

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<sup>2</sup> *Shopping for Safety: Providing consumer automotive safety information*, Transportation Research Board, National Research Council, National Academy Press, 1996.

<sup>3</sup> NCSA, *Characteristics of Rollover Crashes*, DOT HS 809 438, (Apr. 2002), at 14 and 20; *See also* "Registration Data for 1975-2001

<sup>4</sup> National Highway Traffic Safety Administration; *Initiatives to Address the Mitigation of Vehicle Rollover.*, 2003. 50 IAMV NHTSA

<sup>5</sup> National Center for Statistics and Analysis, National Highway Traffic Safety Administration. *2002 Annual assessment of motor vehicle crashes. Motor vehicle traffic crash fatality and injury estimates for 2002*. Washington, DC: NCSA, 2003

<sup>6</sup> Herbst, B., Forrest, S., Meyer, S., Hock, D., "Alternative Roof Crush Resistance Testing with Production and Reinforced Roof Structures", SAE 2002-01-2076

<sup>7</sup> NCSA, *Characteristics of Rollover Crashes*, DOT HS 809 438, (Apr. 2002), at 14 and 20; *See also* "Registration Data for 1975-2001

<sup>8</sup> Runge, Jeffrey. Speech to the 3<sup>rd</sup> Motor Vehicle Safety Symposium, United Nations University, Tokyo, Japan, September 17, 2002. < <http://www.nhtsa.dot.gov/nhtsa/announce/speeches/020917Runge/UNU%20speech.doc>>

<sup>9</sup> NHTSA Advanced Glazing Research Team; "Ejection Mitigation Using Advanced Glazing: A Status Report;" November 1995; NHTSA Docket 95-41 GR.

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<sup>13</sup> Five Year Plan for Motor Vehicle Safety and Fuel Economy and Invitation for Applications for Financial Assistance, National Highway Traffic Safety Administration, Docket No. 78-07, Notice 1, March 1978.

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<sup>15</sup> Terhune, Kenneth W., and Thomas A. Ranney, "Components of Vehicle Aggressiveness," 28<sup>th</sup> Annual Proceedings of the American Association for Automotive Medicine, 1984.

<sup>16</sup> Monk, Michael W., and Donald T. Willke, "Striking Vehicle Aggressiveness Factors for Side Impact," National Highway Traffic Safety Administration, 1986.

<sup>17</sup> *See, e.g.*, Hollowell Gabler, "NHTSA's Vehicle Aggressivity and Compatibility Research Program," 16<sup>th</sup> International ESV Conference, Paper No. 98-S#-O-01 (1996); Hollowell Gabler "The Aggressivity of Light Trucks and Vans in Traffic Crashes," SAE Paper No. 980908 (1998); K. Digges, A. Eigen and J. Harrison, "Application of Load Cell Barrier Data to Assess Vehicle Crash Performance and Compatibility," SAE paper no. 1999-01-0720, 1999; K. Digges and A. Eigen, "Analysis of Load Cell Barrier Data to Assess Vehicle Compatibility," SAE paper no. 2000-01-0051 (March 2000); Gabler, Hampton C. and Hollowell, William T., "The Crash Compatibility of Cars and Light Trucks," Journal of Crash Protections and Injury Control, Volume 2, Issue 1, pp. 19-31, March 2000; K. H. Digges and A.M.Eigen, "Load Cell Barrier Measurements of Geometric Compatibility," Vehicle Safety 2000, I Mech E, London, June 2000; K. Digges and A. Eigen "Measurements of Stiffness and Geometric Compatibility in front-to-side crashes," ESV Conference, Amsterdam, Holland, Paper Number 349, 2001.

<sup>18</sup> Bradsher, Keith, "High and Mighty: The Dangerous Rise of the SUV," Public Affairs, New York 2002 at 1989.

<sup>19</sup> *See* Bradsher, Keith. "Light Trucks Will Get Designs That Are Safer, Official Says," *New York Times*, June 2, 1998, (quoting then-NHTSA Administrator Dr. Ricardo Martinez).

<sup>20</sup> IIHS Status Report: Crash Compatibility, How Vehicle Type, Weight Affect Outcomes, Feb. 14, 1998, at 10-11.

<sup>21</sup> Insurance Institute for Highway Safety *Status Report*, Vol. 34, No.9, Oct 30, 1999 p. 3.

<sup>22</sup> Marc Ross and Tom Wenzel, "An Analysis of Traffic Deaths by Vehicle Type and Model," U.S. Department of Energy LBNL-49675, Washington, DC Mar. 2002.

<sup>23</sup> *See* Joksch, Hans C., "Vehicle Design versus Aggressivity," Apr. 2002 at 41. Further calculations by Hans Joksch state that: "In 1996, 890 car occupants died in collisions with SUVs. If the risk in collisions with cars of the same weight had been half as high, as estimated at that time, 445 deaths would not have occurred if SUVs had been replaced by cars of the same weight." Email from Hans Joksch on February 24, 2003 (on file at Public Citizen).

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<sup>24</sup> "Initiatives to Address Vehicle Compatibility," June 2003, 68 FR 36534, and Docket NHTSA-2003-14622.

<sup>25</sup> National Center for Statistics and Analysis, National Highway Traffic Safety Administration. 2002 Annual assessment of motor vehicle crashes. Motor vehicle traffic crash fatality and injury estimates for 2002. Washington, DC: NCSA, 2003

<sup>26</sup> Haliday, Jean "Marketing: Nissan 'cube' touts Armada," *Automotive News*, March 1, 2004.

<sup>27</sup> T.M. Klein, *A Statistical Analysis of Vehicle Rollover Propensity and Vehicle Stability*, SAE Tech. Pap. 920584 (Warrendale, PA: Society of Automotive Engineers, 1992) 135-150.

<sup>28</sup> W. Riley Garrott, Barbara Rhea, Rajesh Subramanian, and Gary J. Heydinger, *The Rollover Propensity of Fifteen-Passenger Vans*, Research Note (Washington, DC: NHTSA, Apr. 2001).

<sup>29</sup> *See* 49 CFR § 571.201.

<sup>30</sup> *See* 49 CFR § 571.202.

<sup>31</sup> *See* 49 CFR § 571.206.

<sup>32</sup> *See* 49 CFR § 571.214.

<sup>33</sup> *See* 49 CFR § 571.216.

<sup>34</sup> *See* 49 CFR § 575.105.