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Chronology of 1971 Roof Strength Standard –  
*33-Year Old Standard Does Not Provide Basic Crashworthiness  
Protections for Occupants in Vehicles that Roll Over*

*The auto industry and government have known about the deadly consequences of vehicle roof crush since the at least the 1960s, yet have never upgraded the 1971 standard.*

- July 13, 1965 Both General Motors (GM) and Ford highlight the importance of roof strength in rollovers in testimony before Congress.
- April 13, 1966 GM engineering staff memo describes the company's plans to develop a dynamic roof strength drop test from 5.5 feet.
- Aug. 1, 1966 Ford test report describes dynamic roof crush "roof drop test."
- Sept. 9, 1966 President Johnson signs the National Traffic and Motor Vehicle Safety Act.
- Oct. 11, 1967 The National Highway Traffic Safety Administration (NHTSA)'s predecessor, 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 NHTSA, formerly NTSB, issues a Notice of Proposed Rulemaking (NPRM) on roof intrusion protection for passenger cars that would statically test both front sections of the roof on passenger vehicles.
- 1971 NHTSA issues Federal Motor Vehicle Safety Standard (FMVSS) 208 with optional dolly rollover test. Most companies use the dolly test internally, but do not publish results.
- April 1971 GM and the Automobile Manufacturers Association (which later became the Alliance of Automobile Manufacturers) argued in comments to the docket that testing both sides of the roof was unnecessary. It was later revealed in litigation that GM had used NHTSA's two-section test on six of its production model vehicles and that only one vehicle it tested 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 test results from the agency.
- Dec. 8, 1971 NHTSA issues a final rule establishing a roof crush standard for passenger cars to take effect in 1973. The standard, which is virtually the same today as in 1973, statically measures the result of pressure to only one side of the vehicle's roof.

- March 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 (MPVs) 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 40 miles per hour.
- April 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.
- April 17, 1991 NHTSA issues a final rule, effective Sept. 1, 1993, extending the application of FMVSS 216, the existing roof crush resistance standard, to light trucks, vans, buses and MPVs with GVWR of 6,000 pounds or less, specifically declining to extend the standard to light trucks, vans, buses and MPVs with a GVWR up to 10,000 pounds.
- Dec. 18, 1991 The 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 pounds 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 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 the agency could take to address the 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, the effective date for application of FMVSS 216, the roof crush resistance standard, to light trucks, vans, buses and MPVs with GVWR of 6,000 pounds or less.
- Jun. 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, petition NHTSA for rulemaking and request that the agency require roll cages as standard equipment on passenger cars.
- Jan. 8, 1997 NHTSA grants petition requesting rulemaking to require roll cages.
- April 27, 1999 FMVSS 216, the roof crush standard procedure, clarified the placement of the test device to accommodate certain vehicles that have raise and/or highly sloped roofs. This change in the standard did not address or upgrade underlying roof crush testing and strength requirements.
- Sept. 2000 In the wake of the expose of the Ford/Firestone rollover fatalities, the NHTSA administrator states that the agency needs to improve roof crush safety standard for rollover protection in testimony before Congress.
- Oct. 22, 2001 NHTSA publishes a notice and request for comments on roof crush resistance, describing the agency’s roof crush research and testing as part of its rollover protection program over the past 30 years.
- 2002 “Alternative Roof Crush Resistance Testing with Production and Reinforced Roof Structures,”<sup>i</sup> paper 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, the Society of Automotive Engineers (SAE) developed a standardized procedure to perform full vehicle inverted drop tests. Many domestic and import auto manufacturers have used the inverted drop test technique since the 1960s and 1970s to evaluate roof strength.
- Apr. 2002 NHTSA publishes *Characteristics of Fatal Rollover Crashes*, which notes that rollover crashes are more likely to be fatal than other crashes.<sup>ii</sup>
- Sept. 17, 2002 NHTSA Administrator Jeffrey Runge states that roof crush intrusion potentially contributes to serious or fatal injury in 26 percent of rollover crashes.<sup>iii</sup>
- Feb. 26, 2003 The Senate Commerce Committee holds a well-publicized hearing on SUV safety where Senators, auto industry representatives, the NHTSA administrator and spokespeople from consumer safety groups speak about the problems of roof crush in SUV rollovers.
- Mar. 3, 2003 *The Detroit News* 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.

- April 2003 NHTSA publishes *Characteristics of Fatal Rollover Crashes* and reports the following:
- Rollovers are more likely to result in fatalities than other crashes;
  - Rollovers constitute about one-fifth of all fatal crashes;
  - 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).
- June 2003 NHTSA issues *Initiatives to Address the Mitigation of Vehicle Rollovers* – 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 drivers.
- July 15, 2003 National Transportation Safety Board (NTSB) concludes roof crush contributed to severity of driver injuries and diminished passenger survival space in the Henrietta, Texas crash of a 15-passenger van that killed four occupants and seriously injured eight others.
- July 2003 NHTSA issues *National 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 occupant highway deaths.
- Nov. 25, 2004 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 a final rule as a possible 2005 action, in *Vehicle Safety Rulemaking Priorities and Supporting Research 2003-2006*, with little description of the rule's possible contents.
- 2003 – Jan. 2004 Safety researchers at Xprts, in Goleta, California, conduct roof crush dynamic tests using the Jordan Rollover System (JRS) on Chevrolet Blazers, Chevrolet Suburbans and Ford Explorers. During the JRS tests, a section of roadbed surface moves forward along a track, while the vehicle is rotated on a spit. The tests 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, in addition to roof strength.

- Feb. 12, 2004 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 pounds that will consider the prescription of a dynamic roof strength standard that realistically duplicates actual crash forces;
  - Consider improved seat structure and seat belt design (including belt pretensioners), side impact head protection airbags and roof injury protection measures.
- Aug. 2005 Congress enacts the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the federal surface transportation bill. It includes vehicle safety mandates, including rollover prevention, ejection mitigation and upgraded roof crush resistance for both “driver and passenger sides,” requiring the agency to evaluate dynamic testing for the rollover protection rule.
- Nov. 21, 2005 The comment period on NHTSA’s proposal closes. The agency is widely criticized by consumer safety advocates because it does not require two-sided testing as mandated by the law, does not consider dynamic testing and does not provide adequate information about occupant risk in rollover crashes. Over 120 documents are submitted to the docket after the close of the comment period.
- Aug. 3, 2006 Public Citizen, Advocates for Highway and Auto Safety and the Center for Auto Safety submit a joint letter asking for a change to respond to late industry comments to the docket.
- Dec. 13, 2006 Public Citizen, the Center for Auto Safety and the Center for Injury Research present the results of dynamic rollover tests conducted on the JRS and encourage the agency to revisit the roof crush proposal. In a letter to the NHTSA administrator, these groups also requested that NHTSA publish a supplemental notice of proposed rulemaking (SNPRM).
- Feb. 23, 2007 Representatives from NHTSA travel to Goleta, California to see a test conducted using the Jordan Rollover System (JRS).
- Oct. 18, 2007 The Senate Commerce Committee holds an oversight hearing of the Department of Transportation. The committee wants to know the progress on the roof crush rulemaking. Transportation Secretary Mary Peters responded that NHTSA would issue a supplemental notice related to “different types” of roof strength testing than the agency had used previously.

- Jan. 30, 2008 NHTSA issues an SNPRM for the roof crush rule. The notice includes the results of 26 two-sided static tests the agency conducted to assess whether two-sided testing was advisable. NHTSA did not make a specific recommendation for regulatory action, but requested comments about the use of two-sided testing and whether it should use a 2.5 or a 3.0 strength-to-weight ratio.
- Mar. 27, 2008 End of formal comment period for 2008 SNPRM on roof crush resistance.
- Jun. 6, 2008 A Subcommittee of the Senate Commerce Committee holds an oversight hearing to investigate the implementation of the roof crush rulemaking, particularly with respect to the agency's failure to consider dynamic testing, and the preemption language.
- Jul. 1, 2008 Transportation Secretary Peters sends a letter to the committees of jurisdiction, requesting an extension from July 1, 2008 until Oct. 1, 2008 to complete the roof crush rule, as permitted under SAFETEA-LU.

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

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