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DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–2011–0078]

Federal Motor Vehicle Safety Standards; Seat Belt Assemblies

AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.

ACTION: Denial of Petition for Rulemaking.

SUMMARY: This document denies a petition for rulemaking submitted by Mr. Michael R. Schramm, to amend the Federal motor vehicle safety standard on seat belt assemblies, to include a requirement that seat belts be releasable without unbuckling. We are denying the petition because the petitioner did not demonstrate a safety need for such a requirement or show how such a requirement could be implemented without increasing inadvertent release of seat belts during normal vehicle operation and certain crash scenarios, resulting in increased risk to vehicle occupants.

FOR FURTHER INFORMATION CONTACT:

For Non-Legal Issues: Ms. Carla Rush, Office of Crashworthiness Standards, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590, Telephone: (202) 366–4583, Facsimile: (202) 493–2739.

For Legal Issues: Mr. Edward Glancy, Office of Chief Counsel, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590, Telephone: (202) 366–2992, Facsimile: (202) 366–3820.

SUPPLEMENTARY INFORMATION:

I. Background

Federal Motor Vehicle Safety Standard (FMVSS) No. 209, *Seat Belt Assemblies*, includes a provision, S4.1(e) *Release*, that requires a seat belt

assembly to provide a buckle that is readily accessible to the occupant to permit the easy and rapid removal of that occupant from the assembly. Furthermore, S4.3(d) *Buckle release*, requires the following:

(1) The buckle of a Type 1 or Type 2 seat belt assembly shall release when a force of not more than 133 N is applied.

(2) A buckle designed for pushbutton application of buckle release force shall have a minimum area of 452 mm² with a minimum linear dimension of 10 mm for applying the release force, or a buckle designed for lever application of buckle release force shall permit the insertion of a cylinder 10 mm in diameter and 38 mm in length to at least the midpoint of the cylinder along the cylinder's entire length in the actuation portion of the buckle release. A buckle having other design for release shall have adequate access for two or more fingers to actuate release.

(3) The buckle of a Type 1 or Type 2 seat belt assembly shall not release under a compressive force of 1,779 N applied as prescribed in paragraph S5.2(d)(3).¹ The buckle shall be operable and shall meet the applicable requirement of paragraph S4.4² after the compressive force has been removed.

II. Petition

On December 8, 2009, Michael R. Schramm (henceforth referred to as the petitioner) petitioned NHTSA to amend FMVSS No. 209, to require seat belts to be releasable without unbuckling in response to a 5 pound (lb.) minimum seat belt assembly tension load when a vehicle is not moving faster than a threshold speed of 5 miles per hour (mph). Specifically, the petitioner recommended the incorporation of the following language in FMVSS No. 209, “Said seat belt assembly shall release (without “unlatching” said buckle release mechanism) in response to a 5 lb. minimum load when and only when

¹ S5.2(d)(3) applies the force on a test line that is coincident with the center line of the belt extended through the buckle or on any line that extends over the center of the release mechanism and intersects the extended centerline of the belt at an angle of 60 degrees. The load shall be applied using a curved cylindrical bar placed with its longitudinal center line along the test line and its center directly above the point or the buckle to which the load will be applied.

² S4.4 contains the requirements for assembly performance, including strength tests, elongation requirements, breaking strength, and fracture resistance.

the vehicle in which said seat belt is installed is not moving at a speed of greater than 5 mph.” The petitioner also included a copy of a November 23, 2009 nonprovisional patent application for an “Adaptive Seatbelt Apparatus” for which the petitioner was listed as the inventor. The petitioner provided a cost estimate of \$3.50 per seating position for such a feature.

The petitioner cited several arguments in support of requiring seat belts to be releasable without unbuckling, including reducing the likelihood of death and injury of entrapped vehicle occupants. The petitioner cited the possibility of occupants being unable to extricate themselves from a vehicle due to a broken arm or hand. The petitioner also identified a case where a child almost got strangled by a seat belt. The petitioner further suggested there is a demand for such a feature as evidenced by the availability of seat belt cutting devices. He also suggested that seat belt use would increase, claiming a current lack of seat belt use by police officers who have the fear of being unable to immediately egress an engaged seat belt in emergency situations.

III. The Automotive Occupant Restraints Council's Comments

On March 1, 2010, the Automotive Occupant Restraints Council (AORC) submitted a letter to NHTSA declining support of Mr. Schramm's petition. The AORC provided the following reasons for declining to support the petition: (1) A stationary vehicle that is struck would likely experience a seat belt release as soon as the belt is loaded; (2) merely moving around in the vehicle, while the vehicle is stationary, could cause the seat belt to release without intent/awareness of the occupant, which, even if the occupant were aware of the situation, would likely be annoying; (3) it is not clear how the proposed tension load was determined as proper; (4) a child restrained in a seat could unlatch the seat belt during low speed maneuvers by pulling on it; and (5) in a slow rollover with no or low vehicle speed, a buckle could release as the vehicle lands on its roof. In summary, the AORC stated that these hazards far outweigh any potential benefit for the extremely rare cases cited by the petitioner.

IV. Analysis of Petition

FMVSS No. 209 already requires the release mechanism to provide a rapid and easy removal from the seat belt assembly. The petitioner raised concern about extremely rare instances where crash deformation could cause the release mechanism to be damaged or become inaccessible. When such severe crashes occur, emergency medical services personnel use specialized equipment to extricate occupants. Also, should vehicle occupants be concerned about such a situation, there are aftermarket products, such as seat belt webbing cutters, that can be used. The petitioner also cited the possibility of vehicle occupants being unable to extricate themselves from their seat belt due to injuries (*i.e.*, broken arm/hand) as a reason for requiring seat belts to be releasable without unbuckling. However, if the occupant was impaired in such a way that they were unable to unbuckle their seat belt and relied on the seat belt to release without unbuckling, such injuries may also limit their ability to exit through the vehicle door or window. The issue raised by the petition is whether there is a safety need to justify rulemaking to consider revising the existing standard in the manner recommended by the petitioner. The following section discusses technical concerns identified by the agency.

A. Technical Concerns

The petitioner's main argument for seat belts that release without unbuckling is that they would reduce the likelihood of death and injury of entrapped vehicle occupants. However, it is unclear how the petitioner's request would be implemented to function without inadvertently releasing the seat belt during certain, more common, crash scenarios, *e.g.*, a vehicle struck while slowly traveling through an intersection or a vehicle struck while stopped. The petitioner argued that it could be possible to require seat belts to not release as petitioned if the vehicle is traveling below the specified speed threshold and it detects an imminent oncoming crash. However, to accomplish this, vehicles would further require integration of electrical signals from existing front and side crash sensor information into the mechanical system that controls the petitioned buckle release technology, and presumably also require additional crash sensors for rollover and rear-end crash events for vehicles without such sensors. Crash imminent sensors, or sensors that detect an impending crash, may also be needed.

It is also unclear how such a seat belt feature would perform during a slow rollover. NHTSA is concerned that releasing the seat belt in a slow rollover could increase the risk of occupant ejection and lead to rollover fatalities and serious injuries. Given that the petitioner did not go into the specifics³ of how the integration of electrical signals from vehicle crash sensors would work with the requested mechanical seat belt feature, we have concerns that the system would not act in time to keep the occupants restrained before the tension load threshold was reached.

Such a feature would also be a potential risk during normal vehicle operation, *e.g.*, children who cannot sit still or reach for items when the vehicle is traveling below the 5 mph threshold would likely be required to continuously re-buckle their seat belts during trips, which poses a potential disturbance to the driver and a safety risk to the child. Of greater concern would be that the parent would not be aware that the child has inadvertently released their buckle. In addition, for adult occupants the inadvertent seat belt release would present a considerable annoyance.

The petitioner further suggested that by requiring such a feature, seat belt use would increase, especially among law enforcement and emergency response personnel that fear vehicle entrapment or being unable to immediately egress an engaged seat belt. While the petitioner provided a newspaper article that discussed police officers' concerns about time delays in tense situations if they have to undo their seat belt,⁴ the petitioner did not demonstrate that police officer seat belt use would increase if the requested rule were adopted. Similarly, the petitioner also included only anecdotal information regarding children being injured or strangled by seat belts, which would not necessarily be addressed by the requested rule.

Finally, no information was provided to show how the petitioner determined that 5 lbs. was a proper tension load. The petitioner merely suggested that NHTSA can determine a more appropriate load, or alternatively, it could be designed with a release load

³ The petitioner's patent simply stated that the vehicle would have the means to detect vehicle speed, oncoming vehicle speed, occupant presence, occupant weight, etc., and that it would communicate such information as needed to appropriately actuate the invention, but it did not give specifics on how it would communicate with the apparatus. It further assumed that all vehicles would have all the cited detection capabilities.

⁴ Fruhwirth, Jesse, Standard Examiner Davis Bureau, November 23, 2008, Page 1A.

that adjusts according to the occupant's size or weight. However, the agency currently has no data or research findings that would allow for the determination of an appropriate load value. For the technical reasons previously discussed, the agency has no plans to devote resources towards this at this time.

B. Preliminary Analysis of Real World Crash Data

Although the petitioner did not provide data showing a real world safety problem, the agency examined its crash data as part of considering the petition using the National Automotive Sampling System (NASS) Crashworthiness Data System (CDS) and Fatality Analysis Reporting System (FARS) data.⁵

Using 1997–2008 NASS data, the agency identified cases that: (1) Involved at least one death to a belted occupant who was not completely ejected and for which the case summary included text that suggested submersion, immersion, drowning, or asphyxiation; and (2) involved at least one death to a belted occupant who was not completely ejected and suffered a burn injury. Based on our review of these 65 cases (29 submersion cases and 36 burn cases), the agency could not conclude that any of the occupants would have benefitted from a rule requiring releasable without unbuckling seat belts. While 22 cases, a weighted estimate of 84 occupants (over the twelve-year period) were classified as having an “unknown potential benefit” from such a rule, many of those were unlikely to have benefitted because: Drugs and alcohol were involved, other damage to the vehicle may have impacted extrication (doors jammed shut), or the occupant may have been unconscious due to blunt force trauma and unable to extricate themselves.

The 2006–2008 FARS files were also searched for unejected belted occupants for whom “safety belts” was listed as a vehicle contributing factor, and three cases were identified. Upon review of the three FARS case Police Accident Reports, none of the fatalities was a result of not being able to unbuckle the seat belt.

We also considered the potential unintended consequences that could result from the petitioned change to FMVSS No. 209. As discussed in the previous section, there are several scenarios where releasable without unbuckling seat belts would not be desirable and may result in increased

⁵ Refer to the technical analysis in the docket for this notice for further details.

risk to the vehicle occupants. For example, child passenger safety is an area of great importance to the agency. Children restrained using seat belts that can be inadvertently released presents a major safety concern, because children tend to move around more in their seats and could easily be unaware that the seat belt could release if loaded when the vehicle is stopped or travelling slowly. Similar risks could be present for children in child restraints. As a result of the inadvertent release of the seat belt by a child, the act of having to get the child restrained again during a trip would be a distraction for the driver and a large safety risk for the child. The child would be exposed to an even greater risk if no one is aware that the child is unrestrained and the child does not reattach their seat belt.

In the previous section we also discussed how occupants of a vehicle that is stationary⁶ or travelling below the buckle release speed threshold that is involved in a collision would experience an inadvertent buckle release upon loading of the belt, and how rollovers are also a crash scenario where belts that are releasable without unbuckling would be undesirable from a safety perspective. These technical

⁶ A National Motor Vehicle Crash Causation Survey (DOT HS 811 059) conducted between July 3, 2005 and December 31, 2007 found that an estimated 16 percent (350,000) of the vehicles were stopped in the traffic lane prior to the crash event (pg. 22, Table 7).

concerns and potential safety risks are insufficiently addressed by the petition. Further, the petitioner has not shown that his solution will not create additional problems, beyond those mentioned herein.

C. Analysis of Countermeasure Costs

The petitioner cited a cost of \$3.50 countermeasure cost per seating position to comply with the petitioner's recommendation. However, we are dubious of this minimal cost estimate, since the petition did not account for the software and hardware integration necessary to monitor the vehicle speed and determine whether it is below the threshold for release. For seat belts to remain buckled if the vehicle is traveling below the threshold for release and an oncoming crash is detected, the device would require software and integration of crash imminent detection for existing front and side crash sensors and further installation cost and integration of rollover and rear-end crash sensors. Such costs were not accounted for in the petition.

V. Conclusion

FMVSS No. 209 already requires the release mechanism to provide a rapid and easy removal from the seat belt assembly. While the petitioner cites concerns about death and injury of entrapped vehicle occupants who are unable to unbuckle their seat belts, he does not demonstrate that this is an

actual real-world safety problem of any significance. In rare instances where an extreme crash could cause the release mechanism to be damaged or become inaccessible, emergency medical services personnel also have their own specialized extrication equipment. Should vehicle occupants have a concern about such a situation, they can purchase aftermarket webbing cutters. The agency reviewed its data on fatal crashes and could not definitively conclude that any of the occupants would have benefitted from a rule requiring seat belts that are releasable without unbuckling. We also conclude that the potential for unintended consequences of inadvertent release of the seat belt during normal vehicle operation and certain crash scenarios, justify denying the petition.

Therefore, NHTSA is denying the petition to amend FMVSS No. 209 to include a new requirement that seat belts be releasable without unbuckling. In accordance with 49 CFR part 552, this completes the agency's review of the petition.

Authority: 49 U.S.C. 322, 30111, 30115, 30117 and 30166; delegation of authority at 49 CFR 1.50.

Issued on: August 19, 2011.

Christopher J. Bonanti,

Associate Administrator for Rulemaking.

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