The Associate Administrator signed the following document on August 27, 2009, and we are submitting it for publication in the Federal Register. While we have taken steps to ensure the accuracy of this Internet version of the document, it is not the official version. Please refer to the official version in a forthcoming Federal Register publication or on GPO's Web Site. You can access the Federal Register at: www.gpoaccess.gov/fr/index.html.

**DEPARTMENT OF TRANSPORTATION**

**National Highway Traffic Safety Administration**

**49 CFR Part 571**

**Docket No. NHTSA-2009-0154**

**RIN 2127-AK52**

# Federal Motor Vehicle Safety Standards; Power-operated window, partition, and roof panel systems

**AGENCY:** National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** The Cameron Gulbransen Kids Transportation Safety Act of 2007 (the "K.T. Safety Act of 2007") directs NHTSA to consider amending the Federal motor vehicle safety standard aimed at minimizing the likelihood of death or injury from the accidental operation of power window systems. The amendment would require power windows and panels on motor vehicles to automatically reverse direction when such power windows and panels detect an obstruction to prevent children and others from being trapped, injured, or killed. In the event that NHTSA chooses not to require power windows and panels on motor vehicles to automatically reverse direction when such power windows and panels detect an obstruction, the Act requires that the agency submit a report to Congress describing why such standards were not prescribed and publish a list

of vehicles that are or are not equipped with power windows and panels that automatically reverse direction when an obstruction is detected.

In this document, NHTSA summarizes its most recent rulemakings related to power window hazards and the types of injuries and fatalities they were aimed at mitigating; discusses its current assessment of the number and causes of the remaining deaths and injuries related to power windows; and analyzes the means of mitigating those remaining injuries and fatalities. While the agency analyzed and considered the benefits of installing automatic reversal systems in all types of vehicle windows, including front and rear main windows, sunroofs, and small "vent" windows, NHTSA is proposing to require automatic reversal systems on "express-up" or "one-touch closing" windows, i.e., those windows that close without continuous actuation of the window switch by the window operator. We believe that this is an efficient, targeted rule that would close this gap in our power window safety requirements. We are also seeking comments on a broader requirement for automatic reversal systems, and could include such a requirement in a final rule. Additionally, we will be providing consumers with information regarding which vehicles are equipped with automatic reversal systems at www.safercar.gov by October 2009.

**DATES:** You should submit your comments early enough to ensure that Docket Management receives them not later than **[INSERT DATE 60 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**.

**ADDRESSES**: You may submit comments to the docket number identified in the heading of this document by any of the following methods:

- Federal eRulemaking Portal: Go to http://www.regulations.gov. Follow the online instructions for submitting comments.
- Mail: Docket Management Facility: U.S. Department of Transportation, 1200 New Jersey Avenue S.E., West Building Ground Floor, Room W12-140, Washington, D.C. 20590-0001.
- Hand Delivery or Courier: 1200 New Jersey Avenue S.E., West Building Ground Floor, Room W12-140, between 9 a.m. and 5 p.m. ET, Monday through Friday, except Federal holidays.
- Fax: 202-493-2251.

*Instructions:* For detailed instructions on submitting comments and additional information on the rulemaking process, see the Public Participation heading of the Supplementary Information section of this document. Note that all comments received will be posted without change to http://www.regulations.gov, including any personal information provided. Please see the Privacy Act heading below.

*Privacy Act*: Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the *Federal Register* published on April 11, 2000 (65 FR 19477-78) or you may visit http://DocketInfo.dot.gov .

*Docket*: For access to the docket to read background documents or comments received, go to http://www.regulations.gov or the street address listed above. Follow the online instructions for accessing the dockets.

**FOR FURTHER INFORMATION CONTACT:**

For technical issues, you may contact Mr. Michael Pyne, Office of Rulemaking (Email: mike.pyne@dot.gov) (Telephone: 202-366-2720) (Fax: 202-493-2739). For legal issues, you may contact Mr. Ari Scott, Office of Chief Counsel (Email: ari.scott@dot.gov) (Telephone: 202-366-2992) (Fax: 202-366-3820). You may send mail to these officials at National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590.

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## I. Executive Summary

Federal Motor Vehicle Safety Standard (FMVSS) No. 118, Power-operated window, partition, and roof panel systems[1] specifies requirements for power operated window, partition, and roof panel systems to minimize the likelihood of death or injury from the accidental operation. The National Highway Traffic Safety Administration (NHTSA) has reevaluated the safety concerns inherent in the operation of power windows and is proposing an amendment to ensure that the requirements of the standard address a safety problem that is not addressed by the current requirements. This rulemaking is being undertaken in response to the Cameron Gulbransen Kids Transportation Safety Act of 2007 (the "K.T. Safety Act of 2007"),[2] in which Congress required NHTSA to consider requiring automatic reversal systems (ARS) on all power windows for light passenger vehicles.

While the K.T. Safety Act of 2007 required that NHTSA consider requiring ARS on all power windows in vehicles, the agency has tentatively determined that the scope of the power window safety issue can be effectively addressed without mandating ARS on all windows. In large part, this is because NHTSA has recently addressed the majority of the safety problem associated with power windows by establishing new "safer switch" requirements. Under these new requirements, as of October 1, 2008, vehicles with power windows must have switches designed to prevent inadvertent actuation. In promulgating that earlier rule, we believed that the fatalities associated with power windows were

[1] 49 CFR 571.118.
[2] P.L. 100-189, February 28, 2008, 122 Stat 639.

largely due to this type of incident.[3] We continue to believe that the "safer switch" rule will have the effect of eliminating the majority of the most severe power window-related incidents. Thus, in evaluating the remaining safety issues that an automatic reversal system could address, the data indicate that there are few if any fatalities and serious injuries remaining.

Despite the small relative size of the problem, NHTSA's assessment did show one area in which it may be possible to improve safety. This is with regard to windows that close with one touch of the switch (referred to as "express-up" functionality). Because closing these windows does not require the continuous engagement of a human operator, we believe there is a potential risk of injury to persons in or around the vehicle. We are accordingly proposing to require automatic reversal systems on those windows that close without continuous actuation of the window switch by the window operator. We are also seeking comments on a broader requirement for automatic reversal systems, and could include such a requirement in a final rule. Additionally, in order to provide comprehensive information on the subject and per the direction of the K.T. Safety Act of 2007, we will be providing consumers with information regarding which vehicles are equipped with ARS. We expect to provide this information on www.safercar.gov by October 2009.

## II. Cameron Gulbransen Kids Transportation Safety Act of 2007

Subsection (b) of the Cameron Gulbransen Kids Transportation Safety Act, directs the Secretary of Transportation to initiate a rulemaking to amend Federal Motor

[3] We note that these incidents typically occurred when children were left in vehicles with the ignition on. In these cases, removal of the ignition key would have disabled the power windows, as required by a longstanding FMVSS No. 118 criterion.

Vehicle Safety Standard (FMVSS) No. 118, Power-operated window, partition, and roof panel systems, to consider requiring power windows and panels on motor vehicles to automatically reverse direction when they detect an obstruction.

The relevant provisions in subsection (a) are as follows:

(a) POWER WINDOW SAFETY.—

(1) CONSIDERATION OF RULE.—Not later than 18 months after the date of the enactment of this Act, the Secretary of Transportation (referred to in this Act as the ''Secretary'') shall initiate a rulemaking to consider prescribing or amending Federal motor vehicle safety standards to require power windows and panels on motor vehicles to automatically reverse direction when such power windows and panels detect an obstruction to prevent children and others from being trapped, injured, or killed.

(2) DEADLINE FOR DECISION.— If the Secretary determines such safety standards are reasonable, practicable, and appropriate, the Secretary shall prescribe, under section 30111 of title 49, United States Code, the safety standards described in paragraph (1) not later than 30 months after the date of enactment of this Act. If the Secretary determines that no additional safety standards are reasonable, practicable, and appropriate, the Secretary shall—

(A) not later than 30 months after the date of enactment of this Act, transmit a report to the Committee on Energy and Commerce of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate describing the reasons such standards were not prescribed; and

(B) publish and otherwise make available to the public through the Internet and other means (such as the ''Buying a Safer Car'' brochure) information regarding which

vehicles are or are not equipped with power windows and panels that automatically reverse direction when an obstruction is detected.

(c) Phase-In Period-

(1) PHASE-IN PERIOD REQUIRED- The safety standards prescribed pursuant to subsections (a) and (b) shall establish a phase-in period for compliance, as determined by the Secretary, and require full compliance with the safety standards not later than 48 months after the date on which the final rule is issued.

*Applicability*

With regard to the scope of vehicles covered by the mandate, the Act refers to all motor vehicles less than 10,000 pounds (except motorcycles and trailers) in gross vehicular weight. This language means that the revised regulation would apply to passenger cars, multipurpose passenger vehicles, buses, and trucks with a Gross Vehicle Weight Rating (GVWR) less than 10,000 lbs (4,536 kg).

*Statutory Deadline*

The Cameron Gulbransen Kids Transportation Safety Act of 2007 specified a rapid timeline for development and implementation of this rulemaking. Specifically, the Secretary is required to publish a final rule within 30 months of the passage of the Act (August 28, 2010). Moreover, the agency must initiate rulemaking within 18 months of the Act (August 28, 2009). However, it should be noted that under Section 4 of the Act, if the Secretary determines that the deadlines applicable under this Act cannot be met, the Secretary shall establish new deadlines, and notify the Committee on Energy and Commerce of the House of Representatives and the Committee on Commerce, Science,

and Transportation of the Senate of the new deadlines and describe the reasons the deadlines specified under the Act could not be met.

## III. Background

### a. Power Window Related Injuries and Past Efforts to Combat Them

The matter of preventing injuries and fatalities that occur through the operation of power window systems is one that has been considered numerous times by NHTSA. These kinds of injuries fall into two predominant categories. Most severe, but most infrequent, are cases in which occupants, usually young children, are killed through strangulation or compression when trapped by a closing power window system. Even when no fatality occurs, serious brain or bodily injury can result when the neck, body, or a limb is trapped in a closing power window for a prolonged period of time. Much more common, although less severe, are injuries that occur when a power window closes on a person's hand or finger. Unlike the more severe types of incidents involving power windows, which usually involve occupants, these types of injuries also frequently involve non-occupants, such as those who are grasping the window or door frame from the outside of the vehicle, such as to open a vehicle door.

Due to the nature of power window-related injuries and fatalities, many of which occur off of public roadways, or otherwise may not be reported to authorities as automobile-related incidents specifically, it has been difficult to quantify the exact extent of this problem. However, based on analysis described below and in the accompanying Preliminary Regulatory Evaluation (PRE), included in the docket with this notice, we

estimate that approximately 6 fatalities and 1,955 injuries result every year from the operation of vehicle power window systems.

In order to prevent deaths and injuries that can occur from the operation of powered vehicle windows, there are several technical design features that can be implemented. These include modification of the window switch to prevent inadvertent actuation, additional window-closing safeguards such as lockout switches that prevent children from operating the windows, or installation of an automatic reversal system (ARS), which would cause the window to stop and reverse direction when it senses an obstruction in the window-closing path.

NHTSA has addressed the problem of power window safety through two prior rulemakings dealing with the switch design. Both of these rulemakings essentially addressed the same problem, which is what we call an "inadvertent actuation" of the window switch. Inadvertent actuation had been the root cause of the most serious and tragic power window safety incidents. In these events, an occupant, typically a toddler, would kneel, stand or lean on the door panel or armrest with his or her head or body outside an open window. Then the child occupant would inadvertently activate a "toggle" or "rocker" switch located in the armrest or door panel with his/her foot or knee, thereby closing the window. The result could be death or serious injury to the child.

NHTSA's response was to create a performance requirement for the power window switch, which mandated that the switch not be able to be activated by application of a metal sphere with the approximate diameter of a child's knee (this procedure is commonly known as the "ball test").[4] Following passage of SAFETEA-LU,[5] NHTSA

[4] 69 FR 55517, September 15, 2004.

further amended the standard to permit only "pull-to-close" window switch designs, which require that the user physically pull upward or outward on the switch in order to close the window.

In the K.T. Safety Act of 2007, Congress again addressed the issue of power window safety. This time, instead of focusing on the switches, Congress required the agency to consider the possibility of requiring automatic reversal systems (ARS) on all windows in passenger vehicles. Unlike safer switches, ARS can be effective in cases not only of inadvertent actuation, but also instances where the operator of a window is closing the window, but is unaware that another person's body may be obstructing the window. In this document, we are referring to this type of incident, generally, as an "obstructed closing."

While incidents involving inadvertent actuation of the window switch account for a large proportion of severe injuries and fatalities, incidents involving obstructed closings are more common, but also generally less severe than inadvertent actuations. Based on our analysis of the data, the overwhelming majority of these types of incidents involve injuries to fingers, hands, and arms that were caught in the path of a closing window as the occupant or driver closed a window. These injuries generally translate to the AIS 1 level on the Abbreviated Injury System (AIS) scale, the lowest classification available. However, there were still some instances in which obstructed closings led to more severe injuries, especially when a person's body, neck, or head was in the path of a window being closed. Other injuries were due to cases such as a piece of clothing or jewelry, such as an earring, becoming ensnared on a power window.

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[5] Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Pub. L. No. 109-59, § 1109, 119 Stat. 1114, 1168 (2005).

Prior to the K.T. Safety Act of 2007, in response to petitions, NHTSA had evaluated the possibility of mandating ARS on all vehicle windows. However, in response to each petition, NHTSA declined to do so, because the requirements to prevent inadvertent actuation had addressed nearly all the safety risk from power windows. Most recently, in the rulemaking requiring safer switch designs, NHTSA again analyzed the possibility of requiring ARS, but concluded that the safer switch requirement would prevent a large proportion of the injuries associated with power windows.[6]

Despite NHTSA's past position, in this document we are taking a new look at ARS and attempting to determine whether it would be an effective means of enhancing safety at this time. In doing so, we conducted more detailed investigations into the number of incidents involving power windows, the percentage of those that could have been prevented by ARS, and the cost of installing ARS. We have further broken down the analysis to examine scenarios where ARS is installed on three different window groups, namely, those equipped with an express-up feature, main (front and rear) power windows not equipped with express-up, as well as the possibility of installing ARS on sunroofs and power vent windows.

**b. Information on Automatic Reversal Systems (ARS)**

Since the early 1990's when ARS was first introduced as a feature on a few luxury cars in the U.S., there have been a variety of technologies considered as the basis for ARS. These technologies fall into two main categories. The first category is contact-based or "force-sensing" systems which require contact between the window and an obstruction, i.e., they sense the build-up of resistive force that occurs when an object like

[6] In the September 15, 2004 Final Rule (69 FR 55517), NHTSA denied three petitions, from Michael Garth Moore, David W. Little, and a coalition of auto safety advocates including Kids and Cars, requesting that the agency require ARS as a standard safety feature for power windows.

a person's hand or arm is trapped between the frame and glass of a closing window. The second category is non-contact systems. Among the concepts in the latter category are light beam interruption ("electric eye") systems, infrared and ultrasonic scanning systems, and capacitive sensing systems. (There is also a type of system that is integrated into window seals (seal-based) that requires incidental contact with the window perimeter to close an electric circuit. Since it does not rely on a build up of pinch force, it is included in the non-contact category.)

In a 2004 final rule,[7] NHTSA amended the FMVSS No. 118 automatic reversal requirements. These requirements, set forth is paragraph S5 of the standard, permit the windows to close in unsupervised situations, but require a higher level of reversal performance than many ARS in use today that are installed in S4-compliant (supervised closing only) vehicles. This amendment was made to accommodate an infrared ARS which was then under development by an automotive supplier. The amendment added to the standard new test rod specifications intended to facilitate testing of systems that sense obstructions by infrared reflection. However, to the best of our knowledge, no such system was ever put into production for use in U.S. vehicles.

It has been our observation that contact-based and force-sensing ARSs are the prevailing types of technology that have been broadly applied in light vehicles. They are designed to monitor electric current to the window drive motor and to reverse the motor by recognizing current spikes that exceed pre-determined limits. Force-sensing systems have also been designed to function by counting rotations of the window drive motor. Through a logic circuit, they are able to identify the window position relative to fully closed and can reverse the motor if there is a sudden change in the rotations per unit time

[7] 69 FR 55517, September 15, 2004.

prior to the window reaching the fully closed position. Our understanding is that this latter technology is favored in contemporary automatic reversal systems.

Over time, the technology has been improved where contact-based ARSs appear to have become sophisticated enough to differentiate between entrapments and other sources of window resistance and to have minimized some of the shortcomings that were characteristic of older force-sensing systems. At one time, the available ARS technology was somewhat unreliable when the presence of snow or ice, or even window seals that had become un-pliable in very cold conditions, resulting in high closing resistance and the likelihood of false reversals. Additionally, some current generation ARSs have been designed to be inactive during the normal closure mode (i.e., when the power window switch was continuously held in the window closing position), or they have an override feature. Although newer ARS operate more reliably under adverse conditions, they still provide this override feature.[8]

Despite the continual improvement in force-sensing ARS technology, no current systems are certified as meeting the requirements of S5.

We have considered whether it may be possible for manufacturers to produce effective ARS systems that are less costly. We note that most current ARS are installed on a window-by-window basis, rather than using a centralized processor for the directional control of all of the windows. Therefore, each ARS-equipped window contains a motor, sensor, and processor to control the motor for ARS functionality (although the sensor and motor can be integrated into one unit). Because of this segmentation, the cost of installing ARS generally scales up with the number of windows

[8] An ARS equipment supplier, Nartron, stated that another reason is to allow a customer the convenience of wedging something between the window glass and the seal or the hypothetical scenario where an intruder is trying to gain access into an occupied vehicle through an open window.

it is installed on (e.g., the cost of installing ARS on four windows is approximately twice the cost of installing it on two windows).

The agency considered whether centralized processors could be used to consolidate the costs of ARS applications in multiple windows (thereby only requiring the motor and sensor to be installed in the individual windows). However, our current information indicates that this would not be a way of reducing costs compared to putting an independent ARS in each equipped window, for reasons described below.

There are several problems with installing centralized ARS processors that can lead to increased costs or degraded system performance. These problems include power/signal degradation through the wires connecting the window motors to the centralized processor, the need for ARS suppliers to have "full system understanding," and the high cost of the centralized processor itself, compared to the costs of individual processors for each window's ARS. Based on our understanding of various systems, these factors have the effect of increasing the costs of a centralized system beyond the costs of individualized sensors. However, NHTSA welcomes comments relating to centrally-controlled ARS, its costs, and its relative benefits or drawbacks.

## IV. Safety Issues Addressed in this Rulemaking

In two previous rulemakings relating to power window switches, we had estimated an average of only two fatalities occurred per year due to the operation of power windows. Those rulemakings, which mandated safer window switches designs in order to prevent inadvertent power window actuation, were estimated to have prevented half of all power window-related fatalities, on the order of one per year.

In accordance with the mandate in the K.T. Safety Act of 2007, we have closely reexamined the fatalities and injuries associated with the functioning of power windows. We used a variety of surveys and case studies to obtain a more recent determination of fatalities and serious injuries relating to this issue. Additionally, we analyzed data taken from a sample of hospital emergency room records to compile a more comprehensive picture of the injuries associated with power windows. These studies presented a more comprehensive picture of the safety problem.

We note that the initial iteration of the safer switches rule (mandating the ball test) only came into effect on September 1, 2008, and the second iteration (the "pull-to-close" requirement) is not fully effective until October 1, 2010. Therefore, given the overall population of vehicles and the dates of the data collected, the vast majority of injuries and fatalities captured by our studies occurred in vehicles that were not subject to these safer switch requirements.[9] Based on the availability of information on more cases, the agency now estimates that safer switches are likely to prevent 50 to 75 percent of all power window-related fatalities. Therefore, in determining the likely benefits of mandating ARS technology, NHTSA is estimating that 62.5 percent (the mid-point of this range) of the serious injuries and fatalities captured in our studies would have been prevented by safer switches (had they been installed fleet-wide), and therefore cannot be factored in when determining the benefits of mandatory ARS. This is a little higher than our earlier estimates for the benefits of the safer switches rulemaking.

In order to develop an up-to-date and more comprehensive tabulation of the data on fatalities and severe injuries associated with power windows, NHTSA acquired data

[9] As shown below and in the accompanying regulatory evaluation, most of the vehicles examined were built prior to 2006.

from a variety of sources. NHTSA obtained mortality data from the Center for Health Statistics' National Vital Statistics System (NVSS) for 2003 and 2004, using death certificates. We also used Special Crash Investigation (SCI) data to further develop our understanding of power window related incidents. While the SCI case reviews are not a comprehensive sample of all incidents, they provide detailed information about how the incidents occurred, and the data also can be also used to extrapolate the relative ratio of those incidents that would have been prevented by safer switches, and those that would have been mitigated if a vehicle had an ARS. Finally we searched for severe injuries in the Consumer Product Safety Commission's National Electronic Injury Surveillance System All Injury Program (NEISS-AIP) statistical sample of emergency department records from 2004 through 2007. The results of our searches are summarized in the following table:

| **Data Source** | **Fatalities** | **Severe Injuries** |
|---|---|---|
| NVSS 2003-2004 | 12 | |
| SCI Oct. 2006 – Mar. 2009 | 2 | 1 |
| NEISS-AIP 2004-2007 | | 3 |

To better analyze the remaining safety problem associated with power windows, NHTSA wanted to focus on the injuries and fatalities that ARS could address. As such, for the purposes of this analysis, we have made a distinction between two broad types of injuries and fatalities. This is because they can occur for different reasons and require different preventative measure to mitigate them. The first type includes fatalities and severe injuries resulting from asphyxia when a power window is closed on the chest or neck of a victim. The second type includes the type of injuries that occur when fingers,

hands, or limbs are trapped in power windows, which can result in bruises, broken bones, and more severe injuries.

**a. Fatalities and Severe Injuries**

The most serious aspect of the safety concern is the fatalities and severe injuries that can result from asphyxiation when a child is trapped in a power window. There are several scenarios where this can occur. The most common is a situation that NHTSA has attempted to address in the past, which are inadvertent actuation scenarios where a child inadvertently activates the power window (typically, using his or her foot or knee), while leaning out the window. This problem, we believe, will largely be alleviated by the safer switches rulemakings, which prevent this sort of actuation by requiring that a switch require a pulling-out motion to close the window. All vehicles already are required to meet the performance specifications of the ball test, and will need to meet the pull-to-close specifications beginning October 1, 2010. Therefore, when calculating the benefits of the installation of ARS, we exclude those injuries and fatalities that would have already been prevented had the vehicles been equipped with safer switches.

However, asphyxiation can also occur when a driver closes another occupant's window from the driver controls, without knowing that a passenger is entrapped in the closing window. Given that this type of actuation has nothing to do with the switch design, we would not expect the safer switch regulations to have any effect on this type of incident. Nor would lockout switches have any effect, as the window is being operated by the driver, and not the occupant in the seat. Incidents like these may only be prevented by an ARS having appropriate override safeguards that function in such a way

that they do not prevent an ARS from engaging when the window is operated by a single, continuous activation of the window switch.

Our search of the mortality data uncovered 12 fatalities over a two-year-period that were likely related to power windows, all of which were caused by asphyxiation. Close examination of the death certificate records, however, provided only three cases where enough information was provided to determine what could have prevented the incident. Of those three, we believe that all three would have been prevented by safer switches.

SCI investigations to date have produced three reports detailing severe injuries and fatalities relating to power windows. Of those, one appeared to be an inadvertent closing cause by a child and could have been prevented by safer switches. A second case involved an injury caused by a driver using her window controls to close a rear window, unaware that a child had become entrapped in the process, and may have been preventable with an ARS (assuming that the driver was not engaging an ARS override feature). In the third case, it is not clear whether the driver or the child caused the fatal window closure incident. It is our belief that ARS, with appropriate override safeguards, may be the only effective current technology that could prevent cases like the one in which the driver unknowingly closed the window on an adult rear seat occupant or unrestrained child rear seat occupant.

An SCI case ultimately involving no serious injury has also been reported. In that case, an unattended child closed a rear window on herself and was strangled, but was discovered and released from the window in time to be revived via CPR. In that case, we believe safer switches would have prevented the entrapment.

Finally, the search of the NEISS-AIP sample identified three cases of severe injuries (Maximum Abbreviated Injury Scale (MAIS) 5). In two of the cases, the child was left unsupervised or unattended inside the vehicle, and we believe that these cases would have been preventable with safer switches. The third case did not provide enough information to make a determination.

In summary, the agency estimates that there are 6 fatalities and 12 AIS 5 critical level non-fatal injuries annually due to power windows.

**b. Less Severe Injuries**

In addition to the MAIS 5 (critical injuries) and fatalities, NHTSA's examination of the data indicated that there were a substantial number of less severe injuries related to the operation of power windows. For purposes of this document, we classified as "finger" injuries those that could be translated to MAIS 1-3 injuries, which typically included bruises, broken bones, and severed fingers. Based on our data, we estimate that there are approximately 1,943 injuries of this type per year. This is broken down to 1,726 MAIS 1, 196 MAIS 2, and 21 MAIS 3 injuries. We also realize that this may be a low estimate, because our analysis was based primarily on narratives taken from emergency rooms. We do not believe that every injury caused by a power window entrapment of a limb would have resulted in immediate medical treatment, so we are reasonably confident that our analysis depicts a floor, rather than a ceiling, in terms of the overall number of finger injuries. We have detailed how we arrived at the estimate in the companion PRE.

## V. Current Regulatory Requirements for ARS

FMVSS No. 118 currently specifies requirements for power-operated window, partition, and roof panel systems[10] in motor vehicles to minimize the risk of injury or death from their inadvertent operation. These requirements apply to passenger cars, multipurpose passenger vehicles, and trucks with a gross vehicle weight rating of 4,536 kilograms (10,000 lbs.) or less, and provide a substantial degree of protection from injuries that can result from the operation of power windows, especially in relation to children. FMVSS No. 118 offers manufacturers several means of compliance, depending on design preferences. Among the provisions at issue, FMVSS No. 118 provides different means of protection to prevent unintentional window injuries, the ignition key requirements of paragraph S4 and the ARS requirements of S5. Paragraph S4 relies on the presence of the vehicle operator or ignition key holder to ensure safety, whereas paragraph S5 is a more technology-centric solution that allows greater design flexibility, although is costlier to comply with.

Additionally, the agency has recently amended the standard to include a requirement (reflected in paragraph S6) that window switches be resistant to inadvertent actuation, a major contributor to power window related injuries to children. This requirement mandates that all power window switches be designed as “pull-to-close” switches. This type of switch can help to prevent a large percentage of the injuries that result when an object (e.g., a child’s foot, knee, pet, or other object) might otherwise cause the power window to close at a time when the occupant does not intend it cause it

[10] The term “power window”' is used in the preamble of this final rule to refer to power-operated windows, interior partitions, and roof panels, all of which are covered by FMVSS No. 118. Power roof panels and partitions are similar to power windows in their operation. However, any distinctions in applicability among the three types of systems will be delineated clearly in both the preamble and the amended regulatory text.

to do so. This is a switch level of protection above the “ball test” effective September 1, 2008.

**a. Key Requirements of S4**

The first level of protection, for windows that can only be activated when the ignition key is in (or near) the ignition, is enumerated in paragraph S4 of the standard. The provisions of S4 include the fundamental requirement that power windows must not be operable unless the vehicle's ignition switch is in the "On," "Start," or "Accessory" position. In this way, the standard provides a simple means (*i.e.*, ignition key removal) by which a vehicle's windows can be disabled and thus safeguarded from inadvertent closure. Paragraph S4 specifies several exceptions where power windows may close without the vehicle’s ignition being turned on (*e.g.*, by use of a limited-range remote control), but each exception is specified in such a way that safety can still be assured by the presence of a responsible operator.

The underlying rationale for the requirements in paragraph S4 is that, under its strictures, the windows of a vehicle cannot be operated outside of the presence of the vehicle operator. By simple ignition key removal from the vehicle, it ensures that children in a vehicle will not be able to operate the windows. In situations where the key is still in the ignition in the “On,” “Start,” or “Accessory” position, the driver or other responsible party is presumed to be in the vehicle, and can thus react to potential incidents involving the operation of the windows. Paragraph S4 also allows design flexibility, such as permitting a limited-range remote control to operate the vehicle windows, which allow users additional control over their systems, while limiting that

control to situations where the vehicle operator is present to ensure that there is no danger from unattended, operational power windows.

**b. ARS Requirements of S5**

Paragraph S5 of FMVSS No. 118 allows an alternative means of compliance through the use of power window automatic reversal systems. If such a system is used in a vehicle and it meets the specified performance requirements of the standard, then the vehicle is not required to meet the window operating restrictions of paragraph S4. The ARS requirements set forth in this paragraph allow power windows to be operated safely in circumstances where no supervision is present. For example, vehicles equipped with S5-compliant ARSs can have the windows close in the event that the vehicle detects precipitation or the windows are controlled remotely without being observed. In these situations, while there is the distinct possibility that an unattended child may be positioned in an otherwise dangerous manner with regard to the closing window, the ARS system assures that no injuries will result.

The ARS performance requirements of paragraph S5 have the effect of requiring that a closing window stop and reverse direction in 0.015 seconds.[11] Additionally, the test procedure specifies the use of a rod that is not perpendicularly oriented (with respect to the window), which requires additional refinement of the ARS by the manufacturer due to the fact that an angled test rod, placed in the corner of a window, can cause the window to "scissor" rather than reverse, thereby failing the performance requirements of FMVSS No. 118. Most vehicle manufacturers (even those with an ARS), have certified compliance with the ignition key requirements of paragraph S4. We note that this does not necessarily mean that the windows would not have met the more stringent S5

[11] Assuming a window closing speed of 100 mm/sec, and the test rod requirements of S8.1.

requirements. Because ARS helps to ensure protection even when no supervision is present, they give vehicle manufacturers a compliance option with maximum design freedom compared to the relatively limited operating conditions allowed under section S4.

One option that is currently under consideration by NHTSA, although not in the proposed regulatory text in this document, is replacing the performance specification currently in paragraph S5 with the specifications listed in United Nations Economic Commission for Europe (ECE) R21. NHTSA is considering this as a possibility and notes that this might be included in the text of a final rule. As we have stated above and implied in previous notices, the primary difference, in terms of safety considerations, between the two specifications is the potential effect on very small fingers.[12] NHTSA believes that the S5 specification will prevent injury, with approximately a 98 percent success rate, to even a single child's finger entrapped in a closing window. Conversely, because the ECE specification does not require that the window reverse in the same timeframe, and tests the reversal feature only with a perpendicular-oriented test rod, there may be a greater possibility that children's fingers could be injured if an ARS were designed to meet only the ECE R21 specifications.

NHTSA is requesting comment on the idea of replacing the ARS specification in paragraph S5 with the ECE specifications. By specifying a very ambitious S5 ARS requirement in order to prevent injuries to fingers, the difficulty and expense of meeting the S5 requirement may have discouraged the implementation of perhaps only slightly

[12] See, e.g., 58 FR 16782, at 16783, March 31, 1993. In that notice, NHTSA rejected the petitioner's 10 N/mm value for the test rod stiffness due to the estimated 10 mm of compression that would occur before reversal, instead using a test rod with a stiffness of 65 N/mm, which would permit only 1.5 mm of compression before reversing. The agency stated that "[a] child's finger placed in a 10 mm opening could be severely injured in such a situation."

less robust systems that could have prevented fatalities and serious injuries involving asphyxiation of young children.[13] We also note that, unlike today, at the time of the development of the current performance requirements, the alternative requirements now specified in ECE R21 were not in widespread use. We request comment on whether there have been significant number of injuries to extremities caused by power windows equipped with ECE R21-compliant ARS.

No vehicle manufacturer to date has certified a vehicle to comply with the S5 specification for ARS. Instead, all vehicles currently sold in the U.S. with power windows have been certified to comply with the key requirements of S4. This, by definition, prohibits the installation of original equipment "smart windows," long-range remote controls, or other conveniences that are available only to vehicles certified to comply with S5. The agency believes there is a possibility, if the technical requirements for ARS were made to be more achievable and less expensive, that it would encourage manufacturers to install more of these advanced power window features. As such, we are requesting comment on replacing the specification for ARS currently contained in FMVSS No. 118 with the specification and test procedure for ARS in ECE R21. We are interested in receiving input from manufacturers and other interested parties as to whether such a change would encourage the installation of additional power windows with ARS and certification to the requirements of (a revised) paragraph S5.

In requesting this information, NHTSA is also concerned that any reduction in the ARS performance specifications could result in increased finger injuries. In designing the S5 specification, NHTSA made a judgment that there was a risk that the German

[13] We note that the agency estimated there are approximately two fatalities and four serious injuries per year that will not be prevented by safer switches. Either ECE R21-compliant or S5-compliant ARS, however, would prevent these injuries and fatalities.

specification (that would ultimately form the basis for that part of ECE R21) might not prevent all injuries to children's fingers. Specifically, the agency was concerned that because the German specification permitted more compression (approximately 10 mm of compression before reversal) prior to reversal than the current S5 specification in FMVSS No. 118 does (1.5 mm of compression before reversing), permitting it in windows that can close when unsupervised by an operator could permit injuries to fingers and hands that are caught in the windows that do not occur with the current regulatory provisions.[14] However, we believe that there are good reasons to revisit those assumptions. First, we are aware that many installed ARSs in fact exceed the minimum-specified reversal requirements, so the danger to children's fingers and hands may be even less than originally considered. Second, ECE R21-compliant ARS windows have, since the 1993 final rule, been installed in numerous vehicles worldwide. This affords the opportunity for more data to have been accumulated than was available at the time the original S5 specification was written, and we request comment on the number of estimated finger injuries, especially to children, that can be attributed to windows equipped with an ECE R21-compliant ARS.

**c. Safer Switches Requirements**

NHTSA amended FMVSS No. 118 in 2004 to safeguard the switches that operate power windows in vehicles. In that amendment, NHTSA introduced a switch test requirement, referred to as the "ball test," adding a new section S6 to the safety standard. According to the new test procedure, a 1.5 inch diameter rigid ball is applied with a

[14] The agency simply stated that, "[t]he available crush space for small openings must be limited; fingers placed in a small opening can be injured even if the [window] opening is reduced by only a few millimeters." 58 FR 17683, March 31, 1993.

specified force and direction to each switch which controls the closing of a power window or sunroof.[15] This test methodology was conceived of as simulating the action of a small child's knee on a switch. To pass the test, a switch has to be adequately recessed, shrouded, or otherwise configured so as to resist actuation by the test ball, and the window must be prevented from closing when contacted by the ball, thus preventing window closure.

The requirements of the new section S6 took effect on October 1, 2008, meaning that the power window switches in all vehicles manufactured on or after that date subject to FMVSS No. 118 must comply with the ball test. Later in 2004, Congress enacted the SAFETEA-LU legislation which included a mandate for NHTSA. Acting on this mandate, the agency again issued an amendment of FMVSS No. 118 affecting power window switches. SAFETEA-LU mandated that NHTSA limit power window switches to a pull-to-close type, thereby prohibiting other types of switches which may have complied with the ball test, such as recessed toggle or rocker switches. Between the two rulemakings, the agency believes that it has eliminated all of the injuries and fatalities that were caused by inadvertent actuation of power windows.

**d. Requirements of ECE R21**

The European safety requirements for power windows are included in an Economic Commission for Europe (ECE) regulation. That regulation, ECE No. 21, is titled Uniform Provisions Concerning the Approval of Vehicles with Regard to Their Interior Fittings. It covers the safety and other regulated aspects of numerous parts in the

[15] Overhead switches are exempted, as are switches for S5-compliant windows, although these switches are not exempted from the “pull-to-close” requirements.

passenger compartments of vehicles, including, among others, controls, fittings, seat backs, and also power-operated windows.

The power window requirements are set forth in section 5.8 of ECE R21. There are two main sections, section 5.8.2 which deals with normal power window operating requirements, and section 5.8.3 which deals with automatic-reversing requirements.

Section 5.8.2 of ECE R21 specifies that windows can operate only under certain limited conditions, primarily with the ignition key in the ignition. It also allows window operation by a key lock on the exterior of the vehicle, by limited range remote controls, and during the time interval between removal of the ignition key and opening of a front door.

Section 5.8.3 states that power windows equipped with auto-reversing capability do not have to meet section 5.8.2 if the auto-reversing feature meets a certain minimum level of performance. Section 5.8.3 specifies the necessary performance, including the allowable pinch-force level and procedures for measuring it.

Additionally, ECE R21 includes section 5.8.4 which limits the locations allowed for power window switches and also requires a driver-controlled lock-out switch for any windows for use by rear seat occupants. Other power window requirements are enumerated in sections 5.8.5 through 5.8.7 of ECE R21 to cover overload protection, owner's manual instructions, and alternative approval requirements.

## VI. Current Implementation of ARS and Compliance with FMVSS No. 118 in the United States

Currently, in certifying compliance with FMVSS No. 118, manufacturers have the option to certify that their vehicles comply with the requirements of paragraph S4 or S5. Although a variety of current vehicles are equipped with automatic reversal capability on one or more of their windows, we are not aware of any systems that are certified as complying with paragraph S5 of FMVSS No. 118. Instead, all current vehicles are certified to paragraph S4, even if they are equipped with ARS.

**a. Differences in FMVSS and ECE Performance Specifications**

Like FMVSS No. 118, ECE R21 permits design flexibility in terms of power windows if ARS is installed. Both ECE R21 and FMVSS No. 118 allow power windows to be safeguarded by means other than auto-reversal capability – mainly by ignition key removal and related strictures. However, the ECE specification for ARS is slightly different from the specification contained in paragraph S5 of FMVSS No. 118. This section describes the similarities between the two standards, as well as crucial differences in stopping speed and testing procedures.

To begin, ECE R21 Section 5.8.2 is analogous to FMVSS No. 118 section S4 in that it enumerates the specific conditions under which window closure is allowable. Like the FMVSS, the ECE regulation makes ignition key insertion in the vehicle's ignition the primary restriction on power window operation. Other allowable conditions listed in ECE section 5.8.2 correspond closely with those listed in section S4 of FMVSS No. 118. For example, both standards specify that windows may be closed by remote control with a range of no greater than 6 meters, or 11 meters for remote controls requiring direct line-of-sight, and both standards allow the windows to operate after ignition key removal up until the time either of the vehicle's front doors is opened to allow egress of the driver.

With respect to ARS requirements, the U.S. and European standards are also highly similar. Like FMVSS No. 118, ECE R21 does not mandate the use of ARS. Instead, it allows power windows to close under conditions other than the listed ones, i.e., without any ignition key restrictions, as long as the windows are ARS-equipped and the automatic reversal functions according to a certain level of performance. The automatic reversal compliance option appears in section 5.8.3 of ECE R21 along with the performance characteristics for that reversal capability. ECE R21 section 5.8.3 and FMVSS No. 118 section S5 are analogous in this respect. Both standards require that ARSs be tested by using rigid test rods that are placed within window openings while the power windows are closed on them. The rods can be any size within a prescribed range to simulate the various body parts of occupants which are most likely to be entrapped by power windows. The range is from a minimum of 4 mm (0.16 inches), equivalent to a small child's finger, to a maximum of 200 mm (about eight inches), equivalent to the greatest width of the head of a 95th percentile adult male.

Both standards set a limit of 100 Newtons of pinch force over the entire range of window openings from 4 mm to 200 mm, and they both specify three alternative positions to which the window must open after reversal. However, there are two key differences between the two standards, both of which arise with respect to the procedure for measuring ARS pinch force.

First, while both standards stipulate the use of cylindrical test rods ranging from 4 mm to 200 mm in diameter to evaluate ARS performance, ECE R21 specifies that the test rods used must have a stiffness, i.e., force-deflection ratio, of 10 Newtons per millimeter (N/mm) for any size test rod in the range, which equates to a 10 mm maximum

compression at the maximum allowed 100 Newton force. This contrasts with the requirements in FMVSS No. 118, where a rod stiffness of 20 N/mm (allowing up to 5 mm compression) is specified for larger test rods (between 25 mm and 200 mm diameter) to represent larger body parts like arms or heads, and 65 N/mm (allowing a mere 1.5 mm of compression) for smaller test rods (25 mm diameter or less), the latter used to simulate fingers.

Inclusion of these stiffness specifications is essential because it is impossible for a power window that is in motion to instantaneously stop and reverse itself. Instead, a window must have some finite time interval and distance of travel over which it decelerates to a stop and then begins to accelerate in the reverse direction. Minimizing this reaction time is a fundamental challenge in the design of an ARS, especially given that there are many other important design factors to be considered.

The different test rod specification means that an S5-compliant ARS must be designed to stop and reverse a closing window more quickly than an ECE R21-compliant ARS. Under S5, a closing window must decelerate and stop over a distance of no more than 1.5 mm, corresponding to 0.015 seconds of reaction time at a typical closing speed of 100 mm/sec, after contacting a test rod before reversal is initiated; for obstructions larger than 25 mm, as much as 5 mm of window movement, corresponding to 0.05 seconds, could occur before reversal. Under ECE R21, a window could continue closing by as much as 10 mm after initial contact with a test rod, equating to a reaction time of 0.1 seconds before reversal is triggered.

The significance of this difference is that small parts of the body like fingers could be less protected under ECE R21 than they are under FMVSS No. 118, and even

larger body parts would be subject to as much as twice the compression under the ECE standard before reversal is triggered. This is especially relevant with regard to finger injuries. If a small finger is caught between the window and the frame, a window traveling an additional 10 mm (between initial contact and the time when it stops) before reversing could still do substantial damage to the finger, yet a larger body part, such as an arm, is likely to suffer far less damage from being momentarily compressed the same 10 mm distance.

However, the actual design of an ARS is such that this difference in required reversal sensitivity between the U.S. and European standards may not be important in all instances. For one thing, the analysis above assumes that an ECE R21-compliant ARS performs exactly at the limits of the specification, whereas an actual ARS is likely to outperform those limits. Furthermore, either type of system would be effective in preventing the most catastrophic events, i.e., strangulation or amputation of limbs which, from a safety standpoint, are the types of incidents which are of the greatest importance.

Because there have been no certified S5-compliant ARSs in the vehicle fleet, there are no data to compare its effectiveness to that of ECE R21-compliant systems. To the best of our knowledge, there has never been a significant injury caused by any of the many ARS-equipped power windows that have been in service in a variety of U.S. vehicles over many model years. This is true even though existing automatic reversal systems, while mostly ECE R21-compliant, include systems that do not even necessarily meet ECE R21. This fact attests to the relative effectiveness of ARS in general, at least with regard to severe injuries and fatalities, regardless of the exact specifications in terms of force deflection and reversal speed, that it may meet.

A second key difference between U.S. and European ARS test procedures relates to the orientation of test rods when they are placed in window openings. Unlike FMVSS No. 118, ECE R21 indicates that rods must remain perpendicular to the window during testing. This distinction can, under certain circumstances, make ECE R21 easier to meet from a design standpoint. However, this is very much dependent on particulars of the window design such as the shape of the mating surface of the frame where the window glass seats upon closure and the contour and density of weather stripping. These factors can vary substantially from one vehicle model to another.

A third, less significant, difference between the U.S. and European standards involves the positions that a window must open to after an automatic reversal takes place. ECE R21 and FMVSS No. 118 both specify three possible opening positions, and two of those are identical in both standards. However, for the third optional opening position, ECE R21 specifies that the window be "at least 50 mm more open than the position when reversal was initiated." The corresponding option in FMVSS No. 118 specifies a position of at least "125 mm more open than when reversal was initiated." The consequence of this difference is that, for an ECE R21-compliant ARS designed to meet this option, a window which has reversed automatically upon contact with a person's neck would re-open sufficiently to relieve all pinching force on the person but not necessarily far enough to allow the person to completely extract his head from the window opening. Under the corresponding FMVSS No. 118 specification, a person would have plenty of clearance to easily extract his or her head from the window opening after window reversal.

### b. Implementation of ARS in the U.S. and Other Countries

As stated above, NHTSA is not aware of any vehicles that are certified to comply with the requirements of paragraph S5 of FMVSS No. 118. Instead, discussions with vehicle manufacturers and ARS suppliers appear to indicate that most if not all current automatic reversal systems installed in power windows in the U.S. (usually, in conjunction with an express-up feature) meet the European reversal test procedural requirements contained within ECE R21. Further it is noted that we are unaware of any manufacturers that utilize any technologies for ARS other than physical contact systems, although we are aware of some proximity detection systems, such as those based on capacitive or infrared technologies that may be used in the future.

Based on NHTSA's sampling of a MY 2010 fleet with an estimated 13 million passenger cars and light trucks , ECE-compliant ARS already exists in approximately 39 percent of the total population of power windows; that is, approximately 19.2 million of the 49.0 million power windows in vehicles produced annually (not counting roof panels, or power vent windows), are equipped with an ARS. Another 4.9 million windows have ARS that are not claimed to be ECE-compliant. In all of these cases, the ARS is installed as a supplemental safety system for a design that complies with the requirements of paragraph S4 of FMVSS No. 118. The distribution of ARS windows by seating position are 9.1 million driver's side front windows, 6.2 million passenger side front windows, and 8.8 million rear windows. Almost all of these windows are equipped with express-up systems, for which ARS acts as a supplemental safety system. NHTSA is aware of several estimates for the number of makes and models equipped with ARS in Europe and Japan. Since around 2000, the estimates purported have hovered around 80 percent.

However, during the development of this NPRM, NHTSA was not able to confirm these estimates.

## VII. Expanding ARS to Various Subsets of Windows

In accordance with the mandate in the K.T. Safety Act of 2007, NHTSA has closely re-examined the issue of fatalities and injuries related to the operation of power windows. We have tentatively determined two things. First, if we require that ARS should be mandated on windows, we believe that the ARSs should conform to the force specifications laid out in ECE R21, rather than those in S5 of FMVSS No. 118 (we note, of course, that this would not preclude the ARSs from complying with both specifications), as our primary goal is to prevent serious injuries resulting from window entrapment. Additionally, we have examined the feasibility of requiring ARS on a variety of power windows. Because the costs and benefits of equipping each window group with an ARS system appear to be different, we have broken down our analysis by window category. We have divided the vehicle windows into three different categories, based on the estimated cost of adding an ARS to those windows, and the types of injuries that can reasonably be anticipated to be prevented by installing ARS in them. These categories are: 1) windows equipped with the "express-up" feature; 2) the four main windows, ; 3) sunroofs or moonroofs (we use these terms interchangeably) and power vent windows and other panels (such as power rear windows on pickup trucks or SUVs).

### a. Windows Equipped with "Express-up"

As discussed previously in this notice, one-touch closing of power windows, also called "express-up," is a convenience feature that has become commonplace in modern

vehicles. This feature allows a user to close a window by momentarily actuating the window switch. Whereas a conventional window will stop moving unless pressure is applied to the switch, an express-up window continues to fully close after the switch is released. At this time, the agency knows of no injuries associated with these sorts of windows in the U.S.

Most often, only the driver's window in a vehicle has this feature. Logically, the driver's window is the one most often operated, and it would appear that manufacturers recognize that this frequent operation, for example at toll booths or restaurant "drive through windows," is made more convenient by one-touch operation capability. What might be deemed "express down" capability, i.e., one-touch opening of a window, is typically also present on windows equipped with an express-up feature (and many without it), but there are no safety ramifications of express down, so it is not included in this discussion.

There are also a number of vehicle models that have express-up on the front outboard (front passenger's) window as well as the driver's. Less common, but still well represented,[16] are vehicles with express-up capability on all of their main windows, i.e., all four outboard windows including those in the rear of four-door vehicles.

It is also common for power sunroofs to have express-close capability. Conversely, we are not aware of any power vent windows that currently have this feature. However, due to the nature and infrequency of incidents involving these types of windows, they are discussed separately, below.

[16] According to NHTSA compliance data received from vehicle manufacturers, approximately 31 percent of the fleet have all main windows with an express-up feature.

To the best of our knowledge, in all vehicles sold to date in the U.S., each power window equipped with an express-up feature also is voluntarily equipped with automatic reversal capability. These ARSs typically comply with the ECE R21 performance specification, instead of the performance specification in FMVSS No. 118, paragraph S5. However, because every U.S. vehicle is certified as compliant with section S4 of FMVSS No. 118 (which safeguards window operation by necessitating the use or presence of the vehicle ignition key), they do not certify to any ARS specifications, including those of ECE R21 or section S5 of FMVSS No. 118.

In summary, in the current fleet of U.S. vehicles, automatic reversal systems are installed voluntarily on windows with express-up capability. Furthermore, since the ARS are not relied upon for certification, their performance does not have to meet any safety standard. However, because suppliers generally design one type of system for use in multiple vehicles sold in markets around the world, most vehicles with ARS have one that is ECE-compliant, despite there being no requirement in the U.S. that this be so.

The likelihood that many vehicles in the U.S. are equipped with the less stringent ECE-compliant ARS, as opposed to the more stringent requirements of FMVSS No. 118, affords this agency an opportunity to discuss the safety differences between the two specifications. As stated above, FMVSS No. 118's specification in paragraph S5 is a more difficult design to conform to than ECE R21, mainly because of the orientation of the test rods and the resultant force on the object. Nonetheless, despite this difference in design specifications, NHTSA has found no evidence that express-up windows, which we believe are uniformly protected by an ECE-compliant ARS, have caused significant

numbers of injuries. This raises the issue of what the specific safety benefits and rationales are for the two different specifications, which is discussed below.

The practical difference in terms of safety is that, in our opinion, the requirement of FMVSS No. 118 will protect "pinching" injuries to children's fingers, whereas the ECE specification may allow some of those finger injuries to occur. Both specifications, however, will protect against the more severe entrapment or compression injuries, such as can occur when a child's body or neck becomes entrapped in a power window, because that part of the body is able to withstand substantially more compression than a finger can before severe damage is done, assuming the window retracts in time to prevent an injury resulting from an obstructed airway or blood vessel.

**b. Main Windows Not Equipped with Express-up**

We believe from our analysis of power window injuries that outboard main windows (in this rulemaking, we refer to generally as "side" windows), which means those in the front doors of virtually all passenger cars and light trucks and the rear doors of four-door versions of those vehicles, account for almost all of those injuries. This is not a surprising result since side windows, being by far the most numerous, account for the vast majority of occupant exposure to power window operation. Furthermore, as would be expected, most of the harm associated with side windows comes in the form of pinching of hands, fingers, wrists and forearms, which reflects the proximity and disposition of occupants' bodies to side windows.

Among side windows, we surmise from the data that front side windows appear to be most often involved in injuries. Again, this is predictable based solely on exposure -- the front seats being the most frequently occupied in a vehicle. Unfortunately, the data

are not codified in a way that allows us to consistently determine which side window (i.e., front or rear) in a vehicle was responsible for an injury, and the associated narratives are inconsistent in providing that information. From the narratives, however, we can see that a typical scenario is a driver using the central power window controls located by the driver's seat unintentionally closing the passenger side window on the hand or arm of an occupant in that seating position. Despite the probable higher frequency of this scenario for front passengers, the risk is essentially the same for rear seat passengers, since front and rear windows operate identically. The only significant difference for rear windows is that they are further outside of the driver's field-of-view than front windows, and so it is possible that the driver may be less likely to curtail window closing in time to avoid or mitigate an entrapment.

**c. Sunroofs and Power Vent Windows**

Injuries from vent-type windows are not discernible in our data, which is expected since exposure should be comparatively very low. Vent windows are usually located at the far rear sides of a vehicle, and occupants are not often seated adjacent to them. In addition, vent windows create openings too small to accommodate larger appendages, particularly occupants' heads.

Incidents involving sunroofs are easier to pick out in the data, but are still uncommon. Again, exposure would be the most prominent reason. Harm from sunroofs is undeniably lower than from windows since the proportion of vehicles equipped with sunroofs is a fraction of the total power-window-equipped vehicle population. In a given vehicle, there is only one sunroof (exceptions do exist for vehicles having multiple sunroofs) as opposed to from two to upwards of six operable windows in a given vehicle.

Additionally, occupants, especially young children, are far less prone to place their bodies or limbs out of sunroofs than they are for side windows.

**d. Lockout Switch and Override Function Considerations**

The agency has considered whether proposing requirements for ARS override and lockout switches, two components that are closely related to the performance of power windows, is justified based on the information we have. Lockout switches are common features on many vehicles, which allow a driver to control whether the passengers can operate their windows. Many vehicles have lockout switches that can prevent all non-driving occupants from operating the windows, or at least the rear windows. Lockout switches can also serve a safety purpose. For example, it is our understanding that one design consideration for these switches is to prevent children from opening a window. However, when the windows are locked out, injuries from inadvertent actuation and obstructed closings caused by the occupant's deliberate actions are also prevented.

Under ECE R21, vehicles that are not equipped with ARS are required to have lockout switches that can be used to deactivate the rear window switches. Furthermore, virtually all vehicles sold with power windows already have a lockout switch installed and as such, there would be little benefit in requiring them. Given these facts, after careful consideration, the agency has decided not to propose requirements for lockout switches at this time, since we are unable to determine that there would be any safety benefits at all from such a rule.

Override functions are generally provided as convenience features in windows with ARS. These allow a user to close the window in situations where an ARS either falsely detects an obstruction or the user does not want the ARS to stop at the obstruction.

An example of the former is when the window motor encounters resistance caused by ice or cold weather causing the window liner to contract, which could have the effect of triggering the ARS. Alternatively, a user may wish the window to close on an object as a way to have the window hold that item in place.

We are aware that override strategies for ARSs do not work in a standardized way across all vehicles. While some overrides require that a user release and then quickly reactivate the window switch, others do not. Instead, they may allow continuous activation of the window switch to engage the override, even if the operator is not aware that there may be an ongoing entrapment situation. However, we are not aware of any studies or analysis to support one design iteration over another. Therefore, after careful consideration, the agency has decided not to propose requirements for override capabilities at this time, since we are unable to determine the benefits of doing so.

## VIII. Proposal to Mandate that Main Windows with Express-up be Equipped with ARS

Given the available estimates of the effectiveness of ARS, the scope of the safety problem that ARS effectively addresses, and the Congressional mandate, NHTSA is proposing in this document to require that all main windows (that is, all windows except vent windows and sunroofs/moonroofs) equipped with an express-up feature, and certified to comply with the requirements of S4 be required to have an ARS that complies with the test specifications of section 5.8.3 of ECE R21. We are not including a broader requirement as part of our primary proposal, given the scope of the remaining safety

problem that could be addressed by ARS after factoring in the benefits attributable to the two prior safer switches rulemakings.

Instead of requiring the most expensive safety equipment for all situations, NHTSA has tentatively decided to adjust for three different levels of risk. These levels, in descending order, are: 1) the risk posed by power windows when they close in an environment entirely unattended by an adult operator; 2) the risk posed by power windows when they close in the presence of the operator, but without his or her active control; and 3) the risk posed by power windows when they close while the operator is actively controlling the window switch. We have tentatively determined that these three situations warrant different safety measurements.

For the first situation, where power windows operate in an unattended environment, the highest level of safety may be necessary. Unlike situations where a driver or adult occupant is likely to be present (and the key is in the ignition), unattended closing power windows can pose a serious risk to the safety of children. NHTSA's requirements in FMVSS No. 118, paragraph S5 are designed such that windows will only compress a test rod about 1.5 mm before reversing, which requires an extremely fast reaction time on the automatic-reversing mechanism. The agency established these stringent requirements specifically in order to protect the fingers of children.

We have stated that incidents where the windows raise unexpectedly, as would be the case when the windows raise without any occupant activation, present particularly high dangers of window entrapment. The agency would expect that a larger proportion of these closings would result in a potential injury, and that therefore, the highest degree of protection is required. While we have requested comment regarding the possibility of

adopting the ECE R21 force requirements for ARS, without additional data we did not specifically include it in the proposed regulatory text. However, it is under consideration and may be included in a final rule.

With regard to situations where the windows are closing in the presence of the vehicle operator, but without his or her personal manipulation of the switch (i.e., windows with express-up), NHTSA believes that there is justification for proposing to increase the protection surrounding windows with express-up that currently are certified to conform to the requirements in paragraph S4. Unlike all other windows that conform to the key requirements of paragraph S4, windows with express-up do not require continued action by the window operator or driver in order to close them. This means that if the closing path is obstructed, the operator's hand is likely to not be on the switch at the time of entrapment. This creates a crucial delay between the time when the obstruction is detected and the time that the operator can manually stop the motion of the window (in a normally-activated power window, all the operator needs to do is to remove his/her finger from the window switch).

We are also aware of the relatively limited circumstances in which a person could be injured by a window equipped with express-up. Unlike windows that close automatically without driver supervision (and as such, are required to have ARS subject to the paragraph S5 requirements), express-up windows will always be operated with some degree of supervision, because the key must be in the "Accessory," "On," or "Start" position. While this does not ensure that an unsupervised child will not be left alone with such a window active, the supervision requirement does significantly, in the agency's opinion, lessen the risk.

Nonetheless, by virtue of the fact that these windows can close without the operator of the window physically maintaining contact with the switch after initial activation, we tentatively believe that there is an increased risk of injury if ARS were not present. To begin, while safer switches will prevent inadvertent actuation of a window switch by a child's knee or foot, there is still the possibility that a playing child will manipulate the switches by hand and activate the power window, which could lead to entrapment if the child's head or neck is in the path of the closing window. With regard to windows without an express-up feature, this is generally not a problem. As the window rises, it is likely that the child would reflexively move his/her hand from the switch, thereby stopping operation of the window. For some children, given their small stature, it is doubtful that they could even continue to reach the switch with their hand if their neck were entrapped in a window raised nearly to the top of its travel path.[17]

The third situation, where the main windows close while the operator is actively using the switch, is one where NHTSA does not, at this time, believe that the danger warrants the requirement of ARS. If the closing path is obstructed, then the window operator should be able to quickly remove his/her hand from the switch, thereby preventing further injury. As shown above in section IV, due to the relatively low number of severe injuries and fatalities that result from the operation of power windows (excluding those incidents that would have been prevented by the safer switch requirements), we tentatively believe that they remain safe.

While the scenarios involving severe injuries or fatalities for power windows equipped with safer switches are extremely rare, we have found one case where such

[17] For example, the distance of a typical 3 year old child's tip of their longest finger to the center of shoulder is 369 mm, with an additional 68 mm distance to the midpoint of the neck, which is not enough to reach most switches with one's neck entrapped in the window, even if the arm was fully extended.

incidence did occur. In this documented case, it appears that the driver operated the driver's window controls to close a rear-seat window, while not realizing that a child was entrapped in the window being closed. The window that entrapped the child was not equipped with an express-up feature. Because the child was not activating the switch, these incidents could not have been prevented by safer switches or by a lockout feature.[18] ARS, however, may have prevented these injuries. Given the available information about ARS, described above, we believe it would be nearly 100 percent effective in preventing serious injuries such as these.

While an ARS requirement for all main windows would prevent some injuries to fingers and hands, we are not including such a requirement as part of our primary proposal given the scope of the remaining safety problem that could be addressed by ARS after factoring in the benefits attributable to the two prior safer switches rulemakings.

The purpose of the K.T. Safety Act of 2007 is to prevent deaths and serious injuries to children, so we have focused our safety analysis on the severe injuries and fatalities that have occurred due to power window entrapment, rather than the more commonplace, but less severe, injuries involving bruised and pinched fingers that occur to adults and children alike.

NHTSA also conducted an analysis of requiring ARS at all main window positions. The estimates, described at length in NHTSA's Preliminary Regulatory Evaluation, show that the injuries prevented by ARS in all main window positions consist

[18] We note, however, that these incidents would have been prevented had the child been properly restrained in a child safety seat.

primarily of low-level injuries to fingers and hands, and there would be substantial costs to install ARS in tens of millions of windows.

Therefore, we are not including in our primary proposal a requirement that windows that conform to the current requirements of paragraph S4 and do not have the express-up feature, which currently constitute a majority of all windows, should be required to have ARS as standard equipment. Instead, we believe that the S4 ignition key requirement remains the most effective means to prevent unattended children from suffering power window related injuries in vehicles. We believe that careful child supervision by adults is a crucial factor in preventing a variety of vehicle-related injuries to children, whether related to power windows or any other attendant dangers, such as incidents of hyperthermia and vehicle rollaways (addressed in other portions of the K.T. Safety Act of 2007), which can result when children are left unsupervised in a vehicle. We believe that these factors along with safer window switches together should eliminate virtually all serious injuries and fatalities associated with power windows. However, we request comments as to whether there is additional information that could lead us to require ARS on a broader group of power windows.

**Costs and Benefits**

Overall, we do not believe that our primary proposal would impose significant costs. To our knowledge, virtually every power window that is equipped with an express-up feature is also equipped with an ARS. Furthermore, we believe that most of these windows are built in accordance with the specifications in ECE R21. Therefore, this proposal would only require manufacturers to take the precautions with express-up windows that, as far as the agency is aware, they have already been taking in most cases.

Furthermore, we tentatively believe that this proposal will promote the development of ECE-compliant ARS for those manufacturers who are currently producing ARS that does not adhere to this specification (or the specifications currently in FMVSS No. 118). Given these facts, we do not believe that this proposal would impose any significant costs on vehicle manufacturers or ARS suppliers.

The agency is placing in the Docket a Preliminary Regulation Evaluation (PRE) that analyzes costs and benefits. That document can be summarized as follows:

The PRE analyzes the cost, benefits, and cost-effectiveness of installing automatic reversal systems in the vehicle windows. While the agency considers the benefits of installing reversal systems in all types of vehicle windows, including front and rear main windows, sunroofs, as well as small "vent" windows, NHTSA proposes requiring automatic reversal systems (ARS)[19] in those windows equipped with "one-touch closing" or "express-up" operation, in which a window closes without continuous actuation from the window operator. As discussed above, we are also seeking comments on a broader requirement for automatic reversal systems, and could include such a requirement in a final rule.

Five alternatives are analyzed by the PRE. The primary proposal would require ARS for windows with the express-up operation. This analysis assumes that this alternative has no costs or benefits, because, as far as we know, the difference in costs and benefits between power windows with the express-up operation that meet the United Nations Economic Commission for Europe Regulation 21 (ECE R21) requirements and that have ARS already and that don't quite meet ECE R21 is minimal. Comments are requested on costs of improving those systems that don't comply to meet the

[19] The proposed ARS requirements are from ECE Regulation 21.

requirements of ECE R21. The second alternative considers requiring ARS that meets the ECE Regulation 21 requirements for all power side windows. The PRE also analyzed a third alternative: the costs and benefits of requiring power windows to meet the requirements of S5 of FMVSS 118. A fourth alternative, requiring that power windows with express-up be equipped with S5-compliant ARS, is included for comparative purposes. Similarly, a fifth alternative, which is to require ECE-compliant ARS at rear side windows only, was analyzed, considering that most children sit in rear seats. The agency did not analyze an alternative to require ARS for all power windows, sun roofs, etc., since we could find very few cases of injuries involving sun roofs or moon roofs, or power vent windows.

The following table shows the estimated costs, benefits, and cost per equivalent life saved for the five alternatives.

| | Cost per window (2007 economics) | Total Incremental Cost | Annual Fatality Benefits | Annual Injury Benefits | Cost per Equivalent Life Saved** |
|---|---|---|---|---|---|
| Alternative 1 Requiring ARS at express-up windows to meet ECE 21 | Near $0 | Near $0 | 0 | Near 0[20] | N/A |
| Alternative 2 Requiring ARS at all power side windows to meet ECE 21 | $6 | $149.4 million | 2 | 850 | $18.0 - $22.6 million |
| Alternative 3 Requiring all power side windows to meet S5 of FMVSS No. 118 | $12 | $588.1 million | 2 | 997 | $63.7 - $80.0 million |
| Alternative 4 Requiring ARS at express-up windows to meet S5 of FMVSS No. 118 | $6 | $144.6 million | 0 | 40 | $438.3-550.3 million |
| Alternative 5 Requiring ARS at all rear power side windows to meet ECE 21 | $6 | $91.8 million | 2 | unknown | N/A |

** Note: The range in cost per equivalent live saved is from a 3% discount rate to a 7% discount rate.

[20] There are some vehicles that have ARS for express up windows, but do not meet the ECE Regulation 21 requirements. The costs and benefits of bringing these vehicles into compliance with ECE Regulation 21 are believed to be small. If, for example, these manufacturers that do not meet the ECE Regulation 21achieved 88 percent effectiveness, instead of 90 percent effectiveness assumed for those manufacturers that do meet ECE Regulation 21, then having these vehicles comply with ECE Regulation 21 would result in an estimated annual benefit of 4 AIS-1 injuries.

### a. Listing of Vehicles Having Power Windows With or Without ARS

One additional aspect of the K.T. Safety Act of 2007 requires that NHTSA make information available to the public regarding the availability of power window ARS on new vehicles. Specifically, section 2 of the Act states, in part, that the secretary shall:

> publish and otherwise make available to the public through the Internet and other means (such as the `Buying a Safer Car' brochure) information regarding which vehicles are or are not equipped with power windows and panels that automatically reverse direction when an obstruction is detected.

While we have not reached any conclusions regarding whether and how to mandate ARS in passenger vehicles, we do believe that there is value in informing consumers on which vehicles are already equipped with this safety feature. For that reason, we are providing this information as early as possible.

Furthermore, in order to provide the most relevant information regarding the existence of power windows, we are not limiting the information to only those windows that conform to the specifications currently in FMVSS No. 118. Instead, we will provide information about ARS installed in any window position, which comply with either the current FMVSS No. 118 specifications or the alternative specifications given in ECE R21. We expect to report this information on a vehicle make and model basis at the www.safercar.gov website by October 2009.

### b. Proposed Effective Date

The K. T. Safety Act of 2007 specified that full compliance with the safety standards specified in this regulation shall be required not later than 48 months after the date on which the final rule is issued. In accordance with this requirement, NHTSA is proposing a period of 24 months of lead time for this requirement to take effect, due to the fact that nearly all manufacturers would already comply with the proposed

requirement. Based on information submitted by the Alliance of Automobile Manufacturers and the Association of International Automobile Manufacturers, ECE-compliant ARS already exists in approximately 30 percent of the total population of power windows. The agency found that approximately 24.1 million of the 49.0 million power windows in light vehicles produced annually (not counting roof panels, or power vent windows), are equipped with the express-up feature and an ARS. Furthermore, fleet compliance information submitted to NHTSA by vehicle manufacturers indicates that 19.2 million of the 24.1 million vehicle windows having the express-up feature and an ARS meet the ECE ARS requirements. Given this existing level of penetration of into the fleet, NHTSA believes that relatively little time would be needed to certify compliance. Thus, NHTSA proposes that the amendments outlined here be effective 24 months after publication of the final rule in the Federal Register, which we believe will provide an adequate period to certify compliance, or make design changes if necessary.

As indicated earlier, the K.T. Safety Act contemplated a phase-in of requirements for ARS. We believe that such a phase-in would be relevant to a rule that required the addition of ARS to a large number of vehicles. Since, for our primary proposal, we believe nearly all manufacturers already meet the proposed requirements, we believe that two years would provide ample lead time to minimize any burdens of compliance.

## IX. Public Participation

### How do I prepare and submit comments?

Your comments must be written and in English. To ensure that your comments are correctly filed in the Docket, please include the docket number of this document in your comments.

Your comments must not be more than 15 pages long. (49 CFR 553.21). We established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments.

Comments may be submitted to the docket electronically by logging onto the Docket Management System website at http://www.regulations.gov. Follow the online instructions for submitting comments.

You may also submit two copies of your comments, including the attachments, to Docket Management at the address given above under ADDRESSES.

Please note that pursuant to the Data Quality Act, in order for substantive data to be relied upon and used by the agency, it must meet the information quality standards set forth in the OMB and DOT Data Quality Act guidelines. Accordingly, we encourage you to consult the guidelines in preparing your comments. OMB's guidelines may be accessed at http://www.whitehouse.gov/omb/fedreg/reproducible.html. DOT's guidelines may be accessed at http://dms.dot.gov.

**How can I be sure that my comments were received?**

If you wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

**How do I submit confidential business information?**

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under FOR FURTHER INFORMATION CONTACT. In addition, you should submit two copies, from which you have deleted the claimed confidential business information, to Docket Management at the address given above under ADDRESSES. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation (49 CFR Part 512).

**Will the agency consider late comments?**

We will consider all comments that Docket Management receives before the close of business on the comment closing date indicated above under DATES. To the extent possible, we will also consider comments that Docket Management receives after that date. If Docket Management receives a comment too late for us to consider in developing a final rule (assuming that one is issued), we will consider that comment as an informal suggestion for future rulemaking action.

**How can I read the comments submitted by other people?**

You may read the comments received by Docket Management at the address given above under ADDRESSES. The hours of the Docket are indicated above in the same location. You may also see the comments on the Internet. To read the comments on the Internet, go to http://www.regulations.gov. Follow the online instructions for accessing the dockets.

Please note that even after the comment closing date, we will continue to file relevant information in the Docket as it becomes available. Further, some people may submit late comments. Accordingly, we recommend that you periodically check the Docket for new material.

## X. Regulatory Analyses

### A. Executive Order 12866 and DOT Regulatory Policies and Procedures

Executive Order 12866, "Regulatory Planning and Review" (58 FR 51735, October 4, 1993), provides for making determinations whether a regulatory action is "significant" and therefore subject to OMB review and to the requirements of the Executive Order. The Order defines a "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The agency has considered the impact of this rulemaking action under Executive Order 12866 and the Department of Transportation's regulatory policies and procedures.

This rulemaking document was reviewed by the Office of Management and Budget under E.O. 12866 The agency has considered the impact of this action under the Department of Transportation's regulatory policies and procedures (44 FR 11034; February 26, 1979), and has determined that it is "significant" under them.

This document proposes to amend Federal Motor Vehicle Safety Standard No. 118 to require that “express-up” or “one-touch closing” windows be equipped with ARS. We are placing in the Docket a Preliminary Regulatory Evaluation which analyzes the costs and benefits of this rulemaking. The costs and benefits are summarized in section VIIIa of this preamble, supra. The costs and benefits for our primary proposal are expected to be very small because all power windows with express-up operation are believed to have ARS already.

**B. Regulatory Flexibility Act**

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 et seq., as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of proposed rulemaking or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small governmental jurisdictions). The Small Business Administration's regulations at 13 CFR Part 121 define a small business, in part, as a business entity "which operates primarily within the United States." (13 CFR 121.105(a)). No regulatory flexibility analysis is required if the head of an agency certifies the proposal will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal

agencies to provide a statement of the factual basis for certifying that a proposal will not have a significant economic impact on a substantial number of small entities.

NHTSA has considered the effects of this proposed rule under the Regulatory Flexibility Act. This proposed rule would impose few if any additional cost burdens on vehicle manufacturers. Furthermore, we do not anticipate that the proposed rule would result in significant expenditures by ARS suppliers, as most already manufacture ARS in accordance with the specifications given in this proposal. We also do not anticipate that the proposed rule would result in expenditures by small governmental jurisdictions or other small organizations. I certify that this proposed rule would not have a significant economic impact on a substantial number of small entities**.**

**C. Executive Order 13132 (Federalism)**

NHTSA has examined today's NPRM pursuant to Executive Order 13132 (64 FR 43255, August 10, 1999) and concluded that no additional consultation with States, local governments or their representatives is mandated beyond the rulemaking process. The agency has concluded that the proposal does not have federalism implications because the proposal does not have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

Further, no consultation is needed to discuss the issue of preemption in connection with today's proposed rule. The issue of preemption can arise in connection with NHTSA rules in at least two ways. First, the National Traffic and Motor Vehicle Safety Act contains an express preemption provision: "When a motor vehicle safety standard is in effect under this chapter, a State or a political subdivision of a State may

prescribe or continue in effect a standard applicable to the same aspect of performance of a motor vehicle or motor vehicle equipment only if the standard is identical to the standard prescribed under this chapter." 49 U.S.C. 30103(b)(1). It is this statutory command that unavoidably preempts State legislative and administrative law, not today's rulemaking, so consultation would be unnecessary.

Second, the Supreme Court has recognized the possibility of implied preemption: in some instances, State requirements imposed on motor vehicle manufacturers, including sanctions imposed by State tort law, can stand as an obstacle to the accomplishment and execution of a NHTSA safety standard. When such a conflict is discerned, the Supremacy Clause of the Constitution makes the State requirements unenforceable. See Geier v. American Honda Motor Co., 529 U.S. 861 (2000). However, NHTSA has considered the nature and purpose of today's proposal and does not currently foresee any potential State requirements that might conflict with it. Without any conflict, there could not be any implied preemption.

**D. Executive Order 12988 (Civil Justice Reform)**

When promulgating a regulation, Executive Order 12988 specifically requires that the agency must make every reasonable effort to ensure that the regulation, as appropriate: (1) specifies in clear language the preemptive effect; (2) specifies in clear language the effect on existing Federal law or regulation, including all provisions repealed, circumscribed, displaced, impaired, or modified; (3) provides a clear legal standard for affected conduct rather than a general standard, while promoting simplification and burden reduction; (4) specifies in clear language the retroactive effect; (5) specifies whether administrative proceedings are to be required before parties may file

suit in court; (6) explicitly or implicitly defines key terms; and (7) addresses other important issues affecting clarity and general draftsmanship of regulations.

Pursuant to this Order, NHTSA notes as follows. The issue of preemption is discussed above in connection with E.O. 13132. NHTSA notes further that there is no requirement that individuals submit a petition for reconsideration or pursue other administrative proceeding before they may file suit in court.

**E. National Technology Transfer and Advancement Act**

Under the National Technology Transfer and Advancement Act of 1995 (NTTAA) (Public Law 104-113), "all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments." Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies, such as the Society of Automotive Engineers (SAE). The NTTAA directs us to provide Congress, through OMB, explanations when we decide not to use available and applicable voluntary consensus standards. The agency is not aware of any applicable voluntary consensus standards that apply to ARS.

**F. Unfunded Mandates Reform Act**

The Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of more than $100 million

annually (adjusted for inflation with base year of 1995). This proposed rule would not result in expenditures by State, local or tribal governments, in the aggregate, or by the private sector in excess of $100 million annually.

### G. National Environmental Policy Act

NHTSA has analyzed this rulemaking action for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action would not have any significant impact on the quality of the human environment.

### H. Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995 (PRA), a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. This proposal does not contain any new reporting requirements or requests for information.

### I. Plain Language

Executive Order 12866 requires each agency to write all rules in plain language. Application of the principles of plain language includes consideration of the following questions:

- Have we organized the material to suit the public's needs?
- Are the requirements in the rule clearly stated?
- Does the rule contain technical language or jargon that isn't clear?
- Would a different format (grouping and order of sections, use of headings, paragraphing) make the rule easier to understand?
- Would more (but shorter) sections be better?
- Could we improve clarity by adding tables, lists, or diagrams?

- What else could we do to make the rule easier to understand?

If you have any responses to these questions, please include them in your comments on this proposal.

### J. Regulation Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

## XI. Proposed Regulatory Text

### List of Subjects in 49 CFR Part 571

Motor vehicle safety, Reporting and recordkeeping requirements, Tires.

In consideration of the foregoing, NHTSA proposes to amend 49 CFR part 571 as follows:

PART 571 – FEDERAL MOTOR VEHICLE SAFETY STANDARDS

1. The authority citation for Part 571 of Title 49 continues to read as follows:

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

2. Section 571.118 is amended by adding the following definition to S3, by revising S4, and by adding S4.1 and S4.2, to read as follows:

§571.118 Standard No. 118; Power-operated window, partition, and roof panel systems.

* * * * *

S3. *Definitions.*

* * *

*One-touch closing (or "express-up")* means any power window, partition or roof panel closing operation whereby the window, partition or roof panel continues in motion in the closing direction after release of the switch used to initiate the closure.

* * * * *

S4. Operating requirements.

S4.1 Except as provided in S5, power-operated window, partition, or roof panel systems may be closed only in the following circumstances:

(a) When the key that controls activation of the vehicle's engine is in the ''ON'', ''START'', or ''ACCESSORY'' position;

(b) By muscular force unassisted by vehicle supplied power;

(c) Upon continuous activation by a locking system on the exterior of the vehicle;

(d) Upon continuous activation of a remote actuation device, provided that the remote actuation device shall be incapable of closing the power window, partition or roof panel from a distance of more than 6 meters from the vehicle;

(e) During the interval between the time the locking device which controls the activation of the vehicle's engine is turned off and the opening of either of a two-door vehicle's doors or, in the case of a vehicle with more than two doors, the opening of either of its front doors;

(f) If the window, partition, or roof panel is in a static position before starting to close and in that position creates an opening so small that a 4mm diameter semi-rigid

cylindrical rod cannot be placed through the opening at any location around its edge in the manner described in S5(b); or

(g) Upon continuous activation of a remote actuation device, provided that the remote actuation device shall be incapable of closing the power window, partition or roof panel if the device and the vehicle are separated by an opaque surface and provided that the remote actuation device shall be incapable of closing the power window, partition or roof panel from a distance of more than 11 meters from the vehicle.

S4.2 During any one-touch closing operation as defined in S3 above, a power window must reverse direction before it exerts a squeezing force of more than 100N within any opening from 4mm to 200mm between the leading edge of the window and the window frame or mating surface, on a cylindrical test rod, maintained in a perpendicular orientation to the window surface, and having a force-deflection ratio of 10±0.5 N/mm. Upon reversal, the window must open to a position that meets at least one of the following criteria:

i) a position which is at least as open as the initial position before closing commenced;

ii) a position which is at least 50 millimeters more open than the position at the time reversing was initiated;

iii) a position which permits a semi-rigid cylindrical rod of 200 millimeters diameter to be placed through the opening at the same contact points at which the squeezing force was measured.

* * * * *

Issued:

_____

Stephen R. Kratzke
Associate Administrator
for Rulemaking

Billing Code: 4910-59 P

[Signature page for Notice of Proposed Rulemaking, Automatic Reversal Systems for Power Windows]