November 26, 2019

Docket Management Facility
National Highway Traffic Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
West Building Ground Floor, Room W12-140
Washington, DC 20590-0001

Re: Docket No. NHTSA–2019-0093;
Comments by IMMI on NHTSA's ANPRM to Initiate Rulemaking to Amend Federal Motor Vehicle Safety Standard Number 208, "Occupant Crash Protection" to Require a Seat Belt Use Warning System for Rear Seats

Dear Sirs:

IMMI would like to thank the National Highway Traffic Safety Administration (NHTSA) for this opportunity to comment on the agency's consideration of rulemaking for rear seat belt use warning systems. This proposal, if adopted, would amend Federal Motor Vehicle Safety Standard (FMVSS) No. 208, Occupant Crash Protection, to require warning systems that would confirm proper lap shoulder belt usage for all rear seat passengers similar to systems currently required for front row occupants. The agency's Notice of Proposed Rulemaking (NPRM) and its proposed guidance was published at Fed. Reg. Volume 84, Number 188 (September 27, 2019).

This ANPRM serves as an opportunity for NHTSA to seek public comment on 26 issues related to this potential requirement. This comment by IMMI is to specifically address issue #19 on the applicability of this requirement to different vehicle types. IMMI has much experience with lap shoulder belt systems in high occupancy commercial vehicles and will respond only to this type application of the requirement. IMMI agrees with NHTSA's recognition that there is value in the use of seat belt warning devices as a means to increase lap-shoulder belt usage. Installation of these systems is technically feasible in multi-passenger commercial vehicles. However, IMMI believe the application of these systems will be costly and not suitable for high occupancy use.

SafeGuard/IMMI Seating Products

IMMI is a leading manufacturer of occupant restraint components and systems for commercial vehicle, off road vehicles, and child passenger systems. These products are used for a wide range of vehicle types. In addition, IMMI also manufactures seating systems for motor coaches and school buses under the SafeGuard brand name. The company has been performing research related to truck, bus and school bus crashworthiness for over 20 years, including full-scale

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barrier crashes, hundreds of dynamic sled tests, and countless tests using the procedures specified in FMVSS No. 208, No. 210, No. 222 and No. 225.

In 2002, IMMI began to manufacture and sell school bus seats equipped with lap-shoulder belts. To achieve acceptance and growth in this market, IMMI has been actively involved with school districts and their transportation services. IMMI has helped school districts with their lap-shoulder belt seating implementation process while enabling us to better understand how to promote and maintain lap-shoulder belt usage. Furthermore, our customer service and field service representatives work directly with inquiries for solutions to improve usage. These in turn generate opportunities to innovate features in our seat design to increase the belt system's user friendliness.

In January 2009, IMMI, in conjunction with American Seating Company, introduced a new motorcoach seat named "Premier®. This new motorcoach seat incorporated IMMI's patented "dual frame technology" with lap shoulder belts and an energy absorbing seat back capable of meeting FMVSS 222 forward and rearward deflection requirements. The primary market for this seat has been on First Group's Greyhound coach lines. IMMI receives much feedback regarding usage of lap-shoulder belts by occupants in motor coach passenger seats through Greyhound.

Specific Comments on the NHTSA Proposal

A. Technical Feasibility

The technology for sensing occupant presence on a seat and the securement of that occupant with the available lap-shoulder belt system has been in existence for many years now. Technology has been enhanced to determine occupant weight and location on the seat. Belt usage can be analyzed to confirm that the belt has been properly located on the occupant rather than just buckled. Connectivity to warning indicator systems can be achieved through methods other than traditional hard wiring. The belt usage warning indicator systems have the capability to provide the driver receiving the warning with multiple levels of information.

Requests for such systems have occurred since our 2002 SafeGuard/IMMI introduction of school bus lap-shoulder belt seating systems. The inquiries generally have come from drivers and transportation directors requesting such devices as a solution to their fear that students may not buckle up and drivers will be held liable. Samples of such system solutions have been presented to the industry since then. Even at the 2019 National Association for Pupil Transportation conference exhibition held in November, two new examples of this technology were displayed.

This technology comes at a cost. Large school buses will require sensing technology for up to 90 occupants or 30 standard width 3 occupant seats. Connectivity for that many seats and the means to analyze and display the inputs will add cost as well. In addition, back up provisions will be required to reduce liability should there be any power or connectivity failures. This too will add cost. This additional cost becomes a greater deterrent to the adoption of lap shoulder belts in school buses as the cost of basic lap-shoulder belt systems is a primary reason state legislatures and local school boards refuse to proceed with the equipping of their school buses with this proven safety device despite NTSB and NHTSA recommendations for their installation.

Similarly, the costs for this technology will add to the cost of each new motorcoach. Typical motorcoach configurations will require sensing for approximately 40-60 occupant positions or 20-30 two occupant seats. Although lap shoulder belts have been required in all motor coaches since November 2016, the increased costs for this technology will need to be either absorbed by the operator or passed on to the consumer.

Issues and Concerns in School Bus Applications

There are several primary areas of concern that present themselves as a significant obstacle for successful implementation of these warning devices. Concerns begin with the ability of passengers to defeat these systems, either intentionally or unintentionally. Failures in the connectivity can also prevents drivers from receiving accurate information regarding belt usage. Finally, reception and interpretation of the data by the driver can become an additional distraction at times when full attention to driving matters and not student discipline is required.

A. Student defeat of warning device detection systems. Conventional sensor detection systems can readily be defeated by buckling the belt system behind the occupant's back. Additional steps to prevent extracted webbing from returning may be necessary, however creative solutions do exist. Students can also use the warning system as an annoyance to the driver by frequent buckling and unbuckling of their restraint system or the system of an adjacent position.

   The most common configuration of lap shoulder belt equipped school bus seats is that of the standard 39 inch wide seat with flexible seating technology. Flexible seating enables the seat to accommodate either two large passengers (middle school and high school) or three smaller passengers (elementary school). This technology enables students to position themselves in varying locations across the width of the seat. Depending on the seat design, students may choose variations of shoulder belts and buckles that most comfortably suit their location on the seat. Sophisticated sensor design would be required to not warn the driver of a non-use when the student has selected a shoulder belt and buckle combination not specific to the sensor location. Objects typically brought by students such as backpacks, could also provide false readings. Two high school students could stack their backpacks between themselves creating sufficient weight to activate the warning device.

B. Failures in the connectivity. Electrical power will be required for each installed occupant seating sensor and each buckle and potentially each retractor (for sensing of web payout) to provide use data to the centralized warning device. This electrical power may be provided through the use of hardwired bus voltage or a multiplexsystem, localized battery power, or a combination of these systems. Each of these power sources is subject to potential failure.

   The school bus interior is a harsh environment. Hardwiring for up to 84 + unique occupant positions demands large quantities of bundled wiring each connected in some way to potentially 9 sensors per standard width seat. This wiring and the connections to each of the seat sensors are all subject to failure by exposure or tampering.

   This failure for hardwired systems could be eliminated through use of wirelesss technology. However, transmitting devices are also subject to failure, and require power. The power to

each seat could be through hardwiring or battery powered at each seat. Battery failures not detected could result in liabilities by the assumption that students are buckled up when not buckled up.

School districts would need to determine for liability if the failure of a warning system to properly function would require that the seat being position be rendered unusable despite the lap shoulder belt system functioning properly.

C. Driver Distraction. The potential for unnecessary driver distraction is perhaps the greatest concern for the implementation of warning device technology in school buses. The primary function of the school bus driver is to safely transport the student passengers from their point of pickup to their point of drop off. To successfully perform this duty, the bus driver must be able to fully focus on all road conditions, traffic, surroundings, and vehicle operations. Any momentary distraction that takes from this focus could result in fatal consequences in the worst-case.

   Each activation of a warning device would require a bus driver to transfer focus to the display source to read the data, understand the data, then interpret the data to the exact student/location in the bus. At that point the driver will have to communicate to the student that they will need to buckle themselves up if that is the actual need. If the student is already buckled and perhaps the warning system is activated accidentally by an object such as a heavy backpack, then the driver must dialog with the student(s) involved to find a solution to stop the warning system activation. This situation could occur simultaneously with several or more students causing a chaotic distraction for the driver. In driving situations with high density urban traffic or high-speed rural two-lane roads with much commercial vehicle traffic, the potential for a crash could significantly increase.

D. Alternate Proven Solution. The use of modern lap shoulder belt systems in school buses has been in existence since 2002. Proper usage of lap shoulder belts among all student passengers on these buses has always been a concern. However, it is a concern that each local district can determine uniquely how to manage. The local district establishes its own policy for proper student behavior on its buses and also determines the consequences for violations of the policy. Existing policy expectations range from general behavior to student seating to items brought on the bus and how they are used. The addition of a lap shoulder belt usage requirement is well within the rights of the school district providing the school bus transportation. Districts with lap shoulder belt equipped school bus seats that establish enforceable usage policies with violation consequences report usage at rates up to 100%. Though 100% usage may not always be attainable, students violating the policy will respond in two possible manners: 1) Leave their proper seating position in some manner that will capture the driver's attention when compared to the other properly seated and secured students thus resulting in a response from the driver, or 2) Sit quietly and properly upright and facing forward in their defined seating location within the seating compartment. Although not catching the driver's attention, the student will receive the benefits of the primary compartmentalization protection as well as not create a disruptive environment within the school bus that fully distracts the driver's attention.

Issues and Concerns in Motorcoach Applications

As with the school bus application, there are several primary areas of concern that present themselves a significant obstacle for successful implementation of these warning devices in motorcoach applications. In the motorcoach, passengers will also have the ability to defeat these systems, either intentionally or unintentionally. Failures in connectivity may also prevent motorcoach drivers from receiving accurate information regarding belt usage. Finally, as with the school bus, reception and interpretation of the data by the driver can become a burdensome distraction at times when full attention to driving matters is required.

In commercial aviation, there is no expectation of the pilot to monitor passenger belt usage. Likewise, there should not be an expectation of motorcoach drivers. The messaging of required belt usage for passengers can be communicated through the use of passenger reminder lamps as well as formal announcements from the crew. These seatbelt use reminders can be announced on an automated basis rather than dependence on the driver to implement into his driving process.

Recommendations

Establish design and performance standards for warning device systems for optional school bus and motorcoach applications.

Do not mandate use of rear seat warning device systems in school buses and motorcoaches.

Allow optional installation of warning device systems for individual customers to purchase if desired. Let the market prove out acceptability and demand for these systems.

Conclusion

IMMI supports NHTSA's efforts to enhance the safety of bus passengers and drivers. Although in principal the addition of rear seat warning device systems may be beneficial, the actual application may result in conditions that reduce safety due to driver distractions caused by intentional and unintentional activations of unused passenger belt systems. Furthermore, the additional cost for this technology may decrease the acceptance of optional equipping of school buses with lap shoulder belts by those school districts considering their optional installation,

IMMI recommends that NHTSA only establish design and performance standards for these rear seat warning systems so they are developed to a single standard. By establishing these standards and allowing for optional installation, the market can prove out its need for these safety systems.

Sincerely Yours,

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IMMI