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DOT Docket Management Facility  
U.S. Department of Transportation  
1200 New Jersey Avenue, SE  
West Building, Ground Floor, Rm. W12-140  
Washington, DC 20590-0001

SUBJECT: 49CFR 571.208 Occupant Crash Protection Notice of Proposed Rulemaking (NPRM)

REFERENCE: DOT Docket NHTSA–2019-0093, RIN 2127–AL37

Blue Bird Body Company (Blue Bird), with headquarters in Macon, Georgia, is a major manufacturer of both school and commercial passenger buses and appreciates the opportunity to comment. Blue Bird is submitting these comments in regards to the Notice of Proposed Rulemaking (NPRM) published in the Federal Register (Volume 84, No. 188, pages 51076- 51090) on September 27, 2019.

Blue Bird manufactures school buses with as many as 30 rear passenger seats and up to 90 rear designated seating positions. These seats include a combination of FMVSS 222-compliant school bus seats without seat belts, school bus seats with Type 1 seat belts, and school bus seats with Type 2 seat belts. Each of the various seat designs are available with either LATCH seat anchorages (with or without seat belts), integrated child seats (with or without seat belts), or in a flip-seat design (with or without seat belts) for installation at side emergency doors. Many of these seat designs are also designed to be ‘convertible’ by the end user, so that a seat without seat belts can be converted to include Type 1 seat belts or Type 2 seat belts. These seats can be secured directly to the bus floor or track-mounted to provide seating flexibility for the end user. Seat plan configurations also include floor track for designated wheelchair spaces.

For reference, the commercial buses that Blue Bird produces are basically a derivative of our school bus products. The commercial buses can be equipped with as many as 28 rear passenger seats and up to 70 rear designated seating positions. These buses are often equipped with the same seats as used on a school bus, but also may be supplied with commercial bus seats and Type 2 seat belts.

Blue Bird also provides a variety of driver’s seats in order to comply with various state and customer specifications. The various driver’s seat configurations available include mechanical suspension, air suspension, heated and unheated, and with/without armrests. Driver’s seat belts are available as a body-mounted three-point design with an emergency locking shoulder retractor or integral to the driver’s seat. Blue Bird also offers a driver’s seat with a seat belt warning indicator (audible and visible). (Note that the driver’s seat with a seat belt warning indicator is only required by a single state specification.)

As noted by the Agency on page 51080, FMVSS 208 currently requires a seat belt warning for the driver’s seat belt on buses with a GVWR of 3,855 kg (8,500 lb) or less and an unloaded weight less than or equal to 2,495 kg (5,500 lb), which is not applicable to any of the buses manufactured by Blue Bird. The Agency also noted that current regulations do not require seat belt warnings for any seating position other than the driver’s seat. Except for the single exception noted



above to meet a state specification, a driver's seat belt warning alarm is not provided on any bus manufactured by Blue Bird.

It is Blue Bird's position that for vehicles with a larger number of rear passenger seats, such as buses, any consideration to require a rear passenger seat belt warning system as described in 49CFR 571.208 Occupant Crash Protection NPRM is both impractical and prohibitively expensive. Blue Bird is opposed to any changes which expand the requirements of FMVSS 208 for buses with a GVWR greater than 3,855 kg (8,500 lb), including the proposed requirement for rear passenger seat belt warning systems. As many schools are already struggling with the additional cost of equipping a school bus with seat belts, the unintended consequence of requiring a rear seat belt monitoring system, and the associated cost increase, might be to discourage a school system from purchasing a school bus with seat belts. Blue Bird's concerns with the requirements under consideration are detailed below.

### **Comments on the Proposed Regulatory Text (pages 51076- 51090)**

#### ***A. Potential Specifications for a Required Rear Belt Warning System***

##### ***1. Triggering conditions.***

On page 51083, the Agency questions whether the warning should be initiated at the beginning of a trip or delayed to a time when the warning could be given greater attention and, perhaps, the driver is less distracted. The Agency also asks if the warning should be required/allowed/disallowed if the/a belt is buckled and if there should be a warning if a seat belt becomes unbuckled in the course of a trip. It is Blue Birds position that any triggering condition other than initiation at the beginning of a trip when the ignition switch is moved to the "on" or "start" position will necessitate occupant detection, which is both impractical and prohibitively expensive on a vehicle with a large number of rear passenger seats. As noted above, Blue Bird offers a multitude of rear seat configurations on the buses that we manufacture and any requirement for occupant detection will require a redesign of all passenger seats with a seat belt to include detection hardware as well as a redesign of the electrical architecture to provide an electrical connection to the passenger seats. Blue Bird also has concerns regarding track-mounted seats which can be repositioned by the end user to adjust knee clearance or removed entirely to provide a space for securing a wheelchair. Blue Bird questions the availability of an electrical system which can differentiate between a seat removed from the bus and a seat with an electrical disconnect.

##### ***2. Alternative warning systems.***

On page 51083, the Agency asks whether the rear seat belt warning should differ from the type of audio-visual warning that is currently required for the driver's seat belt. The Agency also questions whether an audible signal such as the sound of the latch plate clicking into the buckle when a belt is fastened or a haptic warning such as steering wheel or seat vibration would be an appropriate indication of rear seat belt use. Blue Bird maintains that in a bus environment, with as many as 90 passengers, an audible alarm similar to that required for emergency exits would be necessary to provide an effective notice to the driver that a rear seat occupant had not buckled the belt. Blue Bird does not support the use of a haptic warning on a bus to advise a driver of an unbuckled rear occupant. The steering mechanisms and driver's seats used on buses are comparable to those used in medium duty trucks which do not typically transport rear passengers. The requirement for haptic warnings would require new steering component or driver's seat designs unique to the bus market. The requirement for new and unique components in a limited market would also be cost prohibitive.

##### ***3. Occupant detection technology.***

On page 51083, the Agency requests comment on warning systems that utilize occupant detection. As noted above, Blue Bird is opposed to any requirement for rear seat occupant detection on a bus. Any system that attempts to monitor seat



occupancy and report seat belt usage to a driver on a bus with as many as 90 passengers will be extremely complicated and provide a constant barrage of notifications to the driver. Blue Bird installs a significant number of rear seat configurations on the buses that we manufacture. Some of the seats are designed to accommodate 3 small passengers or 2 larger passengers, and an occupant detection system designed to differentiate between these situations will be extremely complicated and no doubt prone to failure. Seats with integrated child seats are often designed to accommodate 3 older children or 2 children in the integrated child seats. The seat can also be used to accommodate one older child and one child in the integrated child seat. In these situations the detection system will be required to differentiate the number of occupants in the seat and monitor the appropriate belt use. Buses with LATCH seats will require a detection system capable of differentiating whether an occupant is unbuckled or secured using the LATCH attachments. Seats with an integrated child seat will require a detection system capable of differentiating whether an occupant is unbuckled or secured using the securement harness provided with the seat. Some seats, as noted above, are track-mounted to facilitate removal for providing a wheelchair space. An occupant detection system will be required to differentiate between removed seats and those with incorrect electrical connections. As suggested by the Agency, occupant detection for the various configuration of rear seats will certainly present both technical and cost challenges and will definitely add cost to a rear seat warning system.

An additional concern, as noted by the Agency, is that any book bags or similar carry-on items which are common for bus passengers will generate false warnings. While the Agency noted in the NPRM that “Having an audible or longer-duration visual warning activate for an unoccupied seat (such as might be the case if the system did not have occupant detection) could be a nuisance for the driver and might either desensitize the occupants to the warning signal, or lead them to circumvent or defeat the system”, it is Blue Bird’s position that a barrage of alarms based on false detections on a bus is even more likely to be a nuisance for the driver and likely to result in desensitization or circumventing of the system altogether.

#### **6. *Belt use criteria.***

On page 51084, the Agency questioned whether the criteria to determine if a rear seated occupant belt is “not in use” should be, at the option of the manufacturer, either the seat belt latch mechanism is not fastened or the belt is not extended at least 10.16 centimeters (cm) (4 inches (in)) from its stowed position. As noted above, the prolific use of LATCH seats and integrated child seats on buses will necessitate an alternate means of seat belt use detection. Blue Bird is not aware of a currently available detection system to recommend as an alternative.

#### **7. *Seat occupancy criteria.***

On page 51084, the Agency seeks recommendations for rear seat occupancy criteria. Blue Bird suggests that criteria must absolutely register children that would presumably be placed in a child restraint system. It is not uncommon for children as young as 4-years old to be transported on a bus and any system must be designed to recognize the presence of a child of this size. Likewise the system criteria should consider the presence of child restraint systems, including integrated child seats and LATCH seats.

#### **8. *Making the system resistant to intentional and inadvertent defeat.***

On page 51085, the Agency questioned whether requirements should be proposed to address circumvention of the system. The agency suggested that potential countermeasures to prevent circumvention of the system might include: A sequential logic system that would require that the belt be buckled after the seat has been occupied in order for the system to recognize the seat belt as being buckled; utilizing seat belt buckle and spool-out sensors and deactivating the warning only if the webbing were spooled out more than a predetermined length; programming the system to require input from door or occupant sensors to verify that the driver is in the vehicle. While the Agency’s case for addressing system circumvention is valid, Blue Bird is concerned that a requirement for a bus to be equipped with a



rear belt warning system is prohibitively expensive and is made even more so if circumvention countermeasures such as those suggested are mandated.

#### **9. *Electrical Connection Requirements.***

On page 51085, the Agency requested comments regarding the need for a warning signal to inform the driver if a proper electrical connection has not been made with respect to an easily removable seat. As noted above, Blue Bird frequently manufactures buses with floor track-mounted rear seats. These seats are designed to facilitate the removal or relocation of passenger seats and, as the Agency suggests, are subject to improper electrical connections when the seats are reinstalled. The potential for an improper electrical connection also exists if a track-mounted seat is installed by the end user in a bus originally configured with a wheelchair space. In this situation, electrical connections will not be present in the bus for connection to the seat and therefore not be monitored by the system. Blue Bird is not aware of any wireless technology which would be available to permit a rear belt warning system to communicate with the individual seats. Blue Bird is concerned that, if developed, any such wireless technology capable of monitoring up to 90 seating positions will be prohibitively expensive.

#### **10. *Visual warning location.***

The Agency asks, on page 51086, for comments regarding whether the driver, the rear passenger(s), or both should receive the warning signal. As noted above, a bus manufactured by Blue Bird can seat up to 90 passengers. Blue Bird believes that it is impractical to consider providing a warning system signal to a rear passenger on a bus. Incorporation of rear warning signals will require new wiring architecture which adds cost to the bus. In addition, the various seat configurations available on the buses manufactured by Blue Bird mean that each bus will require a custom wiring harness with warning signals customized to reflect the number of designated seating positions at each location. Flexible seating will require warning signals for both 2-passenger seat use and 3-passenger seat use, depending on the physical size of the seat occupant. FMVSS 222 requirements for head impact performance greatly limits the available location for the warning signal on a school bus. Any track-mounted seats installed by the end user would also require the end user to provide the necessary electrical connection to properly monitor seat belt usage for the passengers in these seats.

#### **11. *What type of information should the warning convey?***

On page 51086, the Agency requests comments concerning whether a “positive-only” system (indicates how many or which rear seat belts are in use), a “negative-only” system (indicates how many or which rear seat belts are not in use), and a “full-status” system (indicates how many or which rear seat belts are in use and how many or which rear seat belts are not in use) should be required. Blue Bird believes that any system which requires occupant detection, whether “positive only”, “negative only”, or “full-status” is impractical for a bus with up to 90 passengers. A means to transmit the status of as many as 90 passengers so as to be read by the driver will present significant technical difficulties. In addition, with such a large number of designated seating positions, it would be extremely time consuming for a driver to determine which seat location was occupied by an improperly buckled passenger on the bus. This timeframe is compounded when multiple passengers in multiple locations would likely be detected. It should also be considered that, particularly on a school bus, some passengers might intentionally unbuckle the seat belts as a means to delay the school bus arrival or simply to annoy the driver.

The Agency questions whether an alternative warning system, such as a specialized system of mirrors, would convey to the driver which passengers are not properly restrained. It should be noted that all buses manufactured by Blue Bird are supplied with an interior mirror designed to permit the seated driver to view the bus passengers. It is Blue Bird’s position that the interior mirror, while not as effective in determining proper seat belt use as an electronic monitoring system,



has proven to be an effective tool in aiding the driver to observe those passengers that were obviously not properly secured with seat belts.

#### ***B. Applicability***

On page 51087, the Agency seeks comment on the vehicles to which any proposed rear seat belt warning requirements should apply, as well as comment on whether any vehicles within the broad applicability criteria should be exempt. It is Blue Bird's position that for vehicles with a larger number of rear seats, such as buses, any consideration for rear passenger warnings is both impractical and prohibitively expensive. Blue Bird is opposed to any changes which expand the requirements of FMVSS 208 for buses with a GVWR greater than 3,855 kg (8,500 lb), including the proposed requirement for rear passenger seat belt warning systems. As noted by the Agency with respect to school buses, a rear seat belt warning requirement will result in significant cost for the school bus manufacturer, which will result in higher purchase prices for school buses with seat belts. It should also be noted that the increased cost associated with rear seat belt monitoring systems will only impact those school systems which chose to purchase school buses with seat belts. As many schools are already struggling with the additional cost of equipping a school bus with seat belts, the unintended consequence of requiring a rear seat belt monitoring system, and the associated cost increase, might be to discourage a school system from purchasing a school bus with seat belts.

#### ***C. Effectiveness***

#### ***D. Consumer Acceptance***

On page 51088, the Agency requested comment on potential consumer acceptance concerns with a proposed seat belt warning system, especially in regard to the balance between effectiveness and acceptability. The Agency acknowledged that any system "must be noticeable enough to prompt occupants to buckle their seat belts, but not so intrusive that the public does not accept the warning system, that an occupant will circumvent or disable it, or that the warning system could lead to driver distraction that could increase the risk of a crash." It is Blue Bird's position that the requirement for a high occupancy vehicle such as a bus will not serve to prompt passengers not under the direct observation of the driver to buckle their seat belts as much as it will result in driver distraction.

It should also be noted that, especially in regard to school buses, any situational malfunction of a rear passenger seat belt warning system, i.e. false positives, failure to detect passengers in child restraint seats, etc., will result in a school bus being removed from service until such time that the system works as required. Because of the complexity of any system required for a vehicle with a large number of rear seating positions, improper detection is a real possibility. A school bus with a non-compliant rear passenger seat belt warning system, even with passengers protected by means of compartmentalization, will not be permitted to be placed into service until the system performs as required. A school bus in the middle of a route which experiences a monitoring system failure will be deemed non-compliant with FMVSS and present school districts with the decision to continue transporting students with a non-compliant bus or transfer the students to another bus in an off-site location. The placing of an otherwise compliant school bus out of service due to an improperly functioning rear passenger seat belt monitoring system will certainly lead to user frustration.

#### ***E. Technological and Economic Feasibility***

Blue Bird agrees with the Agency's concerns expressed on page 51089 "that larger vehicles with many rear designated seating positions may present challenges." Any rear seat belt warning system communication to a bus driver without becoming a distraction will be a significant challenge. With as many as 90 seating positions, and a continually changing passenger load at every bus stop, the driver will no doubt face extreme pressure to interpret any information provided by the rear passenger seat belt warning system and take necessary action to ensure that any unbuckled passengers are properly restrained. The ability of a system to detect and differentiate between objects such as book bags, band



instruments, and other typical carry-on items placed on the passenger seats with actual passengers of various weights and sizes will necessarily be extremely complex and likely very costly. The system must also differentiate between a typical seated passenger and a child secured in a child restraint anchorage system. Blue Bird is not aware of any occupant detection monitoring system for rear passenger seats that is currently available for use in buses, so all rear passenger seats currently in use will require significant development efforts.

***F. Benefits and Costs***

The Agency stated, on page 51089, that “many of the technologies discussed in this ANPRM are currently in use, either for front seat passengers or, in more limited models, rear seat passengers.” Blue Bird is not aware of any rear seat belt warning systems that are being considered or currently available for use on vehicles with multiple rear seating positions such as buses.

***G. Safety Act Criteria***

As noted by the Agency on page 51089, any amendments to FMVSS 208 to require a rear seat belt warning system must meet the requirements in section 30111 of the Safety Act. As noted in footnote 3 on page 51087, 49 U.S.C. 30111 “requires, among other things, that a federal motor vehicle safety standard be practicable, meet the need for motor vehicle safety, and be stated in objective terms.” It is Blue Bird’s position that a requirement to require a rear seat belt monitoring system on a bus does not meet the requirement for practicality as previously noted and therefore does not satisfy the requirements set forth in section 30111 of the Safety Act.

In summary, based on the inherent complexity, increased cost, and lack of data supporting effectiveness of rear seat belt warning system on a motor vehicle with a large number of rear seating positions such as a bus, Blue Bird is opposed to any changes in FMVSS 208 which expands either the current application or requirements on buses.

Blue Bird appreciates the opportunity to comment on this important NPRM dealing with passenger safety concerning occupant crash protection and working with NHTSA further.

Respectfully submitted,

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