



December 27, 2020

James C. Owens, Esq.
Acting Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

RE: Notice of Proposed Rulemaking (NPRM); Occupant Crash Protection, NHTSA Docket No. 2020-0094, 85 Fed. Reg. 68541 (October 29, 2020)

Dear Acting Administrator Owens:

The Alliance for Automotive Innovation (Auto Innovators) appreciates this opportunity to provide comments on NHTSA's October 29, 2020, Notice of Proposed Rulemaking (NPRM) to update the child restraint system (CRS) list in FMVSS 208, Occupant Crash Protection. The list identifies CRSs that NHTSA may use to evaluate the performance of advanced air bag systems. Auto Innovators is comprised of manufacturers producing nearly 99% of new cars and light trucks sold in the U.S. as well as original equipment suppliers, technology and other automotive-related companies, and trade associations.

Auto Innovators supports, in principle, updating the CRS list. By updating the list, the agency helps assure that CRSs used in advanced air bag suppression and low risk deployment (LRD) testing will correspond to the CRSs that are available in the market today. In addition, by excluding CRSs that are no longer sold in the market, the agency will avoid CRS availability problems for agency staff and manufacturers in assessing compliance with FMVSS 208.

Auto Innovators is concerned, however, that while the NPRM serves the goal of updating the list of CRSs used for advanced air bag testing, it does not sufficiently address the potential for misclassification of occupants. The size and weight of CRSs continue to grow, bringing them (combined with their intended child occupants) closer to the size of small adults. The narrowing of this gap creates an increasing risk of misclassifications by vehicle occupant classification systems (OCS), potentially leading to air bag inflation in instances when suppression

might be the safer outcome. Significant changes to the air bag systems and related software will be required to address this matter, along with changes to the vehicle instrument panels to accommodate the new systems. Additional lead-time beyond that proposed in the NPRM is critical in order to achieve a robust/stable technical solution considering the significant change contents. For example, some OEMs may need to apply low risk deployment for 6YO and 3YO child dummies for the first time, and such a change in strategy from suppression to deployment/LRD requires a careful approach. Due to the limited time available for submitting comment on the NPRM, we are presenting our initial thoughts on this matter in this comment. We intend to continue our study and submit additional comments as soon as possible. We recommend that there be discussions among the agency, vehicle manufacturers, and CRS manufacturers to develop a path forward on this matter. When a solution is developed, the agency should present that solution for public comment and reopen the comment period.

Effect of Additional CRS Weight

Automakers use a variety of occupant classification system (OCS) sensor technologies, including weight-based systems, for occupant classification and air bag activation/suppression. Differing considerations apply to suppression and LRD systems. It is our understanding that the majority of current systems use suppression technology based on sensing of weight. In general, suppression systems must be able to sense the weight of a front seat occupant (with CRS, if applicable) and assign a classification to that occupant. Based on that classification, the air bag system is either activated or suppressed. For suppression systems, one critical weight gap that must be correctly assessed for the air bag deploy/suppress decision is generally between the 5th percentile adult female device (AF5 - 108 pounds) and the 6-year-old test device (H-III6C – 51.6 pounds plus weight of CRS). The correct classification for suppression must also balance the potential for misclassification of smaller occupants where air bag activation would most reduce the risk of injury. Weight gap concerns may also apply regarding the smaller test devices in vehicles using a combination of suppression and LRD systems. (See Additional Comment #4 below.)

FMVSS 208, section 23.2.1, specifies that testing of vehicles that are equipped with advanced air bags using automatic suppression technology must be conducted using the H-III6C installed in one of the CRSs in Subpart D of the Appendix to the standard (Appendix A-1 currently relevant).

The CRSs now listed in Subpart D of Appendix A-1 and their weights are as follows:

<u>Child restraint</u>	<u>Weight (pounds)</u>
Britax Roadster 9004	7.6
Graco Platinum Cargo	11.3
Cosco High Back Booster 22-209	8.09
Evenflo Right Fit 245	3.3
Evenflo Generations 352xxxx	11.7
Cosco Summit Deluxe High Back Booster 22-262	15.2

The CRSs that NHTSA proposes to add to Appendix A-1, Subpart D, for testing using the H-III6C are as follows:

<u>Child restraint</u>	<u>Weight (pounds)</u>
Chicco MyFit #04079783-0070	24.2
Cybex Eternis	27.1
Safety 1 st Grow and Go #CC138	15.2
Evenflo Chase #306	8.5
Cosco Finale #BC121	8.7
Cosco Rise Belt-Positioning Booster Seat #BC126	2.1
Graco Backless TurboBooster	4.3
Britax Grow with You #E1C19	25.2

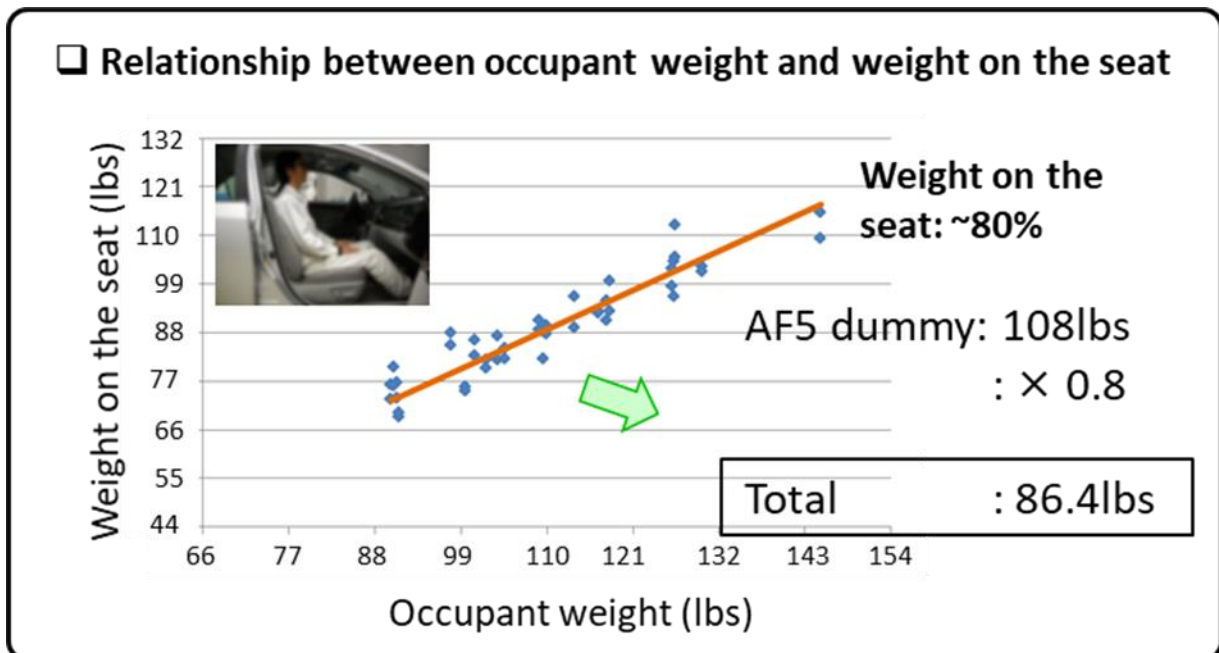
Of the CRSs currently included in FMVSS 208 Appendix-1, the heaviest that is suitable for testing with the H-III6C (i.e., in Subpart D) is the Cosco Summit Deluxe, at 15.2 pounds. Of the CRSs proposed to be added to the Appendix, those heavier than the Summit Deluxe and suitable for use with the H-III6C are the Chicco MyFit (24.2 pounds), Cybex Eternis (27.1 pounds), and Britax Grow with You (25.2 pounds).

The following illustrates the weight gap between these CRSs (with H-III6C installed) and the AF5 test device:

Reference	5 th Percentile Adult Female Test Device (AF5)	108 pounds
Current	Cosco Summit Deluxe plus H-III6C	66.8 pounds
Proposed	Chicco MyFit plus H-III6C	75.8 pounds
	Cybex Eternis plus H-III6C	78.7 pounds
	Britax Grow with You plus H-III6C	76.8 pounds

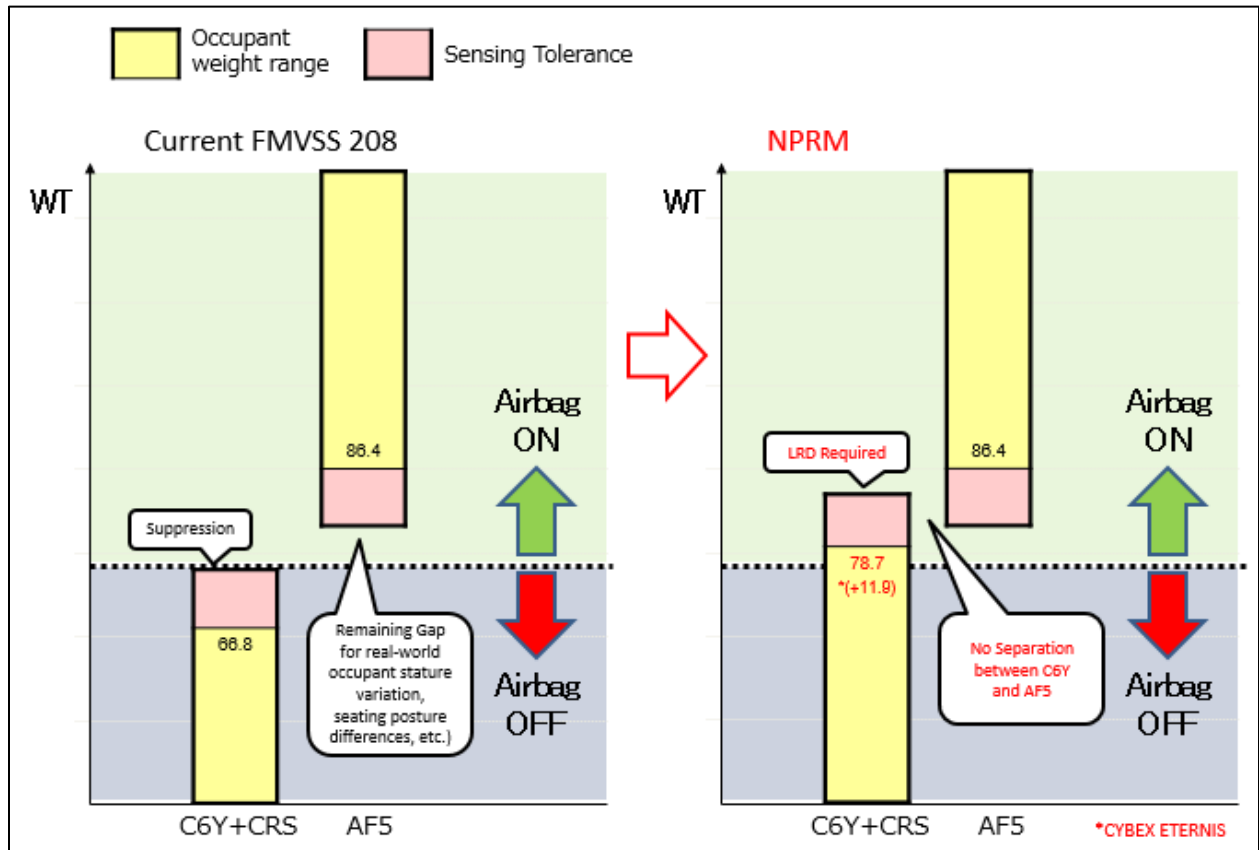
The weight gap is decreased by nearly 30% when comparing the heaviest current and proposed models for FMVSS 208 Appendix A-1 (Subpart D).

While the full AF5 dummy weight is 108 pounds, the weight sensor reading is actually considerably less than 108 pounds because the dummy weight is also offloaded onto the floor where the dummy legs are placed and in some cases to arm rests. One of our member companies provided the following information regarding the actual occupant weight (x-axis), vs. sensed weight on the seat (y-axis):



Moreover, the accuracy/tolerance of weight sensors may further reduce the weight gap between the AF5 and the CRS plus H-III6C eliminating it for some

CRS-vehicle combinations. The combined effect of the heavier CRS, the off-loading of some of the AF5 weight to the vehicle structure, and sensor tolerance is illustrated by the following:



This concern is exacerbated by manufacturers need to assure a significant margin in compliance testing.

The above analysis describes the effect of the addition of heavier CRS in FMVSS compliance testing. However, while the AF5 and H-III6C are currently used to evaluate occupant classification, such classification in the real world must also consider variations due to occupant size/shape, seating position, seat design etc. For example, occupants may have different loading characteristics due to body shape, or how much they are resting their body weight on the armrests or floorboard. Manufacturers must also assure that their occupant classification

systems consider real world occupant variations.¹ Optional hardware that is sold with CRSs such as cup holders, trays, and tablet adapters may also increase the weight of CRS, further reducing the air bag suppress/activate margin. We urge the agency to assure that its certification tests do not unintentionally increase the thresholds for air bag suppression/activation in a way that is inconsistent with overall occupant safety.

Assessment of New CRSs and Assessment/Implementation Steps

The addition of heavier CRS to the FMVSS 208 Appendix would require manufacturers to take a series of steps. Substantial testing will be required to assess the performance of occupant classification systems with the heavier CRS installed. Such testing may identify the need for air bag system design changes. Changes to air bag size, shape, and inflators may necessitate changes to instrument panel design. Suppression may no longer be an option for some models with weight-based occupant classification sensors. Those models may have to switch from suppression to LRD approaches. In that case, the air bag module as well as the instrument panel may also need to be re-engineered. Significant changes may be required to accommodate the new systems. Our initial study indicates that, after further consideration of this matter by the affected parties and development of technical solutions, additional lead-time will likely be needed to implement these strategies, beyond what is proposed by the agency in the NPRM. This scenario will require full frontal crash development which typically takes more than two years.

We look forward to working with the agency and CRS manufacturers to address these concerns.

Additional Comments

1. The NPRM notes that the “SAFETY 1ST DREAMRIDE SE LATCH #IC238” is one of the only readily available infant car beds on the market. However, initial efforts to procure this CRS have proven to be difficult since this relatively niche product may require additional medical approval. Since one of the goals of this NPRM is to make it easier for vehicle manufacturers to acquire CRSs for testing purposes, we recommend that there be an established formal means for automakers to procure CRSs for the purposes of FMVSS No. 208. (e.g. phone number or e-mail).

¹ For example, a Cybex Eternis CRS fitted with a 10-year-old child dummy weighs approximately 99.5 pounds, making it indistinguishable in terms of weight from the AF5 (considering floor/arm rest off-load effect).

2. Comparing the NPRM which was published on October 29, 2020 and the current standard, it seems that “S21” has been accidentally deleted. As NHTSA’s intention was to redesignate “Appendix A-1” of the current regulation as “Appendix A” in the October 29, 2020 NPRM, we believe the section numbers in Subpart D should be the same (i.e. should refer to “S21 or S23”). See FR page 68552, proposed FMVSS 208, section D of Appendix A

*D. Any of the following forward-facing child restraint systems and belt positioning seats, manufactured on or after the date listed, may be used by the National Highway Traffic Safety Administration as test devices to test the suppression system of a vehicle that has been certified as being in compliance with **r S23** of this standard:*

Current standard

*D. Any of the following forward-facing child restraint systems and belt-positioning seats, manufactured on or after December 1, 1999, may be used by the National Highway Traffic Safety Administration as test devices to test the suppression system of a vehicle that has been certified as being in compliance with 49 CFR 571.208 **S21 or S23**:*

3. There appears to be an inconsistency in the proposed regulations. Comparing proposed FMVSS 208 S14.8 vs. Part 585.35 and Part 585.36, it seems that “first” in S14.8 should be “second.” See FR pages 68551 and 68553 (FMVSS 208 S14.8 vs. §585.35 Response to inquiries. and § 585.36 Reporting requirements.)

S14.8

*At any time during the production year ending August 31, [Year of **first** September 1st after publication of final rule], each manufacturer shall...*

§585.35

*At any time during the production year ending [DATE OF **SECOND** AUGUST 31ST AFTER PUBLICATION OF FINAL RULE], each manufacturer shall...*

§ 585.36

*(a) Phase-in reporting requirements. Within 60 days after the end of the production year ending [DATE OF **SECOND** AUGUST 31ST AFTER PUBLICATION OF FINAL RULE],...*

4. We request clarification on forward-facing installations for two child restraint seats proposed in Subpart C where the CRS Owner's Manual specifies a minimum child size that is greater than the 49 CFR Part 572 Subpart R 12-month-old CRABI child dummy (29.1 inches height, 22 lbs.). Actual testing with these child seats for air bag suppression, forward-facing installation with a 12-month-old CRABI, may be a limiting test condition which could decrease the ability to enable air bags for adolescent or adult occupants that may benefit from an air bag. The weight of the child restraint seats which are designed for children larger than an average 12-month-old causes a decrease in the weight range between suppress and deploy conditions. According to the child seat manuals, the occupant size and age are beyond the 12-month-old CRABI and would not be applicable in the field. For a manufacturer that utilizes Infant Only Suppression technology, these test configurations would increase the risk that the air bag may be suppressed for an adolescent or small adult occupant. These CRSs are:
 - a) Cosco Finale DX #BC121 forward-facing, specified for 30-65 lbs. and 32-49", age range > 1yr
 - b) Chicco MyFit #04079783-0070 specified for 25-65 lbs. and 34-49", age range > 2yr
5. We also request clarification on child restraint seats which feature a belt tensioning mechanism. Through physical testing and measurement, it is possible to exceed the 134N belt load by 80-106N if slack is removed from the belt prior to applying the child seat belt tensioning mechanism. We request that the agency confirm that the belt should only be cinched to "up to 134N". Higher belt cinch loads will create greater input to weight-based suppression systems and further reduce the grey zone. This will result in even greater difficulties enabling air bags for adolescent and small adult occupants than simply installing a heavier child seat with no belt tensioning mechanism. In the field, these child seats with belt tensioning can exceed the belt tension in the OEM compliance testing. There is an increase in the risk of an undesired air bag deployment with heavier child seats, a child heavier than the dummy and excessive belt load due to child seat belt tensioning systems. With no FMVSS 213 limits on child restraint seat weight and the allowance of belt tensioning systems that can increase belt loads beyond an OEM suppression test requirement, OEMs may have to warn consumers not to install these child seats in the front outboard seating position

Auto Innovators appreciates the opportunity to provide input to NHTSA on this important topic. We look forward to any follow up with the agency to expand on these comments further.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Schmidt", with a stylized flourish at the end.

Scott Schmidt
Senior Director, Safety