cybex

April 4, 2021

Via Regulations.gov
Acting Administrator Cliff
Document Management Facility, M-30
U.S. Dept. of Transportation
West Building, Ground Floor, Room W12-140
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Re: Comment from CYBEX, GmbH on Notice of Proposed Rulemaking (NPRM) Docket No. NHTSA-2020-0093; 85 FR 69388-69459

Dear Administrator Cliff and NHTSA Leadership:

CYBEX, GmbH ("CYBEX") is offering comment on the NPRM regarding updates to Federal Motor Vehicle Safety Standard ("FMVSS") 213, as a leading, global manufacturer of child restraints and booster seats. CYBEX appreciates the opportunity, through this process, to participate in improving regulatory requirements focusing on child-occupant safety in motor vehicles.

CYBEX has organized the comments based on the sections of the proposed rule.

III(b) Updating the Representative Seat Assembly – Consistency with the Side Impact Bench

CYBEX advocates using the same seat bench for both frontal and side impact test methods to simplify the assessment of a car seat's crashworthiness. CYBEX believes that using a consistent test bench based on more recent research and analysis, (i.e. more representative of the current vehicle fleet) is beneficial to real-world crashworthiness. Given the implied change in test bench to the proposed side impact rule, CYBEX is requesting a reasonable timeframe to evaluate and comment to confirm the applicability of the bench change.

XI. Child Passenger Safety Issues Arising from Research Findings, 1.(b) Shield-Only CRSs

NHTSA's paper describes a collaboration between UTAC CERAM and Transport Canada to investigate the performance of shield systems in vehicle rollover tests. A moving car-to-moving car 40% frontal offset test was also carried out. The findings were presented in a paper by Tylko, et al. at the Protection of Child in Cars Conference in December 2013. Very little information is provided

about the shield systems used in the study, but it seems likely they were type-approved or certified to local requirements (i.e. UN Regulation No. 44 in the UTAC tests and C/FMVSS213 in the Transport Canada tests).

As Tylko notes in the Introduction, the child restraint system overturning test was amended in UN Regulation No. 44 to better reflect vehicle rollover dynamics. The amendment was led by France, and the new requirements were derived from vehicle rollover tests carried out by UTAC. The amendment was first proposed to the UN in 2012, and the performance of shield systems in vehicle rollover tests was part of the justification for increasing the stringency of the requirements.[1] The improved test increased the rotation angle of the child restraint to 540° and applied a weight to the dummy in the inverted position of four times its own weight. When presenting the proposal, the expert from France explained that it was not intended to prevent the type-approval of shield systems in favor of harness systems, but rather to improve the overturning test.

The UN adopted the proposal, and it entered force on 13th February 2014.[2] Following a similar process, the improved overturning test procedure was also introduced in the new UN Regulation for child restraints being developed at the time (UN Regulation No. 129). The amendment to Regulation No. 129 entered into force on 10 June 2014.[3] Neither Tylko, nor the UN, investigated real-world collision data or highlighted a single real-world case of a child being ejected from a shield system type-approved to UN Regulation No. 44 or No. 129. Nevertheless, shield system manufacturers responded to the new performance requirements and all shield systems type-approved after the aforementioned dates meet these improved overturning requirements. Due to the timing of the study, the shield systems used by Tylko would not have been subject to these more stringent overturning requirements. CYBEX is unaware of follow-up tests with newer generation shield restraints.

NHTSA's paper also describes a study carried out by TRL, under contract to Britax, to compare the performance of shield and harness systems in front impact tests like those carried out by European Consumer organizations. The findings were presented in a paper by Visvikis et al. at the Protection of Child in Cars Conference in December 2014. Partial ejection from one of the shield systems was observed during the rebound phase of the impact test. The child restraint systems used in the study were type-approved per UN Regulation No. 44 and were likely approved prior to the amendment made to the overturning test described above. CYBEX is unaware of follow-up tests with newer generation shield restraints.

---

1 Informal Document GRSP-52-12 – Item 15 of the provisional agenda, Regulation 44, Proposal for Supplement 7 to the 04 series of amendments, submitted by the expert from France. https://unece.org/fileadmin/DAM/trans/doc/2012/wp29grsp/GRSP-52-12e.pdf

2 Supplement 7 to the 04 series of amendments to Regulation No. 44 (Child restraint systems), ECE/TRANS/WP.29/2013/46, https://unece.org/fileadmin/DAM/trans/doc/2013/wp29/ECE-TRANS-WP29-2013-046e.pdf

3 Supplement 2 to Regulation No. 129 (Enhanced child restraint systems), ECE/TRANS/WP.29/2013/110, https://unece.org/fileadmin/DAM/trans/doc/2013/wp29/ECE-TRANS-WP29-2013-110e.pdf

UN Regulation No. 129 is now the primary child restraint system regulation in those parts of the world that follow UN Regulations (e.g., European Union, Japan, Russia, United Kingdom, etc.). UN Regulation No. 129 specifies a number of requirements intended to improve the performance of child restraint systems, some of which are focused on shield systems. For example, during the front impact test, the head of the dummy is not allowed to pass, unprotected, beyond a plane that extends from the surface of the seatback of the test bench. This requirement, coupled with stringent horizontal (500 mm) and vertical (800 mm) head excursion limits mean that a shield system that allows the rebound partial ejection described by Visvikis would not gain type-approval. In addition, several design requirements have been added to Regulation No. 129 to ensure the shield engages with the pelvis for both the smallest and the largest children covered by the stature range.

It is the opinion of CYBEX that NHTSA should consider adopting performance-based requirements in lieu of specifying design constraints (e.g., minimum radius, curvature of contactable surface, shoulder straps). An additional requirement regarding abdominal pressure was included in Regulation No. 129 to reduce the risk of injury of concentrated forces on the abdomen of a child occupant.

CYBEX welcomes the opportunity to review any additional information that is available related to real-world crash outcome involving shield restraint systems or laboratory data whether from computer simulations or crash tests.

On Infant Carriers Better Accommodating the Height of Children Recommended for the Restraint

UN Regulation No. 129 (R129) specifies internal dimensions requirements based on child size data, which are used to classify CRSs according to the child's stature. Likewise, the Australian and New Zealand child restraint standard (AS/NZ 1754) establishes critical dimensions for all manufacturers to use in the design and development of CRSs and booster seats. CYBEX believes that NHTSA could achieve the objective of *"infant carriers' height and weight recommendations should better match the children for whom the CRS is recommended"* through similar means as R129 or AS/NZ 1754.

Availability of Computer Models to Assist Fit

The UMTRI-developed models have limited use in the development of CYBEX CRSs and boosters. Standard measurement data of children provides nearly the same utility. If the models could be

manipulated into more natural positions with a simple software tool, then their usefulness would be greater.

Respectfully,

Costandinos Visvikis

Director Industrial Relations Child Safety

CYBEX, GmbH