DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Parts 571 and 585

[Docket No. NHTSA–2024–0089]

RIN 2127–AL20

Federal Motor Vehicle Safety Standards; Child Restraint Systems, Child Restraint Anchorage Systems, Incorporation by Reference

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

ACTION: Final rule.

SUMMARY: This final rule amends Federal Motor Vehicle Safety Standard (FMVSS) No. 225; Child restraint systems, and FMVSS No. 213b; Child restraint systems, to improve ease-of-use of the lower and tether anchorages, improve correct use of child restraint systems in vehicles, and maintain or improve the correct use and effectiveness of child restraint systems (CRSs) in motor vehicles. This final rule fulfills a mandate of the Moving Ahead for Progress in the 21st Century Act (MAP–21) requiring that NHTSA improve the ease-of-use for lower anchorages and tethers in all rear seat positions.

DATES:

Effective date: March 10, 2025.

IBR date: The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register beginning March 10, 2025.

Compliance date: This final rule adopts a 3-year phase-in period to comply with the updated requirements in FMVSS No. 225. The phase-in begins on September 1, 2028, and requires that 20 percent of a manufacturer's applicable vehicles produced from September 1, 2028, to August 31, 2029, comply with the updated FMVSS No. 225, followed by 50 percent from September 1, 2029, to August 31, 2030, and 100 percent on and after September 1, 2030. Early compliance is permitted.

Reconsideration date: If you wish to petition for reconsideration of this rule, your petition must be received by February 21, 2025.

ADDRESSES: Petitions for reconsideration of this final rule must refer to the docket number set forth above and be submitted to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590. Note that all petitions received will be posted without change to *www.regulations.gov,* including any personal information provided.

Confidential Business Information: If you wish to submit any information under a claim of confidentiality, you should submit your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given under **FOR FURTHER INFORMATION CONTACT**. In addition, you should submit a copy, from which you have deleted the claimed confidential business information, to Docket Management at the address given above. When you send a submission 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). Please see further information in the Regulatory Notices and Analyses section of this preamble.

Privacy Act: The petition will be placed in the docket. Anyone is able to search the electronic form of all documents 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 FR19477–78) or you may visit *www.transportation.gov/individuals/privacy/privacy-act-system-records-notices.*

Docket: For access to the docket to read background documents or comments received, go to *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 call Cristina Echemendia, Office of Crashworthiness Standards (phone: 202–366–6345). For legal issues, you may call Natasha Reed, Office of the Chief Counsel (phone: 202–366–2992). The mailing address of these officials is: National Highway Traffic Safety Administration, U.S. Department of Transportation, 1200 New Jersey Avenue SE, West Building, Washington, DC 20590.

SUPPLEMENTARY INFORMATION: In accordance with MAP–21 (Pub. L. 112–141), this final rule amends FMVSS No. 225 [1] and 213b [2] to improve the ease-of-use of child restraint anchorage systems. MAP–21 Section 31502 requires the Secretary of Transportation (NHTSA by delegation) to improve the ease-of-use for lower anchorages and tethers in all rear seat seating positions if such anchorages and tethers are feasible. Section 31502 of MAP–21 states that the Secretary must issue a final rule unless such an amendment to FMVSS No. 225 does not meet the requirements and considerations set forth in subsections (a) and (b) of section 30111 of title 49, United States Code (the National Traffic and Motor Vehicle Safety Act (Safety Act)). NHTSA is issuing this final rule, as directed by MAP–21, after determining that the rule meets the requirements and considerations of section 30111(a) and (b) of the Safety Act. This final rule also fulfils NHTSA's goal of improving the usability of child restraint anchorage systems.[3]

NHTSA published the notice of proposed rulemaking (NPRM) preceding this final rule on January 23, 2015 (80 FR 3744). In this final rule preamble, NHTSA is using the term ''child restraint anchorage system'' (CRAS) to refer to the full vehicle system [4] that is designed for attaching a child restraint system (CRS) to a vehicle at a particular designated seating position (DSP).'' [5] NHTSA also uses the term ''lower anchorages'' for the lower anchorage points of a CRAS. The agency refers to the tether securement point as a ''tether anchorage.'' For the CRS, this preamble

[1] 49 CFR 571.225, ''Child restraint anchorage systems.''

[2] The 2015 NPRM proposed changes to FMVSS No. 213; however, NHTSA recently amended FMVSS No. 213 and issued FMVSS No. 213b for plain language reasons relating to multiple compliance dates of the amendments (88 FR 84514). NHTSA decided the requirements would be easier to read and understand if the agency issued amendments becoming effective on December 5, 2024, for FMVSS No. 213 and December 5, 2026, for FMVSS No. 213b.

[3] NHTSA's 2011–2013 Priority Plan. Link: *www.regulations.gov/document/NHTSA-2009-0108-0032.*

[4] A full vehicle child restraint anchorage system has two lower anchorages and one tether anchorage in a designated seating position.

[5] Many in the child passenger safety community refer to the child restraint anchorage system as the ''LATCH'' system, an abbreviation of the phrase ''Lower Anchors and Tethers for Children.'' This term was developed by a group of manufacturers and retailers soon after the 1999 final rule (64 FR 10786) to educate consumers on the availability and use of the anchorage system and for marketing purposes. ''LATCH'' has historically been used in various field materials and by NHTSA to refer to the vehicle 3-point child restraint anchorage system. However, the term has also been used to refer to only the lower two anchorages of the system, or to refer to the connectors of the child restraint system that attach to the lower anchorages. Further, NHTSA understands many consumers identify the tether anchorage solely with the ''LATCH'' system, and thus mistakenly do not attach the CRS's tether strap when using the vehicle belt system to attach a child restraint. As such, NHTSA has chosen to avoid using the term ''LATCH'' in this document where possible to avoid ambiguity.

uses the following terms to refer to the various parts of a child restraint that connect to the CRAS, as appropriate: ''child restraint system connectors'' (or ''CRS connectors''), ''lower anchorage connector(s),'' ''tether anchorage connector,'' ''tether strap,'' and ''tether hook.''

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I. Executive Summary

a. Introduction

This final rule amends FMVSS No. 225 to improve the usability (ease-of-use) of the standardized CRASs required by the standard. Prior to FMVSS No. 225, CRSs were anchored to a vehicle seat solely by the seat belt. Because seat belts are primarily designed for passengers and not child restraints, incompatibilities existed between seat belts and CRSs. NHTSA issued FMVSS No. 225 in response to this problem to optimize the safety performance and ease of the correct use of child restraints through a dedicated CRAS. The standard aims to reduce the likelihood of an anchorage system's failure and increase the likelihood that CRSs are properly secured to achieve the CRS's safety benefits during motor vehicle crashes.[6]

The CRAS required by FMVSS No. 225 entails a 3-point system consisting of two lower anchorages and a tether anchorage, designed for attaching a CRS to a vehicle. Each lower anchorage consists of a 6-millimeter (mm) diameter straight rod, or ''bar,'' onto which a CRS connector can be attached.[7] The two lower anchorage bars are typically located at or near the seat bight (the area where a seat cushion intersects with the seatback) in a position where they will not be felt by seated adult occupants. The tether anchorage is a permanently installed vehicle system to which a CRS tether hook can be attached.[8]

CRASs meeting FMVSS No. 225 and child restraints meeting the associated requirements of FMVSS No. 213 have been successfully implemented in the fleet since the implementation of FMVSS No. 225. According to a 2006 study by Decina, consumers who use the CRAS generally like the system [9] and prefer using lower anchorages to attach child restraints to the vehicle over seat belt attachments. The study also found that CRASs help reduce the incorrect installation of child restraints (61 percent of CRSs installed with CRAS were securely installed compared to 40–46 percent of CRSs that were securely installed using seat belts).[10] However, the study found many consumers do not use CRASs because they do not know enough about the systems.[11]

Gathered data also indicates that many consumers misuse the CRAS or find aspects of it difficult to use. Specifically, in 2007 NHTSA held a public meeting on CRAS to see how the systems could be improved.[12] Attendees repeatedly stated that lower anchorages were often embedded deep into the seat bight, making it difficult for consumers to reach the lower anchorages and attach the lower anchorage connectors. Attendees also indicated that it was difficult to attach lower anchorage connectors to the lower anchorages because of surrounding stiff cushions, stiff fabric/leather, or the proximity of seat belt buckles. In response to comments received at the public meeting NHTSA studied possible ways to improve the usability of CRASs.[13] NHTSA used the information obtained from these studies to assist in responding to the 2012 Congressional mandate set forth in section 31502(b)(1) of MAP–21 in 2012, publishing an NPRM on January 23, 2015, to commence rulemaking to improve the ease-of-use of child restraint anchorage systems.[14]

b. Summary of the Final Rule

This final rule adopts most, but not all, of the proposals in the NPRM to improve CRAS ease-of-use. This final rule also adjusts several provisions in response to comments received on the NPRM.

1. This final rule amends FMVSS No. 225 to enhance requirements for the usability of CRASs. The final rule's requirements are based in part on findings from the University of Michigan Transportation Research Institute (UMTRI) about characteristics of the vehicle seat that enhance the usability of CRASs (''LATCH Usability study'').[15] This final rule adopts a ''clearance angle'' for each lower anchorage of at least 54 degrees (clearance angle relates to the clearance around a lower anchorage from interfering parts that can make it difficult to maneuver the CRS lower anchorage connector) and an ''anchorage depth'' limit (location of the lower anchorage within the seat bight)

[6] 49 CFR 571.225, S1.

[7] When NHTSA issued FMVSS No. 225, the agency also amended FMVSS No. 213 to require child restraint systems to have the CRS connectors permanently attached to each child restraint. In the case of rear-facing child restraints with detachable bases, only the base is required to have the components.

[8] FMVSS No. 225 requires vehicles with three or more forward-facing designated rear seating positions to be equipped with child restraint anchorage systems at not fewer than two forward-facing designated rear seating positions and a tether anchorage at an additional designated rear seating position. If the vehicle has fewer than three forward-facing rear designated seating positions, fewer child restraint anchorage systems are required.

[9] Decina, L., et al., ''Child Restraint Use Survey: LATCH Use and Misuse,'' December 2006, (''Decina study''), DOT HS 810 679, Docket No. NHTSA–2006–26735. The Decina study is summarized in Appendix A to the NPRM preamble.

[10] *Id.*

[11] *Id.*

[12] Docket No. NHTSA–07–26833. A summary of the public meeting can be found in Appendix B to the NPRM preamble.

[13] NHTSA included plans to address the CRAS usability concerns raised at the 2007 LATCH public meeting in its Vehicle Safety and Fuel Economy Rulemaking and Research Priority Plan (2011–2013). Docket No. NHTSA–2009–0108–0032.

[14] Further background on the development of the NPRM can be found in the NPRM preamble. NHTSA discusses its reasons for using the UMTRI LATCH Usability study, *infra,* in section III of the NPRM (80 FR 3748–3753).

[15] Klinich et al., *supra.* Link: *http://deepblue.lib.umich.edu/handle/2027.42/90856.* The report was sponsored by the Insurance Institute for Highway Safety (IIHS) for developing IIHS's rating of the usability of the child restraint anchorage systems in various vehicles. *See* IIHS Status Report: Vol. 47 No. 3, April 12, 2012.

of less than 25 millimeters (mm). Although the 2015 NPRM included an ''attachment force'' limit, NHTSA has decided not to adopt an attachment force requirement in this final rule based on comments received and additional study by NHTSA. This final rule's clearance angle and anchorage depth limit requirements will substantially improve consumer ease in using the lower anchorages of CRASs.

2. This final rule modifies the hand-held tools used to measure clearance angle and anchorage depth proposed in the NPRM. Comments received stated that the proposed tools yielded inconsistent results and were hard to use. In response, NHTSA undertook several studies, discussed below in this preamble, to refine the proposed tools and validate their improved repeatability and reproducibility in measurements. This final rule adopts these improved test tools.

3. This final rule restricts tether anchorages from being placed under a vehicle seat or hidden under vehicle components other than a marked tether anchorage cover. The rule also restricts how close the tether anchorage can be from the child restraint, (a too-close tether anchorage can make it impossible to tighten the tether strap properly), but does not adopt the location requirements that were detailed in the NPRM. Some vehicle manufacturers stated that the proposed requirements were too restrictive, involved a procedure that was not executable in certain vehicles, or would result in costly redesign. The procedure adopted in this final rule is less restrictive than those proposed in the NPRM, is clear to execute, and in some cases affects the re-location of the tether by a shorter distance or not at all. NHTSA is also giving more lead time coupled with a 3-year phase-in of the requirements to lessen the burdens of redesigning vehicles and to reduce costs.

4. This final rule amends FMVSS No. 225 to make tether anchorages easier to use by standardizing the configuration of the anchorage such that it is ''a rigid bar of any cross-section shape.'' However, in response to comments, the rule allows vehicles with unique space limitations in the vehicle interior, such as buses, light trucks, and convertibles, to have flexible anchorages that can also be used as a tether strap routing device.

5. This final rule standardizes the markings that will indicate to consumers the location and presence of the lower anchorages and the tether anchorage. These new markings are based on improved anchorage marking designs developed by the International Standardization Organization (ISO). Specifically, this final rule amends FMVSS Nos. 225 and 213b to require, among other things, vehicles and CRSs to use a standardized symbol to more clearly identify vehicle anchorages and CRS components that attach to those anchorages. With these markings all consumers can easily look for the specific marks and ''match up'' the symbols on the vehicle to the symbols on the child restraint.

6. This final rule amends FMVSS Nos. 213b to require the top tether hook and attachment hardware on child restraint systems to be limited in length, as proposed in the NPRM.

This preamble discusses these amendments and others in detail below.

c. How This Final Rule Differs From the NPRM

Highlighted below are the main differences between the NPRM and this final rule. More minor changes (*e.g.,* how a tool is oriented during a test) are not highlighted here but are discussed in the sections relevant to the topic.

The final rule differs from the NPRM in the following ways:

- This final rule does not adopt the proposed requirement for maximum attachment force of 178 Newtons (N) (40 lbf) to the lower anchorages to improve ease-of-use. NHTSA worked to improve the repeatability of the attachment force tool and conducted a repeatability and reproducibility (R&R) study. Results showed that the force measurements were not repeatable or reproducible enough to be adopted because the force attachment tool measurements contain too much variance.
- This final rule fine-tunes the proposed Clearance Angle and Depth Tools to achieve greater R&R in measurements. The improvements to the tools address comments on variability and subjectivity of the measurements. The improved tools incorporate new or additional instrumentation or features to enable consistent and non-subjective measurements.
- This final rule specifies that the lower anchorage must be located 25 mm or less within the seat bight instead of the 20 mm within the seat bight proposed by the NPRM. This increase in depth measurement takes into consideration the manufacturing variability across vehicles of the same model.
- This final rule does not adopt the proposed requirement for 165 mm minimum distance of a tether anchorage from a reference point on a vehicle seat to provide enough clearance for tightening the tether strap. Instead, this final rule requires the tether anchorages for vehicle seats with no head restraint or with adjustable or removable head restraints to be located outside of a zone bounded by a 325 mm radius sphere centered at the R-point of the vehicle seat and truncated by a horizontal plane located 230 mm below the sphere's center. This change was made to address multiple concerns from commenters. For example, the new zone addresses the difficulty of defining the proposed reference point (SB) and uses an already defined reference point in the standard (R-point). This measurement also takes into consideration the seat's depth to account for the distance that is routed over the seat towards the CRS, addressing a concern raised by one commenter. The new measurement required by this final rule will result in fewer vehicle models requiring tether anchorage relocation. Additionally, for those vehicle models requiring the relocation of tether anchorages, the relocation distance will, in most cases, be reduced. The final rule does not require vehicle seats with fixed head restraints to comply with the minimum distance of a tether anchorage from the R-point, as such seats do not have any elements that would interfere with the installation and tightening of the tether. To reduce cost burdens on the vehicles that will need redesign, we have extended the lead time for manufacturers to comply by introducing a 3-year phase-in that will begin on the first September 1 that is three years after publication of the final rule.
- This final rule revises the proposed forward-most allowable tether anchorage zone under the seat from the ''plane parallel to the torso line passing through the rearmost point of the bottom of the seat'' to a ''vertical transverse plane 120 mm rearward of the seating reference point.'' Commenters stated that the proposed allowable tether anchorage zone based on the rearmost point of the bottom of the seat may not be objectively determined in some seat designs. Additionally, commenters stated that some current seat designs with easily accessible tether anchorages located slightly under the back of the seat may not be compliant with the proposed tether anchorage zone. This final rule's alternative measurement can be objectively determined for all seat designs, will allow tether anchorages that are on the seatback but still accessible, and will prevent tether anchorages that are deep under the seat.
- This final rule provides exceptions to the NPRM's originally proposed requirement that all tether anchorages be rigid bars. Tether anchorages will not

be required to be rigid bars for buses with a GVWR less than or equal to 4,536 kg (10,000 lb) and for vehicles with DSPs where the ''allowable tether zone'' in FMVSS No. 225 falls in an area that is only accessible by removing a seating component of the vehicle. These vehicles can be equipped with tether strap routing devices that can be used as tether anchorages. Commenters stated that flexible tether anchorages (that can also be used as routing devices) in vehicles such as pick-up trucks are easy to use for installing CRSs but would no longer be permitted under the proposed requirements for rigid tether anchorages. If only rigid bar tether anchorages are permitted, the allowable locations for these tether anchorages would be behind the seatback where folding the seat or moving the seat forward is necessary to access the tether anchorage. Such a seat design requires an iterative tensioning of the tether to install a CRS, which is more time-consuming and difficult. Therefore, the agency is continuing to allow flexible anchorages in vehicle that cannot locate the tether anchorage in the allowable zone.

- This final rule updates the tolerances and positioning of lower and tether anchorages markings to that proposed in response to comments received. This final rule increases the tolerances of the position of the markings from that proposed in the NPRM and makes some allowances on the position of the markings to accommodate a variety of vehicle designs.
- This final rule adopts a 3-year phase-in period to comply with the updated requirements in FMVS No. 225. The phase-in period starts on the first September 1 that is three years after the publication of the final rule. This additional lead time and phase-in period will reduce potential tooling costs by allowing manufacturers the opportunity to make required changes to subject vehicles during their regular design update cycles.

d. Rulemaking Goals

The requirements of this final rule, aimed at increasing consumer use of CRASs for the installation of CRSs, will make the CRASs more conspicuous and easy to use.[16]

If CRASs becomes easier to use correctly, more consumers will achieve a tight fit of the CRS in the vehicle, resulting in reduced child head and torso excursions in motor vehicle crashes, and thus fewer child head and torso injuries from crashes. The goal of this rulemaking is supported by studies showing that many consumers are not aware of or do not fully understand the CRASs available in their vehicle. Specifically, the 2006 Decina study found that many consumers did not know about CRASs, that CRASs were available in their vehicle, the importance of using CRASs to install CRSs, or how to properly use CRASs. The Decina study also found that users attempting to use CRASs generally liked the systems, and that drivers with experience attaching a CRS using a CRAS strongly preferred using a CRAS's lower anchorages over seat belts. Moreover, the study found consumers were more likely to install a CRS correctly using a CRAS than a seat belt. Finally, the LATCH Usability study found that test subjects who correctly used the lower anchorage hardware were 3.3 times more likely to achieve a tight CRS installation than subjects who made errors using the hardware.

e. NHTSA's Determination of MAP–21 Requirements and Considerations

This final rule satisfies subtitle E, Section 31502 of the ''Moving Ahead for Progress in the 21st Century Act'' (MAP–21). Section 31502(a) requires NHTSA (by delegation of authority 49 U.S.C. 30111) to initiate a rulemaking proceeding to improve the ease-of-use for lower anchorages and tether anchorages in all rear designated seating positions if such anchorages and tether anchorages are feasible. Section 31502(b)(1) of MAP–21 states that, subject to exceptions, NHTSA (by delegation) must issue a final rule. An exception is for an amendment to Standard No. 225 which ''does not meet the requirements and considerations set forth in subsections (a) and (b) of section 30111 of title 49, United States Code [the National Traffic and Motor Vehicle Safety Act (Vehicle Safety Act)].'' As discussed below, NHTSA has made such a determination regarding the final rule amendments to FMVSS No. 225 to improve the ease-of-use of the CRAS.

The provision at 49 U.S.C. 30111(a) of the Safety Act authorizes the Secretary (NHTSA, by delegation) to prescribe Federal motor vehicle safety standards that are practicable, meet the need for motor vehicle safety, and are stated in objective terms. ''Motor vehicle safety'' is defined in the Safety Act as ''the performance of a motor vehicle or motor vehicle equipment in a way that protects the public against unreasonable risk of accidents occurring because of the design, construction, or performance of a motor vehicle, and against unreasonable risk of death or injury in an accident, and includes nonoperational safety of a motor vehicle.'' [17] This final rule meets the need for motor vehicle safety because it would increase the likelihood that CRASs and CRSs will be correctly used, thereby reducing the risk of injury to restrained children in motor vehicle crashes. This final rule improves the correct use of CRASs and CRSs by requiring the lower anchorages and tether anchorage of the CRAS to be more accessible, easy to use, and clearly labeled so that consumers can easily identify and use them. This final rule is practicable because a number of vehicle and child restraint models already meet the requirements of the final rule. NHTSA is also providing a substantial lead time to meet the requirements. Some vehicle seat designs will change pursuant to the rule, but the redesigns would involve relatively straightforward modifications to the existing vehicle materials (*i.e.,* the seat cushion); most vehicles will not have to change the vehicle structure. This final rule is objective because the requirements are stated in unambiguous terms and assessed using tools and procedures with demonstrated R&R.

49 U.S.C. 30111(b) specifies that, when prescribing Federal motor vehicle safety standards, the Secretary (NHTSA, by delegation) must, among other things, consider all relevant, available motor vehicle safety information, consider whether a standard is reasonable, practicable, and appropriate for the types of motor vehicles or motor vehicle equipment for which it is prescribed, and consider the extent to which the standard will further the statutory purpose of reducing traffic crashes and associated deaths and injuries. NHTSA has determined that this final rule is reasonable, practicable, and appropriate for the types of motor vehicles and child restraint systems for which it is prescribed. This final rule accounts for challenges that buses and light trucks could have in meeting the proposed requirement that all tether anchorages be rigid bars located in a particular zone. Among other things, the rule permits these vehicles to have tether strap routing devices that can be used as the tether anchorage if the rigid bar is not feasible.

NHTSA considered existing industry standards and conducted extensive research prior to the finalization of this

[16] NHTSA designed FMVSS No. 213 and No. 225 to require each applicable child restraint to be able to attach to a vehicle seat by way of the CRAS, and additionally by way of the seat belt (continuing what was done prior to the standard, so that child restraints could continue to be attached using the seat belt, which is at every designated seating position in a vehicle).

[17] 49 U.S.C. 30102(a).

final rule to improve the tools and test procedures in existing industry standards to ensure objectivity of the ease-of-use assessments. NHTSA's assessments indicate that most vehicle models and child restraints already comply with the requirements of the final rule. For products that do not, the final rule provides ample lead time for modifications to be implemented with little to no cost.

f. Estimated Costs and Benefits

The agency estimates that the adopted requirements for improved usability of CRASs would not result in any increase in material cost but would entail some redesign of vehicle seat features. In response to the comments received, NHTSA is providing a 3-year phase-in period to comply with the updated FMVSS No. 225 requirements. The phase-in period starts on the first September 1 that is three years after the publication of the final rule. We believe this approach would respond to commenters' concerns and provide sufficient time for vehicle manufacturers to accommodate any redesign of the vehicle seat and rear shelf structures to meet this final rule in their normal course of manufacture without a cost increase.

NHTSA estimates the cost of ISO markings for a set of lower anchorages to be $0.07 and that for the tether anchorage to be $0.03. The total incremental cost of equipping all CRASs with appropriate ISO markings is about $760,000. The final rule also requires similar ISO markings on child restraint anchorage connectors, for which the agency estimates an incremental cost of $970,000. The cost of changing the written instructions accompanying the vehicle or the CRS to explain the ISO markings is expected to be negligible (<<$0.01). Therefore, the total cost of the proposed rule is estimated to be $1.73 million.

These new usability requirements will assist in improving correct (tight) installation and increase tether use. If there were a 5 percent increase in correct installation using the lower anchors and a 5 percent increase in tether use, the agency estimates that the proposed requirements would save approximately 3 lives and prevent 6 moderate to higher severity injuries per year.

II. Statutory Authority

This final rule is issued under the Safety Act [18] (49 U.S.C. 30101 *et seq.*) and MAP–21.

Under the Safety Act, the Secretary of Transportation [19] is responsible for prescribing motor vehicle safety standards that are practicable, meet the need for motor vehicle safety, and are stated in objective terms.[20] ''Motor vehicle safety'' is defined in the Safety Act as ''the performance of a motor vehicle or motor vehicle equipment in a way that protects the public against unreasonable risk of accidents occurring because of the design, construction, or performance of a motor vehicle, and against unreasonable risk of death or injury in an accident, and includes nonoperational safety of a motor vehicle.'' [21] ''Motor vehicle safety standard'' means a minimum performance standard for motor vehicles or motor vehicle equipment.[22] When prescribing such standards, the Secretary must consider all relevant, available motor vehicle safety information, and consider whether a standard is reasonable, practicable, and appropriate for the types of motor vehicles or motor vehicle equipment for which it is prescribed.[23] The Secretary must also consider the extent to which the standard will further the statutory purpose of reducing traffic crashes and associated deaths and injuries.[24]

MAP–21

MAP–21 (Pub. L. 112–141) incorporates Subtitle E, ''Child Safety Standards.'' Subtitle E, section 31502(a), requires that not later than 1 year after the date of enactment of the Act, the Secretary (NHTSA, by delegation) shall initiate a rulemaking proceeding to amend FMVSS No. 225 ''to improve the ease-of-use for lower anchorages and tethers in all rear seat seating positions if such anchorages and tethers are feasible.'' NHTSA published the NPRM preceding this final rule on January 23, 2015. Section 31502(b)(1) of MAP–21 states that, subject to exceptions, the Secretary must issue a final rule not later than 3 years after the date of enactment of MAP–21. An exception is for an amendment to Standard No. 225 which ''does not meet the requirements and considerations set forth in subsections (a) and (b) of section 30111 of title 49, United States Code [the National Traffic and Motor Vehicle Safety Act (Safety Act)].'' [25]

NHTSA interprets section 31502(a) as directing DOT to initiate rulemaking to improve the ease-of-use of lower anchorages and tether anchorages currently required by FMVSS No. 225 if improved anchorages are feasible.[26] This final rule satisfies the mandate by adopting requirements that will improve the ease with which consumers can access and use the anchorages and improve the visibility of the anchorages so that consumers can more easily identify them as parts of a CRAS.

NHTSA carefully considered the potential merits of requiring additional CRASs in vehicles, with the NPRM requesting comment on whether additional lower anchorages and tether anchorages should be required in vehicles. Manufacturers commented that it is difficult to have additional CRAS systems due to spacing and complex designs that may increase misuse of the lower anchorages. Following careful consideration and review of comments, NHTSA has determined the available data does not support a safety need to require additional CRASs or tether anchorages in vehicles already covered under FMVSS No. 225.

The NPRM also requested comment on the merits and feasibility of installing tether anchorages and lower anchorages in vehicles excluded from such requirements by the issuance of FMVSS No. 225 in 1999. This final rule removes the current exclusion from tether anchorages for convertible vehicles [27] and vehicles described in FMVSS No. 225 S5(e) from having to provide lower anchorages and a tether anchorage in rear designated seating positions. This decision was made based on the agency's determination that installing the tether and lower anchorages in these previously excluded vehicles is practicable [28] and, given data showing the benefits of tether anchorages and CRASs, will meet the need for safety. These topics are discussed in greater detail below.

Section 31502 gives NHTSA no discretion in issuing a final rule if a rule would meet the conditions set forth in MAP–21. As discussed above, NHTSA has determined that amending FMVSS No. 225 as set forth in this final rule meets the requirements and considerations established in subsections (a) and (b) of 49 U.S.C 30111 and are feasible. Accordingly,

[18] National Traffic and Motor Vehicle Safety Act (Safety Act).

[19] The responsibility for promulgation of Federal motor vehicle safety standards is delegated to NHTSA. 49 CFR 1.95.

[20] 49 U.S.C. 30111(a).

[21] 49 U.S.C. 30102(a)(8).

[22] 49 U.S.C. 30102(a)(9).

[23] 49 U.S.C. 30111(b).

[24] *Id.*

[25] *See* 49 U.S.C. 31502(b)(2).

[26] *See* 80 FR 3747 Section II. Statutory Mandate.

[27] S5(a) of FMVSS No. 225.

[28] There are vehicles that have solved the challenges of providing lower anchorages and tether anchorages, proving that solutions are feasible.

NHTSA is issuing this final rule as mandated by MAP–21.

III. Summary of the NPRM

The NPRM proposed to reduce the physical difficulties associated with attaching a child restraint to the lower anchorages and to the tether anchorage, and to improve how easily a consumer can identify the anchorages and match them up with parts on a child restraint system. Regarding the physicality of using the vehicle's CRAS, the proposed changes to FMVSS No. 225 were based on the findings in UMTRI's LATCH Usability study, *supra,* about characteristics of the vehicle seat that enhance the usability of CRASs. NHTSA proposed the limits on the clearance angle, attachment force, and the depth of the anchorage in the seat bight to address the ease-of-use problems described in the Decina study, *supra,* and expressed by various attendees to the 2007 public meeting. The NPRM's proposals are further summarized below.

Ease of Using Lower Anchorages

Although FMVSS No. 225's current requirements for the location of lower anchorage bars near the seat bight intend for the bars to be accessible, some consumers find it difficult to use the bars. NHTSA proposed new requirements for the bars to improve ease-of-use: a minimum ''clearance angle'' of 54 degrees (clearance angle relates to the clearance around a lower anchorage from interfering parts that can make it difficult to maneuver the CRS's lower anchorage connector), a maximum ''attachment force'' of 178 N (40 lbf), and an ''anchorage depth'' of less than 20 millimeters (mm)). These are the ease-of-use specifications the UMTRI LATCH Usability study found to correlate with correct child restraint installation by test subjects.

In accordance with the LATCH Usability study, NHTSA proposed the use of three new tools: one to measure clearance angle, another to measure attachment force, and a third to determine anchorage depth. Clearance angle would be measured by a tool based on a Society of Automotive Engineers (SAE) draft J2893 recommended practice that attaches to the lower anchorages. Attachment force would be measured by a force gauge. Anchorage depth would be measured by a simple tool, similar to one UMTRI developed, with a hook-type CRS connector marked every 20 mm. The NPRM also proposed to incorporate by reference drawing packages into FMVSS No. 225.

Ease of Using Tether Anchorages

FMVSS No. 225 currently requires tether anchorages to be located in a specified zone and to be accessible without the need for any tools other than a screwdriver or coin. To improve the usability of the tether anchorage, NHTSA proposed the following requirements to make it easier for consumers to recognize and access the anchorage.

- The NPRM proposed to reduce the zone in which a tether anchorage must be located, to prevent tether anchorages from being placed deep under a vehicle seat.
- The tether anchorages would have to be accessible without the need for any tools and without folding the seatback or removing carpet or other vehicle components. The tether anchorage could be covered with a cap, flap, or cover, provided that the cap, flap, or cover is specifically designed to be opened, moved aside, or to otherwise give access to the anchorage without the use of any tools and is labeled with a specific symbol indicting the presence of the tether anchorage underneath.
- Some tether anchorages are too close to a structure, such as a head restraint, to allow tightening of the tether strap. NHTSA proposed to specify a minimum 165 mm (6.5 in) distance from a specified reference point on the vehicle seat to the tether anchorage so that adequate clearance will be provided for tightening of the tether strap.
- Currently, there are some tether anchorages made from flexible webbing. NHTSA proposed to require that the tether anchorage be a standardized rigid bar so consumers could more easily recognize and find it.
- NHTSA proposed to limit the length of the CRS tether hardware assembly (which consists of a tether hook and hardware to tighten and loosen the tether strap) to 165 mm (6.5 in) so that the tightening mechanism can be easily used in the clearance space around a tether anchorage.

Enhanced Ability To Identify Anchorages

In relation to consumers' seeing or recognizing the anchorages, FMVSS No. 225 currently requires the lower anchorage bars to be visible, or that the vehicle seat back be marked showing the location of the bars. To improve consumers' ability to see, recognize, and use lower anchorages, NHTSA proposed to require that motor vehicles be marked with a standardized ISO-developed marking near the location of each lower anchorage bar even when the lower anchorage is visible. Similarly, tether anchorages would be marked with the ISO-developed marking. To complement these markings, NHTSA proposed that child restraints bear the same ISO marking on the lower anchorage connectors on the child restraint system and on the tether hook or tether strap, so consumers could be taught to match up the symbols when they attach a CRS.[29]

IV. High Level Summary of the Comments Received

NHTSA received submissions from 30 entities. The commenters fell into the following general categories: vehicle manufacturers or associations (the Alliance of Automobile Manufacturers (Alliance), Association of Global Automakers (Global),[30] Ford Motor Company (Ford), General Motors Company (GM), American Honda Motor Co., Inc. (Honda), Fiat Chrysler Automobiles U.S. (Chrysler),[31] Toyota Motor North America (Toyota), Porsche Cars North America, Inc. (Porsche), and Hyundai Motor Company (Hyundai)); child restraint manufacturers (the Juvenile Products Manufacturers Association (JPMA), Britax Child Safety, Inc. (Britax), Dorel Juvenile Group (Dorel), and Graco Children's Products, Inc. (Graco)); suppliers (Motor and Equipment Manufacturers Association (MEMA), and HSM Transportation Solutions, Inc. (HSM)); auto dealers (National Automobile Dealers Association (NADA)); forensics experts (ARCCA); consumer advocacy groups (Advocates for Highway and Auto Safety (Advocates), Safe Kids Worldwide (Safe Kids), Safe Ride News (Safe Ride News); research-associated organizations (University of Michigan Transportation Research Institute (UMTRI), Insurance Institute for Highway Safety (IIHS), MGA Research Corporation (MGA), Consumer Union [32]); and other (including private individuals).

There was almost unanimous agreement for improving the ease-of-use of CRASs. However, commenters varied in their support for specific requirements in the proposal. Many vehicle manufacturers expressed concern about the extent of changes needed to meet some of the

[29] The NPRM also proposed to require vehicle and child restraint manufacturers to provide written information (*e.g.,* in owners' manuals) explaining the meaning of the ISO markings.

[30] The Alliance and Global later merged and became the Auto Innovators. This document refers to these commenters in the name in which the comment was submitted.

[31] Fiat Chrysler Automobiles U.S. is now Stellantis North America.

[32] Consumers Union is the public policy and advocacy division of Consumer Reports.

requirements. Specifically, the manufacturers expressed concerns over extensive redesign to relocate tether anchorages, costs of relocating the tether anchorage, and challenges of meeting some of the lower anchorage requirements given the involvement of soft seating surfaces. Some manufacturers stated there was no need to specify all three requirements (clearance angle, attachment force, and anchorage depth). Suppliers urged NHTSA to provide more flexibility in marking vehicle seats to identify lower anchorage locations so suppliers could avoid extensive redesigns that would impose costs on suppliers and vehicle manufacturers. Several vehicle manufacturers stated that the clearance angle, attachment force, and anchorage depth test tools did not produce repeatable or reproducible measurements, stating the proposed test procedures were ambiguous and could not be followed. Vehicle manufacturers generally objected to the proposed 3-year lead time as insufficient to account for necessary changes. Many vehicle manufacturers asked for a phase-in of the requirements.

Commenters split on the issue of removing certain vehicle exemptions in FMVSS No. 225, such as the exclusion of convertible vehicles from the requirement to provide tether anchorages (S5(a)), or vehicles described in S5(e) of the standard from having any CRAS. A vehicle manufacturers' association and vehicle manufacturers responding to the issue were generally opposed to removing the exemptions. Consumer advocates and research organizations strongly supported removing the exemptions.

Many consumer advocates and research groups supported the NPRM but contended the proposal should go further to improve the ease-of-use of the anchorage systems. Consumer advocates and individuals described numerous problems seen in the field that they believed should be addressed. Overall, child restraint manufacturers and private individuals supported the proposal.

Many commenters responded to NHTSA's questions posed in Section X of the NPRM (80 FR 3764). Included in this section were questions about whether there were safety concerns about using a ''simulated'' CRAS in the rear center seating position.[33] Most commenters concurred they did not see safety issues raised using simulated CRASs in rear center seating positions, provided the child restraint and vehicle manufacturer at issue supported such use. NHTSA also asked whether its education materials should recommend that tethers should be used for all children regardless of the child's weight in the child restraint, based on data indicating inherent benefits stemming from the use of a tether.[34] Most commenters on the issue supported the agency's recommendation that tethers should be used by all children regardless of weight, but one commenter (the Alliance) was opposed due to the current strength requirements in FMVSS No. 225, which limit the forces a tether anchorage can hold.

Many commenters provided input on issues that were outside of the scope of the rulemaking. NHTSA may consider these ideas for possible future updates to FMVSS No. 213 and/or No. 225, but generally will not further address comments outside the scope of the rulemaking in this document.

V. Improving the Ease of Using Lower Anchorages

a. Attaching to the Lower Anchorages

The NPRM proposed ease-of-use requirements to ensure that vehicle manufacturers produce lower anchorages that: (a) have sufficient clearance around each lower anchorage for consumers to maneuver the CRS connector to attach to the lower anchorage (''clearance angle'' of 54 degrees or more); (b) are located such that the CRS connector can be attached to the bar without applying excessive force (''attachment force'' 178 N (40 pounds (lbf)) or less); and, (c) are not too deep within the seat bight so they are easily accessible (''anchorage depth'' twenty millimeters (mm) or less from the outer surface of the seat bight).

General Comments

Commenters varied in their views about the proposed clearance angle, attachment force and anchorage depth requirements. Consumer advocates expressed general support for the proposed lower anchorage usability requirements. Advocates for Highway and Auto Safety (Advocates) stated that the strengthening of FMVSS No. 225 through the proposed revisions will likely result in more children being properly restrained. Advocates concurred with the agency's view that improvement in ease-of-use of the CRASs will increase use of CRSs and proper child restraint system installation, which will in turn improve child safety. Consumers Union supported the NPRM because, in their opinion, CRASs provide an easier and more secure installation than seat belts.

IIHS strongly supported the NPRM, stating that IIHS confirmed UMTRI's findings in the real world using data from Safe Kids' car seat checkpoints from records of more than 14,000 child restraint installations. IIHS found that anchor depths less than 4 cm, clearance angles greater than 54 degrees, and attachment forces less than 178 N (40 lbf) were associated not only with correct use, but also with use of the anchorage system. While the commenter suggested the attachment force tool could be improved, IIHS supported incorporating the proposed measures into FMVSS No. 225. IIHS stated the proposed thresholds are supported by real-world and laboratory data.

In contrast, many vehicle manufacturers expressed concerns about the proposed requirements for lower anchorages. They expressed concern about the extent of changes needed to meet some of the requirements and the difficulties in consistently meeting requirements involving measurements on soft materials like foam and cushions. The Alliance supported the goal of establishing ease-of-use measurements for the lower anchorages but did not agree with the proposed requirements and test methods. The Alliance commented that only an anchorage depth requirement is needed. It stated that the LATCH Usability study showed the measurement of attachment force and clearance angle serve as surrogates for anchorage accessibility. The commenter stated vehicles with anchorages deeper in the seat bight generally had a smaller clearance angle and higher attachment force in the study and that more visible anchorages had larger clearance angles and lower attachment forces, making the child restraint attachment step easier to accomplish.

The Alliance stated that, since the proposed requirements for anchorage location (anchorage depth) will expose the lower anchorages in the vehicle, it can be expected that the attachment forces will be lowered and the clearance angles will increase by design, making the attachment force measurement and clearance angle measurement unnecessary. Similarly, Fiat Chrysler

[33] A ''simulated'' child restraint anchorage system consists of the inboard lower anchorages of the CRAS in the two outboard seating positions and the tether anchorage in the center seat. NHTSA explained in the NPRM preamble that available data indicate that simulated CRASs appear crash-worthy and acceptable. Given these data, the agency sought comment on whether NHTSA should encourage or require CRS and vehicle manufacturers to include, in instruction manuals, statements that endorse the use of simulated CRASs in the rear center seating position to consumers who wish to place a CRS in that center position.

[34] That is, even if the tether or anchorage broke in a severe crash, the tethering would have attenuated some of the crash forces.

Automobiles U.S. (FCA) [35] stated that clearance angle, force, and anchorage depth are mutually inclusive and supported the Alliance's position that relocating anchorages further forward in the vehicle will generate similar results to the proposed requirements. FCA recommended removing the attachment force and clearance angle criteria.

Comments Specific to the Tools

The NPRM proposed to assess clearance angle, attachment force, and anchorage depth using a set of specialized tools based on the tools used in the UMTRI study. Prior to the NPRM, NHTSA evaluated the proposed procedures and tools in 10 vehicles, model years (MY) 2005–2013, and concluded that the procedures appear objective and repeatable.[36]

Notwithstanding the agency's data, several vehicle manufacturers raised concerns about the usability of the proposed test tools and questioned the repeatability and reproducibility (R&R) of test tools measurements and recommended more refinement of the tools.

Clearance Angle Tool (CAT)

Clearance angle relates to the open space around a lower anchorage, free from interfering seat components. Interfering components can make it difficult to maneuver and attach a CRS lower anchorage connector. A clearance angle requirement facilitates easier attachment of a CRS lower anchorage connector by ensuring surrounding components do not impede access to the anchorage.

NHTSA proposed a clearance angle measurement tool, illustrated in figure 1 in the NPRM, for this final rule. That clearance angle tool (CAT) includes a load cell with a handle to measure the applied vertical force on the tool and a potentiometer to measure the angle achieved with respect to the horizontal plane by the tool during the force application. In the proposed test procedure, the CAT is attached to a lower anchorage. A vertical force of 67 N (15 lbf) is applied to the tool. The angle the tool measures (with respect to the horizontal) when that force is applied is the ''clearance angle.'' The NPRM proposed to adopt a clearance angle requirement of not less than 54 degrees, as supported by the findings of the LATCH Usability study.

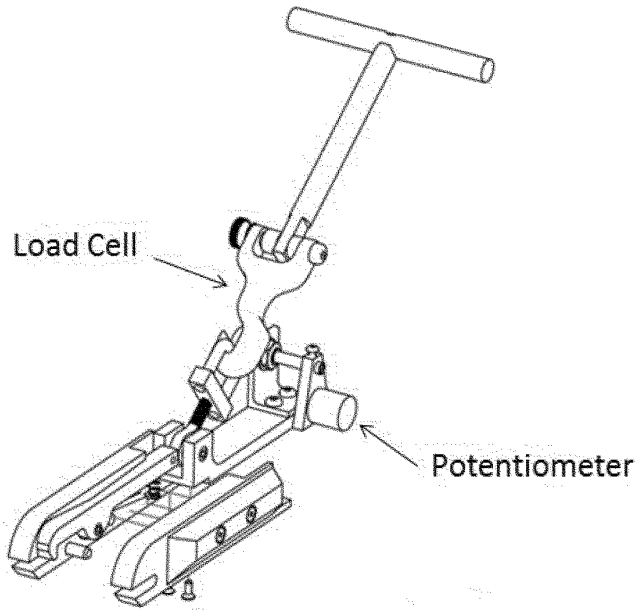


Figure 1. Proposed Clearance Angle Tool (CAT)

Some of the Alliance members commented on their experience with the SAE Prototype and UMTRI clearance angle test devices. The members stated they found those devices difficult to use and not sufficiently repeatable. GM and FCA commented that oscillations caused by the free-hanging weight attached to the rotary potentiometer resulted in non-repeatable measurements. GM recommended replacing the rotary potentiometers on the CAT with a digital inclinometer connected to a data acquisition system. FCA commented that without real-time readout of the vertical force applied, the operator will always overshoot/undershoot the specified vertical load. Similarly, GM recommended adding a means of indicating the force to the operator during the measurement process so that the operator is notified when 67 N (15 lbf) is achieved. GM and the Alliance recommended a small diameter cylindrical style load cell with a lower range of measurement. GM also stated that the multiple pivot points between the handle and the load cell and between the load cell and the main body should be reduced to a single pivot at attachment to the main body.

GM stated that, in some cases, it is difficult to apply the vertical force due to interference with the seatback. FCA commented that an operator will have difficulty maintaining 67 N (15 lbf) of vertical force even if there was a real time display of the vertical force. GM recommended that the handle pivot point to the main body on the tool be moved farther from the connection to the lower anchorage to allow more

[35] FCA changed its name in 2020 to Stellantis. This preamble refers to the commenter by its name on the comment, FCA.

[36] NHTSA Technical Report, ''Evaluation of LATCH Usability Procedure,'' Docket No. NHTSA–2014–0123–0005.

clearance between the load cell and the seatback. GM indicated that eliminating this interference should improve the repeatability of the process. GM added that the equivalent moment can be applied by specifying a lower force along with the increased moment arm.

Attachment Force Tool (AFT)

Vehicle manufacturers raised concerns that the attachment force tool did not provide repeatable or reproducible results. Ford suggested that NHTSA include in FMVSS No. 225 language that would permit an average of several trials (*i.e.,* five trials of each anchorage) as criteria for compliance. Ford and the Alliance stated that the repeatability of this test is very dependent on operator skill and experience and not adequately repeatable and reproducible when used by different operators in different labs.

The Alliance explained that many vehicle models feature lower anchorage designs that include either a cover or a slit in the seat cushion that allows access to the anchorage bar. Assuming that these types of design are not prohibited by the new proposed maximum attachment force requirement for lower anchorages, the Alliance recommended that the test be rerun if the test device becomes caught in the slit or cover.

GM commented that the AFT does not provide real-time feedback, making it difficult to ensure the operator performs the insertion force measurement at a consistent angle with the 0–45-degree range specified. GM noted that this would be particularly important if the trim interferes with insertion of the tool. GM added that the operators found the AFT angle difficult to control with the short T-handle (*see* figure 2) while trying not to touch the tool beyond the load cell. GM found that a digital inclinometer was helpful in observing the angle and improved its confidence in the force data being collected. GM recommended that the rotary potentiometer be replaced with a digital inclinometer including a real-time readout for the operator and a signal output for data acquisition. GM also suggested that the T-handle be replaced with a longer axial handle to improve control of the insertion angle and to avoid touching the tool along the load path.

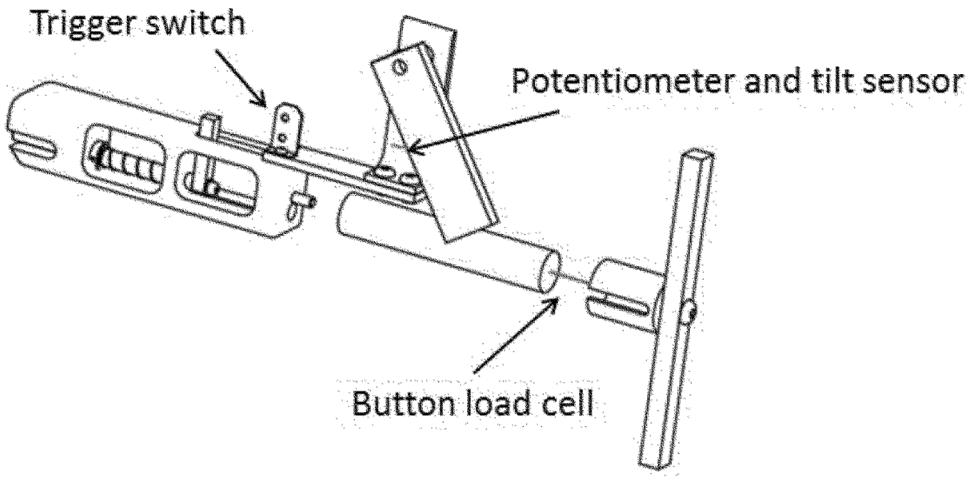


Figure 2. Proposed Attachment Force Tool (AFT)

GM commented that the AFT does not indicate to the operator that the switch used to detect full engagement of the tool on the anchorage bar has been activated. GM explained that this lack of an indication could result in a ''no switch closure'' event, and that the peak attachment force prior to bottoming out cannot be determined if this happened. GM added that if the AFT was not sufficiently perpendicular to the anchorage bar, it would be possible to mechanically bottom out the tool without closing the switch and that the perpendicular requirement is dependent on the distance the slide pin must travel before activating the switch. Additionally, GM stated that, depending on the lower anchorage style in the vehicle, particularly for non-visible anchorage bars, it can be difficult to determine perpendicularity.

GM requested that the current tool be revised to allow a larger tolerance to the range of perpendicularity, as a child restraint anchorage connector may be attached at a larger range of angles than the current tool design. GM suggested that this goal may be accomplished by lengthening the slide pin or increasing the thickness of the slide tab and that either solution will allow the slide tab to close the switch earlier during anchorage bar engagement and increase the perpendicularity tolerance. GM also recommended that an LED be included on the tool to indicate to the operator when the switch is closed.

GM also commented on the oscillations caused by the free-hanging weight attached to the rotary potentiometer. GM noted that, depending on the timing, the angle value at the time of switch closure could be very close to a maximum or a minimum of an oscillation. GM explained that in the example in figure 2 of its comment submission,[37] the oscillation is within the 0 to 45 degree force application range specified in the proposal; however, these oscillations can be eliminated by the utilization of a digital inclinometer. GM recommended that the rotary potentiometer be replaced with a digital inclinometer that includes a real-time readout for the operator and a signal output for data acquisition. GM added that the rotational freedom of motion of the AFT makes it difficult to control without touching the tool beyond the load cell and potentially altering the force measurement. GM also noted that the wiring to the load cell is susceptible to damage due to its location relative to

[37] NHTSA–2014–0123–0056.

the handle used to apply the force.[38] GM recommended that an in-line load cell with a threaded attachment between the main body and the handle be adopted to alleviate these issues.

Similarly, FCA commented that the potentiometer attached to the weight that is allowed to swing freely to capture the angle causes oscillations in the recorded angle, that at the point in time when the switch is triggered the attachment force increases drastically, the operator's rate of force application can influence the results, and that the AFT can interact with the seat cushion.

Global requested that lateral and vertical motions with the proposed tool be allowed prior to the application of the insertion force perpendicular to the center of the anchorage bar to represent typical actions taken by the consumer when attaching a child restraint to the lower anchorages.

IIHS stated that the agency's proposed changes to the AFT should improve repeatability of measurements over the tools used in the original IIHS/UMTRI research. IIHS provided the following two concerns:

1. IIHS and UMTRI stated the recorded attachment force should be the peak force from initial engagement with the seat cushion until full engagement of the tool on the lower anchorage. IIHS added that for some vehicles the peak force occurs as the tool is inserted between the cushions. IIHS stated such a peak force will not be captured when following the proposed protocol because the AFT records the force only at full engagement with the lower anchorage.

2. IIHS explained that the proposed changes to the tool do not address the off-axis vertical force required to align the tool with the lower anchorage.[39] IIHS noted this vertical force was not measured in NHTSA's evaluation. Instead, the force was assigned subjective ratings, making it difficult to standardize the measurement procedure and limiting R&R. IIHS noted it had developed a lower anchorage attachment force tool[40] that eliminates the need for additional vertical or lateral forces. This IIHS-developed tool replaces the slide pin, slide tab, and spring assembly with a square cross-section guide rod with a convex notch that prepositions the tool, aligning it with the lower anchorage bar before the force is applied. IIHS added that the new tool replaces the original depth gauge, as the depth scale is inscribed on the IIHS revised tool.[41] IIHS encouraged NHTSA to make further refinements to the attachment force tool to remove the need for off-axis forces to properly align with the lower anchorage bar.

Hyundai commented that the proposed AFT did not represent the hardware currently used in CRSs in the market. Hyundai stated it observed 100 percent of forward facing/convertible child seats sold at a retail store it visited are either the Safeguard clip system[42] or a simple hook. Hyundai noted the AFT has an exaggerated flat front face that requires more effort to insert into the seat bight for attachment. Hyundai also noted the attachment slot of the tool is not tapered, potentially leading to false readings if not properly engaged with the attachment bar. Hyundai performed a comparison evaluation with the proposed tool and found that the force was reduced by 20–50 percent when using a Safeguard attachment clip common in the industry. Hyundai pointed out that CRS manufacturers have already found a solution for increasing ease-of-use in attaching hardware by only using the Safeguard clip system connectors or a simple hook system.

Anchorage Depth Tool (ADT)

Anchorage depth refers to how deeply the lower anchorages are embedded in the vehicle seat (usually in the seat bight or seatback). The LATCH Usability study found that an anchorage depth of less than 20 mm within the seat bight is associated with a significantly higher rate of correct lower anchorage use than anchorage depths of 20 mm or more. NHTSA proposed a requirement for each lower anchorage to have an anchorage depth of less than 20 mm, as measured by a specially designed lower anchorage depth tool (ADT). The proposed ADT incorporates a hook-type CRS connector (*see* figure 3). The 20 mm distance is marked on the tool. In a compliance test, the tool would be attached to a lower anchorage. The NPRM proposed that the 20 mm mark would have to be visible from a vertical longitudinal plane passing through the center of the bar, along a line making an upward 30-degree angle with a horizontal plane, without the technician manipulating the seat cushions in any way.

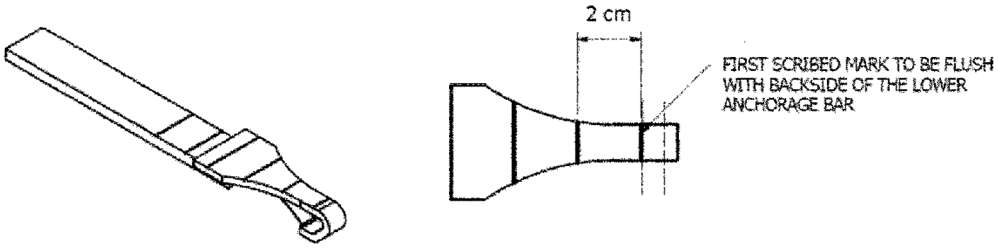


Figure 3. Proposed Anchorage Depth Tool (ADT) (left) and Top View (right)

The Alliance explained that the current requirements for FMVSS No. 225 are based on the visibility of the lower anchorages around the soft trim and that the current FMVSS No. 225 does not place the vehicle development process at risk as the standard gives manufacturers the option to certify the vehicles by adding seat cover markings if the lower anchorage is not visible. The Alliance stated anchorage depth in the current regulation is defined relative to a reference point, ''Z'' on the child restraint fixture (CRF), and the rearward-most location is defined in

[38] Figure 3 of GM's comments can be found in Docket No. NHTSA–2014–0123–0056.

[39] Evaluation of LATCH Usability Procedure, Louden et al., 2014.

[40] IIHS provided drawings of the new tool and a more detailed description of its use in its comments. *See www.regulations.gov/comment/NHTSA-2014-0123-0020.*

[41] Cicchino JB, Jermakian JS. ''Vehicle characteristics associated with LATCH use and correct use in real-world child restraint installations.'' Journal of Safety Research. 2015 June. *www.iihs.org/topics/bibliography/ref/2068.*

[42] Safeguard is a brand that produces push-on-type lower anchorage connectors.

Section 9.2.2(a) as: ''Not more than 70 mm behind the corresponding point Z of the CRF, measured parallel to the bottom surface of the CRF and in a vertical longitudinal plane, while the CRF is pressed against the seatback by the rearward application of a horizontal force of 100 N at point A on the CRF'' and that section S9.2.2(b) requires that the anchorage be located ''Not less than 120 mm behind the vehicle seating reference point.'' The Alliance explained that these two requirements ''in essence'' create the fore/aft ''zone'' for anchorage placement with respect to the seating reference point and the positioned CRF. The Alliance stated that during initial design of a vehicle, a virtual CRF is placed on the nominal seat to define the maximum anchorage depth and that this process locates the anchorages relative to defined hard points and ensures that the final anchorage location will be compliant to the regulation. The Alliance added that the application force of 100 N allows for the variation of foam and trim in a production vehicle.

Difficulty Meeting the Current Lower Anchorage Location Requirements and the Proposed Anchorage Depth Requirement

The Alliance explained that with certain current vehicle and seat designs, it is challenging to balance the maximum distance that the anchorage can be from the Z-point on the CRF with the 120-mm minimum distance the anchorage can be from the seating reference point (SgRP). The Alliance added that it may be difficult to meet the proposed lower anchorage depth requirements without violating the minimum distance the anchorage can be located from SgRP (S9.2.2(b)). The Alliance questioned the agency's conclusion that because the proposed anchorage depth specifies an anchorage must be less than 20 mm deep into the seat bight, lower anchorages will be able to meet the proposed requirement without conflicting with S9.2.2(b). The Alliance disagreed with NHTSA's conclusion, stating that (1) it does not consider the trim surface variation described above, and (2) it assumes all lower anchorages are located at the bight line, which is often not the case in vehicles with high bight lines.

Difficulties in the Design Process for Ensuring Compliance With the Proposed Lower Anchorage Requirements

The Alliance and FCA explained that the seat development process begins with virtual modeling tools used to establish the Vehicle Occupant Package (VOP) ''hard points,'' such as h-point, torso angle, seat belt anchorage locations, seat structure dimensions, etc., as well as the location of the lower anchorages. The Alliance and FCA added that these VOP ''hard points'' are established to ensure the final vehicle package will conform to all regulatory requirements while supporting customer-driven objectives such as comfort, seat adjustment forces, etc., for the seat design.

The Alliance and FCA added that the production seat contour cannot be developed exclusively in the virtual design space and that design models cannot adequately capture the complex interaction of foam and trim tension, folding actuation clearance, and comfort requirements. The Alliance noted that in the typical vehicle development process, the seat trim outline (STO) begins in the CAD design space and then matures through several phases of physical properties to allow incremental evaluation of the VOP dimensions, occupant comfort, seat folding/adjusting efforts, and overall appearance.

FCA explained that early seat development properties are built using skived foam (a foam cut from a solid block of foam) and that while these properties allow early evaluations of customer driven factors such as seat comfort, they are only directionally representative of final seat designs. FCA added that this is because skived foam does not have the same force/displacement properties of production cast foam and that production foam is produced using a molding process that results in a ''skin'' at the surface of the foam and a variable density and stiffness that cannot be mimicked by skived foam (which has a constant density and stiffness). As a result, FCA explained it cannot accurately predict child seat installation efforts with the accuracy and confidence necessary for regulatory compliance.

The Alliance and FCA stated that the virtual seat design process lacks the material properties necessary to predict lower anchorage attachment force with the accuracy necessary to guarantee regulatory compliance and that vehicle manufacturers will run the risk of late changes to the product design that will significantly increase design, manufacturing, and testing costs.

The Alliance and FCA recommended that the agency investigate alternatives to those in the proposal, including dimensional reference from a CRF, to determine a more objective method of measurement that will accomplish the associated ''ease-of-use'' goal. FCA stated this approach will accomplish the goal of relocating anchorages closer to the seat bight, while still using proven design and compliance measurement processes.

FCA stated that while it supports the overall goal of increasing the ''ease-of-use'' of child restraint systems for caregivers, the proposed requirements and test methods are too dependent on ''soft'' seat features like trim and foam. Similarly, the Alliance stated that the proposed method is overly sensitive to foam stiffness and the production variability between trim surface and the lower anchorages could exceed 20 mm.

Ford stated it does not agree that seat design changes needed to meet the proposed lower anchorage requirements can be accomplished through steps such as cutting larger open areas in the seat foam surrounding the lower anchorage bars, as stated by NHTSA in the NPRM. Ford explained that the manufacturing process for seat cushions doesn't typically involve secondary cutting operations. Ford also stated that design changes to meet the proposed requirements would require modifications to foam tooling. Ford explained these modifications could require inserts and separate compartments in the tool to locally revise the density of the foam and that any local voids in the cushion or seatback to provide clearance to anchorages would require a more labor-intensive process to sew trim covers to achieve acceptable appearance and craftsmanship. Ford also explained that since the system characteristics are evaluated after the seat is built, the design process will be iterative, and won't be fully understood until it fabricates the assessment tools and conducts evaluations of existing vehicles.

Ford stated that, at minimum, the proposed requirements would require seat cushion, back foam, and trim changes to locally modify the foam density in the area of the lower anchorages. Ford added that lower anchorage bars in some vehicles may require modification so that the anchorages extend further forward in-vehicle.

Subjectivity Reading Angle and ADT Angle During Measurement

FCA expressed concerns that the angle of the line of sight for measuring the lower anchorage depth using the ADT can vary due to the parallax effect and therefore the lower anchorage depth measurement is user-dependent and lacks objectivity. Similarly, GM explained that the ADT measurements are subjective in some cases, such as when overlapping trim opening is

present.[43] GM requested clarification of the procedure regarding trim covering or surrounding trim being displaced by the tool and the angle of the tool during determination of the depth measurement. The Alliance stated there were differences between the UMTRI LATCH Usability study and the NPRM ADT measurements. The Alliance noted that the UMTRI Study specified no tension on the hook, which implies that the ADT will lie on the seat cushion, while the Vehicle Research and Test Center (VRTC) study was kept approximately parallel with the seat cushion. The Alliance added that S9.2.2(a) did not specify any tension to be maintained in the ADT, so it is implied that the tool would lie on the seat cushion when making the measurement. GM recommended that the test procedure require that the tool be kept parallel to seat cushion when reading the depth measurement.

Repeatability

FCA expressed concern regarding the tool's R&R during two different ex parte meetings with NHTSA.[44] During the September 21, 2015, meeting, FCA presented two R&R studies showing the measurements with the force and clearance angle tools had poor repeatability and reproducibility. FCA recommended NHTSA conduct its own R&R study and harmonize tools with IIHS if possible. GM also presented results from a limited study of gauge repeatability with the proposed tools during a November 23, 2015, ex parte meeting.[45] GM explained that the gauge repeatability study showed that further refinement of the proposed tools was required to meet industry guidelines of repeatability.

b. Post-NPRM Research

After careful consideration of comments received in response to the NPRM, NHTSA carried out a study to assess whether and how the tools proposed in the NPRM could be modified. Specifically, some commenters expressed concerns about the R&R of the tools and the subjectivity of some measurements. Some commenters suggested improvements to the tools and the tools' instrumentation to have more repeatable measurements and better usability. Finally, some commenters also stated that NHTSA should harmonize or adopt the tools and procedures being used by the IIHS for consistency of evaluation on the lower anchorage attachments.[46]

During the course of the study, NHTSA reviewed IIHS's rating protocols and tools to consider any beneficial features provided by the tools. NHTSA proceeded to implement tool improvements to address the commenters concerns by updating the AFT and its instrumentation via an iterative process.[47] Specifically, NHTSA added features to the AFT, similar to the IIHS rating protocol,[48] by including a guide rod to guide the tool towards the anchorage. Other modifications included updating instrumentation to digitally record the angle during the test, adding an actuator allowing for a steady rate of force application, and adding a support leg to stabilize the tool and maintain the approach angle during the attachment force measurements. These modifications were expected to produce more consistent results by resolving the issue of aligning the tool with hidden anchorages, reducing the inconsistencies from off-axis loading and having more consistent readings with new instrumentation. The repeatability study results are discussed in greater detail in the GR&R Study portion of this section below.

For the updated CAT, NHTSA added a pulley bridge (with adjustable feet to make it level) to apply a 67 N (15 lbf) force vertically to remove the difficulty of applying the constant load manually. NHTSA also added digital instrumentation that allowed time-history data to be recorded. Further, NHTSA replaced the rotary potentiometer several commenters expressed concerns about with an analog position sensor to collect the angle data more reliably. To improve durability, the jaw of the tool was also reinforced with steel plates and the latch tooth was updated to be refabricated completely out of steel.

For the depth measurement[49] NHTSA modified the ADT through the addition of a sliding view bar to create a more consistent view angle and an additional depth gauge measurement device to provide a numerical value for the depth, rather than using color markings for the 20 mm depth reading.

GR&R Study

Following its initial study and tool modifications, NHTSA considered comments expressing concerns over tool repeatability and reproducibility. In response to comments that NHTSA should use the industry's standard gauge repeatability and reproducibility (GR&R) methodology to evaluate the measurement tools' R&R, NHTSA conducted a GR&R study with the improved tools to determine if the updated tools provided repeatable and reproducible measurements.

NHTSA contracted UMTRI to evaluate the NHTSA-improved tools. The evaluation sought to identify any further improvements that could be made to the tools and to do a GR&R assessment study with the modified tools. NHTSA also required UMTRI to perform a statistical analysis to quantify the usability of the toolsets according to industry standards to address manufacturers' NPRM comments.[50]

UMTRI conducted the GR&R study in two phases to evaluate the effects of different operators, tools, and vehicles. Each phase used 10 different vehicle models for the modified tool evaluations. UMTRI picked the first phase's vehicles based on the 214 vehicles used for the IIHS CRAS study. Phase one vehicles were selected to allow evaluation of the tools and procedures across a range of different seat styles found in the MY 2016 vehicle fleet.[51] For phase two, UMTRI again based vehicle selection on the IIHS CRAS study vehicles, with an emphasis on finding vehicles with lower anchorages in the second-row center (2C) seating position or vehicles with a third row of seats. UMTRI also looked at the data from phase one to identify

[43] Shown on figure 8 of GM's submitted comments in Docket No. NHTSA–2014–0123–0056.

[44] Ex parte memo for September 22, 2015, meeting with FCA. *See* docket NHTSA–2014–0123–0052 and NHTSA–2014–0123–0053 in *www.regulations.gov*.

[45] Ex parte memo for November 23, 2015, meeting with GM. *See* docket NHTSA–2014–0123–0056 in *www.regulations.gov/*.

[46] In June 2015, IIHS released its rating protocol along with tools to assess the usability of the lower anchorages with similar requirements.

[47] Detailed documentation of these changes can be found in the technical report: Louden, A.E., Wietholter, K., & Pruitt, C.E. (2022, May). Evaluation of LATCH Usability Tools Update (Report No. DOT HS 813 229). National Highway Traffic Safety Administration. This report will be available in this final rule's docket.

[48] IIHS developed a tool that included a depth measurement gauge within the AFT.

[49] NHTSA evaluated the IIHS depth tool method that is embedded in IIHS's attachment force tool; however, results showed that the readings using this tool were different from the proposed tool, so NHTSA did not continue to use IIHS's tool for depth measurements. Details can be found in the report: Louden, A.E., Wietholter, K., & Pruitt, C.E. (2022, May). Evaluation of LATCH Usability Tools Update (Report No. DOT HS 813 229). National Highway Traffic Safety Administration. This report will be available in this final rule's docket.

[50] Klinich, K.D., Manary, M.A., Boyle, K., Malik, L., Bowman, P., Flannagan, C.A., ''Evaluation of Repeatability and Reproducibility of Proposed Tools to Assess Lower Anchor Usability'' UMTRI–2018–4, July 2018. This report will be docketed with the final rule.

[51] This analysis is available in the technical report: Klinich, K.D., Manary, M.A., Boyle, K., Malik, L., Bowman, P., Flannagan, C.A., ''Evaluation of Repeatability and Reproducibility of Proposed Tools to Assess Lower Anchor Usability'' UMTRI–2018–4, July 2018.

measures of interest for phase two, such as pick-up trucks and coupe vehicles. In selecting vehicles for the study, UMTRI tried to maximize variation among manufacturers, while also considering the availability to rent such vehicles for testing. UMTRI's GR&R study [52] found that for the clearance angle measurement 92 percent of variance is attributable to the vehicle (part) variability and only 8.4 percent is attributable to system variability (combined variability of the tools, operator, and repeat measurements). For the depth measurement UMTRI found that 93 percent of the variance is attributed to the vehicle (part) variability and only 7 percent to the system variability. For the force measurement, UMTRI found that 67 percent of the variance comes from vehicle (part) variation and 33 percent comes from the system variability. According to the Measurement Systems Analysis Reference Manual (MSA),[53] a system variation in the measurement of 10 percent or less is considered acceptable R&R of the measurement, while a system measurement variability of 30 percent or more is considered unacceptable. The results of UMTRI's GR&R Study demonstrate that the anchorage depth and clearance angle measurements obtained via the updated ADT and CAT have good R&R, but that the anchorage force measurement with the AFT V2 does not. Further details of the GR&R analysis are available in the UMTRI GR&R study report.[54]

c. Summary of Decision on Assessing Usability of Lower Anchorages

This final rule adopts the updated lower anchorage depth and clearance angle tools and requirements, but not the attachment force requirement. These adopted requirements will ensure that lower anchorages on vehicles subject to this rule have sufficient clearance around each lower anchorage, and that the lower anchorages are within 25 mm of the outer surface of the seat bight (anchorage depth).[55] Lower anchorages meeting these requirements will be easier to use, as shown by the UMTRI and IIHS data.

The LATCH Usability study found these ease-of-use specifications correlate with correct child restraint installations. National Child Restraint Use Special Study (NCRUSS) [56] data showed that a loose CRS installation comprises one of the five most significant mistakes consumers make when installing child restraints. Loose CRS installations can result in greater movement of a child and their CRS during a crash, increasing the risk for injury and higher injury severity due to possible contact with vehicle interior structures. CRASs designed to be easier to properly use will increase correct (tight) CRS installations, making children safer in a crash.

The NPRM proposed clearance angle, attachment force, and anchorage depth specifications. This final rule is only adopting requirements and measurement tools for the clearance angle and anchorage depth. The agency evaluated a series of changes to the attachment force tool to improve its R&R. However, the GR&R [57] study found that measurements from the attachment force tool lacked acceptable level of R&R needed for adopting into the standard.[58] NHTSA does not believe further improvements to the attachment force tool will be enough to achieve a sufficient R&R.

UMTRI's LATCH Usability study [59] identified three vehicle hardware characteristics serving as predictors for correct CRS use, analyzing the predicting factors of force and depth separately and together. Depth and attachment force when analyzed separately showed each were highly significant predictors of correct lower anchors use. But when these vehicle characteristics were analyzed together, force became marginally significant while depth remained a highly significant predictor. UMTRI concluded that while these results do not guarantee a causal relationship between depth and correct installations, the results do indicate that depth is a better predictor of correct installations than force.

Although Alliance and FCA commented that only the anchorage depth requirement was warranted, NHTSA disagrees. UMTRI's LATCH Usability in Vehicles Study analyzed depth and clearance angle. Study results concluded that separately they each were highly significant predictors of correct use of lower anchors. When analyzed together, to the extent there is unique variance attributable to depth and clearance separately, depth and clearance angle both became marginally significant. This indicates that both are equally predictive of correct installation.

Because the study could not estimate the contribution of each feature, NHTSA cannot accurately calculate the effect of not having the attachment force as a requirement. The data does indicate that by having clearance angle and depth requirements, correct CRS usage will improve.

d. Detailed Agency Decisions Regarding the Tools and Performance Criteria

1. Clearance Angle Tool and Minimum Allowable Clearance Angle

NHTSA understands that some vehicles will need redesign to meet both requirements. But as presented in figure 9 of the 2015 NPRM,[60] the depth requirement is feasible in many vehicles without making any design changes to meet the S9.2.2(b) requirements. Following careful consideration of comments received and further studies described above, NHTSA has modified the NPRM's proposed clearance angle tool (CAT) to address several concerns raised by commenters. The final design of the CAT now includes a pulley bridge to apply a consistent vertical force of 67 N (15 lb) to address commenters' concerns regarding the difficulty in applying the force in the proposed CAT. Further, although the proposed CAT had digital instrumentation allowing for the recording of time-history data, based on comment feedback, NHTSA has implemented new instrumentation to improve measurement repeatability, including an analog position sensor and an Interface S-Type load cell.

UMTRI's GR&R study found that the measurement variability of the updated CAT [61] system was less than 10 percent of the total measurement variability, confirming that the updated CAT

[52] For details on the vehicles and measurements *see* Klinich et al (2018).

[53] This reference manual, developed by the vehicle industry, contains guidelines for assessing the quality of a measurement system. Down, M., Czubak, F., Gruska, G., Stahley, S., Benham, D. (2010) Measurement Systems Analysis Reference Manual, Fourth Edition. Chrysler Group LLC, Ford Motor Company, General Motors Corporation. *http://www.rubymetrology.com/add_help_doc/MSA_Reference_Manual_4th_Edition.pdf.*

[54] Klinich et.al. 2018.

[55] *See* Anchorage Depth Tool Decision below (section V.d.2), where NHTSA explains why the anchorage depth threshold changed from 20 mm to 25 mm.

[56] Greenwell, N.K. (2015, May). Results of the national child restraint use special study. (Report No. DOT HS 812 142). Washington, DC: National Highway Traffic Safety Administration.

[57] GR&R is the process used to evaluate a gauging instrument's accuracy by ensuring its measurements are repeatable and reproducible. The process includes taking a series of measurements to certify that the output is the same value as the input, and that the same measurements are obtained under the same operating conditions over a set duration. *See https://asq.org/quality-resources/gage-repeatability.*

[58] Klinich, K., Manary, M.A., Boyle, K., Malik L.J., Bowman, P., Flannagan, C.A.'' Evaluation of Repeatability and Reproducibility of Proposed Tools to Assess Lower Anchor Usability'' July 2018. Report will be docketed with this final rule.

[59] Klinich et al., ''LATCH Usability in Vehicles,'' UMTRI–2012–7, April 2012. Link: *https://deepblue.lib.umich.edu/handle/2027.42/90856.*

[60] *See www.regulations.gov/document/NHTSA-2014-0123-0001.*

[61] Identified as CAT V2 in technical reports.

measurements have sufficient R&R for regulatory purposes.

Accordingly, this final rule incorporates the requirement of a minimum of 54-degrees clearance angle in FMVSS No. 225 when applying a 67 N vertical load to the updated tool. Drawings of the final updated CAT design have been incorporated by reference into FMVSS No. 225. NHTSA has placed a copy of the drawings in the docket for this final rule.

While supportive of a clearance angle requirement, Advocates argued that the proposed 54 degree minimum was too low. NHTSA selected the 54-degree clearance angle based on a 50 percent correct CRS use in UMTRI's LATCH Usability study. Only 2 of the 98 vehicles studied by UMTRI had a clearance angle above 75 degrees, which calls into question the feasibility of defining 75 degrees as a limit. The proposed values provide an improvement on correct installations and are not overly burdensome for manufacturers to meet. NHTSA also believes that vehicles will be well above the 54 degree clearance angle, as the standard will also require anchorages depths that typically result in higher clearance angles. Fifty-four of the 98 vehicles in UMTRI's study had clearance angles over 54 degrees (ranging 54–83 degrees), which will improve correct installations beyond the 50 percent used to establish the threshold.

In response to the Alliance's request for clarification on whether the CAT measurements must be made independently or at both anchorages concurrently, the CAT measurements are to be done independently at each lower anchorage in the vehicle. Further, NHTSA does not agree with the Alliance's suggestion that the weight of the tool needs to be subtracted from the total force applied to arrive at the 67 N requirements. With the tool modifications to the CAT, the 67 N will provide a constant load, and subtracting the force due to the weight of the tool would add unnecessary complexity to the system.

NHTSA acknowledges comments made by MGA [62] on the proposed tools and technical drawings published with the NPRM. Specifically, MGA stated that ''the spring pockets are 0.146'' offset, which causes the spring to fall out during compression.'' Based on this, MGA stated that it did the following: (1.) moved the pivot to spring pocket distance as follows: 4.970 − 2.500 = 2.470 (upper spring pocket); (2.) moved the pivot to spring pocket distance as follows: 3.216 − 0.600 = 2.616 (lower spring pocket); (3.) moved the upper spring pocket forward 0.125'' to align the upper and lower spring pocket more closely, and prevent the spring from falling out during compression.

In addition to these changes, MGA pointed out that the load cell presented in NHTSA's NPRM is not commercially available. As such, MGA replaced the load cell with an Interface SSM–AJ–100 load cell. MGA explained the hardware to attach the load cell to the handle and ball and joint connection are Interface CLV–104 clevises. MGA also noted the female rod end is McMaster part number 60645K32, while the male rod end is unchanged. Finally, MGA redefined the clearance angle tool handle measurements to fit the Interface clevis CLV–104 that is used with the Interface SSM–AJ–100 load cell.

In response to these comments, NHTSA has updated the drawings as follows: the dimension 4.97 inches in drawing DA609–001 (figure 9 in MGA comments) is corrected to 5.15 inches to eliminate the offset this dimension created with drawing DA609–003. However, NHTSA did not move the upper spring pocket forward 0.125 inches as suggested by MGA because the spring was modified to a conical spring (in Drawing DA609–000), which prevents the spring from falling out during compression. The upper spring pocket was thus left in the same location as proposed. In response to comments on the load cell, NHTSA updated the drawings as follows for this final rule: the proposed load cell is changed to the S-Type load cell suggested by MGA, which is commercially available. However, suggested changes to the handle and attachments to the handle will not be implemented, as they are now moot as this part was removed and replaced with a pulley system.

Finally, NHTSA acknowledges MGA's request for clarification on certain inconsistent dimensions in two drawings, as seen in figures 17 and 18 of MGA's comments.[63] In response to these comments, this final rule updates the drawings as follows: the material in Drawing DA609–005 is changed from having a material PL 1″ x 1 3/16″ x 1 7/8″ to PL 1″ x 1 3/16″ x 5″ to correct the inconsistent dimensions in the drawing. Further, drawing DA609–006 is removed as the mount in this drawing is no longer needed.

2. Anchorage Depth Tool and Maximum Allowable Anchorage Depth

NHTSA acknowledges that several commenters, including GM and FCA, expressed concerns about the repeatability of the ADT tool and the subjectivity of the viewing angle in determining whether the measurement was 20 mm or less. After careful consideration this final rule's updated ADT [64] addresses concerns over viewing angle subjectivity through the addition of a view bar and zero-strip that translate the viewing angle into a physical measurement. In support of this decision, UMTRI's GR&R study found that the ADT measurement variability of the updated system was less than 10 percent of the total measurement variability (specifically, 93 percent of the variance in the depth measurements is attributed to vehicle variation and only 7 percent to the system variability), confirming that the updated ADT measurements have sufficient R&R for regulatory purpose.

This final rule is also increasing the NPRM's proposed 20 mm limit to 25 mm. As noted earlier, since the study vehicles were selected based on their different characteristics and not as a randomized selection, the agency's analysis does not fully evaluate the variability across vehicles. There could be some anchorage depth measurement variability in some seat designs. Further, the GR&R study by UMTRI considered depth measurements rounded to the nearest quarter cm. In acknowledgment of these limitations in the GR&R analysis, NHTSA is specifying that the anchorage depth be 25 mm or less, rather than the 20 mm proposed in the NPRM. As such, measurement by the finalized ADT will account for measurement and manufacturing variability. Expanding the depth requirement to 25 mm will still result in improved usability and a higher number of correct installations.[65]

NHTSA did not consider lowering the anchorage depth to less than 20 mm, which would be a more stringent threshold than that proposed in the NPRM. In response to the Alliance's comment asking why a 4 cm anchorage depth was not proposed, as that depth also showed correct installations in UMTRI's LATCH Usability study, NHTSA points out that the UMTRI LATCH Usability study found that study

[62] For full comments and associated figures *see www.regulations.gov/comment/NHTSA-2014-0123-0049.*

[63] Docket No. NHTSA–2014–0123–0049.

[64] Identified as ADT V4 in technical reports.

[65] UMTRI's LATCH Usability study (2012) was not conducted with the precision tools such as the ADT included in this final rule. The UMTRI Study tools had some ambiguities regarding a consistent viewing angle to detect the change in color from the hook-type tool. The additional 5 mm is in the realm of depth reading variability from that study.

volunteers correctly installed CRSs 50.7 percent of the time when using anchorages with depths 2 to 4 cm,[66] but that anchorage depths of 0 to 2 cm showed a more pronounced improvement to 85.9 percent correct CRS installation. As a 35 percent increase in the number of correct CRSs installed is a significant increase in the crash safety protections provided to young children, the Agency declines to consider a 4 cm anchorage depth for this final rule. In response to the Alliance's suggestion to better define the tensioning and angle placement of the ADT during the procedure, as the updated ADT is pulled taut so that the anchorage bar engages the tool, a need to define the tension does not exist, as the required tool is rigid.

NHTSA is rejecting a comment requesting the removal of the prohibition in FMVSS No. 225 on stowable lower anchorage bars, as lower anchorages should be readily available for use and no further steps should be necessary (other than removing a lower anchorage specific cover) to access and use them.

NHTSA agrees with GM's recommendation to position the ADT at an angle parallel to the seat cushion to make measurements and has revised the NPRM's proposed procedure to specify that the ADT will be positioned at an angle parallel to the seat cushion. The test procedure will indicate how to measure the seat cushion angle (using a 2 ft level and an inclinometer) and how to position the ADT to reach this angle (use of shims if necessary). In response to expressed concerns over the measuring tool potentially displacing the trim covering or surrounding trim being displaced by the tool, NHTSA notes that this final rule's anchorage depth measurement procedure allows for clear depth measurement via the taping away from anchorages (with masking tape) such things as coverings, flaps, or other vehicle parts. In relation to concern over trim coverings, including slits where the fabric or leather is too stiff to be taped, there should be minimal manipulation of the slit to introduce and hook the ADT in the anchorage and pull it back. The ADT may push away some of the fabric or leather when it is engaged to the lower anchorage. The depth will be measured where the viewing strip comes in contact with the vehicle seat (which includes the fabric or leather). Since the vehicle is prepared before the test measurement by marking the vehicle seat with a line perpendicular to the anchorage center, the tool can be easily directed to the anchorage.

In response to commenters that suggested developing a depth measure based on a hard point given the difficulty in designing and controlling the variance of the foam/trim elements during the design process, NHTSA respectfully disagrees with this suggestion. The LATCH Usability study[67] found that anchorages positioned less than 20 mm from the seat bight result in more correct installations. Further, one noted issue consumers experience when installing CRSs with deep anchorages is difficulties with the foam of the seat and/or the fabric/leather surrounding the anchorage. As anchor depth measurement from a hard point measurement does not take the interactions of the seat foam and fabric into consideration, a depth measurement based on a seat hard point would not necessarily improve ease-of-use and correct installations. NHTSA does acknowledge that there may be greater variability in foam and different trim levels than those considered in the UMTRI GR&R analysis. To account for any potential measurement or manufacturing variability this final rule specifies an anchorage depth of no more than 25 mm, as opposed to the proposed 20 mm, to account for measurement and manufacturing variability.

Several commenters expressed concerns over the costs of required tooling changes to meet the depth requirements of this final rule. NHTSA acknowledges that tooling changes for existing production vehicles can be very costly and are better accommodated during the early design stage of a vehicle's renewal cycle to minimize any potential costs. Accordingly, the agency finds good cause to provide more lead time and a phase-in for manufacturers to account for different trims and the possibility of tooling changes to meet the depth requirements required by this final rule. As such, this final rule is providing a longer lead time than that proposed in the NPRM, with a phase-in schedule (*see* Lead Time Section). NHTSA is permitting optional early compliance with this final rule's requirements.

3. Attachment Force Tool

Following careful consideration of comments received and additional testing, NHTSA has decided not to adopt the NPRM's proposed attachment force requirements into FMVSS No. 225. Following publication of the NPRM, NHTSA attempted to improve the R&R of the AFT. However, UMTRI's GR&R study, which used the improved AFT, found that 67 percent of depth measurement variance came from vehicle (part) variation and 33 percent came from system variability (variability attributed to the tools, operators, and repeated measurements). The Measurement Systems Analysis Reference Manual (MSA)[68] document, followed by the vehicle industry, indicates that when evaluating a test procedure, it is acceptable if the system's percentage variation is less than 10%. This means the improved AFT failed to reach an acceptable R&R for adoption into the standard. NHTSA does not believe further improvements to the AFT would achieve sufficient repeatable and reproducible measurements for regulatory purposes. Further, although Ford suggested using the average of several measurement trials using the AFT as the criteria for anchorage attachment force, NHTSA found R&R was not sufficiently improved by considering the average of five measurement trials for some vehicle seats. As NHTSA has determined the adoption of the AFT into FMVSS No. 225 is not feasible, this final rule does not address additional comments received suggesting improvements to the tool.

Despite the decision not to include an attachment force criterion into FMVSS No. 225, the remaining requirements of this final rule will improve the ease-of-use of the lower anchorages. UMTRI's study[69] identified the characteristics of attachment force, clearance angle, and attachment depth as predictors for correct CRS use, and then modeled the predicting factors of force and depth both separately and together. Analyzed separately, depth and attachment force were highly significant predictors of the correct use of lower anchors. Analyzed together, depth remained a highly significant predictor, while attachment force was only a marginally significant

[66] The UMTRI ''LATCH Usability'' study showed correct use of 85.9 percent, 50.7 percent and 43.1 percent for lower anchorage depths of 0–2 cm, 2–4 cm and 4–6cm respectively. We expect lower anchorages with depths between 2–4 cm that are closer to 2 cm would have higher correct use and those closer to 4 cm would have lower correct use.

[67] Klinich et al., ''LATCH Usability in Vehicles,'' UMTRI–2012–7, April 2012. Link: *https://deepblue.lib.umich.edu/handle/2027.42/90856.*

[68] Down M, Czubak F, Gruska G, Stahley S, Benham D. (2010) Measurement Systems Analysis Reference Manual, Fourth Edition. Chrysler Group LLC, Ford Motor Company, General Motors Corporation. Link: *http://www.rubymetrology.com/add_help_doc/MSA_Reference_Manual_4th_Edition.pdf.*

[69] Klinich et al., ''LATCH Usability in Vehicles,'' UMTRI–2012–7, April 2012. Link: *https://deepblue.lib.umich.edu/handle/2027.42/90856.*

predictor. As such, UMTRI concluded that although these results do not guarantee a causal relationship between depth and correct installations, they do indicate that depth is a somewhat better predictor of correct CRS installations than attachment force. This final rule's depth requirements ensure that the lower anchorages will be placed in a more forward position, making them more likely to avoid foam material and structures and potentially resulting in decreased force needed to attach the lower anchorage. Further, this final rule's required clearance angle will ensure no material or structure will prevent placement of the lower anchorage attachment, which may also result in less required force to attach the lower anchorage.

VI. Improving the Ease of Using the Tether Anchorage

FMVSS No. 225 currently requires vehicle manufacturers to equip vehicles with a tether anchorage at three rear designated seating positions (two of these positions are also required to be equipped with lower anchorages). Tether anchorages must be in a specified zone accessible without the need for any tools other than a screwdriver or coin. Tether anchorages must be easy to use, as they are the primary factor behind the estimated 36–50 lives saved a year following NHTSA's adoption of FMVSS No. 225.[70]

To further improve the usability of the tether anchorage by making it easier for customers to recognize and access, the NPRM proposed the following requirements:

- Reduce the zone in which a tether anchorage must be located to prevent tether anchorages from being placed deep under a vehicle seat.
- As some tether anchorages are too close to a structure, such as a head restraint, specify a minimum 165 mm (6.5 in) distance from a specified reference point on the vehicle seat to the tether anchorage to allow for the tightening of the tether strap. This requirement will ensure that adequate clearance is provided to tighten the tether strap.[71]
- Tether anchorages must be accessible without the need for any tools other than a screwdriver or coin, and without folding the seatback or removing carpet or other vehicle components. The tether anchorage could be covered with a cap, flap, or cover, provided that the cap, flap, or cover is specifically designed to be opened, moved aside, or to otherwise give access to the anchorage without the use of any tools and is labeled with a specific symbol indicting the presence of the tether anchorage underneath.
- Requiring a standardized rigid bar so consumers could more easily recognize and find it, as currently some tether anchorages are made from flexible webbing.
- Standardizing the tether anchorage marking by requiring that it match a marking on the child restraint system tether and be placed within a specified distance from the anchorage.

General Comments

Commenters almost unanimously supported improving the ease-of-use of tether anchorages but differed in their views on specific NPRM proposals. Overall, child restraint manufacturers and private individuals supported the proposed improvements to the ease-of-use of the tether anchorage. SRN and an individual, Dr. Baer,[72] agreed on the standardization, accessibility, and clearance (165 mm distance to tether anchor) proposals to improve tether use. However, Dr. Baer disagreed with allowing tether anchorage covers, stating that they hide a safety feature. SRN and Dr. Baer expressed concerns over some tether anchorage designs concealed by other vehicle structures, making them difficult to access. IIHS also supported reducing the allowable zone for tether anchorages to better align allowable locations with the locations parents expect to find tether anchorages. Safe Kids[73] expressed support for a harmonized, consistent, and easily understood way to identify and use the CRAS.

In contrast, the Alliance and several vehicle manufacturers objected to the proposed requirements to reduce the zone where top tethers could be located, including specifically to the proposed tether anchorage location on the package shelf[74] behind second-row seats in vehicles such as sedans. The Alliance stated that many passenger cars that have the tether anchorages conveniently located in the package shelf behind the seat will not meet the proposed 165 mm minimum wrap around distance. The Alliance explained that current design locations that would be precluded by the proposed requirements do, in fact, enable effective attachment since the path over a fixed head restraint or under an adjustable head restraint provides additional wraparound distance to tighten the tether strap. Several vehicle manufacturers stated that the proposed requirement would force the relocation of tether anchorages rearward in the vehicle, resulting in less hand clearance to the vehicle backlight[75] window for manipulating the tether hook. Vehicle manufacturers also expressed concern over costly repackaging of components such as speaker assemblies that currently occupy the space where the tether anchorage would have to be placed. Some commenters urged NHTSA to use a point farther forward in the vehicle's seat than the proposed SB point, explaining the SB point is not a reference that can be found on all of their vehicles.

The Alliance and several vehicle manufacturers sought clarification on some terms related to the reduced tether anchorage zone under the seat, and also commented on other proposed provisions for improving the ease-of-use of tether anchorages (*e.g.,* accessing tether anchorages without tools, accessing tether anchorages without folding the seatback or removing carpet or other vehicle components, such as luggage compartment security covers, and using rigid bars in light trucks). Commenters also expressed concerns with the proposed requirements based on their implications and costs. Vehicle manufacturers generally commented that the proposed 3-year lead time is insufficient to account for necessary changes, and many asked for a phase-in of the requirements.

a. Attaching to the Tether Anchorage

Tether Anchorage Accessibility—Zone Under the Seat

To promote accessible tether anchorages, current FMVSS No. 225 requires that tether anchorages be located within the shaded zone shown in figures 3 through 7 of FMVSS No. 225 for the designated seating position (DSP) where the anchorage is installed. In considering changes to FMVSS No. 225 to further increase tether anchorage accessibility, the agency first evaluated vehicle fleet data to better understand where tether anchorages are currently located. The evaluation found that the most common tether anchorage

[70] 64 FR 10786.

[71] The NPRM also proposed amending FMVSS No. 213 to limit the length of the CRS tether hardware assembly (which consists of a tether hook and hardware to tighten and loosen the tether strap) to 165 mm (6.5 in) so that the tightening mechanism can be easily used in the clearance space around a tether anchorage.

[72] Dr. Baer is a pediatrician, advocate and nationally certified child passenger safety instructor best known as The Car Seat Lady.

[73] Safe Kids is a network of organizations working to prevent unintentional childhood injury, the leading cause of death and disability for children ages 1 to 14.

[74] The shelf behind the rear seat in a sedan.

[75] Backlight is the rear windshield or back window glass in a vehicle.

locations are the seatback (41 percent), the package shelf (37 percent), the back wall of the occupant compartment (8 percent), the roof (6 percent), the floor (4 percent), and under the seat (3 percent). NHTSA contemplated the merits of designing the NPRM to considerably limit the zones in figures 3 through 7, but decided against this approach following review of NHTSA's test data. This data showed that the current allowable locations of tether anchorages do not increase the risk of injuries, as their performance and loading to the anchorages are very similar to tether anchorages that are centered and closer to the seat. Further, NHTSA acknowledges that vehicle manufacturers must consider many factors in deciding where to place a tether anchorage, including the strength of the structure to which the tether anchorage is affixed, the degree to which the tether anchorage—or the child restraint, when using the anchorage—interferes with ingress, egress, seating, and/or the comfort and safety of vehicle occupants. Due to these considerations, vehicle manufacturers sometimes install tether anchorages slightly off-center to a seating position, or on the roof, floor, or back wall. Recognizing there is merit in providing flexibility to manufacturers to balance where to locate the anchorages, the agency decided not to considerably narrow the zones in figures 3 through 7.[76] Instead, the NPRM sought to improve the ease of using tether anchorages via other means.

First, the agency proposed to reduce the allowable zone under the seat, because the shaded zone shown in figures 3 through 7 encompasses a wide area that has resulted in some tether anchorages being located where consumers have had difficulty accessing them, such as deep under the seat where folding the seat is required to reach/attach the tether anchorage.[77] As such, NHTSA proposed to amend figures 3 through 7 in the standard to disallow tether anchorages from being placed deep under the seat. Specifically, the agency proposed that the forwardmost edge of the allowable tether anchorage zone represented by the shaded area in figure 3 of the standard be moved rearward to a position defined by the intersection of the vehicle floor with a plane parallel to the torso line reference plane passing through the rearmost point of the bottom of the seat at its centerline.[78]

Comments Received

Vehicle manufacturers generally disagreed with the proposal laid out in the NPRM. Global stated that for certain vehicle designs the bottom of the seat may be the most suitable location for the anchorages and requested that the agency permit continued use of the bottom of the seat for tether anchorages if the manufacturer includes appropriate markings on the seatback to alert consumers to the anchorage location. The Alliance argued the proposal to restrict the allowable tether zone under the seat may be appropriate for passenger cars with limited space under the seat, but it unnecessarily limits the location of the anchorage for mini-vans, vans and some SUVs. The Alliance provided figures in its comments[79] showing a full-size van rear seat with the upper tether anchorage located on the seat structure forward of the forward-most limit of the proposed zone and explained that the location provides a readily accessible upper anchorage point formed into the seat. The Alliance stated the proposed acceptable zone would require additional anchorage hardware that would need to be welded to the seat structure. The Alliance explained that because the current design is stamped into the existing seat structure, manufacturers can voluntarily provide additional anchorages at very low cost (*i.e.,* the 10-seat version of this full-size van has eight tether anchorages available for use). The Alliance opined that there is no need to revise the zone such that these tether anchorages would no longer be permitted, given the easy access and visibility of tether anchorages.

Similarly, Ford commented that the proposal to limit the tether anchorage location using a plane that is parallel to the torso line that passes through the ''rearmost point of the bottom of the seat'' is overly restrictive for some free-standing seats (*i.e.,* SUVs and vans). Ford suggested basing the forward-most limit of the acceptable zone on the SgRP. Ford proposed using a vertical plane 120 mm rearward of the SgRP as the forward limit of the acceptable zone, which would remove the ambiguity regarding the ''rearmost point of the bottom of the seat'' and, combined with labeling, permit some currently existing under-seat designs that do not have accessibility issues. Ford added that the plane is already specified in the standard to define the forward-most limit of the lower anchorage acceptable zone. Ford included three illustrations[80] depicting the current allowable under-seat zone, the allowable zone proposed in the NPRM, and a modified proposal that would limit the anchorage location to the plane 120 mm rear of the SgRP.

The Alliance and Honda requested clarification on how to define the intersection of the vehicle floor with a plane parallel to the torso line reference plane passing through the rear-most point of the bottom of the seat at the centerline of the seat. Both the Alliance[81] and Honda[82] presented illustrations of different scenarios where they indicated the rearmost point of the bottom seat was unclear and requested clarification.

In addition, the Alliance explained that tether anchorages cannot be in the seatback if the seatback plane is located anterior[83] to the proposed line in figure 3 of the proposed regulatory text in the NPRM. To prevent misinterpretation, the Alliance recommended removing the line from figure 3 in the proposed regulatory text in the NPRM or amending the requirement to call out this line as a line that represents the vehicle specific seatback surface within the prescribed zone, for the seatback profile similar to the callout for the vehicle floor pan.

[76] IIHS was the sole commenter that encouraged NHTSA to further reduce the allowable zone for tether anchorages to better align allowable locations with where parents expect to find tether anchorages. While NHTSA agrees a more reduced zone would place tether anchorages where consumers may be more likely to anticipate them, the agency must also consider other factors a vehicle manufacturer has to weigh when deciding the location of tether anchorages. Manufacturers consider factors such as strength of the structures, features that the manufacturer may design into seats such as pass through openings, seat back folding mechanisms that may cause the tether anchorages to be in the back of the seat, and other design considerations. Thus, NHTSA is not reducing the zones in this rulemaking.

[77] This deep under the seat location is the forward-most edge of the area under the vehicle seat. The location is defined by the intersection of the torso line reference plane (defined by the 2016 SAE J826 two-dimensional drafting template) and the floor pan.

[78] Vehicles with tether anchorages located deep under the seat where the seat must be folded to reach the anchorages are no longer manufactured, so this change in requirements will have little or no impact on current vehicle designs. However, the amendment is needed to prevent these designs from coming back into the fleet.

[79] Figure 3 of Docket No. NHTSA–2014–0123–0027.

[80] Ford's illustrations can be found in figure 3 of Docket No. NHTSA–2014–0123–0026.

[81] Alliance's illustrations can be found on pages 8–9 of Docket No. NHTSA2014–0123–0027.

[82] Honda's illustrations can be found on pages 3 of Docket No. NHTSA2014–0123–0017.

[83] The Alliance's illustrations can be found on pages 9 of Docket No. NHTSA2014–0123–0027.

Agency Response

Comments expressing concerns over how the NPRM proposed to define the rearmost point of the bottom of the seat to locate the plane setting the limit of the allowable zone have merit. Therefore, following careful consideration and evaluation, this final rule adopts requirements to specify the allowable tether anchorage zone under the seat using a vertical plane 120 mm rear of the H-Point to define the allowable limit.

Commenters presented several scenarios in which defining the rearmost point of the bottom of the seat was not possible, as the proposed requirement did not provide sufficient details on how to precisely define it. Commenters also stated that some existing easily accessible tether anchorages near the back of but slightly under the seat may not be compliant with the proposed tether anchorage zone. These anchorages are considered easily accessible because the seats do not require folding to access the anchorages and the anchorages can be easily identified since they have the proposed markings.

In acknowledgment of these concerns the Agency did a series of installations and measurements to evaluate whether the vehicles with existing tether anchorages near the back but slightly under the seat are easy to use, and to determine whether the zone under the seat suggested by Ford is appropriate to define the allowable tether zone under the seat.[84] NHTSA selected three vehicles (2015 Toyota Sienna, 2018 Freightliner Sprinter, and 2020 Ford Transit) with tethers located low on the seatback (similar to the ones commenters stated were easily accessible locations) to evaluate whether they were easily accessed when installing a CRS, whether the tether anchorage location would fail to be located within the NPRM's proposed allowable tether anchorage zone, and whether it would be within the Ford-proposed allowable tether anchorage zone (defined by a vertical plane 120 mm rearward of the SgRP as the forward limit of the allowable tether anchorage zone).

In conducting the evaluation, NHTSA installed the Evenflo Triumph and the Britax Advocate Clicktight in the three selected vehicles to determine whether the tether was easily installed. The trials showed that the tether anchorages were easy to locate and use for attaching the CRS tether anchor connectors.

NHTSA defined the allowable tether zones under the seat using both the NPRM's proposed zone (parallel torso reference line that passed through the rearmost point of the bottom of the seat) and Ford's proposed zone (defined with a vertical plane 120 mm rearward of the H-point) [85] in the three selected vehicles. These measurements were performed to verify whether Ford's proposed method for defining the allowable tether zone under the seat would remove the ambiguities present in the NPRM's proposed zone, and to evaluate whether the tether anchorages in the vehicles are located within the NPRM's proposed allowable zone and/or Ford's proposed zone (but using the H-point rather than the SgRP suggested by Ford).

The evaluations confirmed that defining the tether anchorage zone with the vertical line 120 mm behind the H-point removed the ambiguities contained in the NPRM's proposed method. The evaluations showed that the tether anchorages of all three vehicle seats were easy to access and use for installing child restraints. However, these tether anchorages would not meet the allowable tether anchorage zone proposed in the NPRM, while they would pass using the 120 mm behind the H-point measurement method. This result indicates that an allowable tether anchorage zone determined as a plane 120 mm rearward of the H-point better reflects ease of access and use of the tether anchorages than the NPRM's proposed allowable zone.

TABLE 1—SUMMARY OF TETHER ANCHORAGE LOCATION WITH RESPECT TO THE NPRM'S PROPOSED ALLOWABLE TETHER ANCHORAGE ZONE AND THAT DETERMINED AS A PLANE 120 mm BEHIND THE H-POINT

Year	Manufacturer	Model	Seat position	Current zone	NPRM zone	Final rule zone (120 mm behind H-point)
2015	Toyota	Sienna	2nd Row Driver Outboard.	Pass	Fail	Pass.
2018	Freightliner	Sprinter	2nd Row Passenger Outboard.	Pass	Fail	Pass.
2020	Ford	Transit	2nd Row Passenger Outboard.	Pass	Fail	Pass.

The NPRM's proposed requirement sought to eliminate tether anchorages located deep under the seat where folding the seat is necessary to reach it. NHTSA believes the limit on the tether anchorage location under the seat defined by a vertical plane 120 mm rear of the H-Point meets this intent. NHTSA also concludes that using a vertical plane 120 mm rearward of the H-point is easily defined, removes ambiguities commenters noted in the NPRM's proposed tether anchorage zone, and better reflects the accessibility and usability of the tether anchorages. Therefore, the agency is adopting requirements to specify the allowable tether anchorage zone under the seat using a vertical plane 120 mm rear of the H-Point to define the allowable limit. This requirement will prevent tether anchorages from being located deep under the seat where they are difficult to access, addressing comments received.

b. Tightening the Tether

NHTSA proposed requirements to make it easier for a consumer to attach a child restraint tether hook to a tether anchorage and tighten the tether strap. Currently, FMVSS No. 225 specifies that tether anchorages must be located within the shaded zone shown in figures 3 to 7 of the standard for the DSP

[84] Evaluation of FMVSS No. 225 Tether Anchor Zones Under the Seat. May 2022. Kedryn Wietholter, National Highway Traffic Safety Administration. Evaluation summary will be docketed along with this final rule.

[85] NHTSA chose to use the H-point as it can be measured in the laboratory as opposed to the SgRP, which is a manufacturer-defined point. Both points are very similar.

in which the anchorage is installed.[86] NHTSA proposed to amend FMVSS No. 225 to require that tether anchorages have clearance space for tightening the strap.

The NPRM proposed to require a 165 mm (6.5 in) minimum distance from each tether anchorage to a seat-based reference point for each designated seating position (DSP) with a tether anchorage. In 2012 the LATCH Usability study[87] found that, under the current FMVSS No. 225, tether anchorages can be located too close to the head restraint, on top of the seatback, or the tether attachment point on a CRS, resulting in insufficient clearance to tighten the CRS tether strap. The study reviewed the tether hardware assembly on 21 child restraint systems made by 11 different CRS manufacturers.[88] The review found the tether hardware assembly of the 21 child restraints ranged from 102 to 184 mm (4 to 7.2 in) in length, with 15 CRSs having tether hardware assembly lengths between 140 mm (5.5 in) and 165 mm (6.5 in). The study suggested that having tether anchorages on a package shelf or behind the seatback at a distance of at least 165 mm (6.5 in) rearward or below the back of the head restraint or top of the seatback for DSPs without a head restraint would provide greater clearance for attaching the tether hook of a CRS and tightening the strap.

In drafting the NPRM NHTSA reviewed the LATCH usability study and tentatively determined that specifying a minimum 165 mm (6.5 in) distance from the tether anchorage to a defined reference point on the vehicle seat would improve tether anchorages' ease-of-use. The NPRM explained that this clearance would allow for the tightening of tether straps in most vehicles without interference from other structures, such as the head restraint.

[86] The standard specifies a reference point ''W'' that is 50 mm (1.9 in) below and 50 mm (1.9 in) rearward of the shoulder reference point (R-point), and a reference point ''V'' that is 350 mm (13.7 in) vertically above and 175 mm (6.8 in) horizontally back from the H-point. The standard also specifies a strap wrap-around length of 200 mm (7.8 in) from the W-point and a strap wrap-around length of 250 mm (9.8 in) from the V-point (*see* figure 4 of FMVSS No. 225). Tether anchorages may be located only within the zone that is generated using both reference points and their associated strap wrap-around lengths to ensure there is sufficient distance for a tether strap and hook to be attached to the anchorage.

[87] Klinich, K.D., Flannagan, C.A., Manary, M.A., and Moore, J.L. ''LATCH usability in vehicles.'' Link: *http://deepblue.lib.umich.edu/handle/2027.42/90856.* The report was sponsored by IIHS for developing IIHS's rating of the usability of the child restraint anchorage systems in various vehicles. *See* IIHS Status Report: Vol. 47 No. 3, April 12, 2012. *http://www.iihs.org/sr/default.aspx.*

[88] This hardware consists of the tether hook and hardware to tighten and loosen the tether strap.

The NPRM proposed that the reference point on the vehicle seat, which NHTSA designated as ''SB,'' be defined as the intersection of the plane parallel to the torso line reference plane (defined in figure 3 of FMVSS No. 225) that passes through the rearmost point of the seat and the wrap-around line from the ''V-point'' to the tether anchorage.[89] The agency noted that both the V- and W-point could have been used for determining the vehicle seat reference point SB. NHTSA selected the V-point to define the reference point because it would encompass both low mounted and high-mounted tether straps.

1. Tether Anchorage Location—165 mm to a Reference Point

Comments on 165 mm Distance to Reference Point

In response to the NPRM many vehicle manufacturers stated that requiring manufactures to move tether anchorages to locations meeting the 165 mm (6.5 in) specification is impractical within current styling because substantial vehicle components currently occupy the locations. The Alliance stated that the relocation of a single component has implications for other design considerations including, but not limited to, wiring harnesses, body in white attachments and reinforcements, electromagnetic interference, and radio-frequency interference re-qualification. FCA stated that moving the tether anchorages rearward would force a complete redesign of the package shelf, including re-packaging of the existing package shelf components as well as moving the reinforcements. FCA said that if speakers or modules must be relocated to the door or the trunk changes to these components would also be necessary, including side impact countermeasures, door electrical wire harnesses, and interior trim modifications. The Alliance added that many passenger cars with tether anchorages located in the package shelf behind the seat will not meet the proposed 165 mm minimum wrap around distance,[90] even though the anchorages are easy to use.

Many vehicle manufacturers, the Alliance, and Global stated that tether anchorage distance and CRS hardware incompatibility should be addressed in FMVSS No. 213 by limiting the size of the tether hook and other CRS attachment hardware.[91] Some vehicle manufacturers and the Alliance provided data on the sizes of tether hooks and hardware in stating that the lack of uniformity in CRS attachment hardware and its mounting location on the CRS point to the actual source of the compatibility issue, rather than the vehicle ''swing zone'' behind the seatback or head restraint. Hyundai stated that tight installations can be achieved even with vehicles that have less than the proposed 165 mm (6.5 inches) distance, with a CRS tether hardware and strap measuring 170 mm (6.7 inches).

The Alliance and Toyota identified potential problems with applying the proposed procedure to certain vehicles regarding the definition of the point SB. They presented a case for some head restraints where the torso reference plane may not intersect the strap wrap around line. Therefore, for this type of head restraint, the reference point SB does not exist. The Alliance and Toyota also presented a case in which the reference point SB cannot be defined when the seatback angle is larger than the torso angle.

Toyota requested that NHTSA develop a repeatable and feasible requirement regarding the distance from the tether anchorage to the DSP. Toyota suggested that because the existence of reference point SB is dependent on the rearmost point of the seat, which can vary dramatically based on seat design, one potential method to solve this issue would be to develop a new tool to measure the distance of 165 mm from the tether anchorage instead of using the concept of reference point SB.

Several commenters also suggested an alternative way of defining a clearance zone. FCA recommended a general redefinition of the reference point SB without providing a suggested definition. The Alliance opined that the proposed minimum wraparound distance, measured from point SB, is unnecessarily stringent and does not take current CRS installation practices into account. The Alliance and Honda recommended that a point farther forward in the vehicle DSP, representing a tether attachment point on a child restraint, would provide a more practicable reference point for this measurement.

Britax stated that mandating a minimal vehicle interior distance should facilitate better tether

[89] The rearmost point of the seat includes the head restraint if one is present. The V-point represents a low-mounted tether strap on a CRS and the W-point represents a high-mounted tether strap on a CRS.

[90] The term wrap around distance is a distance measurement made using a flexible tape measure. One end of the tape is held at a defined point, the tape is wrapped around desired structures, and held taut at a second defined point.

[91] The NPRM proposed to limit the tether hook and hardware to 165 mm (6.5 in).

installation, particularly in sedan vehicles with rear windows close to rear seatbacks. Britax anecdotally noted it has experienced situations where the distance between the vehicle seat and tether anchorage would not permit proper tether attachment and tightening. UMTRI supported the implementation of a 165-mm clearance around the tether anchorage in vehicles and the regulation of a maximum adjusted length of the tether attachment hardware to 165 mm to improve compatibility. UMTRI noted that these recommendations were based on usability testing of CRS with a single strap tether.

Post NPRM Research

UMTRI Research

After carefully reviewing comments that raised concerns over the proposed 165 mm tether anchorage clearance criterion, the agency determined that it was appropriate to task UMTRI with conducting a study [92] to: (1) define an alternate reference point to the proposed SB point that would be more practical, (2) ensure that the requirements do not interfere with Australian Design Rule (ADR) 34/2,[93] (3) estimate the number of vehicles that may need modification to meet clearance criteria based on the proposed and alternative reference points, and (4) evaluate alternative ways of ensuring tether tightness.

In carrying out its study UMTRI used two data sets to estimate the proportion of vehicles that would meet the proposed 165-mm clearance criteria. First, UMTRI surveyed 60 top selling 2012–2013 MY vehicles to collect data on each vehicle's tether anchorage location, head restraint characteristics, and tether routing path. UMTRI used a rigid 165-mm gauge with tether hook to evaluate whether the tether anchorage location met the proposed criteria. This data set showed that 21 of the surveyed vehicles had tether anchorages on the rear package shelf. Eighteen of these vehicles were sedans and three were pickup trucks. Of the sedans, only one met the proposed criteria. For the 17 sedans that did not meet the NPRM's proposed criteria, routing the tether over the head restraint improved access to the tether hardware.

UMTRI surveyed photos of the 21 vehicles with a tether in a package shelf to evaluate potential barriers in moving the tether anchorages. About half of the vehicles had no visible barriers at outboard seating positions, two vehicles had potential for interference from rear window glazing during installation, and the remaining vehicles had speakers in the way. The center seating position in 5 vehicles had rear defroster structures that may be in the way of relocation.

The second data set used a survey of 98 top selling 2010–2011 MY vehicles. The tether anchorage location was measured for these vehicles via wraparound distance relative to an estimated shoulder reference point. These surveys collected photos that helped identify structures that would hinder any tether anchorage relocation if the 165 mm criterion was not met. Data from the 98 vehicle-dataset showed that 44 percent of vehicles with the tether anchorage on the seatback would meet the 165 mm criterion. Of the 35 vehicles with the tether anchorages located in the package shelf of the outboard seating position, 24 percent would not meet the 165 mm criterion, but could improve usability if the tether was routed over the head restraint.

UMTRI then developed an alternate reference zone using established reference points such as the H-point (hip point) and the R-point (shoulder point) using 21 vehicles (MY2010–2014) scanned by UMTRI during previous projects.[94] A circle with a 325 millimeter radius centered on the R-point and truncated 230 mm below its center was used to create the limits of the allowed tether anchorage zone.

UMTRI evaluated 11 SUVs and trucks in the scanned vehicle dataset [95] that had an upper seatback tether anchorage location. To avoid conflicts with the IIHS usability rating criteria [96] the circle was truncated at 230 mm below the R-point. Doing so allowed for the tether anchorage to be located far enough to ensure tightness while not conflicting with IIHS usability rating criteria.

UMTRI evaluated the proposed and alternative tether anchorage clearance criteria against 20 of the 21 [97] scanned vehicles (MY2010–2014) to determine whether vehicles met the proposed distance criteria and quantify the distance a tether anchorage would have to be relocated if that vehicle did not meet the proposed or alternative criteria. Results were mixed.[98] Eleven models met both criteria. Four failed both criteria but using the alternative criterion the tether anchorage relocation distance was shorter than for the 165 mm clearance criterion. Two passed the alternative criterion but failed the 165 mm criterion. Two vehicles with tether anchorages in the upper seatback (and not the package shelf) passed the 165 mm criterion but failed the alternative criterion. For these two vehicles, tightening the tether was difficult for installing some child restraints. The tether anchorages for these two vehicles would need to be moved 1–2 mm lower to meet the 325 mm truncated sphere zone, which would also permit tightening the tether.

UMTRI also performed in-vehicle evaluations for both tether anchorage clearance criteria on 10 vehicles (MY 2004–2014).[99] For this set of vehicles UMTRI found that three vehicles failed both criteria, while seven met both criteria. Of the three vehicles that failed both criteria, the distance to move the tether anchorages to meet the alternative criterion was shorter than that for meeting the proposed criterion in two vehicles.

In its review of the two vehicle surveys UMTRI found that about one-third of vehicles had tether anchorages located on the package shelf and that the majority did not meet the 165-mm criteria if the tether strap was specified for routing under the head restraint. However, UMTRI found that in most of these vehicles routing the tether strap over the head restraint provided good access to the tether adjuster hardware.

VRTC Research

Following review of the UMTRI study, VRTC evaluated the alternative criterion (zone based on a 325 mm circle centered on the R-point), the proposed 165 mm clearance distance, and the

[92] Klinich, K.D., Boyle, K., Orton, N.R., Manary, M.A., & Ebert, S. (2016, January). *Investigation of clearance criterion between tether anchor and head restraint.* Ann Arbor: University of Michigan Transportation Research Institute. Report will be docketed alongside this final rule.

[93] ADR 34 Link: *https://ablis.business.gov.au/service/vic/australian-design-rule-adr-34-child-restraint-anchorages-and-child-restraint-anchor-fittings/24383.* This standard specifies a clearance around the tether anchorage to enable access and attachment of the tether hook to the anchorage.

[94] *See* Table 1 in the report titled ''Investigation of clearance criterion between tether anchor and head restraint'' by UMTRI. Report will be docketed along this final rule.

[95] The other 10 vehicles were sedans.

[96] IIHS LATCH usability rating considers tether anchorages located in the top 85 percent of the seat back as ''good.'' The IIHS LATCH Usability Rating Guidelines can be found here: *www.iihs.org/media/8f828313-d122-4d27-a3b0-f2b8ec60065d/wOdYVA/Ratings/Protocols/current/LATCH_rating_guidelines.pdf* (last accessed 4–16–2024).

[97] The Ford F150 was not evaluated, as pickup trucks have different geometry.

[98] *See* Table 1 in UMTRI's report for detailed results. Klinich, K.D., Boyle, K., Orton, N.R., Manary, M.A., & Ebert, S. (2016, January). *Investigation of clearance criterion between tether anchor and head restraint* (Report No. UMTRI–2016–4). Ann Arbor: University of Michigan Transportation Research Institute. Report will be docketed along with this final rule.

[99] *See* Table 2 in UMTRI's report for detailed results. Klinich, K.D., Boyle, K., Orton, N.R., Manary, M.A., & Ebert, S. (2016, January). *Investigation of clearance criterion between tether anchor and head restraint* (Report No. UMTRI–2016–4). Ann Arbor: University of Michigan Transportation Research Institute. Report will be docketed along with this final rule.

lengths of CRS tether hardware.[100] VRTC measured six vehicles with various tether anchorage locations in the rear driver side position and rear center position.

Tether Anchorage Measurements

The VRTC Tether Anchorage Measurement results were similar to those found by UMTRI (*see* Table 2). The six vehicles' seating positions with package shelf tether anchorages failed the proposed 165 mm distance. Only two of those six tether anchorages failed the alternative criterion. Of the two vehicles that failed both criteria, the needed relocation distance of the tether anchorage to meet the criteria was smaller for the alternative criterion than the proposed criterion. All seating positions with the tether anchorage on the seatback or roof passed both criteria.

TABLE 2—VRTC TETHER ANCHORAGE VEHICLE SURVEY RESULTS

Vehicle			Tether location		325 mm zone (mm)	165 mm tether distance (mm)
Year	Make	Model	Rear driver position (RDP)	Rear center position (RCP)		
2010 Ford Taurus			Package Shelf		384	*149*
				Package Shelf	436	*141*
2011 Cadillac CTS			Package Shelf		*294*	*68*
				Package Shelf	409	*74*
2016 Toyota Sienna			Seatback		742	757
				N/A	N/A	N/A
2011 Hyundai Sonata			Package Shelf		*308*	*75*
				Package Shelf	365	*65*
2016 Chevrolet Tahoe			Seatback		625	657
				Seat Back	628	637
2016 Nissan Rogue			Seatback		433	469
				Roof	630	460

VRTC found one of the six vehicles' tether anchorages was off-center for its designated seating position. VRTC used a FARO arm[101] to plot the desired points into a 2D circle diagram. Due to the offset, measurements for that tether anchorage do not correctly capture the depth distance. Therefore, VRTC used a 325 mm sphere (truncated at the bottom) instead of a two-dimensional circle to define the 325 mm zone (*see* figure 4).

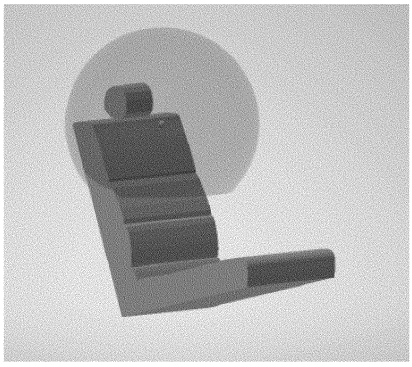


Figure 4. Three-Dimensional 325 mm Zone.

CRS Hardware Measurements

VRTC also measured the tether hardware length of twenty CRSs. The longest tether strap hardware was 190 mm. The shortest was 83 mm. Sixteen of the twenty tether hardware were less than 165 mm in length.

CRS Installation on Vehicles

VRTC completed CRS installations to verify that a vehicle with a 165-mm tether anchorage distance measurement would allow for proper installation of a CRS with a tether hardware length of 165 mm. The CRS selected was an Evenflo Triumph with a tether hardware length of 164 mm. Two vehicles with short distances (close to the 165 mm proposed minimum distance) to the tether anchorage were selected for this portion of the study. The 2010 Ford Taurus (RDP), which had a 149-mm

[100] Wietholter, K., & Smith, J. (2019, November). Evaluation of tether anchor zones for FMVSS No. 225 (Report No. DOT HS 812 842). Washington, DC: National Highway Traffic Safety Administration. Report will be docketed along with this final rule.

[101] A FARO arm is a portable coordinate measuring machine that measures the location of a probe in a 3D space.

tether anchorage distance measurement, was closer to 165 mm than the other selected vehicle. The 2011 Cadillac CTS (RCP) had one of the smaller tether anchorage distance measurements of 74 mm and an odd seat shape. Both the 2010 Ford Taurus (RDP) and 2011 Cadillac CTS (RCP) positions passed the UMTRI alternative criterion based on the 325-millimeter circle centered on the R-point.

Because the 2010 Ford Taurus (RDP) had a tether anchorage distance measurement from the proposed SB point of less than 165 mm, the study anticipated that the tightening of the tether would be difficult. However, the vehicle owner's manual included instructions to install the CRS using the tether attachment by routing it under the head restraint. Since the head restraint was adjustable, no difficulties were experienced when tightening the tether. This result suggests that the tether anchorage distance measurement, defined as the distance from the tether anchorage to the rearmost point on the seat (SB point), does not account for the ease of installation when the head restraint is raised or removed for CRS installation.

Further, since the tether anchorage distance from the SB point for the 2011 Cadillac CTS (RCP) was only 74 mm (significantly lower than the proposed 165 mm), NHTSA expected that the tether would be difficult to tighten when installing a CRS in this seating position. However, installation was not difficult because of the lack of head restraint. Specifically, the seatback cushion in the Cadillac was thick, which allowed enough space between the tether anchorage and the CRS for the tightening of the hardware. For the 2011 Cadillac CTS (RDP), the vehicle owner's manual specified that the CRS tether attachment should be routed over the fixed head restraint, which permitted easy tightening of the tether attachment. If a vehicle with similar spacing had an adjustable head restraint and specified routing under the head restraint in the vehicle owner's manual, it would have been difficult to tighten the tether attachment because the tether attachment hardware would be underneath the head restraint. This finding indicates that ease of installation can be improved with vehicle owner's manual instructions and not just measurement requirements.

Agency Response

After carefully considering comments received and reviewing the results of the UMTRI and VRTC studies, this final rule is implementing a 325 mm radius sphere zone (from R point, with truncation) instead of the NPRM's proposed 165-mm distance from the tether anchorage to the back of the seatback. The decision to adopt the alternative 325 mm zone resolves noted issues in defining the SB point for the 165-mm distance, because the R-point, already defined in the standard, is used in the alternative 325 mm radius sphere zone to define the center of the sphere. Therefore, NHTSA will adopt a 325 mm radius sphere zone (from R-point, with truncation) to define the allowable area for the tether anchorages.

Some commenters, including Honda, Alliance, Ford, and FCA, expressed concern for the expensive tooling costs needed to relocate the tether anchorages. However, the modified requirements adopted by this final rule will minimize or eliminate the number of vehicles that need tooling changes to relocate the tether anchorages, greatly reducing any projected tooling costs.

NHTSA acknowledges Honda's suggestion that the required minimum distance of the tether anchorage should be from a point simulating the attachment of the tether strap on the CRS to the tether anchorage, rather than the SB point. However, the current specifications of the tether anchorage location in FMVSS No. 225 are with respect to the W-point, which is approximately the tether strap attachment point on the CRS. Additionally, this final rule's requirements specify a minimum distance of the tether anchorage with respect to the R-point, which was found to be sufficient for correctly installing and tightening the tether of CRSs. This final rule's adopted approach achieves the goal of improving usability in a practicable manner without imposing design restrictions and undue cost and redesign.

Finally, NHTSA is providing a longer lead time (discussed in detail below) to minimize any costly design changes borne by manufacturers to move tether anchorage locations during the mid-lifecycle of their vehicles.

Comments on Backlight Interference

Several commenters, including FCA, the Alliance, and Hyundai, raised concerns that moving the tether anchorage rearward will likely interfere with the backlight during child restraint tether hook attachment and detachment. FCA noted that the slope of the back glass may need to be changed to alleviate the interference condition. FCA further stated that all of its current tether anchorages are harmonized worldwide and that, if NHTSA mandates relocating the tether anchorage rearward, its vehicles may no longer meet the requirements of ADR34,[102] which governs child restraint anchorages for vehicles sold in Australia. FCA stated that ADR 34.6 requires accessibility to engage an attaching clip and a clearance zone around the tether anchorage. FCA stated that, in the worst-case event, two designs for the package shelf might be necessary, which would increase the overall vehicle cost in all markets. The Alliance stated that the proposed requirement's forced relocation of tether anchorages rearward in the vehicle would result in less hand clearance to the vehicle backlight for attaching and detaching the tether hook.

Agency Response

With this final rule's adoption of the aforementioned changes in determining the allowable tether anchorage zone, any cases where the tether anchorage is pushed back towards the rear window, causing potential conflict with the ADR, will be minimized or eliminated. However, UMTRI's evaluations of the updated measurement showed a small portion of vehicles would still experience conflict based on the requirements of this final rule, so some vehicle designs would have to find alternative locations or design to meet both ADR 34 requirements and FMVSS No. 225 requirements. To the extent doing so is required, the extended lead time and phase-in period provided by this final rule should help to alleviate cost and design burdens to manufacturers.

Comments on Head Restraints and Routing of Tether

The Alliance suggested that the tether anchorage location requirements relative to the back of the seat or head restraint should not apply to vehicle seating positions (1) without a head restraint, (2) with a head restraint that is removed for child restraint installation, or (3) when the vehicle manufacturer specifies that the tether strap is to be routed over or around the head restraint. Similarly, Global commented that the tether anchorage location requirements should not apply to seats having adjustable or removable

[102] Australian Design Rule 34. The stated function of this Australian Design Rule is to specify requirements for ''Child Restraint Anchorages' and 'Child Restraint Anchor Fittings' which provide for the connection of standard 'Attaching Clips' so that 'Child Restraints' may be adequately secured to the vehicle. It specifies a standard package of fitting hardware and accessibility requirements to facilitate correct installation and interchangeability of 'Child Restraints'. *www.infrastructure.gov.au/infrastructure-transport-vehicles/vehicles/vehicle-design-regulation/australian-design-rules/third-edition.* Last accessed November 4, 2024.

head restraints, since such head restraints can be adjusted or removed to allow sufficient space for tether adjustment. Global agreed that the distance criterion might be applied to certain seats having a fixed head restraint, where there is no space between the head restraint and the seat top to enable tightening of the tether strap.

Agency Response

Following careful consideration, this final rule requires vehicles with adjustable/removable head restraints and no head restraints to locate the tether anchorages beyond the 325 mm truncated sphere from the R point to ensure tethers can be easily tightened. The agency disagrees with the Alliance's recommendation that the tether anchorage location requirement behind the seat should not apply to DSPs with no head restraints and removable head restraints. Vehicles in this category could run the risk of having the tether anchorage too close to the CRS, preventing a tight tether installation. While the tether could be routed over the adjustable/removable head restraint, thereby increasing the wraparound distance to the tether anchorage and removing interferences for tightening the tether strap, most manufacturer instructions specify routing the tether strap under the adjustable/removable head restraint. Routing the tether under the head restraint provides the shortest path from the tether anchorage to the CRS, which may have some benefits during a crash (less webbing length results in less stretch). Routing the tether under the head restraint may also offer improved CRS performance in far side impact scenarios as tether routings over the head restraint sometimes slip to the side of the head restraint, allowing for more side excursion. In addition, because some head restraints that protrude or tilt to the front at times interfere with the installation of the CRS, it is typically advised to remove or move the head restraint to a higher position to eliminate this interference. Because adjustable/removable head restraints are likely to be used with a tether routed under the head restraint (for adjustable head restraints), it is important to have the tether anchorage beyond the 325 mm truncated sphere from the R point to ensure tethers can be easily tightened.

In contrast with the Alliance's recommendation, Global suggested that the requirement for the tether anchorage location behind the seat should only apply to DSPs with fixed head restraints. We disagree. As fixed head restraint seating positions do not have any elements that interfere with the installation and tightening of the tether, the agency believes these seating positions should be excluded from the tether anchorage location requirements to ensure there is sufficient space to tighten the tether. Additionally, seating positions with fixed head restraints where the tethers are routed over the restraints increase the wraparound distance from the CRS to the tether anchorages, so they are less likely to prevent tightening of the tether due to limited distance. Finally, there is no interference of the head restraint to route and tighten the tether for seats with fixed head restraints. For these reasons, this final rule excludes DSPs with fixed head restraints from the tether anchorage location requirements.

Comments on Tether Anchorage Location and Pass-Through Door

The Alliance expressed concerns with relocating the center tether anchorage as proposed in the NPRM in relation to a specific design featuring a tether anchorage installed above a luggage compartment pass-through door.[103] The Alliance stated that the proposed minimum wraparound distance would necessitate a tether anchorage position lower on the seatback. The Alliance explained that to accommodate this revised tether anchor position, the size of the pass-through door/opening to the luggage compartment would need to be smaller, thereby significantly limiting its usefulness. The Alliance stated it is not practicable to locate the tether anchorage on the pass-through door because the door lacks the structural strength to meet FMVSS No. 225's tether anchorage strength requirements. The Alliance recommended that the center seating position should thus be exempted from the minimum tether anchorage distance requirement relative to the SB point.

Agency Response

The modified requirements adopted by this final rule will minimize or eliminate the tooling costs that would be necessary to relocate the tether anchorages, and will minimize or eliminate cases where the tether anchorage location could interfere with the position of a pass-through on a center seat (if the tether anchorage cannot be located elsewhere). If a tether anchorage can't be located towards the top of the seat within the new requirements because of a pass-through opening, the tether anchorage could instead be located lower in the seat where a tether strap would go over the pass-through opening area. This scenario would not interfere with the function of the pass-through door because it would not be used when a CRS is installed in the center seating position. As such, the agency is declining to adopt the proposed exemption.

Comments on the Need for Vehicle Manual Information

SRN stated that head restraints present a significant impediment to tethering the CRS in many vehicles and recommended that FMVSS No. 225 require vehicle manuals to provide specific instruction for the proper routing of the tether *vis a vis* the head restraint, along with clear guidance for how to adjust the head restraint to achieve proper routing when necessary. SRN explained that because tethers come in two styles that affect routing (two-point and three-point), instructions should be required to address these differences. SRN also stated that instructions calling for the removal of the head restraint should clarify whether the head restraint can be reattached once the tether is attached, or, if not, where the head restraint should be safely stored. SRN stated that some vehicle owner's manuals have improved these types of instructions over the years, but that this improvement is far from consistent. SRN also stated that in some cases, cargo covers, dog gates, and other accessories supplied by the vehicle manufacturer impede the route of a tether to the tether anchorage. Based on these issues, SRN suggested that the manufacturer be required to provide clear tether routing instructions in the vehicle's manual.

Agency Response

The agency is declining SRN's suggestion to require tether routing instructions in vehicle manuals, as it falls outside scope of the proposed requirements in the NPRM and this rulemaking. NHTSA may consider the addition of instructions for tether routing in vehicle owners' manuals at a later date.

Comments on the Length of the Minimum Distance to the Tether Anchorage and Maximum Length of the Tether Hardware

SRN supported efforts to match up the distance from the child restraint to the tether anchorage and a maximum length of the tether hardware (the hook + adjuster). However, SRN expressed concern that by specifying 6.5 inches as

[103] Shown in figure 16 of the Alliance's submitted comments. Link: *www.regulations.gov/comment/NHTSA–2014–0123–0027*.

both the minimum for the distance from the child restraint to the vehicle's tether anchorage and a maximum for the very shortest tether length, it will continue to be difficult to properly tighten the tether when both the CRS and vehicle meet (but do not exceed) the standard. SRN stated that the minimum distance to the tether anchorage should be at least a half inch (or more) greater than the maximum-allowed fixed length of the tether anchorage for the solution to be effective in all situations (for example, the shortest length for the tether hook and adjuster could be a maximum of 6 inches and the tether anchorage distance no less than 6.5 inches).

Agency Response

SRN commented that having the same 165 mm distance as the requirement to both the tether anchorage distance and the tether hardware length does not ensure proper tightening of the tether, commenting that the minimum distance of the tether anchorage needs to be at least a half inch (or more) greater than the maximum allowed fixed length of the tether hardware for the solution to be effective. As the final rule requirements for tether anchorage location have been modified from those proposed in the NPRM, SRN's suggestion no longer applies to this final rule.

In support of the modifications adopted in this final rule, during the VRTC CRS hardware survey, only 4 of the 20 CRSs had hardware exceeding the 165 mm limit. This finding supports NHTSA's decision to adopt a tether hardware length requirement of 165 mm or less as proposed, as most CRSs already comply with this length. Any changes needed to the tether hardware design in CRSs that currently do not meet this length should not be burdensome, as there are many tether hardware designs available that meet the requirement. Further, this requirement will help address the Alliance and FCA's suggestions to promote CRS uniformity.

Comments on Requiring Tether Anchorages To Be Close to the Proposed 165 mm Requirement

ARCCA commented that NHTSA's assessment of tether anchorage locations appeared to only consider the tether's effectiveness in frontal crashes. ARCCA stated that side impact crashes can result in a similar number of injuries and fatalities as frontal crashes, and that they should be given equal consideration. ARCCA explained that the tether is most effective in frontal crashes, and that a tether also reduces the amount of roll that a forward-facing CRS experiences when the tether length is sufficiently limited. ARCCA added that its own sled testing and quasi-static load testing indicate that the longer the tether, the more the CRS can roll towards the impact during a side impact, and that an increased CRS roll results in increased lateral head excursion. ARCCA explained that this increased head excursion results in increased head impact injuries, the most frequent mechanism of serious injury. For these reasons, ARCCA recommended that tether anchorage locations should be limited to the package shelf and the back of the vehicle seat, and as close to the proposed 165 mm (6.5-inch) minimum as possible. Alternatively, ARCCA recommended that when the distance of the tether anchorage exceeds the 165 mm (6.5-inch) minimum, a tether guide should be provided at the back top of the seatback that has sufficient strength to maintain the tether within the guide during side impact crashes.

Agency Response

This final rule will not reduce the allowable tether anchorage zone to distances close to 165 mm from the SB point as possible, as suggested by ARCCA, because doing so would greatly reduce the allowable tether zone in the standard and may not be feasible in some vehicle designs.

ARCCA's suggested proposal to include a tether guide is not within the scope of this rulemaking, and will thus not be addressed, as it was not proposed in the NPRM and NHTSA does not have any data on tether guides to aid in side impact crashes.

Requests for Clarification

Global requested clarification of the following:

- Which portion of the routing device will be the reference position for the 165-mm distance measurement?
- How much force is to be applied on the strap when making the measurement?

Agency Response

As the agency is not adopting the 165 mm distance from the SB point to the tether anchor, these requested clarifications are moot and need not be addressed, as they do not relate to requirements of this final rule.

2. Tether Hardware Restrictions

To improve compatibility between vehicles and CRSs, NHTSA proposed to amend FMVSS No. 213 to require that the tether hardware assembly (consisting of the tether hook and hardware to tighten and loosen the tether strap) be no longer than 165 mm (6.5 in). NHTSA proposed this limit so that all CRS tether straps can be tightened given the minimum tether anchorage distance from the SB reference point. NHTSA stated that limiting the length of the tether hardware assembly would not be overly burdensome for CRS manufacturers, since the assembly consists of simple parts.

General Comments

The Alliance and FCA opined that the tether anchorage distance and CRS hardware incompatibility is better addressed through the introduction of design rules for the attachment hardware in FMVSS No. 213. The Alliance stated that a survey of 16 child restraints manufactured between 2003 and 2014 found that attachment hardware lengths varied from 120.6 to 171.4 mm (4.75 to 6.75 inches) in length, tether hooks alone varied from 60.3 to 63.5 mm (2.375 to 2.5 inches) in length, and adjuster assemblies varied in both length and circumference (from 120.6 to 196.8 mm (4.75 to 7.75 inches) in circumference). The Alliance stated that the lack of uniformity in CRS attachment hardware and its mounting location on the CRS points to the actual source of the compatibility issue, rather than the vehicle ''swing zone'' behind the seatback or head restraint. Similarly, Hyundai presented a 12 CRS hardware length survey that found a range between 140 to 185 mm (5.5 to 7.3 inches). Hyundai stated that limiting the length of the tether hardware assembly would not be overly burdensome for CRS manufacturers, since that assembly consists of simple parts.

Britax recommended against adopting restrictive dimensional requirements for tether hardware length (165 mm), as it might prevent advancement in tether technologies, and against requiring child restraint manufacturers to modify current tether hardware design. Instead, Britax recommended that child restraint manufacturers simply provide compatible tether hardware as the vehicle tether anchorage dimensions are standardized.

Agency Decision

This final rule adopts a tether hardware length requirement of 165 mm or less as proposed by the NPRM. Most CRSs already comply with this length and changing the tether hardware design in CRSs that currently do not meet this requirement should not be burdensome, as there are many tether hardware designs available that can meet the requirement. Although Britax did not describe how a new tether

technology would not be able to comply with this requirement, any hardware design with a longer distance than 165 mm could prevent tight installations, and therefore, would not comply. Having this requirement will also address the Alliance and FCA's suggestion to promote CRS uniformity.

V-Shaped Tethers

Britax stated it has a patented tether technology which incorporates, in part, a V-shaped tether assembly. Britax stated that the V-shaped tether assembly would meet the proposed tether hardware length requirement. In contrast, UMTRI stated that for V-shaped tethers, the adjustment hardware is typically located a considerable distance from the tether hook, so these tethers may not be able to comply with the proposed requirement. UMTRI also stated that has had had difficulties tightening the V-shaped tether in some Britax CRSs.

Agency Decision

Unlike common tethers that are usually routed directly from the middle of the CRS back to the tether anchorage, a V-shaped tether is routed from the two CRS attachments near the side of the CRS back to the tether anchorage.[104] A V-shaped tether would most likely have a longer distance from each of the back/side attachment points to the tether anchorage and would not have a head restraint interfering during attachment, as it is routed on either side of the head restraint. Factors outside the scope of the proposed requirements on tether anchorage location and tether hardware length may be the cause of difficulties in tightening V-shaped tether anchorages. However, any potential solution is out of scope of this rulemaking and will thus not be addressed by this final rule.

c. Noticing the Tether Anchorages

1. Structures Covering Anchorages

The NPRM proposed to require that a tether anchorage must be in a location where the anchorage is accessible without the need to remove carpet or other vehicle components to access the anchorages. However, the NPRM proposed that a tether anchorage may be covered with a cap, flap, or cover, provided that the cap, flap, or cover is specifically designed to be opened, moved aside, or otherwise provide access to the anchorage. It must also be labeled with the ISO symbol indicating the presence of the tether anchorage underneath. The NPRM also proposed to require the anchorage to be accessible without the use of any tools, including the use of a screwdriver or coin.

Covered Tether Anchorages

Dr. Baer strongly disagreed with the provision allowing for the covering of tether anchorages with any cap/flap/cover, stating concerns that parents do not notice these covers, because vehicle manufacturers do a very good job of making the caps/flaps/covers blend in with their surroundings. Dr. Baer stated that aesthetics of the vehicle need to take a back seat to child safety, and that hiding of the CRAS has directly contributed to the failure of CRAS to reduce misuse rates in the population as a whole since so many parents never find the anchorages in their vehicles.

Agency Response

The agency disagrees that tether anchorage covers should not be allowed. Data from IIHS's study [105] shows that the package shelf is the tether anchorage location most widely used in the field. Tether anchorage covers are most commonly used in package shelf locations and are usually voluntarily labeled with the ISO tether symbol. Although IIHS data does not provide details on whether the tether anchorages in their study had covers or not, data in the IIHS study suggests that it is not detrimental to have a labeled cover on the tether anchorages.

Cargo Covers

The Alliance stated that many SUVs, CUVs, and station wagon-type vehicles are equipped with a luggage compartment cover. The Alliance stated that some of these cover designs must be removed when access to the tether anchorages is required, while others are retracted into their own housing.[106] The Alliance commented that the compartment cover removal does not require any special tools and is, in most cases, conducted with a simple twist, turn, and lift-up movement of the hardware. The Alliance added that in some hatch-back and coupe style vehicles, the package shelf may have to be moved/removed temporarily to facilitate accessing the tether anchorages on the vehicle seatback.[107]

The Alliance provided examples of a hatchback equipped with a lightweight removable security cover hinged near the seatback on one side and tethered to the rear hatch on the other side. The Alliance explained that the cover is designed to be easily removed to transport large cargo when the rear seat is folded flat and that the cover needs to be temporarily lifted or removed to attach the tether to the tether anchorage located on the vehicle structure. The Alliance added that removing the cover is not an impediment to tethering the CRS and the regulation should not prohibit manufacturers from providing the security the covers provide. The Alliance stated that because these compartment covers are easily removable and provide ready access to the anchorages, they do not qualify as vehicle components as provided under the proposed provision.

Global requested clarification on whether luggage room boards or covers that are readily movable to gain access to the tether anchorage are permitted under the proposal, and whether such covers must be labeled.

Agency Response

After careful consideration, this final rule allows cargo covers to be present if they do not need any tools for removal and are marked with a tether marking for each tether anchorage available (*i.e.,* if there are three tether anchorages available under the cargo cover, there should be three tether anchorage markings). As this cargo cover could be removed or relocated away from the actual tether anchorage, the anchorage must also be marked.[108] The agency considered not allowing the cargo cover feature, but the cargo cover is a component that consumers would want to use in most cases to hide the cargo whenever they do not need to access it from the rear seat. Also, because the cargo cover does not have sufficient structural strength to locate the tether anchorage on it, it would not be adequate for installing tether anchorages.

Tether Anchorages Located Under the Fabric With Slit

SRN expressed concerns about some tether anchorages located on vehicle seatbacks and hidden behind the seatback fabric. SRN explained that although a scored slit in the fabric is provided for this design (and in some cases, a tether anchorage marking may

[104] *See* details of attachment to the tether anchorage at *https://us.britax.com/why-britax/innovation/v-shaped-tether.*

[105] Jessica B. Cicchino, J.B., Jermakian, J.S. ''Vehicle Characteristics Associated with LATCH Use and Correct Use in Real-World Child Restraint Installations.'' April 2014.

[106] Illustration can be found on page 14 of Alliance comment submission in Docket No. NHTSA2014–0123–0027. Link: *www.regulations.gov/document/NHTSA-2014-0123-0027.*

[107] Illustration can be found on page 13 of Alliance comment submission in Docket No. NHTSA2014–0123–0027. Link: *www.regulations.gov/document/NHTSA-2014-0123-0027.*

[108] Marking requirements are discussed in a later section of this final rule.

even be nearby), it is consistently difficult for vehicle owners to recognize how to access these type of tether anchorages. SRN explained it is hard to see the slit in low light (such as in a garage) and bewildering to owners that they would be required to perform this step. SRN commented that, because this type of hidden tether anchorage technically could meet the requirements of the proposal, wording should be included in the standard that eliminates this design option and makes exposing the tether anchorage part of the factory assembly procedures.

Agency Response

In response to SRN's expressed concerns, the proposed requirements that ''allow a cap, flap or cover that is specifically designed to be opened, move aside or to otherwise give access to the anchorage'' would not permit such slit access (unless it stays open by itself) because it would not expose the tether anchorage without obstruction. However, in acknowledgement of this concern and to provide greater clarity and avoid any potential confusion, NHTSA is modifying this final rule's regulatory text to ''allow a cap, flap or cover that is specifically designed to be opened, move aside or to otherwise give *unobstructed* access to the anchorage'' to more explicitly rule out slit designs.

Tether Anchorages Under Cargo Floor

Dr. Baer and SRN also commented on tether anchorages located below the level of the cargo floor (*e.g.,* in the Toyota Prius V), explaining that when the second-row seating is rolled back to the regular passenger seating position, the seatback abuts the cargo area floor, and the tether anchorages are completely out of sight and inaccessible. SRN recommended that NHTSA address the problem of tether anchorages that are inaccessible in certain seating locations through an amendment to FMVSS No. 225.

Agency Response

The proposed requirement to have tether anchorages in a location available without the need to remove carpet or other vehicle components to access the anchorages (except for caps, flap or covers designed to provide access to the anchorage) adequately addresses the concerns raised over anchorages positioned below the level of the cargo floor.[109] The agency considers an interfering cargo floor as a vehicle component that is not providing access to the tether anchorage, and therefore not meeting the intent of this requirement. However, as discussed in the previous section, the agency will change the regulatory text to ''otherwise give *unobstructed* access to the anchorage'' to more explicitly rule out slit designs and obstructed anchorages below the cargo floor.

Tether Strap Over Cargo Area

Dr. Baer stated that other tether anchorage locations include the rear wall of the vehicle, which makes it impossible to put cargo in the trunk area with a tether strap crossing over the cargo area. Dr. Baer explained that when forced to decide between using a tether and having room for cargo, most parents will choose the cargo and leave the car seat untethered. Therefore, Dr. Baer disagreed with NHTSA's statement that ''those atypical locations do not appear to pose a safety problem.'' Dr. Baer added that while in the crash test lab a rear wall tether anchorage is fine, in the real world it isn't practical and simply doesn't get used.

Agency Response

Regarding Dr. Baer's comment on not allowing anchorages that interfere with cargo space, this is out of the scope of this rulemaking, as NHTSA did not propose any requirements on this topic or how to evaluate interference with cargo.

2. Elimination of the Option To Use a Tool or Coin To Remove the Anchorage Cover

The NPRM proposed that a tether anchorage must be in a location where the anchorage is accessible without the need to remove carpet or other vehicle components to access the anchorages. NHTSA also proposed the anchorage must be accessible without the use of any tools, including the use of a screwdriver or coin. NHTSA clarified that a tether anchorage may be covered with a cap, flap, or cover, provided that the cap, flap, or cover is specifically designed to be opened, moved aside, or otherwise provide access to the anchorage, and it must also be labeled with the ISO symbol indicting the presence of the tether anchorage underneath.

Comments

Advocates expressed support for improving the regulation regarding better access to tether anchorages, stating that currently tether anchorages must be accessible without the need of any tool except a screwdriver or coin and anchorages are frequently placed in a location requiring consumers to fold back a seat or remove camouflage coverings such as carpet, seat fabric, or a plastic cap. Advocates stated that eliminating the need to use a screwdriver or coin to access a tether anchorage is essential to make CRAS anchorages more user-friendly. Advocates stated that CRAS anchorages intended for use by consumers should be user-friendly, and their location should be readily apparent when needed.

Agency Response

The agency received no comments in opposition to the proposed requirement to require access to the tether anchorages without the use of tools, including a screwdriver and coin. As the agency received comments in support of this proposal and new vehicle models do not have tether anchorages that require a screwdriver or a coin to access them, eliminating this option is feasible, would incur no cost for vehicle manufacturers, and would prevent such designs from coming back into the fleet. As such, the agency is adopting the NPRM's proposal to require access to tether anchorages without the use of tools, including a screwdriver or coin. The agency will also adopt the NPRM's proposed requirement that the tether anchorages must be accessible without the need to remove carpet or other vehicle components to access the anchorage (other than marked caps, flaps, or covers specifically designed to be opened, moved aside, or to otherwise provide unobstructed access to the anchorages). Marked cargo covers will also be allowed as discussed in the previous section.

d. Recognizing the Tether Anchorages

1. Rigid Bar

Currently FMVSS No. 225 does not provide any material or dimensional requirements for tether anchorages, other than specifying that the tether anchorage must permit the attachment of a tether hook meeting the configuration and geometry specified in figure 11 of Standard No. 213. Most vehicle manufacturers use a metal bar design for the tether anchorage. These metal bars vary in cross section shape; some are round, and others are flat. However, a few pickup trucks and MPVs provide a webbing loop as the tether anchorage that can also be used as a router to loop the tether through it and attach to the tether anchorage in an adjacent seat. The webbing loop is so different from the conventional metal bar design that consumers have difficulty identifying them as a router

[109] *See www.cars.com/articles/2014/02/2014-land-rover-range-rover-sport-top-tether-trouble-/.*

and a tether anchorage.[110] Also, in some cases, the webbing anchorages need to be retrieved from another component such as a foldable carpet flap that runs across the back seat. In certain cases, the carpet flap needs to be folded back to find the webbing tether anchorage and then the webbing needs to be pulled out via an object such as a pencil.

To increase the ease-of-use of tether anchorages, NHTSA proposed amending FMVSS No. 225 to standardize the configuration of the tether anchorage such that it is a ''rigid bar of any cross-section shape.'' One of the main objectives of the proposal was to increase the standardization of CRAS features, to increase consumers' familiarity with the anchorage systems, and to increase the ease of using the systems, particularly when coupled with education efforts that provide a simple and uniform message. The NPRM stated its belief that having a standardized design for the tether anchorages such that they can be described as a ''rigid bar'' would help consumers easily recognize the anchorages in their vehicles and facilitate simplified and more effective messages in educational materials.

The NPRM requested comment on whether further standardization of the tether anchorage should be pursued to make the tether anchorage a more recognizable vehicle feature. The agency tentatively decided not to specify dimensions for the tether anchorage to give manufacturers some design flexibility in meeting FMVSS No. 225's strength requirements.

General Comments

Three commenters (UMTRI, Advocates, and Dr. Baer) supported the standardization of the tether anchorages to a rigid bar. UMTRI specifically supported prohibiting the use of webbing as a vehicle tether anchorage. Advocates commented that standardizing the tether anchorage will allow consumers to identify the device and understand its intended use more easily. Global supported NHTSA's approach in not specifying the dimensions of tether anchorages, as this would provide manufacturers design flexibility in meeting FMVSS No. 225 strength requirements. Some commenters, including CR, GM, the Alliance, FCA, and Global, expressed concern regarding eliminating the flexible anchorages in certain vehicles. These concerns will be discussed in detail in the following sections.

The Alliance stated that because the NPRM included the proposed requirement for marking all tether anchorages with standardized symbols, any further standardization is not necessary to make the anchorages more recognizable. The Alliance further stated that there is no data to substantiate that the proposed requirements standardizing the configuration of the tether anchorages will increase consumers' familiarity with the anchorage systems and will increase the ease of using the systems, aside from facilitating simplified messages in educational materials.

Agency Response

After careful consideration and review of comments received, NHTSA is adopting the proposed requirements for tether anchorages designs to be a ''rigid bar of any cross-section shape.'' However, this final rule allows for some exceptions to this provision, which are discussed in detail below.

2. Flexible Tether Anchorages for Pickup Trucks Versus Foldable Seats

Pickup Trucks

FCA commented that several proposed requirements within the NPRM present technical feasibility concerns for pick-up trucks, as the inherent architecture of a pick-up truck is such that the seats are located near the rear of the occupant compartment with a glass window directly behind the seat.[111] FCA explained that taken together, the proposals of the rigid bar requirement for tether anchorages, accessibility without folding the seatback, and the minimum distance of 165 mm from the reference point ''SB,'' make the technical feasibility of the design solution even more complex in pickup trucks, going against the goal of the NPRM. FCA also stated that the tentative design solutions to meet all the requirements proposed in the NPRM would not increase usability of tether anchorage and would add unnecessary cost and weight to the vehicles.

The Alliance stated that to meet the proposed requirements (rigid tether anchorage, no folding of seat to access the tether anchorage, and the minimum distance of 165 mm from the reference point ''SB'' to the tether anchorage), manufacturers would have to include seat tracks so that they can move the seat forward (instead of folding) to allow access to the tether anchorage. Alliance added that currently the standard allows for designs that provide a folding seat in the rear row of a pickup to provide access to the tether anchorages.

GM stated it uses flexible tether anchorages made with steel cable in conjunction with routers on many of its pickup truck models. GM and the Alliance explained that the need to use routers will increase if access to the tether anchor is no longer permitted by folding the seatback.

Agency Response

After reviewing comments received regarding the standardization of the tether anchorages as a rigid bar and the requirement for tether anchorages to be accessible without folding the seat, the agency believes flexible tether anchorages should be allowed in some types of vehicles. The agency acknowledges that permitting flexible tether anchorages in some vehicle types will not achieve the proposed standardization of tether anchorages, but believes the design challenges associated with adding tether anchorages on pickup trucks and other vehicles where the tether anchorage cannot be installed within the tether ''allowable zone'' in the required standard merits allowing these vehicles the option of having flexible tether anchorages (that can also be used as routing devices).

Using Flexible Tether Anchorages With Routers Versus Accessing Tether Anchorages Behind Seatback

CR expressed concern about the elimination of the adjacent routing option for tethers in pickup trucks. CR acknowledged that the adjacent loop method of attaching the tethers in pickup trucks is different and less intuitive than in most other vehicles; however, CR stated that based on evaluations of tether anchorage access in pickups prior to the availability of the adjacent routing technique, it was still a preferable alternative to some of the more hidden tether anchorage locations behind a folding seatback. CR stated these alternate locations create a unique imbalance when installing a forward-facing seat between holding the seat and accessing the tether anchorage.

Similarly, GM relayed feedback it received from child passenger safety technicians (CPST) regarding the flexible cable tether anchorage versus rigid anchorage located behind a folding seatback. Feedback received stated that while it may take some familiarity or consultation with the owner's manual,

[110] Klinich, K.D., Manary, M.A., Malik, L.A., Flannagan, C.A.C. ''Tether Anchors in Pickup Trucks: Assessing Usability, Labeling, and Performance'' November 2016. *https://deepblue.lib.umich.edu/bitstream/handle/2027.42/156027/UMTRI-2016-30.pdf?sequence=1&isAllowed=y.*

[111] Illustration can be found on page 10 of FCA's Appendix A submission in Docket No. NHTSA2014–0123–0025. Link: *www.regulations.gov/document/NHTSA-2014-0123-0025.*

once a user understands how to route and attach the tether using the flexible routers it is easier to do than it is to fold the seat forward to access a rigid anchorage on the back of the seat or cab wall, attach the tether, fold the seatback upright, and then install the CRS and tighten the tether strap. GM opined that it is no more complicated or confusing to attach the tether hook to a flexible cable-type anchorage than to a separate rigid anchorage in situations where use of a router is required.

FCA [112] submitted current designs with webbing straps, located behind each seating position, that serve as both the tether strap routing device and the tether anchorage. FCA explained that when a child restraint is installed in a seating position, the tether strap for the child restraint is routed through the routing device behind the seating position in which the child restraint is installed and the tether hook is then attached to the strap in the adjacent seating position. FCA stated that it provides clear installation instructions in the owner's manual to explain the correct child restraint installation procedure and that due to the flexibility of the strap on the vehicle, it is quite easy to attach the tether hook to the tether anchorage. FCA pointed out that due to the proposed NPRM requirement that the tether anchorage be a rigid bar, this design will no longer be allowed.

Agency Response

Following careful consideration of comments received, NHTSA agrees with CU, GM, and FCA that flexible tether anchorages that can also be used as routers are easier to use than tether anchorages located behind a folding seatback. While the tethering method of looping the tether strap through the routing device and attaching it to a tether anchorage (also a routing device) of an adjacent seating position is not intuitive at first, once the method is known it is easily understood and easily performed. Therefore, flexible tether anchorages will continue to be allowed in some vehicles.

Request To Allow Folding Seat To Access Tether Anchorage

Global requested that the agency allow the folding of seatbacks to access the tether anchorage in pickup trucks where no practical alternative exists to locate the tether anchorage.

The Alliance stated that packaging space in single row vehicles (discussed in the next section) and in pickup trucks is often limited and seats are often located near the rear of the occupant compartment. The Alliance added that locations for tether anchorages are regulated in the current FMVSS No. 225 and need to have suitable vehicle structure to manage the forces of the child restraint in a crash. The Alliance elaborated that one solution often found in sports coupes and pickup trucks is to locate the tether anchorage on the vehicle body where loads can be managed, behind the passenger seat.[113] The Alliance stated that access to the anchorage requires the seat to be moved or tilted forward to attach the tether hook to the anchorage and that once the hook is engaged, the seatback is moved backward to a locked position and the tether strap is tightened. The Alliance explained that, as currently proposed in the NPRM, the tether anchorages would likely need to be relocated to the vehicle's body and that the relocated anchorage would require the addition of a tether routing loop behind the head restraint.

Agency Response

The agency has decided not to allow seats to be folded to reach the tether anchorages in pickup trucks because it is more difficult to install a CRS using this method, as it may require an iterative installation process to achieve the desired tight installation. Pickup truck designs that require the vehicle seatback to be folded to access the tether anchorages can be modified to include flexible tether anchorages (that can be used as routing devices). Some of these pickup designs may already have enough structure to handle the tether loads if changed to a flexible tether anchorage design, although some may have to be reinforced.

Based on comments and inspections performed by the agency, pickup trucks that do not use the flexible tether anchor/routing device have a foldable seatback that allows access to a rigid tether anchorage in the seatback in the back wall or floor of the pickup. Additionally, in some pickup trucks, depending on the design of the CRS tether hardware, the hardware can prevent the seatback from latching, which could cause consumers to not use the tether at all.

While the agency acknowledges Global and the Alliance's comments that some pickup trucks should be permitted to have folding rear seats to access anchorages, as no practical alternative exists to locate them, we respectfully disagree with this view. Although certain pickup trucks may require some modifications to meet the requirements of this final rule, pickup trucks that have folding rear seats should be able to accommodate the routing/tether anchorage design. Further, this design should not interfere with vehicle models that have moving or foldable backs to access other elements such as storage or tools.

Reduced Rear Seat Space if Other Solutions Are Not Allowed

FCA stated that because the NPRM proposal does not allow for flexible tether anchorages and folding the seatback to access the tether anchorage space behind the seat, accessible tether anchorages would come at the expense of passenger space in the rear seat to meet the proposed requirements. FCA stated that reducing the space behind the front seat is counterproductive to the overall goal of fitting children in child restraints in the back seat of vehicles, including pickup trucks.

Agency Response

Since this final rule permits flexible anchorages and routers, manufacturers should not have to choose to include seat tracks to move the seat forward or to reduce the rear seat space to access the tether anchorage without folding the seatback. We agree that reducing the rear seat space to create an accessible tether anchorage would be counterproductive to helping fit CRSs in the rear seat.

Conflicts With FMVSS No. 202

FCA stated that other regulations such as FMVSS No. 202a can be in direct conflict with the changes proposed in the NPRM because they can impede the access to the tether anchorage even further.[114] FCA stated the proposed rigid bar requirement for tether anchorages, accessibility without folding the seatback, and the minimum distance of 165 mm from the reference point SB make the technical feasibility of the design solution even more complex, as the head restraint would block access to the rigid tether anchorage and the head restraint could not be folded, as the folding the seatback is assumed to not be allowed.

Agency Response

Continuing to allow the flexible anchorage with router design should

[112] Illustration can be found on page 13 of FCA's Appendix A submission in Docket No. NHTSA 2014–0123–0025. Link: *www.regulations.gov/document/NHTSA-2014-0123-0025.*

[113] Illustration can be found on page 11 of Alliance comment submission in Docket No. NHTSA2014–0123–0027. Link: *www.regulations.gov/document/NHTSA-2014-0123-0027.*

[114] Illustration can be found on page 12 of FCA's Appendix A submission in Docket No. NHTSA2014–0123–0025. Link: *www.regulations.gov/document/NHTSA-2014-0123-0025.*

eliminate the concerns expressed by FCA in relation to any potential conflict with the new tether location requirements (*see* section above VI.b.1), the restriction of folding the seatback to access the tether anchorage, and having to place the tether anchorages in locations that will allow tightening of the tether. The cost to implement the routing device/tether anchorage designs should be low, as most pickup trucks already have such designs. Further, per this final rule, flexible anchorages and routers will be allowed in vehicles where no part of the shaded tether anchorage zone in the standard is accessible without folding the seat or removing a seating component of the vehicle (per S6.2.1.1 of FMVSS No. 225). Head restraints will also be allowed to be moved/folded or removed to provide better access to the anchorages.

Conflicts With Canadian Standard

The Alliance stated that if NHTSA revised S6.2(b)(1) as proposed it would create a dilemma if CMVSS 210.1 is not similarly revised, since most or all manufacturers of these vehicles also sell these vehicles in Canada.

Agency Response

The requirements adopted by this final rule continue to allow flexible tether anchorages with routers for vehicles that cannot locate the tether anchorage in the ''allowed zone.'' Therefore, these requirements do not conflict with Canada's standard.

Labeling Instead of Vehicle Modifications

The Alliance recommended NHTSA require a label on the top/side of the seatback (facing toward the door) directing consumers to the presence of the tether anchorage behind the seatback to prevent costly vehicle modifications. The Alliance stated that this requirement would allow tether anchorages to remain in relatively accessible and expected locations in these vehicles.

Agency Response

NHTSA disagrees with the Alliance's suggestion to require a label on the seatback to direct consumers to the tether anchorage behind the seatback, as such a label would not solve the difficulties in tightening the tether when it is located behind the seat, or the inability to re-latch the seatback due to interference with certain CRS tether hardware. NHTSA also does not have information on the effectiveness of such a label, and it falls outside the scope of this rulemaking.

3. Single Row Vehicles

FCA stated that packaging space in single row vehicles is very limited, with seats often located near the rear of the occupant compartment. FCA explained that because the location for the tether anchorage needs to have a suitable structure to manage the forces in a collision, tether anchorages are often located on the structure behind the passenger seat. FCA added that access to such tether anchorage requires the seatback to be moved or tilted forward to attach the tether hook to the tether anchorage, and that once the hook is engaged, the seat is returned to its normal driving position and the tether strap is tightened.[115]

FCA described two of its single row vehicles, the Dodge Viper, and the Alpha 4C, which require the user to fold the front passenger seatback forward to gain access to the tether anchorage located on the vehicle structure directly behind the passenger seat. FCA stated there are limited engineering solutions available capable of withstanding the forces required by FMVSS No. 225 in both vehicles, and recommended NHTSA continue to allow the folding of the seatback to gain access to tether anchorages installed in single row vehicles.

Agency Response

NHTSA disagrees with FCA's expressed concern regarding access of tether anchorages for single row vehicles and this final rule will not permit the folding of the seatback to access the tether anchorage. Pickup trucks also have a challenging geometry and have been able to accommodate tether anchorages with routing devices. NHTSA acknowledges single row vehicles face similar challenges where no part of the shaded tether anchorage zone in the standard is accessible without removing a seating component of the vehicle or folding the seat-back forward. However, as discussed earlier in this section, vehicles with these characteristics will be allowed to accommodate routing devices to avoid folding the seatback to access the tether anchorages. CRS installation is easier using routing devices for attaching the tether-to-tether anchorages than CRS installation involving folding the seatback to access the tether anchorage, because such an installation would be an iterative process for tightening the tether or, depending on the CRS tether hardware design, could create a condition where the seatback cannot be re-latched, resulting in consumers not using the tether at all. As previously stated, this final rule will permit flexible anchorages and routers in vehicles where no part of the shaded tether anchorage zone in the standard is accessible without folding the seat or removing a seating component of the vehicle. Further, head restraints will be allowed to be moved/folded or removed to provide better access to the anchorages. This allowance should alleviate the aforementioned concerns raised by FCA.

4. Buses With a GVWR of 10,000 Pounds or Less

GM requested that buses under 10,000 pounds gross vehicle weight (*i.e.,* 12 and 15 passenger vans) be exempt from the requirement that the tether anchorages be a rigid bar. GM pointed out that school buses are already exempt altogether from requirements to provide any tether anchorages. GM explained that the 12–15 passenger van segment is a very small (much less than 1 percent of total market sales) specialized segment of vehicles which are typically driven by employees or individuals affiliated with a business or organization. GM provided figure 5 below showing the metal anchorage in these vehicles is attached to a flexible strap which is bolted to the lower seat structure. GM also noted that the seats in these vehicles have a single seatback shared by 3 or 4 seating positions and that these seats are already quite heavy and would become even heavier if additional structures were added to it to handle CRS tether loading. GM explained that today, as marked, these anchorages are readily recognizable and easy to use. GM recommended allowing flexible strap tether anchorages for bus applications.

[115] Illustration can be found on page 9 of FCA's Appendix A submission in Docket No. NHTSA2014–0123–0025. Link: *www.regulations.gov/document/NHTSA-2014-0123-0025.*

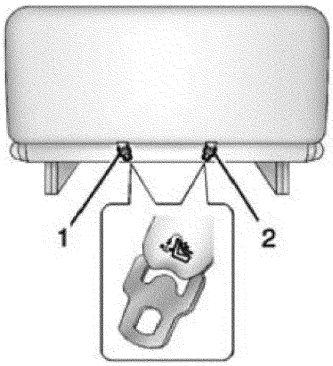


Figure 5. Chevrolet Express Tether Anchorage

Agency Response

NHTSA agrees that there is merit to GM's request to permit flexible tether anchorages on buses with a gross vehicle weight of 10,000 pounds or less. Requiring rigid anchorages in these types of vehicles may increase the weight of the vehicle when adding structures for the rigid anchorages. This is an important concern as vehicles are only required to provide 3 tether anchorages, and added weight might deter manufacturers from continuing to provide additional tether anchorages in these types of vehicles. The agency will therefore exclude buses with a GVWR of 10,000 pounds or less from the requirement for rigid tether anchorages.

VII. Conspicuity and Identification of Vehicle Anchorages and CRS Connectors

NHTSA proposed to amend FMVSS No. 225 to require all vehicles to bear the ISO standardized markings developed by ISO's voluntary standard near all lower anchorages and tether anchorages provided in the vehicle to improve the ease with which consumers find lower anchorages and tether anchorages in the vehicle. The agency also proposed requiring the same ISO markings on CRS lower anchorage connectors and on tether hooks. The agency proposed that the lower anchorage connector marks must be at least 9 mm (0.35 in) in diameter. Further, the NPRM proposed that the markings on the tether anchorage connector must be on the tether strap or a tag attached to the strap, and that the marking must be located within one inch of the tether hardware assembly (tether hook and adjustment hardware). The proposal also stipulated that the tether anchorage connector markings must be at least 8 mm (0.35 in) in height.

NHTSA also proposed that both vehicle and CRS manufacturers must include an explanation of the meaning of the markings in the vehicle manual to make consumers more aware of the existence of CRASs and to facilitate consumer education efforts by simplifying education messages. Currently, the ISO voluntary standard has two different tether anchorage symbols and under the agency's proposal CRS manufacturers and vehicle manufacturers would have the option of using either marking.

a. General Comments and Agency Responses

1. General Support for Markings and Manuals Requirements for Vehicle and CRSs

Several commenters expressed support for the proposed standardized ISO markings on all child restraint anchorages and the child restraint anchorage connectors. Two commenters, IIHS and Dorel, also stated they supported the proposed language requirements for the vehicle and child restraints manuals. IIHS and Dr. Baer agreed that the standardized symbols and presence of markings will help simplify educational messaging to parents.

Britax commented that consumers are reluctant to review vehicle owner's manuals to determine tether anchorage locations and that they have witnessed consumers attaching the tether to non-tether anchorage points. Britax further stated that making vehicle tether anchorages more visible and consistently marked should improve and encourage tether usage. Similarly, Advocates stated that a common error in properly installing a CRS is the attachment of the tether to a device that is in fact not a tether anchorage. Advocates explained that requiring a standard symbol at the location of each tether anchorage, regardless of whether the anchorage is visible, will assist consumers in not only properly installing a CRS but increasing awareness of the existence of these devices. Advocates commented that instituting uniformity in markings by requiring a standard symbol already used by the International Standardization Organization (ISO) and adopted by a majority of vehicle manufacturers will further assist consumers in identifying both the lower anchorages and tether anchorages.

Agency Response

Following review of comments received, the agency has decided to adopt the proposed lower anchorage and tether anchorage markings, as well as the proposed markings for CRS lower anchorage connectors and tethers. The agency received widespread support for the markings, although some commenters had concerns with the restrictive locations of the markings with respect to the anchorages, the symbols required, and some vehicles that have specific challenges such as pickups and hatchbacks that may have an open trunk. The following section further discusses the issues raised by the commenters regarding the proposed requirements for anchorage marking location and design, NHTSA's decision on the issues, and the final rule requirements.

2. Marking Contrast and Color Coding

IIHS and Dr. Baer supported the proposed improved labeling to identify tether anchorages but stated that a color contrast requirement for the label should be incorporated in the standard. IIHS stated that labeling itself was not associated with tether use in its study,[116] explaining that this result may be because the embossed labels that are

[116] Jermakian J.S., Klinich K.D., Orton N.R., Flannagan C.A.C., Manary M.A., Malik L.A., Narayanaswamy P. 2014. Factors affecting tether use and correct use in child restraint installations. *J Safety Res* 51:99–108.

frequently used are often difficult to see. Similarly, SRN and Dr. Baer stated that some tether anchorage markings currently in vehicles are extremely difficult to see, even in daylight conditions, because the marks are engraved into dark plastic. SRN stated that the tether anchorage markings will only accomplish the intended goal if they are easily visible.

Advocates stated that during the 2007 public meeting they urged NHTSA to require all tethers anchorages and lower anchorages to be conspicuously marked. Advocates added that the 2006 Decina study, *supra,* revealed that the majority of consumers who did not use lower anchorages (55 percent) reported that they did not use them partly because they could not find them or did not know where they were located in the vehicle. Advocates stated that while it would be optimal to have all persons who install add-on CRSs be fully acquainted with the FMVSS No. 225 CRAS, a portion (if not a majority) of the public will not be fully conversant and informed regarding the CRAS. Advocates stated that requiring anchorages and connectors that are color-coded or otherwise conspicuous, and that obviously match the CRS anchorages or connectors, is one way to provide intuitive cues that can lead to increased rates of proper installation even among those members of the public who are not fully conversant with technical details and requirements of FMVSS No. 225. Dr. Baer supported the markings on CRS lower connectors and tethers but suggested that vehicle and CRS manufacturers should be required to use a specific color on the symbol to help parents match the colors in addition to the symbol.

Graco requested clarification on (1) whether the proposed marking on the CRS lower anchorage and tether anchorage connectors can be embossed or engraved (*i.e.,* molded in plastic or stamped in steel), (2) whether the required markings can, but do not have to be, color contrasting, (3) whether the pictogram for lower anchorages can be on a tag or if it must be in the connector, and (4) whether the pictogram on figure 16 in the NPRM is permitted on an attached tag that is located 25 mm, measured from the shortest distance from the nearest edge of the pictogram, to the tether hardware. Dorel agreed that if the marking is on the tether strap or a tag attached to the strap, the marking must be located within one inch of the tether hardware assembly (tether hook and adjustment hardware).

Agency Response

NHTSA acknowledges the suggestion raised by several commenters that the proposed vehicle markings should have contrast or even color coding. However, the agency is declining to include color coding requirements in the markings for this final rule, as this specific issue is outside of the scope of this final rule since the NPRM did not propose any color contrast or color coding on the markings. Further, NHTSA does not have data on the incremental benefit of having contrast and/or color coding in the markings; this determination would require evaluation of whether contrast/color markings result in more correct installations than markings without color contrast. However, NHTSA encourages manufacturers to make the markings as visible as possible, including via contrast and/or color to further improve the usability of the equipment. Similarly, the CRS connectors will not be required, but will be allowed, to have color contrast.

For the markings on the CRS connectors, Graco requested clarification on whether the proposed marking on the CRS lower anchorage and tether anchorage connectors may be embossed or engraved (*i.e.,* molded in plastic or stamped in steel). The proposed FMVSS No. 225 does not have any requirements on how the marking is fabricated; therefore, molded plastic, stamped in steel, and other methods are allowed as long as the location and size of the required marking requirements are met. As certain methods of marking could be applied to webbing, manufacturers are reminded that component requirements of FMVSS No. 213, *e.g.,* webbing breaking strength,[117] are subject to compliance testing with the marking included, if it is present on the sample to be tested.

Further, although the proposal did not explicitly permit the lower anchorage connector mark to be on a tag, the option of having the marking on the connector itself or a tag located 25 mm (similar to the proposal for the tether anchorage connector tag) from the connector is beneficial, as some connectors (hook-type) may have more difficulties accommodating the symbol. As such, in response to Graco's comment, NHTSA is permitting the pictogram to be located on a tag that is 25 mm from the connector. This measurement will be made from the nearest part of the connector (plastic/metal part not webbing) to the tag with the tether symbol.

b. Lower Anchorage Marking Comments and Agency Responses

1. Lower Anchorages I-Size, ISOFIX and Other Text in Symbols

MEMA urged NHTSA to consider allowing the use of other existing marking designs used in ISOFIX and i-Size labels (figure 6), which are widely used in the industry in many markets. MEMA explained that consistency of markings is critical for its global company members that supply to global vehicle manufacturers. MEMA added that the small differences between the agency's proposed markings and those already in use would result in redesigning and changing component production to feature the different symbols, which adds cost and burden for manufacturers.

MEMA added that, depending on the overall design, the surrounding shape of the symbol may not always take the form of a circle or sphere. Although the agency did not propose any changes to the marking shape language in the current standard, MEMA suggested the agency consider permitting other shapes to enclose the symbol as the United Nations Economic Commission for Europe (ECE) regulations do permit ISO or iSize symbols/labels. Similarly, the Alliance stated that parts of ECE Regulation 44[118] are incorporated into the new UN R–129[119] with new size and functional performance criteria, and that the new CRS will be marked as i-size-ready. The Alliance explained that in order to guarantee the fitment of these CRSs in the vehicle, original equipment manufacturers must fulfill requirements in addition to those currently in ECE R14 and R16. The Alliance added that if seating positions fulfill the new i-Size option of ECE R14 and R16, they may be marked as an ''i-Size seating position'' with the i-size-symbol (square) replacing the ISO-symbol (round). MEMA urged NHTSA to clarify the marking location to allow the symbol to appear within other shapes, and to consider harmonization with ECE label requirements.

[117] FMVSS No. 209, S5.1.

[118] ECE R.44, ''Restraining devices for child occupants of power driven vehicles (Child restraint systems),'' *www.unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/2015/r44r3e.pdf.*

[119] ECE R.129, ''Uniform provisions concerning the approval of enhanced child restraint systems used on board vehicles (ECRS),'' *www.unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/2013/R129e.pdf.*

Figure 6. ISO and i-Size Symbols

MEMA added that NHTSA's proposed language appears to only allow for the use of a single symbol as depicted in the NPRM, which is a much narrower requirement than the current regulation that allows for words, symbols, and pictograms. MEMA raises this issue because the ISO standard symbol, in some cases, may include the term ''ISOFIX'' or ''i'' near the symbol. MEMA urged NHTSA to allow text to be either inside or adjacent to the ISO standard pictogram symbol (indicating such allowances in the notes associated with the attributed figure/symbol) and to consider harmonization with ECE label requirements.

The Alliance stated that one element of the i-Size option in European regulation (ECE R14 and R16) is the support leg installation assessment. The Alliance relayed that some rear-facing infant child restraints have introduced this feature and more, (including forward-facing restraints) may follow as the newly proposed FMVSS No. 213 side impact requirements [120] become effective. The Alliance stated that vehicle manufacturers have already received questions regarding the use of these types of seats for installation purposes and that a vehicle manufacturer could potentially indicate, with the placement of the new square symbol, that its floor design will uphold use of a support leg.

The Alliance added that when comparing both ISO and i-Size symbols, the i-Size symbol could even encourage the user to check the owner's manual since ''I,'' in general ISO terms, is the symbol for ''information.'' The Alliance suggested that as long as the symbol's meaning is explained in the owner's manual, either the ISO or i-Size symbols should be permitted to identify the lower anchorages in the vehicle.

Agency Response

MEMA and the Alliance requested allowing both the ''i-size'' marking and the ISO lower anchorage marking, as they are very similar (instead of a circle, the ''i-size'' marking is a rounded square and has a letter ''i'' in the marking), and that doing so would help harmonization efforts. The Alliance stated that if the vehicle had an ''i-size'' symbol the consumer would be able to recognize vehicles where they can use CRSs with support legs or that the ''i'' could be used as an ''information'' icon so that the consumer looks in the vehicle's manual.

Following careful consideration, this final rule does not allow for the use of the i-size marking. Since ''i-size'' requirements are not in U.S. standards, the U.S. cannot verify that anchorages marked with the ''i-size'' symbol meet the corresponding European ''i-size'' requirements. This means that NHTSA could not ensure that the vehicle would accommodate a CRS with a support leg. Further, the agency could not ensure that vehicle manufacturers would consistently use an ''i-size'' symbol only when vehicles do meet the European ''i-size'' requirements. NHTSA is also not persuaded that the ''i'' in ''i-size'' could be used as an information icon, which would be inconsistent with the meaning of ''i-size''.

This final rule does allow the term ''ISOFIX'' to be displayed near, but not instead of, the new required symbol. This is because the ISOFIX standard is more aligned with U.S. standards and the term has been used for the lower anchorages in the U.S. market for many years.

2. Lower Anchorage Markings Tolerances

MEMA stated that adding markings to visible lower anchorages may require trim design changes and redesign to meet the proposed requirements. MEMA commented that seat designs with a visible lower anchorage would not be able to accommodate a marking placed in the existing 50 mm zone. MEMA explained that because some seat designs have trim seams running vertically through the 50 mm zone, the button markings are offset from the seams, making it challenging to have the marking within the compliance zone.

MEMA added that other designs have the seat-cushion bight line within the marking zone, making it difficult to package the marking and meet the proposed dimensional capability. MEMA stated that the industry solution for this difficulty has been to make the lower anchorage wire visible.

MEMA stated the proposed requirement to add markings to visible lower anchorages may not have a safety implication, but might have a quality implication on the trim. Thus, MEMA urged NHTSA to reconsider the need to mark visible lower anchorage wires. In the alternative, at minimum, MEMA requested that NHTSA expand the compliance zone dimensions to accommodate seat trim design elements. MEMA recommended increasing the lower anchorages' vertical zone to 25 to 125 mm and the horizontal zone to ±50 mm from the centerline of the wire. MEMA stated that these increased tolerances will help marking visibility, keep the marking within compliance, and avoid potential redesign of seating function/design elements. MEMA also requested clarification on S9.5(a) of the current regulation, which reads: ''Above each bar installed pursuant to S4, the vehicle shall be permanently marked with a circle.'' MEMA asked for clarification on the ''above,'' as there are cases where the latch wires are positioned higher than at the seat bight, meaning that the label may not be situated above the latch wire, but in front of it.

SRN agreed with the proposals related to the ability to identify anchorages and recommended a requirement that the lower anchorage markings be placed on the vehicle seatback cushion in an area above the lower anchorages. SRN explained that this recommendation would allow for consistent usage verbiage to describe searching below the mark. SRN added that although nearly all current markings comply with this suggestion, there are exceptions in which the marking is placed below the lower anchorage bar on the vehicle seat cushion.

Agency Response

The agency disagrees that markings should not be required for visible anchorages, which would not accomplish the standardization the agency is seeking. The current standard allows for the marking of the lower anchorages to be on a tag, and

[120] The proposed FMVSS No. 213 side impact protection was later adopted as FMVSS No. 213a-Side Impact Protection.

manufacturers could use this method if vertical seams do not allow for the positioning of a button-type marking centered ±25 mm with the anchorage. The agency also disagrees with the suggestion that the standard should increase the allowable vertical zone for the marking from 50–100 mm to 25–125 mm and the horizontal zone from +100 mm (forward) to ±50 mm. Specifically, a 25 mm (vertical) distance above the lower anchorages may be too small, as the contour of the seat may position the marking downwards, making it difficult for a customer to see. Additionally, a 125 mm distance may be too far away from the lower anchorage to be able to identify the correct equipment. However, NHTSA does agree that the horizontal zone should be expanded to accommodate seat contours where the marking would be positioned behind the anchorage when a visible anchorage is more forward. Therefore, NHTSA is expanding the allowable horizontal zone for marking from +100 to −50 mm (*see* figure 7) for this final rule.

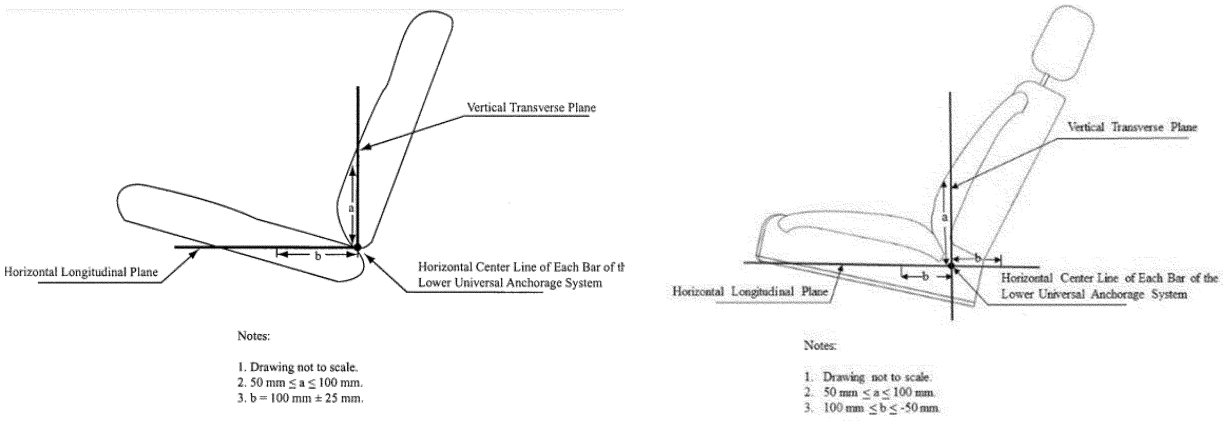


Figure 7. FMVSS No. 225 Figure 22 (left) and Updated FMVSS No. 225 Figure 22 (right)

Given the additional lead time provided by this final rule, manufacturers should be able to make any necessary adjustments to their trim design to enable them to always have the lower anchorage marking above the lower anchorage in all vehicles, whether they are visible or not.

In response to the request for clarification on S9.5.1(a), NHTSA agrees that the word ''above'' could cause confusion, as S9.5(a)(3) specifies the allowable location of the marking which can be above, or in front of, the lower anchorage. Therefore, this final rule will delete the word ''Above'' from section S9.5.1(a) to avoid any confusion.

In response to the comment that the lower anchorages' markings should be placed above the lower anchorages based on SRN's finding that while most vehicles have the marking above, some manufacturers place it below the lower anchorage bar, NHTSA points out that the current FMVSS No. 225 requires the marking to be on the seatback area between 50 and 100 mm above the anchorage or on the seat cushion 100 ±25 mm forward, as illustrated in figure 22 of FMVSS No. 225 (which will be slightly changed to accommodate visible lower anchorages in this final rule). The marking also must be centered with the center of the bar (±25 mm). Given differences in seat, anchorage, and seat designs, we believe having the marking centered with the anchorages along the seatback or seat cushion is sufficient to identify the lower anchorage. Additionally, as the agency did not propose removing the already allowed area for the marking on the seat cushion, additional restrictions on this area would be outside the scope of this rulemaking.

3. Lower Anchorage Tag With Weight Limit

Britax suggested that the agency consider requiring ''acknowledgment'' of the load limits of the lower anchorages with a flag tag or vehicle seat label consistent with the recent revisions to FMVSS No. 213, which restricts use of the lower anchorages to the child weight limit of 29.5 kg (65 lb) minus the CRS weight. Britax explained that currently this weight restriction is indicated on labels on the child restraint, but that also providing lower anchorage flag tags or vehicle seat labels instructing the consumer to check their vehicle owner's manual would reduce the opportunity for misuse and remind consumers that the use of lower anchorages is weight limited.

Agency Response

NHTSA does not believe requiring a label with a weight limit identified on the lower anchorage markings will help consumers or promote ease-of-use, as the child weight limit required on the CRS label is specific to each CRS. Therefore, vehicle manufacturers cannot calculate the child weight limit specific to each CRS to use with the lower anchorages to install a CRS. In fact, a label on the lower anchorages with the combined allowable weight of the CRS and child could confuse the consumer, because they would have to determine the CRS weight, calculate the allowable child weight, and then compare it to the CRS label, which may not match in many cases. As such, this final rule will not require a label with a weight limit identified on the lower anchorage markings.

4. Tether Anchorage and Connector Marking Size Height vs. Diameter

MEMA commented that the reference to the figure 25 pictogram in the NPRM indicated that the tether anchorage cannot be less than 20 mm in diameter, but pointed out that the figure itself actually shows a height of 20 mm, rather than a diameter. MEMA expressed concern that the 20 mm diameter on the tether anchorage may not include the entire pictogram for some applications (depending on the function/design of the tether anchorage component); therefore, MEMA urged NHTSA to revise the regulatory text to refer to a height, rather than a diameter.

Similarly, Global, GM, and the Alliance stated that given the manner in which the pictogram measurement is shown in figure 25 of the proposed

regulatory text, along with the irregular shape of the pictogram, the 20 mm criterion can more appropriately be described as ''height,'' rather than ''diameter.'' Finally, the Alliance stated that the ''circle'' referred to in the last line of 9.5.2(b) means a ''symbol'' in figure 25, and should be referenced as such in the regulatory text.

Agency Response

NHTSA agrees with the aforementioned comments expressing concerns over the reference to the diameter, rather than the height, in relation to figure 25 of the NPRM, and is correcting the proposed regulatory text in response to these comments. As such, this final rule will state that the tether anchorage marking cannot be less than 20 mm in height. NHTSA also agrees with the Alliance's statement that the ''circle'' referred to in the last line of 9.5.2(b) means a ''symbol'' in figure 25 of the NPRM, and this final rule will reference the marking as a symbol instead of a circle for clarification purposes.

c. Tether Anchorage and Connector Marking Comments and Agency Responses

Tether Anchorage and Connector ISO Symbols

In response to the proposal to use either of the two ISO symbols to mark child restraint tether anchorages and connectors, Dorel commented that with the introduction of CRASs it adopted the same standardized ISO symbol marking of child restraint anchorage connectors to harmonize and improve the ease-of-use of CRASs. Dorel added that child restraint manufacturers would have the option of using either marking. The Alliance stated that either of two ISO labeling tether symbols may be used.

In contrast, SRN and UMTRI stated it would be better to choose a single ISO tether anchorage symbol to mark the tether anchorages and connectors to reduce any confusion that may arise from the different symbols. SRN stated it was unaware of the original reason for ISO developing two similar symbols or whether having two symbols serves an ongoing purpose. SRN also stated that the two designs do not have a purposeful difference.

Agency Response

The agency received comments in support of and in opposition to standardizing the two tether anchorage markings currently available in the ISO standard (figure 8). NHTSA believes the symbols are sufficiently similar for consumers to recognize either of them; therefore, the agency will allow either ISO symbol to be used, rather than selecting only one permitted symbol for use. Although the agency has not done an analysis on whether one symbol is more easily understood by consumers than the other, given the extremely similar nature of the symbols, the agency believes either symbol will provide sufficient identification for ease-of-access for consumers.

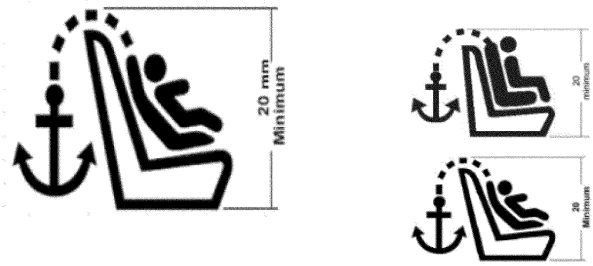


Figure 8. NPRM Regulatory Text Figures 25 (left) and 16 (right): ISO Tether Symbols

d. Tether Anchorage Marking Comments and Agency Responses

1. Whether the Tether Anchorage and Tether Anchorage Cover Marking Location Is Too Restrictive

The Alliance, MEMA, and Global expressed several concerns regarding the NPRM's proposed requirements on the tether anchorage and tether anchorage cover marking location. The Alliance did not support the proposed requirement to locate the tether anchorage symbol a distance no farther than 25 mm from the center of the anchorage for uncovered anchorages. The Alliance stated that NHTSA provided no explanation for the basis of selecting 25 mm for tether anchorage labeling. The Alliance further stated that markings for tether anchorages in current vehicles can be located much farther away at either 50–100 mm above or 25–100 mm in front of the anchorage bars while still being easily recognizable.[121] The Alliance pointed out that some current vehicles that have easily recognizable anchorage markings would not meet the proposed marking requirements.

The Alliance explained that for these vehicles the distance from the anchorage bar to the edge of the recess well is 35 mm, and the distance to the symbol is 38 mm. As such, to meet the maximum proposed 25 mm distance, the clearance provided by the plastic bezel would need to be shortened by 13 to 22 mm, making it more difficult for consumers to attach and detach the tether hook. The Alliance stated that this requirement would reduce ease-of-use, producing the exact opposite effect that the NPRM is attempting to accomplish.

The Alliance also requested clarification on how ring style tether anchorages[122] would be handled under the proposed requirements. The Alliance stated that type of anchorage is well marked, but where the tether hook attaches to the anchorage is 38 mm from the symbol. The Alliance added that to meet the 25 mm requirement, the size of the ring would need to be decreased to 25 mm and that such a modification is unnecessary and would make the anchorage less easy to use.

Similarly, MEMA stated that the 25 mm distance is too constrained for current standard production components. MEMA explained that, depending on the functional design size

[121] As illustrated in figure 17 of the Alliance comments in Docket No. NHTSA–2014–0123–0027. Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027*.

[122] As illustrated in figure 18 of the Alliance comments in Docket No. NHTSA–2014–0123–0027. Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027*.

of the component piece that surrounds the tether bar, such a tolerance could place the mark either on the edges or in the interior of the bar and its surrounding component. MEMA added that not only is it difficult to achieve such a marking (under typical molding and manufacturing processes), but that it could also potentially obscure the marking and impact visibility, thus defeating the agency's goal to improve conspicuity. Further, MEMA commented that the proposed 25 mm dimension tolerance may force redesign of tether hook components, which could impact the surrounding opening of the tether bar, thus making attachment of the tether hook more difficult. MEMA explained that under that scenario, NHTSA's goal to improve usability would be defeated; therefore, to properly mark the component containing the tether bar/hook attachment without forcing redesign of the component fascia or function, MEMA urged NHTSA to increase the compliance marking zone dimension to at least 50 mm.

The Alliance stated that the proposed requirement to have the center of the symbol aligned with the center of the anchorage length to a tolerance of ±5 mm is unnecessarily restrictive. The Alliance explained that a 5 mm tolerance from the centerline is either not practicable, given current seat labeling and construction manufacturing processes, or unnecessary to achieve the agency's stated goal. In making these statements the Alliance referenced its comments and petitions for reconsideration to the original CRAS rulemaking, documenting practicability limitations.[123] The Alliance recommended that the tolerance for tether anchorage markings be ±25 mm, consistent with the requirements for lower anchorage markings.

The Alliance also commented that for some designs it is very difficult or impossible to include a tether anchorage marking that complies with the proposed requirements in section 9.5.2.[124] The Alliance explained that some tether anchorages have recessed plastics from which the anchorage protrudes and that although the mark does not fall within 25 mm of the center of the anchorages, those tether anchorages' marks are clear and visible to the consumer. The Alliance suggested that tether anchorage marking locations be allowed in both the longitudinal and lateral directions from the anchorage. Similarly, Global explained that in some cases there may be no practical location meeting the centerline and 25 mm anchorage bar-pictogram distance criteria. Global urged the agency to establish less stringent criteria to allow for variations in vehicle interior architecture. Global also explained that the more detailed specification could be impractical for some vehicle designs, and stated that manufacturers have every incentive to ensure that the pictogram is located in a manner that is not confusing to consumers.

Agency Response

Regarding the location of the tether anchorages markings, we agree that the proposed distance from the anchorages to the symbol is too restrictive and that in some cases it could make the tether anchorage shorter while also making it more difficult to use. NHTSA also acknowledges comments presenting examples of markings that were more than 25 mm away from the anchorage while still clearly identifying the tether anchorage as such. In response to these comments, NHTSA agrees that a distance of 100 mm is reasonable; however, the agency will also require that no other anchorage (cargo tie down or similar) or structure that could be confused with an anchorage be closer to the tether anchorage marking than the corresponding tether anchorage (figure 9). This requirement will ensure that the markings clearly identify the corresponding tether anchorages, while giving manufacturers more flexibility to position the markings. NHTSA believes that 100 mm is a reasonable distance, as it is still within the current lower anchorage location marking distance range.

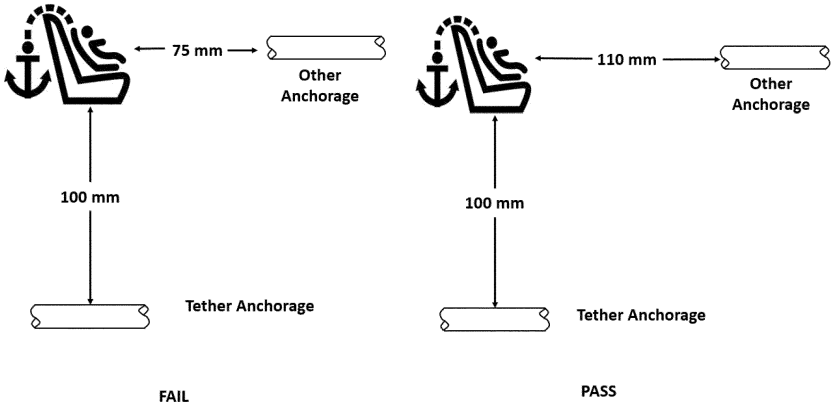


Figure 9. Revised Distance of Tether Anchorage Marking from Tether Anchorage.

Further, NHTSA acknowledges comments made by the Alliance and MEMA relating to the restrictive tolerances proposed for the centering of tether anchorage markings with a ±5 mm tolerance; however, we disagree with the suggestion of a ±25 mm tolerance. Unlike lower anchorages, tether anchorages do not have a required minimum length of 25 mm. Therefore, as some tether anchorages can be quite narrow in design, a ±25 mm tolerance would allow a marking located completely to the side of the tether anchorage, which may cause confusion.

[123] June 2, 2000, NHTSA–1999–6160–0022 (p3–5), August 11, 2003, NHTSA–2003–15438–0005 (p3–4), and March 24, 2004, NHTSA–2003–15438–0011 (p2 and attachments C and D).

[124] As illustrated in figure 19 of the Alliance comments in Docket No. NHTSA–2014–0123–0027. Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027*.

This final rule will instead have the tether anchorage marking centerline intersect the tether anchorage along the tether anchorage's length (figure 10). This requirement will ensure that the tether anchorage marking centerline crosses the length of the tether anchorage. It will also give the manufacturer the flexibility to choose an anchorage width and a tether symbol size that suits their manufacturing needs.

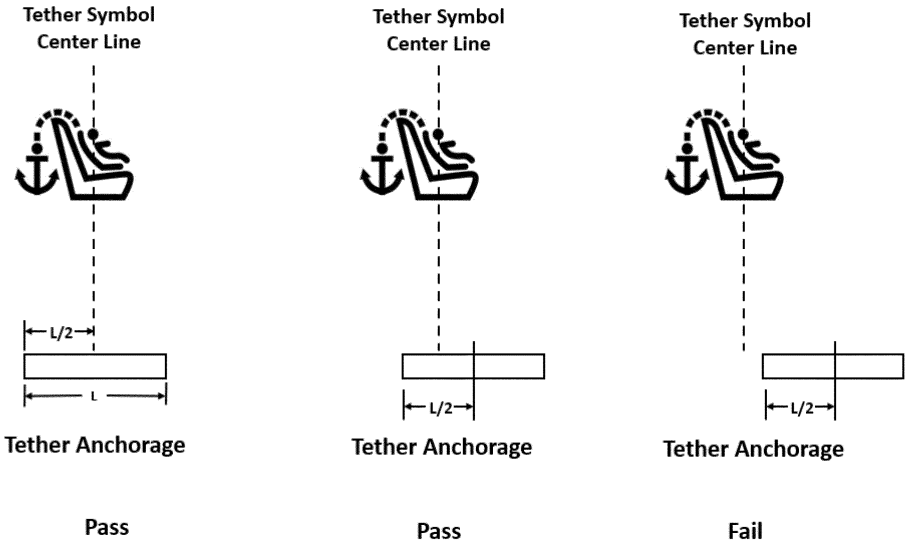


Figure 10. Tether Symbol Centered to Tether Anchorage (vertically)

The agency also agrees with the Alliance that in some cases it would be difficult to align the tether anchorage marking to the width of the tether anchorage. However, NHTSA would like to keep some consistency on the location of the markings to easily guide the consumer to the tether anchorage. Therefore, NHTSA will also allow locating the tether anchorage marking to the sides of the anchorage. Per this final rule's requirements, half of the height of the marking must overlap/intersect the tether anchorage, as shown below in figure 11. Manufacturers may choose a larger symbol size (with a minimum height of 20 mm) that gives them the flexibility to meet this requirement.

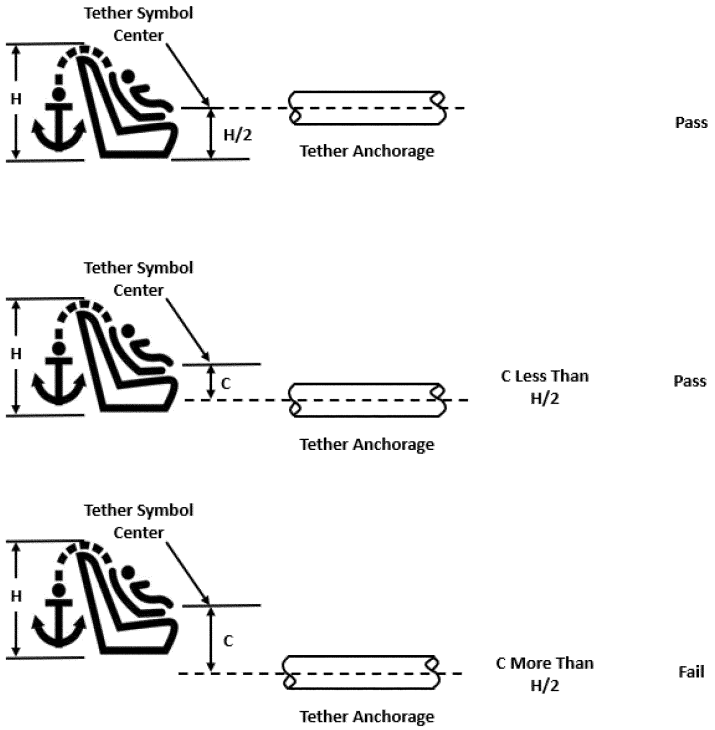


Figure 11. Tether Anchorage Symbol Centered to Tether Anchorage (horizontally)

Finally, the agency agrees with comments stating that the NPRM's proposed alignment and tolerances of the marking on the tether anchorage cover would create an unnecessarily restrictive and impractical requirement, as consumers will still understand that what is under the cover is a tether anchorage even without these rigid requirements. Such manufacturing precision would thus be an unnecessary and increased burden on manufacturers. As such, this final rule will still require the proposed marking on the tether anchorage cover but will not specify the alignment and tolerances of the marking location.

3. Tether Anchorage Markings in Cargo Covers

As discussed earlier in this final rule, NHTSA will allow the presence of cargo covers as long as they do not need any tools for removal. In addition to the markings by the tether anchorages, cargo covers will have to be marked with a tether symbol for each tether anchorage available below the cargo cover.

There will be no requirements on the location of the marking on the cargo cover, as the location of the cargo cover with respect to the anchorage is varied. Manufacturers should indicate in their instruction manuals how to access the tether anchorages. Tether anchorages under the cargo cover will also need to be marked with the ISO symbols adopted in this standard.

2. Tether Anchorage Markings for Routing Devices

Global suggested that FMVSS No. 225 should require a separate label for tether routing devices to assist consumers in proper routing of the tether strap. Global further suggested that a different symbol than the proposed tether anchorage symbol should be used for tether routing devices to avoid consumer confusion.

The Alliance stated that given the proposed requirements for rigid anchorages in pickups for use in conjunction with routers, it is unclear whether the marking requirements can be met. The Alliance stated that the location of the marking may not be visible or help consumers readily identify and locate the correct tether anchorage for the corresponding seating position. Similarly, Global suggested a separate label for tether routing devices and/or use of a different tether symbol to avoid consumer confusion.

Agency Response

NHTSA disagrees with comments suggesting that FMVSS No. 225 should require a separate label for tether routing devices to assist consumers in proper routing of the tether strap and disagrees that a different symbol than the proposed tether anchorage symbol should be used to avoid consumer confusion. Specifically, we disagree that there is a need to provide a different label and symbol for pickup trucks, as part of the effort of this rulemaking is to standardize markings and features to help develop simple educational efforts. NHTSA has reached this decision after careful consideration of comments received and the findings of a UMTRI research study,[125] which showed that using different labeling strategies to identify and guide users to the tether anchorages had no effect on tether use, attaching the tether to the correct anchorage, or correct tether use. NHTSA does recognize the unique aspects of pickup trucks, and believes that standardizing tether markings, paired with instructions in user manuals and education outreach efforts, will help improve current levels of correct tether use.

In response to concerns regarding difficulty meeting the proposed marking requirements for rigid anchorages in pickup trucks in conjunction with routers in pickup trucks, as discussed previously, this final rule allows for the use of flexible tether anchorages that may also be used as routers.

NHTSA also recognizes that tether anchorages in pickup trucks may not be visible unless the consumer looks for them behind the head restraint. Notwithstanding this issue, the agency believes the tether markings required by this final rule are warranted both for standardization purposes and consumer awareness. However, given the expressed concerns over the unique designs of some pickup trucks, if a marking cannot be positioned within the allowed distances of this final rule, NHTSA will permit its placement on the flexible routing/tether anchorage device with a tag, or for the marking to be positioned within 100 mm of the anchorage.

4. Differences in the NPRM's Tether Symbol in Tether Anchorage Marking Location (No Cover and With Cover) Figures and the ISO Symbol

MEMA and the Alliance stated that figures 26 and 27 referenced in the proposed regulatory text (figure 12) depict a different pictogram than the proposed ISO Tether Symbol inside a label and that the pictogram is not referenced elsewhere. MEMA requested clarification on this issue and asked that NHTSA use consistent pictograms in all of its figures in the regulation.

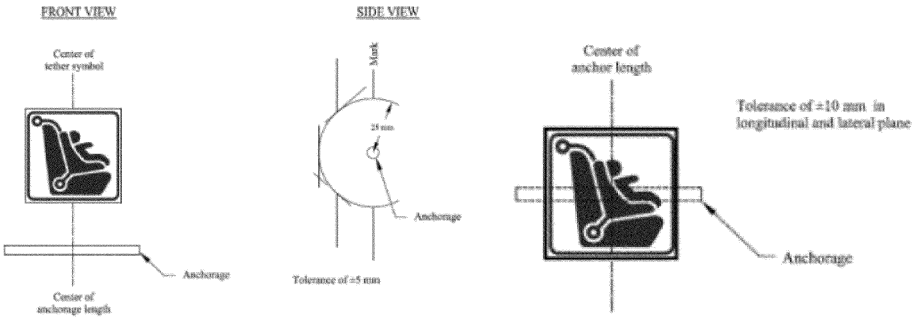


Figure 12. NPRM Figures 26 (left and center) and 27 (right): Tether Anchorage Marking Locations with No Cover and Cover Respectively.

[125] Klinich, Kathleen D., Manary, Miriam A., Malik, Laura M., Flannagan, Carol A.C. ''*Tether Anchors in Pickup Trucks: Assessing Usability, Labeling and performance*''. UMTRI–2016–30. November 2016. *https://deepblue.lib.umich.edu/bitstream/handle/2027.42/156027/UMTRI-2016-30.pdf?sequence=1&isAllowed=y.*

Agency Response

The agency is making changes to the pictograms so that they match the ISO standardized markings to avoid any confusion.

VIII. Applying FMVSS No. 225 to Vehicles Currently Excluded From FMVSS No. 225

The 2015 NPRM requested comments on the feasibility of installing tether anchorages in convertibles, as FMVSS No. 225 currently excludes convertibles from having to provide tether anchorages in rear seating positions (see S5(a) of FMVSS No. 225). The NPRM proposed deleting the tether anchorage exclusion for convertible vehicles because several convertible model vehicles have demonstrated that they can accommodate them. Specifically, the agency found that among 35 convertible vehicle models from the 2013 vehicle fleet, 10 were equipped with the full CRAS (lower anchorages and tether anchorage) in two rear DSPs, 14 were equipped with only the lower anchorages at two rear DSPs, and 11 were not equipped with any anchorages.

NHTSA also requested comment on whether the exclusion of lower anchorages in rear designated seating positions where interference with the transmission and/or suspension components prevent the location of the CRAS lower anchorages anywhere within specified zones (S5(e) of FMVSS No. 225) is still needed. NHTSA explained that manufacturers have gained experience in designing and installing vehicle seats with lower anchorages since the issuance of FMVSS No. 225. The 2015 NPRM tentatively determined there is no longer a need for S5(e) and proposed deleting it. NHTSA requested comment on why the technical problems that existed at the time of the implementation of the final rule in 1997 could not be overcome by the knowledge gained since 1997 and on the feasibility of installing tether anchorages in the second row of convertibles, and in the first row in convertibles that do not have a second row.

Comments

Several commenters supported removing the exclusion of CRASs on convertibles, with some pointing out that manufacturers have had many years of experience installing CRASs in vehicles and should now have the experience to overcome obstacles in installing tether anchorages in these vehicles. UMTRI stated that the challenge of implementing tether hardware in pickup trucks is no greater than what would be required for convertible vehicles, and that the innovations and designs that have been developed to allow tether anchorages in pickup trucks should be sufficient to guide methods to implement tether hardware in convertibles.

Dr. Baer commented that if the exemption for convertible vehicles does continue, convertibles should be required to state that forward-facing children may not ride in the positions lacking tether anchorages. Dr. Baer further stated that the tether anchorage is of greater importance in vehicles with minimal head excursion room, as most convertibles have far less than the 32 inches in their back seats.[126] Dr. Baer stated that exempting these vehicles leaves children at risk, as parents continue to put forward-facing children in these back seats, and that because most rear-facing CRSs cannot fit in a convertible, children placed in car seats in the back are most likely in a forward-facing seat. Advocates stated that the elimination of this exemption will serve as an important incentive to meet current safety standards for manufacturers that do not offer rear tether anchorages in convertibles.

The Alliance and Porsche supported continued exemption for convertibles. The Alliance explained that some vehicle manufacturers may have addressed certain technical problems (such as deployable head restraints) by placing the tether anchorages on the vehicle seatback or the vehicle structure behind the passenger seat.[127] However, the Alliance pointed out that the proposed FMVSS No. 225 S6.1(b) will no longer allow for this type of solution, because the vehicle seatback would have to be unlatched and moved forward to access the top tethers. Therefore, the Alliance recommended continued exemption for convertible vehicles from the installation requirements for tether anchorages.

The Alliance and Porsche also opposed removing S5(e) from FMVSS No. 225 on the grounds that the same issues that existed when S5(e) was created may exist today or in the future; specifically, space limitations or transmission/suspension part interference issues may prevent lower anchorages from being located in the zone described by S9.2 or S15.1.2.2(b) so that the attitude angles of S15.1.2.2(a) cannot be met. The Alliance and Porsche also stated that S5(e) should be retained to maintain harmonization with ECE Regulation 14.

Agency Response

After careful consideration of comments received, this final rule will remove the exception provided for convertibles in S5(a) for the lower anchorages. NHTSA disagrees with commenters suggesting that the NPRM's proposed prohibition on moving the vehicle seat to reach the tether anchorages would make it impossible for some convertibles to have a tether anchorage. Specifically, convertible vehicles could incorporate a tether router/anchorage to accommodate this requirement through a method similar to that used by pickup trucks,[128] which, like many of these currently excluded vehicles, have a back wall instead of a package shelf or trunk space that would give more options for installing the tether anchorages. Further, in response to comments that the lower anchorage exception in (S5(e)) should not be removed because the same challenges that existed at the time of implementation still exist today, NHTSA has observed that some of these vehicles have already been redesigned to accommodate anchorages despite existing challenges. For example, the Porsche 911 Carrera already includes the implementation of the lower anchorages in newer designs. While the agency acknowledges that changes might be required for some vehicles to accommodate the lower anchorages, industry has already shown that it is possible to do it in ways that would comply with this final rule.

However, taking into consideration comments received and in acknowledgement that changes required to meet this final rule may include redesign of convertibles and/or vehicles with a rear designated seating position for which interference with transmission and/or suspension components prevents the location of the lower bars of the child restraint anchorage system in the allowable zones, this final rule will provide a 6-year lead to provide manufacturers enough time to accommodate any necessary changes.

[126] It is the agency's understanding that Dr. Baer is referencing the 32-inch head excursion limit allowed in FMVSS No. 213 when CRSs are tested without a tether attached.

[127] *See* figure 25 of Alliance Comments Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027.*

[128] An earlier section of this final rule discusses how, contrary to the NPRM's proposal, NHTSA will still allow flexible tether anchorages and routers as a solution for pickups, single row vehicles and buses.

IX. Public Responses to Request for Comments and NHTSA's Views

a. Center Rear Seat—Dedicated, Shared, or No Lower Anchorages

Currently FMVSS No. 225 (S4.4) requires vehicles with three or more forward-facing rear DSPs to have a CRAS at no fewer than two of the rear DSPs. Vehicles with three or more forward-facing rear DSPs must currently have a tether anchorage at a third forward-facing DSP. At least one tether anchorage must be in a forward-facing rear DSP other than an outboard DSP (*i.e.,* a center seat). The March 5, 1999, final rule (64 FR 10803) acknowledged that vehicle manufacturers would likely install the lower anchorages in the two outboard seating positions as two CRAS were unlikely to fit side-by-side in the rear seat. Thus, the requirement for a third tether anchorage at a center seat provides consumers the option to install child restraints in a center DSP, where there is the vehicle's belt system and a tether anchorage. Vehicle surveys of applicable MY 2010–2011conducted by NHTSA and UMTRI revealed that of vehicles with a rear center DSP, none offered two dedicated lower anchorages in the center position.

Since the issuance of the 1999 final rule, many consumers have expressed a desire to use the rear center seating location to install a CRS using the lower anchorages. In response to these requests, NHTSA's 2015 NPRM sought comment on possible ways to address this issue, suggesting and seeking comment on the following approaches:

(1) *Require a set of lower anchorages in the rear center seating position, instead of one or both of the CRASs available at the outboard positions in most current vehicle models.* We requested comment on the feasibility of installing a CRAS in a rear center seating position and on whether we should require such installation.

(2) *Require a third set of dedicated lower anchorages in the rear center seat.* The agency requested comment on the feasibility of installing a dedicated CRAS in the rear center seating position in addition to the two-anchorage system in the outboard seating positions in vehicles with 710 mm (27.9 in) or more distance between the centerlines of outboard lower anchorages.

(3) *Require a simulated CRAS.* We requested comment on whether the standard should require a simulated CRAS in the rear center seating position consisting of the inboard lower anchorages of the CRAS in the two outboard seating positions and the center seat tether anchorage.

Comments

Dedicated, Shared, or No Lower Anchorages in Center Seat

IIHS, SRN and Global supported the ability to use center lower anchorages (simulated or dedicated) but indicated that the decision to provide dedicated anchorages or to allow simulated ones should be left up to the vehicle manufacturer. IIHS and SRN explained that vehicle manufacturers are in the best position to determine the solution that works best in each vehicle, and that requiring dedicated anchorages in all three second-row seats, where available, may increase confusion and the likelihood for misuse if lower anchorage sets overlap and it is not clear which anchorage pairs are intended for each seat position. SRN also suggested that CRS manufacturers should be required to address simulated CRASs in their instruction manuals and be encouraged to test for this usage so that it can be permitted, whenever possible, with their CRSs that have flexible lower anchorage straps.

Similarly, Global stated that the decision on how to provide center lower anchorages should be left to the manufacturer to avoid limiting design flexibility and interior layout. Global commented that for smaller sized vehicles with two rows, the current CRAS requirements are adequate for rear seating positions. Global added that if anchorages for a rear center seating position were required it would not allow a rear seat fold-down design that splits at the middle (50 percent centerline), as there would be interference with an installed rear center CRS.

SRN stated that parents concerned with safety often wish to put their child in the center seating position. SRN further stated that many sources indicate that the center seating position is the safer location (including American Academy of Pediatrics (AAP) and many CRS manufacturer websites), supported by at least one major study showing it to be 43 percent safer than an outboard position.[129] SRN indicated support for the options to use lower anchorages in the center, as it is something many caregivers want. SRN explained that many caregivers install the CRS in the center seat using what NHTSA calls a simulated system, but in circumstances in which doing so is not allowed by one or both manufacturers (CRS and vehicle). SRN added that since the majority of caregivers do not get assistance from a CPST, they are often surprised when told they may not do use a simulated system because the installation would otherwise appear to be correct (sufficiently tight). SRN further stated that some caregivers are upset when they realize they cannot use the lower anchorages in the preferred center position, especially when it is their impression that an installation is safer when using the lower anchorages, so they feel they are in a no-win situation. Finally, SRN stated that the seat belt in the center is not always easy to use for installing a CRS and does not always provide an adequately tight installation.

UMTRI, CR, and Advocates supported the addition of a dedicated third set of lower anchorages to the center position of rear seats when there is space available, and a simulated lower anchorages installation allowance for vehicles with insufficient space to fit a dedicated set of lower anchorages. CR supported increased education from manufacturers to allow a simulated lower anchorage installation for flexible lower anchorage straps on wider lower anchorages.[130] CR added that standardized spacing is still necessary for the smaller population of CRSs equipped with rigid attachments but stated that the recommendation to use simulated/non-standard spacing would help installation success for the larger number of seats equipped with flexible lower anchorage straps.

UMTRI stated that the frequency of having three children in a single row using CRS is low; however, having center and outboard seating positions equipped with (or allowed to use) lower anchorages provides flexibility and options, so parents traveling with one child can use the safest center position, but can use both outboard positions if CRSs are too large to be installed in adjacent seating positions.

UMTRI suggested that testing on nonstandard spacing of lower anchorages using CRSs with both push-on and hook-on connectors be conducted. UMTRI explained that since the majority of tests run to evaluate the effects of non-standard spacing have been run with hook-on connectors, a more diverse data set might reassure CRS manufacturers that non-standard spacing is acceptable across a variety of products.

Advocates indicated that they have been a proponent of equipping the rear

[129] Kallan MJ, Durbin DR, Arbogast KB. ''Seating patterns and corresponding risk of injury among 0- to 3-year-old children in child safety seats'' Pediatrics. 2008 May;121(5):e1342–7. doi: 10.1542/peds.2007–1512. PMID: 18450877.

[130] CR relayed that only two manufacturers consistently allow use of the inboard anchorages for center lower anchorage installation in their owner's manuals, if the practice is also allowed by the CRS manufacturer.

center seating position with lower anchorages for many years since the CRAS was proposed in 1997. Advocates added that they also urged NHTSA to require full CRS anchorage systems in all center seats during the 2007 public meeting. Advocates explained that current (FMVSS No. 225) requirements have generally resulted in consumers installing CRSs with the CRAS in the outboard seating positions when the center rear seating positions did not have the lower anchorages available, but that many consumers have expressed a desire to place a CRS in the rear center seat.

Advocates stated that many other child passenger safety authorities have also long recommended that when a child is transported the safest location is the center rear seating position. Advocates explained that placing the child in the rear seat moves the child away from safety concerns associated with travel in the front passenger seat and that locating the CRS in the rear center position keeps children away from doors and windows and potential intrusion in the event of a side impact crash. For this reason, Advocates stated that NHTSA's not addressing the need for a CRAS in the center rear seat in the initial 1999 final rule, and in the intervening 15 years, has been difficult to understand.

Advocates added that a 2009–2010 survey conducted by Safe Kids revealed approximately a third of children restrained by a CRS ride in the rear center seat. Advocates stated the desire to seat young children in CRSs in the rear center seating position should not be new information to the NHTSA, as the agency itself, along with many passenger and vehicle safety organizations, had been recommending the use of the rear center seating position as the optimal location from a safety standpoint for a single CRS for many years, even before concerns about airbag interactions with young children seated in the front passenger seating position became known. Advocates also referenced a December 2014 study performed for NHTSA by UMTRI that found that the majority (56 percent) of 2010–2011 MY vehicles included in the survey could support a dedicated set of lower anchorages in the rear center seat.[131]

Ford stated that the UMTRI conclusion that seats with 710 mm (27.9 inch) or more distance between the centerlines of outboard lower anchorages would have sufficient space to provide three sets of usable dedicated lower anchorages in the right, center, and left seating positions in the rear row does not consider spacing issues related to seatbacks that fold down. Ford stated it has found a high customer expectation for folding seatbacks due to the cargo carrying flexibility they offer, and now offers this feature on nearly all its passenger cars and SUVs. Ford commented that some parents want to place children in the center position using child restraint anchorages and that it has evaluated different alternatives to address consumers' desires. Ford stated that large vehicles may be able to provide an additional pair of lower anchorages in the center position; however, this option is not feasible on most seats due to packaging of seat belt hardware and seatback pivot mechanisms.

Ford agreed with NHTSA's conclusion that use of lower anchorages spaced wider than 280 mm is acceptable in most vehicles, provided the child restraint can be installed securely, and the child restraint manufacturer permits this installation. Ford stated that it has found loads applied to lower simulated anchorages spaced 520 mm apart are comparable to loading of anchorages spaced 280 mm apart. Since the anchorages are already tested using the SFAD2, Ford expressed its belief that additional testing would be redundant. Ford stated that in recognition that some seat designs may preclude secure installation, it has included the following owner manual notices, which provide clear direction to a care giver using lower anchorages at the center seating position.:

- Depending on where you secure a child restraint, and depending on the child restraint design, you may block access to certain safety belt buckle assemblies and LATCH lower anchors, rendering those features potentially unusable. To avoid risk of injury, occupants should only use seating positions where they are able to be properly restrained.
- Never attach two child safety seats to the same anchor. In a crash, one anchorage may not be strong enough to hold two child safety seat attachments and may break, causing serious injury or death.
- The standardized spacing for LATCH lower anchors is 11 inches (28 centimeters) center-to-center. Do not use LATCH lower anchors for the center seating position unless the child seat manufacturer's instructions permit and specify using anchors spaced at least as far apart as those in this vehicle.
- The lower anchors at the center of the second-row bench seat are spaced 520 mm (20.5 inches) apart. The standardized spacing for LATCH lower anchors is 280 mm (11 inches) center-to-center. A child seat with rigid LATCH attachments cannot be installed at the center seating position. LATCH compatible child seats (with attachments on belt webbing) can only be used at this seating position provided that the child seat manufacturer's instructions permit use with the anchor spacing stated. Do not attach a child seat to any lower anchor in an adjacent child seat that is attached to that anchor.

Manufacturer's Option To Provide Dedicated Lower Anchorages, and To Recommend or Not Recommend Sharing Lower Anchorages

The Alliance explained that manufacturers need to balance the necessity for CRS anchorages with other customer requirements like seat adjustments, the location of seat belts, etc., and that often vehicle packaging precludes providing a dedicated set of center lower anchorages. The Alliance added that many vehicles (*e.g.,* small cars and vehicles where the rear seat is between the wheel wells) are not wide enough to accommodate three distinct CRAS-equipped positions. The Alliance stated that even where the rear seat is wide enough, the vehicle may have insufficient structure to carry the simultaneous loading of three sets of anchorages.

The Alliance further commented that in certain vehicles, components such as a seatback adjuster would not provide the space required for a dedicated third set of lower anchorages. The Alliance added that vehicles using a separate fore/aft seat movement in a split rear seat may not be able to accommodate two pairs of lower anchorages on an individual section of the seat.

The Alliance explained that vehicle manufacturers have, for various reasons, equipped certain vehicles with the potential to attach a child seat in the rear center seating position while not providing three distinct sets of child restraint lower anchorages in the rear. As an example, the Alliance pointed to a vehicle configuration using a 60–40 split rear seat with greater than 710 mm between the centerlines of the outboard lower anchorages. Instead of a third set of lower anchorages, the vehicle is equipped with a ''fifth'' lower anchorage provided to create a set of center anchorages by ''borrowing'' from the inboard anchorage of the adjacent seating position.[132] The Alliance stated

[131] Klinich, K.D., Manary, M.A., Orton, N.R. ''Feasibility of Center LATCH.'' NHTSA–2014–0123–0007.

[132] As illustrated in figure 20 of the Alliance comments in Docket No. NHTSA–2014–0123–0027.

Continued

that this arrangement allows for the potential to attach either a center child restraint or an outboard child restraint (on the 60 percent seat side). The Alliance added that other solutions to provide center anchorages in small vehicles have led to customer confusion, such as where anchorage locations overlap, causing customer confusion as to which anchorages created a ''pair'' to install a child restraint equipped with flexible attachments.

The Alliance explained that the space required by a child restraint system and the location and accessibility of the lower anchorages are regulated by using a Child Restraint Fixture (CRF),[133] and that the dimensional characteristics of a CRF were developed to represent a typical child restraint system. The Alliance further explained that in a vehicle with over 710 mm between the centerline of the two outboard lower anchorages, three CRFs (that represent a child restraint system) [134] are not feasible in the same row at the same time, and thus requiring manufacturers to design a vehicle with three sets of lower anchorages is not practicable because installing three child restraints simultaneously in such vehicles cannot be achieved in the field. The Alliance therefore stated that it recommends that NHTSA not require a dedicated set of center lower anchorage in addition to the two outboard lower anchorages.

The Alliance next described a mid-sized SUV with a distance between the centers of outboard seating positions of 800 mm, and the distance between the inboard lower anchorages of 520 mm.[135] The Alliance explained that customer expectations for split back, reclining, fold flat seatbacks, center fold down armrest, and an expectation for a bias in roominess and comfort at the second row outboard positions would preclude the addition of dedicated lower anchorages in the center position. The Alliance added that a caregiver still has the option to use the center seat belt to secure a child restraint in that position.

The Alliance stated that there are circumstances where it is permissible to install a CRS that has flexible lower anchorage attachments in the rear center location using a simulated restraint anchorage system. However, it explained that in order to do so, several factors need to be considered and controlled. Specifically, the Alliance listed the following considerations:

- The center position must be a DSP (or else a CRS installed using the outboard anchorages might be very unstable). The Alliance explained that in vehicles without a center DSP, simulated rear center child restraint locations are typically not permitted by the vehicle manufacturer.
- The spacing between the anchorages must be within a range acceptable to both the vehicle and CRS manufacturers and that for rigid anchorage CRSs with fixed spacing, this will be a significant limitation.
- The vehicle seats must be positioned such that the lower anchorage bars on the outboard seats are collinear (*i.e.,* one seat cannot be positioned either forward or rearward of the other). Alliance explained that this can occur if the two seating positions can be moved fore/aft independently.[136]
- The CRS manufacturer must not recommend against use of non-standard spacing for the particular CRS model.
- There must be no more than one CRS attached to any lower anchorage, and,
- There must be no contact or obstruction between the CRS lower anchorage straps and vehicle safety belts being used in the outboard positions (such contact could damage the straps and/or the belts and could adversely affect initial belt routing and/or safety performance in a crash).[137]

The Alliance stated it would be difficult to effectively communicate these limitations to the majority of consumers. The Alliance added that some manufacturers allow the use of ''simulated'' center anchorage positions in specific vehicles that meet the above conditions but that the majority of vehicle/seat configurations may not safely accommodate such fitment. As a result, the Alliance explained that vehicle manufacturers provide vehicle-specific guidance to consumers about when it is appropriate to use the simulated center anchorage position as well as instructions for using the simulated center anchorage position. The Alliance further stated that the LATCH Manual (published by Safe Ride News) also documents the vehicles that provide this option; however, since such fitment cannot be universally applied to all vehicles, seating configurations, and CRSs, the Alliance does not recommend that the agency issue a ''blanket'' recommendation in this area.

The Alliance also commented that there is no regulatory test device to assess the strength of simulated CRAS. The Alliance explained that neither the SFAD 1 nor the SFAD 2 can be used to test a set of lower anchorages spaced wider than 11 inches apart. The Alliance recommended that a standardized test fixture and test procedure should be developed for both the CRS manufacturers (to assess integrity and performance in frontal and side impacts) and for the vehicle manufacturers (to assess anchorage strength) if the agency wishes to encourage wider acceptance of simulated center anchorage systems in vehicles.

The Alliance commented that another concern with the simulated rear center CRAS is that consumers may attach two child restraint systems to the inboard anchorage of an outboard seating position. The Alliance explained that in such cases, the combined loading from two CRSs might overload the single lower anchorage, causing it to fail in a crash. The Alliance stated that although manufacturers can provide warning statements in their owner's manuals for such a scenario,[138] this does not prevent caregivers from making this error. The Alliance further stated that this misuse scenario is why manufacturers do not support such simulated rear center anchorage systems.

Dr. Baer added that studies of both adults and children show that the center is the safest spot in the back seat,[139] and as such, the focus should be put on requiring vehicle manufacturers to design their center seats in ways that accommodate a car seat. Dr. Baer further stated that the proposed requirement for the installation of center lower anchorages in vehicles with 710 mm or

Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027.*

[133] As defined and shown in FMVSS No. 225, figure 2.

[134] As illustrated in figure 21 of the Alliance comments in Docket No. NHTSA–2014–0123–0027. Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027.*

[135] As illustrated in figure 22 of the Alliance comments in Docket No. NHTSA–2014–0123–0027. Link:*www.regulations.gov/comment/NHTSA-2014-0123-0027.*

[136] As illustrated on page 28 of the Alliance comments in Docket No. NHTSA–2014–0123–0027. Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027.*

[137] As illustrated in figure 23 of the Alliance comments in Docket No. NHTSA–2014–0123–0027. In this example the Alliance showed that while there is good access to the seat belt buckle for the adjacent seating position, interference with the CRS lower anchorage strap could adversely affect the positioning of the lap belt on an adjacent occupant (in this case it would cause the lap belt to be positioned high on a small occupant, increasing the potential for submarining). Link: *www.regulations.gov/comment/NHTSA-2014-0123–0027.*

[138] Alliance provided an example of an owner's manual warning in its comments (page 30) in Docket No. NHTSA–2014–0123–0027. Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027.*

[139] Kallan, M.J., Durbin, D.R., and Arbogast, K.B. ''Seating Patterns and Corresponding Risk of Injury Among 0- to 3-Year-Old Children in Child Safety Seats'' Pediatrics 2008 and Mayrose, J.S. and Priya, A. ''The safest seat: effect of seating position on occupant mortality'' J Safety Res. 2008.

more space between the centerlines of the outboard lower anchorages is an important step to increasing the number of vehicles on the road that can more easily accommodate CRSs in a wider variety of configurations and installation methods.

Center Seat Use of Simulated Lower Anchorages Only When CRS and Vehicle Allow It

Graco encouraged the CRS and vehicle manufacturers to include statements on whether they endorse the use of simulated CRAS in rear center seating positions in instruction manuals. However, Graco did not support a requirement on the use of simulated center seat anchorages, as some vehicles may have split center seating that would cause the possibility of misuse by the consumer. Graco further explained that CRS connector designs may be limited in their tolerance for attachment to the vehicle anchorages. As such, Graco explained that it recommends an instruction manual recommendation for simulated center seat anchorage use only when both the vehicle and CRS manufacturers would allow its use.

Dr. Baer commented that while many parents are creating their own simulated CRASs in the center of their vehicles (when the vehicle and CRS manufacturers prohibit it), she is concerned that the simulated CRAS as presented in the NPRM may increase injury risk for the following reasons:

1. Dr. Baer stated that when the simulated position's lower anchorages are wider than 11 inches, the lower anchorage hardware typically crosses over the seat belt buckle for both side seats—meaning that an adult trying to ride in back will not be able to wear a seat belt, which is clearly a dangerous situation not only for the adult, but everyone else in the vehicle as well.

2. Dr. Baer stated that when the simulated position has one lower anchorage that is shared with one of the side seats, several issues arise, including that the shared lower anchorage typically blocks the seat belt buckle for the side seat, or caregivers may try and attach two car seats to one lower anchorage.

3. Dr. Baer commented that simulated positions may have interference with the usage of the side seat belt buckles. She further commented that the interference is less in vehicles that offer side seat belt buckles that are on a flexible webbing stalk, instead of those that are on rigid stalks and/or are flush mounted with the vehicle seat cushion. However, Dr. Baer stated that all vehicles should allow simulated lower anchorages, as there are cases where a caregiver does not have adults riding in back, and/or the lower anchorage strap does not interfere with adjacent seat belt hardware.

4. Dr. Baer stated not all CRs in the United States allow for an installation with lower anchorages spaced wider than 11 inches, which might cause more confusion over where and when a lower anchorage installation is permitted.

Agency Response

After careful review of comments received, NHTSA has decided not to include any new requirements on the center seating position if a center DSP is available. The agency does not believe that a 710 mm [140] rear width criterion for determining whether a dedicated lower anchorage should be required is sufficient, as other design factors brought up by commenters come into play to ensure correct use. Specifically, the rear seat environment is complex and such a requirement could limit vehicle manufacturer design options to provide features in high demand by consumers, such as foldable seatbacks. The agency is concerned that new requirements might have unintended consequences, such as vehicle manufacturers opting to make vehicles without a center DSP to accommodate high demand features such as foldable seats instead of a center DSP that can be used to install a CRS with seat belts. Additionally, the UMTRI study that determined the 710 mm width in rear seats did not account for the complexities of vehicle designs with hardware for foldable seats.[141] Further, at this moment, the agency does not have an estimate of how much space is necessary to include such features and how difficult it is to accommodate both features (dedicated center lower anchorages and seat folding hardware). The 710 mm rear width criterion is too simplistic as it cannot account for a set of more complex designs and NHTSA would need further studies to develop requirements that would be more encompassing of vehicle designs that won't risk the elimination of the center designated seating position by the manufacturer.

NHTSA has also decided not to require vehicle manufacturers to recommend a simulated lower anchorage center seating position if a center DSP is available. NHTSA made this determination after careful review of concerns raised by manufacturers, who pointed out several issues with simulated lower anchorages in the center seating position that could increase misuse of the anchorages, including: (1) where a vehicle rear seat is split (50/50 or 60/40) and can be moved for-aft, the lower anchorages, being in different sections of the rear seat, may not be collinear; (2) the consumer would have to be aware that only one CRS can be used on a simulated anchorage; (3) both CRS and vehicle manufacturers must allow the use of non-standard lower anchorages spacing; (4) the spacing between the simulated center lower anchorages must be within a specified range that is acceptable to both vehicle and CRS manufacturers; and (5) installing a CRS in a simulated lower anchorage center position should not interfere with the safety belts being used in the outboard positions such that they could be damaged or produce a bad belt fit for the outboard occupant.

NHTSA agrees with SRN, Ford, and IIHS's suggestion that the option to provide a dedicated or simulated center lower anchorage seating position should be left to the vehicle manufacturer. NHTSA believes that vehicle manufacturers should determine whether they will provide a lower anchorage equipped center seating position (if a center DSP is available) by including a dedicated set of lower anchorages, or recommending a simulated one, as they can take into consideration all the other design restrictions and requirements they have. Manufacturers must also make the choice on whether there may be no lower anchorage in the center seating position.

In summary, the agency will not adopt additional requirements in vehicles to provide means of installing a CRS in the center seat using simulated lower anchorages at this time. The different designs in vehicles make it difficult to standardize certain aspects of the lower anchorages and the agency has not fully evaluated the impact of some of the requirements on all the vehicle models. For this reason, NHTSA believes that the recommendation of using the CRAS in the center seat (if a dedicated one is not provided) is best left for the vehicle manufacturer to decide and establish the conditions on how they should be used (*i.e.,* for/aft seating position on a split bench, seat belt interference, etc.). NHTSA encourages vehicle and CRS manufacturers to provide in their owner's manuals instructions to the consumer on how and if simulated lower anchorages can be used for a center seating position. Consumers

[140] The 710 mm rear seat width limit was determined by UMTRI 's NHTSA-sponsored study.

[141] Klinich, K.D., Manary, M.A., Orton, N.R. ''Feasibility of Center LATCH.'' NHTSA–2014–0123–0007.

should be directed to see both vehicle and CRS instruction manuals to decide whether they can use and how to use a non-standard lower anchorage in the center seat.

Recommendation To Not Install CRSs in the Rear Center Seat if There Are No Dedicated Lower Anchorages

Dr. Baer commented that a few MY2015 vehicles have two dedicated lower anchorages in the center position (for a total of 6 lower anchorages in the rear seat) that do not crisscross with any of the other lower anchorages. However, for these vehicles, Dr. Baer explained that the spacing between some of the lower anchorages is so close together (often less than 2 inches apart) that it is impossible to install 2 CRSs side-by-side in the center and side position, as CRSs are typically 6–10 inches wider than the 11 inches between their lower anchorage connection points.

Dr. Baer proposed that if a center seating position does not have lower anchorages, it must be assumed that the position was likely too narrow to accommodate it, and the vehicle manufacturer must clearly state in its owner's manual that this position is too narrow to accommodate a car seat or booster. Dr. Baer also stated that the issues with the lack of usability of the center seat extend beyond the lower anchorages. Specifically, she asked why it is acceptable for vehicle manufacturers to sell a vehicle (especially one targeted to families) where it is impossible to secure any CRS to the center seat without taking up the adjacent seating position by virtue of the CRS blocking an adjacent position's seat belt buckle. Dr. Baer stated that several vehicles cannot accommodate a car seat in the center without sacrificing the rear driver's side seat, turning the vehicle into a 2-seater back seat instead of a 3-seater. Dr. Baer stated this is something that dealerships do not mention to families, nor do all of the manuals clearly explain it.

Agency Decision

NHTSA disagrees with Dr. Baer's suggestion that if a center seating position does not have lower anchorages it must be assumed that the position was likely too narrow to accommodate it. NHTSA also disagrees with Dr. Baer's suggestion that in this scenario the vehicle manufacture must clearly state in its owner's manual that the position is likely too narrow to accommodate a car seat or booster seat. While NHTSA recognizes concerns that in some cases the center seat may be too narrow to accommodate some wider CRS designs, or a passenger in an outboard seating position when a CRS is installed in the center seating position, we disagree that vehicle manufacturers should prevent CRSs from being installed in the center designated position where no lower anchorages exist. Requiring manufacturers to prohibit the use of CRSs in the center seat when the seat is too narrow will eliminate the option for parents or caregivers to install the seats (with seat belt or with non-standard lower anchorages if allowed) in the center seat based on their need to accommodate all passengers.

Finally, in response to Dr. Baer's comment raising questions on the appropriateness of vehicle manufacturer sales practices to families, NHTSA will not address this comment as it does not relate to the proposals in the NPRM and is outside the scope of this rulemaking.

Requiring Dedicated Center Lower Anchorages With Standard Spacing To Accommodate Rigid Lower Anchorage Attachments

ARCCA recommended providing lower anchorages for the center rear occupant position, stating research has shown that a CRS properly secured in the center rear occupant position provides the most effective occupant crash protection. ARCCA added that research also indicates that CRSs secured by CRASs provide superior occupant crash protection compared with CRSs secured by a seat belt, especially in side impacts, and that rigid-lower-anchorage-attachments-secured CRSs provide the greatest amount of side impact crash protection. ARCCA stated that while the center rear seat may not be plausible when there is more than one child,[142] many couples only have one child, and those that have more children typically only have one initially, so many children can be secured in the center rear occupant position.

ARCCA stated that for optimal crash protection a child should be properly secured in the center rear occupant position in a CRS with rigid lower anchorage attachments. In addition, ARCCA commented that CRSs incorporating rigid lower anchorage attachments have recently become available in the U.S and that parents choosing to use these CRSs for the increased crash protection should not be forced to compromise that crash protection by having to place the CRS in an outboard location, when the center position is available but does not have lower anchorages. ARCCA also recommended that labels and color coding be used to prevent confusion over which anchorages correspond to each occupant position. ARCCA explained that manufacturers integrate seat belt anchorages in the same general area as the lower anchorages, and that the seat belt anchorages are able to withstand much higher loads than what a lower anchorage sustains when restraining a high weight CRS. Therefore, ARCCA stated that increasing the strength of the lower anchorages is also readily technically feasible.

Agency Decision

As previously stated, this final rule will not require a CRAS in the rear center seating position, but will permit manufacturers to voluntarily include a CRAS in rear center seating positions, or recommend a method of attaching CRSs using CRASs (sharing outboard anchors) in the rear center seat. This approach balances safety, ease of use, and design flexibility. NHTSA acknowledges ARCCA's recommendation that a dedicated center position should be available to accommodate CRSs with rigid lower anchorage connectors; however, as explained previously, a dedicated set of anchorages in the center seat is not always feasible due to space restrictions. Further, CRSs with rigid lower anchor connectors make up a very small number of CRSs in the field. As such, requiring lower anchorages in the center seating position to install CRSs with rigid lower anchor connectors would not add significant benefit as the CRS can also be safely installed using the seat belt. ARCCA expressed that many parents have only one child, or one child initially, and stated that they should be able to use the center seat for installing the CRS. Because center seating positions provide seat belts, CRSs can be installed in the center seat with a seat belt, or, if available, lower anchorages; therefore, NHTSA, does not see this issue as concerning. As stated earlier, parents or caregivers will have the option of installing CRSs with rigid lower anchor connectors with the seat belt in the center seating position or in an outboard position where a dedicated lower anchorage set should be available.

Additionally, ARCCA recommended labels and color coding be used to prevent confusion over which anchorages correspond to each occupant position. Since NHTSA is not adopting any new requirement for additional lower anchorages (dedicated or shared), NHTSA is not adopting any labels or color coding to identify the lower anchorages per seating position. As NHTSA did not propose any labels and color coding to identify the lower

[142] The agency observes that many CRSs are difficult to install adjacent to each other because they are wide and occupy part of the adjacent seat.

anchorages per seating position, adopting these requirements for vehicles that voluntarily provide additional anchorages would fall outside the scope of this rulemaking and will thus not be addressed by this final rule.

Finally, increasing the lower anchorage strength requirements, as suggested by ARCCA, was not addressed in the proposed rule and will not be addressed as it is out of scope of this rulemaking.

Spacing of Non-Standard Lower Anchorages

Dorel and JPMA stated that virtually all CRS designs in the U.S. use flexible lower anchor connectors (as opposed to rigid), which are capable of installation using a child restraint-equipped flexible anchorage system with varying vehicle center position spacing widths. Dorel observed that test data indicate that CRASs attached to lower anchorages of widths greater than the standard 280 mm have crashworthiness that performs satisfactorily.

JPMA requested that NHTSA evaluate and provide guidance on the potential of standardizing the spacing of the non-standard lower anchorages. JPMA suggested having an allowance in the standard seat test bench assembly to accommodate some distance of spacing. JPMA explained this would afford CRS manufacturers the opportunity to choose whether to allow the use of CRASs with their seats and that NHTSA could conduct compliance tests if this is the case. JPMA requested NHTSA's guidance in determining the non-standard spacing to allow for the potential redesign of the CRAS anchorages to accommodate the angular pull of the lower anchorages and lower anchor connectors during the crash testing.

Britax stated it has not evaluated or tested the variety of simulated child seat anchorage spacing that might be presented by diverse vehicle rear seat designs. Britax suggested that the analysis presented in the NPRM [143] may be useful in providing guidance so that the use of simulated child seat anchorages requires at least a minimum spacing between the simulated child seat anchorages.

Agency Response

In response to JPMA's request that NHTSA evaluate and provide guidance on potentially standardizing the spacing of non-standard anchorages (with an allowance in the standard seat test bench assembly to accommodate greater spacing of lower anchorages), NHTSA understands this comment to suggest that CRS manufacturers would want a certification test in FMVSS No. 213 [144] with different lower anchorage spacing in order to recommend/allow it in their manuals.

NHTSA does not plan to add this additional certification test to FMVSS No. 213, as the agency's dynamic front and side sled testing showed no significant changes to anchorage loads or CRS performance that would justify these additional test burdens. Were NHTSA to require vehicle manufacturers to provide a non-standard lower anchorage center seating position (shared or adding a 5th anchorage, etc.), it is highly likely that CRS manufacturers will prohibit it.[145] As such, NHTSA would have imposed a burden on vehicle manufacturers for features that will not be used.

In response to JPMA's request for guidance in determining the non-standard spacing to allow for the potential redesign of the lower anchorages to accommodate their angular pull during the crash testing, the agency points out that NHTSA-funded sled tests using non-standard lower anchorage spacing showed that increasing the lower anchorage spacing did not affect the injury measures of the dummies used in the frontal and side impact sled tests.[146] The updated standard seat assembly (Docket No. NHTSA–2023–0040) for the frontal and side impact tests for CRSs per FMVSS No. 213b and FMVSS No. 213a, respectively, permits changing the width of the anchorages with ease. CRS manufacturers may voluntarily conduct additional testing with greater anchorage spacing than the standard 280 mm to determine whether to permit CRS installation in vehicle seats using CRASs with anchorage spacing greater than 280 mm.

Finally, regarding Britax's suggestion to use the NPRM data analysis to provide guidance to establish at least a minimum spacing between the simulated child seat anchorages, the agency is not currently issuing any guidance on non-standard spacing, but CRS and vehicle manufacturers may use the NPRM's data analysis to explore their own recommendations.

b. Third Row

Currently, FMVSS No. 225 requires that at least one of the two required CRASs be installed at a second-row seating position in each vehicle that has three or more rows. A number of comments to the 2007 LATCH public meeting expressed dissatisfaction with the number of CRASs present in the third row of vehicles. Specifically, some commenters stated that consumers sometimes purchase vehicles with three or more rows to accommodate large families but are unable to install all of the child restraints with a CRAS because the third row does not have available systems.

The agency examined data and comments from the February 25, 2011,[147] request for comments on the proposed NCAP Vehicle-CRS Fit program. The information reviewed indicates there is only a small percentage (2.4 to 4.5 percent) of children in CRSs with internal harness (CRSs that would use the lower anchorages) using the third row, and that the reduced space in the third row makes it difficult to fit most rear-facing CRSs.

The NPRM stated that due to the lower anchorages (plus tether anchorage) weight limit of 29.5 kg (65 lb) combined weight (CRS + child) and car seat use recommendations developed by NHTSA and the AAP that children should stay in a rear-facing CRS for as long as possible, most CRSs installed with lower anchorages will be rear-facing ones; therefore, the use of the lower anchorages in the third-row might only be for a relatively short period for forward-facing restraints.

NHTSA's 2015 NPRM requested comment on the following:

- Whether FMVSS No. 225 should require CRASs or tether anchorages in all rear seating positions.
- Would requiring CRASs or tether anchorages in all rear seating positions meet the need for motor vehicle safety?
- Would requiring CRASs or tether anchorages in all rear seating positions protect the public against unreasonable risk of death or injury in an accident?
- Whether FMVSS No. 225 should require CRASs in the third row if it is not altogether feasible to use rear-facing CRSs in the third-row due to reduced space in that row.

[143] Amenson, T., Sullivan, L.K., ''Dynamic Evaluation of LATCH Lower Anchor Spacing Requirements and Effect of Tether Anchor Location on Tether and Lower Anchor Loads.''

[144] FMVSS No. 213 will be replaced by FMVSS No. 213b on December 5, 2026.

[145] For example, most CRS manufacturers currently prohibit the use of inflatable seat belts and the use of their products in a non-front facing vehicle seat. Manufacturers stated that their products are not certified for those conditions, and, therefore, prohibit them (even though research shows they perform well with inflatable seat belts and in any direction crash).

[146] Amenson, T., Sullivan, L.K., ''Dynamic Evaluation of LATCH Lower Anchor Spacing Requirements and Effect of Tether Anchor Location on Tether and Lower Anchor Loads,'' NHTSA, 2013. *www.regulations.gov/document/NHTSA-2014-0123-0004.*

[147] 76 FR 10637. *See www.govinfo.gov/content/pkg/FR-2011-02-25/pdf/2011-4212.pdf.*

- The likelihood of consumers placing rear-facing CRSs in the third row, even if CRSs could fit in that row. Even if rear-facing child restraints could not or would not be installed using CRAS in the third row of a vehicle, are CRAS needed in the third row for forward-facing CRSs?
- Would an amendment requiring CRASs or tether anchorages at some or all third-row seating positions meet the requirements and considerations of section 30111(a) and (b) of the Vehicle Safety Act?
- The feasibility of installing CRASs and tether anchorages in some or all rear seating positions in vehicles with three or more rows.

Comments

In response to these questions, three commenters (SRN, IIHS, and UMTRI) supported requirements for additional lower anchorages and/or tether anchorages in the third row of vehicles (if available). The Alliance stated that additional anchorages should be optional, and Britax stated that additional anchorages systems in the third row would not likely result in increased harnessed seat installations.

Support for Tether Anchorages in All Rear Seating Positions

SRN, IIHS, and UMTRI strongly recommended requiring tether anchorages in every rear seating position. IIHS further stated that parents have the option of installing a child restraint with the vehicle seat belt in lieu of lower anchorages, but that there is no substitute for a tether anchorage when installing a forward-facing child restraint. IIHS explained that providing parents with a tether anchorage in all rear seating positions will not only provide additional flexibility in where child restraints can be installed, but also potentially increase awareness and use of tether anchorages, as parents would know they could expect to see a tether anchorage in every seat.

Support for Additional CRAS-Equipped Seating Positions in the Third Row

SRN stated that consistently providing at least one CRAS for the third row would be helpful. SRN explained that there are few CRASs provided for third rows in vehicles and that in MY 2014 vehicles there were 18 models with at least one CRAS in the third row (many of these being full size vans that are not typical family vehicles). SRN commented that having additional CRAS equipped seating positions in the third row would ease installation in the cramped environment of a third row. SRN explained that CRS installation in third rows is even more difficult than usual as seat belts are sometimes anchored to the ceiling and back wall, and these types of vehicles often have more difficult geometry for use with CRS installation and/or are the dual-buckle variety that confuses many caregivers.

SRN, IIHS, and UMTRI encouraged requiring additional CRASs in the third row of vehicles. IIHS stated that the NPRM suggested that there may be limited benefit for CRAS hardware in the third row because of the relatively short time that children are in forward-facing child restraints, but commented that CRASs can beneficial longer than NHTSA anticipates. IIHS explained that according to the most recent National Survey on the Use of Booster Seats (NSUBS),[148] nearly three-quarters of children aged 1 to 3 years, almost a third of those aged 4 to 5 years, and an increasing number of those aged 6 to 7 years are seated in forward-facing child restraints. IIHS added that booster seats are increasingly available with lower anchorage connectors, increasing the likelihood that lower anchorages will be used after children transition from the forward-facing child restraints to boosters.

UMTRI commented that vehicles with more than one row of rear seating should be required to have at least two sets of lower anchorages and tether anchorages at every seating position in each row. UMTRI explained that families that purchase vehicles with multiple rows of seating usually plan to have children sit in all the rear seating positions at some point during the life of the vehicle. Additionally, UMTRI stated that even if families are not going to use all of the lower anchorages simultaneously, it would be beneficial for families to have options as their needs evolve. UMTRI explained that the youngest children might first sit in the second row to be closer to adults, and that families with a mix of preschool and school-aged children might put children in harnessed restraints in the third row to allow easier ingress and egress during carpooling for older children using booster seats in the second row.

Support for Optional Anchorages in Third Row

The Alliance commented that the installation of child restraint lower anchorages in the third row should remain optional based on the following assertions:

- The safety belt provides an acceptable alternative for restraining a harness CRS in the third row.
- Usage of rear and forward-facing harness CRSs in the third row is low; data gathered from 87,655 Safe Kids Worldwide checklist forms from January 1, 2013, through December 31, 2013, indicate that only 1.7 percent of all children sit in the third row in either a rear-facing or forward-facing harness CRS that could use lower anchorages.[149]
- Forward-facing harness CRS cannot use lower anchorages above a combined weight of 65 lbs., which will limit their usage of lower anchorages, further decreasing the potential usage of lower anchorages in the 3rd row.

The Alliance added that as smaller vehicles continue to be introduced for fuel economy purposes, it becomes difficult, if not impracticable, to install a rear-facing CRS in the third row in certain of these smaller vehicles due to space limitations. The Alliance added that even if a rear-facing CRS can be fitted in the third row of these smaller vehicles, it may not be possible for a passenger to be seated in the second-row seat when a rear-facing CRS is installed in the third row.[150] The Alliance stated that in these cases customers will naturally choose to install the CRS in the second row rather than the third row, rendering the CRAS in the third-row unnecessary.

Britax commented that, according to its installation polling, consumers frequently cannot easily access third-row seats for harnessed child restraint installation. Britax explained that rear-facing installation involving children under the age of two is even more unlikely, as third-row seating tends to be relegated to older children who can perhaps buckle themselves into booster seats or in a belted seat position. Britax added that the vehicle interior space between many third-row seats and rear vehicle doors may prevent the installation of either rear-facing harnessed seats or tether usage generally. Finally, Britax stated that mandating anchorage systems in third-row seating would not likely result in increased harnessed seat installations.

Agency Response

After careful consideration the agency has decided not to require additional lower anchorages or tether anchorages in vehicles with more than three rear designated seating positions.

[148] NSUBS publications: *https://crashstats.nhtsa.dot.gov/#!/PublicationList/20.*

[149] Alliance comments in Docket No. NHTSA–2014–0123–0027.

[150] As illustrated on figure 24 of Alliance Comments. *See* Docket No. NHTSA–2014–0123–0027. Link: *www.regulations.gov/comment/NHTSA-2014-0123-0027.*

CRSs equipped with harnesses to restrain the child are not widely used in the third rows of vehicles,[151] which supports comments received that for the most part forward-facing CRSs and rear-facing CRSs do not fit in third rows (without having to make the front seat unusable). As these areas are seldomly used and seat belts offer a safe alternative to install forward-facing CRSs to higher combined weights, requiring additional lower anchorages in the third row offers no significant benefit to justify the cost and weight added to the vehicle.

NHTSA acknowledges comments made by UMTRI, IIHS, and SRN indicating that increased availability in lower anchorages and tether anchorages in the third row would offer added flexibility and options to caregivers when installing CRSs. However, we agree with comments received that the limited space in many third rows would make it difficult for a child to have enough space to be seated in a rear-facing or forward-facing CRS (without making the seat in front unusable by pushing it forward or folding the seatback), thus limiting the use of third rows for transporting children in rear-facing and forward-facing CRSs. The agency encourages vehicle manufacturers to continue voluntarily providing additional lower and tether anchorages where feasible, especially in vehicles designed for families (*e.g.,* mini vans, SUVs) as those consumers would likely be seeking the most flexibilities to transport children in CRSs.

c. Terminology

The agency requested comment on whether the written information [152] provided pursuant to Standards No. 225 and No. 213 using standardized terminology referring to the parts of the CRAS and the components of the child restraint that connect the CRS to the vehicle would help improve the ease of use of CRAS.

NHTSA also requested comment on whether requiring the following terms in child restraint and vehicle user's manuals would help make instructions clearer and more uniform: ''lower anchor(s)'' and ''tether anchor'' for components of the vehicle CRAS, and ''lower anchor attachments'' and ''tether'' for components of the CRS that are used to connect the CRS to the vehicle. A ''lower anchor attachment'' is comprised of a ''lower anchor connector'' and a ''lower anchor strap'' (for flexible lower anchor attachments), and a ''tether'' is comprised of a ''tether hook'' and a ''tether strap.''

Comments

Graco recommended that NHTSA update FMVSS No. 213 with the same terminology for lower anchorages and tether anchorage so that there is no confusion with how the labels will read verses the requirements in the NPRM. For example, Graco pointed out that currently section S5.5(j) of FMVSS No. 213 says ''Secure the top anchorage strap provided with this child restraint.'' However, according to Graco, per the NPRM's proposal it should say ''Secure the tether provided with this child restraint.'' Graco also commented that section S5.6.1.12(a) of FMVSS No. 213 says ''Do not use the lower anchorages of the CRAS (LATCH system) to attach this child restraint when restraining a child weighing more than . . .'' Graco asked for clarification on whether the term ''(LATCH system)'' should be included in the statement.

Similarly, Dorel stated that the use of the acronym LATCH, as required by FMVSS No. 213, can be confusing to consumers. Dorel explained that the English language's use of the word ''LATCH'' has several meanings, one of which describes a device that holds a door, gate or window, and another referring to a mechanical device that engages in order to ''fasten.'' Dorel added that the word LATCH implies a single device, and not multiples of devices or functions which combined make up a system. Dorel explained that the plain language use of terms in child restraint and vehicle user's manuals should help make the instructions clearer and more uniform. Dorel agreed that use of plain words such as the proposed ''lower anchor(s)'' and ''tether anchor,'' or ''lower anchor attachments'' and ''tether'' for components, are in fact more descriptive of the word's intended purpose than a single acronym that could be confusing.

Dorel further explained that for bilingual members of the U.S. population, especially those for whom English is a second language or other comprehension factors are involved, ''lower'' and ''top'' can be confusing language modifiers. By way of example, Dorel pointed to mini-vans and SUVs that have tether anchorages at the base of the vehicle seat or on the floor behind the vehicle seat. Dorel explained that when the ''lower anchorages'' are higher than the ''top anchorage,'' comprehension can become quite challenging. Dorel stated that requiring installation diagrams labeled with standardized terminology could help with comprehension. Britax also indicated support for efforts to standardize common terminology related to anchorage systems and requested additional time to incorporate such changes into its CRS printed materials. SRN agreed that uniform terminology would help to make CRAS instructions clearer and less confusing. SRN stated that given the proposed new requirements for instructions explaining the new CRAS markings, it seems reasonable to make sure that those instructions have uniformity of terms. SRN added that it is comfortable with the terms proposed.

Dorel stated that standardized terminology, combined with associated symbols, would improve consumers' ability to comprehend the intended function of a system made up of separate components. Dorel further indicated that this would increase the likelihood of the correct use of child restraints. UMTRI agreed that the use of the term LATCH may mask the importance of the tether component of the system; however, UMTRI stated that avoiding the term LATCH doesn't necessarily reduce confusion, as it has been in widespread use for over 16 years. Similarly, IIHS supported the use of consistent terminology and the explicit use of the proposed terminology in owner's manuals but encouraged NHTSA to continue to allow and encourage the term LATCH to refer collectively to the dedicated CRAS and associated child restraint hardware. IIHS explained that changing to new terminology at this point in lieu of the term LATCH would confuse parents with no apparent off-setting benefit.

IIHS further stated that it is prudent to have the ability to refer to all the anchorage hardware in one efficient phrase, while clearly specifying lower anchorages and tether anchorages when necessary. IIHS also stated that the phrase ''child restraint anchorage system'' is ambiguous and cumbersome and does not convey the important message that lower anchorages and tether anchorages are hardware distinct from safety belts, as belts could also be considered a CRAS. Finally, IIHS stated that the absence of the term LATCH in

[151] NHTSA conducted the National Child Restraint Use Special Study (NCRUSS) in 2011, observing the use of car seats and booster seats for child passengers (birth to 8 years old) in 4,167 vehicles. The NCRUSS is a nationally representative survey. This study found that less than 3 percent of children in the study were seated in the third row of the vehicle. Greenwell, N.K. (2015, May). Results of the national child restraint use special study. (Report No. DOT HS 812 142). Washington, DC: National Highway Traffic Safety Administration.

[152] Standard No. 225 (S12) requires vehicle manufacturers to provide written instruction for using child restraint anchorage systems and tether anchorages. Standard No. 213 (S5.6.1) specifies that child restraint systems provide printed instructions that include a step-by-step procedure for installing and securing the child restraint system in a vehicle.

the NPRM and NHTSA's website might suggest the term LATCH is discouraged.

UMTRI suggested that the term LATCH continue to be used, while employing additional efforts to emphasize the tether component. UMTRI stated that some of the confusion over the term LATCH stems from the requirement by NHTSA to refer to LATCH anchorages and connectors as the ''child restraint anchorage system.'' UMTRI further stated that if NHTSA harmonized terminology and permitted the use of the term LATCH in required labeling it would do more to reduce confusion than discontinuing use of the term LATCH. UMTRI also suggested requiring vehicle owner's manuals to include language to convey the idea that the tether component of the LATCH system must be used when installing forward-facing car seats using the seatbelt. UMTRI explained that many vehicle manuals do not mention or emphasize this point.

UMTRI also stated that it would be helpful if vehicle manuals included directions on how to use and route single strap or V-style tethers in relation to the vehicle interior components, such as head restraints. UMTRI stated it preferred the term ''LATCH belt'' to ''lower anchor strap,'' as the word belt emphasizes that either the seatbelt or the LATCH belts are the primary means of attaching the CRS. Finally, IIHS stated that standardized terminology should include a term for rigid lower anchorage connectors, found on several booster seats in the U.S. market.

Agency Response

The agency acknowledges several comments indicating support for a standardized terminology and/or agreement with the terms proposed in the NPRM to have more consistent education messages and user manuals to improve the ease-of-use of CRASs. The agency also acknowledges commenters who stated that removing the term LATCH could cause more confusion to consumers, as parents will have to be re-educated with new terminology.

This final rule does not prohibit CRS or vehicle manufacturers from using the term LATCH (a term originally coined by industry and retail groups, not the agency). However, to help reduce potential confusion the agency will now require CRS and vehicle owner's manuals to include the standard terminology proposed in the NPRM when describing the components of the CRAS and its connectors.[153] This decision is being made based in part on over 15 years of consumer education efforts by the agency, manufacturers, and the safety community to clearly explain what the term LATCH means and to use it consistently. Given the ongoing confusion with this term, despite these ongoing efforts, it is clear consumers still struggle to understand the term. Although the standardized definitions required by this final rule will likely result in a transition period, with the need to inform parents and CPSTs about the terminology change, the new terminology will become commonplace and should assist in reducing current confusion.

NHTSA acknowledges UMTRI's statement that some of the confusion over the term LATCH stems from the requirement by NHTSA to refer to LATCH anchorages and connectors as the ''child restraint anchorage system.'' However, the term CRAS [154] is not widely used in owner's manuals or any education materials, but is instead mostly used in the FMVSS No. 213 required labels. Although the use of the term CRAS in FMVSS No. 213 may contribute to consumer confusion, the agency does not believe it is the predominant reason for the confusion as most other sources (such as manuals, voluntarily labels, education material, advertising material) typically use the term LATCH. Specifically, confusion is primarily created when referring to a LATCH installation because of different views on what the term means during everyday use. For example, to some consumers it may mean using the lower anchor installation, but not necessarily with the tether, as it may be a CRS that can be installed rear-facing where the tether is not used, or because they do not know that the tether should be used in a forward-facing CRS. To others, a LATCH installation may mean that the CRS is installed with the lower anchors and the tether. Therefore, under this understanding of the term, for CRSs that can be installed rear-facing (typically installed without a tether), a LATCH installation reference may not be appropriate.

NHTSA agrees with Graco's suggestion to update FMVSS No. 213 with the same terminology for lower anchorages and tether anchorage so that there is no confusion with how the labels will read versus the requirements in the NPRM, as the current regulatory text in FMVSS No. 213 calls for the use of child restraint anchorage systems in some instances. This final rule will update the required label text to reflect the new terminology proposed in the NPRM.[155] This decision also addresses UMTRI's comments regarding potential confusion over the term LATCH and child restraint anchorage systems in the required labeling text in FMVSS No. 213. NHTSA notes that in the standards' regulatory text, other than information presented to the consumer through labels or instruction manuals, the term anchorage will continue to be used, as it is part of the child restraint anchorage system. Further, as discussed below in the ''Housekeeping'' section of this final rule, the regulatory text required in FMVSS No. 225 that currently uses the term LATCH will be deleted from the standard per this final rule, as those sections are no longer active.

In response to UMTRI's suggestion to use the term ''LATCH belt'' instead of ''lower anchor strap,'' NHTSA disagrees with this suggestion, as the term ''strap'' is more often used when referring to the lower anchor strap and the agency has no information on whether the term ''belt'' instead of ''strap'' would have the effect of emphasizing that either the seatbelt or the LATCH belt are the primary means of attaching the CRS, as UMTRI expects. Further, FMVSS No. 213 & 213b standards currently have required labeling statements which use the word strap, so it would also promote consistency instead of introducing a different term. Finally, in response to UMTRI's recommendation to include required written instructions on how to use the V-tether straps and to use the tether with CRSs installed with seat belt, these comments are outside the scope of the NPRM's proposals and will therefore not be addressed as they fall outside the scope of this rulemaking.

d. Recommendation for Tether Anchorage Use Regardless of Child Weight

NHTSA requested comment on the merits of an instruction to consumers to use the tether to install all forward-facing child restraints with internal harnesses, whether installed with lower

[153] The NPRM proposed to add the term and definition of ''rigid lower anchor attachment'' (which means the child restraint system's lower anchorage connector that is rigid and does not have a lower anchorage strap), which also addresses comments recommending a standardized term.

[154] A ''child restraint anchorage system'' means a vehicle system that is designed for attaching a child restraint system to a vehicle at a particular designated seating position, consisting of two lower anchorages and a tether anchorage.

[155] The terminology proposed in the NPRM and adopted in this final rule is as follows: ''lower anchor(s)'' and ''tether anchor'' for components of the child restraint anchorage system, and ''lower anchor attachments'' and ''tether'' for components of the CRS that are used to connect the CRS to the vehicle. A ''lower anchor attachment'' is comprised of a ''lower anchor connector'' and a ''lower anchor strap'' (for flexible lower anchor attachments), and a ''tether'' is comprised of a ''tether hook'' and a ''tether strap.''

anchorages or seat belt, regardless of child weight.

The 2015 NPRM explained that a simple instruction would increase the ease-of-use of the tether, resulting in a decrease in injuries. The NPRM also presented data indicating that tether anchorages are already reasonably robust to withstand crash forces, and that the benefits of tether use for all children in the subject CRSs (regardless of child weight) outweigh the potential risks occurring from tether anchorage failure due to a higher combined weight and/or a higher severity crash.

Comments

Several commenters, including Graco, JPMA and UMTRI, supported the NPRM's recommendation that forward-facing CRSs should always be used with the tether. Graco agreed that the consumer should be advised to attach the tether when restraining a child in a harness CRS, regardless of the weight of the child. Graco explained that the limiting factor for structural strength is the CRS, which generally has a tether anchorage point in the plastic seat shell, and that crash energy dissipation can be had by the deformation of the plastic shell, reducing the energy going to the child while at the same time reducing the displacement of the child.

UMTRI stated that the potential benefits of the tether in a range of crashes far outweigh the hypothetical risks of injury due to a tether anchorage failure that has never been documented in a real-world crash and has only been demonstrated in a very small number of high-severity crash tests (less than 5).

Only one commenter, the Alliance, stated that it would be inappropriate for the agency to issue blanket instructions for consumers to use tethers with all children restrained in forward-facing CRS without providing some limits on both the child and CRS weight. The Alliance further explained that its members have differing opinions regarding use of tethers for child/CRS combinations in excess of 65 pounds based on internal testing and analysis conducted by each member company. The Alliance stated that when the current strength limits were developed for FMVSS No. 225, the agency made certain assumptions about the size and weight of the child/CRS combination, and that NHTSA originally considered a combined child and child restraint weight of 65 pounds when defining the strength requirements. The Alliance stated that its members agree that the 65 pounds combined weight limit is appropriate for child restraints secured with the lower and tether anchorages, but do not all agree that the same weight limit should be applied to a child restraint that uses a tether to supplement the seat belts for attachment.

The Alliance stated that the strength requirements specified in the current regulation are appropriate to assess anchorage strength in the regulation, since it is a repeatable test method and provides an appropriate design margin, given the rate-sensitive properties of the anchorages that result in increased load-carrying capabilities in real-world, short-duration crash pulses. However, the Alliance explained that the relationship between static and dynamic strength is dependent on the design of the system, including materials, geometry and attachment method. The Alliance added that the issue is further exacerbated by the lack of limits within FMVSS No. 213 on the size, weight, and capacity of the child restraints the anchorages are intended to restrain.

The Alliance further stated that while NHTSA references test data in the NPRM indicating many vehicles have tether anchorage strength that exceeds the FMVSS No. 225 regulatory static strength requirements, the agency has not tested every vehicle combination. The Alliance pointed out that while results from dynamic testing conducted by Transport Canada (referenced in the NPRM), are encouraging, this testing did not include all vehicle designs.

The Alliance stated it is well known that certain vehicles, based on their layout, have significant structure available to support tether anchorages, and thus might have a large compliance margin; however, the Alliance stated there may be vehicles which have to place the anchorages in locations with limited structural support. As a result, the Alliance explained that manufacturers may have to redesign those systems to add additional strength, which would impose additional cost and weight exceeding the values anticipated (and accepted by OMB) in the original rulemaking proposal. The Alliance added that tether anchorages located in the middle of seatbacks might have to move to the floor, pillars, or roof to meet higher loading requirements, conflicting with the goal to locate anchorages in uniform, easily accessible positions such as the center of the seatback.

The Alliance requested that if the agency does impose such a requirement for all vehicles, it must also impose a weight limit for CRSs, and/or require CRSs above a certain weight and designed for use by heavier children to include load limiting features on their tether anchorage attachment hardware. The Alliance also stated the new usage requirement must only apply to new vehicles, pointing out that it cannot be retroactive to all vehicles already in the field.

Agency Response

This final rule will implement the NPRM's proposal to develop simple education materials to promote the use of the tether when a tether and a tether anchorage are available. The agency made this decision following review of comments received. Most commenters, including JPMA, Graco, and UMTRI, expressed support for the NPRM's proposal to promote tether use by recommending its use in all forward-facing CRSs, whether installed using lower anchorages or seat belts, via a simple and uniform instruction.

Analysis of NHTSA's crash data files shows that the most common moderate to higher severity injuries among children restrained in rear seats are to the head and face and the most common contacts for these injuries to children are the seat and back support. Sled test data indicates that use of the upper tether reduces head excursions of the occupant restrained in the CRS and therefore, reduces the likelihood of head impacts against the vehicle structure.[156] Tether use may particularly benefit taller children since they may experience greater head excursion than children with shorter seated height.

The 2015 NPRM noted that 99.4 percent of crashes involving restrained children occur at change in velocities less than 30 mph and that for a majority of these crashes the loads on the tether anchor would be lower than the required strength per FMVSS No. 225, even if the child restraint and child combined weight exceeds 65 lb.[157] The NPRM noted that a forward-facing child restraint with tether attached would reduce the risk of head excursion and subsequent head contact and head injuries to the child in crashes with change in velocity less than 30 mph, which are the most common injury types to CRS restrained children.

[156] Legault, F. Garndner, B., Vincent, A., ''The Effect of Top Tether Strap Configurations on Child Restraint Performance,'' Society of Automotive Engineers, SAE No. 973304, 1997. In addition, the quantifiable safety benefits that NHTSA estimated will accrue from the LATCH rulemaking was due to the tether.

[157] FMVSS No. 225, ''Child restraint systems,'' established lower anchorage strength requirements developed to ensure that the vehicle child restraint anchorage system would be able to withstand forces resulting from a 65 lb mass in a severe crash of a vehicle into a rigid barrier.

The 2012 (77 FR 11626) [158] and 2014 (79 FR 10396) [159] final rules adopted labeling requirements into FMVSS No. 213, ''Child restraint systems,'' to inform the consumer when to stop installing a CRS using the lower anchorage attachments. These requirements consisted of calculating the maximum child weight a CRS could be used for when it is installed with the lower anchorages, based on the maximum combined weight (CRS weight + child weight) of 65 lb.

While the 2012 and 2014 final rules established a child weight limit for CRS lower anchorage installation, NHTSA did not adopt any requirements establishing a weight limit for tether use or issue any recommendations of tether use, as the agency needed more research to evaluate the potential benefits and risks. The tether supplements the primary attachment of the CRS to the vehicle seat (the primary attachment is accomplished by the lower anchorages of the child restraint anchorage system or by the vehicle seat belt). The primary attachment of the CRS to the vehicle should never fail in a crash since its integrity is needed to avoid a catastrophic uncoupling of the CRS from the vehicle.[160] The tether anchorage is a supplemental attachment point that enhances the safety of the CRS by reducing head excursions. Additionally, when the lower anchorages cannot be used to install a CRS due to the combined weight of the child and CRS exceeding the weight limit, the CRS can be installed using the vehicle's seat belt. However, even when the vehicle seat belt is used instead of the lower anchorages the tether anchorage should still be used.

As noted in the NPRM, crash test and quasi-static test data indicates that many tether anchorages in current vehicles can withstand the loads imparted in crashes up to 56 km/h by a CRS restraining 6-year-old and 10-year-old crash test dummies. These measured loads imparted to the tether anchorage represent the upper limit of expected tether anchorage loads in nearly all real-world crashes involving children restrained in CRSs. NHTSA has monitored field data for injuries resulting from tether anchorage failures due to excess loads in a crash and believes that such an event is very rare and any potential injury risk resulting from such an event is small.

NHTSA acknowledges the Alliance's comments expressing concerns over the NPRM's request for comment regarding consumer information to always use the tether for forward-facing CRSs regardless of child weight or attachment method (lower anchorages or seat belt). However, the organization did not provide any data suggesting the risk of tether anchorage failure outweighs any benefits of the use of the tether anchorage.

NHTSA disagrees with the Alliance's comments that (1) manufacturers would have to redesign some of their tether anchorage systems to support additional strength, which would impose additional cost and weight that would exceed the values anticipated in the original rulemaking proposal; and (2) the requirement cannot be retroactive to all vehicles already in the field. The agency is not requiring vehicle manufacturers to comply with a higher strength requirement on the tether anchorages. Instead, NHTSA is recommending consumers always use a tether (when available in CRS and vehicle seating position) when installing forward-facing CRSs to enhance the safety of all children in CRSs. Further, the required label on the CRS specifying the child and CRS weight limit only applies to the use of the lower anchorages for installing the CRS in the vehicle. This combined child and CRS weight limit does not apply to the use of tether anchorages when the CRS is installed using seat belts or the lower anchorages.

NHTSA is aware that since the publication of the 2012 final rule some vehicle manufacturers have applied the lower anchorage weight limit to the tether anchorages or to the full child restraint anchorage system (lower anchorages and tether) in the vehicle owner's manual. However, NHTSA points out that the 2012 final rule did not impose any child weight restrictions for the use of the tether anchorages.

The agency believes that the increased use of tethers expected from these uniform and simple instructions will help minimize injuries in most crashes involving children where the loads to the tether would be within the required strength requirements. Specifically, a single consistent statement will promote tether use.[161] Therefore, the agency's recommendation for best protection is to always use the tether when installing a forward-facing CRS.

X. Housekeeping

Section 5(c) of the FMVSS No. 225 current standard has sections that refer to requirements for vehicles with an air bag on-off switch. However, the air bag on-off switch requirements in Section 4.5.4 of FMVSS No. 208; ''Occupant crash protection,'' ceased to be in effect on September 1, 2012, and, therefore, are no longer available in production vehicles.[162] As such, this final rule is revising section 5(c) to remove the obsolete requirements.

XI. Lead Time and Phase-In

In the 2015 NPRM, NHTSA proposed a compliance date [163] 3 years after the final rule is published. NHTSA noted 3 years would provide sufficient time for vehicle manufacturers to accommodate any redesign of the vehicle seat in their normal course of vehicle design cycles without a cost increase. Additionally, the agency considered the 3-year lead time sufficient for child restraint manufacturers to comply with the proposed tether hardware length limit.

Comments on Lead Time for Vehicles

Global, Ford, Toyota, Alliance, FCA, and Honda stated that the proposed lead time was insufficient. The commenters provided several reasons in support of a longer lead time, including that design changes needed to meet the proposed requirements would involve significant design changes, body structure reinforcement and re-design, changes to tether anchorage markings on plastic base/cover, changes to the seat and anchorages, and, in some cases, development of new attachment schemes.

Global and Toyota commented on the need to redesign the package shelf, located behind the rearmost row of seats. Global and Toyota stated that package shelf speakers would need to be relocated to accommodate the tether anchorage beyond the 165-mm proposed requirement. Global stated that center

[158] In the 2012 final rule the CRS was required to have the statement: ''Do not use the lower anchors of the child restraint anchorage system (LATCH system) to attach this child restraint when restraining a child weighing more than _*_with internal harness of the child restraint,'' where ''*'' is a value where the sum of the recommended child weight and the weight of the child restraint system do not exceed 65 pounds (29.5 kg).

[159] In the 2014 final rule the CRS was required to have an installation diagram of the CRS using the lower anchorages with the statement ''Do not install by this method for a child weighing more than _*_,'' where ''*'' is the child weight limit in accordance with tables described in the standard. The tables were based on a 65 lb combined weight but give some allowances to allow manufacturers to round the child weight limit and maximize lower anchorage use.

[160] Thus, the combined weight of CRS + child should not exceed 29.5 kg (65 lb) on the lower anchorages.

[161] Research indicates that only about half of vehicle owners read their owner's manual.

[162] On September 17, 2024, the agency published an NPRM (89 FR 76035) proposing to remove the *retrofit* air bag on-off switch sunset date. The agency is not removing the sunset of air bag on-off switches in production vehicles.

[163] Compliance date is the date by which manufacturers must demonstrate adherence to the regulation. Effective date is the date when the CFR is amended by following the instructions in a final rule.

seating positions in second and third rows would implicate significant design changes. Ford indicated that these changes would require design and tooling changes outside the normal product design cycle.

Commenters proposed adding a phased schedule for all new vehicle models to meet the new requirements, lasting from two to four years. Specifically, Global suggested a compliance date four years after the date of final rule publication, followed by an additional two-year phase-in period for each manufacturer to achieve 100 percent compliance. Toyota suggested delaying start of compliance at least four years from the September 1 following the publication of the final rule, followed by a three-year phase-in period. Under Toyota's phase-in schedule, twenty percent of a manufacturer's vehicles would need to comply the first year, fifty percent the second year, and one hundred percent in the final year, similar to what was used in the rulemaking for FMVSS No. 225 in 1999. FCA requested a three-year compliance date followed by four-year phase-in, with credits permitted. Honda recommended a three-year effective date followed by a three-year phase-in with percentages equal to Toyota's proposal.

Toyota and the Alliance stated that the compliance dates should not deviate from September 1 (typical MY changeover). FCA remarked that a longer lead time would reduce the overall cost and not cause significant delays in a vehicle program.

Agency Response

The NPRM proposed a 3-year lead time to provide sufficient time for vehicle manufacturers to accommodate any redesign of the vehicle seat in their normal course of manufacture without a cost increase. However, the agency acknowledges multiple NPRM comments indicating that significant design changes, such as body structure reinforcement and re-design, changes to the seat and anchorages, and, in some cases, development of new attachment schemes, would be necessary to meet the proposed requirements. Based on these concerns, several commenters indicated the need for significantly more time than the proposed 3-year lead time to redesign their vehicles to meet the proposed rule. After full consideration of the comments received, NHTSA agrees with the request for a longer compliance lead time followed by a phase-in period for vehicle requirements.

When FMVSS No. 225 was introduced, the final rule contained a compliance phase-in for the tether anchorages that started 1.5 years after the rule was published and 2.5 years for the lower anchorages.[164] In response to petitions for reconsideration of that final rule, the agency granted extensions and temporary alternative options to comply with the standard. Based on the changes proposed in this final rule, a 3-year phase-in schedule that begins at least three years after the publication of the final rule should provide manufacturers with similar relief as the schedule that took place with the adoption of FMVSS No. 225. The 3-year phase-in will begin on the first September 1 that is 3 years after publication of the final rule. In the first year of the phase-in, a minimum of 20 percent of each manufacturer's applicable vehicles produced during that 1-year period will be required to meet the updated standard, followed by 50 percent of the applicable vehicle production in the second year, and 100 percent of applicable vehicle production in the third year and later.

Providing a 3-year phase-in period for complying with the final rule, following a lead time of at least 3 years, will provide sufficient time for vehicle manufacturers to accommodate any redesign of the vehicle seat, rear shelf structures, and other components in the vehicle in their normal course of design and manufacture without a cost increase.

NHTSA will remove the exceptions in current S5(a) and S5(e) as discussed in section VIII of this final rule starting on the first September 1 that is six years after publication of the final rule. After this date convertible vehicles will be required to be equipped with tether anchorages, and all applicable vehicles, with no exceptions, will be required to provide lower anchorages. This lead time will give manufacturers time to update their vehicle designs within their design cycles and potentially incorporate the change within the same cycle as the rest of the requirements.

Comments on Lead Time for CRSs

In response to the proposed 3-year lead time for CRSs, Britax and JPMA stated that a three-year implementation period from the adoption of a final rule is necessary to make tooling changes for the metal components of the tether anchorages and/or to ensure that tethers in CRSs are assembled with tags displaying this symbol as well as to facilitate incorporating the revisions to CRS printed materials.

Dorel agreed that 3 years is sufficient lead time to meet the proposed FMVSS No. 213 requirements. Dorel asked that an early compliance option to the new standard be available from the date of publication of the final rule for both vehicle and CRS manufacturers to further incentivize early compliance and ease-of-use claims to the new standard.

The agency did not receive comments in opposition to the proposed lead time for CRS requirement updates.

Agency Response

This final rule provides a 3-year lead time with no phase-in period for CRS manufacturers, as proposed, to give enough time to redesign, make tooling changes, and include markings.

XII. Cost Benefit Analysis

The agency estimates that the adopted requirements for improved usability of CRASs would not result in any increase in material cost but would entail some redesign of vehicle seat features. Approximately 79 percent of vehicles would need some redesign to meet the proposed lower anchorage usability requirements. Some lower anchorages would need to be repositioned or the trim and structures around them modified to meet the clearance angle and lower anchorage depth requirements adopted in this final rule. Some tether anchorages would have to be repositioned farther from the head restraint to meet the minimum strap wrap-around distance requirement. Based on feedback received, this final rule is providing a 3-year phase-in period following a 3-year lead time that starts on the first September 1 after the publication of the final rule, for manufacturers to comply with the final rule. This lead time will provide sufficient time for vehicle manufacturers to accommodate any needed redesign of the vehicle seat and rear shelf structures into their normal course of design and manufacture, without a cost increase.

For child restraints, the agency estimates that approximately 30 percent of forward-facing child restraints may need minor modification to the tether hardware assembly to meet the 165 mm (6.5 in) maximum length requirement, such as changing the supplier to other available tether hardware models. Minimal or no costs are expected from this change as many available tether designs are available in the market.

In relation to this final rule's requirement that all lower anchorages and tether anchorages must be marked with the ISO symbol, we estimate the cost of ISO markings for a set of lower

[164] The final rule was published in March 1999 and the phase-in period for the tether was September 1, 1999, through September 1, 2000. For the lower anchorages, the phase-in period was September 1, 2000, through September 1, 2002.

anchorages to be $0.07 and that for the tether anchorage to be $0.03. The total incremental estimated cost of equipping all CRASs with appropriate ISO markings is approximately $0.76 million. The final rule also requires similar ISO markings on child restraint anchorage connectors, for which the agency estimates an incremental cost of $0.97 million. The cost of changing the written instructions accompanying the vehicle or the CRS to explain the ISO markings is expected to be negligible (less than $0.01). Therefore, the total cost of the final rule is estimated to be $1.73 million.

In relation to the benefits of this proposed rule, the new usability requirements will improve correct (tight) installation and increase tether use. If the changes required by this final rule provide a 5 percent increase in correct installation using the lower anchorages and a 5 percent increase in tether use, the agency estimates that the proposed requirements would save approximately 3 lives and prevent 6 moderate to higher severity injuries annually.

XIII. Regulatory Notices and Analyses

Executive Order 12866, Executive Order 14904, Executive Order 13563, and DOT Regulatory Policies and Procedures

NHTSA has considered the potential impact of this final rule under Executive Order 12866, Executive Order 14094, Executive Order 13563, DOT Order 2100.6A, and the Department of Transportation's regulatory policies and procedures. This final rule is not considered to be significant under the Department of Transportation's regulatory policies and procedures.[165]

This final rule makes several changes to FMVSS No. 225 and FMVSS No. 213b by specifying additional requirements for CRAS and CRSs to improve ease-of-use of CRAS and improve the likelihood that CRSs will be correctly used in vehicles. The agency estimates that the adopted requirements for improved usability of CRASs would not result in any increase in material cost but would entail some redesign of vehicle seat features.

Specifically, NHTSA is providing a 3-year phase-in period following a 3-year lead time that starts on the first September 1 after the publication of the final rule for complying with the final rule. We believe this lead-time and phase-in schedule will provide sufficient time for vehicle manufacturers to accommodate any redesign of the vehicle seat and rear shelf structures into their normal course of design and manufacture without increased cost. NHTSA is also providing an additional 3-year lead time for removing some exclusions for providing lower anchorages and tether anchorages in some vehicles. We estimate a total cost of $1.73 million for the requirements for markings to identify and locate CRAS in vehicles.

More information can be found in the ''Cost Benefit Analysis'' section above. The minimal impacts of this final rule did not warrant the preparation of a regulatory evaluation.

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 rulemaking for any proposed 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 that the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the Regulatory Flexibility Act to require federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities. NHTSA has evaluated the effects of this action on small entities.

I hereby certify that this final rule will not have a significant economic impact on a substantial number of small entities. This final rule specifies additional requirements for CRAS and CRSs to improve ease-of-use of CRAS and to improve the likelihood that CRSs will be correctly used in vehicles. The final rule provides a 3-year lead start time, followed by a 3-year phase-in period for complying with the final rule that would provide sufficient time for small manufacturers to modify designs within normal design cycles, and thereby not incur additional manufacturing costs.

NHTSA estimates there are 38 manufacturers of child restraints, none of which are small businesses. Even if there were a small CRS manufacturer, the impacts of this proposed rule would not be significant. This final rule adopts minor changes to the requirements applying to CRSs. The requirements are: Limiting the length of the tether hardware assembly (tether hook and tightening mechanism) to 165 mm (6.5 in) (UMTRI estimated that about 30 percent of CRS models might need some changes to the tether hardware assembly to meet the 165 mm (6.5 in) limit), marking the lower anchorage connectors and the tether hook or tether strap with the ISO marking, and changing written instructions provided to the owners to include the defined terms and instruction on using the tether. These are minor changes that do not affect the shell or any other structure of the child restraint. We believe that there would be no incremental cost due to limiting the tether hardware assembly to 165 mm (6.5 in) since the tether hardware assembly costs would not increase because of the requirement. We estimate that the cost of marking the CRS child restraint anchorage connectors would be about $0.07 per set of lower anchorage connectors and $0.04 per tether hook. Changing the written instructions accompanying CRSs would be negligible (significantly less than $0.01).

NHTSA is aware of six vehicle manufacturers that may be categorized as small businesses. However, the proposed rule will not have a significant economic impact on these manufacturers, as vehicles produced by these small manufacturers already have to provide child restraint anchorage systems and tether anchorages meeting FMVSS No. 225, unless the vehicle is excluded from the standard. The changes proposed in this NPRM only adjust the physical features of the anchorage systems, adjustments which should have a positive impact on the ease of use of the systems, but that are small in terms of affecting the overall configuration of current anchorage systems. We estimate the cost of marking the lower anchorages and the tether anchorages to be less than approximately $0.16 (depending on the number of anchorages in the vehicle) per vehicle. The cost of changing the written instructions accompanying the vehicle would be negligible, less than $0.01.

This rule may also affect final stage manufacturers and alterers, many of whom would be small businesses. However, NHTSA believes that the impacts of this final rule on such entities would not be significant. Final-stage manufacturers or alterers installing rear seats in vehicles subject to FMVSS No. 225 must already provide child restraint anchorage systems and tether anchorages meeting FMVSS No. 225.

[165] 44 FR 11034 (Feb. 26, 1979).

We believe that the changes adopted in this final rule only make small adjustments to the physical features of the anchorage systems, adjustments that should have a positive impact on the ease of use of the systems, but that are minor in terms of the impact on the configuration of current anchorage systems. We estimate the cost of marking the lower anchorages and the tether anchorages would be less than $0.16 per vehicle (depending on the number of anchorages in the vehicle). The cost of changing the written instructions accompanying the vehicle would be negligible (significantly less than $0.01 per vehicle).

Federalism

NHTSA has examined this final rule pursuant to E.O. 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 rulemaking would not have sufficient federalism implications to warrant consultation with state and local officials or the preparation of a federalism summary impact statement. This final rule would 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.''

NHTSA rules can have a preemptive effect in 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 by Congress that preempts any non-identical state legislative and administrative law address the same aspect of performance.

The express preemption provision described above is subject to a savings clause under which ''[c]ompliance with a motor vehicle safety standard prescribed under this chapter does not exempt a person from liability at common law.'' 49 U.S.C. 30103(e). Pursuant to this provision, state common law tort causes of action against motor vehicle manufacturers that might otherwise be preempted by the express preemption provision are generally preserved.

NHTSA rules can also preempt state law if complying with the FMVSS would render the motor vehicle manufacturers liable under state tort law. Because most NHTSA standards established by an FMVSS are minimum standards, a state common law tort cause of action that seeks to impose a higher standard on motor vehicle manufacturers will generally not be preempted. However, if and when such a conflict does exist—for example, when the standard at issue is both a minimum and a maximum standard—the state common law tort cause of action is impliedly preempted. *See Geier* v. *American Honda Motor Co., 529 U.S. 861 (2000).*

Pursuant to E.O. 13132, NHTSA has considered whether this final rule could or should preempt state common law causes of action. The agency's ability to announce its conclusion regarding the preemptive effect of one of its rules reduces the likelihood that preemption will be an issue in any subsequent tort litigation. To this end, the agency has examined the nature (*e.g.,* the language and structure of the regulatory text) and objectives of this final rule and finds that this final rule, like many NHTSA rules, prescribes only a minimum safety standard.

Accordingly, NHTSA does not intend that this final rule preempt state tort law that would effectively impose a higher standard on motor vehicle manufacturers than that established by this final rule. Establishment of a higher standard by means of state tort law would not conflict with the minimum standard finalized in this document. Without any conflict, there could not be any implied preemption of a state common law tort cause of action.

National Environmental Policy Act

NHTSA has analyzed this rule for the purposes of the National Environmental Policy Act. In accordance with 49 CFR 1.81, 42 U.S.C. 4336, and DOT NEPA Order 5610.1C, NHTSA has determined that this rule is categorically excluded pursuant to 23 CFR 771.118(c)(4), (planning and administrative activities, such as promulgation of rules, that do not involve or lead directly to construction). This rulemaking, which amends Federal Motor Vehicle Safety Standard (FMVSS) No. 225, ''Child Restraint Anchorage Systems,'' and FMVSS No. 213b, ''Child Restraint Systems,'' to improve ease-of-use of the lower and tether anchorages, improve correct use of child restraint systems in vehicles, and maintain or improve the correct use and effectiveness of child restraint systems (CRSs) in motor vehicles, is not anticipated to result in any environmental impacts, and there are no extraordinary circumstances present in connection with this rulemaking.

Paperwork Reduction Act (PRA)

Under the procedures established by the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501, *et seq.*), a Federal agency must request and receive approval from the Office of Management and Budget (OMB) before it collects certain information from the public and 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 rulemaking creates new information collection requirements for phase-in reporting and record retention requirements.

In compliance with the requirements of the PRA, NHTSA is separately publishing a document requesting comment on NHTSA's intention to request approval for a new information collection request. Specifically, NHTSA is requesting approval for a new information collection that would require manufacturers of passenger cars and trucks and multipurpose passenger vehicles with a GVWR or 3,855 kg (8,500 lb) or less and buses with a GVWR of 4,536 kg (10,000 lb) or less to annually submit a report, and maintain records related to the report, concerning the number of such vehicles that meet the child restraint anchorage system requirements of FMVSS No. 225 during the phase-in of those requirements.

The phase-in of the requirements would be completed approximately 6 years after publication of the final rule. The purpose of the reporting requirements is to aid the agency in determining whether a manufacturer of passenger cars and trucks and multipurpose passenger vehicles with a GVWR of 3,855 kg (8,500 lb) or less, or buses with a GVWR of 4,536 kg (10,000 lb) or less, has complied with the child restraint anchorage system requirements during the phase-in of those requirements.

NHTSA estimates this collection will impact 22 manufacturers each year and will have a total annual burden of approximately 22 hours and $0 non-labor costs.

Unfunded Mandates Reform Act (UMRA)

The Unfunded Mandates Reform Act of 1995 (UMRA) requires Federal 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 annually for inflation, with base year of 1995). UMRA also requires an agency issuing an NPRM or final rule subject to the Act to select the ''least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule.'' This final rule would not result in a Federal mandate that will likely 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 annually for inflation, with base year of 1995).

Executive Order 12988 (Civil Justice Reform)

With respect to the review of the promulgation of a new regulation, section 3(b) of Executive Order 12988, ''Civil Justice Reform'' (61 FR 4729, Feb. 7, 1996), requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect; (2) clearly specifies the effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct, while promoting simplification and burden reduction; (4) clearly specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. This document is consistent with that requirement.

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

Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. NHTSA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. This rule does not meet the criteria in 5 U.S.C. 804(2) to be considered a major rule. The rule will be effective sixty days after the date of publication in the **Federal Register**.

National Technology Transfer and Advancement Act

Under the National Technology Transfer and Advancement Act of 1995 (NTTAA) (Pub. L. 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 International Organization for Standardization (ISO) and the Society of Automotive Engineers (SAE). The NTTAA directs this agency to provide Congress, through OMB, explanations when we decide not to use available and applicable voluntary consensus standards. There are no voluntary consensus standards developed by voluntary consensus standards bodies pertaining to this final rule.

Plain Language Requirement

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?

NHTSA has considered these questions and attempted to use plain language in promulgating this final rule. If readers have suggestions on how we can improve our use of plain language, please write us.

Regulatory Identifier Number (RIN)

The DOT 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. The RIN contained in the heading at the beginning of this document may be used to find this action in the Unified Agenda.

Privacy Act

In accordance with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform its decision-making process. DOT posts these comments, without edit, including any personal information the commenter provides, to *www.regulations.gov,* as described in the system of records notice (DOT/ALL–14 FDMS), which can be reviewed at *www.transportation.gov/privacy.* Anyone can 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 (Volume 65, Number 70; Pages 19477–78).

Incorporation by Reference

Updates to FMVSS No. 225 (49 CFR 571.225) in this final rule include new requirements to evaluate the lower anchorage depth and clearance angle using new tools. NHTSA incorporates by reference two drawing packages, with detailed drawings of the tools used to measure these new requirements, into FMVSS No. 225 (49 CFR 571.225). The drawing packages are titled, *Anchorage Depth Tool,* dated April 2020, and *Clearance Angle Tool,* dated April 2020. Interested persons may use the drawing package to manufacture the standard seat assembly for their own use if they wish to do so.

NHTSA has placed a copy of the material in the docket for this final rule. Interested persons can download a copy of the material or view the material online by accessing *www.regulations.gov,* phone 1–877–378–5457, or by contacting NHTSA's Chief Counsel's Office at the phone number and address set forth in the **FOR FURTHER INFORMATION CONTACT** section of this document. The material is also available for inspection at the Department of Transportation, Docket Operations, Room W12–140, 1200 New Jersey Avenue SE, Washington, DC; phone: 202–366–9826.

Regulatory Text

List of Subjects

49 CFR Part 571

Imports, Incorporation by Reference, Motor vehicle safety, Motor vehicles, Tires.

49 CFR Part 585

Reporting and recordkeeping requirements

In consideration of the foregoing, NHTSA amends 49 CFR part 571 as set forth below.

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

■ 1. The authority citation for part 571 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117 and 30166; delegation of authority at 49 CFR 1.95.

■ 2. Section 571.5 is amended by adding paragraphs (k)(10) and (11) to read as follows:

§ 571.5 Matter incorporated by reference.

* * * * *

(k) * * *

(10) Drawing Package, *Anchorage Depth Tool,* dated April 2020; approved for § 571.225.

(11) Drawing Package, *Clearance Angle Tool,* dated April 2020; approved for § 571.225.

* * * * *

■ 3. Section 571.213b is amended by:
■ a. Revising S5.5.2(j);
■ b. Adding S5.6.1.13 and S5.6.1.14;
■ c. Revising S5.9(a) through (c); and
■ d. Adding figures 15 and 16.

The revisions and additions read as follows:

§ 571.213b Child restraint systems; Mandatory applicability beginning December 5, 2026.

* * * * *

S5.5.2 * * *

(j) In the case of each child restraint system equipped with a tether strap the statement: Secure the tether strap provided with this child restraint.

* * * * *

S5.6.1.13 In the case of child restraint systems marked as specified in S5.9(a) and (b) of this standard, explain that the markings identify the lower anchor connectors and the tether anchor connector, respectively, and that the consumer should look for corresponding marks on the vehicle child restraint anchorage system to attach the appropriate connectors of the child restraint system.

S5.6.1.14 Use the following terms when referring to the different components of the child restraint anchorage system or for components of the child restraint system that are used to connect the child restraint system to the vehicle: ''lower anchor'' means the lower anchorage of the child restraint anchorage system in the vehicle, ''tether anchor'' means the top tether anchorage of the child restraint anchorage system in the vehicle, ''lower anchor attachment'' means the child restraint system or the detachable base's (in the case of a rear-facing child restraint with a detachable base) lower anchorage connector and the lower anchorage strap (for flexible lower anchorage attachments), ''rigid lower anchor attachment'' means the child restraint system or the detachable base's (in the case of a rear-facing child restraint with a detachable base) lower anchorage connector that is rigidly attached to the CRS and does not have a lower anchorage strap, and ''tether'' means the child restraints system's tether hook and tether strap.

* * * * *

S5.9 * * *

(a) Each add-on child restraint system other than a car bed, harness, or belt-positioning seat shall have components permanently attached to the system that enable the restraint to be securely fastened to the lower anchorages of the child restraint anchorage system specified in Standard No. 225 (§ 571.225) and depicted in NHTSA Standard Seat Assembly; FMVSS No. 213, No. NHTSA–213–2021, (March 2023) (incorporated by reference, *see* § 571.5). The components must be attached to the add-on child restraint by use of a tool, such as a screwdriver. In the case of rear-facing child restraints with detachable bases, only the base is required to have the components. All components provided to attach the add-on child restraint or the detachable base (in the case of a rear-facing child restraint with a detachable base) to the lower anchorages of the child restraint anchorage system shall be permanently marked with the pictogram in figure 15 to this section.

(b) In the case of each child restraint system that has components for attaching the system to a tether anchorage, those components shall include a tether hook that conforms to the configuration and geometry specified in figure 11 to this section. The tether hook or the tether strap shall be permanently marked with either pictogram shown in figure 16 to this section. If the mark is on the tether strap or on a tag attached to the tether strap, the mark must be located within 25 mm of the tether hardware assembly (which consists of a tether hook and a webbing tightening mechanism designed to tighten or loosen the tether strap).

(c) In the case of each child restraint system that has components, including belt webbing, for attaching the system to an anchorage of a child restraint anchorage system (lower anchorage or tether anchorage), the belt webbing shall be adjustable so that the child restraint can be tightly attached to the vehicle. The length of the tether hardware assembly, which consists of a tether hook and a mechanism designed to tighten and loosen the tether strap, shall not exceed 165 mm.

* * * * *

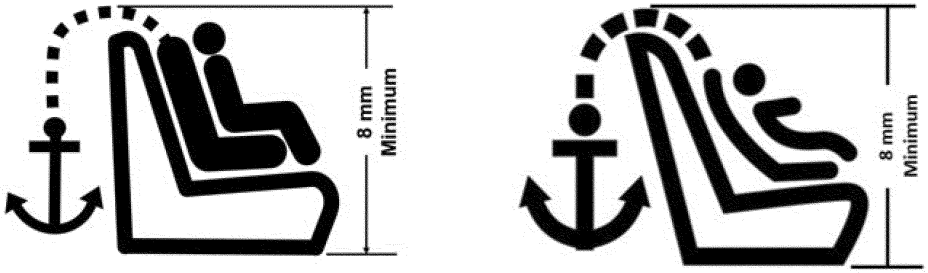
Figure 15 to § 571.213b—Lower Anchorage Connector Symbol

Note 1 to Figure 15 to § 571.213b: Drawing not to scale.

Note 2 to Figure 15 to § 571.213b: Symbol may be shown in mirror image.

Note 3 to Figure 15 to § 571.213b: Color of the symbol is at the option of the manufacturer.

Figure 16 to § 571.213b—Tether Anchorage Connector Symbols



Note 1 to Figure 16 to § 571.213b: Drawing not to scale.

Note 2 to Figure 16 to § 571.213b: Symbol may be shown in mirror image.

Note 3 to Figure 16 to § 571.213b: Color of the symbol is at the option of the manufacturer.

Note 4 to Figure 16 to § 571.213b: Either symbol may be marked at the option of the manufacturer.

■ 4. Section 571.225 is amended by:
■ a. Revising S4.2;
■ b. Removing S4.3, S4.4, and S4.5;
■ c. Redesignating S4.6 as S4.3 and revising it;
■ d. Revising S5 and S6;
■ e. Revising the first sentence of S8 introductory text and revising S8.1 introductory text;
■ f. Removing and reserving S8.2;
■ g. Revising S9 introductory text and S9.1.1(d) and S9.2;
■ h. Adding S9.2.4 and S9.2.5;
■ i. Revising S9.5;
■ j. Revising S11, S12, and S13;
■ k. Removing S14, S15, and S16;
■ l. Revising figures 8, 9, 10, and 19, removing and reserving figure 11, and adding figures 23 through 28.

The revisions and additions read as follows:

§ 571.225 Child restraint anchorage systems.

* * * * *

S4.2 Vehicles shall be equipped as specified in paragraphs S4.2(a) through (c), except as provided in S5 of this standard.

(a) Each vehicle with three or more forward-facing rear designated seating positions shall be equipped as specified in S4.2(a)(1) and (2).

(1) Each vehicle shall be equipped with a child restraint anchorage system conforming to the requirements of S6 and S9 of this standard at not fewer than two forward-facing rear designated seating positions. At least one of the child restraint anchorage systems shall be installed at a forward-facing seating position in the second row in each vehicle that has three or more rows, if such a forward-facing seating position is available in that row.

(2) Each vehicle shall be equipped with a tether anchorage conforming to the requirements of S6 of this standard at a third forward-facing rear designated seating position. The tether anchorage of a child restraint anchorage system may count towards the third required tether anchorage. In each vehicle with a forward-facing rear designated seating position other than an outboard designated seating position, at least one tether anchorage (with or without the lower anchorages of a child restraint anchorage system) shall be at such a designated seating position.

(b) Each vehicle with not more than two forward-facing rear designated seating positions shall be equipped with a child restraint anchorage system conforming to the requirements of S6 and S9 of this standard at each forward-facing rear designated seating position.

(c) Each vehicle without any forward-facing rear designated seating position shall be equipped with a tether

anchorage conforming to the requirements of S6 of this standard at each forward-facing front passenger designated seating position.

S4.3 *Movable seats.* (a) A vehicle that is equipped with a forward-facing rear designated seating position that can be moved such that it is capable of being used at either an outboard or non-outboard forward-facing designated seating position shall be considered as having a forward-facing non-outboard designated seating position. Such a movable seat must be equipped with a tether anchorage that meets the requirements of S6 of this standard or a child restraint anchorage system that meets the requirements of S6 and S9 of this standard, if the vehicle does not have another forward-facing non-outboard designated seating position that is so equipped.

(b) Tether and lower anchorages shall be available for use at all times, except when the seating position for which it is installed is not available for use because the vehicle seat has been removed or converted to an alternate use such as allowing for the carrying of cargo.

S5 *General exceptions.* Vehicles manufactured before September 1, 2031, must meet the requirements of S5.1. Vehicles manufactured on or after September 1, 2031, must meet the requirements of S5.2.

S5.1 *Vehicles manufactured before September 1, 2031.* (a) Convertibles and school buses are excluded from the requirements to be equipped with tether anchorages.

(b) A vehicle may be equipped with a built-in child restraint system conforming to the requirements of Standard No. 213 (§ 571.213) or Standard No. 213b (§ 571.213b) as applicable, instead of one of the required tether anchorages or child restraint anchorage systems.

(c) Vehicles with no air bag in front passenger designated position:

(1) Each vehicle that does not have a rear designated seating position and does not have an air bag installed at front passenger designated seating positions pursuant to a temporary exemption granted by NHTSA under 49 CFR part 555, must have a child restraint anchorage system installed at a front passenger designated seating position. In the case of convertibles, the front designated passenger seating position need have only the two lower anchorages meeting the requirements of S9 of this standard.

(2) Each vehicle that has a rear designated seating position and meets the conditions in S4.5.4.1(b) of Standard No. 208 (§ 571.208), and does not have an air bag installed at front passenger designated seating positions pursuant to a temporary exemption granted by NHTSA under 49 CFR part 555, must have a child restraint anchorage system installed at a front passenger designated seating position in place of one of the child restraint anchorage systems that is required for the rear seat. In the case of convertibles, the front designated passenger seating position need have only the two lower anchorages meeting the requirements of S9 of this standard.

(d) A vehicle that does not have an air bag on-off switch meeting the requirements of S4.5.4 of Standard No. 208 (§ 571.208) shall not have any child restraint anchorage system installed at a front designated seating position.

(e) A vehicle with a rear designated seating position for which interference with transmission and/or suspension components prevents the location of the lower bars of a child restraint anchorage system anywhere within the zone described by S9.2 of this standard is excluded from the requirement to provide a child restraint anchorage system at that position. However, except as provided elsewhere in this S5, such a vehicle must have a tether anchorage at a front passenger designated seating position.

S5.2 *Vehicles manufactured on or after September 1, 2031.* (a) School buses are excluded from the requirements to be equipped with tether anchorages.

(b) A vehicle may be equipped with a built-in child restraint system conforming to the requirements of Standard No. 213b (§ 571.213b) instead of one of the required tether anchorages or child restraint anchorage systems.

(c) Vehicles with no air bag in front passenger designated position:

(1) Each vehicle that does not have a rear designated seating position and does not have an air bag installed at front passenger designated seating positions pursuant to a temporary exemption granted by NHTSA under 49 CFR part 555 must have a child restraint anchorage system installed at a front passenger designated seating position.

(2) Each vehicle that has a rear designated seating position and meets the conditions in S4.5.4.1(b) of Standard No. 208 (§ 571.208), and does not have an air bag installed at front passenger designated seating positions pursuant to a temporary exemption granted by NHTSA under 49 CFR part 555, must have a child restraint anchorage system installed at a front passenger designated seating position in place of one of the child restraint anchorage systems that is required for the rear seat.

(d) A vehicle that does not have an air bag on-off switch meeting the requirements of S4.5.4 of Standard No. 208 (§ 571.208), shall not have any child restraint anchorage system installed at a front designated seating position.

S6. *Requirements for tether anchorages.* Vehicles subject to Standard No. 225 (this section) shall meet the tether anchorage requirements specified in S6.1, S6.2, and S6.4 according to the phase-in schedule specified in S13 of this standard.

S6.1 *Configuration of the tether anchorage.*

S6.1.1 Each tether anchorage shall:

(a) Permit the attachment of a tether hook of a child restraint system meeting the configuration and geometry specified in figure 11 of Standard No. 213 (figure 11 to § 571.213);

(b) Be accessible without the need for any tools other than a screwdriver or coin;

(c) Once accessed, be ready for use without the need for any tools; and

(d) Be sealed to prevent the entry of exhaust fumes into the passenger compartment.

S6.1.2 Each tether anchorage shall:

(a) Consist of a rigid bar of any cross-section shape that permits the attachment of a tether hook (of a child restraint system) meeting the configuration and geometry specified in figure 11 of Standard No. 213 (figure 11 to § 571.213), except in buses with a GVWR less than or equal to 10,000 pounds and vehicles that use a routing device per S6.2.1.2;

(b) Be accessible without the need for any tools and without folding the seat back (other than the head restraint) or removing carpet or other vehicle components (other than cargo covers) to access the anchorages. Individual tether anchorages may be covered with a cap, flap, or cover, provided that any cap, flap, or, cover is specifically designed to be opened, moved aside, or to otherwise give unobstructed access to the anchorage and is labeled with the symbol shown in figure 25 to this section;

(c) Once accessed, be ready for use without the need for any tools; and

(d) Be sealed to prevent the entry of exhaust fumes into the passenger compartment.

S6.2 *Location of the tether anchorage.*

S6.2.1 Subject to S6.2.1.2, the part of each tether anchorage that attaches to a tether hook must be located within the shaded zone shown in figures 3 through 7 to this section of the designated seating position for which it is installed. The zone is defined with reference to the seating reference point (*see* § 571.3).

(For purposes of the figures, ''H Point'' is defined to mean seating reference point.) A tether anchorage may be recessed in the seat back, provided that it is not in the strap wrap-around area at the top of the vehicle seat back. For the area under the vehicle seat, the forwardmost edge of the shaded zone is defined by the torso line reference plane.

S6.2.1.1 [Reserved]

S6.2.1.2 In the case of a vehicle that—

(a) Has a user-ready tether anchorage for which no part of the shaded zone shown in Figures 3 to 7 of this standard of the designated seating position for which the anchorage is installed is accessible without removing a seating component of the vehicle; and

(b) Has a tether strap routing device that is—

(1) Not less than 65 mm behind the torso line for that seating position, in the case of a flexible routing device or a deployable routing device, measured horizontally and in a vertical longitudinal plane; or

(2) Not less than 100 mm behind the torso line for that seating position, in the case of a fixed rigid routing device, measured horizontally and in a vertical longitudinal plane, the part of that anchorage that attaches to a tether hook may, at the manufacturer's option (with said option selected prior to, or at the time of, certification of the vehicle) be located outside that zone.

(c) The measurement of the location of the flexible or deployable routing device described in S6.2.1.2(b)(1) is made with SFAD 2 properly attached to the lower anchorages. A 40 mm wide nylon tether strap is routed through the routing device and attached to the tether anchorage in accordance with the written instructions required by S12 of this standard. The forwardmost contact point between the strap and the routing device must be within the stated limit when the tether strap is flat against the top surface of the SFAD and tensioned to 55 to 65 N. In seating positions without lower anchorages of a child restraint anchorage system, the SFAD 2 is held with its central lateral plane in the central vertical longitudinal plane of the seating position. The adjustable anchor attaching bars of the SFAD 2 are replaced by spacers that end flush with the back surface of the SFAD.

S6.2.2 Subject to S6.2.2.2, the part of each tether anchorage to which a tether hook attaches must be located within the shaded zone shown in figures 3 through 7 to this section of the designated seating position for which it is installed. The zone is defined with reference to the seating reference point (*see* § 571.3). (For purposes of the figures, ''H Point'' means seating reference point.) A tether anchorage may be recessed in the seat back, provided that it is not in the strap wrap-around area at the top of the vehicle seat back. For the area under the vehicle seat, the forwardmost edge of the shaded zone is defined by a vertical plane 120 mm rearward of the ''H Point,'' as shown in figure 3 to this section.

S6.2.2.1 Subject to S6.2.2.2, for vehicles with adjustable or removable head restraints or no head restraints, the tether anchorage to which a tether hook attaches must be located outside the zone created by a 325 mm radius sphere with its center on the R-point and truncated horizontally at 230 mm below the sphere's center as shown in figures 8 and 9 to this section.

S6.2.2.2 In the case of a vehicle that—

(a) Has a user-ready tether anchorage for which no part of the shaded zone shown in figures 4 through 7 and 10 to this section of the designated seating position for which the anchorage is installed is accessible without the need for folding the seatback (other than the head restraint) or removing a seating component of the vehicle; and

(b) Has a tether strap routing device that is—

(1) Not less than 65 mm behind the torso line for that seating position, in the case of a flexible routing device or a deployable routing device, measured horizontally and in a vertical longitudinal plane; or

(2) Not less than 100 mm behind the torso line for that seating position, in the case of a fixed rigid routing device, measured horizontally and in a vertical longitudinal plane, the part of that anchorage that attaches to a tether hook may, at the manufacturer's option (with said option selected prior to, or at the time of, certification of the vehicle) be located outside that zone.

(c) The measurement of the location of the flexible or deployable routing device described in S6.2.2.2(b)(1) is made with SFAD 2 properly attached to the lower anchorages. A 40 mm wide nylon tether strap is routed through the routing device and attached to the tether anchorage in accordance with the written instructions required by S12 of this standard. The forwardmost contact point between the strap and the routing device must be within the stated limit when the tether strap is flat against the top surface of the SFAD and tensioned to 55 to 65 N. In seating positions without lower anchorages of a child restraint anchorage system, the SFAD 2 is held with its central lateral plane in the central vertical longitudinal plane of the seating position. The adjustable anchorage attaching bars of the SFAD 2 are replaced by spacers that end flush with the back surface of the SFAD 2.

S6.3 *Strength requirements for tether anchorages.* (a) When tested in accordance with S8, the tether anchorage must not separate completely from the vehicle seat or seat anchorage or the structure of the vehicle.

(b) Provisions for simultaneous and sequential testing:

(1) In the case of vehicle seat assemblies equipped with more than one tether anchorage, the force referred to in this S6.3 may, at the agency's option, be applied simultaneously to each of those tether anchorages. However, that force may not be applied simultaneously to tether anchorages for any two adjacent seating positions whose midpoints are less than 400 mm apart, as measured in accordance with S6.3(b)(i) and (ii) and figure 20 to this section.

(i) The midpoint of the seating position lies in the vertical longitudinal plane that is equidistant from vertical longitudinal planes through the geometric center of each of the two lower anchorages at the seating position. For those seating positions that do not provide lower anchorages, the midpoint of the seating position lies in the vertical longitudinal plane that passes through the SgRP of the seating position.

(ii) Measure the distance between the vertical longitudinal planes passing through the midpoints of the adjacent seating positions, as measured along a line perpendicular to the planes.

(2) A tether anchorage of a particular child restraint anchorage system will not be tested with the lower anchorages of that anchorage system if one or both of those lower anchorages have been previously tested under this standard.

S6.4 *Marking and conspicuity requirements for tether anchorages.* Vehicles subject to Standard No. 225 (this section) shall meet S6.4 according to the phase-in schedule specified in S13 of this standard.

(a) For each tether anchorage installed pursuant to S4 of this standard, there shall be a permanent marking that:

(1) Consists of one of the pictograms shown in figure 25 to this section that is not less than 20 mm in height;

(2) Except for vehicles that use a routing device per S6.2.2.2, the center of the pictogram in the longitudinal direction must be in the vertical longitudinal plane that passes through the center of the tether anchorage bar (± half of the tether anchorage length), as shown in figure 26 (Left) to this section;

or the center of the pictogram in the lateral direction must be in the horizontal lateral plane that passes through the center of the tether anchorage bar (± half of the pictogram height), as shown in figure 26 (right) to this section.

(3) The nearest edge of the marking shall be located not more than 100 mm away from the tether anchorage bar as shown in figure 27 to this section. No other attachment feature to secure occupant items (*i.e.,* cargo hooks or similar) shall be nearer to the marking than the distance from the marking to the tether anchorage. Vehicles with routing devices per S6.2.2.2 may use tags attached to the routing device.

(b) The tether anchorage bar may be covered by a cap or cover that is removable without the use of any tool, provided that the cap or cover is permanently labeled with a marking meeting the requirements of S6.4(a)(1). If the cap or cover is permanently attached to the vehicle, the tether anchorage is not required to be separately marked. If the cap or cover is not permanently attached to the vehicle, the tether anchorage must also be marked with the symbol meeting S6.4(a)(1) through (3).

(c) For vehicles that have a cargo cover that needs to be moved or removed to access the tether anchorages, the cargo cover must be permanently marked with the symbol meeting S6.4.1(a)(1) of this standard for each tether anchorage that is accessible under the cargo cover. Tether anchorages under the cargo cover must also be marked per S6.4(a).

* * * * *

S8 *Test procedures.* Each vehicle shall meet the requirements of S6.3 when tested according to the following procedures. * * *

S8.1 Apply the force specified in S6.3 as follows—

* * * * *

S9. *Requirements for the lower anchorages of the child restraint anchorage system.* Vehicles subject to Standard No. 225 (this section) shall meet the lower anchorage requirements specified in S9.2 and S9.5 according to the phase-in schedule specified in S13 of this standard.

S9.1 *Configuration of the lower anchorages*

S9.1.1 * * *

(d) The bars must not be capable of being stowable or foldable.

* * * * *

S9.2 *Location of the lower anchorages.*

* * * * *

S9.2.4 The lower anchorages shall be located such that the lower anchorage depth tool depicted in Drawing Package, *Anchorage Depth Tool,* dated April 2020 (incorporated by reference; *see* § 571.5), measures an anchorage depth of 25 mm or less using the procedure in S11(c) of this standard.

S9.2.5 The lower anchorages shall be located such that the tool depicted in Drawing Package, *Clearance Angle Tool,* dated April 2020 (incorporated by reference; *see* § 571.5), measures a clearance angle of at least 54 degrees using the procedure in S11(b) of this standard.

* * * * *

S9.5 *Marking and conspicuity requirements.*

S9.5.1 *Requirements for lower anchors.* Lower anchorages must meet the requirements in S9.5.1(a) or (b).

(a) For each bar installed pursuant to S4, the vehicle shall be permanently marked with a circle:

(1) That is not less than 13 mm in diameter;

(2) That is either solid or open, with or without words, symbols, or pictograms, provided that if words, symbols or pictograms are used, their meaning is explained to the consumer in writing, such as in the vehicle's owner's manual; and

(3) That is located such that its center is on each seat back between 50 and 100 mm above or on the seat cushion 100 ±25 mm forward of the intersection of the vertical transverse and horizontal longitudinal planes intersecting at the horizontal centerline of each lower anchorage, as illustrated in figure 22 to this section. The center of the circle must be in the vertical longitudinal plane that passes through the center of the bar (±25 mm).

(4) The circle may be on a tag.

(b) The vehicle shall be configured such that the following is visible: Each of the bars installed pursuant to S4, or a permanently attached guide device for each bar. The bar or guide device must be visible without the compression of the seat cushion or seat back, when the bar or device is viewed, in a vertical longitudinal plane passing through the center of the bar or guide device, along a line making an upward 30-degree angle with a horizontal plane. Seat backs are in the nominal design riding position. The bars may be covered by a removable cap or cover, provided that the cap or cover is permanently marked with words, symbols or pictograms whose meaning is explained to the consumer in written form as part of the owner's manual.

S9.5.2 *Requirements for lower anchors.* Lower anchorages must meet the requirements in S9.5.2(a) and (b), as applicable.

(a) For each bar installed pursuant to S4, the vehicle shall be permanently marked with a symbol that:

(1) Is not less than 13 mm in diameter;

(2) Contains the pictogram shown in figure 24 to this section; and

(3) Is located such that its center is on each seat back between 50 and 100 mm above or on the seat cushion between 100 to −50 mm forward of the intersection of the vertical transverse and horizontal longitudinal planes intersecting at the horizontal centerline of each lower anchorage, as illustrated in figure 19 to this section. The center of the symbol must be in the vertical longitudinal plane that passes through the center of the bar (±25 mm).

(4) The symbol may be on a tag.

(b) The bars may be covered by a removable cap or cover, provided that the cap or cover is permanently marked with the pictogram shown in figure 24 to this section. If the cap or cover is permanently attached to the vehicle, the lower anchorage bars are not required to be separately marked with the pictogram. If the cap or cover is not permanently attached to the vehicle, the lower anchorage bars must also be marked with the symbol meeting S9.5.2(a)(1) through (4).

* * * * *

S11. *Test procedures.* Each vehicle shall meet the requirements of this standard when tested according to the following procedures. Where a range of values is specified, the vehicle shall be able to meet the requirements at all points within the range.

(a) *Strength requirements*—(1) *Forward force direction.* Place SFAD 2 in the vehicle seating position and attach it to the two lower anchorages of the child restraint anchorage system. Do not attach the tether anchorage. A rearward horizontal force of 135 ±15 N is applied to the center of the lower front crossbar of SFAD 2 to press the device against the seat back as the fore-aft position of the rearward extensions of the SFAD is adjusted to remove any slack or tension. Apply a preload force of 500 N horizontally and in the vertical centerline of the SFAD 2 at point X. Increase the pull force as linearly as practicable to a full force application of 11,000 N in not less than 24 seconds and not more than 30 seconds and maintain at an 11,000 N level for 1 second.

(2) *Lateral force direction.* Place SFAD 2 in the vehicle seating position and attach it to the two lower anchorages of the child restraint anchorage system. Do not attach the tether anchorage. A

rearward force of 135 ±15 N is applied to the center of the lower front crossbar of SFAD 2 to press the device against the seat back as the fore-aft position of the rearward extensions of the SFAD is adjusted to remove any slack or tension. Apply a preload force of 500 N horizontal and perpendicular to the longitudinal centerline of the SFAD 2 at point X of the test device. Increase the pull force as linearly as practicable to a full force application of 5,000 N in not less than 24 seconds and not more than 30 seconds and maintain at a 5,000 N level for 1 second.

(b) *Clearance angle.* The seat back angle, if adjustable, is set at the manufacturer's nominal design seat back angle. If the position is not specified, set the seat back at the first detent rearward of 25° from the vertical. Remove or open any lower anchorage cover, if present, to expose the lower anchorage. To measure clearance angle, attach the clearance angle tool to the lower anchorage and apply a vertical force of 67 N (15 lbf) to the tool. Measure the angle (with respect to the horizontal) of the tool while the force is being applied.

(c) *Anchorage depth.* The seat back angle, if adjustable, is set at the manufacturer's nominal design seat back angle. If the position is not specified, set the seat back at the first detent rearward of 25° from the vertical. To measure the anchorage depth, subtract 30 degrees from the measured seat pan angle to calculate the view angle. With the anchorage depth tool (*see* figure 28 to this section) on a flat surface, adjust the view bar to read the view angle. Slide the zeroing strip along the view bar so that it is barely touching the top of the depth tool hook. Move the view bar forward, so the end of the zeroing strip is aligned with the zero-scribe line. For hidden anchorages, slide the anchorage depth tool so that it reads 0 mm at the rear edge of the slider. For visible anchorages, align the depth gauge to 25 mm so that negative values can be read. Attach the depth tool centered to the lower anchorage. Adjust the depth tool base to be within ±2 degrees of the view angle (30 degrees minus seat pan angle) to set the tool-parallel to the seat pan angle. Move the entire slider bar forward until the zeroing strip contacts the vehicle seat back or any other vehicle part.

S12. *Written instructions.* Vehicles subject to Standard No. 225 (this section) shall meet the written instruction requirements specified in either S12.1 or S12.2 according to the phase-in schedule specified in S13.

S12.1 Written instructions shall:

(a) Indicate which seating positions in the vehicle are equipped with tether anchorages and child restraint anchorage systems;

(b) In the case of vehicles required to be marked as specified in paragraphs S4.1 and S9.5 of this standard, explain the meaning of markings provided to locate the lower anchorages of child restraint anchorage systems; and

(c) Include instructions that provide a step-by-step procedure, including diagrams, for properly attaching a child restraint system's tether strap to the tether anchorages.

S12.2 Written instructions shall:

(a) Indicate which seating positions in the vehicle are equipped with tether anchorages and child restraint anchorage systems;

(b) In the case of vehicles required to be marked as specified in paragraphs S4.1 and S9.5 of this standard, explain the meaning of markings provided to locate the lower anchorages of child restraint anchorage systems and the top tether anchorages;

(c) Include instructions that provide a step-by-step procedure, including diagrams, for properly attaching a child restraint system's tether strap to the tether anchorages;

(d) Include instructions on how to locate and access the tether anchorage and the lower anchorages; and

(e) Use the following terms when referring to the different components of the child restraint anchorage system that are used to connect the child restraint system to the vehicle: ''lower anchor'' means the lower anchorage of the child restraint anchorage system in the vehicle, ''tether anchor'' means the top tether anchorage of the child restraint anchorage system in the vehicle, ''lower anchor attachment'' means the child restraint system or the detachable base's (in the case of a rear-facing child restraint with a detachable base) lower anchorage connector and the lower anchorage strap (for flexible lower anchorage attachments), ''rigid lower anchor attachment'' means the child restraint system or the detachable base's (in the case of a rear-facing child restraint with a detachable base) lower anchorage connector that is rigidly attached to the CRS or detachable base, respectively, and does not have a lower anchorage strap, and ''tether'' means the child restraints system's tether hook and tether strap.

S13 *Phase-in schedule.* The S13 phase in schedule details when listed requirements become inactive and are replaced by newer requirements. Requirements in Standard No. 225 (this section) not listed in S13 shall be in effect before, during, and after the S13 phase-in.

S13.1 *Vehicle certification information.* At any time during the production years ending August 31, 2029, and August 31, 2030, each manufacturer shall, upon request from the Office of Vehicle Safety Compliance, provide information identifying the vehicles (by make, model and vehicle identification number) that have been certified as complying with the child restraint anchorage usability requirements of this standard. Manufacturers shall specify the number of vehicles meeting each phase-in percentage. The manufacturer's designation of a vehicle as a certified vehicle is irrevocable.

S13.1.1 *Pre phase-in.* Vehicles manufactured before September 1, 2028, are subject to S6.1.1, S6.2.1, S9.2.1, S9.2.2, S9.2.3, S9.5.1, and S12.1 of this standard.

S13.1.2 *Phase-in year 1.* Vehicles manufactured on or after September 1, 2028, and before September 1, 2029. The total number of individual vehicles complying with S6.1.2, S6.2.2, S6.4, S9.2 (except for S9.2.2(a)), S9.5.2, and S12.2 of this standard shall be not less than 20 percent of a vehicle manufacturer's total production for this time period. The remaining 80 percent of a vehicle manufacturer's total production are subject to S6.1.1, S6.2.1, S9.2.1, S9.2.2, S9.2.3, S9.5.1, and S12.1 of this standard.

S13.1.3 *Phase-in year 2.* Vehicles manufactured on or after September 1, 2029, and before September 1, 2030. The total number of individual vehicles complying with S6.1.2, S6.2.2, S6.4, S9.2 (except for S9.2.2(a)), S9.5.2, and S12.2 of this standard shall be not less than 50 percent of a vehicle manufacturer's total production for this time period. The remaining 50 percent of a vehicle manufacturer's total production are subject to S6.1.1, S6.2.1, S9.2.1, S9.2.2, S9.2.3, S9.5.1, and S12.1 of this standard.

S13.1.4 *Phase-in year 3 and beyond.* Vehicles manufactured on or after September 1, 2030. The total number of vehicles complying with S6.1.2, S6.2.2, S6.4, S9.2 (except for S9.2.2(a)), S9.5.2, and S12.2 shall be not less than 100 percent of a vehicle manufacturer's total production.

S13.2 *Vehicles produced by more than one manufacturer.*

S13.2.1 For the purpose of calculating average annual production of vehicles for each manufacturer and the number of vehicles manufactured by each manufacturer under S13.1.1 through S13.1.4, a vehicle produced by more than one manufacturer shall be

attributed to a single manufacturer as follows:

(a) A vehicle which is imported shall be attributed to the importer.

(b) A vehicle manufactured in the United States by more than one manufacturer, one of which also markets the vehicle, shall be attributed to the manufacturer which markets the vehicle.

S13.2.2 A vehicle produced by more than one manufacturer shall be attributed to any one of the vehicle's manufacturers specified by an express written contract, reported to the National Highway Traffic Safety Administration under 49 CFR part 585, between the manufacturers so specified and the manufacturer to which the vehicle would otherwise be attributed under S13.2.1.

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Figures to § 571.225

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Figure 8 to § 571.225. Side View of 325 mm Radius Sphere Zone From R-Point, Truncated at 230 mm Below the Center

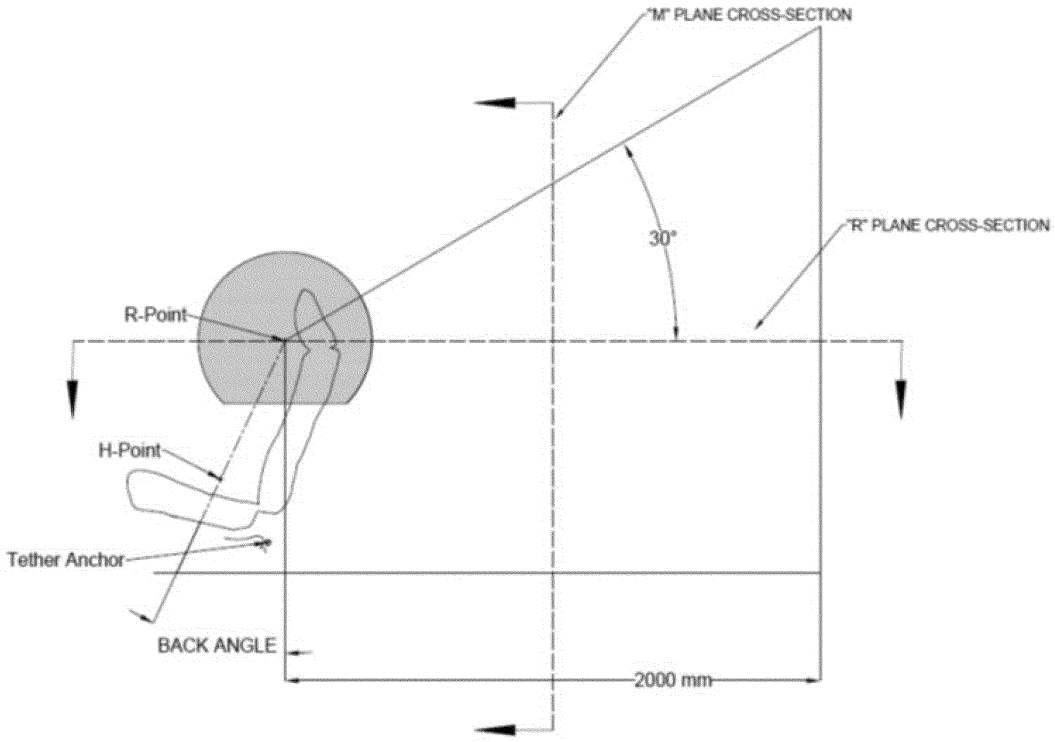


Figure 9 to § 571.225. Three-Dimensional 325 mm Radius Sphere Zone From R-Point, Truncated Along the Lower Edge at 230 mm Below Its Center

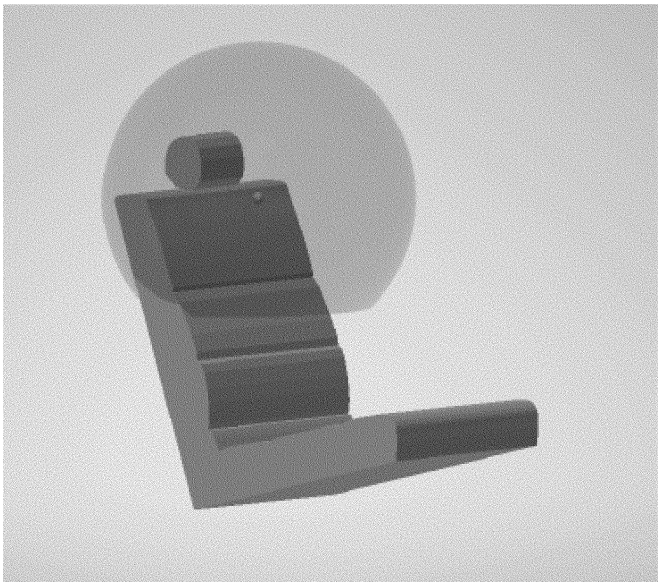
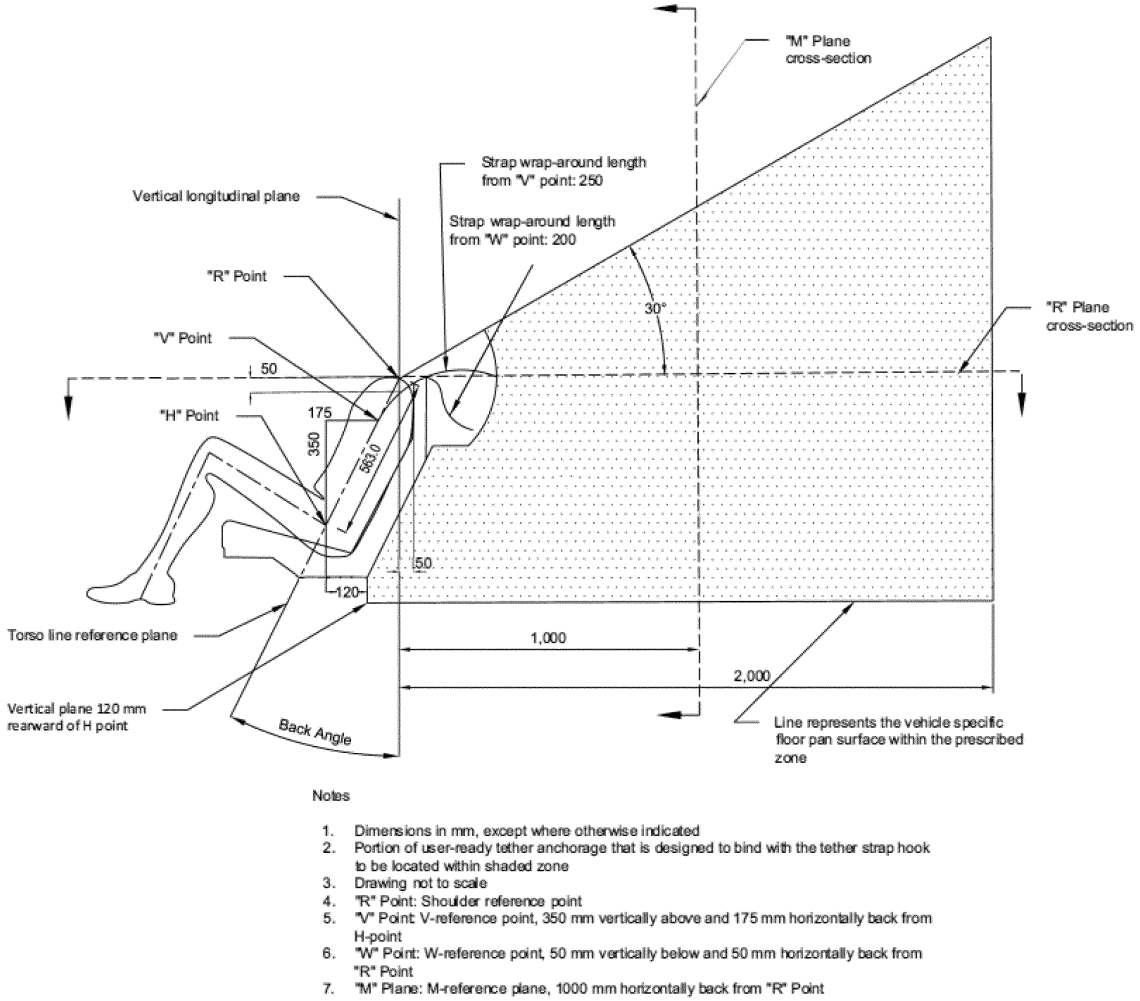


Figure 10 to § 571.225—Side View. User Ready Tether Anchorage Location



Notes

1. Dimensions in mm, except where otherwise indicated
2. Portion of user-ready tether anchorage that is designed to bind with the tether strap hook to be located within shaded zone
3. Drawing not to scale
4. "R" Point: Shoulder reference point
5. "V" Point: V-reference point, 350 mm vertically above and 175 mm horizontally back from H-point
6. "W" Point: W-reference point, 50 mm vertically below and 50 mm horizontally back from "R" Point
7. "M" Plane: M-reference plane, 1000 mm horizontally back from "R" Point

Figure 11 to § 571.225. [Reserved]

* * * * *

Figure 19 to § 571.225. Placement of Symbol on the Seat Back and Seat Cushion of Vehicle

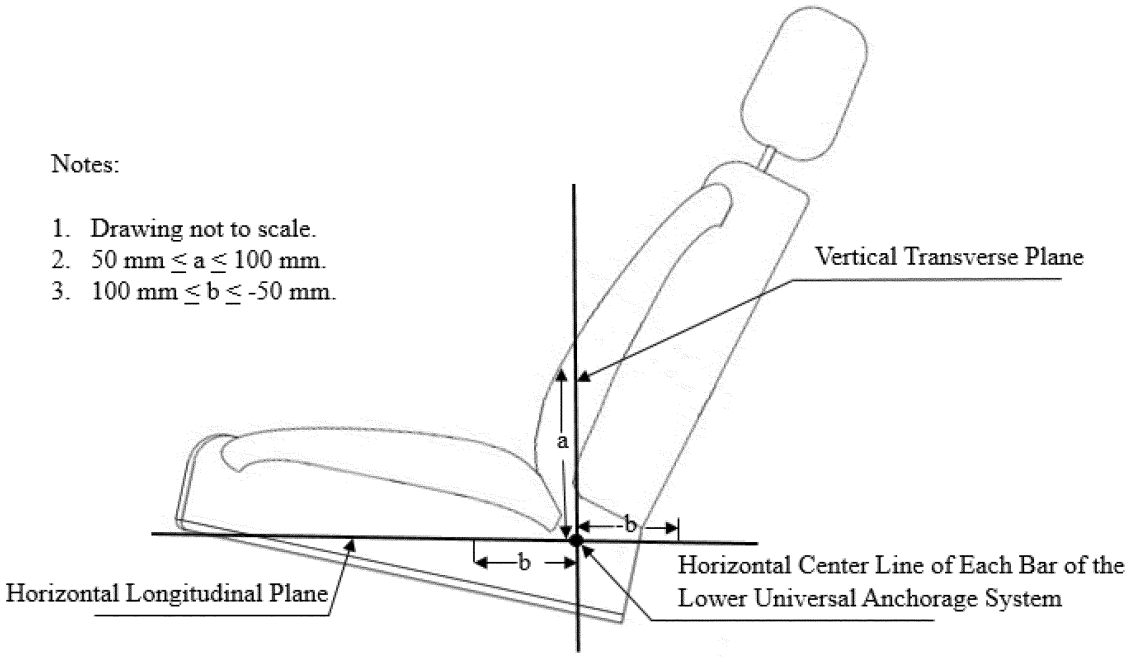


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Figure 23 to § 571.225. Clearance Angle Tool

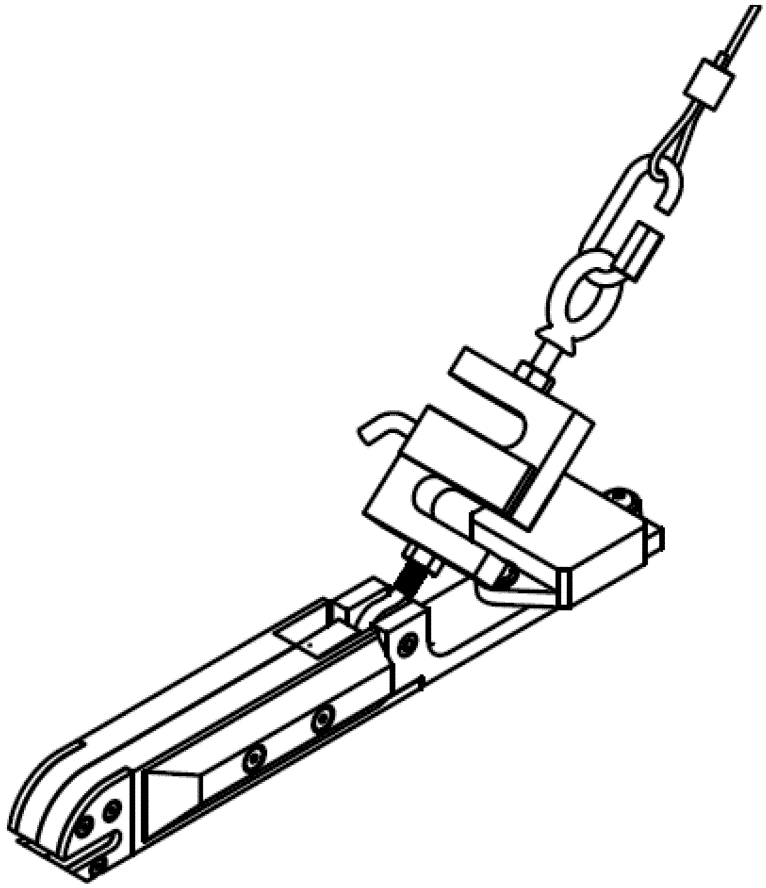


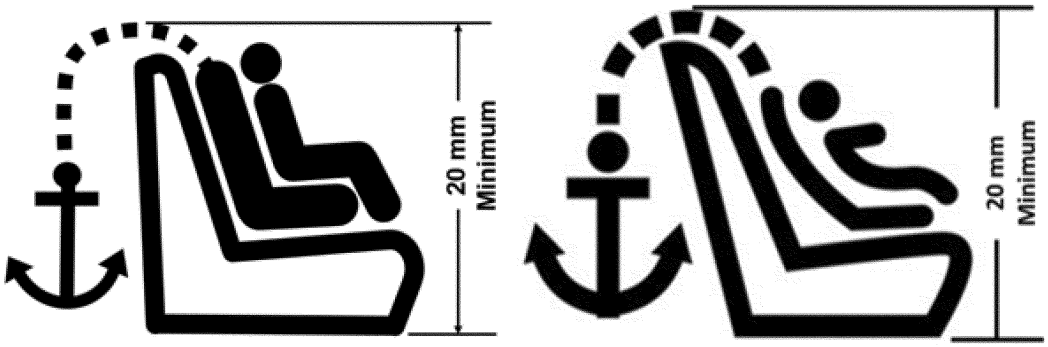
Figure 24 to § 571.225—Lower Anchorage Symbol

Figure 25 to § 571.225. Tether Anchorage Symbols

Note 1 to Figure 24 to § 571.225: Drawing not to scale.

Note 2 to Figure 24 to § 71.225: Symbol may be shown in mirror image.

Note 3 to Figure 24 to § 571.225: Color of the symbol at the option of the manufacturer.

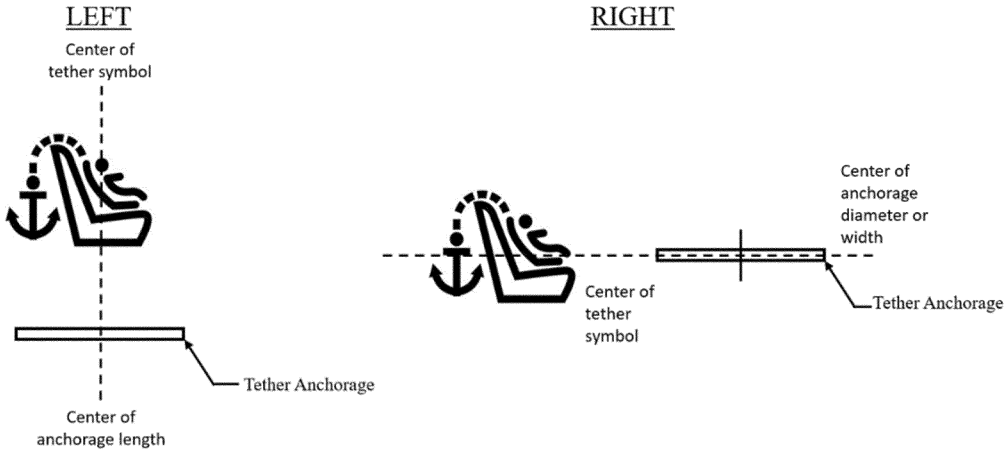


Note 1 to Figure 25 to § 571.225: Drawing not to scale.

Note 2 to Figure 25 to § 571.225: Symbol may be shown in mirror image.

Note 3 to Figure 25 to § 571.225: Color of the symbol at the option of the manufacturer.

Figure 26 to § 571.225. Tether Anchorage Marking Location—Alignment (No Cover)



Note 1 to Figure 26 to § 571.225: (Tolerance of ± half of the anchorage length)/(Tolerance of ± half of the pictogram height).

Figure 27 to § 571.225. Tether Anchorage Marking Location—Distance (No Cover)

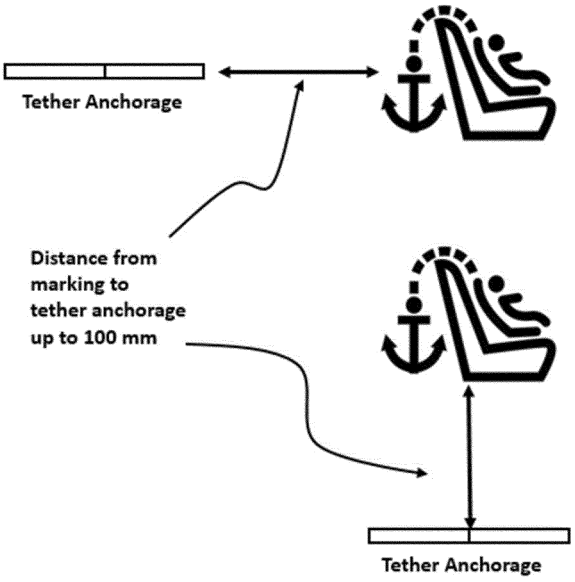
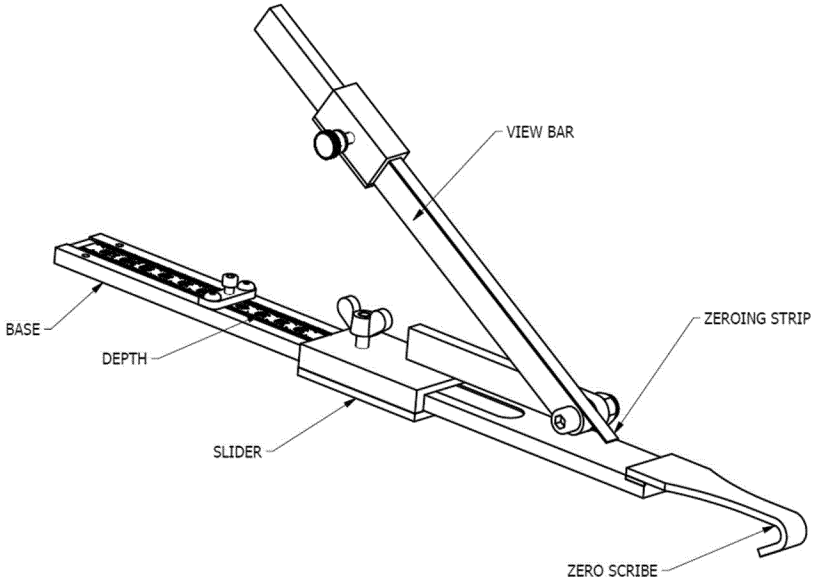


Figure 28 to § 571.225. Anchorage Depth Tool



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PART 585—PHASE-IN REPORTING REQUIREMENTS

■ 5. The authority citation for part 585 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117, and 30166; delegation of authority at 49 CFR 1.95.

■ 6. Add subpart O to read as follows:

Subpart O—Child Restraint Anchorage Systems Phase-In Reporting Requirements

Sec.

Subpart O—Child Restraint Anchorage Systems Phase-In Reporting Requirements

§ 585.135 Scope.

This subpart establishes requirements for manufacturers of passenger cars, and of trucks and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 3,855 kilograms (8,500 pounds) or less, and of buses with a GVWR of 4,536 kg (10,000 lb) or less, to submit a report per § 585.140, and maintain records related to the report according to § 585.141, concerning the number of such vehicles that meet the requirements of Standard No. 225, *Child restraint anchorage systems* (49 CFR 571.225).

§ 585.136 Purpose.

The purpose of these reporting requirements is to assist the National Highway Traffic Safety Administration in determining whether a manufacturer has complied with Standard No. 225 (49 CFR 571.225).

§ 585.137 Applicability.

This subpart applies to manufacturers of passenger cars, and of trucks and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 3,855 kilograms (8,500 pounds) or less, and of buses with a GVWR of 4536 kg (10,000 lb) or less, for which Standard No. 225 (49 CFR 571.225) applies. However, this subpart does not apply to vehicles excluded by S5 of Standard No. 225 from the requirements of that standard.

§ 585.138 Definitions.

(a) All terms defined in 49 U.S.C. 30102 are used in their statutory meaning.

(b) Bus, gross vehicle weight rating or GVWR, multipurpose passenger vehicle, passenger car, and truck are used as defined in 49 CFR 571.3.

(c) *Production year* means the 12-month period between September 1 of one year and August 31 of the following year, inclusive.

§ 585.139 Response to inquiries.

At any time during the production years ending August 31, 2029, and August 31, 2030, each manufacturer shall, upon request from the Office of Vehicle Safety Compliance, provide information identifying the vehicles (by make, model and vehicle identification number) that have been certified as complying with Standard No. 225 (49 CFR 571.225). The manufacturer's designation of a vehicle as a certified vehicle is irrevocable.

§ 585.140 Reporting requirements.

(a) *General reporting requirements.* Within 60 days after the end of the production years ending August 31, 2029, and August 31, 2030, each manufacturer shall submit a report to the National Highway Traffic Safety Administration concerning its compliance with the child restraint anchorage system requirements of Standard No. 225 (49 CFR 571.225) for applicable vehicles produced in that year. Each report shall:

(1) Identify the manufacturer;

(2) State the full name, title, and address of the official responsible for preparing the report;

(3) Identify the production year being reported on;

(4) Contain a statement regarding whether or not the manufacturer complied with the child restraint anchorage system requirements of Standard No. 225 (49 CFR 571.225) for the period covered by the report and the basis for that statement;

(5) Provide the information specified in paragraph (b) of this section;

(6) Be written in the English language; and

(7) Be submitted to: Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Ave. SE, West Building, Washington, DC 20590.

(b) *Report content*—(1) *Basis for phase-in production goals.* Each manufacturer must provide the number of passenger cars and trucks and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 3,855 kilograms (8,500 pounds) or less, and buses with a GVWR of 4,536 kg (10,000 lb) or less manufactured for sale in the United States for each of the most recent three previous production years, or, at the manufacturer's option, for the most recently ended production year. A new manufacturer that has not previously manufactured these vehicles for sale in the United States must submit a report at the end of the initial production year for the number of such vehicles manufactured during the initial production year.

(2) *Production.* Each manufacturer must report for the production year for which the report is filed: the number of passenger cars and trucks and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 3,855 kilograms (8,500 pounds) or less, and buses with a GVWR of 4,536 kg (10,000 lb) or less, that do and do not meet S13 of Standard No. 225 (49 CFR 571.225).

(3) *Vehicles produced by more than one manufacturer.* Each manufacturer whose reporting of information is affected by one or more of the express written contracts permitted by S13.2.1(c) of Standard No. 225 (49 CFR 571.225) must:

(i) Report the existence of each contract, including the names of all parties to the contract, and explain how the contract affects the report being submitted.

(ii) Report the actual number of vehicles covered by each contract.

§ 585.141 Records.

Each manufacturer must maintain records of the Vehicle Identification Number for each vehicle for which information is reported under § 585.140 until December 31, 2032.

Issued in Washington, DC, under authority delegated in 49 CFR 1.95 and 501.

Adam Raviv,

Chief Counsel.

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