

NHTSA'S RESEARCH & RULEMAKING ACTIVITIES ON CHILD PASSENGER SAFETY

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NHTSA's Activities on Child Passenger Safety

I. Notice of Proposed Rulemaking (NPRM) for improving the usability of child restraint anchorages.

- A. Improve Lower Anchor Usability
- B. Improve Tether Anchorage Usability
- C. Improve Conspicuity and Identification of Anchorages and CRS Connectors
- D. Request for comment

II. FMVSS No. 213 Upgrade – Research

- A. Standard Seat Assembly



I. NPRM for improving the usability of child restraint anchorages.

Publication Date: January 23, 2015

Docket No. NHTSA-2014-0123

Notice of Proposed Rulemaking

Goal

- Improve the ease of use of child restraint anchorage systems.
- Standardize features of the child restraint anchorage systems to create more effective education messaging.

I. NPRM Proposal Overview

A. Improve Lower Anchor Usability

Issue: Lower Anchors are difficult for CRS installation

Examples:

- Stiff leather around anchor
- Anchors deep into seat bight



Stiff cushion around anchor



Small opening



Hard plastic near anchor

I. NPRM Proposal Overview

A. Improve Lower Anchor Usability

Proposal to Improve Lower Anchor Usability

Requirements for clearance angle (> 54 deg), attachment force (< 40 lb) and anchor depth (< 2 cm) into FMVSS No. 225.

Requirements based on UMTRI 2012 LATCH Usability Study sponsored by IIHS

Clearance
Angle



Attachment
Force



Anchor
Depth

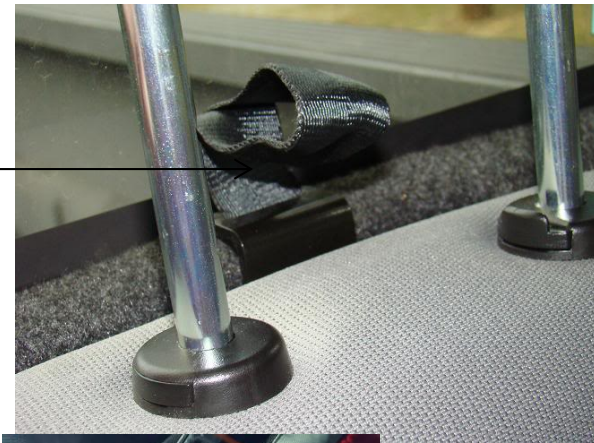
I. NPRM Proposal Overview

B. Improve Tether Anchorage Usability

Issue: Varied Tether Anchor Hardware, Difficult to Find Anchors & Difficult to Tighten Tether



Varied types of anchor hardware



Hidden anchor



Anchor under carpet or plastic



Can't tighten tether

I. NPRM Proposal Overview

B. Improve Tether Anchorage Usability

Proposal to Improve Tether Anchorage Usability

- a. **Limit the Zone.** Disallow tether anchorages from being placed deep under the seat.
- b. **Anchorage Must Be Accessible.** Require tether anchorages be accessible without the need to remove carpet or other vehicle components.
- c. **Standardized Configuration.** Standardize the tether anchorage to be a “rigid bar of any cross section shape.”
- d. **Clearance Around the Tether Anchorage*.** Require a 165 mm (6.5 in) minimum distance from a tether anchorage to a reference point on the vehicle

* Proposal includes amending FMVSS No. 213 to require that the tether hardware assembly must be no longer than 165 mm (6.5 in).

I. NPRM Proposal Overview

C. Conspicuity and Identification of Anchorages and CRS Connectors

Issue: Inconsistent marking of lower anchors



Visible lower anchor, marked lower anchor with fabric slit, imprint of anchor mark and anchor hidden in seat bight, anchor behind door, flap/cutout for lower anchor.

Issue: Confusion identifying tether anchors



I. NPRM Proposal Overview

C. Conspicuity and Identification of Anchorages and CRS Connectors

Proposal to Improve Conspicuity and Identification of Anchorages and CRS Connectors

- a. Proposed ISO markings near all lower anchorages & tether anchorages
- b. Proposed ISO markings on CRS lower anchor attachments & tether hooks



I. NPRM Proposal Overview

D. Request for Comments

A. Additional Child Restraint Anchorages in Rear Seating Positions

- a. Require lower anchors and tether anchor in center seating position
- b. Require lower anchors and/or tether anchors in the third row
- c. Remove exclusions of convertibles from requiring tether anchors and of vehicles with transmission interference from requiring lower anchors.

B. Standardized Terminology for Written Instructions in User's Manuals

- Require use of the following terms: *lower anchor(s)*, *tether anchor*, *lower anchor attachments*, *tether*, *lower anchor connector*, *lower anchor strap*, *tether hook*, and *tether strap*.

C. Recommendation for Tether Anchor Use

- Instruct to always attach the tether when restraining a child in a forward-facing CRS equipped with an internal harness.



II. FMVSS No. 213 Upgrade – Research

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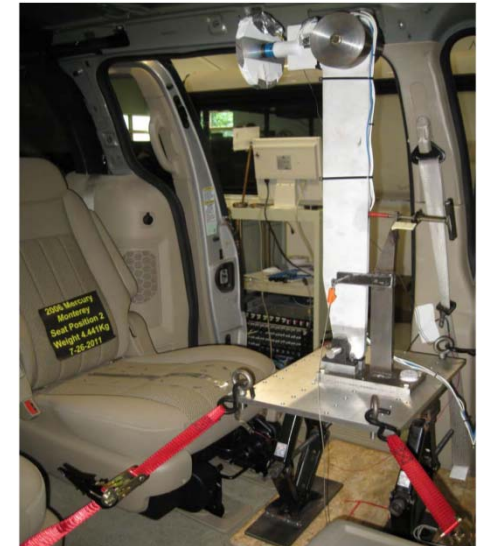
NHTSA is considering upgrades to FMVSS No. 213 standard seat assembly and test parameters that better represent current vehicle fleet and real world conditions.

- **Upgrades of the standard seat assembly include:**
 - Seat cushion stiffness,
 - Seat geometry,
 - Seat belt assembly (3 pt vs. 2pt), and
 - Anchorage locations (seat belt and child restraint anchorages)
 - **Upgrades of the test parameters include:***
 - Crash pulse and test velocity,
 - Excursion limits, and
 - Others
- * Test parameter upgrades are not discussed in this presentation

II. FMVSS No. 213 Upgrade - Research Standard Seat Assembly

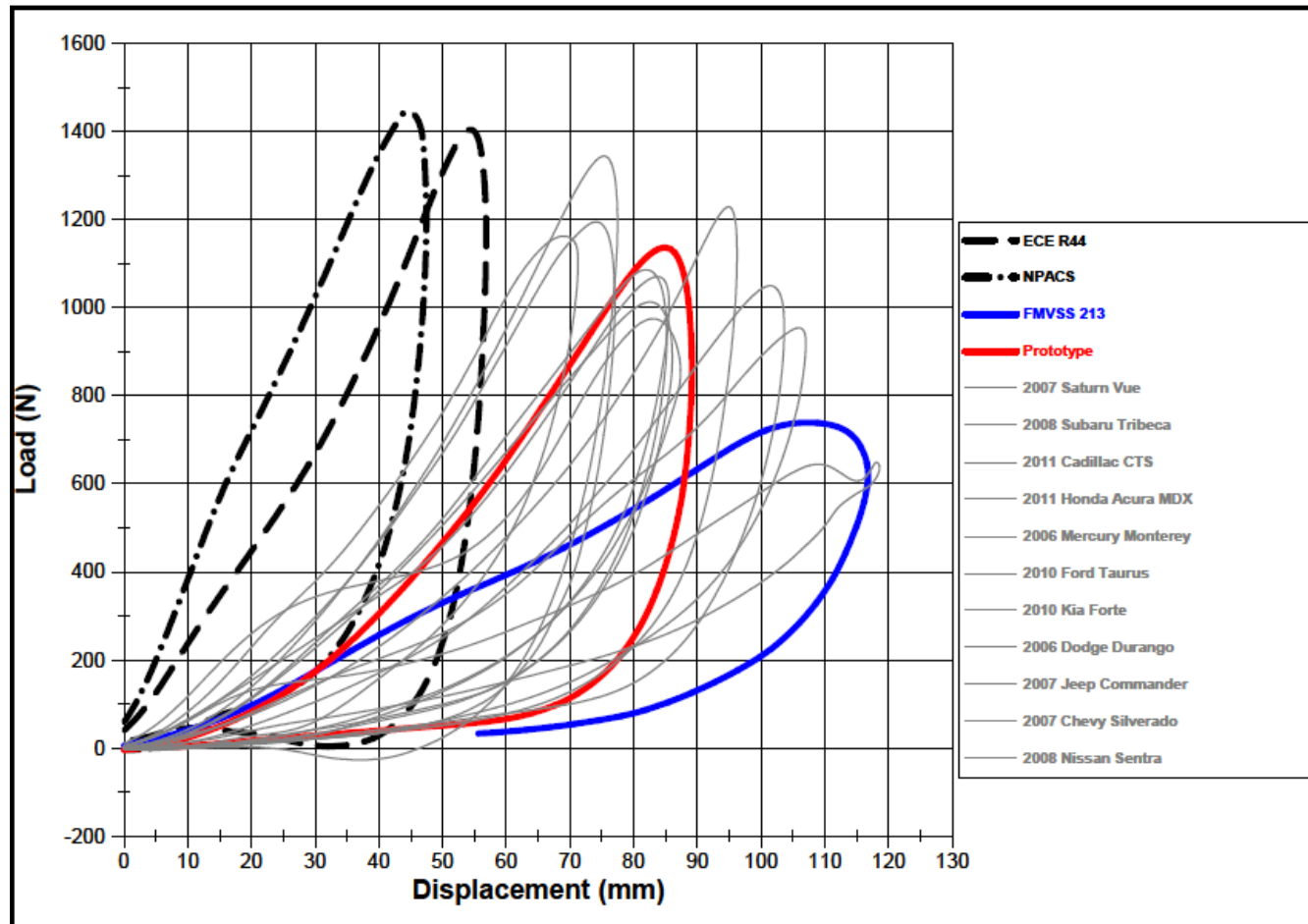
Seat Cushion Foam Stiffness

- **Prototype Foam Specifications**
 - ❑ Density 47 kg/m³ (2.9 pcf) \pm 10%
 - ❑ 50% IFD 440 N \pm 10%
 - ❑ 50% CFD 6.6 pcf \pm 10%
- **Performed dynamic stiffness tests**
 - ❑ Dropping an arm with a 6 inch diameter impactor at target speed of 3 mps
 - ❑ 11 vehicles
 - ❑ Different foams including the ECE R44, NPACS, FMVSS No. 213 and prototype foam.



II. FMVSS No. 213 Upgrade - Research Standard Seat Assembly

- Prototype seat cushion foam stiffness (dynamic stiffness test) representative of the vehicle fleet



II. FMVSS No. 213 Upgrade - Research Standard Seat Assembly

Bench Geometry Measurements

- The agency surveyed vehicles in the fleet to compile data on the rear seat environment¹
 - ❑ Measurements of 43 individual rear seating positions in 24 MY 2010 vehicles including: seat back angle, height cushion thickness, seat width measurements, and seat belt and child restraint anchorage locations.

[1] Aram, M.L., Rockwell, T. "Vehicle Rear Seat Study" Technical Report July 2012



- ❖ *Preliminary Drawings of the standard seat assembly will be available at Docket No. NHTSA-2013-0055*
- ❖ *Drawings are subject to change prior to NPRM*

II. FMVSS No. 213 Upgrade - Research Standard Seat Assembly

Bench Geometry Characteristics

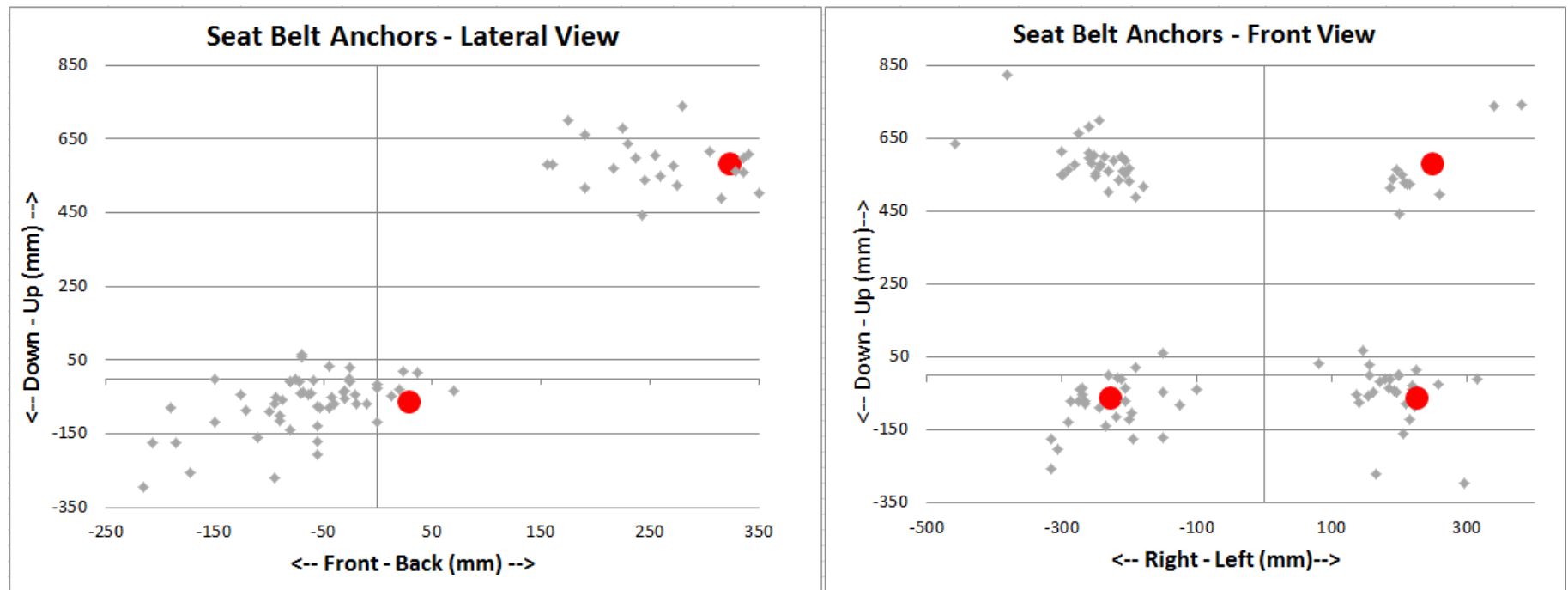
	Fleet	213	ECE	213 Modified (preliminary)
Seat Back Angle	20 ± 4°	20°	20°	20°
Seat Pan Angle	13 ± 4°	15°	15°	15°
Seat Back Thickness (mm)	76 ± 29	152.4	70	50.8
Seat Pan Thickness (mm)	90 ± 40	152.4	140	101.6
Seat Pan Depth/Length (mm)	406 ± 38	416	438	400
Seat Back Height (mm) - without head restraint	578 ± 60	517	432	504



❖ Subject to change prior to NPRM

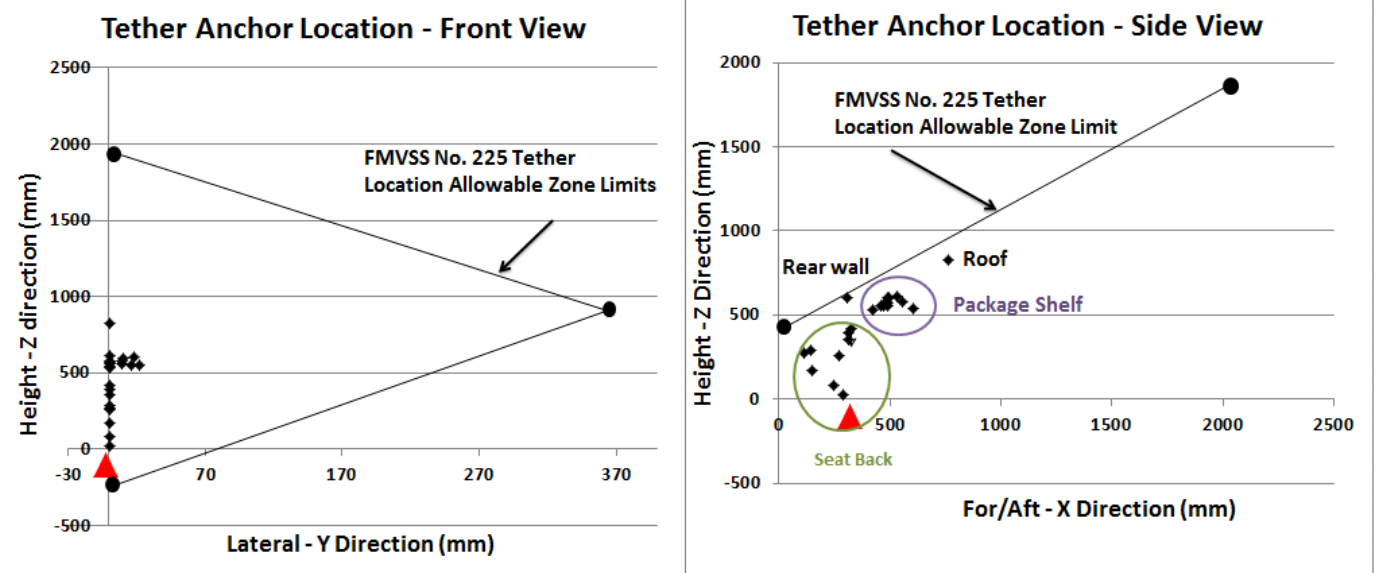
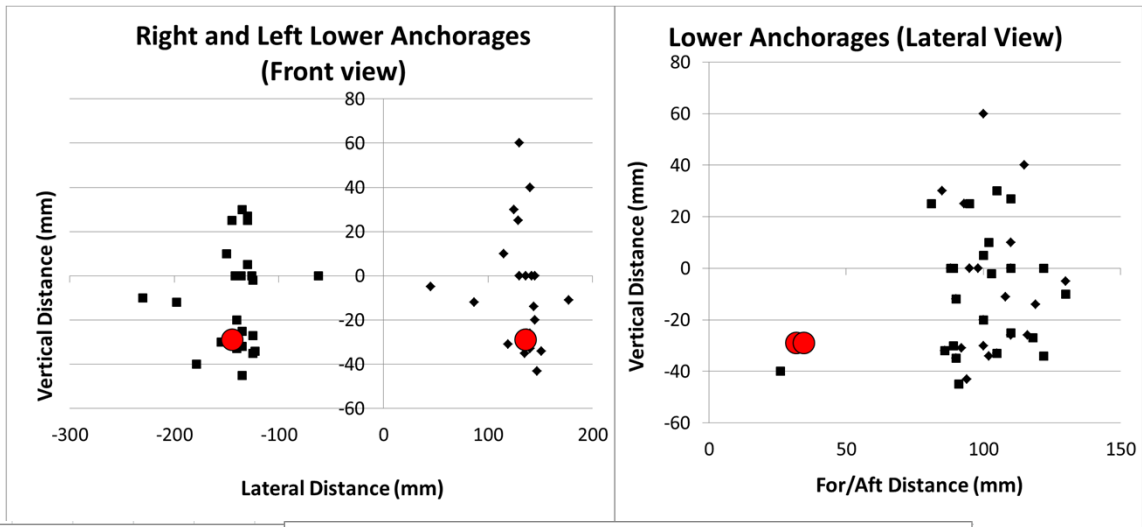
II. FMVSS No. 213 Upgrade - Research Standard Seat Assembly

Seat Belt Anchorage Location



II. FMVSS No. 213 Upgrade - Research Standard Seat Assembly

Average Child Restraint Anchorage Locations



❖ Subject to change prior to NPRM



Questions?

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