industry to tailor proposals and better describe the offeror's intended approach, increases the probability that the offeror's proposal satisfies Government requirements, and often results in better contract performance. Asking contracting officers to conduct discussions with industry provides a reasonable approach to recognizing and addressing valid industry concerns and a constructive alternative to protests resulting from industry frustration over misunderstood requirements.

DoD notes the potential disadvantages of this proposed change in increased time to complete the source-selection process and additional workload for acquisition staff. However, failure to hold discussions in high-dollar value, more complex source selections has led to misunderstandings of Government requirements by industry and flaws in the Government's evaluation of offerors' proposals, leading to protests that have been sustained, and ultimately extending source-selection timelines. DoD proposes to decrease the possibility of this outcome by making such discussions the default procedure for source selections for procurements at or above $100 million. However, use of the term "should," as defined in FAR part 2, provides that the expected course of action need not be followed if inappropriate for a particular circumstance.

## II. Executive Order 12866

This is not a significant regulatory action and, therefore, is not subject to review under Section 6 of Executive Order 12866, Regulatory Planning and Review, dated September 30, 1993. This rule is not a major rule under 5 U.S.C. 804.

## III. Regulatory Flexibility Act

DoD does not expect this rule to have a significant economic impact on a substantial number of small entities within the meaning of the Regulatory Flexibility Act, 5 U.S.C. 601, *et seq.*, because the rule does not add to or delete existing regulations on discussions for the vast majority of DoD procurements, *i.e.*, those under $100 million. For the largest procurements of at least $100 million, any increase in discussions is anticipated to benefit all offerors, including small businesses, by providing them an opportunity to explain details of the offer and market their particular capabilities.

An initial regulatory flexibility analysis has been prepared and is summarized as follows: The opportunity to participate in discussions increases the probability of selection for award, as described above. In fiscal year 2009, the most recent fiscal year for which data is available, DoD awarded 620 new contracts and 252 new task orders/delivery orders of $100 million or more to small businesses. While there is no way to determine how many more small businesses may have been selected for high-dollar value DoD awards had discussions been held, it is reasonable to assume that the number would have been higher, thus providing small businesses with a net positive benefit.

DoD invites comments from small business concerns and other interested parties on the expected impact of this rule on small entities. DoD will also consider comments from small entities concerning the existing regulations in subparts affected by this rule in accordance with 5 U.S.C. 610. Interested parties must submit such comments separately and should cite 5 U.S.C. 610 (DFARS Case 2010–D013) in correspondence.

## IV. Paperwork Reduction Act

The Paperwork Reduction Act does not apply, because there are no information collection requirements that require the approval of the Office of Management and Budget under 44 U.S.C. 3501, *et seq.*

## List of Subjects in 48 CFR Part 215

Government procurement.

**Clare M. Zebrowski,**

*Editor, Defense Acquisition Regulations System.*

Therefore, DoD proposes to amend 48 CFR part 215 as follows:

1. The authority citation for 48 CFR part 215 continues to read as follows:

**Authority:** 41 U.S.C. 421 and 48 CFR chapter 1.

## PART 215—CONTRACTING BY NEGOTIATION

2. Add sections 215.203–71 and 215.209 to read as follows:

**215.203–71 Requests for proposals—procurements of $100 million or more.**

For source selections when the procurement is $100 million or more, contracting officers should conduct discussions with offerors in the competitive range.

**215.209 Solicitation provisions and contract clauses.**

(a) For source selections when the procurement is $100 million or more, contracting officers should use the provision at 52.215–1, Instructions to Offerors—Competitive Acquisition, with its Alternate I.

[FR Doc. 2010–29510 Filed 11–23–10; 8:45 am]

BILLING CODE 5001–08–P

## DEPARTMENT OF TRANSPORTATION

## National Highway Traffic Safety Administration

## 49 CFR Part 571

**Docket No. NHTSA–2010–0158**

**Regulation Identifier No. (RIN) 2127–AJ44**

## Federal Motor Vehicle Safety Standards, Child Restraint Systems; Hybrid III 10-Year-Old Child Test Dummy

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

**ACTION:** Supplemental notice of proposed rulemaking (SNPRM).

**SUMMARY:** This document proposes to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 213, *Child Restraint Systems,* regarding a Hybrid III 10-year-old child test dummy that the agency seeks to use in the compliance test procedures of the standard. This document supplements a 2005 notice of proposed rulemaking (NPRM) and a 2008 SNPRM previously published in this rulemaking (RIN 2127–AJ44) regarding this test dummy. In the 2005 NPRM, in response to Anton's Law, NHTSA proposed to adopt the 10-year-old child test dummy into FMVSS No. 213 to test child restraints for older children. Subsequently, to address variation that was found in dummy readings due to chin-to-chest contact, NHTSA published the 2008 SNPRM to propose a NHTSA-developed procedure for positioning the test dummy in belt-positioning seats. Comments on the SNPRM objected to the positioning procedure, and some suggested an alternative procedure developed by the University of Michigan Transportation Research Institute (UMTRI). Today's SNPRM proposes to use the UMTRI procedure to position the test dummy rather than the NHTSA-developed procedure. We note that the 10-year-old child dummy may sometimes experience stiff contact between its chin and upper sternal bib region which may result in an unrealistically high value of the head injury criterion (HIC) [1] referenced in the standard. Accordingly, NHTSA proposes that the dummy's HIC measurement will not be used to assess the compliance of the tested child restraint. This SNPRM also proposes other amendments to FMVSS No. 213, including a proposal to permit NHTSA to use, at the manufacturer's option, the

[1] Throughout this document, HIC refers to the head injury criterion computed using a 36 millisecond (msec) time interval.

Hybrid II or Hybrid III versions of the 6-year-old test dummy, and a proposal to use the UMTRI procedure to position the Hybrid III 6-year-old and 10-year-old dummies when testing belt-positioning seats.

**DATES:** You should submit your comments early enough to ensure that the docket receives them not later than January 24, 2011. However, comments on our reinstating a provision in FMVSS No. 213 that permitted NHTSA to use, at the manufacturer's option, the Hybrid II or Hybrid III versions of the 6-year-old dummy in compliance testing should be received no later than 30 days after publication of this document in the **Federal Register**.

**ADDRESSES:** You may submit comments (identified by the DOT Docket ID Number above) by any of the following methods:

- *Federal eRulemaking Portal:* Go to *http://www.regulations.gov.* Follow the online instructions for submitting comments.
- *Mail: Docket Management Facility:* U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12–140, Washington, DC 20590–0001.
- *Hand Delivery or Courier:* West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue, SE., between 9 a.m. and 5 p.m. ET, Monday through Friday, except Federal holidays.
- *Fax:* 202–493–2251.

*Instructions:* For detailed instructions on submitting comments and additional information on the rulemaking process, see the Public Participation heading of the **SUPPLEMENTARY INFORMATION** section of this document. Note that all comments received will be posted without change to *http://www.regulations.gov*, including any personal information provided. *Please see* the Privacy Act heading below.

*Privacy Act:* Anyone is able to 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 (65 FR 19477–78).

*Docket:* For access to the docket to read background documents or comments received, go to *http://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 Ms. Cristina Echemendia (*Telephone:* 202–366–6345) (*Fax:* 202–493–2990). For legal issues, you may call Ms. Deirdre Fujita, Office of Chief Counsel (*Telephone:* 202–366–2992) (*Fax:* 202–366–3820). You may send mail to these officials at the National Highway Traffic Safety Administration, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building, Washington, DC 20590.

**SUPPLEMENTARY INFORMATION:**

## Table of Contents



## I. Background

### *a. August 31, 2005 NPRM*

On August 31, 2005, NHTSA published an NPRM proposing to amend FMVSS No. 213, *Child Restraint Systems* (49 CFR 571.213), to adopt into the standard's compliance test an instrumented 78 pound (lb) (35 kilogram (kg)) Hybrid III test dummy representing a 10-year-old child.[2] NHTSA proposed, among other matters, to use this dummy (referred to as the "HIII–10C") to test belt-positioning seats and other child restraint systems recommended for children weighing more than 50 lb (22.7 kg), and to incorporate with this dummy the injury criteria and other performance measures specified in S5 of FMVSS No. 213 for evaluating child restraint systems (CRSs) with current test dummies. (Belt-positioning seats are a type of booster seat, *see,* S4 of FMVSS No. 213, and are commonly referred to as "belt-positioning booster seats" (BPB).) The NPRM proposed expanding the definition of "child restraint system" in FMVSS No. 213 to include any device, except Type I or Type II seat belts,[3] designed for use in a motor vehicle or aircraft to restrain, seat, or position children who weigh 80 lb (36 kg) or less, thus expanding the applicability of FMVSS No. 213 to CRSs recommended for children weighing up to 80 lb (36 kg) from the current threshold of 65 lb (29.5 kg).

The rulemaking proposal was part of an on-going agency initiative to enhance the safety of children in motor vehicle crashes. It also implemented Section 4(b) of Public Law 107–318, 116 Stat. 2772 ("Anton's Law"), which required the initiation of a rulemaking proceeding for the adoption of an anthropomorphic test device (ATD) that simulates a 10-year-old child. Section 4 of Anton's Law, signed on December 4, 2002, stated that not later than 24 months after the date of the enactment of that Act, the Secretary shall develop and evaluate an ATD that simulates a 10-year-old child for use in testing child restraints used in passenger motor vehicles, and that within one year following such development and evaluation, the Secretary shall initiate a rulemaking proceeding for the adoption of an ATD so developed.

In accordance with Anton's Law, NHTSA completed its evaluation of the suitability of the HIII–10C dummy in September 2004. Following the evaluation, NHTSA issued an NPRM to initiate rulemaking to adopt specifications and performance requirements for the test dummy into 49 CFR Part 572, the agency's regulation for anthropomorphic test devices.[4] That July 13, 2005 proposal was followed by the August 31, 2005 NPRM on FMVSS No. 213 initiating rulemaking to adopt the dummy into FMVSS No. 213 as a compliance test device.

### *b. January 23, 2008 SNPRM*

The comments on the August 31, 2005 NPRM supported extending the applicability of FMVSS No. 213 to child restraints recommended for children up to 80 lb (36 kg), and supported having a 10-year-old dummy to test higher weight-rated child restraints. However, commenters raised concerns about the biofidelity of the HIII–10C dummy, particularly with regard to the interaction of the dummy's chin with the upper sternal bib region covering the upper portion of a metal "spine box." Commenters said that the dummy

[2] NPRM for FMVSS No. 213, 70 FR 51720, August 31, 2005, Docket No. NHTSA–2005–21245.

[3] A Type I (or Type 1) seat belt is defined in FMVSS No. 209 as a lap belt for pelvic restraint. A Type II (or Type 2) seat belt is defined in FMVSS No. 209, "Seat belt assemblies," as a combination of pelvic and upper torso restraints, which is commonly referred to as a lap/shoulder or three-point belt.

[4] NPRM for 49 CFR part 572, July 13, 2005, 70 FR 40281; Docket No. NHTSA 2004–2005–21247, RIN 2127–AJ49.

exhibited "chin-to-chest" contacts resulting in high HIC scores and high HIC variability when tested multiple times under the same conditions.

In response to these comments, the agency launched a series of tests to investigate the factors that influenced chin-to-chest contact. Results revealed that dummy posture was the primary factor contributing to HIC variation observed in testing of BPB seats. A consistent posture of the dummy in repeated tests with the same BPB revealed significant decreases in HIC variation. A more upright dummy posture minimized the chin-to-chest contact, which resulted in more repeatable and generally lower HIC values. In response to the comments, the agency developed a new dummy positioning procedure which established dummy posture (14 degree torso angle [5]) and a belt positioned at specific landmarks of the dummy's body.

On January 23, 2008 the agency published a supplemental notice of proposed rulemaking (SNPRM) [6] proposing the new dummy positioning procedure for the Hybrid III 10-year-old dummy and the Hybrid III 6-year-old dummy (HIII–6C) in BPB seats. The SNPRM supplemented the proposals of the August 31, 2005 NPRM in the following manner:

1. The agency proposed dummy positioning procedures that establish dummy posture (torso angle at 14 degrees) and seat belt positions based on specific landmarks of the dummy's body. It was proposed that the dummy positioning procedures would be used when using the HIII–10C and the HIII–6C dummies to test BPB.

2. In response to comments on a proposal in the August 31, 2005 NPRM regarding which CRSs would be tested with the HIII–10C dummy, NHTSA revised the earlier proposal which had envisioned using the HIII–10C to test child restraints for children weighing over 50 lb (22.7 kg). The SNPRM proposed that child restraints recommended for children weighing 50 to 65 lb (22.7 to 29.5 kg) be tested with the HIII–6C dummy for performance, and with the weighted HIII–6C dummy for structural integrity, rather than with the HIII–10C. The HIII–10C dummy would be used to test CRSs recommended for children weighing more than 65 lb (29.5 kg).

3. The SNPRM proposed to maintain the exclusion of belt-positioning seats from the seat back requirement by specifying that the HIII–10C dummy would not be used to determine the applicability of the head support surface requirements.

4. To allow sufficient time for manufacturers to incorporate the SNPRM's seating procedure into their certification testing with the HIII–6C dummy, the SNPRM proposed to postpone, until August 1, 2010, an August 1, 2008 compliance date that had been specified for the mandatory use of the HIII–6C dummy. The proposal was to allow use of the Hybrid II 6-year-old dummy at the manufacturers' option, in lieu of the HIII–6C, until August 1, 2010.[7]

The agency received comments on the January 23, 2008 SNPRM from the University of Michigan Transportation Research Institute (UMTRI), CRS manufacturers (Juvenile Products Manufacturers Association, Inc. (JPMA), Dorel), automobile manufacturers (Chrysler, the Alliance of Automobile Manufacturers (the Alliance)), and a private individual.[8] All commenters that directly addressed the proposed dummy positioning procedure opposed it, finding the procedure to be complicated, cumbersome and difficult to use. Some found they could not position the dummy's torso angle in some BPB seats as specified in the SNPRM. Many commenters believed that the dummy's posture using the SNPRM-proposed method does not position the dummy as a child would sit on a particular BPB seat, and so dynamic tests using the proposed positioning procedure would not evaluate the true performance of BPB seat designs.

UMTRI espoused the strengths of the dummy positioning procedure it developed and urged NHTSA to adopt those procedures.[9] UMTRI stated that tests conducted at its facility show that children sit with a wide range of torso angles that depend on the BPB seat characteristics. UMTRI stated: "We recommend a seating procedure that allows the ATD to sit against the back of the booster like a child, rather than being placed in a single posture regardless of the booster design, a practice that can result in a gap between the ATD and the back of the booster." The commenter stated that its procedures position the test dummies in postures that are more representative of how children similar in size to the ATD sit in different BPB seats, and would produce more meaningful assessments of BPB performance. The commenter also noted that its testing has demonstrated that the SNPRM's procedure, which was developed to reduce HIC variability, may in fact "adversely affect child safety by creating incentives to produce poorer rather than better belt routing." That is, the commenter believed that HIC can be lowered by repositioning the torso belt further off of the dummy's shoulder, placing it in a position that could result in a child rotating out of the belt in a frontal crash.

The UMTRI procedure results in unrealistically high HIC values measured by the dummy due to the more slouched positioning of the dummy. UMTRI suggested that NHTSA suspend use of HIC in the testing of BPB seats with the HIII–10C until the biofidelity of the test dummy is improved. UMTRI suggested that instead of HIC, NHTSA should use other measures to assess BPB seat performance, such as how the BPB seat affects seat belt placement and limits head excursion and submarining.[10]

JPMA stated that the CRS manufacturers support including the HIII–10C dummy into FMVSS No. 213 but do not support the implementation of the proposed dummy positioning procedure. JPMA suggested that the procedure appears to be compensating for "a dummy design issue" and results in the dummy being "artificially positioned" in the BPB seat with the lap and shoulder belt set in a predetermined position on the dummy. JPMA expressed particular concern about using the SNPRM-proposed positioning procedure for testing high back BPB seats that have more than one recline adjustment position. The commenter stated that with some BPB seats, the shoulders of the dummy could be positioned as much as two inches

[5] In the January 23, 2008 SNPRM, *infra,* torso angle was defined as the angle between the line joining the center of gravity of the dummy's head to its H-point and a vertical plane (73 FR 3901, 3907).

[6] SNPRM for FMVSS No. 213, 73 FR 3901, Docket No. NHTSA–2007–0048; reopening of comment period, 73 FR 15963, March 26, 2008.

[7] This proposal was subsequently adopted by a final rule published August 5, 2008 (73 FR 45355, Docket No. 2008–0137).

[8] The private individual worked for a baby product retailer and was in favor of using the Hybrid III 10-year-old child test dummy for testing child restraints rated for children weighing 60 pounds and greater.

[9] The SNPRM referred briefly to the UMTRI seating procedure. NHTSA's view, which was disputed by some commenters, was that the UMTRI procedure was similar to the procedure proposed by the SNPRM. 73 FR at 3907.

[10] As used in the August 5, 2008 NPRM, "submarining" is a term describing the kinematics occurring when a child occupant's pelvis becomes unrestrained by the lap belt portion of a seat belt assembly and then slides under the lap belt in a frontal impact. As a result, the belt can enter the abdominal region and cause injury to the unprotected internal organs and lumbar spine. Submarining frequently involves the child's knees sliding forward and the torso reclining rearward.

forward of the seat back when the torso angle is set to 14 degrees. JPMA stated that since the use of the proposed dummy positioning procedure does not represent how children sit in BPB seats, it does not allow proper evaluation of these seats as intended for use. JPMA stated that the proposed seating procedure would increase the total test time and cost, due to the repeated adjustments and measurements and measuring tools that are required. JPMA expressed support for the UMTRI seating procedure and suggested that NHTSA delay implementation of the HIC requirement until such time that the design/biofidelity issue with the ATD has been addressed.

Dorel expressed concern that the proposed dummy positioning procedure does not address the root cause of the chin-to-chest contact and that the proposed procedure will result in adoption of the HIII 10-year-old and 6-year-old dummies in spite of the ATDs' non-biofidelic necks and torsos.

The concerns outlined above were echoed by Chrysler as well, which stated that the SNPRM's positioning procedure creates an artificial unrealistic testing condition for the dummy that is not representative of a real world 10-year-old child. Chrysler stated that this artificial position seems to have been created in order to reduce the potential for submarining and chin-to-chest contact; the commenter believed that it would be better to correct the design of the dummy rather than establish unnatural seating positions. Chrysler stated that the HIII–10C dummy submarines more frequently in FMVSS No. 213 type sled tests than has been observed in the field for the 8- to 12-year-old age group. Chrysler also stated there were "frequently occurring noise spikes in the dummy chest responses (chest and sternum accelerations) [that] lead to uncertainty in the measurements obtained from the dummy."

The Alliance opposed the SNPRM's dummy positioning procedures as overly complex, impracticable, or otherwise inappropriate. The commenter stated that setting up the dummy torso angle to 14 degrees and leveling the head are likely to require several iterations and expensive measurement tools that make this procedure onerous and unnecessarily burdensome. The commenter noted that the HIII–6C dummy does not have an adjustable neck, and that neither dummy has an orientation marking on the head to use when setting the neck to "level," so it is impractical to achieve the level head requirement for some vehicle seats. Further, some Alliance members found that they had to place shims of varying thicknesses behind the dummy to achieve a torso angle of 14 degrees, or had a gap between the dummy and the seat back. Further, the commenter found that the procedure specified placing the shoulder belt lower on the dummies than where the belt normally would be placed, resulting in sub-optimal belt fit. The Alliance recommended that NHTSA should limit the calculation of HIC to periods prior to chin-to-chest contact. The commenter also suggested that, "until NHTSA and the industry can confirm that the use of LATCH anchorages with heavier children does not create an unsafe situation, the Alliance urges the agency to clarify that it will not use the LATCH anchorages when conducting compliance tests of harness equipped CRSs using the 10-year-old dummy." [11]

### c. Overview of Today's SNPRM

Based on an analysis of the comments to the January 23, 2008 SNPRM and other information, including the results of additional testing by NHTSA of BPB seats using the UMTRI positioning procedure, NHTSA is issuing this SNPRM that supplements the August 31, 2005 NPRM and the January 31, 2008 SNPRM, with the following proposals.[12] Today's SNPRM adds to or supplements the previous documents by proposing to:

1. Adopt a procedure for positioning the HIII–10C dummy in BPB seats based on the procedure developed by UMTRI, instead of the procedure described in the January 23, 2008 SNPRM. The procedure includes specifications for positioning the BPB seat on the standard seat assembly.

2. Suspend the HIC criterion for the HIII–10C dummy in all child restraints, including BPB seats, until problems with the dummy that have resulted in unacceptable chin-to-chest contact in FMVSS No. 213 testing have been resolved.

3. Specify that a child restraint system recommended for children weighing over 65 lb (29.5 kg) will not be subject to testing with the HIII–10C when attached to the standard seat assembly using the LATCH system. These CRSs would be tested with the HIII–10C while attached to the standard seat assembly with the seat belt system. To reduce the likelihood that a consumer may mistakenly use this type of CRS with LATCH, this SNPRM proposes to require harness-equipped CRSs recommended for children of a weight range that includes children weighing over 65 lb (29.5 kg), to be labeled with an instruction to the consumer not to use the vehicle LATCH system with a child weighing more than 65 lb (29.5 kg).

4. Reinstate a provision that expired on August 1, 2010 that permitted NHTSA to use, at the manufacturer's option, the Hybrid II 6-year old (H2–6C) dummy or the HIII–6C dummy for testing child restraints and BPB seats. This SNPRM also proposes using the UMTRI procedure to position the HIII–6C dummy in BPB seats.

## II. UMTRI Positioning Procedure for the HIII–10C

We propose adopting a procedure that is based on UMTRI's positioning procedure for positioning the HIII–10C dummy in BPB seats. UMTRI describes the procedure in its May 12, 2008 comment to the docket for the January 23, 2008 SNPRM.[13] We propose adopting the procedure as we have set forth in the proposed regulatory text of this SNPRM.[14] NHTSA is proposing to adopt the UMTRI-based procedure because the agency has found it simple to use, and because the procedure results in a positioning of the ATD that is substantially more representative of how a child would be positioned in a BPB seat than the procedure of the January 23, 2008 SNPRM. (As noted

[11] LATCH refers to *L*ower *A*nchors and *T*ethers for *Ch*ildren, a term that was developed by industry to refer to the child restraint anchorage system required to be installed in vehicles by FMVSS No. 225. FMVSS No. 213 requires harness-equipped conventional child safety seats to be able to be installed in a vehicle by both a vehicle's LATCH system, and the vehicle's seat belt. (Footnote added.)

[12] Proposals made in the 2005 NPRM and the 2008 SNPRM that are not discussed in today's SNPRM are still being considered by NHTSA. Today's proposed regulatory text mainly reflects the proposals discussed in today's SNPRM and does not reflect all of the earlier proposed amendments to FMVSS No. 213, even though those proposals are still part of this proposed rulemaking. It is not necessary for a commenter to resubmit views on proposals made in the 2005 NPRM and the 2008 SNPRM that the commenter has expressed in previous comments on the earlier NPRMs. The agency will respond to all relevant comments in a final rule or other document following on today's document.

[13] Docket No. NHTSA–2007–0048–0010.

[14] There are a few aspects of the UMTRI procedure that we have modified or that we do not propose to include. For example, we eliminated the "hip offset" tool and all the steps involving the tool. (*See* UMTRI May 12, 2008 comment, p. 7.) The measurements done with the tool are unnecessary for our purposes, so we eliminated its use from our procedure. We followed the instruction on how to apply the belt, but we eliminated any steps that involved "belt fit" measures as we are not including this in our procedure. We do not specify performing three static installations of the ATD and that the mean posture and belt locations obtained in these installations would be the "design" targets when positioning the ATD for the sled test. (UMTRI comment, p. 6.) We found the three static installations to be unnecessary.

below in this preamble, the UMTRI procedure is very similar to the procedure NHTSA currently uses to position ATDs in child restraints for the FMVSS No. 213 compliance tests.) With the UMTRI procedure, no gaps result between the ATD's back and the back of the BPB seat. Moreover, in our evaluation, we have tentatively determined that the HIII–10C dummy positioned according to the UMTRI procedure would yield repeatable ATD readings for determining compliance with FMVSS No. 213's requirements.[15]

Generally described, the UMTRI procedure first involves centering the BPB seat on the seating position of the test bench seat. A 30 lb (133 Newton (N)) force is then applied to push the BPB seat rearward into the test bench seat. The dummy is prepared with a lap form and a pelvis positioning pad before being positioned on the BPB seat. The lap form is placed on the ATD's lap to keep the lap belt from intruding into a gap that the Hybrid-III ATDs have between the pelvis flesh and thigh flesh. The pelvis positioning pad, placed behind the dummy, is used to help position the dummy with a slight slouch, which allows the dummy to adopt a posture similar to a child seated in a relaxed position. The dummy is positioned and centered on the BPB seat and is pushed rearward by applying a 40 lb (177 N) force on the dummy's lower pelvis and the thorax. The dummy's knees are placed pelvis width apart. These steps help the dummy achieve a "natural" seating position on the BPB seat.

To restrain the dummy, the three-point (lap/shoulder) belt is pulled out of the shoulder belt attachment or retractor. The shoulder belt and the lap belt are routed through any guides, if available, according to the CRS manufacturer's instructions. The slack of the belt is removed by feeding the excess webbing into the shoulder belt attachment or retractor. The lap and shoulder belt sections are tightened to 2–4 lb (9–18 N) of tension. The lap belt tension is lower than the one currently specified in the FMVSS No. 213 test (12–15 lb) (53–67 N); however, according to UMTRI's comment, a 2–4 lb (9–18 N) tension is representative of a tension applied by a child in the real world. Accordingly, we are proposing a lap belt tension of 2–4 lb (9–18 N).

To provide readers an idea of the differences between the January 23, 2008 SNPRM and the UMTRI-based procedures proposed today, Table 1 below highlights the significant differences between the two procedures.

TABLE 1—COMPARISON OF 2008 SNPRM AND TODAY'S UMTRI–BASED PROCEDURES

| | 2008 SNPRM procedure | UMTRI-based procedure |
|---|---|---|
| BPB Seat Positioning | Centered and pushed rearward | Centered and pushed rearward applying 30 lb (133 N) of force. |
| Dummy Preparation | | Install lap form and pelvis positioning pad. |
| Dummy Positioning | Centered on BPB seat and torso angle at 14.5 degrees from vertical. | Centered on BPB seat, torso aligned with BPB's back or vehicle's seat back then pushed rearward by applying 40 lb (177 N) on chest and pelvis. |
| Belt Routing (Belt Guides) | According to manufacturer's instructions | According to manufacturer's instructions. |
| Lap Belt Tension | 12–15 lb (53–67 N) | 2–4 lb (9–18 N). |
| Shoulder Belt Tension | 2–4 lb (9–18N) | 2–4 lb (9–18N). |
| Shoulder Belt-Positioning | (1) Outer edge of belt on outer edge of jacket, (2) distance between bottom of dummy's chin and the center of the shoulder belt/middle of the sternum should be 6.1 +/- 0.19 inches (in) (15.5 +/-0.5 cm), and (3) angle of the shoulder belt relative to horizontal should be 50 degrees +/- 10 degrees. | Shoulder belt positioned through the shortest path between the buckle and the shoulder belt attachment. |
| Lap Belt-Positioning | Top of belt is 1 in (2.54 cm) or more below the top rim of the pelvis molded skin. | Hold the lap belt 6 in (15.24 cm) above the midsagittal line of the dummy pelvis, then tighten lap belt by pulling on the shoulder portion of the belt towards the shoulder belt attachment. |

After receiving the comments on the January 23, 2008 SNPRM, NHTSA evaluated the UMTRI positioning procedure to assess its potential use in FMVSS No. 213. The main objective of this evaluation was to assess the repeatability of the UMTRI procedure when used to position ATDs in CRSs in 48 kilometer per hour (km/h) (30 mile per hour (mph)) sled tests. We also compared the test results with those from previously-conducted tests using the SNPRM-proposed procedure.[16]

To assess the UMTRI procedure in positioning the HIII–10C dummy, we tested four different models of BPB seats using the UMTRI positioning procedure and the HIII–10C dummy. Each of the four BPB seat designs was tested three times. We also conducted one test with a fifth BPB seat. Results of this repeatability assessment are shown below in Table 2, below. These data show that the chest acceleration and head and knee excursion of the ATD had good repeatability, with coefficient of variation (C.V.) values lower than 10 percent. The only measure showing a C.V. higher than 10 percent was HIC caused by the chin-to-chest contact interaction present.

Table 2 also compares the average computed torso angles, HIC, chest acceleration, head excursion and knee excursion of the HIII–10C dummy for each BPB design tested multiple times using the UMTRI procedure and the SNPRM procedure with 14 degree torso angle. All tests were performed at a speed differential of 48 km/h (30 mph).

[15] With the exception of the HIII–10C's measurement of HIC. However, as explained below, we are proposing that HIC would not be measured by the HIII–10C using the UMTRI procedure in the FMVSS No. 213 test.

[16] In these tests, NHTSA did not use the lap form recommended by UMTRI to prevent the lap belt from getting caught between the pelvis and thigh of the dummy. In these tests, the lap belt did not get caught in the gap between the pelvis and thigh.

TABLE 2—NHTSA SLED TESTS RESULTS FOR HIII–10C [17]

| Restraint | Test No. | Seating proc. method | Computed torso angle (deg) | HIC 36 ms | 3 ms. Chest acc. (g) | Head excursion (mm) | Knee excursion (mm) |
|---|---|---|---|---|---|---|---|
| | | | | 1000 | 60 | 813 | 915 |
| Safety 1st Apex 65 | UMTRI | Avg. | 24.1 | 1200 | 41.4 | 562 | 890 |
| | | S.D. | 0.6 | 112.9 | 3.35 | 3.6 | 32.3 |
| | | C.V. | 2.59% | 9.41% | 8.09% | 0.64% | 3.63% |
| | SNPRM 14 deg. | Avg. | 13.8 | 802 | 53.4 | 620 | 805 |
| | | S.D. | 0.2 | 107.8 | 2.30 | 14.6 | 13.2 |
| | | C.V. | 1.10% | 13.44% | 4.31% | 2.35% | 1.64% |
| Britax Parkway | UMTRI | Avg. | 20.1 | 1052 | 48.2 | 541 | 763 |
| | | S.D. | 1.4 | 229.2 | 2.66 | 19.6 | 20.5 |
| | | C.V. | 6.96% | 21.79% | 5.51% | 3.62% | 2.69% |
| | SNPRM 14 deg. | Avg. | 14.0 | 467 | 48.1 | 602 | 718 |
| | | S.D. | 0.1 | 43.8 | 1.03 | 24.0 | 14.0 |
| | | C.V. | 0.82% | 9.40% | 2.13% | 3.99% | 1.95% |
| Graco Turbo (No Back) | UMTRI | Avg. | 16.6 | 885 | 48.7 | 491 | 700 |
| | | S.D. | 1.8 | 91.8 | 3.91 | 8.8 | 21.4 |
| | | C.V. | 10.56% | 10.38% | 8.04% | 1.80% | 3.05% |
| | SNPRM 14 deg. | Avg. | 14.1 | 650 | 49.6 | 563 | 691 |
| | | S.D. | 0.1 | 45.9 | 2.41 | 20.3 | 7.0 |
| | | C.V. | 0.71% | 7.07% | 4.86% | 3.60% | 1.02% |
| Recaro Young Style | UMTRI | Avg. | 20.5 | 1346 | 50.1 | 538 | 739 |
| | | S.D. | 0.6 | 60.0 | 1.9 | 13.1 | 14.8 |
| | | C.V. | 2.99% | 4.45% | 3.83% | 2.44% | 2.00% |
| | SNPRM 14 deg. | Avg. | 14.1 | 760 | 49.6 | 673 | 766 |
| | | S.D. | 0.2 | 79.0 | 2.94 | 49.0 | 10.2 |
| | | C.V. | 1.08% | 10.39% | 5.92% | 7.28% | 1.33% |

[17] Results from tests using SNPRM procedure reported in Stammen, J., Sullivan, L. "Development of a Hybrid III 6 Yr. Old and 10 Yr. Old Dummy Seating Procedure for Booster Seat Testing," January 2008, Docket NHTSA 2007–0048.

Not surprisingly, the test results showed that the January 23, 2008 SNPRM positioning procedure consistently yielded the lowest HIC values in all models of BPB seats, while the UMTRI procedure yielded the highest ones. These results illustrate how HIC values were affected—generally reduced—by the dummy upright posture produced by the 2008 SNPRM procedure. UMTRI's dummy positioning procedure resulted in the highest torso angles (i.e., a more slouched dummy) when compared to the 2008 SNPRM procedure using the same BPB seat model, which resulted in the higher HIC values.

As noted above, the UMTRI procedure specifies that the dummy is prepared with a lap form and a pelvis positioning pad before being positioned on the BPB seat. In our tests, NHTSA did not use the lap form recommended by UMTRI to prevent the lap belt from getting caught between the pelvis and thigh of the dummy. In none of our tests did the lap belt get caught in the gap between the pelvis and thigh. However, we tentatively conclude that the lap form should be specified for use in the FMVSS No. 213 compliance test to avoid the possibility that the lap belt could get caught in the thigh/pelvis gap. Thus, in the regulatory text proposed by today's SNPRM, we specify use of the lap form and pelvis positioning pad.

We describe the lap form and pelvis positioning pad in the proposed regulatory text as follows. "Lap form" is described as a piece of translucent silicone rubber 3 millimeter (mm) thick (50A Durometer) cut to a certain pattern that would be specified in a new figure (proposed Figure 13) added to FMVSS No. 213. "Pelvis positioning pad" is described as: a 125 x 95 x 20 mm piece of foam or rubber with a compression resistance between 13 to 17 pounds per square inch (psi) in a compression-deflection test specified in ASTM D–1056–07, a maximum compression set of 25 percent after a 24 hour recovery time in a compression set test for a Type 2—Grade 4 material specified in ASTM D–1056–07, and with a density of 9.5 to 12.5 lb/ft$^3$.[18] The pelvis positioning pad used during NHTSA's testing was made from Ensolite IE4 foam (Armacell Inc.). NHTSA seeks to avoid material- or manufacturer-specific references in the regulatory text. Comments are requested on these specifications.

Comments are requested on the proposed dummy positioning procedure. The proposed positioning procedure would apply when the HIII–10C dummy is used to test BPB seats and not when the dummy is used to test child restraints other than BPB seats ("non-booster seats").[19] NHTSA tentatively concludes that the procedure is not needed to test non-booster seats because those child restraints have an internal harness to help position the dummy. For those restraints, there is already a methodology set forth in FMVSS No. 213 and in the agency's Laboratory Test Procedures for the standard [20] for positioning test dummies in the restraint systems. The methodology specifies applying a certain load to the dummy's pelvic/lower torso area to ensure the dummy is as far back in the restraint as possible, and tightening the internal harness to specifications.

We tentatively conclude that the current FMVSS No. 213 procedures reasonably assure that the ATD is properly positioned in the non-booster seat. We note also that this Laboratory Test Procedure is quite similar to the UMTRI procedure.

[18] American Society of Testing and Materials (ASTM) D1056–07, Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber, *http://www.astm.org/Standards/D1056.htm.*

[19] There are only a few non-booster seats recommended for children weighing over 29.5 kg (65 lb) (*e.g.,* Britax Regent and Sunshine Kids Radian 80).

[20] *http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/Vehicle%20Safety/Test%20Procedures/Associated%20Files/TP213–9a.pdf*

However, although the current positioning procedure and the UMTRI procedure are very similar, the UMTRI procedure includes additional steps throughout the procedure that facilitate more control of the BPB seat, dummy, and belt positioning. The UMTRI procedure includes a step to center the BPB on the sled seat and apply a 30 lb (133 N) force rearward. This step ensures the proper position of the BPB on the test seat. As previously mentioned, the UMTRI procedure also includes a lap form to prevent the lap belt from being caught between the leg and the pelvis, and pelvis positioning pad to allow a slightly slouched seated position of the dummy. The UMTRI procedure uses a tension of 2–4 lb (9–18 N) in the lap belt while the current position uses a 12–15 lb (53–67 N) tension. The UMTRI procedure describes how to install and tighten the seat belt, while the current position does not have any specific steps for doing so. For these reasons, we believe that the UMTRI procedure is a more desirable procedure over the current FMVSS No. 213 positioning procedure and should be used to position the HIII–10C on BPB seats. Comments are requested on the advantages of the UMTRI procedure over the current NHTSA procedure for testing BPB seats.

## III. HIC and the Hybrid III 10-Year-Old Dummy

We propose suspending the HIC criterion when using the HIII–10C test dummy to test BPB seats and other child restraints until we have resolved the problems with the dummy that have resulted in the chin-to-chest interaction that have caused unrealistically high HIC values in FMVSS No. 213 tests.

In the January 23, 2008 SNPRM, we explained the chin-to-chest contact in the HIII–10C ATD and how the HIC values were affected (73 FR at 3904–3905):

A[n] [HIII–10C] dummy that is set up to have a more reclined torso (high torso angle) is more likely to submarine under the vehicle belt. The motion of the head is much different in a submarining case than in a situation where the dummy is well restrained. When the dummy is restrained effectively (shoulder belt centered on the sternum, lap belt on the pelvis), the head moves forward in unison with the upper torso as the belt tension increases. Then, as the belt reaches its spooling limit, the head rotates in a wide arc and late in the event contacts a location either on the ribcage or into a portion of the bib[21] having a large clearance to the spine box. Since the ribcage is compliant, the bib-to-spine box clearance is high, and the contact occurs very late in the event, the resulting head acceleration due to chin contact is low. Thus its contribution to the HIC calculation is minimal.

In contrast, in a submarining case, the head does not translate forward much at all because the shoulder belt engages the neck instead of restraining the upper torso. Therefore the upper torso steadily becomes more horizontal and reclined because the overwhelming majority of the dummy's mass is below the shoulder belt. The head is pulled downward by the weight of the dummy through the neck, and the forward inertia of the head mass causes severe rotation about the shoulder belt at the bottom of the neck. As a result, the head arc is much tighter and chin contact occurs sooner in the event, before a significant amount of kinetic energy is dissipated through the belt. This motion causes the chin to contact the low-clearance portion of the bib overlaying the top part of the spine box housing the lower neck load cell. The bib does not provide much resistance to the head's increased rotational energy and the chin essentially "bottoms out" on the spine box, causing a large spike in head acceleration and increased HIC.

While the UMTRI procedure produces a more lifelike positioning of the test dummy, such positioning results in anomalies in HIC values measured by the dummy due to the more slouched positioning of the dummy.[22] The slouched positioning produces higher rotational velocity in the dummy's head compared to an upright dummy, putting the head/chin in non-representative contact with a more rigid and non-lifelike portion of the dummy structure (the upper sternal bib region covering the upper spine box in the ATD's chest). CRSs tested with the HIII–10C ATD in the slouched position are more likely to produce HIC values in the ATD indicating an unacceptable risk of head injury, even though head injury due to chin-to-chest impacts are not occurring in the real world.

NHTSA analyzed the National Automotive Sampling System (NASS) Crashworthiness Data System (CDS) data files for the years 1999 to 2008 to better understand real world injuries among children in different restraint conditions. The risk and source of injury to different body regions was also determined. The sampled data consisted of children, 5–12 years of age, in rear seats of light passenger vehicles that were involved in non-rollover frontal towaway crashes. Weighting factors in NASS/CDS were applied to the sample data to represent national estimates of towaway crashes. The weighted data consisted of 910,308 (1940 unweighted sample) children of which 49 percent were 5–7-year-olds and 51 percent were 8–12-year-olds. Among the 5–7-year-olds, 69 percent were using vehicle seat belts, 22 percent were in harness CRS or BPB, and 9 percent were unrestrained. Among the 8–12-year-olds, 90 percent were using the vehicle belts, 1 percent was in harness CRS or BPB, and 9 percent were unrestrained.

The risk of AIS 2+ injury for children 5–7 years old was 5.2 percent for unbelted children, 1.2 percent for belted children and 0.9 percent for children in CRSs. The AIS2+ injury risk for children 8–12 years old was 8.1 percent for unbelted children and 1.3 percent for belted children. There were no cases of children 8–12 years old in CRSs. Both age groups showed a decrease of injury risk when using restraints (belt or CRS).

The most common AIS 2+ injuries among children restrained (vehicle seat belt or CRS) in rear seats were to the head and face (48 percent), followed by upper extremities (19 percent), torso (17 percent) and lower extremities (16 percent). The most-common known contacts for AIS2+ head injuries to 5–12 year-old-children restrained by vehicle seat belts or CRS/BPB was the seat back (50 percent). There was only one case in this sample of restrained children where an AIS 2+ head injury occurred due to self-contact. Further examination of this particular case indicated that it involved a 7-year-old child restrained with a vehicle seat belt. The child's head contacted its knee resulting in an AIS 2-severity concussion.

The results of this real world data analysis indicates that the injury risk is substantially reduced when the child is restrained by vehicle seat belts or in child restraints. The results show that most head injuries in restrained children are caused by contact with the seat back. Only one head injury case was associated with self contact (head contact with knee) but no cases were reported where there was chin-to-chest contact that resulted in a head injury.

Thus, the high HIC values measured by the HIII–10C dummy in laboratory sled tests due to chin-to-chest contact do not seem to be replicating a real world injury mechanism. Children are

[21] The bib is a piece of thin plastic on the front of the dummy that serves as an interface between the ribs and the sternum plate. It extends over each shoulder and covers the cavity between the top rib and the lower neck region of the spine box. The chest jacket covers the bib.

[22] The Hybrid III–10C dummy incorporates more pelvic slouch than other dummies in the Hybrid III family. Slouch was introduced in the design of this dummy because children not in booster seats tend to slouch to keep their knees bent over the vehicle seat. This slouching characteristic increases the risk of submarining for the Hybrid III 10-year-old dummy resulting in a more severe chin-to-chest contact (higher HIC values). In addition to this, the neck of the Hybrid 10-year-old dummy has a segmented neck with aluminum intervertebral disks which results in higher excursion and more flexion than the Hybrid III–6C. The higher HIC values (chin-to-chest contact) are more pronounced in the HIII–10C than the HIII–6C.

not being injured by chin-to-chest contact.

To see if the HIC values measured by the dummy in the FMVSS No. 213 could be made more meaningful and relevant, we investigated the possibility of improving the dummy's biofidelity. In 2008, Ash *et al.*[23] published results of a study comparing the responses of a pediatric cadaver restrained by a three-point belt with that of a HIII–10C dummy in frontal sled tests. The cadaver sled test was replicated using the HIII–10C dummy, and the kinematics of the dummy and cadaver were compared, along with the accelerations of the head, shoulder and lap belt loads of the cadaver and dummy. (Due to anthropometric and age-equivalent differences between the cadaver and the dummy, geometric scaling was performed on the signals based on the seated height and material properties.)

The study showed similarities in the shoulder belt and lap belt forces and head excursions of HIII–10C and the scaled pediatric cadaver. However, test data revealed differences in the maximum shoulder excursions and translation and rotation at the cervical and thoracic spine junction. The head excursions between the ATD and the scaled cadaver were similar but there were differences in how the head reached its maximum excursion point. The T1 vertebra (base of the neck) of the cadaver had greater forward travel than that of the dummy while the dummy experienced greater rotation at the base of the neck than the cadaver. These differences in kinematics were attributed to the rigid thoracic spine of the dummy, along with extensive bending at the cervical and thoracic spine junction. The greater neck rotation at the base of the neck of the dummy compared to the cadaver led to greater angular velocity of the head. This greater head velocity, coupled with the stiff chin-to-chest interaction reported by Stammen,[24] resulted in significantly higher HIC values for the dummy than that expected based on field injury risk.

When we evaluated the suitability of the HIII–10C dummy, we found that the individual components of the HIII–10C dummy exhibited excellent performance with respect to the Hybrid III Dummy Family Task Group (HIII DFTG) certification requirements.[25] However, as explained in Ash (2008), the rigid stiff spine of the dummy and the extensive bending at the cervical and thoracic spine junction affected the kinematics of the dummy, particularly chin-to-chest contact. In section VIII of this preamble to this SNPRM, we discuss our plans to improve the biofidelity of the HIII–10C as a complete system. We have tentatively decided that until the biofidelity of the dummy is improved to address the chin-to-chest interaction in the FMVSS No. 213 environment, HIC should not be measured by the HIII–10C dummy in FMVSS No. 213.

Another reason we propose not to use HIC as a criterion when using the HIII–10C dummy to test BPB seats is UMTRI's information demonstrating that HIC can be reduced by poor shoulder belt placement.[26] UMTRI found in sled tests that when the shoulder belt slips off the HIII–10C dummy shoulder, the chin-to-chest contact did not occur because the dummy rolls out of the shoulder belt and moves forward. As a result, the HIC value was low but head excursion increased as the dummy's upper torso was not restrained by the shoulder belt. Although head excursion increased in situations where the shoulder belt slipped off the dummy, the values were still substantially within compliance limits, therefore giving a "passing" value to the BPB seat. These data demonstrated that using HIC as an injury measure may encourage poor belt routing designs that place the shoulder belt more outboard, which could allow the dummy to roll out of the belt in a sled test.

However, we continue to believe that the HIII–10C would be an important test instrument to add to FMVSS No. 213 to assess the performance of CRSs recommended for use by children weighing 65 lb (29.5 kg) or more. The ways in which we would use the ATD in the standard to assess the performance of child restraints for larger children is discussed in the next section below. Incorporating the ATD would fulfill the aspirations of Anton's Law to develop and evaluate a test dummy that represents a 10-year-old child to evaluate the performance of child restraints for older children. Further, without the HIII–10C, little if anything would be gained by extending the applicability of FMVSS No. 213 to CRSs for children weighing 65 lb (29.5 kg) or more, as the performance of the CRSs to protect larger children would not be dynamically tested with an ATD representative of children weighing more than 65 lb (29.5 kg).

We disagree with a point Chrysler made in its comments to the 2008 SNPRM, that the HIII–10C submarines more frequently in FMVSS No. 213 type sled tests than has been observed in the field for the 8- to 12-year-old age group. (The commenter noted that the consequence from submarining was severe chin-to-chest contact which results in increased HIC values.) The agency reviewed the publications referenced by Chrysler[27] in its comment on this point and found that those field observations were based on insurance claims data and involved crashes of significantly lower severity than the FMVSS No. 213 sled test, which represents a 48 km/h (30 mph) frontal crash. Thus, it is understandable that the children in the field studies did not submarine at the same frequency as the HIII–10C in the FMVSS No. 213 test environment.

Moreover, we are aware that UMTRI[28] conducted a series of sled tests to investigate the HIII–10C response to variations in shoulder and lap belt configurations and found that the dummy submarined in lap belt configurations that did not engage the child's pelvis while it did not submarine in belt configurations which engaged the pelvis of a child of similar size as the dummy. Therefore, we believe that the HIII–10C dummy correctly submarines in severe crash environments such as the FMVSS No. 213 sled test.

We are proceeding with our proposal to add specifications for the HIII–10C to NHTSA's regulation for Anthropomorphic Test Devices, 49 CFR part 572, as proposed in the July 13, 2005 NPRM (RIN 2127–AJ49). We will respond to the comments submitted to that NPRM when we publish our rulemaking document following on that NPRM.

[23] Ash, JH, Sherwood, CP, Abdelilah, Y, Crandall, JR, Parent, DP, Kallieris, D., "Comparison of Anthropomorphic Test Dummies with a Pediatric Cadaver Restrained by a Three-point Belt in Frontal Sled Tests," Proceedings of the 21st ESV Conference, June 2009.

[24] Stammen, J., Sullivan, L., "Development of a Hybrid III 6-Yr.-Old and 10-Yr.-Old Dummy Seating Procedure for Booster Seat Testing," January 2008, Docket NHTSA–2007–0048.

[25] Stammen, J., "Technical Evaluation of the Hybrid III Ten-Year-Old Dummy (HIII–10C)," September 2004, Docket NHTSA–2005–21247–0003.

[26] Klinich, K.D., Reed, M.P., Ritchie, N.L., Manary, M.A., Schneider, L.W., Rupp, J.D., "Assessing Child Belt Fit, Volume II: Effect of Restraint Configuration, Booster Seat Designs, Seating Procedure, and Belt Fit on the Dynamic Response of the Hybrid III 10 YO ATD in Sled Tests," September 2008, UMTRI–2008–49–2.

[27] Arbogast, K B, et al., "Predictors of Pediatric Abdominal Injury Risk," Stapp Car Crash Journal, Vol. 48, 2004.

[28] Reed, M.P., Ebert-Hamilton, S.M., Klinich, K.D., Manary, M.A., Rupp, J.D., "Assessing Child Belt Fit, Volume II: Effects of Restraint Configuration, Booster Seat Designs, Seating Procedure, and Belt Fit on the Dynamic Response of the Hybrid III 10 YO ATD in Sled Tests," September 2008, UMTRI–2008–49–2.

We note that in that July 13, 2005 NPRM, we proposed a head drop calibration test (proposed 49 CFR 572.172) to assess the response of the accelerometer in the ATD's head (70 FR at 40289, 40293). Even if HIC is not used as a pass-fail criterion in FMVSS No. 213 with the HIII–10C, we believe that the head drop specification should be included in 49 CFR 572.172, since we plan to obtain HIC data for research purposes when using the HIII–10C in dynamic tests. Comments are requested on this issue.

*Other Measures of Injury Risk*

Although the HIC criterion would not apply to CRSs tested with the HIII–10C, we continue to believe that head and knee excursion and chest acceleration criteria should be adopted. We generally concur with UMTRI's comment to the SNPRM that NHTSA should "use other measures [besides HIC] that assess belt placement, limit head excursion, and evaluate the likelihood of submarining when assessing booster performance" when using the UMTRI procedure.

We believe that the HIII–10C is suitable for measuring head and knee excursion and chest acceleration. As discussed earlier in this preamble, Ash et al., *supra,* published results of a study comparing the responses of a pediatric cadaver restrained by a three-point belt with that of a HIII–10C dummy in frontal sled tests. The study showed similarities in the shoulder belt and lap belt forces and head excursions of the HIII–10C and the scaled pediatric cadaver. While there were differences in the maximum shoulder excursions and translation and in the rotation at the cervical and thoracic spine junction affecting how the head reached its maximum excursion point, the head excursions between the HIII–10C and the scaled cadaver were similar.

In its comment, Chrysler noted noise spikes associated with the HIII–10C dummy chest and sternum acceleration responses without chin-to-chest contact, which were initially observed in a Transport Canada research paper.[29] Chrysler also referred to a second paper [30] where 28 full-scale (56 km/h) (35 mph) New Car Assessment Program (NCAP) tests were analyzed. Chrysler indicated that occurrence of chest acceleration noise spikes were seen primarily in the lateral direction, and occasionally in the longitudinal and vertical directions and were observed in 80 percent of the tests (22 out of 28 tests). In addition, Chrysler stated that a third paper [31] showed that noise spikes in the chest data were observed in 75 percent of the 30 sled tests NHTSA conducted in evaluating the HIII–10C.

Chrysler hypothesized that a possible source of the acceleration spikes is the shoulder, since the shoulder design for the HIII–10C dummy is more complex and potentially more susceptible to mechanical noise/metal contacts than is seen with the other Hybrid III child dummies. Chrysler conducted some internal investigations on this potential noise issue. Quasi-static testing was attempted by loosening the shoulder joint in order to allow full rotation range of motion. Chrysler stated that tests revealed an internal mechanical clicking noise emanating from the shoulder components which may suggest that a potential source of metal-to-metal contact exists within the dummy. Chrysler hypothesized that if this is the cause of the acceleration noise spikes, then it is possible that the acceleration spike could be greater with significant lateral loading, such as that produced by side air bags. Chrysler suggested further dynamic testing to verify this hypothesis.

Chrysler recognized that in most cases, the noise spikes were removed by applying the Society of Automotive Engineers (SAE) Channel Frequency Class (CFC) 180 filtering, but stated that filtering does not eliminate this effect for all cases. Therefore, Chrysler considers it necessary to check for potential influences from these spikes on the 3 millisecond (ms) clip chest resultant acceleration.

The agency reviewed the acceleration data from the agency's tests referenced by Chrysler and found that the noise spikes were removed or attenuated by processing the data using an SAE CFC 180 filter, and determined that these acceleration spikes were of no consequence to injury assessment using the HIII–10C dummy. Further, since the HIII–10C dummy is proposed for use in frontal sled tests where there is little lateral loading, the noise spikes observed by Chrysler in lateral chest accelerations will have negligible effect on the dummy responses.

For the aforementioned reasons, the agency believes that the dummy's chest instrumentation is correctly measuring the acceleration experienced by the dummy, and the chest acceleration injury criterion is not compromised when standard filtering techniques are applied. Therefore, NHTSA is proposing that the HIII–10C is suitable for use in FMVSS No. 213 to measure chest acceleration and that no changes are needed in the dummy regarding the acceleration spikes identified by Chrysler.

*Belt Fit*

We are not proposing belt fit criteria at this time. UMTRI developed belt fit criteria and target values and ranges corresponding to "good" lap and shoulder belt fit.[32] NHTSA conducted a series of tests to evaluate the repeatability and reproducibility of UMTRI's positioning procedure, which also included measurements taken at specific landmarks to evaluate belt fit. These measurements were used to develop belt fit scores for the "lap belt score" (LBS) and the "shoulder belt score" (SBS). The results of these tests are discussed in detail in a memorandum submitted to the docket and are summarized below.

Briefly, the belt fit criteria developed by UMTRI was intended as an objective method for assessing lap and shoulder belt fit for different BPBs. In NHTSA's evaluation of the belt fit criteria, we evaluated four BPBs, taking the belt fit measures three times per BPB. The variance and range in repeated measurements, especially for the shoulder belt fit, was unacceptably high. In NHTSA's evaluation, the range of lap and shoulder belt fit scores from repeated measurements for the HIII–6C dummy were 11.1 mm and 11.5 mm (0.43 in and 0.45 in), respectively, and the range for the HIII–10C dummy were 9.5 mm and 7.4 mm (0.37 in and 0.29 in), respectively. The results indicate poor repeatability of belt fit measures. The results also showed inconsistencies in the LBS and SBS measurements on the same BPB models at different laboratories. The results also suggested that the belt positioning procedure can be influenced by the operator. In short, the repeatability and reproducibility of the belt fit procedure does not seem robust enough to implement in the FMVSS No. 213 at this time. NHTSA believes that future improvements to the procedure may improve its reproducibility. NHTSA is currently assessing the repeatability and reproducibility of a booster seat belt fit evaluation protocol developed by

[29] Tylko, S., "Protection of Rear Seat Occupants in Frontal Crashes," The 19th Enhanced Safety of Vehicles (ESV) Conference Proceedings, (2005), Paper number: 05–258.

[30] Hong, S., Park, C.K. Morgan, R.M., Kan, C.D., Park, S., Bae, H., "A Study of the Rear Seat Occupant Safety Using a 10-Year-Old Child Dummy in the New Car Assessment Program," SAE 2008 World Congress, 2008–01–0511.

[31] Stammen, J., "Technical Evaluation of the Hybrid III Ten Year Old Dummy (HIII–10C)," September 2004, Docket: NHTSA–2005–21247–003.

[32] Reed, M.P., Ebert-Hamilton, S.M., Klinich, K.D., Manary, M.A., Rupp, J.D., "Assessing Child Belt Fit, Volume I: Effects of Vehicle Seat and Belt Geometry on Belt Fit for Children with and without BPB Seats," September 2008, UMTRI– 2008–49–1.

UMTRI and the Insurance Institute for Highway Safety (IIHS) for booster seat belt fit rating.

We note that although we believe that the belt fit procedure is not sufficiently robust at this time, we consider the UMTRI dummy positioning procedure proposed in this SNPRM to be otherwise acceptable. As previously noted, the current FMVSS No. 213 and the UMTRI positioning procedure are very similar, with the UMTRI procedure including additional steps to facilitate control of the BPB seat, dummy, and belt positioning. The repeatability and reproducibility issues regarding belt fit were not attributed to the positioning procedure, but were instead associated with differences in HIII–6C child dummy jackets and friction issues between the belt and the dummy's chest or clothes.

## IV. Optional Use of Hybrid II or Hybrid III 6-Year-Old Test Dummy

For child restraints manufactured before August 1, 2010, CRS manufacturers had the option to specify that NHTSA test their child restraints with either the Hybrid II or the Hybrid III 6-year-old dummy (S7.1.3, FMVSS No. 213). Under current FMVSS No. 213 specifications, NHTSA must test child restraint systems manufactured on or after August 1, 2010 with the Hybrid III ATD. This SNPRM proposes to reinstate the option of allowing manufacturers to specify the use of either ATD in the compliance test, until such time FMVSS No. 213 is further amended to specify otherwise.

The agency adopted the HIII–6C into FMVSS No. 213 in a final rule[33] published in response to a mandate in the Transportation Recall Enhancement, Accountability and Documentation Act (the TREAD Act) (November 1, 2000, Pub. L. 106–414, 114 Stat. 1800) that required NHTSA undertake rulemaking on child restraint systems. Section 14 of the TREAD Act directed NHTSA to initiate a rulemaking for the purpose of improving the safety of child restraints by November 1, 2001, and to complete it by issuing a final rule or taking other action by November 1, 2002. Section 14 specified nine elements for consideration by NHTSA in improving child restraint safety, including considering whether to require the use of the HIII–6C and other Hybrid III ATDs in FMVSS No. 213 compliance tests.

Consistent with the TREAD Act, NHTSA decided in that rulemaking to adopt the HIII–6C into FMVSS No. 213. NHTSA considered the dummy to be "considerably more biofidelic" than its predecessor, the H2–6C dummy, and with unsurpassed potential to measure an array of impact responses never before measured by a child ATD, such as neck moments and chest deflections.

However, the agency acknowledged there was mixed acceptance by the commenters of the HIII–6C dummy. Some commenters believed that the HIII–6C exhibited large neck elongation in the FMVSS No. 213 test environment resulting in chin-to-chest and head-to-knee contact and correspondingly high HICs. In evaluating those comments, NHTSA carefully analyzed its test data of sled testing conducted with the HIII–6C, but found no data indicating that head-to-chest or head-to-knee impacts were an issue or were typical. 68 FR at 37644. Accordingly, the HIII–6C was adopted into the standard, with what was then considered to be sufficient lead time to enable manufacturers to become familiar with the dummy. As noted earlier, the compliance date for the mandatory use of the HIII–6C dummy was originally August 1, 2005. It had since been extended to August 1, 2010.[34]

The agency has again closely examined the performance of the HIII–6C in the FMVSS No. 213 environment, in light of the testing NHTSA conducted in response to Anton's Law and the agency's current efforts to develop dummy positioning procedures for the Hybrid III ATDs in FMVSS No. 213. We continue to believe that the HIII–6C dummy is more biofidelic in its components than its predecessor the H2–6C, and that the HIII–6C also has more extensive instrumentation to measure impact responses such as forces, accelerations, moments and deflections, which are crucial in evaluating vehicle occupant protection systems.[35] Some CRS manufacturers have found the HIII–6C to be a satisfactory test instrument and are using the dummy to certify the compliance of their CRSs to FMVSS No. 213. These manufacturers are positioning the ATD and measuring HIC as currently required by FMVSS No. 213, while positioning the ATD in accordance with FMVSS No. 213 (whose positioning procedure is similar to the UMTRI procedure).

While the HIII–6C is being used to an extent today, NHTSA believes it would be prudent to undertake efforts to improve the HIII–6C dummy to make it more useful as an FMVSS No. 213 test device before testing child restraints solely with this ATD. The Hybrid III 6-year-old dummy has a softer neck than the H2–6C, which results in slightly greater head excursion results and larger HIC values (chin-to-chest contact) than the H2–6C. This, coupled with the stiff thorax of the HIII–6C dummy, accentuates the HIC values recorded by the dummy. Several measures are underway to improve the Hybrid III dummy (*see* discussion later in this preamble). Until such time the HIII–6C is improved, we believe that FMVSS No. 213 should permit NHTSA to allow manufacturers the option of specifying that NHTSA use either the H2–6C or the HIII–6C dummy to test their child restraints.

This proposal seeks to change little if any of the current requirements of FMVSS No. 213 that specify testing with the HIII–6C dummy. When the HIII–6C is used, it would be used to measure the injury criteria and other performance measures currently specified in S5 of FMVSS No. 213 for evaluating child restraint systems as it is used today. As explained below, we are proposing using the UMTRI positioning procedure for the HIII–6C in belt-positioning seats rather than the procedure proposed by the January 23, 2008 SNPRM. We emphasize that the UMTRI procedure is very similar to the current FMVSS No. 213 procedure used for the HIII–6C. As such, the agency intends to make no substantive change to the FMVSS No. 213 requirements now applicable to CRSs tested with the HIII–6C.

Because there is an August 1, 2010 date specified in S7.1.3 of FMVSS No. 213 for the mandatory use of the HIII–6C, NHTSA is providing a 30-day comment period for this aspect of the proposal.

## V. UMTRI Positioning Procedure for the HIII–6C

We are proposing to adopt the UMTRI positioning procedure for the HIII–6C dummy in BPB seats rather than the procedure proposed by the January 23, 2008 SNPRM for many of the reasons explained above for the HIII–10C dummy. That is, the UMTRI procedure results in the HIII–6C being positioned in a posture that is substantially more representative of how a child would be positioned in the BPB seat than the procedure of the 2008 SNPRM. Our test data, discussed below, indicates that the HIII–6C dummy positioned according to the UMTRI procedure would yield

[33] June 24, 2003, 68 FR 37620, Docket No. NHTSA–2003–15351.

[34] 73 FR 45355, *supra*.

[35] FMVSS No. 208, "Occupant crash protection," uses Hybrid III dummies, including the HIII–6C dummy, in its compliance tests. The HIII–6C has been suitable for FMVSS No. 208 testing because the test environment for that standard is different than the FMVSS No. 213 environment, due to the presence of the air bag.

repeatable ATD readings for determining compliance with FMVSS No. 213's requirements.

To assess the UMTRI procedure with the HIII–6C dummy, we tested two different BPB models using the UMTRI procedure and the HIII–6C dummy. Each of the two BPB seats was tested three times. A third BPB seat was evaluated with one test. The BPBs seats were selected so as to enable comparison with previously-conducted tests using the January 23, 2008 SNPRM-proposed procedure.

Results of this repeatability assessment are shown below in Table 3. These data show that the chest acceleration and head and knee excursions of the ATD had good repeatability, with coefficient of variation (C.V.) values lower than 10 percent. The only measure showing a C.V. higher than 10 percent was HIC caused by the chin-to-chest contact interaction. Table 3 also compares the average computed torso angles, HIC, chest acceleration, head excursion and knee excursion of the HIII–6C dummy for each BPB design tested multiple times using the UMTRI procedure and the SNPRM procedure with a 14 degree torso angle. All tests were performed at a speed differential of 48 km/h (30 mph).

TABLE 3—NHTSA SLED TESTS RESULTS FOR HIII–6C [36]

| Restraint | Test No. | Seating proc. method | Computed torso angle (deg) | HIC ms | 3 ms. chest acc. (g) | Head excursion (mm) | Knee excursion (mm) |
|---|---|---|---|---|---|---|---|
| | | | | 1000 | 60 | 813 | 915 |
| Safety 1st Apex 65 | UMTRI | Avg. | 24.9 | 834 | 45.5 | 562 | 755 |
| | | S.D. | 0.9 | 89.7 | 1.87 | 11.3 | 18.4 |
| | | C.V. | 3.7% | 10.8% | 4.1% | 2.0% | 2.4% |
| | SNPRM 14 deg. | Avg. | 14.6 | 525 | 48.1 | 527 | 667 |
| | | S.D. | 0.6 | 65.1 | 1.00 | 12.7 | 24.0 |
| | | C.V. | 4.2% | 12.4% | 2.1% | 2.4% | 3.6% |
| Britax Parkway | UMTRI | Avg. | 20.6 | 1144 | 52.9 | 501 | 689 |
| | | S.D. | 2.5 | 87.0 | 2.87 | 15.4 | 8.5 |
| | | C.V. | 12.3% | 7.6% | 5.4% | 3.1% | 1.2% |
| | SNPRM 14 deg. | Avg. | 14.2 | 463 | 55.7 | 546 | 661 |
| | | S.D. | 0.3 | 52.9 | 2.42 | 7.2 | 12.9 |
| | | C.V. | 2.1% | 11.4% | 4.3% | 1.3% | 1.9% |

As discussed previously, the UMTRI procedure is very similar to the current procedure now used in FMVSS No. 213 to position the HIII–6C. In the agency's view, this SNPRM would make no notable change to any substantive provision in the standard relating to the HIII–6C ATD. We believe there is insufficient need to undertake such a change. Manufacturers now using the ATD to certify compliance with FMVSS No. 213 are measuring and assessing HIC. They should continue to do so without change. NHTSA believes that the HIC criterion should not be suspended for CRSs tested with the HIII–6C, since NHTSA does not believe there is good reason to reduce the stringency of the current requirements of FMVSS No. 213 for CRSs tested with the HIII–6C test dummy. Comments are requested on this issue.

## VI. Other Applications of the UMTRI Procedure

NHTSA also seeks comment on whether the UMTRI procedure should be used in FMVSS No. 213 to position other ATDs used in the standard. Would having a single dummy positioning procedure simplify the test procedures and make the standard easier to understand? The proposed regulatory text does not specify that the UMTRI procedure is used to position the H2–6C dummy in BPB seats. We have not used the UMTRI procedure with the Hybrid II dummy. However, we tentatively believe the UMTRI procedure could be used with the H2–6C dummy, since the procedure is very similar to the current dummy positioning procedure used with the H2–6C. For the sake of simplicity, it appears advantageous to use the same procedure for all BPB, no matter what dummy is used.

The proposed regulatory text specifies that the current FMVSS No. 213 dummy positioning procedure (set forth in S10.2.2) would be used for the H2–6C, the HIII weighted 6-year-old, the HIII–6C in child restraints other than BPB seats, and the HIII–10C in child restraints other than BPB seats. The UMTRI-based positioning procedure is set forth in proposed S10.2.3. For the convenience of the reader, the following Table 4 shows which positioning procedure would apply in tests of CRSs with the ATDs:

TABLE 4—APPLICABLE POSITIONING PROCEDURE (PROPOSED)

| Dummy | Child restraint tested | Position dummy in accordance with: |
|---|---|---|
| Hybrid III 3-year-old (Subpart P*) | All child restraints | S10.2.2 |
| Hybrid II 6-year-old (Subpart I) | All child restraints | S10.2.2 |
| Hybrid III 6-year-old (Subpart N) | Belt-positioning seats | S10.2.3 |
| | All other child restraints | S10.2.2 |
| Hybrid III Weighted 6-year-old (Subpart S) | All child restraints | S10.2.2 |
| Hybrid III 10-year-old (Proposed Subpart T) | Belt-positioning seats | S10.2.3 |

[36] Results from tests using SNPRM procedure reported in Stammen, J., Sullivan, L., "Development of a Hybrid III 6 Yr. Old and 10 Yr. Old Dummy Seating Procedure for Booster Seat Testing," January 2008, Docket NHTSA–2007–0048.

TABLE 4—APPLICABLE POSITIONING PROCEDURE (PROPOSED)—Continued

| Dummy | Child restraint tested | Position dummy in accordance with: |
|---|---|---|
| | All other child restraints | S10.2.2 |

* All subparts in this table are to 49 CFR part 572.

## VII. Other Proposals

### *a. Using the HIII–10C To Test a CRS on LATCH*

In its comment,[37] the Alliance requested that "NHTSA should make it clear that it will not use the LATCH anchorages when conducting compliance tests of CRSs using the 10-year-old dummy." The commenter explained:

> When NHTSA adopted FMVSS No. 225, "Child restraint anchorage systems," and made corresponding changes to FMVSS No. 213 to require CRSs to comply with that standard when tested utilizing Lower Anchorage and Tethers for Children (LATCH) anchorages, the LATCH systems in vehicles were intended for use by children up to 48 pounds. No vehicle manufacturer recommends the use of LATCH anchors with children that even approach the weight of the 10-year-old dummy. And although some CRS manufacturers are offering harness-equipped CRSs that are recommended for use by children that weigh up to 65 pounds, it is the Alliance's understanding that they explicitly instruct parents and caregivers to use the vehicle belts rather than the LATCH anchorages when using such a CRS with a child that weighs more than 50 pounds.

The Alliance was concerned that under the SNPRM's proposed changes, the agency could test, using LATCH attachments and an HIII–10C dummy, a harness-equipped CRS recommended for use with children weighing more than 65 lb (29.5 kg). The Alliance stated:

> The consequences of using LATCH anchorages to restrain harnessed children who weigh up to 65 pounds is the subject of a study currently being conducted by a Working Group consisting of members of the Alliance, the Association of International Automobile Manufacturers (AIAM), and the Juvenile Products Manufacturers Association (JPMA). Unless and until NHTSA and the industry can confirm that the use of LATCH anchorages with heavier children does not create an unsafe situation, the Alliance urges the agency to clarify that it will not use the LATCH anchorages when conducting compliance tests of harness equipped CRSs using the 10-year-old dummy.

*Agency Response:* We agree that this point has merit. In specifying the strength requirement of FMVSS No. 225 (the LATCH standard), NHTSA based the requirement on a calculation of the forces that the agency believed the LATCH system should reasonably be required to withstand in a crash.[38] The calculation assumed a child mass of 65 lb (29.5 kg) (68 FR at 38218). NHTSA also noted its belief that LATCH systems "can best be optimized by focusing on the masses generated by children in child restraints and not by adding to the burden of the LATCH system the goal of restraining older passengers as well." 68 FR at 38220. We also confirm that our understanding is that CRS manufacturers generally instruct consumers to use the vehicle seat belt system rather than the LATCH anchorages when using their harness-equipped CRSs with a child weighing more than 65 lb.

Accordingly, we propose specifying in FMVSS No. 213 that a CRS tested with the HIII–10C test dummy would not be tested with the LATCH system. However, to reduce the likelihood that a consumer may use this type of CRS with LATCH when restraining a heavier child, this SNPRM proposes to require CRSs recommended for children of a weight range that includes children weighing over 65 lb (29.5 kg), to be labeled with an instruction to the consumer to use the vehicle's seat belts to attach the CRS, and not the LATCH system, when restraining a child weighing more than 65 lb (29.5 kg). NHTSA tentatively believes that this warning is needed since the performance of the CRS with LATCH would not be assessed under FMVSS No. 213 with the HIII–10C test dummy under this proposal. CRS manufacturers would be prohibited from stating that the CRS can be used with LATCH when restraining children weighing more than 65 lb (29.5 kg).

While we acknowledge that a label may not mitigate all misuse situations due to caregivers not reading the CRS labels and instruction manuals, we believe this proposal is better than having the CRS manufacturer recommend LATCH use for children weighing more than 65 lb (29.5 kg), as is currently permitted. However, we are seeking comment on this issue. Specifically, we request information on:

- Would the proposed label be effective at preventing misuse? Are there better strategies?
- Is it feasible to design CRSs such that LATCH could only be used less when using the CRS with children weighing less than 65 lb (29.5 kg)?

We note that with regard to CRSs recommended for children weighing less than 65 lb (29.5 kg), under FMVSS No. 213, such CRSs may be tested by NHTSA with the LATCH system or with the belt system, at NHTSA's option. NHTSA may select the ATDs used to test the child restraint in accordance with S7 of the standard, and may choose to use LATCH or the belt system, notwithstanding any statements by the CRS manufacturer as to the children for whom the CRS is recommended or how the CRS should be attached to the vehicle seat. Comments are requested on the label's reference to the 65 lb (29.5 kg) threshold.

### *b. CRSs Must Be Capable of Fitting the ATD*

The January 23, 2008 SNPRM requested comments on whether FMVSS No. 213 should expressly require that each child restraint system must be capable of fitting the test dummy that is specified in S7 of the standard to evaluate the CRS. NHTSA asked: "For example, if the CRS were recommended for use by children weighing more than 30 kg (65 lb), should the standard specify that the CRS must be capable of fitting and being tested with the HIII–10C dummy?" 73 FR at 3908.

NHTSA received only JPMA's comment on this issue.[39] In its comment, JPMA stated: "CRS Manufacturers agree that child restraints *should* be designed to accommodate the ATD with which they will be tested based on the use recommendations with respect to seat back height relative to head [center of gravity], internal width, and adjustments to the shoulder belt. However an explicit fit test is not required as the BPB absolutely must be capable of accommodating the ATDs set

[37] Docket No. NHTSA–2007–0048–0008, page 7.

[38] Final rule, response to petitions for reconsideration of LATCH final rule, 68 FR 38208, June 27, 2003, Docket NHTSA–2003–15438–0001.

[39] Docket No. NHTSA–2007–0048–0012, page 11.

forth in S7.1.2 of FMVSS 213.” (Emphasis in text.)

*Agency Response:* We have decided not to propose amending FMVSS No. 213 to expressly require each child restraint system be able to fit the test dummy specified in S7 of the standard that is used by NHTSA to test the CRS. As stated by JPMA, manufacturers conduct dynamic sled tests using the appropriate dummies based on their weight and height specifications in S7.1.2 of FMVSS No. 213. Therefore, manufacturers are already ensuring that the CRSs accommodate/fit the appropriate child dummies, which makes the need for a fit requirement unnecessary.

*c. Housekeeping*

This SNPRM proposes to amend S10.2.1 of FMVSS No. 213 by removing reference to the 9-month-old dummy in that section. The 9-month-old test dummy is no longer used in the standard's compliance tests. The section would also be amended to add reference to the 12-month-old test dummy in the heading of S10.2.1.

## VIII. Research Plans

The agency has a three-phase research plan to improve the capability of the ATDs to assess BPB seats and other types of CRSs.

*Phase I: Enhancement of Current HIII–6C and 10C Dummies (2013 timeframe)*

NHTSA is planning near-term upgrades to the HIII–6C and HIII–10C dummies. NHTSA is working with the SAE Dummy Abdomen and Pelvis Round Robin task group to develop a HIII–6C dummy retrofit package, consisting of a more biofidelic instrumented abdominal insert, a pelvis with improved anthropometry, and a revised chest jacket. The agency believes there is potential for this type of retrofit package to be implemented into the HIII–10C dummy during this timeframe as well. In addition, NHTSA plans to implement updates which may include revisions to the shoulder, thoracic spine, and neck of the HIII–6C and HIII–10C dummies. The objective of the updates will be to improve the biofidelity of the kinematics for the restrained HIII–6C and HIII–10C dummies. Existing sled test and injury information together with modeling will be used to define the biofidelity/design requirements of the planned updates.

*Phase II: New Biofidelity Response Data (2012 timeframe)*

While Phase I is directed toward enhancements of the current HIII–6C and HIII–10C designs, Phase II encompasses research to generate improved response data from the head, neck, thorax, abdomen, and pelvis for future child dummies. A number of experimental and modeling studies funded by both NHTSA and non-NHTSA sources are in progress at a number of institutions to develop this information. These studies include: (a) component and whole body dynamic experiments to generate response targets and injury criteria; (b) investigations of static range of motion, anthropometry, and mass/inertial properties; and (c) use of finite element and multi-body modeling to develop biofidelity response requirements for new dummies. Some of the research will support both interim work to support incremental improvements of the HIII–6C and HIII–10C dummies (Phase I) and the development of all new child dummies (Phase III).

*Phase III: Prototype Evaluations of New Child Dummies (2015 timeframe)*

The final portion of this research plan includes design, development, and evaluation of new prototype 3-, 6-, and 10-year-old frontal child dummies. NHTSA plans to collaborate with SAE and others in this effort. It is anticipated that conceptual designs of the new prototype dummies could be initiated shortly after biomechanical response data is available in the 2013–2015 timeframe.

## IX. Rulemaking Analyses and Notices

*Executive Order 12866 and DOT Regulatory Policies and Procedures*

This rulemaking document was not reviewed by the Office of Management and Budget under E.O. 12866. It is not considered to be significant under E.O. 12866 or the Department's Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). The August 31, 2005 NPRM provided a discussion of the costs associated with the proposed incorporation of the HIII–10C dummy into FMVSS No. 213. The agency stated in the NPRM that the costs are largely attributable to the expense of an instrumented HIII–10C dummy. The 2004 price of an uninstrumented 10-year-old dummy is about $36,550. The specified instrumentation costs approximately $59,297. The NPRM and this SNPRM do not require manufacturers to use any test dummy in certifying their child restraints. Rather, this rulemaking proposes changes to how NHTSA would conduct compliance testing under FMVSS No. 213. The minimal impacts of today's proposal do not warrant preparation of a regulatory evaluation.

We are unable to quantify the benefits of this rulemaking. However, the agency believes this rulemaking would enhance the safety of child restraint systems by facilitating the dynamic assessment of BPB and other CRSs for older children. The dummy positioning procedures proposed by this SNPRM are more lifelike than the procedures published in the January 23, 2008 SNPRM. The result of this proposed rule would be to provide better assurance that each child restraint fits and restrains the children for whom the restraint is recommended.

*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), unless the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. I certify that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities. The reasons underlying this certification are discussed in the August 31, 2005 NPRM. This SNPRM would not increase the testing that NHTSA conducts of child restraints. The SNPRM addresses dummy positioning procedures and generally would not have any significant impact on the testing performed on child restraints. Manufacturers currently must certify their products to the dynamic test of Standard No. 213. They typically provide the basis for those certifications by dynamically testing their products using child test dummies. The effect of this SNPRM on most child restraints would be to specify procedures that NHTSA would take in positioning the HIII 6-year-old and HIII–10C dummies. Testing child restraints using the procedures is not expected to affect the pass/fail rate of the restraints significantly.

*National Environmental Policy Act*

NHTSA has analyzed this proposed rule for the purposes of the National Environmental Policy Act and determined that it would not have any significant impact on the quality of the human environment.

*Executive Order 13132 (Federalism)*

NHTSA has examined today's proposal pursuant to Executive Order 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. The proposed 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 preempt 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 addressing the same aspect of performance.

The express preemption provision set forth 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. However, the Supreme Court has recognized the possibility, in some instances, of implied preemption of such State common law tort causes of action by virtue of NHTSA's rules, even if not expressly preempted. This second way that NHTSA rules can preempt is dependent upon there being an actual conflict between an FMVSS and the higher standard that would effectively be imposed on motor vehicle manufacturers if someone obtained a State common law tort judgment against the manufacturer, notwithstanding the manufacturer's compliance with the NHTSA standard. 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 Executive Order 13132 and 12988, NHTSA has considered whether this proposal 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 today's proposal and finds that this proposal, like many NHTSA rules, prescribes only a minimum safety standard. As such, NHTSA does not intend that this proposal preempt state tort law that would effectively impose a higher standard on motor vehicle manufacturers than that established by today's proposal. Establishment of a higher standard by means of State tort law would not conflict with the minimum standard proposed here. Without any conflict, there could not be any implied preemption of a State common law tort cause of action.

We solicit the comments of the States and other interested parties on this assessment of issues relevant to E.O. 13132.

*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, February 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 in connection with E.O. 13132. NHTSA notes further that there is no requirement that individuals submit a petition for reconsideration or pursue other administrative proceeding before they may file suit in court.

*Paperwork Reduction Act*

Under the Paperwork Reduction Act of 1995, a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid control number from the Office of Management and Budget (OMB). This proposed rule would not establish any requirements that are considered to be information collection requirements as defined by the OMB in 5 CFR part 1320.

*National Technology Transfer and Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, section 12(d) (15 U.S.C. 272) directs NHTSA to use voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. 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 SAE. The NTTAA directs NHTSA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable voluntary consensus standards.

The agency did not find any voluntary consensus standards applicable to this proposed rulemaking. However, we note that the dummy positioning procedures proposed by this SNPRM were developed by a research organization to use in testing CRSs and appear to be supported by commenters from the child restraint manufacturing industry.

*Unfunded Mandates Reform Act*

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, Federal requires 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 for inflation with base year of 1995). (Adjusting this amount by the implicit gross domestic product price deflator for the year 2000 increases it to $109 million.) This SNPRM would not result in a cost of $109 million or more to either State, local, or tribal governments, in the aggregate, or the private sector. Thus, this SNPRM is not subject to the requirements of section 202 of the UMRA.

*Plain Language*

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?

If you have any responses to these questions, please include them in your comments on this proposal.

*Regulation Identifier Number*

The Department of Transportation 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. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

**X. Public Participation**

*How do I prepare and submit comments?*

Your comments must be written and in English. To ensure that your comments are filed correctly in the docket, please include the docket identification number of this document in your comments.

Your comments must not be more than 15 pages long. (49 CFR 553.21) NHTSA established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments.

Please note that pursuant to the Data Quality Act, in order for substantive data to be relied upon and used by the agency, it must meet the information quality standards set forth in the OMB and DOT Data Quality Act guidelines. Accordingly, we encourage you to consult the guidelines in preparing your comments. OMB's guidelines may be accessed at *http://www.whitehouse.gov/omb/fedreg/reproducible.html.*

*How do I submit confidential business information?*

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under **FOR FURTHER INFORMATION CONTACT**. In addition, you should submit a copy, from which you have deleted the claimed confidential business information, to the docket at the address given above under **ADDRESSES**. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in NHTSA's confidential business information regulation (49 CFR part 512).

**Will the agency consider late comments?**

NHTSA will consider all comments received before the close of business on the comment closing date indicated above under **DATES**. To the extent possible, the agency will also consider comments that the docket receives after that date. If the docket receives a comment too late for the agency to consider it in developing a final rule (assuming that one is issued), the agency will consider that comment as an informal suggestion for future rulemaking action.

*How can I read the comments submitted by other people?*

You may read the comments received by the docket at the address given above under **ADDRESSES**. The hours of the docket are indicated above in the same location. You may also read the comments on the internet.

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**List of Subjects in 49 CFR Part 571**

Imports, Motor vehicle safety, Motor vehicles, and Tires.

In consideration of the foregoing, NHTSA proposes to amend 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 1.50.

2. Section 571.213 is amended by:

a. Adding S5(e);

b. Revising S5.3.2 (and the table for S5.3.2);

c. Revising S5.5.2(g)(1)(ii);

d. Adding S5.6.1.12;

e. Revising S6.1.2(a)(1)(ii), S6.1.2(d)(2)(i) and (ii), S7.1.3, the heading and the introductory text of S10.2.1;

f. Removing and reserving S9.1(b), S10.2.1(a) and S10.2.1(b)(1);

g. Revising the first sentence of S10.2.1(b)(2), the introductory text of S10.2.1(c)(1)(i), and the heading and the introductory text of S10.2.2; and,

h. Adding S10.2.3 and Figure 13.

The revisions and additions read as follows:

**§ 571.213 Standard No. 213; Child restraint systems.**

* * * * *

S5 * * *

(e) Each child restraint system tested with a part 572 subpart T dummy need not meet S5.1.2.1(a).

* * * * *

S5.3.2 *Means of installation.*

S5.3.2.1 Except as provided in S5.3.2.2, each add-on child restraint system shall be capable of meeting the requirements of this standard when installed solely by each of the means indicated in the following table for the particular type of child restraint system:

TABLE FOR S5.3.2.1

| Type of add-on child restraint system | Means of installation | | | | |
|---|---|---|---|---|---|
| | Type 1 seat belt assembly | Type 1 seat belt assembly plus a tether anchorage, if needed | Child restraint anchorage system | Type II seat belt assembly | Seat back mount |
| Harnesses labeled per S5.3.1(b)(1) through S5.3.1(b)(3) and Figure 12 | | | | | X |
| Other harnesses | | X | | | |
| Car beds | X | | | | |
| Rear-facing restraints | X | | X | | |
| Belt-positioning seats | | | | X | |
| All other child restraints | X | X | X | | |

S5.3.2.2 A child restraint system tested with the part 572 subpart T (Hybrid III 10-year-old child) dummy is excluded from the requirement in S5.3.2.1 to meet the requirements of this standard when installed by means of a child restraint anchorage system.

* * * * *

S5.5.2 * * *

(g)(1) * * *

(ii) "Secure this child restraint with the vehicle's child restraint anchorage system (LATCH system) (except when used with a child weighing more than 65 lb), or with a vehicle belt." [For car beds, harnesses, and belt-positioning boosters, the first part of the statement regarding attachment by the child restraint anchorage system is optional. For belt positioning boosters, the second part of the statement regarding attachment by the vehicle belt does not apply.] Child restraint systems equipped with components to attach to a child restraint anchorage system and recommended for children of a weight range that includes children weighing over 65 lb (29.5 kg) must be labeled with the following statement: "Do not use the child restraint anchorage system (LATCH system) to attach this child restraint when restraining a child weighing more than 65 pounds."

* * * * *

S5.6.1.12 The instructions for child restraint systems equipped with components to attach to a child restraint anchorage system and recommended for children of a weight range that includes children weighing over 65 pounds (29.5 kg) must include the following statement: "Do not use the child restraint anchorage system (LATCH system) to attach this child restraint when restraining a child weighing more than 65 pounds."

* * * * *

S6.1.2 * * *

(a)(1) * * *

(ii) *Belt-positioning seats.* A belt-positioning seat is attached to either outboard seating position of the standard seat assembly in accordance with the manufacturer's instructions provided with the system pursuant to S5.6.1 using only the standard vehicle lap and shoulder belt and no tether (or any other supplemental device). Place the belt-positioning seat on the standard seat assembly such that the center plane of the belt-positioning seat is parallel and aligned to the center plane of the outboard seating positions on the standard seat assembly and the base of the belt-positioning seat is flat on the standard seat assembly cushion. Move the belt-positioning seat rearward on the standard seat assembly until some part of the belt-positioning seat touches the standard seat assembly back. Keep the belt-positioning seat and the seating position center plane aligned as much as possible. Apply 133 N (30 pounds) of force to the front of the belt-positioning seat rearward into the standard seat assembly.

* * * * *

S6.1.2 * * *

(d)(2) * * *

(i) The lap portion of Type II belt systems used restrain the dummy is tightened to a tension of not less than 9 N (2 pounds) and not more than 18 N (4 pounds).

(ii) The shoulder portion of Type II belt systems used to restrain the dummy is tightened to a tension of not less than 9 N (2 pounds) and not more than 18 N (4 pounds).

* * * * *

S7.1.3 *Voluntary use of alternative dummies.* At the manufacturer's option (with said option irrevocably selected prior to, or at the time of, certification of the restraint), when this section specifies use of the 49 CFR part 572, subpart N test dummy (Hybrid III 6-year-old dummy), the test dummy specified in 49 CFR part 572, subpart I (Hybrid II 6-year-old dummy) may be used in place of the subpart N test dummy.

* * * * *

S10.2.1 *Newborn dummy and 12-month-old dummy.* Position the test dummy according to the instructions for child positioning that the manufacturer provided with the system under S5.6.1 or S5.6.2, while conforming to the following:

* * * * *

(2) When testing rear-facing child restraint systems, place the newborn or 12-month-old dummy in the child restraint system so that the back of the dummy torso contacts the back support surface of the system. * * *

(c)(1)(i) When testing forward-facing child restraint systems, extend the arms of the 12-month-old test dummy as far as possible in the upward vertical direction. Extend the legs of the 12-month-old test dummy as far as possible in the forward horizontal direction, with the dummy feet perpendicular to the centerline of the lower legs. Using a flat square surface with an area of 2,580 square mm, apply a force of 178 N, perpendicular to:

* * * * *

S10.2.2 *Other dummies generally.* When using the: Hybrid III 3-year-old (part 572, subpart P), Hybrid II 6-year-old (part 572, subpart I), Hybrid III 6-year-old (part 572, subpart N) in child restraints other than belt-positioning seats, the Hybrid III weighted 6-year-old (part 572, subpart S), or the Hybrid III 10-year-old (part 572, subpart T) in child restraints other than belt-positioning seats, position the dummy in accordance with S5.6.1 or S5.6.2, while conforming to the following:

* * * * *

S10.2.3 *Hybrid III 6-year-old in belt-positioning seats and Hybrid III 10-year-old in belt-positioning seats.* When using the Hybrid III 6-year-old (part 572, subpart N) or the Hybrid III 10-year-old (part 572, subpart T) in belt-positioning seats, position the dummy in accordance with S5.6.1 or S5.6.2, while conforming to the following:

(a) *Prepare the dummy with pelvis positioning pad and lap form.*

(1) Create an external horizontal coordinate system. Position the dummy such that the front and side of the lumbar adapter, or the square piece above the lumbar load cell if used, are parallel to the lateral (Y) and longitudinal (X) axes of the external coordinate system.

(2) If necessary, adjust the limb joints to 1–2 g while the torso is in the seated position.

(3) Apply double-sided tape to the surface of a lap form, which is a piece of translucent silicone rubber 3 mm thick (50A Durometer) cut to the pattern in Figure 13. Place the lap form on the pelvis of the dummy. Align the top of the lap form with the superior anterior edge of the pelvis skin. Attach the lap form to the dummy.

(4) Apply double-sided tape to one side of a pelvis positioning pad, which is a 125 × 95 × 20 mm piece of foam or rubber with the following specifications: compression resistance between 13 to 17 psi in a compression-deflection test specified in ASTM D–1056–07, a maximum compression set of 25 percent after a 24 hour recovery time in a compression set test for a Type 2—Grade 4 material specified in ASTM D–1056–07, and a density of 9.5 to 12.5 lb/ft3. Center the long axis of the pad on the posterior of the pelvis with the top edge of the foam aligned with the superior edge of the pelvis skin. Attach the pelvis positioning pad to the dummy.

(5) Dress and prepare the dummy according to S9.

(b) Position the belt-positioning seat according to S6.1.2 (a)(1)(ii).

(c) *Position the dummy in the belt-positioning seat.*

(1) Place the dummy on the seat cushion of the belt-positioning seat such that the plane of the posterior pelvis is parallel to the plane of the seat back of the belt-positioning seat, standard seat assembly or vehicle seat back, but not touching. Pick up and move the dummy rearward, maintaining the parallel planes, until the pelvis positioning pad and the back of the belt-positioning seat or test buck seat back, are in minimal contact.

(2) Straighten and align the arm segments horizontally, then rotate the arms upward at the shoulder as far as possible without contacting the belt-positioning seat. Straighten and align the legs horizontally and extend the lower legs as far as possible in the forward horizontal direction, with the feet perpendicular to the centerline of the lower legs.

(3) Using a flat square surface with an area of 2580 square millimeters, apply a force of 178 N (40 lb) perpendicular to:

(i) The plane of the back of the belt-positioning seat, in the case of a belt-positioning seat with a back, or,

(ii) The plane of the back of the standard seat assembly or vehicle seat, in the case of a backless belt-positioning seat or built-in booster.

(iii) Apply the force first against the dummy crotch and then at the dummy thorax on the midsagittal plane of the dummy.

(4) Rotate the arms of the dummy down so that they are perpendicular to the torso.

(5) Bend the knees until the back of the lower legs are in minimal contact with the belt-positioning seat, standard seat assembly or vehicle seat. Position the legs such that the outer edges of the knees are 180 +/− 10 mm apart for the Hybrid III 6-year-old dummy and 220 +/− 10 mm apart for the Hybrid III 10-year-old dummy. Position the feet such that the soles are perpendicular to the centerline of the lower legs. In the case of a belt-positioning seat with a back, adjust the dummy so that the shoulders are parallel to a line connecting the shoulder guides. This can be accomplished by leaning the torso such that the dummy's head and neck are centered on the backrest components of the belt-positioning seat. In case of a backless child restraint, adjust the dummy's torso so that the head is laterally level, or as close to level as possible.

(d) *Apply the belt.*

(1) Pull the lap belt webbing in a motion across the front of the dummy and belt-positioning seat to the area above the dummy's inboard foot, located on the inboard side of the belt-positioning seat.

(2) Loosely route the lap and shoulder belts in accordance with the manufacturer's instruction using the belt-positioning guides and attachments, if available.

(3) Adjust the belt between the inboard and outboard attachments or lower belt guides, if available, to hold the lap belt 15 centimeters (cm) out from the midsagittal line of the pelvis.

(4) While holding the slack portion of the lap belt between the lower belt guides, pull the lap belt forward along the midsagittal plane of the pelvis to a position 20 +/− 10 mm above the top surface of the thighs, grasp the torso portion of the belt above the inboard belt attachment and slowly pull upward in the direction of the shoulder belt path until the lap belt has no slack.

(5) Apply lap belt tension according to S6.1.2(d)(2)(i).

(6) Feed the excess belt into the shoulder belt attachment or retractor and position the section of the shoulder belt between the upper attachment/guide and the lower attachment/guide so that the belt routes through the shortest path between the two locations.

(7) Apply shoulder belt tension according to S6.1.2(d)(2)(ii).

(e) *Dummy final positioning.*

(1) Check the leg, feet, thorax and head positions and make any necessary adjustments to achieve the positions described in S10.2.3(c)(5). Position the legs, if necessary, so that the leg placement does not inhibit thorax movement in tests conducted under S6.

(2) Rotate each dummy arm downwards in the plane parallel to the dummy's midsagittal plane until the arm contacts a surface of the child restraint system or the standard seat assembly, in the case of an add-on system, or the specific vehicle shell or specific vehicle, in the case of a build-in system, as appropriate. Position the arms, if necessary, so that the arm placement does not inhibit torso or head movement in tests conducted under S6.

* * * * *

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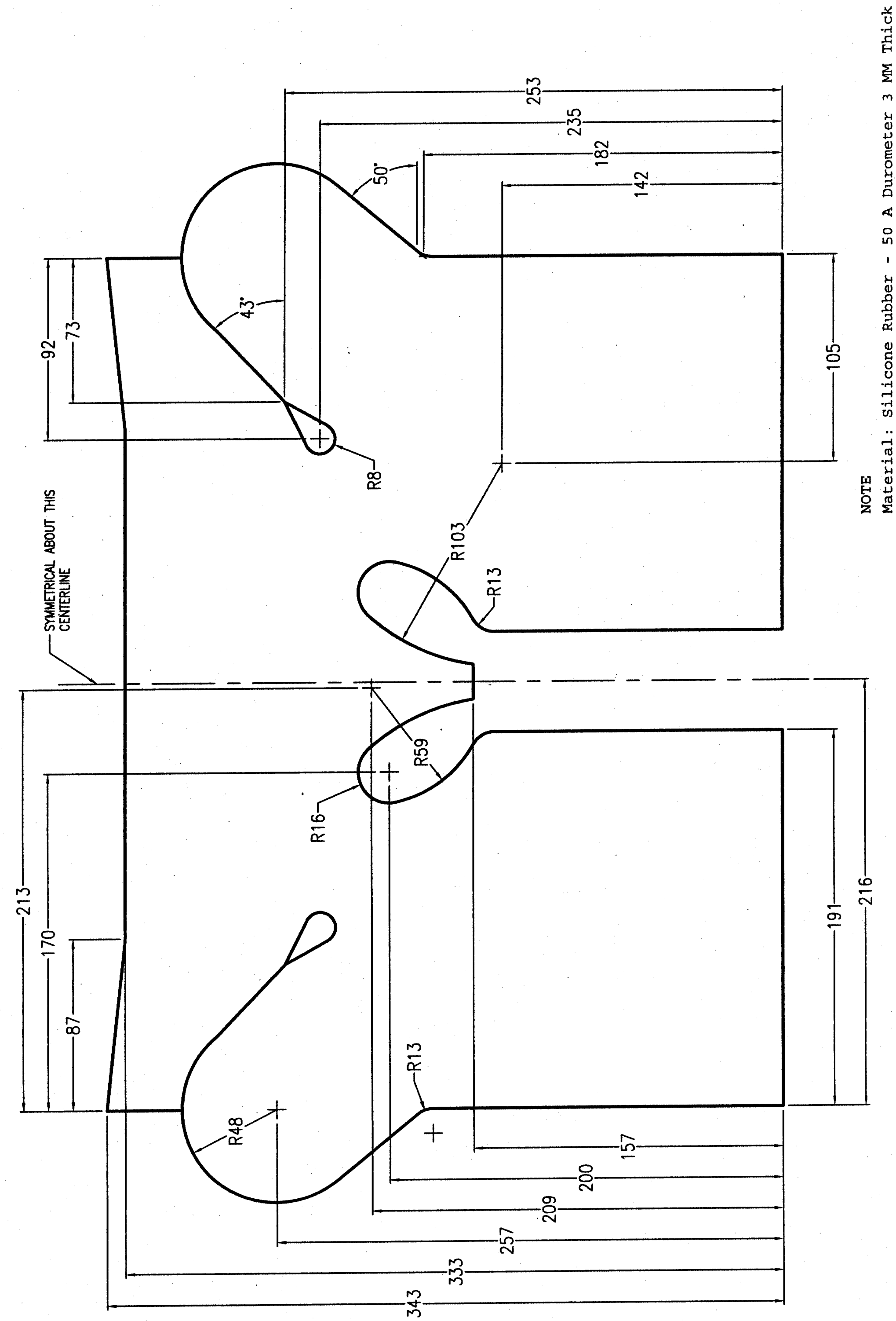


**Figure 13 – Lap Form**

Issued on: November 12, 2010.

**Nathaniel Beuse,**

*Acting Associate Administrator for Rulemaking.*

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**BILLING CODE 4910–59–C**