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FOR FURTHER INFORMATION CONTACT: Lily Wong, EPA Region IX, (415) 947-4114, wong.lily@epa.gov.

SUPPLEMENTARY INFORMATION: On December 13, 2007, EPA proposed to disapprove the State Plan submitted by Nevada on November 15, 2006. The State Plan is intended to address the requirements of EPA's Clean Air Mercury Rule, promulgated on May 18, 2005, and subsequently revised on June 9, 2006. EPA proposed to determine that the submitted Nevada State Plan does not meet certain Clean Air Mercury Rule requirements.

The proposed action provided a 45-day public comment period. In response to a request from Leo M. Drozdoff, Administrator of the Nevada Division of Environmental Protection, submitted by letter on January 3, 2008, EPA is extending the comment period for an additional 45 days.

Dated: January 9, 2008.

Wayne Nastri,

Regional Administrator, Region IX.

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DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 2007-0048]

RIN 2127-AJ44, RIN 2127-AJ49

Federal Motor Vehicle Safety Standards, Child Restraint Systems; Anthropomorphic Test Devices (Hybrid III 10-Year-Old and Hybrid III 6-Year-Old Child Dummies)

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

ACTION: Supplemental notice of proposed rulemaking (SNPRM).

SUMMARY: This document supplements NHTSA's notice of proposed rulemaking

(NPRM) of August 31, 2005 that proposed to: (a) Expand the applicability of Federal Motor Vehicle Safety Standard (FMVSS) No. 213, *Child restraint systems*, to restraints recommended for children up to 80 pounds, and (b) require booster seats and other restraints to meet performance criteria when tested with a crash test dummy representative of a 10-year-old child. In Part 1 of this SNPRM, NHTSA is proposing a test procedure for positioning the 10-year-old child dummy in a child restraint, to reduce variation due to chin-to-lower neck contact that was exhibited by the dummy in sled tests conducted subsequent to the NPRM. Comments are also requested in Part 1 on some other changes or clarifications to the NPRM, proposed in response to the public comments. In Part 2 of this SNPRM, we likewise propose to add a seating procedure for positioning the Hybrid III 6-year-old dummy in a child restraint for FMVSS No. 213 compliance testing. Concerns about the variability in HIC measurements obtained by that test dummy have led NHTSA to postpone mandatory use of the dummy in agency compliance tests. The seating procedure will address this variability issue and facilitate the full use of the dummy as a compliance instrument.

DATES: You should submit your comments early enough to ensure that Docket Management receives them not later than March 24, 2008.

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 Dr. Roger Saul, Office of Rulemaking (Telephone: 202-366-1740) (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.

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Part 1. 10-Year-Old Child Test Dummy

I. Background

On August 31, 2005, NHTSA issued an NPRM proposing: (a) To expand the applicability of FMVSS No. 213, *Child restraint systems*, to restraints recommended for children up to 80 pounds (1b); and (b) to require booster seats and other restraints to meet performance criteria when tested with a Hybrid III crash test dummy representative of a 10-year-old child (70 FR 51720; NHTSA Docket No. 21245).

The rulemaking proposal was part of an on-going agency initiative to enhance the safety of children in motor vehicle crashes. It also furthered 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 that simulates a 10-year-old child.¹

The agency completed its evaluation of the suitability of the Hybrid III 10-year-old dummy in September 2004. Following the evaluation, NHTSA initiated rulemaking to adopt specifications and performance requirements for the test dummy into 49 CFR part 572 (notice of proposed rulemaking published July 13, 2005, 70 FR 40281; Docket No. NHTSA 2004–2005–21247), in addition to publishing the August 31, 2005 NPRM to incorporate the dummy into FMVSS No. 213.

Booster seats provide a seating platform which boosts the child to a position that enables the vehicle lap and shoulder belts to fit better. Without booster seats, children who are too small to be adequately restrained with the vehicle’s lap and shoulder belt system are at higher risk of injury due to the belts’ improper placement. The agency recommends that children who have outgrown their internal harnessed child restraint systems, but who cannot adequately fit a vehicle’s lap and shoulder belt system, be properly restrained using booster seats until they are at least 4 feet 9 inches tall.

The August 31, 2005 NPRM addressed the view expressed by many in the child passenger safety community that efforts to increase booster seat use should go hand-in-hand with expanding the applicability of FMVSS No. 213 to all booster seats. In that way, this view maintains, the seating system that we recommend for older children will be closely assessed in the standard’s rigorous dynamic test for adequate performance in a crash. FMVSS No. 213 currently applies to child restraint systems that are designed to restrain,

seat, or position children who weigh 30 kg (65 lb) or less.² Booster seats recommended for children weighing up to 65 lb are now subject to FMVSS No. 213 testing, but they are currently tested³ with a 52-lb 6-year-old instrumented child dummy for injury performance response criteria, and with a 62-lb weighted 6-year-old uninstrumented child dummy for structural integrity. The NPRM proposed to upgrade the test parameters by using the 78-lb (35 kg) instrumented Hybrid III 10-year-old dummy to test boosters recommended for children weighing up to 80 lb.⁴ (The 10-year-old dummy is referred to as the “HIII–10C dummy.”)

II. Summary of Responses to August 31, 2005 NPRM

The agency received 11 comments on the August 31, 2005 NPRM. Comments were received from Britax Child Safety, Inc. (Britax), Dorel Juvenile Group (Dorel), Evenflo Company, Inc. (Evenflo), Graco Children’s Products, Inc. (Graco), the Children’s Hospital of Philadelphia (CHOP), the American Academy of Pediatrics (AAP), the National Transportation Safety Board (NTSB), the American Automobile Association (AAA), the Insurance Institute for Highway Safety (IIHS), the Advocates for Highway and Auto Safety (Advocates), and Public Citizen.

All commenters supported extending the applicability of FMVSS No. 213 to child restraints recommended for children up to 80 lb, and supported having a 10-year-old dummy to test higher-weight rated child restraints. Dorel, however, expressed concerns about the biofidelity of the HIII–10C dummy, particularly with regard to a metal “spine box” in the dummy’s thorax region. Dorel stated that the dummy exhibited “chin to chest contacts resulting in higher HIC scores in backed boosters as compared to backless.”⁵ Similarly, Graco stated that

it conducted a limited series of sled tests (22) using the HIII–10C dummy and observed a spike in the head X and Z accelerations beginning between 45 and 50 milliseconds, typically of a duration of less than 10 milliseconds. Graco stated that it did not have an explanation for the phenomenon, i.e., “[whether] the spike was caused by a chin strike, the biofidelity of the dummy’s neck or some other cause,” but suggested that additional testing should be performed to ensure that the HIII–10C dummy is appropriate for use in FMVSS No. 213 testing. (See also comments to the July 13, 2005 NPRM proposing to adopt specifications for the HIII–10C into 49 CFR part 572, Docket 2004–21247.)

III. Agency Follow-Up

In response to these comments, NHTSA conducted additional sled tests to assess booster seat performance using the HIII–10C dummy. As a result of the tests, the agency determined that dummy set-up (posture) prior to the test significantly affected the consistency of HIC measurements of repeat tests with the HIII–10C dummy. When the dummy was somewhat reclined in the child restraint at the outset of the test, reduced head forward translation and increased head rotation caused severe dummy chin contact to a rigid portion of the dummy, which resulted in increased HIC readings. After analyzing the test results, NHTSA developed a seating procedure for positioning the HIII–10C dummy for the FMVSS No. 213 compliance test to address the chin-to-rigid body impacts. The agency has issued this SNPRM to seek public comment on incorporating this procedure into the standard. This issue is discussed in more detail in the next section.

Commenters made other suggestions about or asked for clarification of certain aspects of the August 31, 2005 NPRM. Two of these, discussed in the next section, are topics on which we seek comment in this SNPRM. These relate to the proposed parameters that would specify which test dummy would be used by NHTSA to test child restraints of recommended weight ranges (this issue was raised by Britax), and to the issue of head support requirements for CRSs and how the agency would test booster seats and other child restraints if the HIII–10C’s head were above the seat back of the standard seat assembly used in the FMVSS No. 213 compliance test (this issue was raised by Evenflo).

Commenters also remarked on various other aspects of the NPRM. Comments were submitted on the proposed injury

¹ Section 4 of Anton’s Law, signed on December 4, 2002, states:

Section 4. Development of Anthropomorphic Test Device Simulating a 10-Year-Old Child.

(a) Development and Evaluation. Not later than 24 months after the date of the enactment of this Act, the Secretary shall develop and evaluate an anthropomorphic test device that simulates a 10-year-old child for use in testing child restraints used in passenger motor vehicles.

(b) Adoption by Rulemaking. Within 1 year following the development and evaluation carried out under subsection (a), the Secretary shall initiate a rulemaking proceeding for the adoption of an anthropomorphic test device as developed under subsection (a).

² FMVSS No. 213, S4, definition of “child restraint system.”

³ For an overview of the current and proposed weight ranges, see Table 1 of the NPRM, 70 FR at 51723.

⁴ The NPRM also requested comments on whether FMVSS No. 213’s 4.4 kg mass limit (S5.4.3.2) for belt-positioning boosters should be eliminated, and replaced by a chest deflection requirement (70 FR at 51724). In addition, the NPRM document announced NHTSA’s decision not to propose at this time performance criteria for seat belt fit for booster seats or other belt guidance devices (70 FR at 51726).

⁵ Dorel also had concerns about the durability of the HIII–10C, the characteristics of the abdominal inserts, and the availability of the dummy for evaluation. Public Citizen suggested that the HIII–10C dummy “must be upweighted to more closely match the mean weight of children today.”

criteria⁶ (Advocates believed that the agency should conduct research into whether the criteria should be scaled; IIHS and CHOP asked whether the proposed head excursion limits are adequate; and Graco supported the NPRM's approach of having the injury assessment reference values (IARV) and performance measurements be generally the same regardless of child restraint tested). Comments were also submitted on the NPRM's discussion of injury criteria under development, with NTSB, AAP, CHOP and IIHS supporting the development of an abdominal criterion, and the latter opposed to the abdominal injury ratio discussed in the NPRM. Regarding lead time, Graco noted the spikes observed in the dummy's HIC measurements and suggested that three years of lead time should be provided to allow manufacturers time to gain experience with the HIII-10C dummy, and to make any necessary product design changes. A number of comments were received on the agency's decision, announced in the NPRM, not to propose at this time performance criteria for seat belt fit for booster seats.

The agency is evaluating the comments to the NPRMs on the HIII-10C, and will respond to all relevant comments in rulemaking documents following this SNPRM.

It is not necessary for commenters to resubmit views on today's SNPRM that

were expressed in previous comments on the earlier NPRMs. The agency notes that the regulatory text proposed in this SNPRM includes text that was proposed in the August 31, 2005 NPRM. In some instances, comments were received on aspects of the proposed regulatory text. The agency is including text that was proposed in the earlier notice simply to illustrate the appearance of the affected sections. The inclusion does not mean that NHTSA has already decided to adopt the regulatory text. The agency will respond to all relevant comments in a final rule or other document following this SNPRM.

IV. Proposals or Requests for Comments on This SNPRM Relating to the HIII-10C Dummy

a. Dummy Positioning Procedures

Following publication of the NPRM, in March/April 2006 NHTSA conducted additional sled testing of booster seats at the agency's Vehicle Research and Test Center (VRTC) using the HIII-10C dummy. The findings of this testing program indicated that there were HIC measurement inconsistencies in repeated tests with the same booster seat model. To determine the reasons behind this finding, VRTC conducted additional sled tests in July 2006. The following discussion summarizes the findings of these testing programs. The findings are discussed at length in a

NHTSA technical report, "Development of HIII 6-Year-Old and 10-Year-Old Seating Procedure for Booster Seat Testing," (hereinafter "VRTC report"), which has been placed in the docket for this rulemaking.

March/April 2006 Testing Program

VRTC conducted 58 sled test exposures using 30 booster seats with the HIII-10C dummy (see Table 1). All booster seats were installed on the FMVSS No. 213 seat test fixture in accordance with the manufacturers' instructions. High-back child restraints with adjustable head restraints were positioned such that they were at the correct height relative to the dummy's head and also gave optimal shoulder belt fit (i.e., the belt was not on the dummy's neck or too far outboard on the shoulder). Child restraints with non-adjustable head restraints with shoulder belt guides attached were tested according to the manufacturers' instructions as to belt placement, if provided.

Table 1 summarizes the chest acceleration, head and knee excursions, and HIC₃₆ measurements observed in the March/April 2006 tests. The full description of the testing set-up and details of all injury parameters measurements are provided in the VRTC report.

TABLE 1.—EVALUATION OF HIII-10-YEAR-OLD DUMMY IN FMVSS NO. 213 SLED TESTS (MAR/APR 2006)

IARV	HIC 36 ms	Chest acc. 3 ms	Head excursion	Knee excursion
	1000	60 g	813 mm	915 mm
Restraint:				
Graco Treasured Cargo	1094	51	490	667
	903	48	562	763
Graco Treasured Cargo	1128	52	527	736
	910	51	475	637
Cosco High Rise	506	45	421	568
	395	48	436	590
Cosco High Rise	541	45	437	614
	532	44	449	631
Safety 1st Intera	824	52	518	716
Safety 1st Intera	NA	46	502	746
Safety 1st Apex 65	1137	49	540	824
	950	49	521	801
Evenflo Generations	622	56	603	809
	1216	56	580	808
Britax Parkway	764	58	638	863
	649	51	658	834
Graco Treasured CarGo	667	46	539	768
	751	50	537	822
Compass 500	792	65	651	851
	1594	58	583	802

⁶ The NPRM proposed performance criteria for the HIII-10-year-old dummy similar to the current FMVSS No. 213 criteria, because the agency was not aware of any injuries unique to children in booster seats that would necessitate separate and differing injury criteria limits. Thus, we tentatively concluded that the existing injury criteria would

likely ensure the continued effectiveness of child restraints rated to the higher weight limit of 80 lb. The specific injury criteria measurement maximums for the HIII-10-year-old dummy were: HIC₃₆ = 1000; chest acceleration = 60 g's (3 millisecond clip); head excursion = 813 millimeters (mm) for untethered condition, 720 mm for tethered

condition (if applicable); and knee excursion = 915 mm. In preparation for proposing these criteria measurement maximums, the agency's Vehicle Research and Test Center (VRTC) performed testing on booster seats with the HIII-10C dummy; only one child restraint in the test series failed the existing FMVSS No. 213 injury criteria.

TABLE 1.—EVALUATION OF HIII-10-YEAR-OLD DUMMY IN FMVSS NO. 213 SLED TESTS (MAR/APR 2006)—Continued

IARV	HIC 36 ms	Chest acc. 3 ms	Head excursion	Knee excursion
	1000	60 g	813 mm	915 mm
Graco Cherished CarGo	773	55	585	777
	1126	51	650	875
Evenflo Big Kid	836	54	538	770
	731	50	517	743
Cosco Summit Deluxe	481	47	528	775
	753	45	557	862
Cosco Commuter DX	826	52	591	881
	1137	52	670	985
Safety 1st Enspira	586	48	602	874
	653	50	625	905
Cosco Alpha Omega	627	44	601	801
	472	42	560	767
Safety 1st Intera	NA	49	492	751
	1030	43	551	864
Cosco High Rise (no back)	NA	47	470	494
	733	45	682	696
Evenflo Chase Premiere	839	52	639	907
	997	53	560	864
Graco Turbo Booster	450	46	571	753
	903	47	525	739
Recaro Young Style	852	55	678	856
	848	57	592	778
Safety 1st Vantage Point	911	49	694	1024
	725	45	609	909
Combi Dakota (no back)	414	52	507	711
	424	51	505	695
Cosco Protek	511	47	578	740
	855	46	598	794
Recaro Young Sport	931	50	651	884
	808	37	607	802
Combi Kobuk	989	73	679	895
	573	52	653	808
Cosco Commuter	737	51	573	826
Cosco Summit	632	52	598	832
Cosco Alpha Omega	638	42	654	839
Safety 1st Enspira	620	41	616	758
Safety 1st Apex 65	NA	53	577	937
	965	42	530	822

The results of the March/April 2006 tests indicated that there were inconsistencies in several HIC₃₆ measurements in repeated tests with the HIII-10C dummy placed in the same type/model child restraint system. For example, the HIC₃₆ measurements for the belt positioning booster (BPB) Evenflo Generations varied from 622 (Pass IARV) to 1216 (Fail IARV). The HIC₃₆ measurements for the Compass 500 varied from 792 (Pass IARV) to 1594 (Fail IARV) (see Figure 1). Generally, there were no inconsistencies observed in the other FMVSS No. 213 injury criteria measurements of chest acceleration, and head and knee excursions.

After analyzing the test results, VRTC determined that dummy posture and belt placement affected the kinematic response of the dummy, which in turn affected HIC readings. A 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 bib⁷ 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.

⁷ 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.

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.

In summary, VRTC found that a more reclined posture of the HIII-10C dummy leads to an increased likelihood for submarining of the dummy. This situation leads to much higher rotational velocity in the dummy’s head, putting it in non-representative contact with a more rigid portion of the dummy structure. It was thus determined that through kinematics, dummy posture significantly affects HIC.

July 2006 Testing Program

In this test program, an additional matrix of 12 sled tests was conducted to address the finding that the dummy HIC₃₆ response is sensitive to the seating posture of the dummy in the booster seat. The purpose of this testing program was to determine if the HIC₃₆ variability could be decreased by tighter controls on both the dummy’s posture and the placement of the belt to restrain the dummy to the test seat assembly.

Four factors were evaluated in the VRTC testing program:

- Seating position—Left Side vs. Right Side
- Torso angle—Upright vs. Reclined

- Dummy manufacturer—FTSS vs. Denton

- Booster model—Evenflo Generations vs. Compass 500

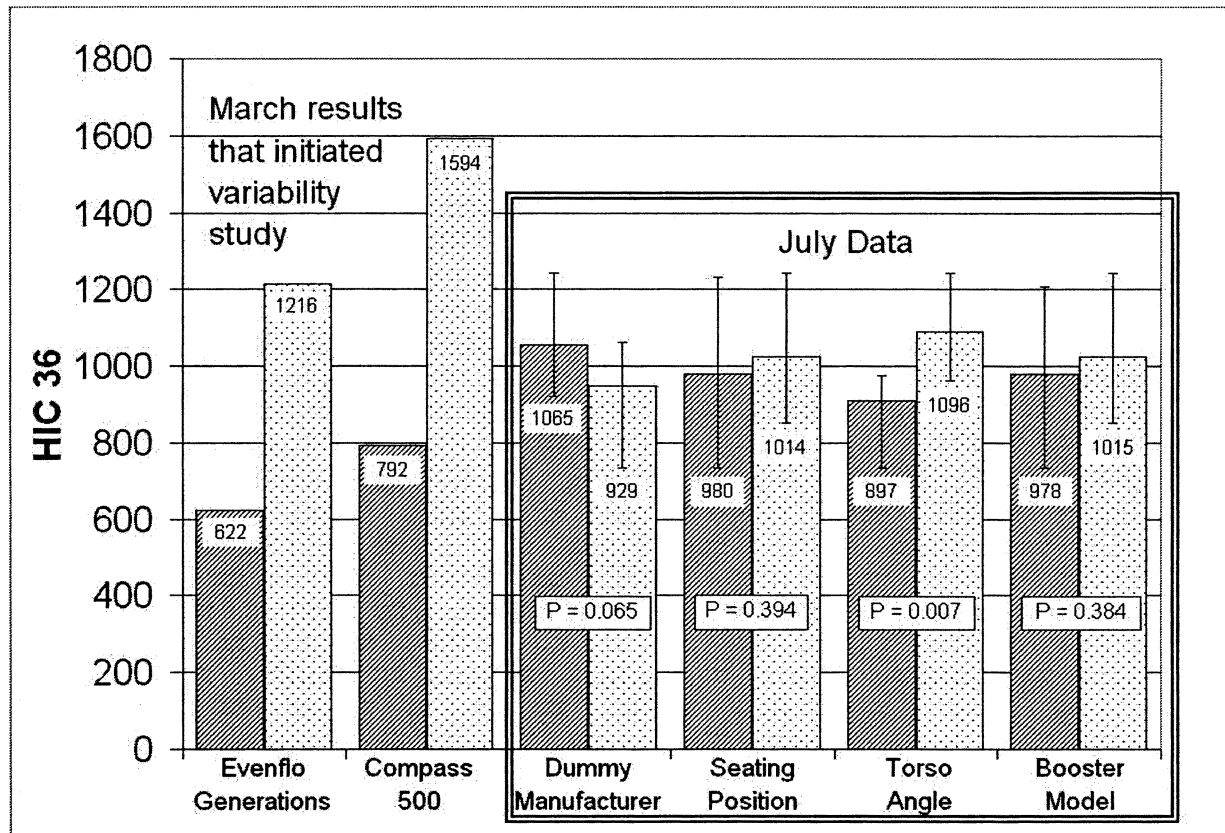
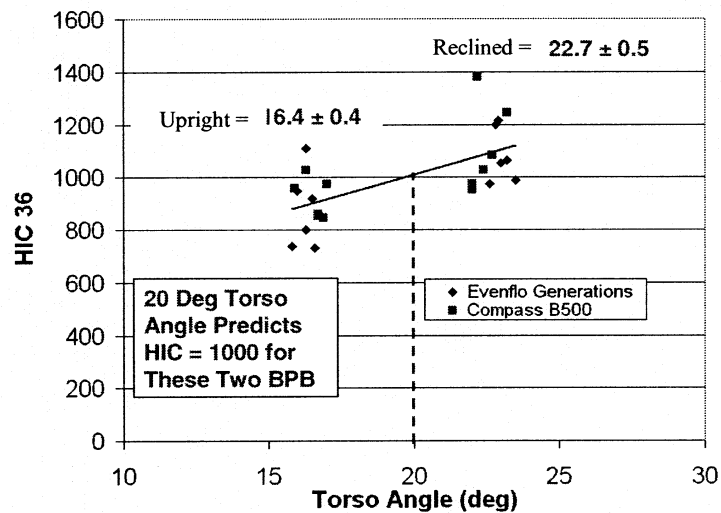
The results of the testing indicate that the dummy torso angle (representing posture) had a much larger effect on HIC₃₆ than the other three variables. Dummy posture was the only variable to have a statistically significant effect on HIC₃₆ outcome (alpha significance level = 0.007, n = 8) and the p-value was more than an order of magnitude smaller than the next largest effector (dummy manufacturer had p = 0.065). Figure 1 shows the average HIC₃₆ with error bars giving the minimum/maximum values for each variable comparison. These test results indicate that the kinematics associated with a more horizontal torso (i.e., reclined initial posture) led to more head rotation and more severe dummy chin contact, which ultimately resulted in higher HIC₃₆ readings. Belt placement, which is largely a function of both booster seat design and dummy posture, was also shown to influence HIC in a similar manner to dummy posture (torso angle). A more inboard shoulder belt was found to have the same effect as a more reclined posture, and thus similarly, resulted in higher HIC₃₆ values. Controlling the posture

and belt placement of the dummy decreased the HIC₃₆ variability in the booster seats tested by 78%.⁸

Figure 2 shows the relationship of HIC₃₆ measurements vs. torso angle (representing posture) for the two belt-positioning boosters (BPs) (Evenflo Generations and Compass 500) that were tested using the pulse and seat assembly of FMVSS No. 213. The plot indicates that for these two BPs, a 20° torso angle is correlated to a HIC₃₆ value of 1000. Note that the dispersion in the data at each torso angle in Figure 2 is due to the combined effects of left side versus right side, dummy manufacturer, dynamic belt motion due to booster seat design, and small variations in the controlled torso angle.

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⁸ When the torso angle for the HIII-10-year-old dummy was set to the upright position of approximately 16°, the average coefficient of variation for HIC₃₆ for repeat tests of the two booster seats used in the July 2006 test series was 12.4%. HIC₃₆ variability was lessened to an acceptable level below the pass/fail criterion of 1000, and the average HIC readings for the two seats used in repeat testing ranged from 874–921.

Figure 1. Comparison of Variables and Their Effect on HIC 36**Figure 2. HIC Measurement vs. Torso Angle for HIII 10-Year-Old Dummy in FMVSS No. 213 Sled Tests (July 2006)****Proposed Dummy Positioning Procedure**

A detailed description of the seating procedure used by VRTC is provided in the VRTC report and in the proposed

regulatory text. The general approach is as follows:

1. Set the dummy's neck angle at 16 degrees.

2. Set the dummy's lumbar angle at standard posture.

3. Place the booster seat on the FMVSS No. 213 bench seat.

4. Place the dummy in the booster seat so that the midsagittal line of the dummy is aligned with the centerline of the booster.

5. Measure the X and Z locations of the left and right shoulder pivots. Make sure that the X and Z values for these two points are within 10 mm of each other to ensure that the dummy is not twisted or tilted in the seat.

6. Locate the head CG, H-point, and knee pivot point. Calculate the H-point location of the dummy relative to the FMVSS No. 213 seat Z point by first measuring the X and Z coordinates of the knee pivot and head center of gravity. Then mathematically locate the intersection point of two circles using the knee pivot and head center of gravity as the centers and the known dummy anthropometric lengths as radii (see VRTC report for more detailed explanation).

7. Set the torso angle (established with the head CG and H-point) to 14 degrees $\pm$ 0.5 degrees from vertical.

8. Apply the belt restraints following the booster manufacturer's routing instructions and using standard FMVSS No. 213 belt tensions.

We note that the University of Michigan Transportation Research Institute (UMTRI) has also developed a seating procedure for use with the HIII-

10C dummy that is similar to the procedure proposed in this SNPRM.⁹ UMTRI had similar findings to the ones of VRTC concerning HIC measurements of the dummy. In a June 14, 2006 presentation to the agency on its preliminary findings of an on-going biomechanics study, UMTRI stated that both the dummy's initial position and belt placement affected HIC measurements during sled testing of booster seats with the HIII-10C dummy. The test data are publicly available on the NHTSA biomechanics database. The data and videos can also be accessed from the NHTSA Web site <http://www-nrd.nhtsa.dot.gov/database/asp/biodb/querytesttable.aspx>. VRTC used the average child posture data from the UMTRI Stapp paper in combination with the HIII-10C dummy's anthropometry to derive a mean torso angle of 14.5° as the optimal angle to reduce HIC₃₆ variability for the HIII-10C dummy while maintaining a biofidelic posture. This angle is consistent with the upright torso angle of approximately 16° used by the agency in the series of sled tests conducted by VRTC in July 2006.

A series of tests using the HIII-10C dummy was conducted in March/April of 2007 to validate the seating

procedure. This series was a subset of the BPBs that were tested in the March/April 2006 series (see Table 1). Table 2 contains the test matrix and Table 3 summarizes the test results. All of the tests were conducted at the proposed torso angle of 14° $\pm$ 0.5°. This $\pm$ 0.5° tolerance limit was achievable with the various BPB models evaluated. The Graco Turbo Booster was tested both with and without the highback to determine the effect of the highback.

The results indicated that controlling the torso angle reduced dummy response variability for the BPBs that were tested. The IARVs were not exceeded in any of the tests.

TABLE 2.—TEST MATRIX FOR VALIDATION OF PROPOSED SEATING PROCEDURE USING HIII-10C DUMMY (MAR/APR 2007)

BPB model	Dummy SN	Number of tests
Britax Parkway	D001	3
Safety 1st Apex 65 ...	F001	3
Recaro Young Style	D001	3
Cosoc Protek	F001	3
Graco Turbo Booster:		
Without back	D001	3
With back	F001	3

TABLE 3.—RESULTS FOR VALIDATION OF PROPOSED SEATING PROCEDURE USING HIII-10C DUMMY IN FMVSS No. 213 SLED TESTS (MAR/APR 2007)

IARV	HIC 36 ms	Chest acc. 3 ms	Head excursion	Knee excursion
	1000	60 g	813 mm	915 mm
Restraint:				
Safety 1st Apex 65	830	51.1	614	790
	683	55.7	610	815
	893	53.3	637	810
Britax Parkway	473	48.4	574	704
	507	49.0	617	717
	420	47.0	614	732
Graco Turbo Booster:				
With highback	433	42.0	611	707
	356	43.3	602	709
Graco Turbo Booster:				
No back	622	47.3	569	684
	625	49.3	540	698
	703	52.1	579	692
Recaro Young Style	680	50.1	697	770
	838	46.4	617	754
	763	52.2	706	773
Cosco Protek	496	42.9	622	694
	403	43.8	574	603

Comments are requested on the proposed dummy positioning procedure. It is noted that the proposed dummy positioning procedure may not

necessarily lower HIC values across the board for the HIII-10C dummy (i.e., for some restraints, positioning the dummy in an upright posture may not

necessarily prevent submarining and high head accelerations when the seat is tested dynamically). However, when testing the HIII-10C dummy in a more

⁹ Reed MP, et al. "Improved Positioning Procedures for 6YO and 10YO ATDs Based on

Child Occupant Postures," Stapp Car Crash Journal, Vol. 50 (November 2006), pp. 337-388.

upright posture, the HIC values the dummy produces should be within an acceptable range of variability in repeated testing.

The proposed positioning procedure would apply when the HIII-10C is used to test booster seats and not when the dummy is used to test child restraints other than booster seats ("non-booster seats") that are recommended for children weighing over 30 kg (65 lb).¹⁰ NHTSA tentatively concludes that the procedure is not needed in tests of the HIII-10C in non-booster seats because those 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 standard¹¹ 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. Those procedures reasonably assure that the dummy is properly positioned in the child restraint, and appear suitable for positioning the HIII-10C. In contrast, booster seats do not have an internal harness to help position the dummy, so there is more opportunity for variation in the positioning of the HIII-10C and a greater need to control the torso angle and the positioning of the lap/shoulder belt. Comments are requested on this issue.

Comments are also requested on whether FMVSS No. 213 should require boosters or other child restraint systems (CRSs) to be designed such that the dummy can be positioned in the CRS in accordance with positioning procedures. Conversely, if the dummy cannot be so positioned, what flexibility should be established to fluctuate from the procedures to fit the dummy in the CRS? The agency is also considering 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 FMVSS No. 213 to evaluate the restraint. (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?)

b. Continued Use of the Weighted HIII-6-Year-Old Dummy

FMVSS No. 213 requires that booster seats recommended for use by children weighing between 22.7 kg (50 lb) and 30 kg (65 lb) be tested with the HIII 6-year-old (HIII-6C) (52 lb) instrumented dummy for injury assessment performance requirements, and with the weighted HIII 62 lb 6-year-old uninstrumented dummy for assessment of the restraint's structural integrity. Because a number of booster seats are currently recommended by their manufacturers for children weighing up to 80 lb (36 kg), the NPRM proposed to use the instrumented HIII-10C 78 lb dummy (35 kg) to test all child restraints recommended for children over 50 lb, and to discontinue the use of the weighted HIII 6-year-old dummy entirely in FMVSS No. 213.

Britax commented that it agreed with our proposal to use the HIII-10C dummy when testing CRS with a weight capacity greater than 65 lb, but disagreed with using the dummy for testing CRS with a weight capacity between 50 and 65 lb. The commenter stated that "Restraints, and potentially booster seats, with a maximum capacity between 50 and 65 pounds are not structurally and/or dimensionally designed for testing with an ATD [anthropomorphic test device], or use by a child, having the weight or size of the HIII-10C dummy." Britax therefore suggested that FMVSS No. 213 remain as it is currently for CRS with weight capacity between 50 and 65 lb, using the HIII-6C dummy to measure injury criteria and the weighted HIII-6C dummy to assess structural integrity.

We have determined that this comment has merit. We tentatively agree that it might not be advisable to require all child restraints rated above 50 lb to be tested with the 78 lb HIII-10C dummy, since some of these seats are not designed for or intended to accommodate a 10-year-old child. Some of these child restraints do not currently fit a 10-year-old dummy, or, if made to fit, might not be able to meet the performance requirements of the standard when tested with the HIII-10C. Britax stated that some child restraints rated above 50 lb now serve a safety need by providing a 5-point harness restraint system for children up to 65 lb. The commenter was concerned that these child restraints would be pulled off the market because they might not be able to meet FMVSS No. 213's requirements when tested with the HIII-10C dummy, a result that would be unwarranted and undesirable since the

restraints are not intended for children weighing more than 65 lb.

Because Britax's arguments appear reasonable, we are proposing that, for child restraints rated for children weighing from 50 to 65 lb, these restraints would continue to be tested with the HIII-6C instrumented dummy for performance, and with the weighted HIII-6C uninstrumented dummy for structural integrity. Accordingly, under this proposal, the uninstrumented HIII-6C dummy would be retained in FMVSS No. 213. Under the proposal, the instrumented HIII-10C dummy would only be used to test child restraints rated for children weighing 30 kg to 36 kg or more (65 to 80 lb or more).

c. Head Support Surface

FMVSS No. 213 (S5.2.1.1) currently requires some CRSs to have a seat back to provide restraint against rearward movement of the child's head (rearward in relation to the child). The determination of whether a seat back is required is based on the dummy used in the compliance testing of the restraint. A child restraint need not have a seat back if a specified point on the dummy's head (approximately located at the top of the dummy's ears) is below the top of the standard seat assembly on which the restraint is installed for compliance testing (S5.2.1.2). Because the Hybrid II and Hybrid III 6-year-old dummies are not used in the assessment, booster seats are excluded from the requirement to have a seat back. The agency excluded boosters from the seat back requirement because it was concerned that the additional costs associated with redesigning booster seats to add a seat back were not justified from a safety standpoint. The agency did not know of real world crash data that indicated a problem with head or neck injuries in rear impact crashes. (60 FR 35126, 35135; July 6, 1995.)

This SNPRM proposes to keep this exclusion unchanged by amending S5.2.1.2, such that S5.2.1.2 would specify that the HIII-10C, in addition to the 6-year-old test dummies, would not be used to determine the applicability of the head support surface requirements of S5.2.1.1. We are not aware of real world crash data indicating a problem with head or neck injuries in rear impact crashes, i.e., a need for a head support surface requirement. NHTSA is interested in crash data indicating a need for a requirement for a seat back on booster seats for older children. Comments are also requested on any additional costs that might result from redesigning booster seats to provide a seat back.

¹⁰ There are only a few non-booster seats recommended for children weighing over 30 kg (65 lb) (e.g., Britax Regent and Sunshine Kids Radian 80).

¹¹ <http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/Vehicle%20Safety/Test%20Procedures/Associated%20Files/TP213-9a.pdf>

A related issue concerns how the agency would test backless booster seats if the HIII-10C's head were above the seat back of the standard seat assembly used in the FMVSS No. 213 compliance test. Evenflo stated that it instructs its consumers to ensure that the child's head is supported by the vehicle seat back or head restraint. Evenflo noted that when a backless booster is placed on the FMVSS No. 213 test bench, the HIII-10C "is too tall to satisfy this criterion." NHTSA intends to test the booster to FMVSS No. 213's dynamic test requirements even if the HIII-10C's head is above the seat back of the standard seat assembly. Such a test would assess the performance of the CRS with an older child if the CRS did not have a head support, or if the CRS were used in a vehicle that did not have a head restraint or other supporting structure for the child. On the other hand, Evenflo also observed that in a test of a backless booster seat with the HIII-10C, upon rebound the dummy's head struck the cross bar behind the test bench seat back that supports the tether anchorage, resulting in a HIC₃₆ value above 1000. Evenflo believed that the outcome was "purely an artifact of the test environment and does not reflect real-world vehicle experience in this country and in Europe that clearly demonstrates the efficacy of backless boosters." We are interested in other commenters' experiences testing with the HIII-10C, especially during the rebound stage of the FMVSS No. 213 sled test.

d. Housekeeping Measures

In an effort to delete outdated text from FMVSS No. 213, this document will remove and reserve S7.1.1 of the standard and a part of S7.1.3. S7.1.1 and S7.1.3 were adopted when the CRABI and Hybrid III 3-year-old and 6-year-old test dummies were incorporated into FMVSS No. 213's test procedures. The paragraphs relate to the effective date (August 1, 2005) for testing with the new dummies. Since the August 1, 2005 date has passed, the text is no longer necessary in FMVSS No. 213.

Part 2. Hybrid III 6-Year-Old Child Test Dummy

In this Part 2 of the SNPRM, we are proposing to add a seating procedure for positioning the Hybrid III 6-year-old dummy (HIII-6C) in a child restraint for FMVSS No. 213 compliance testing. Concerns about the variability in HIC measurements obtained by that test dummy have led NHTSA to postpone

mandatory use of the dummy in compliance tests. The seating procedure addresses the variability issues and facilitates the full use of the dummy as a compliance instrument.

I. Background

When NHTSA incorporated the Hybrid III (HIII) 6-year-old dummy (codified in 49 CFR part 572, subpart N) into FMVSS No. 213 by way of a 2003 final rule,¹² the agency expected to use the test dummy in compliance tests of child restraints manufactured on or after August 1, 2005. It was brought to the agency's attention, however, that manufacturers needed more time than provided in the final rule to optimize their product designs to the requirements of the standard. Dorel informed the agency¹³ that Dorel belt positioning booster seats evaluated with the new dummy would fail to meet FMVSS No. 213, showing HIC measurements approximately double that when the same booster seats were tested with the Hybrid II (HII) 6-year-old dummy (49 CFR part 572, subpart I). Dorel believed that the HIII dummy "exhibits severe, non-biofidelic neck elongation and head rotation * * * This results in the chin/face of the dummy striking the chest, causing artificially high HIC measurements." [Footnote not included.] Dorel asked NHTSA to take immediate action to permit continued use of the HII 6-year-old to test CRSs manufactured on and after August 1, 2005.

NHTSA issued an interim final rule that delayed the August 1, 2005 date to August 1, 2008. (August 3, 2005; 70 FR 44520, Docket 22010.) The agency sought to provide manufacturers additional time to gain experience using the test dummy and to optimize their product designs. The rule allowed use of the Hybrid II 6-year-old dummy at the manufacturers' option, for child restraints manufactured until August 1, 2008.

II. Proposed Amendments Relating to the HIII-6C Dummy

This SNPRM follows up on the interim final rule by proposing dummy positioning procedures for the HIII-6C dummy that would be used when testing booster seats. The proposed seating procedure for the HIII-10C dummy outlined earlier in this notice is also proposed for the HIII-6C dummy, with the exception of the computational values used to determine the H-point and torso angle. These values are

different for the HIII-6C dummy due to differences in dummy size.

A test program, discussed below, for the 6-year-old dummy was conducted in July 2007, using the new seating procedure. The agency believes that the introduction of this repeatable positioning procedure will address the HIII 6-year-old issues raised by Dorel. We have tentatively concluded that the procedure eliminates the variability of the test environment that is caused by different seating positions, and that implementation of the seating procedure will lead to more consistent results in the transition from the Hybrid II dummies to the Hybrid III dummies.

In order to allow sufficient time for manufacturers to incorporate this seating procedure into their compliance testing with the HIII 6-year-old dummy, NHTSA is proposing to postpone the 2008 effective date until 2010. Comments are requested on this postponement.

As with the HIII-10C, the proposed positioning procedure for the HIII-6C dummy would apply when the dummy is used to test booster seats and not when the dummy is used to test non-booster seats. The agency's reasons for concluding that the procedure is not needed in tests of the HIII-6C in non-booster seats are the same as those explained above for the HIII-10C, i.e., non-booster seats have an internal harness that positions the dummy and, together with the adjustment procedures already in FMVSS No. 213, controlled and careful positioning of the dummy is already achieved. Comments are requested on this issue.

III. Testing

In July 2007, a series of sled tests were conducted to determine if the proposed seating procedure developed for the HIII-10C dummy could be applied to the HIII-6C when tested in a BPB. Two models of BPBs were selected, based on the results observed with the HIII-10C, to test with the HIII-6C: The Britax Parkway and the Safety 1st Apex 65. Each BPB was tested at the optimum torso angle of 14° and in the more reclined posture of 22°. Table 4 contains the test matrix for the HIII-6C and Table 5 contains a summary of the test results.

As with the HIII-10C dummy, the variability in dummy responses was minimal among repeated tests for the HIII 6-year-old dummy. The same trend observed for the HIII-10C was observed with the HIII-6C dummy: a more reclined initial posture resulted in

¹² June 24, 2003, 68 FR 37620, Docket 15351.

¹³ http://dmses.dot.gov/docimages/pdf92/340975_web.pdf.

higher HIC₃₆ values compared to the more upright posture.

TABLE 4.—TEST MATRIX FOR VALIDATION OF PROPOSED SEATING PROCEDURE USING HIII–6C DUMMY (JULY 2007)

[Numbers in cells indicate sled run numbers]

	Torso angle = 14 deg		Torso angle = 22 deg	
	Driver SN 008	Passenger SN108	Driver SN 088	Passenger SN 108
Britax Parkway	1, 2, 3		4, 5, 6	
Safety 1st Apex 65		1, 2, 3		4, 5, 6

TABLE 5.—RESULTS FOR VALIDATION OF PROPOSED SEATING PROCEDURE USING HIII–6C DUMMY (JULY 2007)

Restraint	Torso angle (deg)	HIC 36 ms	3 ms. Chest Acc. (g)	Head excursion (mm)	Knee excursion (mm)
		1000	60	813	915
Britax Parkway	14.2	523	57.4	538	652
	13.9	445	52.9	550	656
	14.5	422	56.7	551	676
	22.3	691	47.0	523	674
	22.3	613	53.8	565	684
Safety 1st Apex 65	21.9	670	52.0	571	695
	15.1	478	47.7	517	649
	13.9	599	49.2	541	694
	14.7	497	47.3	522	657
	21.9	671	46.1	562	726
	22.0	655	43.3	511	693
	21.9	690	44.2	569	729

Submission of Comments

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 submit two copies of your comments, including the attachments, to the docket at the address given above under **ADDRESSES**. You may also submit your comments to the docket electronically.

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 two copies, 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.

Please note that even after the comment closing date, NHTSA will continue to file relevant information in the docket as it becomes available. Further, some people may submit late comments. Accordingly, the agency recommends that you periodically check the docket for new material.

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 (Volume 65, Number 70; Pages 19477–78).

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 cannot quantify the benefits of this rulemaking. However, the agency believes this rulemaking would enhance the safety of child restraint systems by setting dummy positioning procedures for the Hybrid III 6-year-old and HIII-10C. This proposed rule would increase the repeatability of the test dummies' HIC measurements, which increases the utility of the dummies in FMVSS compliance tests. The result of this proposed rule would be to provide better assurance that each child restraint safely 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 restraints recommend for children weighing up to 80 lb. 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 NPRM 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 federalism implications because a final rule, if issued, 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."

Further, no consultation is needed to discuss the preemptive effect of today's rulemaking. NHTSA rules can have preemptive effect in at least two ways. First, the National Traffic and Motor Vehicle Safety Act contains an express preemptive 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 that preempts State law, not today's

rulemaking, so consultation would be inappropriate.

In addition to the express preemption noted above, the Supreme Court has also recognized that State requirements imposed on motor vehicle manufacturers, including sanctions imposed by State tort law, can stand as an obstacle to the accomplishment and execution of a NHTSA safety standard. When such a conflict is discerned, the Supremacy Clause of the Constitution makes their State requirements unenforceable. See *Geier v. American Honda Motor Co.*, 529 U.S. 861 (2000). NHTSA has not outlined such potential State requirements in today's rulemaking, however, in part because such conflicts can arise in varied contexts, but it is conceivable that such a conflict may become clear through subsequent experience with today's proposed standard and test regime. NHTSA may opine on such conflicts in the future, if warranted. See *id.* at 883–86.

Civil Justice Reform

This NPRM would not have any retroactive effect. Under 49 U.S.C. 30103, whenever a Federal motor vehicle safety standard is in effect, a State may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard, except to the extent that the state requirement imposes a higher level of performance and applies only to vehicles procured for the State's use. 49 U.S.C. 30161 sets forth a procedure for judicial review of final rules establishing, amending, or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties 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 Society of Automotive Engineers (SAE). The NHTAA directs NHTSA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable voluntary consensus standards.

The agency searched for, but did not find, any voluntary consensus standards applicable to this proposed rulemaking.

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 NPRM 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 NPRM is not subject to the requirements of sections 202 of the UMRA.

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.

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. Revising the definition of *Child restraint system* in S4, the introductory paragraph of S5.2.1.2, revising S6.1.1(d)(2), S6.1.2(a)(1)(ii), the introductory paragraph of S6.2.3, revising S7.1.2(d) and S7.1.2(e), S7.1.3, S9.1(f), S9.3.2, and the heading and introductory paragraph of S10.2.2;
 - b. Removing and reserving S7.1.1;
 - c. Adding S7.1.2(f), S10.2.3 and S10.2.4, and
 - d. Adding Figures 13, 14, 15, 16, 17a, 17b, 18, 19, 20 and 21, at the end of the section.

The revised, reserved and added text and figures read as follows:

§ 571.213 Standard No. 213; Child restraint systems.

* * * * *

S4. *Definitions.*

* * * * *

Child restraint system means any device, except Type I or Type II seat belts, designed for use in a motor vehicle or aircraft to restrain, seat, or position children who weigh 36 kilograms (kg) (80 lb) or less.

* * * * *

S5.2.1.2 The applicability of the requirements of S5.2.1.1 to a front-facing child restraint, and the conformance of any child restraint other than a car bed to those requirements is determined using the largest of the test dummies specified in S7.1 for use in testing that restraint; provided, that the 6-year-old dummy described in subpart I or subpart N of part 572 of this title and the 10-year-old dummy described in subpart T of part 572 of this title, are not used to determine the applicability of or compliance with S5.2.1.1. A front-facing child restraint system is not required to comply with S5.2.1.1 if the target point on either side of the dummy's head is below a horizontal plane tangent to the top of * * *

S6.1.1 Test conditions.

* * * * *

(d)(1) * * *

(2) When using the test dummies specified in 49 CFR Part 572, subparts N, P, R, or T, performance tests under S6.1 are conducted at any ambient temperature from 20.6 °C to 22.2 °C and at any relative humidity from 10 percent to 70 percent.

* * * * *

S6.1.2 * * *

(a) * * *

(ii) *Belt-positioning seats.* A belt-positioning seat is positioned on 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, except that only the standard vehicle lap and shoulder belt is used to fasten the belt-positioning seat. No tether strap or any other supplemental device is used to attach the belt-positioning seat to the standard seat assembly. Place the booster seat on the standard seat assembly such that it is centered between the lap belt anchor positions. Position the base of the booster rearward as far as possible against the seat back of the standard seat assembly by pushing the booster seat rearward until the intersection of the booster's back and bottom contacts the intersection of the standard bench seat's back and base cushion.

* * * * *

S6.2.3 Pull the sling tied to the dummy restrained in the child restraint system and apply the following force: 50 N for a system tested with a newborn dummy (49 CFR part 572, subpart K); 90 N for a system tested with a 12-month-old dummy (49 CFR part 572, subpart R); 200 N for a system tested with a 3-year-old dummy (49 CFR part 572, subpart P); 270 N for a system tested with a 6-year-old dummy (49 CFR part 572, subpart N or I); 350 N for a system tested with a weighted 6-year-old dummy (49 CFR part 572, subpart S); or 437 N for a system tested with a 10-year-old-dummy (49 CFR part 572, subpart T). The force is applied in the manner illustrated in Figure 4 and as follows:

* * * * *

S7.1.1 [Reserved]

S7.1.2 * * *

* * * * *

(d) A child restraint that is recommended by its manufacturer in accordance with S5.5 for use either by children in a specified mass range that includes any children having a mass greater than 18 kg (40 lb) but not greater than 22.7 kg (50 lb) or by children in a specified height range that includes any children whose height is greater than 1100 mm but not greater than 1250 mm is tested with a 49 CFR part 572, subpart N dummy (Hybrid III 6-year-old dummy).

(e) A child restraint that is recommended by its manufacturer in accordance with S5.5 for use either by children in a specified mass range that includes any children having a mass greater than 22.7 kg (50 lb) but not greater than 30 kg (65 lb) or by children in a specified height range that includes any children whose height is greater than 1100 mm but not greater than 1250 mm is tested with a 49 CFR part 572, subpart N dummy (Hybrid III 6-year-old

dummy) and with a part 572, subpart S dummy (Hybrid III 6-year-old weighted dummy).

(f) A child restraint that is manufactured on or after [compliance date of final rule] and that is recommended by its manufacturer in accordance with S5.5 for use either by children in a specified mass range that includes any children having a mass greater than 30 kg (65 lb) or by children in a specified height range that includes any children whose height is greater than 1250 mm is tested with a 49 CFR part 572, subpart T dummy (Hybrid III 10-year-old dummy).

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), with regard to testing a child restraint manufactured before August 1, 2010, when this section specifies use of the 49 CFR part 572, subpart N (Hybrid III 6-year-old dummy) test 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.

* * * * *

S9.1 Type of clothing.

* * * * *

(f) Hybrid III 6-year-old dummy (49 CFR part 572, subpart N), Hybrid III 6-year-old weighted dummy (49 CFR part 572, subpart S), and Hybrid III 10-year-old dummy (49 CFR part 572, subpart T). When used in testing under this standard, the dummies specified in 49

CFR part 572, subparts N, S, and T, are clothed in a light-weight cotton stretch short-sleeve shirt and above-the-knee pants, and size 12½ M sneakers with rubber toe caps, uppers of dacron and cotton or nylon and a total mass of 0.453 kg.

* * * * *

S9.3.2 When using the test dummies conforming to part 572 subparts N, P, R, S, or T, prepare the dummies as specified in this paragraph. Before being used in testing under this standard, dummies must be conditioned at any ambient temperature from 20.6 °C to 22.2 °C and at any relative humidity from 10 percent to 70 percent, for at least 4 hours.

* * * * *

S10.2.2 Three-year-old dummy (49 CFR part 572, subpart P), Hybrid II 6-year-old dummy (49 CFR part 572, subpart I), Hybrid III 6-year-old dummy (49 CFR part 572, subpart N), Hybrid III 6-year-old weighted dummy (49 CFR part 572, subpart S), and Hybrid III 10-year-old dummy (49 CFR part 572, subpart T) positioned in child restraints other than belt-positioning seats). Position the 3-year-old dummy and Hybrid II 6-year-old dummy according to the instructions for child positioning that the restraint manufacturer provided with the system in accordance with S5.6.1 or S5.6.2, while conforming to the provisions in S10.2.2. When using the Hybrid III 6-year-old dummy, the Hybrid III 6-year-old weighted dummy and the Hybrid III 10-year-old dummy to test child restraints other than belt-

positioning seats, position the dummy according to the instructions for child positioning that the restraint manufacturer provided with the system in accordance with S5.6.1 or S5.6.2, while conforming to the provisions in S10.2.2.

* * * * *

S10.2.3 Hybrid III 6-year-old dummy (49 CFR part 572, subpart N) in belt-positioning seat. When using the Hybrid III 6-year-old dummy (49 CFR part 572, subpart N) to test belt-positioning seats, position the dummy in the child restraint as follows:

(a) Place the dummy in the booster seat so that the midsagittal line of the dummy is coincident with the centerline of the booster.

(b) Measure the X and Z locations of the left and right shoulder pivots. Position the dummy so that the difference between the X and Z values for these two points is less than or equal to 1 cm (see Figure 13).

(c) As illustrated in Figure 14 of this section, calculate the H-point location of the dummy relative to the standard seat assembly Z point (see Figure 1B of this standard) by:

(1) Measuring the X and Z coordinates of the knee pivot (X_{KP} and Z_{KP}) and head center of gravity (X_{CG} and Z_{CG});

(2) Mathematically locating the intersection point of two circles using the knee pivot and head center of gravity as the centers and the known dummy anthropometric lengths as radii. The equations for calculating the H-point are as follows:

$$X_{HP} = X_{CG} + \frac{A(X_{KP} - X_{CG})}{B} + \frac{\sqrt{473^2 - A^2}(Z_{KP} - Z_{CG})}{B}$$

$$Z_{HP} = Z_{CG} + \frac{A(Z_{KP} - Z_{CG})}{B} - \frac{\sqrt{473^2 - A^2}(X_{KP} - X_{CG})}{B}$$

Where:

$$A = \frac{(473^2 - 238^2 + B^2)}{2B}$$

$$B = \sqrt{(X_{KP} - X_{CG})^2 + (Z_{KP} - Z_{CG})^2}$$

(3) Use the H-point location and head center of gravity location to determine

the torso angle relative to vertical. This angle is calculated using

$$\text{Torso Angle} = \arctan \left(\frac{X_{\text{HP}} - X_{\text{CG}}}{Z_{\text{CG}} - Z_{\text{HP}}} \right) \left(\frac{180}{\pi} \right)$$

(4) Adjust the dummy until the torso angle is 14 ± 0.5 degrees from vertical.

(5) Secure the dummy and booster with belt restraint, following booster manufacturer's instructions for routing the shoulder and lap belts. Only the standard vehicle lap and shoulder belt is used to fasten the belt-positioning seat. No tether strap or any other supplemental device is used to attach the belt-positioning seat to the standard seat assembly. Apply the belt tensions specified in S6.1.2(d) of this standard.

(6) Locate the shoulder and lap belts as follows while conforming to the booster manufacturer's belt-routing instructions. If it is not possible to do both, follow the manufacturer's instructions:

(i) Place the outboard edge of the shoulder belt inside of the outer edge of the chest jacket (see Figure 15) or as close to the outer edge of the chest jacket as possible.

(ii) The straight line distance from the bottom of the dummy's chin to the center of the shoulder belt/middle of the sternum along the dummy's midsagittal line is 15.5 ± 0.5 cm (see Figure 16).

(iii) The shoulder belt angle relative to horizontal is $50^\circ \pm 10^\circ$. If it is not feasible to achieve the specified shoulder belt angle, position the shoulder belt as near as possible to the 50° angle.

(iv) Place the lap belt such that the top of the belt is 2.54 cm or more below the top rim of the pelvis molded skin at the dummy's midsagittal line (illustrated Figure 17). If it is not feasible to locate the lap belt at least 2.54 cm below the top of the pelvis due to the booster seat's routing path, position belt as low as possible on pelvis.

(7) Place upper arms as close as possible to, and in alignment with, the sides of the upper torso. If possible, bend arms at the elbows such that the hands are resting on the booster seat cushion; otherwise bend lower arm perpendicular to upper arm and have hands pointed forward.

(8) Level dummy's head $\pm 1^\circ$ off of horizontal.

S10.2.4 *Hybrid III 10-year-old dummy (49 CFR Part 572, Subpart T) in belt-positioning seat*. When using the Hybrid III 10-year-old child dummy (49 CFR Part 572, Subpart T) to test belt-positioning seats, position the dummy in the child restraint as follows:

(a) Set the dummy's neck angle at the SP-16 setting (Figure 17a). See also Figure 20 of the [Draft] Procedures for Assembly, Disassembly and Inspection (PADI) of the Hybrid III 10-year-old Child Test Dummy (HIII-10C), [April 2005] for more detail.

(b) Set the dummy's lumbar angle at the SP-12 setting ("SP" means standard posture), see Figure 17b. This is done by aligning the notch on the lumbar adjustment bracket with the SP-12 notch on the lumbar attachment. See also Figure 45 of PADI for more detail.

(c) Place the dummy in the booster seat so that the midsagittal line of the dummy is coincident with the centerline of the booster.

(d) Measure the X and Z locations of the left and right shoulder pivots. Position the dummy so that the difference between the X and Z values for these two points is less than or equal to 1 cm (see Figure 18).

(e) As illustrated in Figure 19 of this section, calculate the H-point location of the dummy relative to the standard seat assembly Z point (see Figure 1B of this standard) by:

(1) Measuring the X and Z coordinates of the knee pivot (X_{KP} and Z_{KP}) and head center of gravity (X_{CG} and Z_{CG});

(2) Mathematically locating the intersection point of two circles using the knee pivot and head center of gravity as the centers and the known dummy anthropometric lengths as radii. The equations for calculating the H-point are as follows:

$$X_{\text{HP}} = X_{\text{CG}} + \frac{A(X_{\text{KP}} - X_{\text{CG}})}{B} + \frac{\sqrt{527^2 - A^2}(Z_{\text{KP}} - Z_{\text{CG}})}{B}$$

$$Z_{\text{HP}} = Z_{\text{CG}} + \frac{A(Z_{\text{KP}} - Z_{\text{CG}})}{B} - \frac{\sqrt{527^2 - A^2}(X_{\text{KP}} - X_{\text{CG}})}{B}$$

Where:

$$A = \frac{(572^2 - 288^2 + B^2)}{2B}$$

$$B = \sqrt{(X_{\text{KP}} - X_{\text{CG}})^2 + (Z_{\text{KP}} - Z_{\text{CG}})^2}$$

(3) Use the H-point location and head center of gravity location to determine

the torso angle relative to vertical. This angle is calculated using

$$\text{Torso Angle} = \arctan \left(\frac{X_{\text{HP}} - X_{\text{CG}}}{Z_{\text{CG}} - Z_{\text{HP}}} \right) \left(\frac{180}{\pi} \right)$$

(4) Adjust the dummy until the torso angle is 14 ± 0.5 degrees from vertical.

(5) Secure the dummy and booster with belt restraint, following booster manufacturer's instructions for routing the shoulder and lap belts. Only the standard vehicle lap and shoulder belt is used to fasten the belt-positioning seat. No tether strap or any other supplemental device is used to attach the belt-positioning seat to the standard seat assembly. Apply the belt tensions specified in S6.1.2(d) of this standard.

(6) Locate the shoulder and lap belts as follows while conforming to the booster manufacturer's belt routing instructions. If it is not possible to do both, follow the booster manufacturer's instructions:

(i) Place the outboard edge of the shoulder belt inside of the outer edge of the chest jacket (see Figure 20) or as close to the outer edge of the chest jacket as possible.

(ii) The straight line distance from the bottom of the dummy's chin to the center of the shoulder belt/middle of the sternum along the dummy's midsagittal line is 16 ± 0.5 cm (see Figure 21).

(iii) The shoulder belt angle relative to horizontal is $50^\circ \pm 10^\circ$. If it is not feasible to achieve the specified shoulder belt angle, position the shoulder belt as near as possible to the 50° angle.

(iv) Place the lap belt such that the top of the belt is 2.54 cm or more below the top rim of the pelvis molded skin at the dummy's midsagittal line

(illustrated Figure 21). If it is not feasible to locate the lap belt at least 2.54 cm below the top of the pelvis due to the booster seat's routing path, position belt as low as possible on pelvis.

(7) Place upper arms as close as possible to, and in alignment with, the sides of the upper torso. If possible, bend arms at the elbows such that the hands are resting on the booster seat cushion; otherwise bend lower arm perpendicular to upper arm and have hands pointed forward.

(8) Level dummy's head $\pm 1^\circ$ off of horizontal.

* * * * *

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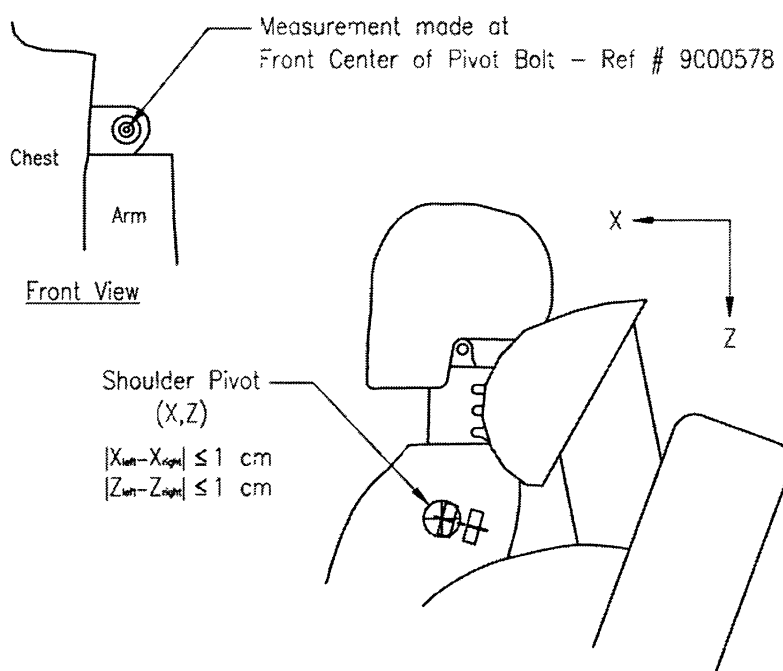


Figure 13. HIII-6C Shoulder Pivot Bolt Alignment

(Note: Ref # 9000578 refers to the drawing number for the HIII-6C dummy)

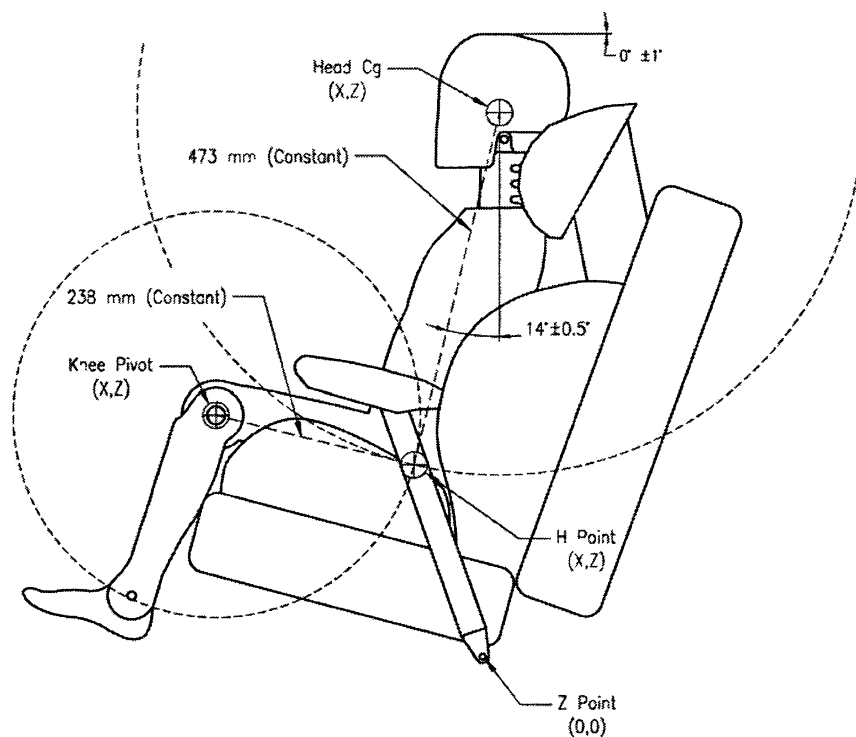


Figure 14. Locating the H-Point so that HIII-6C Torso Angle is 14 ± 0.5 Degrees from Vertical

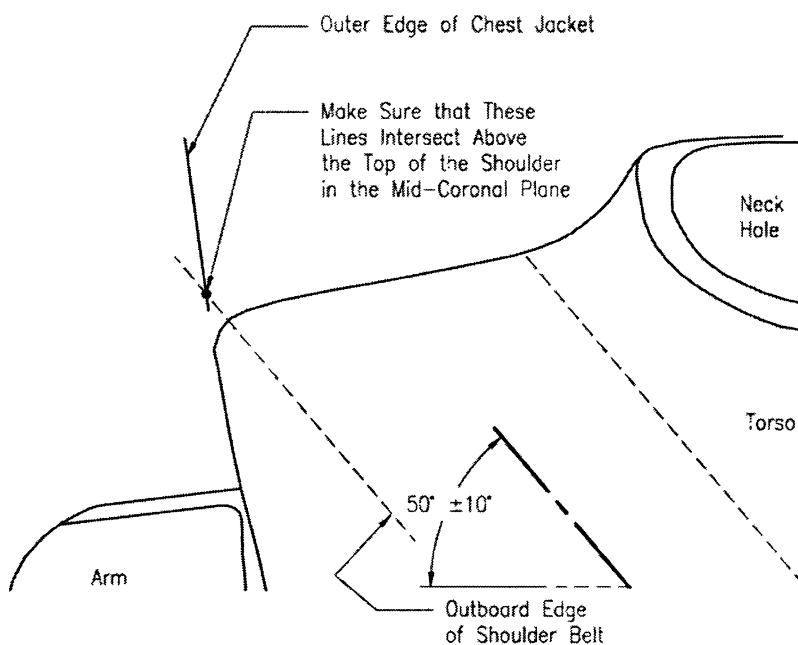


Figure 15. Shoulder Belt Placement for HIII-6C Dummy

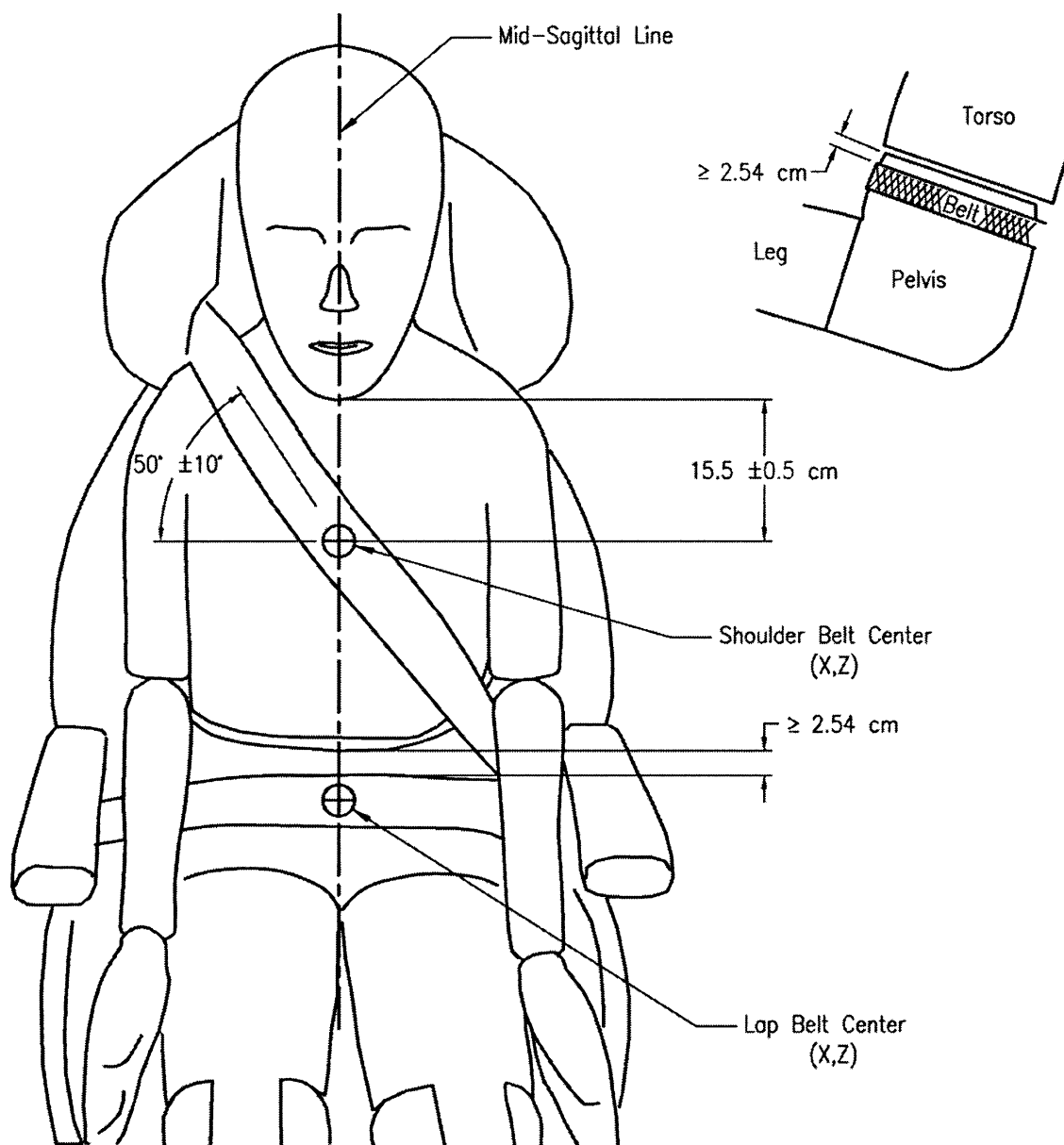


Figure 16. Overall Belt Placement for HIII-6C Dummy

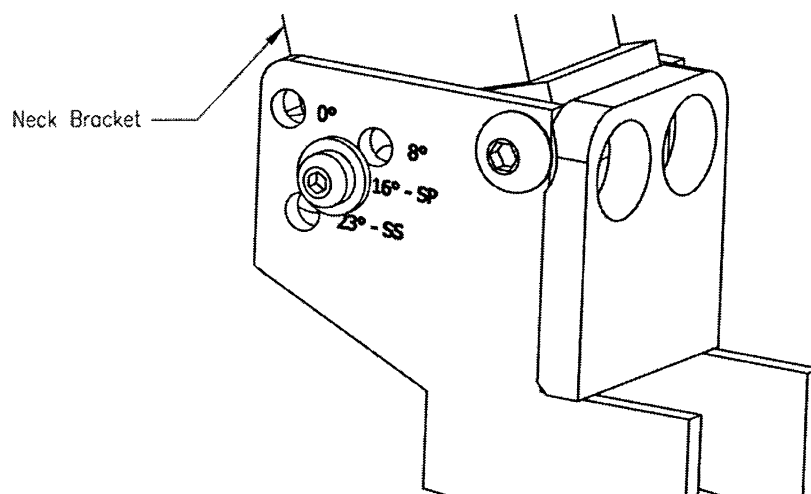


Figure 17a. HIII-10C Dummy Neck Angle Setting is SP-16 Degrees

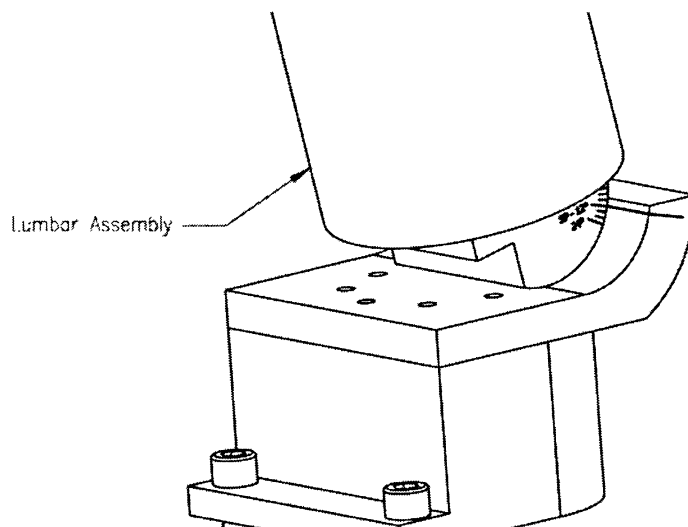


Figure 17b. HIII-10C Dummy Lumbar Angle Setting is SP-12 Degrees

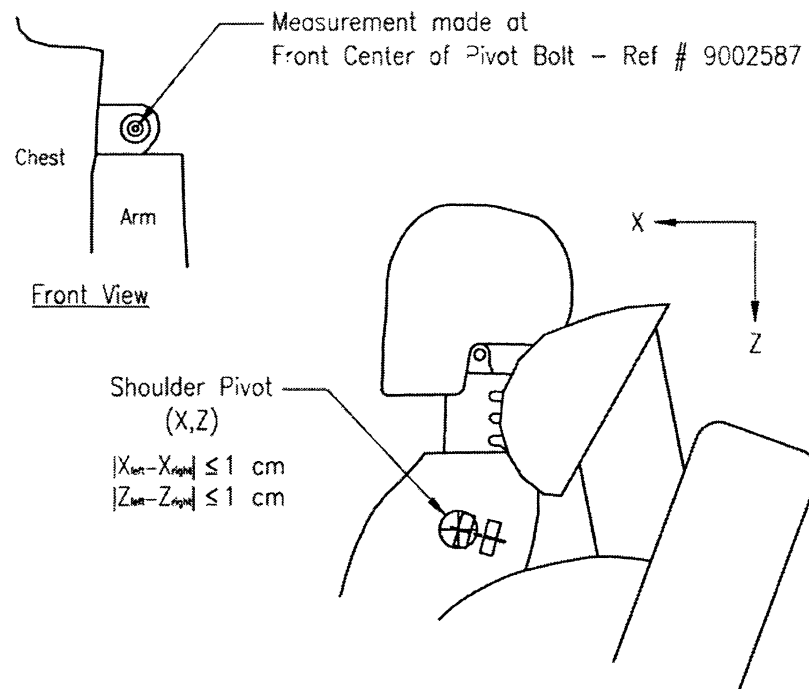


Figure 18. HIII-10C Dummy Shoulder Pivot Bolt Alignment

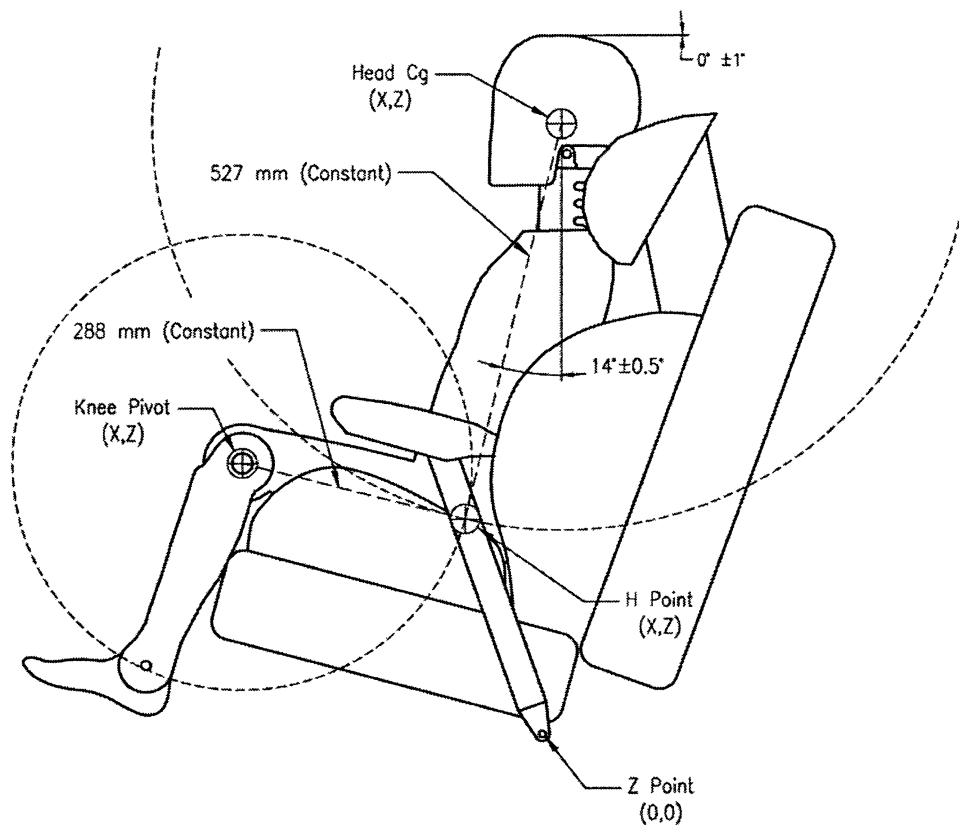


Figure 19. Locating the H-Point so that HIII-10C Torso Angle is 14 ± 0.5 Degrees from Vertical

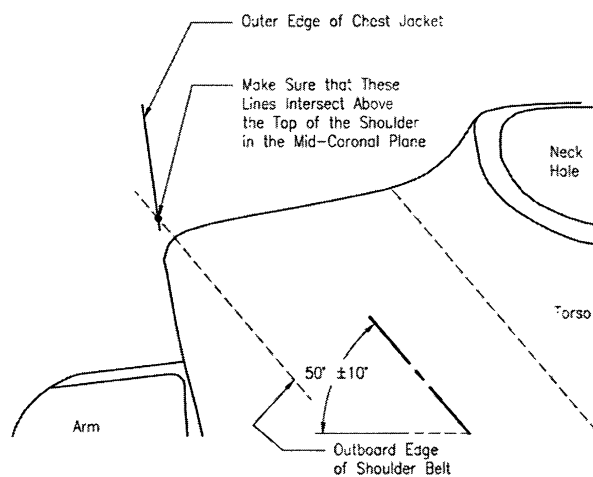


Figure 20. Shoulder Belt Placement for HIII-10C Dummy

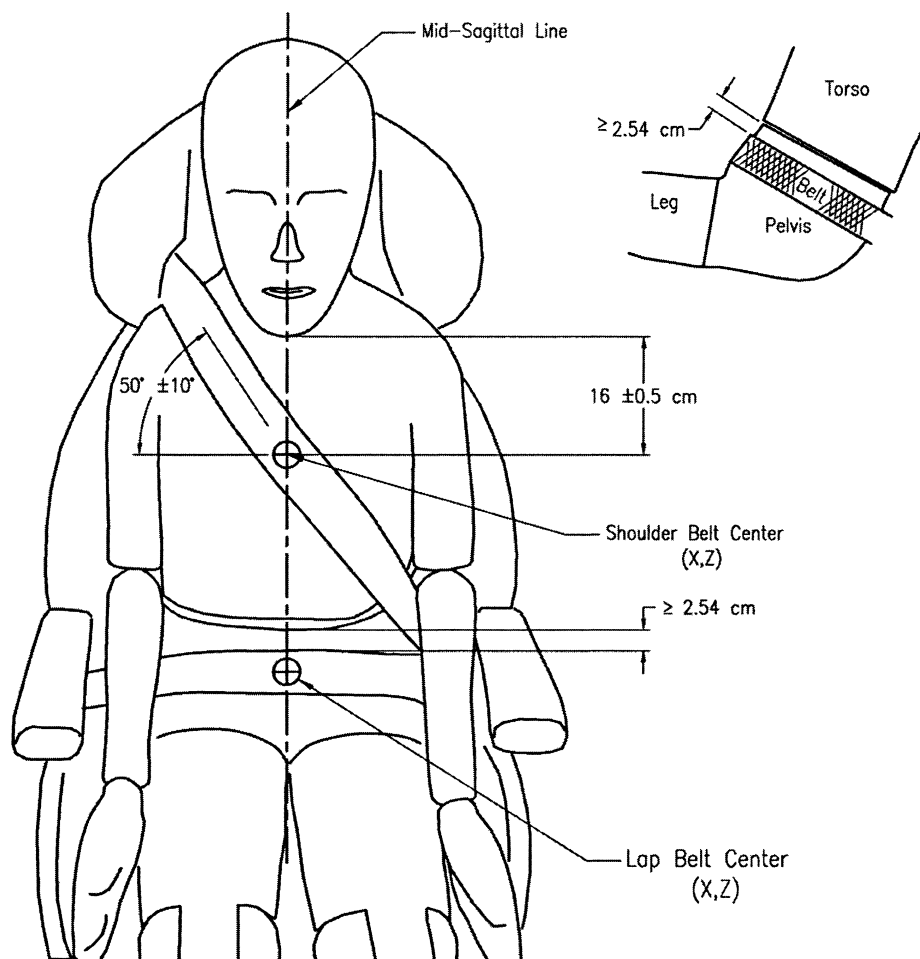


Figure 21. Overall Belt Placement for HIII-10C Dummy

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Stephen R. Kratzke,
Associate Administrator for Rulemaking.
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