

dynamic testing. Comments were requested on what the stiffness should be (67 FR at 21812).

Several commenters believed that the stiffness of the seat cushion has a strong effect on child restraint performance. Consumers Union (CU) commented that it believed that cushion stiffness plays a major role in child restraint installation and suggested that further tests and analysis were needed. UMTRI expressed concern that the foam of the present test seat assembly is softer than many seats in the current fleet: "Instead of representing a worst-case scenario, the response of the soft foam and its tendency to bottom-out on to the unrealistically stiff plywood backing can lead to misleading results that can reduce the level of child passenger safety." Ms. Bidez believed that cushion stiffness has a critical influence on child restraint performance relative to head excursion. These commenters did not provide supporting data.

Some commenters were uncertain whether performance would be affected. JPMA stated that it conducted a small group of tests to evaluate the effect of foam in the tests, but the results "yielded more questions than it answered." Without elaborating on its statement, JPMA provided data from a test program it conducted on foam that was 4 inches thick with a 25 percent compression/deflection resistance of 49.5 lb.<sup>8</sup> The effect on the performance of test dummies in various types of child restraints was varied. JPMA stated that it did not believe that there is yet enough information to evaluate what the foam firmness and density should be, or how child restraint performance would be affected by changing the foam. In its own comment, Graco also expressed that it was unsure of how performance would be affected and suggested that testing and research be completed before changing the foam.

Commenters had different views as to how the seat cushion foam should be changed. JPMA expressed cautious support for changing the foam to resemble more closely the foam thickness and compression of rear seats in real-world automobiles. UMTRI suggested that the agency characterize the overall seat stiffness of several modern vehicles and select a foam stiffness that matches a mean response.

Ford stated that current rear seats are typically thinner and firmer than the test bench seat cushion. Ms. Bidez believed that the test cushion must reflect the softer seats of the majority of used vehicles on the road today. ARCCA believed that the seat cushion in Standard No. 213 may be too thick to match the vehicle seats, thereby allowing more deflection before becoming stiffer. The commenter suggested that the standard "should err on the side of a softer cushion which will likely result in increased occupant excursion \* \* \*."

After reviewing the comments and considering the agency's research needs and limited resources, NHTSA has decided not to endeavor at this time to change the stiffness of the standard seat assembly's seat cushion foam. As discussed in the NPRM, NHTSA is aware of data that indicate that the stiffness of the seat assembly cushion might not have a marked effect on child restraint performance. The agency conducted a study in 1988 comparing the stiffness characteristics of the seat assembly cushion with the characteristics of then current seats. 67 FR at 21812. Most vehicle seats were stiffer than the FMVSS No. 213 seat assembly. Sled tests were performed in the study to compare the dummy responses of the standard's seat cushion, a representative seat cushion that was softer, and a stiff cushion. The agency concluded that dummy response differences were not sufficiently large or consistent to warrant specifying a different cushion than that used in the current test seat assembly. Because possibly revising this parameter of the seat assembly would require further research, utilizing scarce agency resources, for disproportionate safety benefits, the agency will not pursue changing seat cushion stiffness for the time being.

*Harmonize With Transport Canada:* Several commenters concurred with the NPRM that the proposed changes to the test seat assembly would advance harmonization with ECE Regulation 44 in that the seat cushion and seat back angles would be similar, as would the lateral spacing of the seat belt anchors and the rigidity of the seat back. However, the Alliance, General Motors and Evenflo noted that the test bench would differ from that used by Transport Canada in testing child restraints to the Canadian child restraint standard. These commenters urged NHTSA to work with Transport Canada to ensure that the test benches are harmonized.

NHTSA regularly coordinates its vehicle safety plans and programs with

Transport Canada and the agencies work closely on regulatory initiatives concerning child restraint safety. Harmonizing the countries' requirements to the extent consistent with the safety needs of each country is a goal shared by both entities. Specifically with respect to the TREAD Act, NHTSA has discussed each of the revisions with Transport Canada. Transport Canada is aware of the changes, and the agencies will continue efforts to harmonize regulations to the extent possible.

#### *b. Crash Pulse*

The comments received on this aspect of the NPRM focused generally on the issues of the sled pulse shape (widening of the corridor) and severity.<sup>9</sup>

##### *1. On Widening the Corridor*

As for widening the corridor of the sled pulse from 80 milliseconds (ms) to approximately 90 ms in duration, all but few of the commenters responding to this issue supported the change. Many agreed with the agency that the change would allow more laboratories to run the compliance test "without decreasing the effectiveness of the testing" (quoting UMTRI). SafetyBeltSafe (SBS) also agreed with NHTSA's assessment, explained in the preamble to the NPRM, that the pulse would enable tests to be conducted closer to 30 mph.

The JPMA and Graco did not support revising the corridor. JPMA stated that widening the corridor necessarily makes the standard more stringent, because child restraint manufacturers will have to design products that can comply at the new extremes of the compliance corridor. The commenter stated that difficulties experienced by test labs in fitting their pulses within the existing corridor "should be addressed by insisting that the test labs figure out how to meet the existing test corridor."

<sup>9</sup>Ford was concerned that the proposed pulse only specified sled movement during the first 90 ms, but limited dummy responses for 300 ms. Ford stated: "Braking of a Hyge sled can have a substantial effect on dummy kinematics and readings during rebound. Hyge sled tests are generally considered to be unrealistic during the rebound phase because of sled braking. If the agency believes that it is essential to limit dummy measurements during rebound, and the agency plans to use a Hyge-type sled for audit testing, sled accelerations between 90 and 300 ms should be limited to specify an objective test pulse." The agency does not agree that sled braking has caused objectivity problems in the past. The FMVSS No. 208 sled test (see Figure 6 of that standard) specifies a sled corridor only to 130 ms, but at least 300 ms of data is collected in measuring injury criteria. There have not been any problems with the effect of the braking of Hyge sleds on dummy kinematics and readings during rebound. Accordingly, the agency is not specifying a pulse corridor between 90 and 300 ms.

<sup>8</sup>The foam in the current seat assembly is thicker and softer than the foam tested by JPMA. The foam in the current seat assembly is 6 inches thick. Two pieces of foam (one 2 inches and one 4 inches) may be used to achieve the required dimension. To be suitable for compliance testing, foam inserts must compress 25 percent under the following load limits: (1) 45–55 pounds for the 2-inch thick foam, and (2) 21–27 pounds for the 4-inch thick foam.