

that was tested, even though all restraint types meet the current FMVSS No. 213 requirements and appear to be equally effective based upon field studies. Not all VRTC results were similar to those of JPMA, however, as the HIC₁₅ results for the CRABI dummy were typically better in the VRTC tests than in the JPMA tests. Overall, the VRTC follow-on tests did confirm the wider range of test results found in the JPMA testing. The follow-on testing results can be found in the docket.

2. Comments and Conclusions

i. Head Injury Criterion (HIC). The agency received widely divergent comments on the proposal to limit measurement of HIC to 15 milliseconds and to use the injury criteria of Standard No. 208 that were scaled for children. The Alliance, UMTRI and SafetyBeltSafe supported the use of a 15 ms limit on the head injury criterion (HIC) limit as a more realistic way to assess head and brain injury, with the lower HIC values proposed for each dummy. In contrast, Advocates stated that it was "reluctant to change the duration of HIC measurement from 36 ms to 15 ms without more definitive evidence that this change would not inhibit accurate HIC measurements associated with non-contact head injuries." Advocates suggested that NHTSA should scale the injury assessment reference values for children even if the agency decides not to shorten the HIC measurement duration, to "take into account the different anatomy of children." Ford stated that, while the purpose of the 15 ms limit on the HIC calculation interval is to try to differentiate between HICs caused by hard head contacts and non-contact HICs due to head whipping, the 15 ms HIC measurement should not be used to differentiate between non-contact and "chance contact" of the dummy's head with the dummy's knees.

JPMA stated that it was willing to consider supporting a 15 ms limit (HIC₁₅), if the agency can undertake research to assure that there will not be unintended consequences from countermeasures needed to meet HIC₁₅. However, JPMA did not support the other proposed new injury criteria, including the scaled HIC values. The commenter stated that the tests of child restraints it conducted with the proposed CRABI and Hybrid III dummies produced injury reference values that exceeded the proposed limits, which the commenter said is a concern given the high level of effectiveness of current child restraints. The commenter suggested that it might be more feasible to use the FMVSS No.

208 criteria in FMVSS No. 213 if the agency were to specify a "more realistic crash pulse for FMVSS No. 213, such as the one contained in the FMVSS No. 208 sled test." Graco questioned why the scaled HIC values would be applied to in-position child restraint testing if they were derived from out-of-position occupant airbag testing. Graco believed that the values might not be "applicable to child restraint testing with a 213-style pulse." The commenter stated that it saw minimal benefit to child passenger safety from using the proposed injury criteria. It was concerned that some seats that have historically performed well in the real world and in compliance testing would fail the new criteria.

Response: This final rule retains the existing FMVSS No. 213 HIC threshold of 1000 for the CRABI 12-month-old and Hybrid III 3- and 6-year-old dummies.

Since the TREAD Act directed NHTSA to consider adopting the scaled injury criteria adopted by the May 2000 final rule on advanced air bags, NHTSA proposed that the HIC limits of 390₁₅, 570₁₅ and 700₁₅ be incorporated into FMVSS No. 213 for tests with the CRABI 12-month-, and Hybrid III 3- and 6-year-old dummies, respectively. However, NHTSA believed that it should take a cautious approach in modifying the head injury tolerance level set by the HIC requirement. The agency requested comments on issues related to the proposed injury criteria, such as on what risk levels are acceptable, what factors should be considered in selecting performance limits and whether the same limits as in FMVSS No. 208 should be established for the child restraint standard. The agency noted that the two standards address different sources of potential harm to children. The injury criteria for children in FMVSS No. 208 are intended to minimize the risk from a deploying air bag (ensuring that the air bag deploys in a manner much less likely to cause serious or fatal injury to out-of-position occupants). The injury criteria in FMVSS No. 213 are intended to limit the severity of forces imposed on a child during a crash. Child restraints meeting these criteria have worked effectively to maintain high levels of performance in crashes. Because the injury criteria of the standards are intended to minimize risks from different injury sources, the agency stated that it might be reasonable to have non-identical criteria.

In this final rule, NHTSA has decided against incorporating the scaled injury limits used in FMVSS No. 208 because the data obtained from the JPMA and NHTSA (series III) test programs

indicate that current child restraints generally do not meet the proposed limits. There are several reasons why this was a concern for the agency. First and foremost, child restraints are currently highly effective in reducing the likelihood of death and/or serious injury in motor vehicle crashes. The agency was unable to identify a safety problem that the scaled injury limits of FMVSS No. 208 would remedy.

Second, it is unknown what modifications to child restraints would be necessary for the restraints to meet the proposed injury limits. Commenters did not provide information on how child restraints that failed to meet the proposed Nij and other limits could be modified to meet the criteria. Assuming that the restraints could be redesigned to meet the proposed injury limits, there would likely be costs associated with the redesign which would result in increases in the price of the restraints. As noted above in section IV of this preamble, the agency considers the consumer acceptance of cost increases to child restraints (an already highly-effective item of safety equipment) in determining the net safety effects of changes to the child restraint standard. In balancing the effects of meeting the scaled injury criteria against the possible impacts on the price of restraints, the agency determined that the net effect on safety could be negative in this instance because of the minimal benefits of such a change, weighed against the delayed replacement of old restraints by current owners or non-purchase by non-owners. For these reasons, in accordance with the TREAD Act, we have considered whether to apply scaled injury criteria performance levels developed for FMVSS No. 208 to child restraints and have determined it would not be prudent to do so.

NHTSA is adopting HIC₃₆ with a limit of 1000 for all tests with the Hybrid III and CRABI dummies. This final rule does not adopt the 15 ms window that was proposed in the NPRM. This is because the shorter time interval would likely substantially reduce the values calculated for the HIC in compliance tests. Further, as discussed later in this section, NHTSA is not incorporating a neck injury criterion into FMVSS No. 213. A 36 ms time interval to measure HIC allows the HIC measurement in FMVSS No. 213 to capture risk of neck injury indirectly. Given that the agency is declining to adopt a neck injury criterion at this time, the longer measurement window associated with HIC₃₆, as opposed to HIC₁₅, will provide reasonable assurances that a child's neck will not be subjected to excessive forces in a crash. The 36 ms time