

will almost always position the infant's head very close to that air bag. Closeness is a problem because, in order for an air bag to cushion an occupant's head, neck, chest and abdomen and keep the occupant from hitting the steering wheel, windshield or instrument panel, the air bag must move into place quickly. The force of a deploying air bag is typically greatest close to the air bag module as the air bag begins to inflate. If occupants are very close to or in contact with the cover of an air bag, they can be hit with enough force to cause serious injury or death when the air bag begins to inflate. Twenty-two fatally-injured infants were close to the air bag because they were in rear-facing infant seats installed directly in front of a passenger air bag.

In recent years, significant changes have occurred that have reduced the number of persons killed by air bags. As a result of public education programs, improved labeling, and media coverage, the public is much more aware of the dangers air bags pose to children in the front seat and is taking steps to reduce those dangers. Children are riding in the back seat more regularly. In cars with passenger air bags, the percentage of toddlers and infants riding in the back seat increased from about 70 percent in 1995 to about 90 percent in 1999. Technological changes in the design of air bag systems have also reduced the risk posed by air bags. These changes include reducing the air bag outputs (*i.e.*, pressure rise rate and the peak pressure), relocating the air bag modules farther away from the driver and passenger, and changes to features of air bags. Additional technological changes will be made in the future. NHTSA has amended Standard No. 208 by adding a wide variety of new requirements, test procedures, and injury criteria to require that future air bags be designed to create less risk of serious injury than current air bags, particularly for small women and young children. 65 FR 30680, May 12, 2000; as amended 66 FR 65376, December 18, 2001.

Petition for Rulemaking

Today's document responds to a December 3, 2001 petition for rulemaking from a child restraint manufacturer that seeks to amend Federal Motor Vehicle Safety Standard No. 213, "Child Restraint Systems" (49 CFR 571.213), to implement changes that the petitioner believes would aid the sale of its restraints. The petitioner, Xportation Safety Concepts, Inc. (Xportation), believes it has developed an "air bag resistant, rear-facing infant restraint." The petitioner further believes that it has identified a test

procedure that can be used to demonstrate the compatibility of its infant restraints with an air bag. Xportation asks that the test procedure be added to Standard No. 213, and that child restraints shown, when tested in accordance with that test procedure, to be able to limit sufficiently the forces that are imposed on a test dummy restrained in the child restraint be excluded from the requirement to bear the air bag warning label specified in S5.5.2(k)(4) and Figure 10 of the standard. The label, which is required to be a permanent and prominent part of rear-facing restraints, is intended to provide greater assurance that caregivers are aware of the dangers posed by passenger air bags to children in rear-facing restraints.

Xportation's very brief petition did not discuss in any level of detail the suggested test procedure, the test devices, or the injury criteria. It did not provide any test data regarding its child restraint. Instead, Xportation stated that the standard should be amended because: (a) The agency indicated in a rulemaking document (59 FR 7643; February 16, 1994) that it would consider a test procedure then under development by the Society of Automotive Engineers (SAE) for testing child restraints with air bags for incorporation into Standard No. 213; and, (b) in the petitioner's view, since the SAE-developed test procedure was completed, the agency should now proceed to incorporate the work of SAE and others into the standard to facilitate the manufacture of "air bag resistant infant restraints." Xportation did not discuss the merits of the work, but attached a bibliography to its petition and referred to documents referenced in the bibliography.

The following constitutes the bulk of the petition:

The [SAE] task force completed the aforementioned guidelines, which were published by the Society of Automotive Engineers as a Surface Vehicle Information Report (Reference 1). Section 7 of the document discusses dynamic test procedures, and section 10 describes the test fixture. The seating portion of the fixture resembles that of the FMVSS 213 test fixture, and it is likely that its features could be incorporated into that fixture.

At the request of the CRABI² Task Force, the SAE Infant Dummy Task Force developed specifications for the 6 Month Old and 12 Month Old CRABI Dummies, and they are now readily available (Reference 2). Further, a member of the CRABI Task Force has developed the appropriate injury assessment

values for the 6 Month Old Dummy (Reference 3).

NHTSA, in its early efforts to determine the interaction of child restraints and passenger air bags, conducted a number of impact simulations using a HYGIE sled. The study was reported in Reference 4. In the report, it is noted that the test buck is similar to the buck design in the CRABI Task Force Information Report, and that it used the Standard 213 seat. The report further notes that the Standard 213 seat was modified to have the same seat cushion and seat back attitudes as the seat in the CRABI buck.

We submit that there are now a test procedure, a test buck, dummies, and injury assessment values, all of the elements necessary to allow the agency to proceed with rulemaking to accommodate air bag resistant, rear-facing infant restraints. The rulemaking will, of course, include the incorporation of the CRABI dummies into 49 CFR part 572.³

Discussion

Previous Rulemaking

In 1994, before there were any injuries or fatalities to infants in rear-facing restraints caused by an air bag, NHTSA issued a final rule that required these restraints to have a warning label against using the restraint in any vehicle seating position equipped with an air bag (59 FR 7643). Public comments on the notice of proposed rulemaking (NPRM) preceding the rule expressed concerns that the rule would restrict child restraint design in the face of what was then only a theoretical risk posed to children. In response, the agency stated that it "[did] not intend for this rule to impede the development of rear-facing restraints that are compatible with an air bag." The agency explained that it was monitoring the work of a task force on Child Restraint and Air Bag Interaction (CRABI) formed by the Society of Automotive Engineers (SAE), particularly the work on test procedures that could evaluate the performance of an infant restraint when used with a passenger air bag. NHTSA stated that if the CRABI task force were to develop a test procedure from its guidelines, NHTSA would evaluate it to determine whether the procedure is appropriate for Standard No. 213. "Among other things," the agency stated, "the procedure would have to be suitable for

³ "Reference 1" in petitioner's bibliography was "Guidelines For Evaluating Child Restraint System Interactions With Deploying Airbags." SAE J2189 (March 1993); Reference 2 was "FTSS Product Catalog: CRABI 6 Month Older Infant Dummy 910420-000; 12 Month Old Child Dummy 921022-000;" Reference 3 was "Injury Assessment Values for the CRABI 6-Month Infant Dummy in a Rear-Facing Infant Restraint With Airbag Development. SAE 950872." J.W. Melvin, 1995; and Reference 4 was "Child Restraint/Passenger Air Bag Interaction Analysis. Final Report, HS 808 004," L.K. Sullivan, 1992. (Footnote not in quoted text.)

² CRABI: Child Restraint Air Bag Interaction. (Footnote not in quoted text.)