

c. New Dummies

1. Post-NPRM Test Program

As part of the test program conducted for NHTSA at the Patuxent River (PAX) test center, PAX conducted a series of dynamic sled tests to evaluate identical child restraints on the revised test seat assembly using both the Hybrid II and the Hybrid III 3- and 6-year-old

dummies. All of these tests were conducted with the restraints attached to the test seat assembly with the lap belt only, as would be done in a compliance test. Similar comparison tests were conducted with the Hybrid II 9-month-old and the CRABI 12-month-old dummy, but as the 9-month-old dummy is uninstrumented, little

comparative information was gleaned from these tests. Accordingly, the data from the latter tests are not provided.

i. Tests With The 3-Year-Old Dummies. The following Table 6 illustrates the injury criteria measurements for the test series using the Hybrid II and Hybrid III 3-year-old dummies:

TABLE 6.—TESTS WITH THE HYBRID II AND HYBRID III 3-YEAR-OLDS

Child restraint	Dummy	HIC _{unlimited}		Chest acceleration		Head excursion		Knee excursion	
		Value	Change	Value	Change	Value	Change	Value	Change
Cosco Touriva	Hybrid II	702.8		40.4		19.6		26.4	
	Hybrid III	446.8	– 256	37.6	– 2.8	15.5	– 4.1	26.4	0
Century Accel	Hybrid II	626.5		26.8		19.5		26.8	
	Hybrid III	355.3	– 271.3	36.1	+9.3	19.9	+0.4	25.2	– 1.6
Century Breverra	Hybrid II	669.7		29.2		22.5		27.4	
	Hybrid III	536.8	– 132.9	50.1	+20.9	21.3	– 1.2	29.1	+1.7
Cosco HB Booster	Hybrid II	446.4		41.6		22.5		26	
	Hybrid III	704.9	+258.5	41.6	0	13.4	– 9.1	22.4	– 3.6

The Cosco Touriva and the Century Accel are both forward-facing convertible child restraints, and the Century Breverra and the Cosco High Back Booster are forward-facing hybrid boosters. All were tested with the dummy in the restraint's internal harness system.

The results from this series of testing appear to be mixed. Three of four tests showed a marked decrease in measured HIC values when testing with the Hybrid III dummy as compared to the

Hybrid II dummy, while the fourth test in the series resulted in a significant increase (446.4 to 704.9) in HIC values. Similar results are seen when looking at chest acceleration and head and knee excursions. The varied results can be attributable in part to the very limited sample size of child restraints tested. No repeatability tests were performed. All injury numbers were well within the current limits prescribed in FMVSS No. 213.

ii. Tests With The 6-Year-Old Dummies. A similar series of tests was conducted with the Hybrid II and Hybrid III 6-year-old dummies in both backless and high back belt-positioning booster seats on the revised test seat assembly. As was the case in tests with the 3-year-old dummies, the test results for the 6-year-old dummies show considerable fluctuation and no clear trends.

The following Table 7 outlines the results of these tests:

TABLE 7.—TESTS WITH THE HYBRID II AND HYBRID III 6-YEAR-OLDS

Child restraint	Dummy	HIC		Chest acceleration		Head excursion		Knee excursion	
		Value	Change	Value	Change	Value	Change	Value	Change
Cosco Gr. Explorer	Hybrid II	267.1		49.2		14.3		24	
Evenflo Right Fit	Hybrid III	357.6	+90.5	37.8	– 11.4	11.7	– 2.6	19.6	– 4.4
Cosco Gr. Explorer	Hybrid II	328.2		38.6		18		25.7	
Evenflo Right Fit	Hybrid III	276.2	– 52	36	– 2.6	19.1	+1.1	21	– 4.7
Century Breverra	Hybrid II	209.4		35.1		19.7		19.7	
	Hybrid III	415.7	+206.3	41.4	+6.3	20	+0.3	11.7	– 8.0
Cosco HB Booster	Hybrid II	380.7		42.4		17.6		27.6	
	Hybrid III	756.1	+375.4	38.3	– 4.1	18.4	+0.8	24	– 3.2

The original test matrix called for testing each restraint with both the Hybrid II and the Hybrid III 6-year-olds to facilitate a direct comparison between the two dummies, as was done for the other dummies. However, during the conduct of the sled tests at PAX, the Cosco Grand Explorer was instead inadvertently tested twice with the Hybrid II 6-year-old, and the Evenflo Right Fit was tested twice with the Hybrid III 6-year-old.

NHTSA acknowledges that this makes a direct comparison between the two

dummies in the same restraint impossible. However, unlike rear-facing infant seats and forward-facing toddler seats, there is very little difference in design characteristics between the two backless booster seats in question that would influence the dynamic response of the dummies in a sled test. As such, NHTSA has included the data for information.

Further, it is noted that VRTC conducted a study comparing the performance between the Hybrid II and the Hybrid III child dummy families in

support of the NPRM for this final rule. (See Docket NHTSA–2002–11707–1; report dated April 12, 2002.) The report concluded in part that sled test results generally show fairly consistent dummy performance with the Hybrid II and Hybrid III child dummies.

2. Commenters Generally Supportive

Commenters generally supported using the CRABI 12-month-old and the Hybrid III 3-year-old dummies in Standard No. 213 compliance tests, in place of the TNO 9-month and the