

strap load and with a SFAD 1 that replicate the results found in NHTSA testing described above. In each instance, the tether anchorage failed at a load measured to be 6,300 N at the tether anchorage itself. (In Toyota's test, the tether anchorage failed when tested with SFAD 1 at a load of 11,500 N. This is compared to the 13,000 N load applied by SFAD 1 in our test of the center tether anchorage. These results are very comparable.) Toyota also conducted dynamic testing of the Toyota Echo with a reinforced anchorage design, at 35 mph, with no failure of the anchorage. In this dynamic test, Toyota measured the force at the tether anchorage itself to be 8,300 N. In comparing the difference between the static breakage load and the top tether load in a 35 mph dynamic test, Toyota found that the tether anchorage was able to withstand about 30 percent greater loads dynamically than statically. Toyota also used the 30 percent margin found in its analysis of the static breakage load using the belt strap test versus the measured tether load in the 35 mph test to estimate what the required SFAD load would need to be to pass a 35 mph dynamic test, given that the anchorage failed the SFAD test at 11,500 N. Multiplying the 11,500 N SFAD breakage load by 1.3 produced an answer of 15,000 N. Thus, Toyota estimated that a 15,000 N static load would be needed to ensure that the anchorage would not break in a 35 mph crash.

The results of this testing indicate that high tether anchorage loads can occur in isolated, and admittedly severe crash conditions. In comparing the results of testing conducted on the initial Toyota Echo tether anchorage design and a reinforced design, Toyota confirmed that an anchorage designed to meet the 15,000 N static test strength requirement (the NHTSA requirement) would be necessary to ensure protection in a 35 mph crash in a vehicle with a relatively severe crash pulse such as the Toyota Echo.¹⁰ The testing also confirmed the ability of these anchorages to withstand greater loads under dynamic conditions as compared to static test conditions.

For the aforementioned reasons, NHTSA will not reduce Standard No. 225's static strength test requirement of 15,000 N. The agency notes that a 15,000 N load requirement harmonizes with the 15,000 N Canadian requirement for the strength of child restraint anchorage systems. Thus,

retention of the standard's strength requirement of 15,000 N furthers the agency's efforts to harmonize its standards with foreign countries and international bodies to the extent consistent with 49 U.S.C. Chapter 301 (the National Traffic and Motor Vehicle Safety Act).

In a related matter, we deny a petition for reconsideration of the March 1999 rule from E-Z-On Products, Inc. of Florida. Petitioner E-Z-On Products asked that NHTSA set the standard's tether anchorage strength requirement at a level sufficient to account for usage by children in safety vests who weigh up to 120 lb.

As discussed in previous sections, the agency has based the determination of the maximum strength requirements on assumptions regarding the mass of the system and vehicle decelerations. Specifically, with respect to the mass of the child, the agency has used 65 lb, as proposed in the TREAD NPRM, which exceeds the current limit of Standard No. 213's applicability by 15 lb. While there are some vest systems and other child restraint systems that are certified for higher weights, it would be unreasonable to require each vehicle manufacturer to design tether anchorages for occupants weighing nearly twice the limit contemplated by the existing child restraint standard.

Further, 120 lb is greater than the weight of a 5th percentile female adult. Persons of this weight should be restrained by the vehicle belt system, not the child restraint anchorage system. One of the purposes of establishing a standard requiring the installation of child restraint anchorage systems in vehicles was to "optimize seat belts to restrain older children, teenagers, and adults." (64 FR at 10788) In a similar vein, the agency believes child restraint anchorage systems can best be optimized by focusing on the masses generated by children in child restraints and by not adding to the burden of the LATCH system the goal of restraining older passengers as well. The agency notes that it expects to address this matter further in the future. We are considering the need for labeling and printed instructions, as well as consumer information, to minimize the potential misuse of using LATCH to restrain persons weighing more than 65 lb.

C. NHTSA Replaces Displacement Limit

The March 1999 final rule had specified that any point on the tether anchorage must not be displaced more than 125 mm in the standard's strength test. The Alliance petitioned for reconsideration of the 125 mm

displacement limit specified in S6.3.2, stating, *inter alia*, that the displacement requirement was not practicable or objective. In the August 1999 response to petitions for reconsideration, NHTSA moved the location of the displacement measurement to point X on the test device and specified that displacement is measured in the horizontal direction. The agency also denied the suggestion to replace the displacement limit with an alternative that the tether anchorage "withstand" the required forces because a displacement limit is more objective than the latter in determining whether an anchorage met the performance criteria. 64 FR at 47576.

The Alliance petitioned again following the denial (docket 6160-11), asking that the displacement limits for tests using SFADs 1 and 2 be deleted. Petitioner stated that displacement of Point X on SFAD 1 is not strongly influenced by tether anchorage characteristics, but by the characteristics of the vehicle seat belt. Petitioner also stated that to comply with the 125 mm displacement criterion, vehicle manufacturers may be forced to redesign lap and lap/shoulder belts and their anchors that would require extensive retesting of the systems. Petitioner explained that redesign is necessary because without it, the belts attached to SFAD 1 will rotate, as the seat cushion is compressed, contributing significantly to the displacement of point X. Further, the petitioner stated that it is likely that lap belt angles would have to be reduced and anchorage locations moved in order to allow the belt to better control the test fixture's displacement (which is primarily due to the belt and not to the tether anchorage). One negative safety consequence of such changes, stated the Alliance, would be increased risk of a belted occupant slipping under the lap portion of the belt during a crash. "This risk would be highest for smaller occupants, particularly children, who are frequent rear seat occupants."

NHTSA has decided to grant petitioner's request to replace the 125 mm displacement limit with different performance criteria for the performance of the tether anchorage. (As discussed in the next section, this change has not been made for tests of the lower LATCH anchorages tested without the tether attached.) One of the reasons underlying the rulemaking to require child restraint anchorage systems is to make the means of attaching child restraints independent of the vehicle's belt system. By making the two systems independent, vehicle manufacturers can optimize vehicle seating and belt systems to better protect older children

¹⁰ Toyota has stated that it is not aware of any tether anchorage failures in real-world crashes, and has since upgraded the tether anchorage designs in the Echo and other models with similar designs.