INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

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The Honorable Jeffrey W. Runge, M.D.
Administrator
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

NCAP Test Improvements with Pretensioners and Load Limiters
Docket No. NHTSA 2003-14838

Dear Dr. Runge:

The National Highway Traffic Safety Administration (NHTSA) has asked for comments on its technical report, "NCAP Test Improvements with Pretensioners and Load Limiters." The Insurance Institute for Highway Safety welcomes the opportunity to comment on this report because we are concerned about some details of the analysis as well as the implications of endorsing load limiters without any reservation.

It is not surprising to the Institute that NHTSA has found that New Car Assessment Program (NCAP) test results improve with the use of pretensioners and load limiters. It is our understanding that these technologies were introduced with the intent of improving scores in this particular test. Several factors suggest the improvements attributed to these technologies are not as great as those cited in the report.

Eight of the 14 vehicles in the "no change" control group were either pickups or utility vehicles. Applying average control group changes across all vehicle types may introduce erroneous interpretation of results because some aspects of vehicle crash performance vary by vehicle type.

NHTSA claims that vehicle pairs in the study were structurally identical and that airbag changes were minimal. However, the Institute identified four models as having significant structural changes in addition to the seat belt technology changes: Dodge Stratus (redesigned for 2001), Jeep Grand Cherokee (1999), Nissan Sentra (2000), and Toyota Avalon (2000). These vehicles have been tested separately in our frontal offset consumer information test program, and all four received improved structural ratings. Three additional vehicles were retested due to significant airbag modifications: Ford Taurus (2000), Nissan Altima (2000), and Chrysler LHS (2001). These vehicles combined represent a considerable portion of the NHTSA study.

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Regardless of how much these technologies improve NCAP results, their effects in other types of crashes also should be considered. The Institute's 64 km/h (40 mi/h) frontal offset tests provide another perspective. In tests conducted during 1995-2003, instrumented dummies in four-door cars with force limiters generally have had lower head injury criterion (HIC) scores and chest deflections compared with dummies in vehicles without force limiters. However, these differences also reflect improvements in vehicle structure and airbag systems; vehicles without force limiters were about four years older, on average. Average chest accelerations actually were higher in vehicles with force limiters.

More troubling is the fact that dummies in vehicles with force limiters bottomed out the airbags nearly four times more frequently than dummies in vehicles without the technology. When this happened, average HIC scores no longer were significantly lower than scores from vehicles without force limiters. In two-thirds of the cases where the airbag bottomed out, the resulting contact with the steering wheel was the source of peak head acceleration. Load limiter designs should account for the possibility of such contacts because many real-world crashes involve off-center loading and most serious crashes have longer crash pulses than NCAP tests.

Pretensioners have reduced HIC scores by a small amount in Institute tests but caused no significant changes to chest deflections or accelerations. However, there was little seat belt slack for pretensioners to retract in these tests. It is likely that benefits would be greater in real-world crashes where occupants may be seated in less ideal positions or wearing bulky clothing.

In conclusion, the Institute agrees that real-world crash data should be evaluated to more fully determine the benefits of new seat belt technologies. In the meantime, other sources must be used to balance the results of NCAP tests for which technologies were specifically designed and tuned. Although load limiters may indeed reduce the risk of certain injuries in high deceleration events like NCAP tests, frontal offset tests suggest they also may increase the likelihood of injuries from other sources.

Sincerely,

Joseph M. Nolan
Vice President, Research

cc: Docket Clerk, Docket No. NHTSA 2003-14838