

much higher than acceptable thresholds. Direct contact of the head of the dummy with the interior of the vehicle compartment, which occurred when the front seat rotated backward excessively due to the rear impact, contributed to these high values. These high values raise concerns about head and neck protection of the occupants. The rear impact testing also raised concerns about the seat back strength, as most seat backs collapsed in those tests. What do the high HIC values and neck loadings registered by the test dummies in those tests indicate about the real world potential for trauma injury to vehicle occupants in rear impacts? Could future vehicles be designed to provide both the improved fuel system integrity necessary to meet the more stringent requirements proposed in this NPRM and, at the same time, provide improved occupant protection in such impacts?

6. How do seat back failures influence the injury potential in rear impacts? Please provide data and other information that would aid the agency in determining the need for improving seat back strength and the appropriate requirements for doing so.

7. Should the agency require vehicles to retain fuel system integrity in tests with 5th percentile female dummies, as well as with 50th percentile male dummies, as is currently required?

8. NHTSA is proposing to eliminate the second sentence in S7.1.6(b) from Standard No. 301. That sentence reads: "If the weight on any axle, when the vehicle is loaded to unloaded vehicle weight plus dummy weight, exceeds the axle's proportional share of the test weight, the remaining weight shall be placed so that the weight on that axle remains the same." Given the specifications in S7.1.6(a) concerning the placement of rated cargo and luggage capacity weight in the luggage area and the placement of dummies, is the second sentence in S7.1.6(b) needed for conducting Standard No. 301 compliance tests?

9. For the rear offset MDB test conditions, the agency is proposing that the barrier be the same as the one shown in Figure 2 of Standard No. 214 and specified in 49 CFR Part 587, with one exception. The exception is that the face of the barrier would be positioned in the rear impact test so that it is 50 mm (2 inches) lower than the barrier face height specified in the current Figure 2 of Standard No. 214.¹⁶

¹⁶ The question also noted that positioning the barrier face in that manner might make it necessary to slightly change the center of gravity and moment of inertia specifications. NHTSA's subsequent

10. With respect to side impact crashes that result in fire, this proposal to upgrade Standard No. 301 addresses vehicle-to-vehicle crashes. There are approximately two to eight times as many side collision fires (depending on vehicle type) when the object struck is another vehicle compared to a narrow object such as a pole. However, the side collision fire rate for cars, light trucks, and vans is highest when a narrow object is struck. Would it therefore be reasonable to consider a pole side impact test as part of a subsequent upgrading of Standard No. 301?

11. Should the agency amend Standard No. 301 to prohibit fuel leakage in any crash test under Standard No. 208?

IV. Summary of Comments

NHTSA received comments to the NPRM from seven vehicle manufacturers (Subaru, DaimlerChrysler, Porsche, Volkswagen, Ford, Honda, and General Motors), two vehicle manufacturer associations (Alliance of Automobile Manufacturers¹⁷ and National Truck Equipment Association), three engineering firms (American Automotive Design, Dynamic Safety, and Syson-Hille and Associates), a test laboratory (Transportation Research Center), the Insurance Institute for Highway Safety, and a consumer advocate group, Advocates for Highway and Auto Safety. Their comments are summarized below by issue.

A. Rear Impact Test Procedure Upgrade

None of the commenters opposed the proposed rear impact test procedure upgrade.

The Alliance suggested that significant vehicle redesign will likely be required to meet the high speed rear crash requirements. Volkswagen (VW) stated that the rear end structure of small cars will need to be made stiffer, which could result in increased acceleration imposed on occupants in more common lower speed rear crashes. Honda commented that increased vehicle body and fuel tank deformation would occur, even on vehicles that pass the fuel leak requirements.

DaimlerChrysler (DC) stated its belief "that the proposal is likely to require significant changes to vehicle structure

analysis indicated that there will be no measurable effect on the center of gravity and the moment of inertia of the MDB by lowering the face of the barrier two inches (NHTSA Docket No. NHTSA-008248-3, November 16, 2000).

¹⁷ The members of the Alliance of Automobile Manufacturers are: BMW Group, DaimlerChrysler, Fiat, Ford Motor Company, General Motors, Isuzu, Mazda, Mitsubishi Motors, Nissan, Porsche, Toyota, Volkswagen, and Volvo.

and design, which are yet to be fully defined and realized." DC argued that the proposed upgrade is a "major rulemaking effort which will present many challenges to the industry that may not yet be fully identified."

DC also expressed concerns with using a MDB at the proposed impact speed (80 km/h). DC stated that in impacts between a MDB and a vehicle at 80 km/h, DC has observed complete crushing of the barrier face and ensuing contact with the rigid cart backer plate and contact between the cart uprights and the impacted vehicle. DC recommended that NHTSA reevaluate the proposed test procedure upgrade to determine if the anticipated benefits could be achieved with a lower impact speed (such as 56–64 km/h), or provide design changes to the MDB and cart system.

GM and Ford observed bottoming of the barrier face to the backing plate and contact between the barrier uprights and the vehicle in some rear impact crash tests. GM also stated that the barrier face can underide the struck vehicle and, upon rebound, the upright that contacted the vehicle can become "caught" on vehicle structure (e.g., bumper, frame cross member, etc.), with undetermined effects on the struck vehicle. GM and Ford suggested that some changes to the MDB might be necessary. Ford recommended that the agency investigate "rounding the corners of the deformable portion of the barrier and increasing its depth." Ford stated that its testing indicated that the right angle corners of the barrier face can "hang up on trim," potentially affecting test repeatability.

Honda commented that it had conducted rear impact crash tests in accordance with the proposed test procedure. Honda noted that the MDB sometimes over-rode the rear of the test vehicle, and that in these instances, the rear frame structure of the vehicle could not absorb crash energy sufficiently to meet the fuel leaking requirements of Standard No. 301. Honda also noted, "Even in instances when the rear frame functioned somewhat to absorb energy, the increased speed and the off-set impact caused extensive deformation of the fuel tank." Honda stated that a vehicle in compliance with the proposed upgrade would have to absorb twice as much energy as a vehicle in compliance with Standard No. 301 as currently written. Honda argued that under the proposed upgrade, significant changes would have to be made to each of its vehicle models.

VW noted that the proposed rear impact would be to either side of the vehicle. VW recommended that this be