

agency sought comment on this approach as well as several other issues.

NHTSA received comments from component and vehicle manufacturers, industry associations, consumer advocacy organizations, and other organizations. After reviewing these comments and further analysis, the agency made the following decisions.

First, after examining the effectiveness of fuel pump shut-off devices in reducing post-crash vehicle fires, the agency decided not to pursue rulemaking with respect to fuel system component performance. The agency's review of NASS data did not reveal a significant difference in the rate or severity of post-crash fire occurrence in vehicles with and without fuel pump shut-off devices. Research conducted under the General Motors (GM) C/K settlement agreement<sup>4</sup> confirmed this finding during crash testing with and without fuel pump shut-off devices. During crash testing, there was no difference in the rate of fuel leakage or severity of post-crash fire occurrence between vehicles equipped with shut-off switches (Ford) and those without (GM, Chrysler and Honda).

Second, the agency decided not to pursue rulemaking related to environmental and aging effects. The agency agreed with vehicle manufacturer comments that further studies were needed to define the problems associated with environmental and aging effects and determine whether rulemaking would be appropriate to address them. The agency stated that it might revisit this issue upon further study. As part of the GM settlement, GM contracted with Southwest Research Institute to conduct research on the environmental factors and aging effects on fuel system components. This report showed some effects of corrosion on metal components and some effects of hot arid conditions on rubber components, and little effect on plastic components. The findings were inconclusive, but did not indicate serious problems affecting fuel system crash performance. No further agency action is planned at this time.<sup>5</sup>

<sup>4</sup> On December 2, 1994, the Secretary of Transportation announced a settlement of an investigation by NHTSA of an alleged safety defect in certain GM pickup trucks with fuel tanks mounted outside the frame rails. Under that settlement, GM contributed over \$51.3 million for a variety of safety initiatives. Among other things, the settlement funded research on ways to reduce the occurrence and effects of post-crash fires. All relevant results of this research are being placed in dockets NHTSA-98-3585, NHTSA-98-3588, Docket No. 96-GMRSCH-GR, and Docket No. 95-20-GR.

<sup>5</sup> <http://dms.dot.gov/search/document.cfm?documntid>

Third, the agency decided to investigate the feasibility and practicability of upgrading Standard No. 301's rear and side impact requirements. The agency reviewed real world crash data to determine what types of rear impact crashes resulted in "moderate," "severe," and "very severe" fires.<sup>6</sup> Next, the agency analyzed the data to determine whether it was the fire or the impact of the crash that caused the fatalities and injuries in the fire-related crashes. NHTSA then examined the data to determine the characteristics of rear crashes that were causing fire-related fatalities and injuries and developed a new crash test procedure to simulate the most frequent crash scenario that leads to fire and fire-related fatalities and injuries in rear impact crashes. The agency then performed seventeen crash tests using the new crash test procedure.<sup>7</sup>

### III. 2000 Notice of Proposed Rulemaking

#### A. Proposed Rear Impact Test Procedure

After reviewing the comments on the 1995 ANPRM and analyzing the real world crash data and data from the seventeen crash tests with the new crash test procedure, the agency published a Notice of Proposed Rulemaking (NPRM) on November 13, 2000.<sup>8</sup> In the NPRM, the agency tentatively concluded that the proposed rear impact test procedure would reduce fire-related fatalities and injuries from rear impact crashes. Thus, the agency proposed to replace Standard No. 301's current rear impact test procedure with one that would specify impacting the rear of the test vehicle at  $80 \pm 1$  km/h (50 mph) with a 1,368 kg (3,015 pound) moving deformable barrier (MDB) at a 70 percent overlap with the test vehicle. That barrier is very similar to that used under Standard No.

=183754&docketid=3588 Docket Number NHTSA-1988-3588-177 (Miller, Michael et al. "First, Second and Third Progress Reports and Final Report—Inspection of Aging Vehicles and Testing Components")

<sup>6</sup> A "moderate" fire is defined as fire damage to between 25 and 50 percent of the vehicle surface; a "severe" fire is fire damage to between 50 and 75 percent of the vehicle surface; and a "very severe" fire is fire damage to more than 75 percent of the vehicle surface.

<sup>7</sup> The rear impact tests used a 1,368 kg (3,015 pound) moving deformable barrier (MDB) with the barrier lowered by 50 mm (2 inches) to simulate pre-crash braking. The MDB impacted the test vehicle at 80 km/h (50 mph) parallel to the longitudinal centerline of the test vehicle with a 70 percent overlap on the side of the vehicle where the fuel filler neck was located. However, the new rear impact test allows the MDB to strike the rear with the overlap on either side of the vehicle for all possible worst case scenarios, including dual fuel tank designs with filler necks on both sides and filler neck in the center of the rear.

<sup>8</sup> 65 FR 67693, Docket No. NHTSA-2000-8248.

214, *Side impact protection*, in dynamic side impact testing except that the face of the MDB used in rear impact testing under Standard No. 301 would be 50 mm (2 inches) lower than the face of the Standard No. 214 barrier to simulate pre-crash braking.<sup>9</sup>

The agency noted that the proposed test procedure would simulate a type of rear vehicle-to-vehicle collision that can result in post-crash fire in an otherwise survivable crash: a high speed offset rear strike to the vehicle that results in fuel leakage from a breach in the fuel system and, potentially, a rapidly spreading fire that results in fatalities and injuries. The agency also noted that NASS estimates show that the majority of fatal and nonfatal occupant burn injuries in rear impact crashes occurred in crashes in the 34 to 48 km/h (21 to 30 mph) delta-v range. The agency stated that the elements of the proposed offset rear impact test procedure were accordingly chosen to simulate vehicle-to-vehicle crashes with a delta-v range of 32 to 48 km/h (20 to 30 mph).

The agency tentatively concluded that the proposed offset rear impact test procedure was practicable. The agency stated:

Crash test results indicate that large, medium, and small vehicles could be designed to meet the standard under the proposed upgraded rear impact procedure. In those tests, some small as well as large existing light-duty vehicles already meet the proposed upgrade. Several larger light-duty vehicles, including passenger cars, multipurpose passenger vehicles, and light trucks, all passed the proposed upgrade. In addition, several small vehicles, the Mazda Miata, Chevrolet Metro, Nissan Sentra, and Honda Civic, passed the proposed upgrade. While we are aware that some existing smaller vehicles leaked fuel when tested under the proposed upgraded test procedure (e.g., the 1996 Suzuki Sidekick, Dodge Neon, and Geo Prizm, and the 1998 Chevrolet Cavalier, VW Jetta, and Ford Escort), we believe that relatively minor, inexpensive design changes would correct the vast majority of the failures.<sup>10</sup> For example, the fuel lines in the Dodge Neon could be rerouted, and the area on top of the tank around the fuel sender unit plastic sealing plate could be reinforced on the VW Jetta.<sup>11</sup>

NHTSA did not propose to require manufacturers to place each vehicle's

<sup>9</sup> Standard No. 214, Side Impact Protection, specifies that the bottom of the face of the barrier is 11 inches above the ground and the bottom of the bumper is 13 inches above the ground. See Figure 2.

<sup>10</sup> The Ford Mustang test series demonstrated the technical feasibility of redesigning a 1993 Ford Mustang so that it would pass the proposed upgrade test procedure (the 1996 Ford Mustang test). It demonstrated that structural and component design are critical, regardless of the fuel tank location, for passing the upgrade.

<sup>11</sup> 65 FR at 67701.