released October 27, 2000. The full text of this Commission decision is available for inspection and copying during normal business hours in the FCC Reference Information Center (Room CY–A257), 445 12th Street, SW., Washington, DC. The complete text of this decision may also be purchased from the Commission's copy contractor, International Transcription Service, Inc., (202) 857–3800, 1231 20th Street, NW., Washington, DC 20036.

Provisions of the Regulatory Flexibility Act of 1980 do not apply to this proceeding.

Members of the public should note that from the time a Notice of Proposed Rule Making is issued until the matter is no longer subject to Commission consideration or court review, all *ex parte* contacts are prohibited in Commission proceedings, such as this one, which involve channel allotments. See 47 CFR 1.1204(b) for rules governing permissible *ex parte* contacts.

For information regarding proper filing procedures for comments, see 47 CFR 1.415 and 1.420.

List of Subjects in 47 CFR Part 73

Radio broadcasting.

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR part 73 as follows:

PART 73—RADIO BROADCAST SERVICES

1. The authority citation for part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 334 and 336.

§ 73.202 [Amended]

2. Section 73.202(b), the Table of FM Allotments under West Virginia, is amended by adding Glenville, Channel 299A.

Federal Communications Commission.

John A. Karousos,

Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 00–28910 Filed 11–9–00; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–00–8248]

RIN 2127–AF36

Federal Motor Vehicle Safety Standards; Fuel System Integrity

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: We are proposing to upgrade the rear impact test in the Federal motor vehicle safety standard on fuel system integrity. That standard currently specifies that the rear of the test vehicle is to be impacted with a flat rigid barrier at speeds up to 48 km/h (30 mph). Under the proposal, we would replace that full rear impact test procedure with an offset rear impact test procedure specifying that only a portion of the width of the rear of vehicles would be impacted, that a deformable and lighter barrier would be used, and that the test would be conducted at 80 km/h (50 mph). We tentatively conclude that the new, more stringent test procedure would save lives and prevent injuries.

We are also proposing to change the standard's procedure for side impact tests. Currently, the standard specifies a side impact test procedure that differs from that specified in our standard on side impact protection. We are proposing to specify that the test procedure in the side impact protection standard be used for both standards. We tentatively conclude that this change would provide a more realistic test, increase safety and reduce testing costs.

DATES: You should submit your comments early enough to ensure that Docket Management receives them not later than January 12, 2001.

ADDRESSES: You may submit your comments in writing to: Docket Management, Room PL–401, 400 Seventh Street, SW, Washington, DC, 20590. You may also submit your comments electronically by logging onto the Dockets Management System website at http://dms.dot.gov. Click on ''Help & Information'' or ''Help/Info'' to obtain instructions for filing the document electronically.

Regardless of how you submit your comments, you should mention the docket number of this document.

FOR FURTHER INFORMATION CONTACT: For non-legal issues, you may call Dr. William J. J. Liu, Office of Vehicle Safety Standards, (Telephone 202–366–2264) (FAX 202–366–4329).

For legal issues, you may call Mr. Stephen Wood, NCC–20, Assistant Chief Counsel for Rulemaking, Office of Chief Counsel, (Telephone 202–366–2992) (FAX 202–366–3820).

You may send mail to both of these officials at National Highway Traffic Safety Administration, 400 Seventh St., SW, Washington, DC, 20590.

You may call Docket Management at 202–366–9324. You may visit the Docket from 10:00 a.m. to 5:00 p.m., Monday through Friday.

SUPPLEMENTARY INFORMATION:

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I. Overview of this Rulemaking

On April 12, 1995, we published an Advance Notice of Proposed Rulemaking (ANPRM) (60 FR 18566) announcing our plans to consider upgrading Standard No. 301, Fuel system integrity.[1] Specifically, we announced our plans to consider research and rulemaking activities related to amending Standard No. 301 to:

- define performance criteria for fuel system components directed at reducing the occurrence and spread of vehicle fires;
- modify the existing Standard No. 301 crash test procedures and performance criteria to better simulate the events that lead to serious injury and fatalities in fires; and,
- define the role of environmental and aging factors such as corrosion and vibration as they affect fuel system integrity, and, if appropriate, specify performance criteria related to this area.

Due to the varying complexity of the above three activities, we also announced that we were considering pursuing a three-phase approach to upgrading the standard:

- Phase 1 would focus on requirements for component performance.
- Phase 2 would address system performance.
- Phase 3 would address issues related to environmental and aging effects.

After evaluating the research related to the frontal and rear impact requirements and the comments submitted in response to the ANPRM, we have decided not to pursue rulemaking related to Phases 1 and 3 at this time. Further analysis by NHTSA of the results of research related to fuel system components conducted by the agency and General Motors (GM) is needed before we can determine whether rulemaking is appropriate and, if so, what form it should take.[2] In addition, we believe that further studies are needed to define the problems associated with environmental and aging effects and determine whether rulemaking would be appropriate to address them.[3]

After evaluating the research related to Phase 2 and the comments submitted in response to the ANPRM, we have tentatively concluded that a more stringent rear impact test procedure would save lives and reduce injuries. We are, therefore, proposing to strengthen the current crash requirements applicable to vehicles with a gross vehicle weight rating (GVWR) of 4,536 kg (10,000 pounds) or less. Specifically, we are proposing to replace Standard No. 301's current rear impact test procedure with one that involves striking the rear of the test vehicle at 80 km/h (50 mph) with a 1,368 kg (3,015 lb) moving deformable barrier at a 70 percent overlap with the test vehicle. We are also proposing to replace Standard No. 301's lateral impact test procedure with the current side impact test procedure of Standard No. 214, Side impact protection. We tentatively conclude that these changes would help to preserve fuel system integrity in a crash, thereby helping to prevent fire-related fatalities and injuries. In addition, we tentatively conclude that the specification of a single lateral impact test procedure instead of two different test procedures would reduce manufacturer certification and agency enforcement costs.

II. Existing Standard

Standard No. 301 sets performance requirements for the fuel systems of light vehicles, *i.e.*, vehicles with a gross vehicle weight rating (GVWR) of 4,536 kg (10,000 pounds) or less. The standard, which was issued in the 1970s, limits the amount of fuel spillage from fuel systems of vehicles during and after being subjected to a frontal, rear, or lateral impact test.

In the frontal impact test, a vehicle is driven forward into a fixed barrier at 48 km/h (30 mph), while in the side impact test, a 1,814 kg (4,000 lb) barrier moving at 32 km/h (20 mph) is guided into the side of a stationary vehicle, and in the rear impact test, a 1,814 kg (4,000 lb) barrier moving at 48 km/h (30 mph) is guided into the rear of a stationary vehicle. The standard limits fuel spillage from crash-tested vehicles to 28 grams (1 ounce) by weight during the time period beginning with the start of the impact and ending with the cessation of vehicle motion and to a total of 142 grams (5 ounces) by weight during the 5-minute period beginning with the cessation of motion. During the 25-minute period beginning with the end of the 5-minute period, fuel spillage during any 1-minute interval is limited to 28 grams (1 ounce) by weight.

Similar fuel spillage limits apply to vehicles tested in accordance with the standard's static rollover test procedure. The rollover test is conducted after frontal, rear and lateral impact tests.

III. Current Safety Problem

Preserving fuel system integrity in a crash to prevent occupant exposure to fire is critical. Although vehicle fires are relatively rare events (occurring in only one percent of vehicles in towaway crashes), they tend to be severe in terms of casualties. According to an analysis of the agency's Fatality Analysis Reporting System (FARS) in 1998, four percent (1,411) of light vehicle occupant fatalities occurred in crashes involving fire.[4] Overall, the fire itself was deemed to be the most harmful event in the vehicle for about 20 percent (282) of these fatalities.

An analysis of 1991–1998 National Automotive Sampling System (NASS) data shows that about 12,941 occupants per year were exposed to fire in passenger cars and light vehicles (vans, pickup trucks, and multipurpose vehicles with GVWR of 4,536 kg (10,000 lb) or less) that were towed away from the fire. Of those occupants, about 1,062 (8 percent) received moderate or severe burns (AIS 2 and greater). Three-quarters of those with moderate and more severe burns had second or third degree burns over more than ninety percent of the body; maximum-severity (AIS 6) burns are nearly always fatal. These statistics underscore the importance of preserving fuel system integrity in a crash in order to prevent vehicle fires.

IV. 1995 Advance Notice of Proposed Rulemaking (ANPRM)

In the 1995 ANPRM, we announced our plans to consider upgrading Standard No. 301. We explained that we were considering using a three-phase approach to upgrade the requirements of Standard No. 301. Phase 1 would focus on requirements for component

[1] Previously, on December 14, 1992, we published a Request for Comments notice (57 FR 59041, Docket No. 92–66, Notice 1) stating that we were "considering initiating rulemaking to upgrade the protection currently provided by" Standard No. 301. The notice also requested answers to specific questions related to test impact speeds, impact barriers, effect of vehicle aging on the likelihood of fire, contribution of occupant entrapment to the likelihood of fire-related injuries, etc.

[2] 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 is contributing over $51.3 million for a variety of safety initiatives. Among other things, the settlement is funding 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.

In addition, GM is conducting an extensive research program related to engine component fires and its propagation into the occupant compartment. Depending on the results of GM's research (which was officially completed in April 2000), we may revisit our decision with respect to Phase 1.

[3] As part of the GM settlement, GM is conducting research on environmental factors and aging effects on fuel system integrity and is preparing a report of its findings. Depending on the results of GM's research, we may also revisit this issue in the future.

[4] These fatalities included fatalities due to burns and/or impact injuries, but not those due to asphyxiation.

performance, Phase 2 would address system performance, and Phase 3 would address issues related to environmental and aging effects. We sought comment on this approach as well as several other issues.

A. Component Performance (Phase 1)

We explained that our focus in Phase 1 was on developing component performance criteria aimed at shutting down the fuel supply and potential fire ignition sources in a crash to help reduce the occurrence and effects of a fire should a breach in the fuel system occur. Quickly shutting off the fuel flow during or immediately after a crash would eliminate a major fire and fuel source and should, therefore, both reduce fires and limit the spread of fire, if one were to start. Phase 1 would also focus on minimizing the possibility of an electrical spark of sufficient intensity to act as an ignition source. Finally, it would explore other means for reducing fires (e.g., engine fire extinguishers). While these criteria would primarily address fires that originate in the engine compartment due to frontal impacts, they would also help to shut off the fuel flow for all crash modes, including a rollover crash.

In the ANPRM, we sought comment about component test requirements for fuel tanks, fuel pumps, the vehicle's electrical system, and engine fire extinguishers. We requested information on the performance, cost, and practicability aspects of various systems for shutting off the fuel flow and the electric power. We also requested comments on ways to develop practicable test procedures and to define specific criteria with sufficient objectivity that test variability would be minimal.

We also explained that we believed that the technology already existed for detecting and identifying conditions when the fuel flow should be shut off. Most new vehicles sold in the United States were already equipped with devices that shut off the fuel pump in any collision that causes the engine to stop.[5] Other vehicles were equipped with inertia switches that shut off the fuel flow and/or the electric current.[6]

We also discussed how fuel system components had to operate in a real-world environment surrounded by extreme conditions imposed by modern engine technology. We explained that the materials and parts used to assemble fuel system components were already subject to manufacturers' specifications, which were often derived from or directly related to other engineering standards such as those of the American Society for Testing and Materials (ASTM). Some of the test requirements are generic to many of the ASTM standards, for example: vibration, shock, endurance testing, temperature cycling, temperature extremes, and compatibility with other materials.

Finally, we also sought comment regarding the extent and scope of component test requirements that could be developed for inclusion in Standard No. 301. We identified the following fuel system and vehicle components as potential candidates for this approach: fuel tank, including filler pipe; fuel pump(s); vehicle's electrical system; and engine fire retardant/extinguisher. We did not include fuel lines in the list because the potential to shut down the entire fuel delivery system when the fuel pump shuts down already exists.

B. System Performance (Phase 2)

While Phase 1 focused on shutting down fuel supply and potential ignition sources in a crash to help prevent or mitigate vehicle fires if a breach in the fuel system occurs, Phase 2 focused on preventing fuel system failures in the first instance. We explained that Phase 2 would focus on the process of upgrading crash test performance in frontal, side, and rear impacts. Phase 2's purpose was to identify tests that represent the crash conditions associated with fires that cause fatal and severe injury.

We explained that available information indicated that the present tests in Standard No. 301 may not be representative of the crash conditions associated with fatal and severe injury-causing fires. We also explained that further tests were needed to define specific upgrades to these crash conditions. We noted that offset/oblique tests in the frontal mode, use of the Standard No. 214 barrier in the rear test mode, and a pole impact or use of the Standard No. 214 barrier for the side impact test all appeared promising for possible inclusion in Standard No. 301.

We explained that a key objective for such tests may be to limit the engagement of the struck vehicle to a narrower area than is engaged using current barriers. We explained that we needed to define the specific crash conditions that cause fuel system loss of integrity and understand which crashes would be survivable if fire were avoided. We explained that we were considering performing crash data analyses and crash testing to further explore these issues. We requested comments on the performance aspects and practicability of this approach.

C. Environmental and Aging Effects (Phase 3)

We explained that the third phase would explore the issue of environmental and aging effects on vehicle condition and the possible relationship to fire occurrence. Our preliminary analyses of FARS and State crash files indicated that the likelihood of fire increases with the age of the vehicle. The analysis also attempted to determine the possible differences, if any, in the occurrence of fire in fatal crashes in states that typically experience more inclement weather (*i.e.,* snow and ice) and as a result, use more salt and other corrosive substances on public roadways, when compared to other states.

Passenger cars registered in the ''salt belt'' states and involved in fatal crashes were found to have an approximately 25 percent greater rate of fire occurrence in fatal crashes, compared with passenger cars in fatal crashes in the ''sun belt'' states. When the fire itself was deemed to be the most harmful event in the vehicle, however, the ''salt belt'' states had a lower rate compared to the ''sun belt'' states. Consequently, it was not clear whether the possible relationship between vehicle aging, weather and use of salt and similar substances and fire occurrence was due to environmental characteristics, to changes in vehicle design, to differences in operator characteristics, or a combination of these factors. We explained that if the disparity could be attributed to environmental factors, it might be possible to add environmental tests, such as a corrosion test, to Standard No. 301.

V. Public Comments on ANPRM

NHTSA received 40 comments on the April 1995 ANPRM. Of the comments, twenty were one-page form letters that supported the proposal and were signed by individuals affiliated with various businesses and organizations. The remaining 20 comments were submitted by: eight manufacturers (1 component manufacturer and 7 vehicle manufacturers), 6 associations, and 6 other organizations (2 separate

[5] For example, in some vehicles, sensors detect the consequence of severe engine damage (rotation stops for camshaft, crankshaft or alternator) and immediately shut off the fuel pump. Often, signals from more than one sensor are used to determine if the engine has stopped running and the decision for fuel pump shut-off is left up to the vehicle's onboard computer (such as the Engine Control Unit or Electronic Control Module).

[6] Inertia switches operate on sudden impact to open the electrical circuit to the fuel pump or the battery during the crash. An inertia switch can be designed to operate at various levels of impact intensity and direction, and, therefore, could be effective in all crash modes.

comments from a consulting firm, 1 state agency, 1 consumer advocacy organization, 1 research institute, and 1 individual). The comments are summarized below.

A. Comments on Component Performance

The First Inertia Switch Company (First Inertia) stated that it first introduced a crash activated fuel pump shut-off switch for the 1981 vehicle models in the U.S. First Inertia argued that an inertia switch is the most direct and effective means of shutting off the fuel pump in a crash. It estimated that during the 1995 model year, 9.5 million inertia switches would be installed in vehicles manufactured in the U.S., Canada, Europe, and Japan. First Inertia believes that its inertia switches can easily be designed for shutting off the electric power in a crash and performing other functions (e.g., unlocking vehicle doors).

While GM expressed interest in the potential benefits that could be derived from possible fuel system component upgrades, it suggested that we conduct careful studies to ensure that we selected proposed countermeasures that would not be ''counterproductive.'' Specifically, GM pointed out that the agency's crash data analysis of vehicle fires showed no statistically significant difference in the rate of crash related fuel leakage and/or fire between the GM vehicles that used an engine rotation sensing device for shutting off the fuel flow and the peer Ford vehicles that, in addition to the engine rotation sensing device, used inertia switches as a redundant fuel pump shut-off device.

GM opposed using a battery shut-off device to interrupt the vehicle's electric power. GM argued that the potential negative side effects (*e.g.*, potentially getting stranded on the road if the engine shuts off while driving) of a crash-activated electrical system shut-off preclude the incorporation of such a device. GM suggested conducting additional research on the nature and relative frequency of real-world crash fire ignition sources.

GM stated that it considered the concept of using fire extinguishers and fire retardant blankets for extinguishing engine compartment fires intriguing and supported doing a thorough evaluation to determine their feasibility. GM also stated that it planned to research means to reduce or delay engine fire propagation into the occupant compartment to help provide occupants with additional time to exit a vehicle and avoid burn injuries.

Volkswagen of America, Inc. (VW) was concerned with potential reliability problems associated with inertia-activated fuel cut-off switches. VW explained that it was using an engine rotation sensing device for cutting-off fuel flow in its vehicles. VW also stated that additional fuel tank filler valve systems were unnecessary. In addition, VW recommended that we refer to ECE Regulation No. 34 for possible component test requirements, but did not specify particular tests.

Mitsubishi Motors America, Inc. argued that the proposed Phase 1 approach could put undue emphasis on the performance of particular isolated components in resisting post-impact fires. Mitsubishi argued that such an approach could have unanticipated negative consequences on maximizing over-all fire resistance in real-world crashes.

Ford Motor Company (Ford) stated that fuel system integrity in a crash is a vehicle/system phenomenon in which the vehicle and its components work as a unit. Ford disagreed with the proposed Phase 1 approach of incorporating separate component tests into Standard No. 301. Ford stated that it uses redundant fuel shut-off devices (an engine speed sensing device and an inertia sensing device) to stop the flow of electric current to the fuel pump in certain conditions.

Chrysler Corporation (Chrysler) argued that fuel system integrity should be evaluated as a system and expressed its opposition to any initiative to introduce component design or performance requirements into Standard No. 301. Chrysler explained that it used a fuel shut-off device that senses engine rotation for stopping the fuel flow and stated that additional protection had not been shown to be any more effective in reducing fuel related fires. Chrysler stated that it was premature to consider using an electrical power shut-off device for reducing fuel induced fires. Chrysler argued that more research is needed to verify that the proposed mitigation approach will not harm other systems that are critical to occupant protection, during and after the crash event. Chrysler opposed the concept of using fire extinguishers and fire retardant systems for engine compartment fires and stated that the ignition of a vehicle fire does not necessarily occur at a predictable point in time during a vehicle crash. In addition, Chrysler stated that, in some fires, a ''second ignition'' is encountered that would not be mitigated by these proposed systems.

Volvo Cars of North America, Inc. (Volvo) stated that shutting off fuel flow quickly during and after a crash could help to reduce the risk of engine fires and the spread of fires once one had started. Volvo stated that since a number of methods could be employed to stop the flow of fuel, there should be no requirement mandating certain equipment. Volvo stated that we should give manufacturers the freedom to design their own systems by specifying performance criteria for them to meet. Volvo suggested that we incorporate the plastic fuel tank test requirements of ECE Reg. No. 34 into Standard No. 301.

Stilson Consulting submitted two sets of comments in favor of the proposed approach. Stilson suggested in its first set of comments (Stilson-1) that the upgrading effort concentrate on preventing fuel siphoning from fuel line and fuel tank failure due to undercarriage impact and requiring a fuel pump shut-off switch for all crash directions. Stilson-1 provided a draft amendment to Standard No. 301 for consideration. Stilson's second set of comments (Stilson-2) contained recommendations for examining vehicle components and testing fuel lines, fuel filler necks and caps, and inertia switches.

The Insurance Institute for Highway Safety (IIHS), Advocates for Highway and Auto Safety (Advocates), National Truck Equipment Association (NTEA), National Association of State Fire Marshals (NASFM), and North Carolina Department of Crime Control and Public Safety (North Carolina) supported the proposed approach. IIHS stated that we should move rapidly to incorporate component testing. IIHS argued that since the fuel flow shut-off technology is readily available, the agency should require manufacturers to demonstrate that their vehicles will automatically interrupt the fuel flow in a crash. IIHS also stated that the technology to interrupt the flow of electrical current was readily available and supported including in the Standard test requirements that assure that electrical sparks do not ignite spilled fuel in crashes. IIHS reiterated its suggestion that we specify additional requirements for nonmetallic fuel tanks.

B. Comments on System Performance

Chrysler, GM, Mitsubishi, Ford, and Volvo expressed general support for upgrading Standard No. 301's test procedures. GM, Ford, and Chrysler stated, however, that more research was needed before the test procedures for frontal and rear impacts were upgraded. The American Automobile Manufacturing Association (AAMA) also stated that additional research and analysis was needed for some of the proposed upgrades. Mitsubishi argued that we should look at the entire spectrum of real-world impact speeds and modes and consider whether the proposed upgrades would yield negative side-effects on other aspects of overall crashworthiness. Volvo stated that Standard No. 301 should adopt the proposed ECE R94 tests using an offset crash condition with a fixed deformable impact barrier. IIHS and Advocates suggested using a deformable barrier for frontal and rear impact offset tests. VW opposed including any additional crash tests in the standard.

For side impact, GM, VW, Ford, Chrysler, AAMA, Advocates, and IIHS all supported replacing the current Standard No. 301 side impact test with the current Standard No. 214 dynamic test. GM, VW, Ford, Chrysler, and AAMA stated that the moving deformable barrier (MDB) used in Standard No. 214 is more realistic than the one currently used in Standard No. 301's lateral moving barrier crash test. They also argued that no new test development was needed because Standard No. 214's test was more stringent and more representative of real-world crash conditions than Standard No. 301's side impact test. Chrysler, GM and AAMA stated that no other side impact tests were justified for the upgrade and opposed including a side impact pole test in Standard No. 301. AAMA, GM and Chrysler all noted that a December 1994 NHTSA report indicates

> that the side collision fire rate for cars, light trucks, and vans is highest when a narrow object is struck. However, 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. Thus, it would appear to be more effective in terms of vehicle side collision fire mitigation to concentrate on the vehicle-to-vehicle collision conditions in the standard.

They argued that Standard No. 214's test procedure would do this.

For rear impacts, GM supported efforts to develop a repeatable and objective rear impact test, using a realistic moving deformable barrier to replace the existing Standard No. 301 rear moving barrier test. However, GM cautioned that, because of the uniaxial nature and construction of the Standard No. 214 barrier, the representativeness of this barrier face in a primarily off-axis crush mode (*e.g.*, in an angled rear impact) had to be evaluated.

Three of the commenters, Stilson, IIHS, and Advocates, supported the system level approach to upgrade Standard No. 301. Stilson-1 argued that since automobile manufacturers were already conducting 80 km/h (50 mph) offset vehicle-to-vehicle impact tests for examining fuel systems, incorporating higher test speeds into Standard No. 301 would not pose an unreasonable burden on the automotive manufacturers. Stilson-2 reiterated the comments in Stilson-1 and stated that the minimum test requirements should be: 56 km/h (35 mph) frontal barrier (NCAP type) and 88 km/h (55 mph) vehicle-to-vehicle 50 percent offset impact tests, 48 km/h (30 mph) rear fixed barrier impact tests, and 88 km/h (55 mph) vehicle-to-vehicle side impact tests.

Advocates stated that all barrier tests at any crash angle should be conducted at least 56 km/h (35 mph). Advocates supported using a more aggressive test barrier design to simulate narrow objects. Advocates expressed support for replacing the current Standard No. 301 side impact test with the current Standard No. 214 dynamic test as a near term upgrade. Advocates also recommended using heavier barrier weights for testing LTVs than those used for cars. Advocates also stated that we should require fuel tanks on light passenger vehicles to be placed forward of the rear axle.

C. Comments on Environmental and Aging Effects

Ford, Mitsubishi and GM all said that additional research and analysis was needed to determine if an association between fire and environmental and/or aging factors exists. Chrysler argued that it was premature to suggest that environmental and aging factors degrade fuel system components and lead to an increase in vehicle fires. Chrysler, Ford and GM stated that manufacturers were already upgrading fuel and evaporative emission components to comply with the regulations of the Environmental Protection Agency (EPA) and the California Air Resources Board. These regulations require the vehicle's fuel system to comply with specified emission performance requirements for a specified period of time (ten years or 100,000 miles for cars and 11 years or 100,000 miles for trucks). The regulations also require manufacturers to install an on-board diagnostic system that detects evaporative emissions. Mitsubishi also stated that the agency needed to do more work to define possible performance tests and said that such tests would have to address issues such as how to ''age'' vehicles or vehicle parts. Advocates argued that we should adopt performance tests that ensure that fuel systems are designed and manufactured to maintain their integrity over the life of the vehicle.

VI. Agency's Response to Comments on ANPRM

A. NHTSA's Component Performance Activities

We examined the effectiveness of fuel pump shut-off devices in reducing post-crash vehicle fires, using the data in NHTSA's 1992 to 1996 NASS file. We compared post-crash fire occurrence in light vehicles with and without inertia activated fuel pump shut-off devices. According to estimates based on the NASS data, 1,552 Ford vehicles that had inertia switches were involved in post-crash fires. In addition, 2,020 GM and 1,008 Chrysler vehicles that did not have inertia switches were involved in post-crash fires. These crash fires accounted for 0.32 percent of all Ford towaway crashes during that period, as compared to 0.34 percent for GM, and 0.41 percent for Chrysler. The fires were classified as minor or major fires with the following results: Ford (0.23 percent minor, 0.09 percent major), GM (0.06 percent minor, 0.28 percent major), and Chrysler (0.35 percent minor, 0.06 percent major), respectively. It appears that Ford and Chrysler vehicles had more minor fires than the GM vehicles.

Based on the foregoing, we have decided not to pursue rulemaking with respect to fuel system component performance at this time. Our own review of NASS data did not reveal a significant difference in the rate or severity of post crash fire occurrence in vehicles with and vehicles without inertia activated fuel pump shut-off devices. GM crash test data support this conclusion. GM monitored the fuel pump circuitry in all of the crash tests that it conducted for its above-mentioned research. All of the crashes caused electrical circuitry shorting that disabled the fuel pump before the inertia switch could be activated.

B. NHTSA's System Performance Activities

In response to the comments and to follow-up on earlier activities, we decided to investigate the feasibility and practicability of upgrading Standard No. 301's current rear and side impact requirements. We reviewed real world crash data to determine what types of rear impact crashes result in ''moderate,'' ''severe,'' and ''very severe'' fires.[7] Next, we analyzed the data to determine whether it was the fire or the impact of the crash that caused

[7] A ''moderate'' fire is defined as fire damage to between 25 percent and 50 percent of the vehicle surface, a ''severe'' fire has fire damage to between 50 percent and 75 percent of the vehicle surface, and a ''very severe'' fire has fire damage to more than 75 percent of the vehicle surface.

the fatalities and injuries in the fire-related crashes. We then examined the data to determine the types 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. We then performed seventeen crash tests using the new crash test procedure. The following two sections summarize the results of the studies and crash tests.

1. Analyses of FARS and NASS Data on Fire-Related Rear Impact Crashes

In the April 1995 ANPRM, we discussed the results of a detailed NHTSA-sponsored research study of a sample of crash cases involving fire from NASS and FARS conducted by GESAC, Inc.[8] The GESAC study selected 150 NASS cases for detailed analysis. They were selected from recent years and involved fire that caused any occupant injury of AIS 2 or greater. One of the objectives of the analysis was to suggest a laboratory simulation for crashes that cause vehicle fires. The suggested crash simulations include impact mode, speed, barrier, location, and orientation.

For vehicles receiving rear damage, the report indicates that a moving deformable barrier with a partial overlap (a partial width of the vehicle involved in the crash) would simulate the most common type of fire-producing crash. The GESAC study also presented information on impact speed for crash simulations. For rear impacts, the delta-v ranged from 11 km/h to 73 km/h (7 to 45 mph) with a 42 km/h (26 mph) median delta-v. Overlap, which is defined as the percentage of the rear width engaged in a crash, ranged from 30 percent to 95 percent with an average level of 71 percent. The rear impact estimates were based on 11 cases in the 1979 to 1986 NASS data. Due to data limitations, we were unable to derive a more detailed and statistically significant delta-v versus occupant burn injury (e.g., 8 km/h (5 mph) delta-v intervals vs. different AIS levels of occupant injury). Therefore, we concluded that further study was needed.

A detailed case study of 214 fire-related fatal crashes was conducted to determine whether the death was caused by the fire or blunt trauma and to determine the specific crash conditions which caused the fire.[9] Fatality Analysis Reporting System (FARS) data for 1990, 1991, 1992, and 1993 were queried to obtain a listing of cases in which fire occurred. Cases were selected from seven states (Illinois, Florida, Colorado, Arizona, Ohio, Delaware, and West Virginia) because the crash records of these states include case history information. The crash records may have included all or part of the following: (1) Photographs which documented the crash site and the vehicle damage, (2) ''police accident reports'' (PARs) that described the crash based on the opinion and findings of the investigating officer, (3) witness statements, sometimes indicating the intensity, location, and timing of the fire, and (4) medical records that stated whether an autopsy was performed and the findings of the autopsy describing the cause of death, typically differentiating between conflagration and blunt trauma. Based on these data, NHTSA determined the cause of death. Generally, we gave priority to death certificates issued by a medical examiner. We also used witness statements in a few cases to determine the immediate post crash state of the burn victim. This study did not use the FARS' variable for most harmful event.

The 214 fire-related fatal crashes involved 251 vehicles and 293 total fatalities. The distribution of these 214 crashes was 58 percent (124) frontal impacts, 15 percent (33) side impacts, 10 percent (22) rollover crashes, 10 percent (22) rear impacts, and 6 percent (13) coded as other impact types. At the crash level, NHTSA's analysis found 21 percent of the crashes (45) resulted in one or more fatalities due to burn-related trauma. Of these 45 crashes, 16 were rear impacts.

At the occupant level, NHTSA's analysis found 22 percent of the 293 occupant fatalities (65) were due to burn-related trauma while the remaining 78 percent (228) were due to impact-related trauma. The subset consisting of the 65 burn-related trauma occupant fatalities was categorized by crash type. The resulting distribution shows that 46 percent (30) of the fatalities occurred from rear impacts, 23 percent (15) from front impacts, 15 percent (10) from side impacts, 11 percent (7) from rollover crashes, and 5 percent (3) were coded as other impact types.

Although the majority of crashes in which fire occurs are frontal crashes (58 percent), an analysis of fatalities due to burn-related trauma shows that rear impacts account for the majority (46 percent). Therefore, a fatal rear impact involving fire is more likely to result in a burn-related fatality than fire-related crashes in other modes.

Based on the methodology used in this analysis, we estimate that 309 burn-related trauma fatalities occurred in 1995 in the United States. Further, based on the distribution of burn-related trauma fatalities, about 143 (46 percent) of these would have occurred in rear impact crashes.

A thorough review of the crash conditions in the rear impact cases revealed a consistent crash and fire scenario. According to the study, ''[i]n all 16 rear impact cases the vehicle [was] struck in the rear causing loss of fuel from the tank area which ignites during impact and results in a rapidly spreading fire and resulting fatalities.'' The study concluded that striking a stationary vehicle at 50–55 mph with a moving deformable barrier (MDB) at a 70 percent overlap (width of vehicle engagement) would provide a reasonable crash simulation of real world rear impact fatal burn cases.

As discussed earlier in this notice, the April 1995 ANPRM described the results of a research study GESAC, Inc. conducted for NHTSA on 150 selected NASS cases for detailed analysis. One of the objectives of the analysis was to suggest a laboratory simulation for each crash that led to vehicle fire. For rear impacts, the GESAC study suggested using a moving deformable barrier with a partial overlap to simulate the most frequent crash scenario. The overlap ranged from 30 percent to 95 percent with an average level of 71 percent. The GESAC study accumulated a delta-v range from 11 to 72 km/h (7 to 45 mph) with a recommended 42 km/h (26 mph) delta-v, if the crash could be simulated by an equal mass vehicle-to-vehicle collision (i.e., where the weights of the two vehicles are equivalent).

According to 1991 to 1997 NASS–CDS estimates of occupant injuries vs. delta-v, there were no occupant *burn* injuries when the delta-v was lower than 32 km/h (20 mph) in light passenger vehicles involved with fire and in nonrollover rear-impact towaway crashes. The NASS–CDS estimates also show that the majority of fatal and nonfatal occupant burn injuries were crashes with a 34 to 48 km/h (21 to 30 mph) delta-v range. For those occupants that suffered both burn and impact injuries, NASS–CDS does not specify whether the most severe occupant injury (MAIS) listed in NASS–CDS is due to burn or impact.

[8] ''Fuel System Integrity Upgrade—NASS & FARS Case Study,'' DOT Contract No. DTNH–22–92–D–07064, March 1994.

[9] The study is summarized in the paper, ''A Case Study of 214 Fatal Crashes Involving Fire,'' by Carl Ragland and Hsi-Sheng Hsia, Paper No. 98–S4–O–08, The Sixteenth International Technical Conference on the Enhanced Safety of Vehicles, Windsor, Canada, June 1998.

Crash data analyses revealed a consistent crash scenario that causes fire and fire-related fatalities and injuries that can be simulated with the following test procedure: a moving deformable barrier (MDB) of 1,368 kg (3,015 pounds) impacting the rear of the test vehicle at 80 km/h (50 mph) with a 70 percent overlap of the vehicle. The 1,368 kg (3,015 lb) moving deformable barrier is the same barrier used for Standard No. 214, except that the barrier's face is situated two inches lower than the face of the Standard No. 214 barrier to simulate pre-crash braking in rear impact crashes.

The lowering of the face of the barrier by 2 inches is consistent with the results of panic braking tests that were performed by the agency as part of its underride research. It is also supported by annualized estimates from NASS–CDS 1995 to 1999 data regarding the frequency of braking by the drivers of striking vehicles in rear impact crashes involving two light vehicles. Based on those data, we estimate that 72% of drivers of striking vehicles involved in those crashes applied the brakes. Based on the same data, we estimate that 36% of drivers applied the brakes in frontal and 54% in side impact crashes, respectively.

According to the October 30, 1990 final rule that adopted the Standard No. 214 barrier, the barrier is intended to simulate a 2,700 pound vehicle containing 300 pounds of passengers or cargo, which we estimated would be the average weight of the striking vehicle in crashes.[10] Using the Standard No. 214 barrier as the rear impact striking device on a range of small, mid-size, and large vehicles [11] at 80 km/h (50 mph) produces a delta-v range of about 32 to 48 km/h (20 to 30 mph). That is the range in which the majority of fatal and nonfatal occupant burn injuries are occurring, according to NASS–CDS estimates.[12]

2. Offset Rear Impact Vehicle Crash Tests

We conducted several series of vehicle crash tests to determine the feasibility and practicability of the offset rear impact test procedure for the types of vehicles to which it would apply.[13] All of the tests used a 1,368 kg (3,015 pounds) MDB with the barrier lowered by 50 mm (2 inches) to simulate pre-crash breaking. The MDB impacted the test vehicle at 80 km/h (50 mph) (parallel to the longitudinal centerline of the tested vehicle) with a 70 percent overlap on the side of the vehicle where the fuel filler neck is located. This test condition approximates the findings of both the GESAC study and the FARS case study with respect to delta-v and vehicle-to-barrier overlap. Once the tests were performed, we looked to see whether the vehicles met the fuel leakage requirements of Standard No. 301. A discussion of the test results follows.[14]

Between February and April 1996 at the Transportation Research Center of Ohio (TRC), we conducted six rear impact tests on 1996 model vehicles using the offset rear impact test procedure. The vehicles tested included a Suzuki Sidekick, Dodge Neon, Geo Prizm, Ford Mustang, Plymouth Voyager, and Chevrolet Blazer. The Suzuki Sidekick, Dodge Neon, and Geo Prizm all leaked fuel in excess of Standard No. 301's requirements.[15] The Ford Mustang,[16] Plymouth Voyager, and Chevrolet Blazer all passed the fuel leakage requirements.[17]

In light of the failure of the smaller vehicles to pass the test, we decided to perform additional crash tests on small compact and light-passenger vehicles to assess the practicability and repeatability of the offset rear impact test procedure with respect to small vehicles.

GM, in cooperation with the agency, conducted five rear impact crash tests between December 1997 and January 1998. The five GM tests were funded by the GM C/K pickup truck settlement research fund. All of the five tested vehicles, a Honda Civic, Chevrolet Cavalier, Nissan Sentra, VW Jetta, and Ford Escort, were 1998 models. The vehicles' test weights ranged from 1,344 to 1,468 kg (2,962 to 3,236 pounds). The Honda Civic and the Nissan Sentra passed Standard No. 301's fuel leakage requirements. The Chevrolet Cavalier, Ford Escort, and VW Jetta all leaked fuel in excess of Standard No. 301's requirements.

We also conducted two additional tests on two mini-cars, a 1998 Chevrolet Metro and a 1999 Mazda Miata, through Veridian (formerly Calspan Corp.). The Metro weighed 996.5 kg (2,196 pounds) and the Miata weighed 1,225.5 kg (2,701 pounds). Both of the vehicles passed the fuel leakage requirements, demonstrating the feasibility of the smallest cars passing the proposed rear impact test procedure.

To assess the repeatability of the offset rear impact test procedure, we conducted additional tests of previously tested vehicles. We decided to retest the Honda Civic, which had passed the test, and the Chevrolet Cavalier, which had failed the test. Between September and October 1998, the agency conducted these two tests through TRC. The Honda Civic passed the TRC test and repeated the results of the GM test. The Chevrolet Cavalier, which failed the GM test, also passed the TRC test and, therefore, did not repeat the results of the GM test.

An examination of the TRC test results revealed that the damage patterns of the TRC tests were nearly identical to the damage pattern of the GM tests, but that the extent of the damage was less. The impact velocity of the TRC test was 1 km/h lower than the GM test. This difference, however, would not account for the difference in crush. Further examination revealed a defective honeycomb barrier assembly. The barrier's honeycomb bumper assembly delaminated during the TRC crash test, which led to more honeycomb crush and less vehicle crush. [18] Because of the consistent crush pattern to both of the vehicles and the MDBs in the two tests of the Cavalier, we decided not to retest the Chevrolet Cavalier at TRC if we obtained a

[10] The barrier was built to behave like a vehicle in a real-world crash. Unlike the flat faced barrier currently used in Standard No. 301's rear impact crash test, the moving deformable barrier absorbs some of the crash energy and distributes crash forces in the striking vehicle in the same way a vehicle would in a real crash. While there is less crush and deformation to the struck vehicle with the MDB, the deformation is uneven and more realistic than the flat, even deformation caused by the current flat-faced barrier.

[11] Vehicles in the range of 907 to 2,041 kg (2,000 to 4,500 pounds).

[12] The delta-v of an 80 km/h (50 mph) impact between a 1,368 kg (3,015 pounds) moving barrier and a 1,368 kg (3,015 pounds) test vehicle is half of the impact speed, specifically, 40 km/h (25 mph). The same test conducted with a lighter test vehicle would yield a higher delta-v; a crash into a heavier vehicle would yield a lower delta-v.

[13] The test results are available in the docket for this rulemaking.

[14] Fully instrumented Hybrid III dummies were placed in the driver and right front passenger seating positions during the crash tests. The dummy measurements are available in the docket of this rulemaking.

[15] The test weights of the three failed vehicles were 1,370, 1,360, and 1,326 kg (3,020, 2,997, and 2,923 lb), respectively.

[16] Between July and November 1995, NHTSA conducted three more rear impact crash tests on 1993 Ford Mustangs through the Transportation Research Center of Ohio (TRC). The tests used the MDB at 80.3, 79.6, and 80.1 km/h (49.9, 49.5, and 49.8 mph) impact speeds and with 88 percent, 80 percent, and 50 percent overlaps, respectively. Only the second of the three tested vehicles passed the Standard No. 301 fuel leakage requirements.

[17] The test weights of the three passed vehicles were 1,628, 1,946, and 1,906 kg (3,588, 4,289, and 4,201 lb), respectively.

[18] Further investigation revealed that the honeycomb supplier had changed the procedure in manufacturing the assembly. The change in assembly procedure reduced the bonding strength of the epoxy. The honeycomb supplier subsequently replaced all untested honeycomb faces.

repeatable outcome in the Veridian testing.

In November 1998, we conducted two additional tests of the Honda Civic and Chevrolet Cavalier through Veridian. The Honda Civic passed and the Chevrolet Cavalier failed the Veridian test. Both the Cavalier and the Civic repeated the results of the GM tests.

3. Analysis of Side Impact Test Procedure

Since 1994, a small number of vehicles have exceeded the limits on fuel leakage in Standard No. 301 in Standard No. 301 lateral and Standard No. 214 compliance tests (one out of more than 100 vehicles in Standard No. 214 compliance tests and one out of 43 in Standard No. 301 compliance tests). In addition, in 1997, the agency's New Car Assessment Program (NCAP) began conducting NCAP side impact tests at a higher impact speed. To date, two out of 76 of the NCAP tested vehicles leaked fuel in excess of Standard No. 301's fuel leakage requirements.

We compared the crash test results of a Standard No. 301 lateral impact compliance test and a Standard No. 214 compliance test for the same vehicle model. According to our analysis, the Standard No. 214 crash test exposes the subject vehicle to higher crush energy and higher crash forces, and to greater changes in velocity than the existing Standard No. 301 test. The data show that the fuel system components are exposed to more stringent forces in the Standard No. 214 test than in the present Standard No. 301 lateral test.

C. Environmental and Aging Effects

At this time, we have decided not to pursue rulemaking related to environmental and aging effects. While we agree with Advocates that preserving fuel system integrity over the life of a vehicle is important, we also agree with the comments of Mitsubishi, GM and Ford that further studies are needed to define the problems associated with environmental and aging effects and determine whether rulemaking would be appropriate to address them.

GM has conducted research on environmental factors and aging effects on fuel system integrity as part of the GM Settlement Agreement and has prepared a report on its findings. A review of this findings, based on a limited number of vehicles from the ''salt belt'' regions, indicates some significant degradation of metal components including fuel tanks. Additionally, a significant degradation of rubber components from the ''sun belt'' regions was observed. There was little degradation of plastic fuel tanks or lines in either region. Upon further study, we may revisit this issue in the future.

As stated in the 1995 ANPRM, the number of cases in the data base is insufficient to produce statistically significant results using vehicle age as a variable. Further studies are needed to relate degradation of components to fire-related occupant injuries. The agency seeks comments on the magnitude of the problem and the need for future rulemaking action. The agency also seeks comments on what procedure and requirements are appropriate to be used in testing for problems associated with older vehicles.

D. Comparison of U.S. and Foreign Fuel System Safety Requirements

The following discussion summarizes the results of our comparison of Standard No. 301's requirements with the following foreign fuel system integrity standards:

(1) The Canadian CMVSS No. 301, *Fuel System Integrity (Gasoline, Diesel);* [19]

(2) The Economic Commission for Europe (ECE) Regulation No. 34, *Uniform Provisions Concerning the Approval of Vehicles with Regard to the Prevention of Fire Risks* (01 Series, Amendment 1, January 29, 1979) (Thirteen European countries have agreed to adopt ECE Reg. No. 34, including Germany, France, Italy, Netherlands, Sweden, Belgium, Czechoslovakia, United Kingdom, Luxembourg, Norway, Finland, Denmark, and Romania); and

(3) The Japanese Standard, *Technical Standard for Fuel Leakage in Collision, etc.* (Amended on August 1, 1989).

In terms of the vehicles covered: Standard No. 301 applies to all vehicles 4,536 kg (10,000 pounds) or less GVWR and school buses over 4,536 kg (10,000 pounds) GVWR. ECE Reg. No. 34 only applies to passenger cars, and the Japanese standard applies to passenger cars and multipurpose passenger vehicles 2,540 kg (5,600 pounds) or less.

In terms of required impact tests: As described above, Standard No. 301 requires frontal, rear and side impact tests at 48, 48 and 32 km/h (30, 30, and 20 mph), respectively, plus a static rollover test, for vehicles 4,536 kg (10,000 pounds) or less GVWR. Standard No. 301 also requires a 48 km/h (30 mph) impact test for school buses over 10,000 pounds (4,536 kg) GVWR.

The ECE Reg. No. 34 requires a 48 to 53 km/h (30 to 33 mph) frontal fixed barrier impact test and a 35 to 38 km/h (22 to 24 mph) rear moving flat rigid barrier impact test. The ECE test device weighs 1,100±20 kg (2,425±44 pounds). A pendulum can be used as the impactor. ECE Reg. No. 34 does not require a rollover test. The standard requires a hydraulic internal-pressure test for all fuel tanks and special tests (impact resistance, mechanical strength, and fire resistance) for plastic fuel tanks.

The Japanese standard requires a 50±2 km/h (31±1 mph) frontal fixed barrier impact test and a 35 to 38 km/h (22 to 24 mph) rear moving flat barrier impact test. The flat rigid barrier weighs 1,100±20 kg (2,425±44 pounds). A pendulum can be used as the impactor.

In terms of test performance requirements: all three standards limit fuel spillage. As in Standard No. 301, the ECE Reg. No. 34 and the Japanese standard, in general, also limit fuel spillage to about 28 grams/min (1 ounce/min). The Japanese standard lists the ECE Reg. No. 34 and Standard No. 301 as equivalent standards.

In summary, Standard No. 301 applies to more vehicle classes and to higher vehicle weights than the ECE Reg. No. 34 or the Japanese standard. Standard No. 301 requires testing in all crash modes (frontal, side, rear, and rollover). ECE Reg. No. 34 and the Japanese standard require only frontal and rear impact tests. Standard No. 301 uses a much heavier moving barrier for impact tests than the ECE and Japanese standards (1,814 kg vs. 1,100 kg). However, Standard No. 301 does not specify a hydraulic pressure test for fuel tanks, a battery retention requirement, or additional tests for plastic fuel tanks; ECE Reg. No. 34 does. In addition, the ECE Reg. No. 34 requires that ''no fire maintained by the fuel shall occur'' and does not allow failure of the battery securing device due to the impact. ECE Reg. No. 34 also requires filling the impacted vehicle's fuel tank ''either with fuel or with a non-inflammable liquid.'' We understand that, in practice, when the ECE Reg. No. 34 tests are conducted, the fuel tank is filled with non-inflammable liquid. Therefore, compliance with the no-fire requirement is based on a judgment about whether a fire would occur given the amount of observed fuel leakage.

VII. Proposal to Upgrade Standard No. 301's Rear and Lateral Impact Test Procedures

A. Proposed Offset Rear Impact Test Procedure

Based on our analysis of real-world fire-related fatal crash data and the results of various vehicle offset crash tests, we are proposing to replace

[19] This Standard is identical to NHTSA's Standard No. 301.

Standard No. 301's current rear impact test procedure with one that specifies striking the rear of the test vehicle at 80 km/h (50 mph) ± 1 km/h with a 1,368 kg (3,015 lb) MDB at a 70 percent overlap with the test vehicle. The MDB face would be located 50 mm (2 inches) lower than the face of the Standard No. 214 barrier to simulate pre-crash braking. We have tentatively concluded that this more stringent test procedure would reduce fire-related deaths and injuries from rear impact crashes.

The greatest number of fatalities due to fire occur in rear impacts. The proposed test procedure simulates 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; the fuel can ignite during or following impact and lead to a rapidly spreading fire which results in fatalities and injuries. NASS estimates show that the majority of fatal and nonfatal occupant burn injuries in rear impact crashes were in the 34 to 48 km/h (21 to 30 mph) delta-v range. The proposed test procedure simulates the vehicle-to-vehicle crashes that result in delta-v's of 32 to 48 km/h (20 to 30 mph).

We have tentatively concluded that replacing the current Standard No. 301 rear impact test procedure with the proposed upgraded test procedure is practicable. 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, 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.[20] 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.

We are not proposing to require manufacturers to place each vehicle's fuel tank forward of the rear axle as suggested by Advocates. We believe such a requirement is unnecessary and would be design restrictive. We note that the fuel tank of the 1996 Ford Mustang, which passed the proposed rear impact test requirement, is located behind the rear axle. We believe that this test demonstrates that structural and component design is a more critical factor than fuel tank location in maintaining fuel system integrity.

We are also not proposing to use a heavier barrier for light trucks and sport utility vehicles, as suggested by Advocates. As noted above, in a 80 km/h (50 mph) rear impact offset crash test, a 1,368 kg (3,015 lb) MDB effectively reproduces the damage profile seen in real world crashes that can lead to fires. If a heavier barrier were used, the proposed rear impact crash test would no longer reproduce that profile.[21]

As to the comments concerning other aspects of crashworthiness, NHTSA plans to upgrade Standard No. 202, ''Head restraints,'' and is considering the possibility of upgrading Standard No. 207, ''Seating systems.''

B. Proposed Side Impact Test Procedure

Commenters on the ANPRM supported replacing Standard No. 301's current lateral crash test with Standard No. 214's side impact crash test, stating that the latter test would impose requirements that are more stringent for evaluating fuel system integrity than the current lateral crash test requirements in Standard No. 301. Manufacturers, safety advocates, and others agreed that this replacement would be beneficial from both a safety and cost perspective. In addition, in November 1992, Volkswagen of America, Inc. (VW) petitioned the agency to replace Standard No. 301's lateral crash test with Standard No. 214's dynamic test. We granted that petition very shortly after it was received.

We are proposing to replace Standard No. 301's current lateral crash test with the side impact crash test of Standard No. 214. Test analyses show that that Standard No. 214 crash test exposes the subject vehicle to higher crush energy and crash forces, and to greater changes in velocity than the existing Standard No. 301 lateral test. The data show that the fuel system components are often exposed to greater forces in the Standard No. 214 test.

Replacing the current Standard No. 301 lateral test with the Standard No. 214 test would both increase safety and reduce certification testing costs for manufacturers. These costs would be reduced because manufacturers would only have to conduct one type of side impact test instead of two.

In proposing to adopt the Standard No. 214 test, we are also proposing a slight change to that test, both as it appears in Standard No. 214, and as it would appear in Standard No. 301. Instead of specifying that the test would be conducted ''at'' 54 km/h (33.5 mph), we are proposing to specify that the test would be conducted at 53 km/h + 1.0 km/h. This is very close to the speed (52.9+0.8 km/h) at which our Office of Vehicle Safety Compliance has been conducting Standard No. 214 tests. In addition to proposing this change to Standard No. 214, we are also deleting several paragraphs of outdated requirements relating solely to vehicles manufactured in the mid-1990s.

C. Additional Considerations

1. Door System Integrity

As discussed previously, NASS data from 1991 to 1998 indicate that potential escape from the fire was made more difficult for most occupants (87 percent for all impacts) with moderate or more serious burns because they (1) were sitting next to a door that was jammed shut by crash forces, (2) did not have a door at their position, or (3) had a part of their body physically restrained by deformed vehicle structure. Real-world crash reports indicate that there were instances in which fire suddenly started several minutes after the vehicle was impacted. Thus, it is critical that occupants are able to quickly and easily exit the vehicle after a crash that could lead to a fire.

We examined the results of the vehicle crash tests we conducted using the offset rear impact test procedure to determine whether the front and rear doors were operable. The driver and passenger side doors in the Ford Mustang, Plymouth Voyager, Chevrolet Blazer, Geo Prizm, Chevrolet Metro and

[20] The Ford Mustang test series demonstrated the technical feasibility of redesigning a failed 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 proposed upgrade.

[21] In a recent notice regarding Standard No. 214, NHTSA stated:

While the current moving deformable barrier used in Standard 214's dynamic test may be too small and too light to represent the future U.S. fleet, the barrier used in EU 96/27/EC is even smaller in size and mass. Instead of adopting the smaller ECE barrier, NHTSA plans to consider adopting a more representative barrier than the current barrier used in Standard 214.

We note that further research and development would have to be done before a heavier MDB could be developed and proposed for use in any test procedure.

the Veridian-tested Honda Civic were all easy to open after the test. The driver side door in the Veridian-tested Chevrolet Cavalier was operable while the passenger side door was not. In the TRC-tested Honda Civic, the driver side door was easy to open; the passenger side door required tools. Tools were needed to open both the driver and passenger side door in the TRC-tested Chevrolet Cavalier. The driver and passenger side doors in the Mazda Miata were reported closed/inoperable. Information was not available on the GM tests of the Honda Civic, Chevrolet Cavalier, Nissan Sentra, VW Jetta, and the Ford Escort. Several of the vehicles had at least one door that was ''easy'' to open or ''operable.'' Several, however, had doors that were inoperable or required tools to open.

In light of these data, we are considering adding a door opening test requirement to Standard No. 206. The purpose of this requirement would be to reduce the risk of injury in the event that a crash results in a fire. The requirement would accomplish this by increasing the chance that vehicle occupants can exit or be extricated from the vehicle after a crash. We request comment on whether such a requirement is necessary and, if so, what type of requirements would be appropriate, objective, and repeatable. Do any manufacturers currently perform post-crash door opening/egress capability tests? If so, how much force is applied to the door? How is the force applied? The ECE's frontal offset crash test requirement (ECE Regulation No. 94, S5.2.5.1, Amendment 2, September 18, 1998) requires that at least one door per row be openable after that frontal crash. Should we include a similar requirement in Standard No. 206 for the Standard No. 301 rear impact crash test? Should we go further and require openability after each type of crash specified in Standard No. 301?

2. Lead Time

The agency proposes a lead time of approximately three years for the rear impact test requirements. This proposal is based on the following analysis:

- All vehicles must be tested with the new requirements, which specifies a higher speed than the one currently used by most manufacturers in their testing. Thus, essentially all make/models that a manufacturer intends to sell after the effective date of these requirements would have to be tested to determine compliance. NHTSA estimates such testing will take at least five months.
- For all vehicles that did not currently comply (6 of 13 vehicles tested failed at least one test), a remedy must be determined, a prototype solution fabricated and incorporated in the vehicle, and the vehicle retested. With potential iterations, this process could take ten months. The design changes we believe are necessary for the vehicles we have tested have been moderate, not requiring retooling.
- Finally, the changes must be implemented on the production line. This is about a 12 month process.

These three factors indicate that a lead time of about 27 months is reasonably necessary. However, if retooling is necessary for some vehicles (we tested 13 make/models), at least an additional 6 months must be added to the process, making the total 33 months. Thus, as noted above, we propose a lead time of approximately three years for the rear impact test requirements. These estimates are based on a study conducted for NHTSA by Ludtke & Associates and documented in a report titled ''FMVSS 301 Fuel System Integrity Rear Impact Test Upgrade: Cost, Weight and Lead Time Analysis,'' dated September 21, 1999. This report is available in the docket for this rulemaking.

As to the new side impact test requirements, few, if any, design changes would be necessary. However, manufacturers would need to certify compliance using the new procedure. Therefore, we propose to put the side impact test requirements into effect on the first September 1st that occurs at least 12 months after the issuance of the final rule.

Between the issuance of the final rule and the effective date of the upgraded Standard, the manufacturers would be allowed the option of certifying to the Standard No. 301 rear and/or side impact requirements based either on the current test procedure or the new procedure. However, consistent with our other recent amendments adding options to our safety standards, a manufacturer would have to select irrevocably a particular option when it certifies the vehicle.

3. Request for Comments on Particular Issues

In addition to the matters discussed above, we seek responses to the following questions:

a. Are there any real-world data, other than the data that the agency has already analyzed for this proposed upgrade, that may better describe the relationship between the risk of occupant injury due to fire and crash severity?

b. Vehicle manufacturers.

i. How many of your vehicle models would need some redesign to comply with the proposed offset rear impact test procedure? Describe the type and extent of design changes. What costs would be associated with those redesigns? Would you have any significant problems completing necessary redesigns within the three-year lead time? If so, please identify those problems and indicate how much lead time would you need.

ii. How many of your vehicle models would need some redesign to comply with the proposed side impact test procedure? Describe the type and extent of design changes. What costs would be associated with those redesigns? Please indicate how much lead time you would need and why.

c. What impact would the proposed changes have on vehicle safety?

d. Are the proposals sufficient and appropriate for the different sizes and types of vehicles?

e. In the various crash tests that were performed during the research for this rulemaking, the values of head and neck injury criteria measured by the responses of the two front Hybrid III anthropomorphic test devices were 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 are also raised 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?

f. 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.

g. Should we 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?

h. We are 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?

i. For the rear offset moving deformable barrier test conditions, we are proposing that the barrier be the same as the one shown in Figure 2 of Standard No. 214, 49 CFR 571.214 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 Standard No. 214, Figure 2. Positioning the barrier face in that manner might make it necessary for us to change slightly the center of gravity and moment of inertia specifications in paragraphs 587.6(d) and (e) of Part 587 of Title 49 CFR for the purposes of testing under Standard No. 301. The agency is in the process of determining the necessary changes to the specifications and plans to docket its findings during the comment period on this notice. Comments are requested on any necessary changes.

j. With respect to side impact crashes that result in fires, this proposal to upgrade Standard No. 301 addresses vehicle-to-vehicle crashes. As noted above, 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, as also noted above, 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 the Standard?

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

VIII. Rulemaking Analyses

A. Executive Order 12866 and DOT Regulatory Policies and Procedures

NHTSA has considered the impact of this final rule under E.O. 12866 and the Department of Transportation's regulatory policies and procedures. This rule was not reviewed under E.O. 12866, ''Regulatory Planning and Review'' and is not considered significant under the Department of Transportation's regulatory policies and procedures.

The agency has prepared a Preliminary Regulatory Evaluation (PRE) describing the economic and other effects of this proposal. The average cost for vehicles that would need to be modified to meet the proposed rear seat requirements is $5 per vehicle. Based on our estimate that 46 percent of the fleet does not currently meet the proposal and on an estimated 15.2 million total sales, we estimate that the total cost for the fleet would be $35 million annually.

The target population of crashes includes multi-vehicle crashes in which a passenger vehicle is struck in the rear by another passenger vehicle and the fire starts in the struck vehicle. There are an estimated 57 fatalities and 119 non-fatal injuries annually in the target population. The non-fatal burn injuries in that population of crashes were mostly minor and were typically not the most severe injury to the occupant. Our estimate of benefits ranges from 8 to 21 lives saved annually, once all vehicles on the road meet the proposed rear impact test.

While we believe the FMVSS 214 side impact test is somewhat stricter than the existing side impact test in FMVSS 301, we could not quantify any benefits in side impacts. There are less than 100 fatalities annually in multi-vehicle side impacts resulting in fire. More important, only one out of more than 100 vehicles tested failed the proposed fuel leakage requirements using the FMVSS 214 proposed test. Based on those test results, it appears that few vehicles would have to be modified to meet the proposed side impact test.

B. Regulatory Flexibility Act

NHTSA has also considered the effects of this proposed rule under the Regulatory Flexibility Act. I hereby certify that it would not have a significant economic impact on a substantial number of small entities. Further, the amendments primarily affect passenger car and light truck manufacturers which are not small entities under 5 U.S.C. 605(b). The Small Business Administration's regulations at 13 CFR part 121 define a small business, in part, as a business entity ''which operates primarily within the United States.'' (13 CFR 121.105(a)). The agency estimates that there are at most five small final stage manufacturers of passenger cars in the U.S. and no small manufacturers of light trucks, producing a combined total of at most 500 cars each year. It is unknown how many of their vehicle models currently meet the proposed requirements. Comments are requested on the impact of this proposal on small vehicle manufacturers.

There are a large number of second-stage manufacturers that could be affected by this proposal. Second-stage manufacturers buy a chassis from a first-stage manufacturer and finish it to the consumer's specifications. The manufacturers that put a work-related body on a pickup truck chassis (like a small tow truck) often perform manufacturing operations affecting the fuel system, both in the structure around the fuel tank and where the fuel filler neck attaches to the body. Other second-stage manufacturers use a van chassis or an incomplete vehicle for ambulances, small mobile homes, small school buses, etc. Typically, the first-stage manufacturer provides the second-stage manufacturer with a body builder's guide which tells the second-stage manufacturer what it can do and still either pass along the original equipment manufacturer's certification for compliance with Standard No. 301 (for chassis cabs) or otherwise be confident that the vehicle will comply (for other types of incomplete vehicles). To the extent that a second-stage manufacturer deviates from the guide, it would have to certify compliance on their own. The agency tentatively concludes that few final stage manufacturers would do so and that therefore this would not result in a significant economic impact on these companies. Comments are requested on this tentative conclusion.

C. National Environmental Policy Act

NHTSA has analyzed this rulemaking action for the purposes of the National Environmental Policy Act. The agency has concluded that implementation of this action would not have any significant impact on the quality of the human environment.

D. Executive Order 13132 (Federalism)

The agency has analyzed this rulemaking in accordance with the principles and criteria contained in Executive Order 13132 and has determined that it does not have sufficient federalism implications to warrant consultation with State and local officials or the preparation of a federalism summary impact statement. The proposal would not have any substantial effects on the States, or on the current Federal-State relationship, or on the current distribution of power and responsibilities among the various local officials.

E. Unfunded Mandates Act

The Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of more than $100 million annually (adjusted for inflation with base year of 1995). As indicated above, NHTSA anticipates that this proposed rule would not result in an annual expenditure of $100 million.

F. Civil Justice Reform

These amendments would not have any retroactive effect. Under 49 U.S.C. 30103, whenever a Federal motor vehicle safety standard is in effect, a State may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard, except to the extent that the state requirement imposes a higher level of performance and applies only to vehicles procured for the State's use. 49 U.S.C. 30161 sets forth a procedure for judicial review of final rules establishing, amending or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties may file suit in court.

G. National Technology Transfer and Advancement Act

Under the National Technology Transfer and Advancement Act of 1995 (NTTAA) (Public Law 104–113), ''all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments.'' We surveyed several voluntary standards organizations to see whether there were any voluntary standards that were applicable to this rulemaking. Standard No. 301's current rear and lateral moving barrier crash test requirements are the same as the Society of Automotive Engineer's (SAE) Standard for rear and side barrier collision tests, SAE, J972. Today's notice proposes to amend Standard No. 301's current rear and lateral moving barrier crash test requirements. The American National Standards Institute (ANSI) and the International Standards Organization (ISO) do not have any automobile fire protection standards relevant to this rulemaking. We seek comment on whether there are any other voluntary standards that may be applicable to this rulemaking.

H. Paperwork Reduction Act

This rule does not contain any collection of information requirements requiring review under the Paperwork Reduction Act of 1995 (Public Law 104–13).

I. Plain Language

Executive Order 12866 and the President's memorandum of June 1, 1998, require each agency to write all rules in plain language. Application of the principles of plain language includes consideration of the following questions:

—Have we organized the material to suit the public's needs?

—Are the requirements in the rule clearly stated?

—Does the rule contain technical language or jargon that is not clear?

—Would a different format (grouping and order of sections, use of headings, paragraphing) make the rule easier to understand?

—Would more (but shorter) sections be better?

—Could we improve clarity by adding tables, lists, or diagrams?

—What else could we do to make the rule easier to understand?

If you have any responses to these questions, please include them in your comments on this NPRM.

IX. Submission of Comments

How Can I Influence NHTSA's Thinking on This Proposed Rule?

In developing this NPRM, we tried to address the concerns of all our stakeholders. Your comments will help us improve this rule. We invite you to provide different views on options we propose, new approaches we have not considered, new data, how this proposed rule may affect you, or other relevant information. We welcome your views on all aspects of this proposed rule, but request comments on specific issues throughout this document. We grouped these specific requests near the end of the sections in which we discuss the relevant issues. Your comments will be most effective if you follow the suggestions below:

Explain your views and reasoning as clearly as possible.

- Provide solid technical and cost data to support your views.
- If you estimate potential costs, explain how you arrived at the estimate.
- Tell us which parts of the NPRM you support, as well as those with which you disagree.
- Provide specific examples to illustrate your concerns.
- Offer specific alternatives.
- Refer your comments to specific sections of the NPRM, such as the units or page numbers of the preamble, or the regulatory sections.
- Be sure to include the name, date, and docket number with your comments.

How Do I Prepare and Submit Comments?

Your comments must be written and in English. To ensure that your comments are correctly filed in the Docket, please include the docket number of this document in your comments.

Your comments must not be more than 15 pages long. (49 CFR 553.21). We established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments.

Please submit two copies of your comments, including the attachments, to Docket Management at the address given above under **ADDRESSES**.

In addition, for those comments of 4 or more pages in length, we request that you send one copy on computer disc to: Dr. George Mouchahoir, Chief, Special Vehicles & Systems Division, NPS–12, National Highway Traffic Safety Administration, 400 Seventh Street, SW, Washington, DC 20590. We emphasize that this is not a requirement. However, we ask that you do this to aid us in expediting our review of all comments. The copy on computer disc may be in any format, although we would prefer that it be in WordPerfect 8.

Comments may also be submitted to the docket electronically by logging onto the Dockets Management System website at http://dms.dot.gov. Click on ''Help & Information'' or ''Help/Info'' to obtain instructions for filing the document electronically.

How Can I Be Sure That my Comments Were Received?

If you wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

How Do I Submit Confidential Business Information?

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under FOR FURTHER INFORMATION CONTACT. In addition, you should submit two copies, from which you have deleted the claimed confidential business information, to Docket Management at the address given above under ADDRESSES. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation. (49 CFR part 512.)

Will the Agency Consider Late Comments?

We will consider all comments that Docket Management receives before the close of business on the comment closing date indicated above under DATES. To the extent possible, we will also consider comments that Docket Management receives after that date. If Docket Management receives a comment too late for us to consider it in developing a final rule (assuming that one is issued), we will consider that comment as an informal suggestion for future rulemaking action.

How Can I Read the Comments Submitted by Other People and Other Materials Relevant to This Rulemaking?

You may view the materials in the docket for this rulemaking on the Internet. This materials include the written comments submitted by other interested persons and the preliminary regulatory evaluation prepared by this agency. You may read them at the address given above under ADDRESSES. The hours of the Docket are indicated above in the same location.

You may also see the comments and materials on the Internet. To read them on the Internet, take the following steps:

(1) Go to the Docket Management System (DMS) Web page of the Department of Transportation (http://dms.dot.gov/).

(2) On that page, click on ''search.''

(3) On the next page *(http://dms.dot.gov/search/)*, type in the four-digit docket number shown at the beginning of this document. Example: If the docket number were ''NHTSA–2000–1234,'' you would type ''1234.'' After typing the docket number, click on ''search.''

(4) On the next page, which contains docket summary information for the materials in the docket you selected, click on the desired comments. You may download the comments.

Please note that even after the comment closing date, we will continue to file relevant information in the Docket as it becomes available. Further, some people may submit late comments. Accordingly, we recommend that you periodically check the Docket for new material.

X. Proposed Regulatory Text

List of Subjects in 49 CFR Part 571

Motor vehicle safety, Reporting and record keeping requirements, Tires.

In consideration of the foregoing, the agency is proposing to amend 49 CFR part 571 as follows:

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

1. The authority citation for part 571 would be revised to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117, and 30166; delegation of authority at 49 CFR 1.50.

2. Section 571.214 would be amended by revising S3(b) to read as follows and by removing and reserving S3(c) and S3(d).

§ 571.214 Standard No. 214; Side impact protection.

* * * * *

S3. *Requirements.* * * *

(b) When tested under the conditions of S6, each passenger car manufactured on or after September 1, 1996 shall meet the requirements of S5.1, S5.2, and S5.3 in a 53 km/h (± 1.0 km/h) impact in which the car is struck on either side by a moving deformable barrier. 49 CFR part 572, subpart F 50th percentile male test dummies are placed in the front and rear outboard seating positions on the struck side of the car. However, the rear seat requirements do not apply to passenger cars with a wheelbase greater than 3302 mm, or to passenger cars which have rear seating areas that are so small that the part 572, subpart F dummies cannot be accommodated according to the positioning procedure specified in S7.

(c) [Reserved]

(d) [Reserved]

3. Section 571.301 would be amended by revising S6.1, S6.2, S6.3, S7.1.6(b), S7.2, and S7.3, and adding a new figure 3 at the end of the section to read as follows:

§ 571.301 Standard No. 301; Fuel system integrity.

* * * * *

S6.1 Frontal barrier crash. When the vehicle traveling longitudinally forward at any speed up to and including 48 km/h impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30 degrees in either direction from the perpendicular to the line of travel of the vehicle, with 49 CFR part 572 50th percentile male test dummies at each front outboard designated seating position, under the applicable conditions of S7, fuel spillage must not exceed the limits of S5.5.

S6.2 Rear offset moving barrier crash. When the vehicle is impacted from the rear by an offset moving deformable barrier at 80 km/h (± 1.0 km/h) with 49 CFR part 572 50th percentile male test dummies at each front outboard designated seating position, under the applicable conditions of S7, fuel spillage must not exceed the limits of S5.5.

S6.3 Side moving barrier crash. When the vehicle is impacted on either side by a moving deformable barrier at 53 km/h (± 1.0 km/h) with 49 CFR part 572 50th percentile male test dummies at positions required for testing to S7 of Standard No. 214, under the applicable conditions of S7, fuel spillage must not exceed the limits of S5.5.

* * * * *

S7.1.6 * * *

* * * * *

(b) Except as specified in S7.1.1, a multipurpose passenger vehicle, truck, or bus with a GVWR of 4,536 kg or less is loaded to its unloaded vehicle weight, plus the necessary test dummies, as specified in S6, plus 136 kg or its rated cargo and luggage capacity weight, whichever is less, secured to the vehicle and distributed so that the weight on each axle as measured at the tire-ground interface is proportional to its GAWR. Each dummy is restrained only by means that are installed in the vehicle for protection at its seating position.

* * * * *

S7.2 Side moving deformable barrier test conditions. The side moving deformable barrier crash test conditions are those specified in S6 of Standard No. 214, 49 CFR 571.214.

S7.3 Rear offset moving deformable barrier test conditions. The moving deformable barrier is the same as the one shown in Figure 2 of Standard No. 214, 49 CFR 571.214 and specified in 49 CFR part 587, except as otherwise specified in paragraph S7.3(b). The barrier and test vehicle are positioned so that at impact—

(a) The test vehicle is stationary;

(b) The deformable face of the barrier is mounted on the barrier 50 mm lower than the height specified in Standard No. 214, Figure 2;

(c) The barrier is traveling at 80 km/h (± 1.0 km/h); and

(d) The barrier impacts the test vehicle with the longitudinal centerline of the vehicle parallel to the line of travel and perpendicular to the barrier face within a tolerance of ± 5 degrees. The test vehicle and barrier face are aligned so that the barrier strikes the rear of the vehicle with 70 percent overlap toward either side of the vehicle. So aligned, the barrier face fully engages one half of the rear of the vehicle and partially engages the other half. At impact, the vehicle's longitudinal centerline is located inboard of the side edge of the barrier face by a distance equal to 20 percent of the vehicle's width ± 50 mm. (See Figure 3.) The vehicle's width is the maximum dimension measured across the widest part of the vehicle, including bumpers and molding but excluding such components as exterior mirrors, flexible mud flaps, marker lamps, and dual rear wheel configurations.

* * * * *

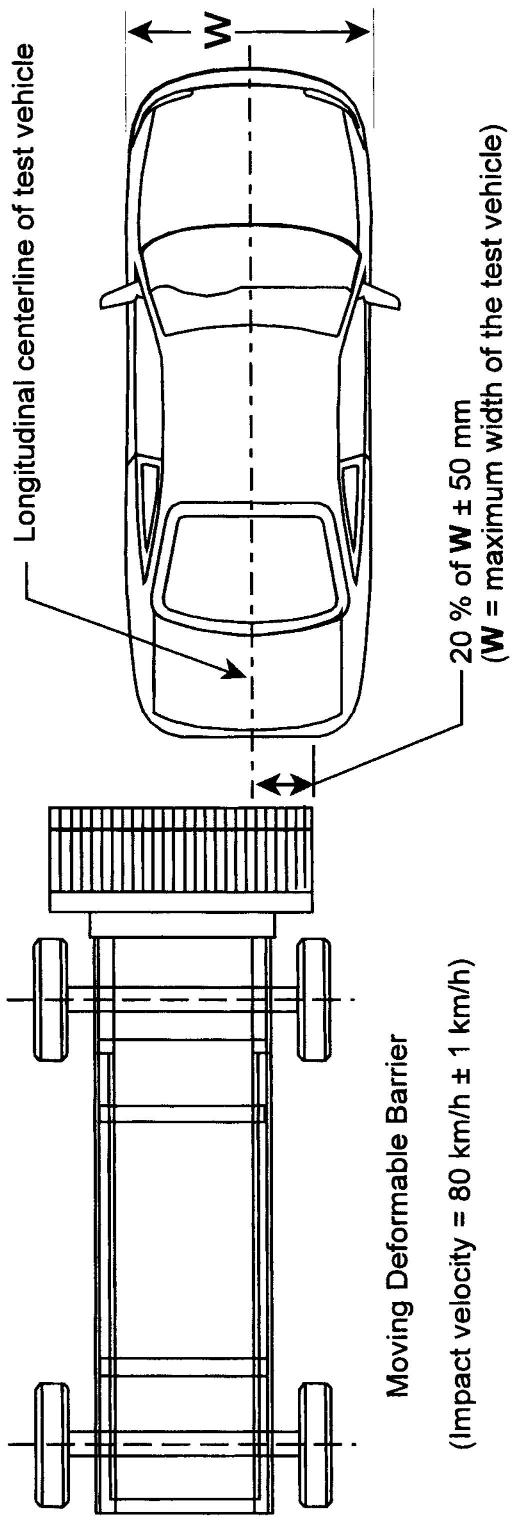

FIGURE 3 – MOVING DEFORMABLE BARRIER REAR IMPACT - 70 % OVERLAP

Issued on: November 6, 2000.

Stephen R. Kratzke,

Associate Administrator for Safety Performance Standards.

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