DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket NHTSA 99–5546]

RIN 2127–AH30

Federal Motor Vehicle Safety Standards: Light Vehicle Brake Systems

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

ACTION: Withdrawal of rulemaking.

SUMMARY: This action withdraws a rulemaking action initiated with the issuance of a proposal in 1996. In that proposal, NHTSA proposed to extend the requirements of the passenger car brake system standard to trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 4,536 kilograms (10,000 pounds) or less. In a 1997 final rule, NHTSA extended the passenger car brake requirements to trucks, buses, and multipurpose passenger vehicles with GVWRs of 3,500 kilograms (7,716 pounds) or less. At that time, the agency deferred its decision on the issue of whether to include vehicles with GVWRs between 3,501 kilograms and 4,536 kilograms.

NHTSA believes that the limited safety benefit that could be derived from requiring these vehicles to comply with Standard No. 135 would not be justified by the considerable costs and burden of redesigning their brake systems. In response to comments by the vehicle manufacturers about the proposal, NHTSA conducted the passenger car brake sequence tests on four late-model vehicles with GVWRs between 3,501 kilograms and 4,536 kilograms. All vehicles were tested to the hydraulic brake standard, which specifies performance standards for hydraulic braking systems on hydraulically-braked vehicles with a GVWR greater than 3,500 kilograms (7,716 pounds). All of the tested vehicles failed some aspect(s) of the test sequence, tending to confirm manufacturers' assertions that redesign of the braking systems of vehicles in this category may be necessary to meet the passenger car brake standard. Accordingly, NHTSA is withdrawing the rulemaking action initiated in 1996.

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For legal issues: Mr. Walter Myers, Attorney-Advisor, Office of the Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, SW, room 5219, Washington, DC 20590.

SUPPLEMENTARY INFORMATION:

A. Background

(1) Rulemaking History

In order to harmonize U.S. brake standards with international brake standards, NHTSA published a final rule on February 2, 1995, establishing a new Federal Motor Vehicle Safety Standard (Standard) No. 135, *Passenger car brake systems (60* FR 64 11). [1] This new standard replaced Standard No. *105, Hydraulic brake systems,* insofar as Standard No. 105 applied to passenger cars.

On May 2, 1996, NHTSA published a Notice of Proposed Rulemaking (NPRM) proposing to extend the applicability of Standard No. 135 to all multipurpose passenger vehicles, trucks, and buses with GVWRs of 4,536 kilograms (kg) (10,000 pounds (lbs)) or less (61 FR 19602) (hereinafter referred to as "LTVs," meaning light trucks and vans). The agency stated in the NPRM that the extension of the provisions of Standard No. 135 to LTVs would be consistent with the agency's policy of achieving international harmonization wherever possible and consistent with the agency's statutory mandate to increase motor vehicle safety in the U.S.

NHTSA received 8 comments in response to the NPRM, 5 from vehicle manufacturers, 2 from vehicle trade

[1] This standard was subsequently renamed Light Vehicle Brake Systems.

associations, and 1 from a safety advocacy group. Most of the vehicle manufacturers and the American Automobile Manufacturers Association commented that compliance with Standard No. 135 may require major modification of the brake systems of vehicles with GVWRs above 3,629 kg (8,000 lbs). They asserted that brake performance requirements in Standard No. 135 are more stringent than those in Standard No. 105. They argued that, because of the heavier weight range of these vehicles, they may not be able to meet the requirements of Standard No. 135 without substantial brake system redesign. They further commented that brake systems on vehicles with GVWRs greater than 8,000 lbs may have undesirable consumer characteristics such as increased noise, wear, and pedal travel if required to meet Standard No. 135 requirements.

In response to those comments, NHTSA decided to extend the applicability of Standard No. 135 only to those with GVWRs of 3,500 kg (7,716 lbs) or less, and reserved for possible later action the issue of whether to further extend those requirements to LTVs with GVWRs between 3,501 kg and 4,536 kg. Consequently, on September 30, 1997, NHTSA published a final rule in the **Federal Register** extending the provisions of Standard No. 135 to trucks, buses, and multipurpose passenger vehicles with GVWRs of 3,500 kg (7,716 lbs) or less, effective December 1, 1997, and becoming mandatory for these vehicles beginning September 1, 2002 (62 FR 5 1064). The agency stated, however, that the issue of extending the applicability of Standard No. 135 to vehicles with GVWRs between 3,501 kg (7,716 lbs) and 4,536 kg (10,000 lbs) would be separately addressed after reviewing brake test data submitted by Ford Motor Company (Ford) and the agency's own testing and analysis of vehicles in this weight range.

(2) Harmonization Considerations

The European equivalent of Standard No. 135 is ECE R13–H, which is applicable to passenger vehicles with a maximum seating capacity of nine. This category of vehicles is designated as the "Ml '' category. Although this category of vehicles has no weight classification, the weight of such vehicles rarely exceeds 3,175 kg (7,000 lbs) . NHTSA's proposal to extend the applicability of Standard No. 135 to vehicles with GVWRs of 4,536 kg (10,000 lbs) or less would have extended the applicability of Standard No. 135 to vehicles in as many as 4 European vehicle classes not covered by R13–H, such as categories M2, M3, N2, and N3. In the interest of maintaining harmonization as nearly as possible with European standards, however, the agency believed 3,500 kg (7,716 lbs) rather than 3,629 kg (8,000 lbs) to be the logical breakpoint for the applicability of Standard No. 135 since this value is also used in the European system as the maximum GVWR for the "N 1'' category, which designates light non-passenger vehicles.

(3) Test Data

Because of the comments of vehicle manufacturers that some of their vehicles between 3,629 kg (8,000 lbs) and 4,536 kg (10,000 lbs) would not be able to comply with all the requirements of Standard No. 135, NHTSA conducted the current brake test sequence of Standard No. 135 on 4 late-model domestic trucks and vans in that GVWR range at the agency's Vehicle Research and Test Center (VRTC). Two pickup trucks and 2 full-size vans were leased for the testing. All had front disc and rear drum brakes, fixed proportioning valves, and front/rear hydraulic circuit splits. Two were equipped with rear-axle-only antilock brake systems (ABS) , while the other two were equipped with 4-wheel ABS. The vehicles were instrumented as necessary to perform the Standard No. 135 test sequence, excluding the torque wheel portion of the sequence. Additional stops were made for certain portions of the test using a 700-Newton (N) pedal force in the cold effectiveness, engine off, hydraulic circuit failure, and failed power assist tests. These higher pedal force stops were made to collect data on stopping capability in response to the NPRM comments of some vehicle manufacturers. These additional stops were made only if there had been no wheel lockup during stops utilizing the currently-prescribed 500-N pedal force. Had there been wheel lockup with a pedal force of 500 N, higher pedal forces would not have improved the stopping performance of the vehicles concerned. The test report, entitled "Extension of FMVSS No. 135 to 8000–10,000 Pound Vehicles," has been placed in the agency's docket (Docket 85-06, Notice 13–001).

The tests confirmed that extending the current requirements of Standard No. 135 to vehicles in the 3,629 kg (8,000 lbs) to 4,536 kg (10,000 lbs) weight range would pose compliance problems for them unless their brake systems were modified, possibly extensively. NHTSA found that the tested vehicles were unable to achieve the specified passenger car brake performance level in a number of the test sections. The failed hydraulic circuit tests, S7.10 (front circuit), resulted in three of the four vehicles failing to meet the requirements for the lightly loaded condition, a stopping distance of 168 m from a speed of 100 km/h. The Ford E-350 stopped in approximately 210 m, the Ford F-350 stopped in approximately 280 m, and the Dodge Ram 2500 stopped in approximately 195 m.

The brake power assist unit inoperative test, S7.11, resulted in all four vehicles failing to meet the requirement of a 168 m stopping distance from a speed of 100 km/h with a maximum pedal force of 500 N. Both the Dodge Ram and the GM G30 had a stopping distance of over 300 m when tested with a maximum pedal force of 500 N. When tested with a pedal force of 700 N, the Dodge Ram had a stopping distance of approximately 280 m, and the GM G30 had a stopping distance of approximately 220 m. The remaining two vehicles passed the test with the 700 N pedal force allowance.

None of the vehicles passed all parts of the hot performance and recovery performance tests, S7.14 and S7.16, respectively. The performance requirements in S7.14 (first stop) and S7.16 are calculated for each vehicle based on its measured stopping distance and its average deceleration achieved during the shortest cold effectiveness stop in S7.5, Cold Effectiveness. With regard to the first of two hot stops required, the Ford F-350 stopped in a distance of approximately 116 m, thereby exceeding the required stopping distance of 104 m. The Dodge Ram stopped in approximately 118 m, exceeding the required stopping distance for the vehicle of 100 m. In the second hot performance stop, the Ford F-350, the Dodge Ram, and the GM G30 failed to meet the 89 m stopping requirement with a maximum pedal force of 500 N. The F-350 required approximately 115 m, the Ram required approximately 105 m, and the G30 required approximately 99 m to stop from 100 km/h. At a 700 N maximum pedal force allowance, the Dodge Ram and the GM G30 both failed the 89 m requirement, with the Ram requiring approximately 104 m, and the G30 requiring approximately 93 m to stop from 100 km/h.

The Dodge Ram was the only vehicle to fail the recovery test (upper limit) with both a 500 N and a 700 N pedal force limit. At 500 N, the Ram required approximately 102 m to stop from a speed of 100 km/h and this vehicle required approximately 100 m to stop with the 700 N pedal force limit thereby exceeding the required stopping distance of 86 m. The Ford F-350 failed

the recovery test when tested with the 500 N pedal force limit, with a stopping distance of 93 m, exceeding the maximum allowable distance of 91 m. At a maximum pedal force of 700 N, the F-350 stopping distance was approximately 83 m, passing the recovery test requirements. The Ford E–350 and the GM G30 met the stopping distance requirements for the recovery test at both 500 N and 700 N maximum pedal force.

B. Discussion

In the September 30, 1997 final rule, the agency estimated annual sales of LTVs with GVWRs between 3,500 kg (7,716 lbs) and 4,536 kg (10,000 lbs) to be 0.5 to 0.7 million, or about 10 to 13 percent of all LTVs sold with GVWRs less than 4,536 kg (10,000 lbs). The agency stated that, based on such a low production volume, brake system redesign for such vehicles without sufficient leadtime could be particularly burdensome. Based on the FMVSS No. 135 performance tests failed by these vehicles, it is apparent that several brake sub-systems would need modification to meet all the requirements of the standard. The failure to meet the requirements of the hydraulic circuit failure test, S7.10 (front circuit), indicates that more braking capacity is required by the front brakes or the circuits could be modified such that each circuit contains one front and one rear brake, a common design for passenger cars. In order to meet the brake power assist unit inoperative requirements, the braking capability of the foundation brake system would have to be improved, which would require larger surface areas for the friction components, larger force actuation components (calipers and wheel cylinders), or a modification to master cylinder to allow for lower pedal force. To meet the hot and recovery performance requirements, S7.14 and S7.16, additional heat venting of the primary braking components at each wheel, or larger components requiring less stress or pressure on force actuation and friction components would be required to reduce fade.

Further, virtually all brake sub-systems on the vehicles tested would have to undergo some modification to meet all the FMVSS 135 requirements, since their brake systems are not currently designed to meet the sub-system failure tests in the standard. As previously stated, the resulting brake systems could have undesirable consumer characteristics such as increased noise, wear, and pedal travel.

Review of the National Automotive Sampling System (NASS) crash data for the calendar years 1995-l 997 indicates that light trucks and vans (LTVs) with a GVWR below 4,536 kg (10,000 lbs.) were involved annually in about 1,018,130 crashes that resulted in non-serious injuries. From the same data base, LTVs with a GVWR between 3,500 and 4,536 kg (7,716 and 10,000 lbs.) were involved annually in about 5 5,270 crashes that resulted in non-serious injuries, or about 5.4 percent of the total LTV non-serious crash experience. The total LTV population was involved annually in about 46,940 crashes that resulted in serious injuries, based on the NASS files. LTVs with a GVWR between 3,500 and 4,536 kg were involved in about 3,050 of these crashes, or about 6.5 percent of the total annual LTV crash experience in which serious injuries occurred. Regarding fatal crashes, data from the Fatality Analysis Reporting System (FARS) for the calendar year 1996 show that LTVs with a GVWR of 4,536 kg or less were involved in 11,035 crashes resulting in fatal injuries. LTVs with a GVWR between 3,500 and 4,536 kg were involved in 1,267 crashes that resulted in fatality in 1996, or about 11.5 percent of the total fatalities involving LTVs that year. The NASS data for 1995-1997 were also queried for evidence of brake performance problems that could be obtained from the crash experience data. The data indicate that braking was an LTV crash avoidance action in about 26.7 percent of tow away crashes involving LTVs with a GVWR of 4,536 kg or less. For LTVs with a GVWR between 3,500 and 4,536 kg, braking was an LTV crash avoidance action in about 2 1.8 percent of the tow away crashes. Braking was an LTV crash avoidance action in about 8.6 percent of crashes resulting in fatality, according to the 1996 FARS, while LTV braking was a crash avoidance action in about 12.2 percent of the fatal crashes involving with LTV in the 3,500 to 4,536 kg range.

The agency estimates that LTVs with a GVWR between 3,500 and 4,536 kg constitute about 10–13 percent of all registered LTVs, which is consistent with their annual production and sales figures in the recent past. The market share of LTVs has increased dramatically over the past five years when compared to the increase in total production of vehicles with a GVWR of 4,536 kg or less. However, the vast majority of the vehicles that are penetrating the passenger cars market are light trucks and vans with a GVWR under 3,500 kg, which are being driven as an alternative to passenger cars. Vehicles with a GVWR between 3,500 and 4,536 kg are primarily commercial vehicles, vans and pick-up trucks driven mostly by business organizations to deliver goods and services during business hours. The crash data and crash avoidance action data show that these vehicles are under represented in terms of crash frequency when compared to their portion of the LTV population. The fatal crash frequency for these vehicles is consistent with their estimated numbers as a percentage of the LTV population, as is the frequency in which braking is reported as a crash avoidance action. These data strongly indicate that there are no inordinate crash or braking problems associated with LTVs in the 3,500 to 4,536 kg weight range.

Although specific manufacturer design strategies are not known to the agency, and resulting costs cannot be precisely quantified, the agency believes that the potential safety benefits of modifying vehicles in the 3,500 to 4,536 kg weight range to meet the requirements of Standard No. 135 are not substantial enough to justify the expected costs of these modifications. As previously stated, vehicles in this weight range are estimated to represent about 10 to 13 percent of all trucks and vans with a GVWR below 10,000 lbs. Sport utility and passenger vehicles in this weight range, such as the Chevy Suburban are estimated to represent a small portion of the total vehicles in this weight range.

The two regulatory options available in selecting the appropriate brake system standard for vehicles in this weight range are: (1) keeping them in Standard No. 105, or (2) further extending the applicability of Standard No. 135 to include them. Keeping them under Standard No. 105 appears to be the more appropriate option, given that Standard No. 135 was originally developed to harmonize passenger car braking standards with vehicles under the ECE regulations for light passenger vehicles, which are in the Ml category. Even if Standard No. 135 is modified to permit a brake pedal force of 700 N, this would not improve sufficiently the performance of many of the vehicles in the 3,500–4,536 kg weight range to bring them into compliance with many of the stopping distance requirements in Standard No. 135. Standard No. 105 allows stopping distance requirements for vehicles with a GVWR between 3,500 and 4,536 kg in this weight range which are slightly longer than the distance allowed for smaller vehicles. Standard No. 135 specifies wheel lock sequence performance to address directional stability during braking, while Standard No. 105 has no similar requirements. On the other hand, the

pre-burnish test, the water test, and the dynamic emergency brake test of Standard No. 105 are not included in Standard No. 135.

C. Agency Decision

NHTSA has decided that Standard No. 105 should continue to apply to vehicles with GVWRs between 3,501 kg (7,716 lbs.) and 4,536 kg (10,000 lbs.) for continuity with current requirements. Continuing to require vehicles with a GVWR above 3,500 kg (7,716 lbs.) to comply with Standard No. 105 would provide most of the safety benefits of Standard No. 135, while eliminating the need for possibly significant brake system redesign if such vehicles were required to comply with Standard No. 135. NHTSA believes that, given the relatively low sales volume of these vehicles, redesign of their brake systems would be particularly burdensome and any safety benefits would be limited.

In addition, extending Standard No. 135 to vehicles in the 3,501–4,536 kg weight category would unnecessarily move the standard away from harmonization with its European counterpart, ECE R13–H. Standard No. 135 was established in the first instance pursuant to NHTSA's ongoing efforts to harmonize its passenger car braking standards with international standards, consistent with the agency's statutory mandate to increase motor vehicle safety. By continuing to align the vehicle applicability of Standard No. 135 with the ECE categories M 1 and N 1, the agency will ensure that future harmonization efforts will be easier to implement. The vehicles to which Standard No. 135 apply will continue to be equivalent to the vehicles covered by ECE categories M 1 and N 1. Standard No. 105 will continue to apply to trucks, buses, and multipurpose passenger vehicles, the equivalent to ECE categories M2, M3, N2, and N3. NHTSA believes, therefore, that alignment of its standards in that way will facilitate the implementation of future harmonization efforts.

In view of the above, the agency withdraws the rulemaking action that it initiated in its May 1996 NPRM.

Authority: 49 U.S.C. 322, 30111, 30115, 30 117, and 30 166; delegation of authority at 49 CFR 1.50.

Issued on April 20, 1999.

Ricardo Martinez,

Administrator.

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