§ 1180.58 Records related to performance.

(a) A grantee shall keep records revealing progress and results under the grant.

(b) The grantee shall use the records under paragraph (a) of this section to:

(1) Determine progress in accomplishing objectives; and

(2) Revise those objectives, if necessary and authorized under the grant.

13. Section 1180.59 is revised to read as follows:

§ 1180.59 Applicability.

Subparts B and C (§§ 1180.30 through 1180.58) apply to General Operating Support assistance, except as otherwise provided in these regulations.

14. Section 1180.75 is amended by revising paragraph (d) to read as follows:

§ 1180.75 Funding and award procedures.

* * * * *

(d) A museum receiving assistance under this subpart must submit a final financial and narrative report that evaluates the success of the assessment and actions taken by the museum as a result of the assessment. IMS may request that the report be submitted up to 12 months after the close of the grant period.

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[20 U.S.C. 961–68]

[FR Doc. 95–30016 Filed 12–12–95; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 92–29; Notice 7; Docket No. 93–06; Notice 4; Docket No. 93–07; Notice 4]

RIN 2127–AF96; 2127–AF97; 2127–AF98; 2127–AF99

Federal Motor Vehicle Safety Standards; Stability and Control of Medium and Heavy Vehicles During Braking; and Stopping Distance Requirements

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

ACTION: Final rule, petitions for reconsideration.

SUMMARY: This document responds to petitions for reconsideration of a final rule that amended Standard No. 105, *Hydraulic Brake Systems*, and Standard No. 121, *Air Brake Systems*, to require medium and heavy vehicles be equipped with an antilock brake system (ABS). This document also responds to petitions for reconsideration of final rules that established 60 mph stopping distance requirements for hydraulic-braked heavy vehicles and reinstated such requirements for air-braked heavy vehicles.

DATES: Effective Dates: The amendments to § 571.101 are effective January 12, 1996, the amendments to § 571.105 are effective March 1, 1999, and amendments to § 571.121 are effective March 1, 1997.

Compliance dates: Compliance with the amendments to 49 CFR 571.101 and 49 CFR 571.105 with respect to hydraulic-braked vehicles will be required on and after March 1, 1999. Compliance with 49 CFR 571.101 and 49 CFR 571.121 with respect to air-braked tractors will be required on and after March 1, 1997 and compliance with 49 CFR 571.101 and 49 CFR 571.121 with respect to air-braked trailers and single unit trucks and buses will be required on and after March 1, 1998.

Petitions for Reconsideration: Any petitions for reconsideration of this rule must be received by NHTSA no later than January 12, 1996.

ADDRESSES: Petitions for reconsideration of this rule should refer to the above referenced docket numbers and should be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

For non-legal issues: Mr. George Soodoo, Office of Crash Avoidance, National Highway Traffic Safety Administration, 400 Seventh Street SW., Washington, D.C. 20590 (202) 366–5892.

For legal issues: Mr. Marvin L. Shaw, NCC–20, Rulemaking Division, Office of Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street SW., Washington, D.C. 20590 (202) 366–2992.

SUPPLEMENTARY INFORMATION:

I. Background

On March 10, 1995, NHTSA published three final rules that amended the agency's brake standards for medium and heavy vehicles.[1] (60 FR 13216). One of those final rules requires heavy vehicles to be equipped with an antilock brake system (ABS) to improve the directional stability and control of these vehicles during braking.[2] The other two final rules announced NHTSA's decision to reinstate stopping distance requirements for air-braked heavy vehicles and to establish such requirements for hydraulic-braked heavy vehicles. (60 FR 13286, 13297)

As specified in the ABS final rule, in addition to the ABS requirement, truck tractors are required to comply with a 30-mph braking-in-a-curve test using a full brake application on a low coefficient of friction surface representing a wet surface. All powered heavy vehicles are also required to be equipped with an in-cab lamp to indicate ABS malfunctions. Truck tractors and other towing vehicles are required to be equipped with two separate in-cab lamps: one indicating malfunctions in the towing vehicle ABS and the other indicating malfunctions in the ABS on one or more towed trailers and/or dollies. Trailers (including dollies) produced during an initial eight-year period are also required to be equipped with an external malfunction

[1] Hereinafter referred to as ''heavy vehicles.''

[2] Hereinafter referred to as ''the ABS final rule.''

indicator that was to be visible to the driver through the rearview mirror of the towing vehicle.

NHTSA issued the ABS final rule pursuant to the Motor Carrier Act of 1991, a part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Section 4012 of ISTEA directed the Secretary of Transportation to initiate rulemaking concerning methods for improving braking performance of new commercial motor vehicles,[3] including truck tractors, trailers, and their dollies. Congress specifically directed that such a rulemaking examine antilock systems, means of improving brake compatibility, and methods of ensuring effectiveness of brake timing. The Act required that the rulemaking be consistent with the Motor Carrier Safety Act of 1984 (49 U.S.C. § 31147) and be carried out pursuant to, and in accordance with, the National Traffic and Motor Vehicle Safety Act of 1966 (Safety Act) (49 U.S.C. § 30101 *et seq.*).

II. Petitions for Reconsideration

NHTSA received petitions for reconsideration from the American Trucking Associations (ATA), the American Automobile Manufacturers Association (AAMA), the Truck Trailer Manufacturers Association (TTMA), the Heavy Duty Brake Manufacturers Council (HDBMC), the United Parcel Service (UPS), vehicle manufacturers, including Chrysler, Navistar, AM General, and brake or component manufacturers including Midland-Grau, Jenflo, AlliedSignal, Rockwell WABCO, Rockwell International, Kelsey-Hayes, and Ferodo America.

The petitioners generally agreed with NHTSA's decision to require all heavy vehicles to be equipped with ABS and to comply with the stopping distance requirements and to require truck tractors to comply with the braking-in-a-curve requirements. Nevertheless, they requested modifications of various aspects of those requirements. The issues raised by the petitioners include the definition of antilock brake systems and the wheels to which the ABS requirement applies, the ABS requirement's applicability to hydraulic-braked vehicles, the implementation schedule, certain aspects of the performance tests, certain aspects of the malfunction indicator requirements, and the requirements addressing trailer ABS powering. The agency responds to each of the issues raised by the petitioners throughout the remainder of the document.

[3] Vehicles with a gross vehicle weight rating (GVWR) of 26,001 pounds or greater.

III. Definitions Related to Antilock Brake Systems

A. Definition of Antilock Brake Systems

In the ABS final rule, NHTSA decided to require that each heavy vehicle be equipped with an antilock brake system that satisfies the following definition:

> ''*Antilock braking system*'' means a portion of a service brake system that automatically controls the degree of rotational wheel slip during braking by:
>
> (1) Sensing the rate of angular rotation of the wheels;
>
> (2) Transmitting signals regarding the rate of wheel angular rotation to one or more devices which interpret those signals and generate responsive controlling output signals; and
>
> (3) Transmitting those controlling signals to one or more devices which adjust brake actuating forces in response to those signals.

To meet this definition, an antilock braking system must be closed-loop.[4] With respect to the definition for ABS, the input is the act of sensing the rate of angular rotation of the wheels, which is typically done by a device known as a wheel speed sensor. The output is the act of transmitting responsive controlling output signals to a device or devices known as modulator valves that adjust brake actuating forces in response to those signals.

Jenflo petitioned the agency to amend the definition of an antilock braking system so that the definition did not refer to components such as wheel speed sensors, control units, and modulators. Jenflo believes that it is possible to control rotational wheel slip and impending wheel lockup without monitoring these conditions, while still providing controlled stops. In its petition for reconsideration, Jenflo submitted 56 pages of test data, but did not explain the relevance of the data to the vehicle's ABS performance.

NHTSA has decided to deny Jenflo's petition to amend the definition of ABS so as to permit open-loop systems. In previous notices, the agency discussed in extensive detail the reasons for requiring a ''closed-loop'' antilock system and for combining an equipment requirement with a dynamic test requirement for truck tractors. (60 FR 13224–13228) NHTSA's definition permits any ABS, provided that it is a closed-loop system that ensures feedback between what is actually happening at the tire-road surface interface and what the device is doing to respond to changes in wheel slip. As many brake and vehicle manufacturers commented on the September 1993 NPRM, a device that satisfies these criteria is necessary to prevent wheel lockup under a wide variety of real world conditions, thereby significantly improving safety. In contrast, a definition that permitted open-loop systems would allow systems that would not necessarily prevent wheel lockup.

NHTSA also stated that the desired safety benefits of ABS could currently be achieved only by means of both a specific equipment requirement for ABS and a dynamic performance test requirement applicable to truck tractors only. In its petition for reconsideration, Jenflo did not provide any information to support reliance solely on a dynamic performance requirement, or to support its statement that it is possible to control rotational wheel slip without monitoring wheel slip conditions. The agency therefore has decided to deny Jenflo's petition to amend the definition for antilock brake system.

B. Directly Controlled Wheel

In the ABS final rule, the agency defined ''directly controlled wheel'' to mean a wheel at which the degree of rotational wheel slip is sensed and corresponding signals are transmitted to one or more modulators that adjust the brake actuating forces at that wheel. (60 FR 13228–13230) The definition further stated that each modulator may also adjust the brake actuating forces at other wheels in response to the same signal or signals. NHTSA explained that, by ''directly controlled wheel,'' it meant that the signal provided at the wheel or on the axle of the wheel would directly modulate the braking forces of that wheel or axle.

AAMA, Chrysler, and Kelsey Hayes petitioned the agency to revise the definition of ''directly controlled wheel'' to allow the use of a single in-differential[5] or in-axle wheel speed sensor to control the rear wheel slip. Chrysler indicated that all of its pickup trucks in the 10,000–12,000 pound gross vehicle weight rating (GVWR) class now successfully use this type of sensor.

After reviewing the petitions for reconsideration regarding in-axle sensors, NHTSA has decided to revise the definition of ''directly controlled wheel'' to allow wheel speeds to be sensed at any point on the axle shaft of

[4] A closed loop control system is one which examines the output of the system and adjusts the input to the system in response to that output. This inclusion of the output (or some function of the output) as part of the input to such a system is referred to as feedback.

[5] A differential is comprised of a set of gears which establish a constant equilibrium of torques between the left-side and right-side driven wheels, and which allow the outer wheels of a vehicle to rotate at a higher speed than the inner wheels during cornering.

the wheel. This includes any point between the wheel hub and the point where the axle shaft mates with the differential output shaft. The agency believes that this modification to the definition will permit the manufacture of proven antilock systems, without any detriment to safety. This amendment is reflected in the revised definition for ''directly controlled wheel'' by adding the phrase ''either at that wheel or on the axle shaft for that wheel'' and allows two in-differential sensors to transmit corresponding signals to one or more modulators that adjust the brake actuating forces at the wheels on that axle.

NHTSA emphasizes that single in-differential sensors will only be allowed on light vehicles with GVWRs between 10,000 and 12,000 pounds. This limitation is reflected in S5.5.1 of Standard No. 105, which permits only vehicles with such GVWRs to provide direct wheel control by means of a single sensor in the drive line. The agency is concerned that sensing of rotational wheel slip at the ring gear or at other points on the driveline [6] forward of the drive axle, does not provide sufficiently precise measurements of wheel slip for effective ABS control on vehicles over 12,000 pounds. The braking distribution between the front and rear axles of heavy vehicles is different than on light vehicles, primarily because of the greater load-carrying capacity of heavy vehicles, which necessitates more braking at the rear wheels. As a result, greater braking efficiency is typically required at the rear wheels of heavy vehicles than on lighter vehicles. Based on the above considerations, the agency has decided to allow the use of a single in-axle or in-differential sensor, and include in-transmission sensors, for ABS control of rear wheel slip on vehicles with a GVWR between 10,000 and 12,000 pounds.

Rockwell WABCO requested that the agency change the definition of a ''directly controlled wheel'' to ensure that the modulator for controlling the wheels of the front axle is not used to control the wheels of the rear axle, and vice versa.

NHTSA has reviewed the definition of a ''directly controlled wheel'' and has concluded that it does not clearly state that, on single unit vehicles and full trailers, the same modulator should not be used to control both the front and rear axles. It is possible that the definition may be misinterpreted to allow a four sensor/one modulator (4S/1M) system on single unit vehicles and full trailers. As discussed in the final rule, it was the agency's intent to require at least one modulator for controlling the front axle(s) and at least one modulator for controlling the rear axle(s) of those vehicles. (60 FR 13230) In revising the definition, the agency has added the phrase ''that are on the same axle or in the same axle set,'' to make it clear that the modulator that controls a directly controlled wheel, can also control a wheel on the same axle or wheel(s) on other axles in the same tandem [7].

Based on the above considerations, NHTSA has decided to amend the definition of directly controlled wheel as follows:

> ''Directly Controlled Wheel'' means a wheel *for* which the degree of rotational wheel slip is sensed, *either at that wheel or on the axle shaft for that wheel,* and corresponding signals are transmitted to one or more modulators that adjust the brake actuating forces at that wheel. Each modulator may also adjust the brake actuating forces at other wheels *that are on the same axle or in the same axle set* in response to the same signal(s).
>
> (Italicized phrases are additions to the definition).

C. Independent Wheel Control

In the ABS final rule, NHTSA defined ''independently controlled wheel'' to mean a directly controlled wheel for which there is a modulator that adjusts the brake actuating forces at that wheel, but not at any other wheel on the same axle.

Jenflo petitioned the agency to delete the requirement for independent wheel control on truck tractors and issue what it called ''performance only'' requirements. That company stated that requiring independent wheel control is unreasonably design- restrictive and is not a performance requirement.

In the ABS final rule, NHTSA set forth the reasons for requiring independent control of at least one axle for truck tractors and the reasons for having more stringent requirements for truck tractors than for other types of vehicles. (60 FR 13230). The agency considers these reasons to be a sufficient basis for requiring independent control. Nevertheless, Jenflo has not addressed these reasons in the petition.

AAMA requested confirmation that the ABS rule requires a truck tractor to have an ABS with at least four sensors and three modulators (which are also known as channels of control)(4S/3M), a single unit vehicle to have an ABS with at least four sensors and two modulators (4S/2M), and a semitrailer to have an ABS with at least two sensors and one modulator (2S/1M). NHTSA confirms the AAMA's interpretation. In addition, the agency notes that a full trailer will be required to have an ABS with at least four sensors and two modulators (4S/2M), and a hydraulic-braked single unit vehicle with a GVWR between 10,000 lbs. and 12,000 lbs. will be required to have at least three sensors and two modulators (3S/2M).

IV. Overall Brake Test Sequence

A. Performance Test Sequence

In Table I of the stopping distance final rule for braked vehicles, NHTSA specified the sequence in which the brake tests are to be conducted for compliance testing, as follows:

(1) Burnish.

(2) Stops with vehicle at gross vehicle weight rating:

(a) Straight line stop at 60 mph on a peak friction coefficient surface of 0.9, for a truck tractor with a loaded unbraked control trailer, or for a single-unit vehicle (straight line stop).

(b) Braking-in-a-curve stop at 30 mph on a peak friction coefficient surface of 0.5, for a truck tractor with a loaded unbraked control trailer.

(c) Emergency brake stops at 60 mph on a peak friction coefficient surface of 0.9, for a single-unit vehicle. Truck tractors are not required to be tested in the loaded condition.

(3) Parking brake test with vehicle loaded to GVWR.

(4) Stops with vehicle at unloaded weight plus up to 500 lbs.

(a) Straight line stop at 60 mph on a peak friction coefficient surface of 0.9, for a truck tractor or for a single-unit vehicle.

(b) Braking-in-a-curve stop at 30 mph service brake stops on a peak friction coefficient surface of 0.5, for a truck tractor.

(c) Emergency brake stops at 60 mph on a peak friction coefficient surface of 0.9, for a truck tractor or for a single-unit vehicle.

5. Parking brake test with vehicle at unloaded weight plus up to 500 lbs.

6. Final inspection of service brake system for condition of adjustment. (60 FR 13297)

AAMA, HDBMC, Midland-Grau, and Navistar requested that the agency revise the performance test sequence in Standard No. 121 by placing both braking-in-a-curve tests for truck tractors immediately after the burnish. These petitioners stated that such a change would result in certain

[6] The driveline constitutes those parts of the vehicle that transfer power from the transmission to the drive wheels, including the drive shaft, differential, and axle shafts of the driven wheel.

[7] An arrangement of two or more axles placed in proximity one behind the other.

advantages, including (1) allowing test track wetting to be accomplished more efficiently; (2) minimizing ABS performance variability since the tires would not be previously subject to the high speed stopping distance tests on a high coefficient of friction surface; and (3) minimizing vehicle transfers for those manufacturers that use a different test site for their low coefficient of friction tests.

After reviewing the petitions, NHTSA has decided to amend the performance test sequence by placing both braking-in-a-curve tests immediately after the burnish. The agency believes that conducting the braking-in-a-curve tests at the beginning of the test sequence simplifies the procedure and reduces the testing burden without compromising safety. The agency has specified the GVWR loading condition first because it coincides with the GVWR/LLVW sequence of the other stopping performance tests. This decision is also supported by the fact that performance variability due to tire wear and flat-spotting will be minimized if the GVWR test runs are conducted first, since wheel lock is more likely to occur in the lightly-loaded condition.

B. Brake Adjustment During Test Sequence

AAMA, HDBMC, Midland-Grau, and Rockwell International petitioned NHTSA to permit manual brake adjustments to be made after each part of the test sequence in Standard No. 121. The petitioners are concerned about the potential for over-adjustment and the impact on the subsequent tests in the sequence, during testing with automatic brake adjusters. Standard No. 121 currently requires that air-braked vehicles be equipped with automatic brake adjusters. The standard allows three manual adjustments, at the manufacturer's recommended intervals, during the burnish sequence, but does not allow subsequent adjustments during the testing itself.

NHTSA agrees with the petitioners that there is a potential for over-adjustment by automatic brake adjusters during a series of full treadle brake applications, as is required for the braking-in-a-curve tests. The agency also believes that it is important to specify precisely where in the test sequence the manual adjustments are allowed, since this enhances uniformity of the test procedures. The agency nevertheless believes that adjusting the brakes as frequently as after each test sequence is inappropriate, because it would be less representative of real world braking conditions.

Based on the above considerations, NHTSA has decided to amend the test sequence in Standard No. 121 by allowing some adjustment during testing. It is allowing two manual brake adjustments for truck tractors - the first at the end of the braking-in-a-curve tests and the second at the end of the GVWR parking brake test. It is also allowing one manual brake adjustment for single unit trucks and buses, at the end of the GVWR parking brake test. The agency believes that allowing a limited number of additional adjustments during testing accommodates the petitioners' concerns, while preserving a well- defined test procedure that properly accounts for the newly adopted test procedures.

NHTSA believes that there is no need to allow additional brake adjustments in the test procedure for Standard No. 105 for hydraulic-braked heavy vehicles, since the brake test procedure currently specifies four burnishes (one burnish and three reburnishes) and a brake adjustment after each burnish. Moreover, hydraulic-braked vehicles are not subject to the braking-in-a-curve test.

C. Final Brake Inspection in Test Sequence

HDBMC and Rockwell International petitioned NHTSA to delete the final brake inspection requirement that is specified at the end of the stopping sequence in Table I of Standard No. 121. They claimed that there are no stated requirements necessary to satisfy the results of this inspection, and that the condition of the adjusters has little significance to the brake adjusters—condition after real world service.

NHTSA disagrees with the petitioners' claims that the final brake inspection provision is unnecessary. The agency notes that Standard No. 121 was amended to include the final brake inspection as part of the amendments for the rulemaking on automatic brake adjusters. This issue has never been included in any of the notices for the heavy vehicle ABS rulemaking. As a result, the agency cannot delete the requirement without giving the public an opportunity to comment on the issue. Moreover, the agency disagrees with the petitioners that there are no stated requirements by which a manufacturer can ensure that its vehicle complies with this inspection. Paragraph S5.9, *Final Inspection*, specifies that the inspection is conducted to determine the condition of adjustment and for the brake indicator display, in accordance with S5.1.8 and S5.2.2 (i.e., brake adjustment within the limits recommended by the vehicle manufacturer). Based on these considerations, the agency has decided to deny the petitioners' request to delete the provision regarding the final brake inspection.

V. Braking-In-A-Curve Test

A. General Considerations

Navistar requested that the agency eliminate the braking-in-a-curve test for ABS-equipped truck tractors. That company stated that such a test is redundant to the provision requiring ABS because the test would not cause any changes to the ABS equipment mandated by the ABS equipment requirement.

NHTSA disagrees with Navistar's claim that the braking-in-a-curve performance test is redundant. As explained in the ABS final rule, the braking-in-a-curve test provides an important check of ABS performance. Merely having the ABS definition does not ensure that an antilock system will provide an acceptable level of performance. The test serves to evaluate the basic performance of an antilock system. The agency notes that the industry, through the Motor Vehicle Safety Research Advisory Committee (MVSRAC), has previously endorsed and recommended to the agency essentially the same dynamic performance test that is contained in the ABS final rule. The agency further notes that Navistar provided no support for its claim that the braking-in-a-curve performance requirement for truck tractors is redundant. Based on the above considerations, the agency has decided to deny Navistar's request to delete the braking-in-a-curve test for truck tractors equipped with antilock systems.

ATA requested that the agency apply the braking-in-a-curve performance requirements to single unit vehicles and trailers. ATA also requested that the agency consider making the requirements less design-restrictive by permitting, for an interim period, the option of meeting either the equipment requirement or the performance requirement.

While NHTSA agrees with ATA's goal of having a performance test for all heavy duty vehicles and not just for tractors, the agency believes that it is premature to do so at this time.

Thus, NHTSA has decided to deny ATA's requests to apply the braking-in-a-curve test to single unit vehicles and trailers at this time. In the ABS final rule, the agency discussed in detail the reasons for including a performance test for truck tractors. (60 FR 13230–13232) One of those reasons was that extensive truck tractor testing conducted by the

agency and the industry indicated that the braking-in-a-curve test on a low mu surface is an objective, repeatable, and practicable procedure for evaluating a heavy vehicle's antilock braking system. However, for other heavy vehicles, the agency decided not to apply the braking-in-a-curve test at that time due to the need to conduct additional testing to ensure that these vehicles could be safely tested to the braking-in-a-curve maneuver. NHTSA is currently planning vehicle research to develop such a procedure for other vehicles and, should the research be successful, will consider adding performance tests for these vehicles to the standard.

As explained in the final rule, NHTSA regards the braking-in-a-curve requirement as a complement to the ABS equipment requirement, and not as an alternative to it. (60 FR 13231) The braking-in-a-curve test alone can neither evaluate the overall effectiveness of ABS nor ensure the use of a closed-loop system. Such an evaluation would require an array of performance tests such as split mu tests, surface transition tests, and stopping distance performance tests. However, as indicated above, the braking-in-a-curve test is an objective, repeatable, and practicable procedure for evaluating the performance of a vehicle's ABS, and will be used by the agency to complement the ABS equipment requirement. Based on these considerations, the agency has decided to deny ATA's request to allow vehicle manufacturers the option of complying either with the equipment requirement or with the braking-in-a-curve requirement.

B. Type of Brake Application

In the ABS final rule, NHTSA decided to specify that a driver conducting the braking-in-a-curve test must make a full treadle application, i.e., apply the brake at a rate sufficient to reach a pressure of 100 psi within 0.2 seconds, in at least one of the treadle valve's output circuits. The agency believed that these values properly represent full brake applications in terms of both the rate of application and level of output pressure. (60 FR 13234) This brake application is intended to evaluate worst case braking applications in an aggressive or ''hard'' stop.

AAMA, Allied Signal, HDBMC, and Midland-Grau petitioned NHTSA to change the definition of full-treadle brake application to allow treadle pressure of 60 psi in 0.2 seconds, or maximum treadle travel in 0.2 seconds. The petitioners claim that some pneumatic systems do not achieve 100 psi in 0.2 seconds, but that all systems can achieve 60 psi in that time. In support of its claim, Midland-Grau submitted data from testing performed on different antilock systems installed on various vehicles. The test data show that with the vehicles in the loaded condition, the full-treadle brake application pressures at the treadle valve were not consistently able to achieve 100 psi in 0.2 seconds. However, they were all able to achieve at least 85 psi within 0.2 seconds.

Based on NHTSA's analysis of the test data submitted by Midland-Grau, the agency has decided to amend the definition for ''full treadle brake application'' to mean a brake application in which the treadle pressure reaches 85 psi within 0.2 seconds * * * '' The agency agrees with the petitioners that not all pneumatic systems would have been able to achieve a treadle valve output pressure of 100 psi within 0.2 seconds and that such a high threshold is not necessary to represent an aggressive stop. Midland-Grau's data further indicate that the ABS would activate at brake chamber pressures below 60 psi on most heavy vehicles in the loaded condition on a test surface with a peak friction coefficient (PFC) 0.5. However, there are some systems that would need at least 60 psi at the brake chamber within 0.2 seconds to ensure sufficient air pressure availability for effective ABS control.

NHTSA has also decided to modify the definition for ''full-treadle brake application'' to include a reference to maximum treadle travel within 0.2 seconds. By ''maximum treadle travel,'' the agency means the distance that the treadle moves, from its position when no force is applied to its position when the treadle reaches a full stop. Allowing such an alternative is consistent with the agency's intent to require a brake application that simulates emergency braking. Moreover, this alternative may facilitate the introduction of certain future technologies such as electronic braking for which the pressure/time relationship at the treadle valve is not applicable.

Jenflo stated in its petition that NHTSA did not specify a duration for the full-treadle brake application. NHTSA agrees that such a duration should be specified to avoid misinterpretation of the brake application requirement. Accordingly, the agency has decided to amend S5.3.6.1 of Standard 121 to read as follows: ''using a full-treadle brake application *for the duration of the stop*, stop the vehicle * * *.'' (emphasis added)

C. Number of Test Stops for Certification

In the ABS final rule, NHTSA decided that requiring compliance with the braking-in-a-curve requirements during three consecutive stops is appropriate. The agency noted that specifying three consecutive full treadle test stops is consistent with both NHTSA's own testing at its Vehicle Research and Test Center (VRTC) and its testing in conjunction with the motor vehicle industry through the MVSRAC ABS Task Force. The agency further noted that because the ABS automatically modulates the brakes, using full treadle brake applications to test an ABS-equipped vehicle in the braking-in-a-curve maneuver requires less driver skill than using a driver-best-effort modulated brake application in the stopping distance performance tests. The agency further noted that the braking-in-a-curve test is easier to perform than the stopping distance test because it is not coupled with a stopping distance requirement. Therefore, NHTSA decided not to adopt the AAMA recommendation in the NPRM that manufacturers should be given the option of complying in only three of ten stops. Adopting that recommendation would have made the braking-in-a-curve requirement unreasonably lenient.

AlliedSignal, Rockwell WABCO, HDBMC, AAMA, and Navistar petitioned the agency to allow truck tractors to be regarded as complying with the braking-in-a-curve test if they make three successful test runs out of six attempts. The petitioners claimed that additional test runs should be permitted given that some variability may be caused by the driver's performance of braking and steering while conducting these stops. They further stated that all of the stopping distance tests of Standard No. 105, Standard No. 121, and Standard No. 135 recognize the significance of driver-best-effort variability by prescribing that just one of six attempts need to be successful to satisfy the requirement.

NHTSA believes that treating three successful runs out of six attempts as demonstrating compliance would not provide a sufficiently stringent test for antilock brake systems, whose technology has demonstrated remarkably consistent performance during vehicle testing conducted by the agency and by the motor vehicle industry. As the agency stated in the final rule, it is unlikely that driver influences will result in significant variability, since the driver does not have to modulate the brake pedal to

reduce wheel lockup and achieve the best stopping distance performance. (60 FR 13234) Nevertheless, since there may be some minor variability in the test driver's performance, the agency has decided to provide that compliance with the braking-in-a-curve test is demonstrated if a vehicle has three successful test runs out of four attempts. NHTSA believes that this number of test runs, which allows one failed test run, is appropriate for an antilock system tested to a braking-in-a-curve maneuver.

D. Initial Brake Temperature

In the March 1995 final rules, NHTSA concluded that an initial brake temperature range of between 150 °F and 200 °F is more appropriate than the proposed temperature range of 250 °F to 300 °F. The agency determined that testing using the 150 °F to 200 °F temperature range is more repeatable and results in less variation between test runs, compared to testing conducted at an initial brake temperature of 250 °F to 300 °F, particularly for the emergency brake stops.

Ferodo petitioned the agency to change the initial brake temperature to between 100 °F and 200 °F, claiming that this is a more practicable range.

NHTSA continues to believe that the initial brake temperature range of between 150 °F–200 °F is appropriate. It appears that Ferodo is not aware that broadening the initial brake temperature range makes the requirements more stringent, since the vehicle would have to comply with the requirements at any point within the specified range. The consensus of the comments received to the ABS and stopping distance NPRMs was that the agency should maintain the 150 °F–200 °F temperature range. In addition, the agency's vehicle research reached a similar conclusion. (60 FR 13235) Based on the above considerations, the agency has decided to deny Ferodo's petition to broaden the initial brake temperature to the range of 100 °F to 200 °F.

VI. Stopping Distance Performance

A. Stopping Distance Requirements for School Buses

AAMA and HDBMC petitioned the agency to allow manufacturers the option of certifying hydraulic-braked school buses to either the existing standard or the new standard with ABS, between now and March 1, 1999. They stated that, by being given such an option, manufacturers would have the incentive to offer ABS on hydraulic-braked school buses prior to 1999, and the vehicles would have to meet the more stringent second effectiveness test. HDBMC also petitioned the agency to immediately delete the first effectiveness test for school buses with a GVWR greater than 10,000 pounds.

NHTSA agrees with the petitioners' request to allow the option of meeting the new requirements, including the ABS requirements, prior to March 1, 1999. This amendment will facilitate the introduction of ABS equipped school buses. Nevertheless, the agency does not agree with HDBMC's request to immediately delete the first effectiveness test, since deleting this requirement prior to a vehicle being equipped with ABS might decrease the braking performance of school buses. NHTSA has modified S5.1.1(c) of Standard No. 105 to allow school bus manufacturers the option of certifying that their vehicles comply with the new requirements, beginning 30 days after this final rule is published.

B. Test Surface Specification

In the stopping distance final rule, NHTSA concluded that a PFC of 0.9 represents a typical dry surface and will not be a significant source of variability in the stopping distance tests. (60 FR 13289, 13290) The agency's conclusion was based on the industry-government cooperative testing to evaluate the effect of fluctuations of PFC on vehicle stopping performance.[8] Testing indicates that the expected minor variability of a high coefficient of friction surface appears to have a negligible impact on vehicle stopping distance performance. This testing led the agency to conclude that any variability in the stopping performance on a high coefficient of friction surface is more likely due to variation in the vehicle's performance than test surface variability. The agency further stated that a test surface specification of PFC 1.0 would result in practicability problems for the agency, since it would have problems finding such a surface and conducting compliance testing on such a surface.

Navistar petitioned NHTSA to specify a PFC of 1.0 instead of 0.9 for the high coefficient of friction surface on which the stopping distance performance tests are to be conducted. The petitioner claimed that the specification of PFC 0.9 will cause industry to incur costs for expensive equipment, maintenance, delays in testing and redeployment of scarce resources without any demonstrable safety improvement.

NHTSA has decided to continue to specify a PFC of 0.9 for high coefficient of friction surfaces, for the reasons set forth in the final rule. The agency notes that Navistar provided no additional information calling into question the agency's earlier conclusion that a test surface specification of PFC 1.0 would result in practicability problems for the agency. The agency therefore has decided to deny Navistar's petition.

AAMA petitioned the agency to allow the PFC of the curved test surface for the braking-in-a-curve test to be measured by the American Society for Testing and Materials (ASTM) trailer on a straight section of the curved test surface. Since the ASTM Method E1337–90 procedure specifies a straight line measurement, the agency agrees that measuring PFC on a curved road might introduce variability in the measurement as a result of lateral forces present at the tire. NHTSA therefore has decided to amend Standard No. 121 to allow the PFC of the 500-foot radius curved test surface to be measured by the ASTM skid trailer on a straight section of the test surface.

ATA requested that the agency amend S5.3.6.1 to specify that the ASTM Method E1337–90 be run either on a wet surface without further water delivery or on a dry surface with water delivery.

NHTSA believes that such an amendment about the test surface is not necessary. The agency's skid trailer measurements taken at VRTC show a negligible difference (i.e., less than 0.05) for PFC measurements for a surface that is ''double wetted'' as compared with an already wet surface. This is the same data variability that VRTC obtains from the skid trailer measurements of a wetted surface when one type of wetting is used. Therefore, if a wet test surface is wetted again just prior to skid trailer testing, the level of stringency of the test would be essentially the same as that for a ''single wetting'' condition.

C. Wheel Lockup Restrictions

AlliedSignal, AAMA, HDBMC, and Midland-Grau petitioned NHTSA to clarify the wording in S5.3.1 and S5.7.1 of Standard No. 121 to explicitly state that ''unlimited wheel lockup is allowed during partial failure stops,'' as is stated in S6.10.2(e) of Standard No. 105.

NHTSA has decided that it is appropriate to modify the regulatory language in S5.7.1 of Standard No. 121 to explicitly allow unlimited wheel lockup during emergency brake stops. The agency emphasizes that this amendment serves merely to make it clear that unlimited wheel lockup is allowed during emergency brake system performance tests. While the agency intends to allow unlimited wheel lockup during emergency brake stops, it does not intend to allow such unlimited wheel lockup for service brake stops in

[8] Public Files Docket PF88–01, MVSRAC ABS Task Force, Round Robin No. 1.

S5.3.1 of Standard No. 121. NHTSA notes that this is only a clarification and does not change the requirements that were adopted in the March 1995 final rules.

D. Burnish Procedure

On May 15, 1995, NHTSA issued a notice that terminated rulemaking to amend Standard No. 105 and Standard No. 121 with respect to the burnish procedures for medium and heavy vehicles. (60 FR 25880) The agency determined that it would be unnecessary to extend the period during which a manufacturer may choose between two burnish procedures. The agency reasoned that its decision was appropriate because manufacturers have been certifying compliance to the brake standards, based on the ''new'' more representative burnish procedure, since September 1994.

In response to the March 1995 final rules, Navistar petitioned the agency to allow, indefinitely, the option of using either the old or the new burnish procedure.

As explained in the May 1995 termination notice, the new burnish procedure is currently in effect. Therefore, the issue of allowing the option of using the old procedure is moot.

E. Definition of Nonsteerable Axle

In the stopping distance final rule, NHTSA stated that wheel lockup is permitted at certain wheels, including ''any wheel on a nonsteerable axle other than the two rearmost nonliftable, nonsteerable axles * * *, for any duration * * *.'' (see paragraph S5.3.1(a))

AAMA requested the agency to make it clear that a nonsteerable axle is an axle that does not steer by means of a driver-controlled mechanism, and that a self-steering axle would be considered a nonsteerable axle.

NHTSA considers a self-steering axle to be a nonsteerable axle in this context, since such an axle is not under the control of the driver. The pertinent criterion is that an axle is only considered ''steerable'' for purposes of this requirement, if the steerability of the wheels on that axle is controlled by the steering wheel of the vehicle. Since a self-steering axle is not under the control of the driver's steering wheel, it is not considered to be steerable.

VII. ABS Malfunction Indicator Lamps

A. In-Cab Malfunction Lamp for Trailer ABS

In the final rule, NHTSA decided to require lamps in the cab of truck tractors to indicate any malfunction with the ABS of any towed vehicles. (60 FR 13244, 13245) The agency also required trailers to supply trailer ABS malfunction signals to the tractor. This requirement is essentially the same as the one proposed prior to the March 1995 final rule.

ATA petitioned the agency to delete the provision requiring in-cab indication of trailer ABS malfunctions. That organization claimed both in its comments to the NPRM and in its petition for reconsideration that such a lamp is unnecessary. It also argued that such a requirement needlessly complicates the electrical system of the tractor and the electrical connector arrangement between tractors and trailers.

NHTSA disagrees with ATA that the in-cab trailer malfunction lamp is unnecessary. Studies have shown that an in-cab malfunction lamp is a more effective means of making the driver aware of an ABS malfunction, compared with an external malfunction lamp on the trailer.[9] The agency also disagrees with ATA's statement that having two malfunction indicators unreasonably complicates the electrical systems in combination vehicles. In their comments on the NPRM, several brake and vehicle manufacturers stated that it was appropriate to have two indicators. For instance, Midland-Grau strongly opposed having a single malfunction indicator, claiming that having a single lamp would make it difficult to identify which vehicle had a malfunction without using separate diagnostic equipment. Since this issue has been addressed in detail in previous notices, and since ATA has not submitted any additional data to substantiate its claim, the agency has decided to deny ATA's request to delete the in-cab malfunction lamp for the trailer ABS.

B. Trailer-Mounted ABS Malfunction Indicator

In the final rule, NHTSA decided to require an external ABS malfunction lamp on trailers and dollies for the eight-year period during which some non-ABS-equipped tractors will be towing ABS-equipped trailers. (60 FR 13244, 13245) The requirement specified that the external lamp ''be visible within the driver's forward field of view through rearview mirrors.''

ATA and UPS petitioned the agency to delete the requirements for an external trailer-mounted malfunction lamp. They claimed that the external malfunction lamp will lead to less safety because drivers will be looking in their mirrors during braking to see whether the ABS lamp is functioning, instead of looking at traffic conditions ahead of their vehicle.

NHTSA continues to believe that it is appropriate to require an external malfunction lamp on trailers and dollies for the eight-year period during which some non-ABS-equipped tractors will be towing ABS-equipped trailers. The external malfunction lamp will indicate trailer ABS malfunctions to the driver of a non-ABS tractor and will also assist Federal and State inspectors in determining the operational status of a trailer's antilock system. NHTSA disagrees with ATA's claim that the external malfunction lamp would create a less safe condition for drivers. The agency anticipates that most drivers will look through their mirrors to check the lamp infrequently, and only when the vehicle is stationary or the road ahead is clear. The agency therefore denies the petitions from ATA and UPS to delete the trailer-mounted ABS malfunction lamp.

Midland-Grau and TTMA petitioned the agency to delete the requirement in S5.2.3.3 that the external indicator on a trailer be visible from the driver's seating position ''through the rearview mirrors.'' Midland-Grau stated that since the truck tractor manufacturers cannot control where the external lamp would be located, requiring that the lamp be visible from the cab of the truck tractor is unreasonable. TTMA stated that since trailer manufacturers have no responsibility for the mirrors, requiring the ABS malfunction lamp on dollies and trailers to be visible ''through the rearview mirrors'' is not appropriate. They also stated that there is no good, practical location for such a lamp on a dolly.

Even though NHTSA believes that the external trailer malfunction lamp is appropriate, the agency agrees with Midland-Grau and TTMA that it is inappropriate to specify a location requirement for the external malfunction lamp that is based on what can be seen in a truck tractor's rearview mirror. Compliance with such a requirement would depend on factors that are not fully controlled by the trailer manufacturer. Rearview visibility of the ABS external malfunction lamp could vary based on truck tractor design and its aerodynamic fairings, the field of view provided by the rearview mirrors, and on the location of the lamp. Accordingly, the agency has decided to delete the requirement in S5.2.3.3 for rearview mirror visibility of the lamp on trailers and dollies.

[9] ''An In-Service Evaluation of the Performance, Reliability, Maintainability, and Durability of Antilock Braking Systems for Semitrailers,'' U.S. Department of Transportation/ NHTSA Report No. DOT HS 808 059, October 1993.

TTMA requested that if the agency retains the requirement for an external malfunction lamp on the trailer, then the location of the lamp, its color, and its intensity should be specified in Standard No. 108, *Lamps, reflective devices, and associated equipment.*

NHTSA emphasizes that it is important for the driver to see the trailer mounted malfunction lamp from his or her driving position. Therefore, the agency is issuing, simultaneously with this final rule, an NPRM that proposes a lamp location on the trailer and the dolly, but without stating any visibility requirements with reference to the tractor. The agency agrees with TTMA that it is appropriate to propose the location, color, and intensity of the trailer and dolly ABS external malfunction lamp. Specifically, the agency is proposing a location for the external ABS malfunction indicator on trailers, which is similar to the location proposed by the agency when it was considering requiring a low pressure warning lamp on trailers (55 FR 4453, February 8, 1995).

ATA and UPS petitioned the agency to only require that the ABS check lamp be visible for visual inspection during a walk-around of a vehicle.

NHTSA believes that only requiring a lamp for visual inspection during a vehicle walk-around is insufficient because current designs would require more than one person to conduct the inspection, if the trailer is powered through the stop lamp circuit. One person would have to apply the brake pedal to provide ABS power to the trailer, and another would need to be outside the vehicle to view the ABS lamp, if it is located somewhere on the trailer's chassis.

C. Activation Protocol for Malfunction Indicators

In the final rule, NHTSA decided to require the malfunction indicator lamp to activate when a problem exists and not activate when the system is functioning properly. (60 FR 13246) Under this requirement, the indicator lamp is required to provide a continuous indication until a function check of the ABS is completed. Under that format, the ABS malfunction lamp extinguishes after a function check, and before the vehicle is driven. The agency explained that this ABS malfunction lamp format, together with the requirement that the system stores malfunctions until the next key-on, is necessary to enable Federal and State inspectors to determine the operational status of an ABS without moving the vehicle. In support of its decision, the agency noted that this activation pattern is consistent with the one for light vehicle ABS and the one adopted by the Economic Commission for Europe (ECE).

Navistar petitioned NHTSA to allow the vehicle to be in motion at low vehicle speed during an ABS system check so that the sensor check could be included before the lamp extinguishes. Navistar stated that the benefits of a sensor check outweigh the convenience for use by Federal or State inspectors.

As explained in the final rule, NHTSA believes that the requirement that the system store malfunctions until the next key-on is necessary to enable Federal and State inspectors to determine the operational status of an ABS without moving the vehicle. On March 10, 1995, the Federal Highway Administration (FHWA) published a notice of intent to initiate rulemaking addressing requirements for motor carriers to maintain the ABS on those vehicles that are subject to NHTSA's final rule. These requirements could include inspecting the vehicle to determine whether ABS is operational. Navistar's request to allow the vehicle to be in motion before the lamp extinguishes would impede FHWA's inspection process to determine the operational status of ABS. The agency therefore has decided to deny Navistar's petition to amend the malfunction lamp protocol to allow the lamp to stay lit until the vehicle is driven.

AlliedSignal and TTMA requested that the check of lamp function on the external trailer ABS malfunction lamp would only activate when power is supplied to the ABS *and* the vehicle is stationary. They stated that such a requirement would prevent the ABS lamp from cycling on and off whenever power is supplied or with every brake application in cases where the trailer ABS is being powered through the stop lamp circuit.

NHTSA agrees with the petitioners that such a requirement reduces potential distractions to the driver or to drivers of other vehicles caused by the lamp cycling on and off with every brake application. The agency notes that this modification retains the requirement's primary purpose, which is to indicate an ABS malfunction to the driver or to Federal and State inspection personnel. The agency has therefore decided to amend paragraph S5.2.3.3 to specify that the check of lamp function will activate the trailer ABS malfunction lamp, whenever power is supplied to the ABS and there is an absence of wheel speed (i.e., that the vehicle is stationary).

TTMA stated that the final rule does not address the operation of the ABS malfunction lamp in the event of a total loss of electrical power. That organization requested that the agency explicitly state that neither the external trailer lamp nor the in-cab lamp is required to be activated if there is a total loss of electrical power to the trailer.

A total loss of power causes the control unit to be incapable of sending a malfunction signal to the indicator lamp, since the control unit for an electronic ABS requires electrical power for operation. NHTSA notes that no vehicle system is capable of indicating a warning or malfunction in the event of a total loss of electrical power. The agency therefore believes that there is no need to specify regulatory language about the operation of the ABS malfunction lamp in the event of a total loss of electrical power.

D. Signal Storage

In the final rule, NHTSA decided to require that the ABS indicator lamp system be capable of storing information regarding any malfunction that existed when the ignition was last turned to the ''off'' position or in the case of towed vehicles, when power was last received by the ABS. (60 FR 13246, 13247) The agency explained that the malfunction storage requirement is necessary to ensure that relief drivers and Federal and State inspectors are advised about any malfunctions in a vehicle's ABS without having to move the vehicle.

Rockwell WABCO, Midland-Grau, AAMA, TTMA, and ATA requested that the agency define a pre-existing malfunction as a malfunction that existed when the ignition switch was last turned to the ''off'' position. These petitioners argued that such a definition is necessary to clarify that malfunctions that no longer exist are to be cleared and do not need to be indicated.

After reviewing the petitions, NHTSA had decided to amend S5.3.3(b) of Standard No. 105, and S5.1.6.2 (a) and (b) and S5.2.3.2 of Standard No. 121 to clarify that a pre-existing malfunction is a malfunction that existed when the ignition switch was last turned to the ''off'' position. The agency never intended to require the indication of malfunctions that have been corrected but still remain in the long-term memory of the electronic control unit.

E. ABS Failed System Requirements

In the final rule, NHTSA decided to revise Standard No. 121 to prohibit any change in brake timing in the event of ABS malfunctions that affect the generation or transmission of response or control signals. The agency explained that this modification will ensure that the brake system reverts to normal

braking without antilock control, in the event of such a malfunction in the antilock system.

AlliedSignal, HDBMC, and Midland-Grau petitioned the agency to amend S5.5.1 to require each vehicle to meet the emergency brake stopping requirements but not the service brake, actuation and release timing requirements. The petitioners are concerned about the potential for noncompliance that is not within the control of known antilock brake systems.

NHTSA believes that it is important that a heavy vehicle's brake system revert to normal braking without antilock control, in the event of an ABS malfunction that affects the generation or transmission of response or control signals in any part of the antilock system. The agency believes that it would be inappropriate to allow brake performance to degrade to the level of the emergency braking performance requirements when a typical ABS malfunction exists. The service brakes of a vehicle with a malfunctioning ABS should provide a level of braking performance that is not substantially different from the service brake performance with the ABS operational. This is necessary so that the resulting braking performance will not surprise a driver when the ABS malfunctions. Based on the above considerations, the agency has decided to deny the petitions to amend the performance requirements for a vehicle with a failed antilock system.

VIII. Power Source

A. Separate Powering for Trailer ABS

In the final rule, NHTSA decided to require full time powering for the trailer ABSs as well as requiring that the towing vehicle have a corresponding separate circuit. (60 FR 13248–13250) The agency explained that this requirement provides the strongest possible source of electrical power from the tractor to ensure the functioning of the ECU, the modulators, and a continuous malfunction indication whenever a malfunction exists.

AAMA, Midland-Grau, and TTMA requested the agency to make it clear that the phrase, ''separate electrical circuits, specifically provided to power the antilock system,'' is not intended to require that a circuit be exclusively utilized by the towed vehicle ABS. AAMA and Midland-Grau want the agency to allow other uses for this circuit, such as interior van trailer lights and multiplexing applications. ATA asserted that the requirement for a separate circuit is redundant and costly. ATA subsequently requested the agency in a September 6, 1995 letter to interpret the requirement for a separate electrical circuit.

NHTSA has decided to deny the request to permit other uses for the separate ABS circuit. As emphasized in the final rule, based on the best data available to the agency, NHTSA determined that it is necessary for the ABS on towed vehicles to receive full-time power through a circuit that is exclusively used by the towed vehicle ABS, so as to reduce the possibility of the ABS being inoperative due to lack of power. Throughout the rulemaking, the agency has intended that a towed vehicle antilock system be powered through a separate electrical circuit that is specifically provided to power the antilock system.

NHTSA based that decision on the results of its field evaluation of the durability, reliability, and maintainability of trailer ABS systems (as reported in DOT Report No. HS 808 059). That report noted that each of the three electrical powering methods that employed a separate circuit (e.g., the Cole-Hersee 13-pin connector, the separate 6-pin connector, and the separate ISO connector) was superior to the stoplamp powering approach. Each of these separate powering approaches used completely dedicated electrical circuits, which included separate, fully dedicated positive and ground wires, to power the trailer ABS ECUs. Based on the existing data, the agency therefore believes that both positive and ground wires separate from those now provided for other uses are necessary to adequately power trailer ABS systems. The agency has no technical basis for concluding that circuits that share the existing ground provided by the currently-used SAE J560 connector would provide power as well as a fully separate circuit, and therefore has no basis to conclude that such a powering scheme would be adequate.

NHTSA is aware of extensive industry efforts in various Society of Automotive Engineers' (SAE) technical committees to establish performance standards for electrical systems used to power tractor and trailer ABS systems which include objective performance test procedures, measurement criteria, and, in some cases, target performance levels. If those efforts result in the development of consensus standards that would ensure high quality tractor and trailer electrical systems that could be demonstrated to adequately supply electrical power to trailer ABS systems, the agency would consider alternative means of satisfying the safety need for adequate trailer ABS powering, other than the one which currently available data indicate is necessary.

NHTSA has been asked whether the rule allows the use of the SAE J560 connector. The agency reiterates the point it made in the final rule, i.e, that it is leaving to industry the decision as to which design approach is used to implement the performance requirement that trailer ABS be supplied power through a separate circuit and that a means of signaling trailer ABS malfunctions to the tractor also be provided. SAE J560 standard both specifies the physical connector and standardizes the uses for each of the seven pins. Thus, the connector, if it is configured as specified in the J560 standard could not be used, because there is, at most, one pin available for new uses, and up to three new ones could be required. However, if the industry chooses to reconfigure the presently-used SAE J560 connector hardware in such a manner as to meet the requirements for a separate trailer ABS powering circuit (both positive and ground) and malfunction signaling, then that solution would be permitted. The agency notes that such a solution would require multiplexing of some circuits, in order to free up enough pins for ABS power.

NHTSA agrees with TTMA's concern that ''if the auxiliary circuit is used to provide full-time power to ABS, then there would be potential for inadvertently powering the auxiliary devices, due to human error, if a manual switch is left on * * *'' Such an inadvertent powering of an auxiliary device that uses the same power circuit as the ABS could result in a low voltage condition at the electronic control unit of the ABS, thus making the ABS inoperative. Also, the suggestion that the trailer ABS powering circuit could be shared with other electrical devices and still be adequate if power to those devices were automatically switched off (except when the vehicle is stationary), lacks an objective basis to gauge whether such an automatic means would be fail-safe. If the automatic means failed, the trailer ABS systems could have insufficient power. The agency therefore considers this approach to providing separate power to trailer ABSs to be inadequate.

B. ABS Malfunction Signal Circuit and Ground

In the final rule, NHTSA specified detailed requirements about the capabilities of the electrical circuits. Among other things, paragraph S5.2.3.2 requires each non-towing trailer to have the means for connection of the antilock

malfunction signal circuit and ground, at the front of the trailer.

AAMA and Midland-Grau petitioned the agency to delete the word ''circuit'' in the phrase ''malfunction signal circuit and ground'' in S5.2.3.2, claiming that it could be interpreted as requiring a separate circuit with dedicated power and ground wires.

After reviewing the petitions, NHTSA has decided to amend paragraph S5.2.3.2 to delete the words ''and ground'' from the phrase ''malfunction signal circuit and ground.'' The agency notes that it did not intend to require a dedicated circuit for the ABS malfunction signal circuit on trailers. The agency agrees with the petitioners that since a ''circuit'' is defined as an electrical path having both a power source and a ground, the present language could be confusing, and that the language should be changed to avoid being misinterpreted.

TTMA requested that the agency amend S5.1.6.2(a) and S5.2.3.2, which require that the vehicle be equipped with an ''electrical circuit that is capable of signaling a malfunction.'' The petitioner stated that the ABS, not the electrical circuit, should be required to signal a malfunction.

NHTSA agrees that TTMA's requested language is more precise than the wording in the final rule's regulatory text, and amends the regulatory language accordingly.

AAMA, Midland-Grau, and TTMA petitioned the agency to amend S5.1.6.2(c), which currently requires that a truck or truck tractor designed to tow another vehicle have an electrical circuit that is capable of ''transmitting'' information about a malfunction. The petitioners requested that the word ''transmitting'' be changed to ''receiving.''

NHTSA believes that it would be inappropriate to substitute the word ''receiving'' for ''transmitting'' since this electrical circuit both transmits and receives information. When towing a trailer, a tractor transmits the malfunction information that it receives from the trailer's ABS to the ABS malfunction indicator lamp in the cab of the tractor or the truck. Even though the agency has decided not to change the word ''transmitting'' in S5.1.6.2 to ''receiving,'' it has decided to clarify the provision's wording.

In addition to the changes specifically addressed by the petitions, NHTSA has decided to reword all three ABS malfunction circuit and indicator provisions (S5.1.6.2, S5.2.3.2, and S5.2.3.3) to clarify them and make them more consistent in form and wording to each other and to the other parts of the standard.

In particular:

(a) The new [10] S5.1.6.2(a) is written as a general requirement.

(b) The old S5.1.6.2(a) and S5.1.6.2(b) has been combined into one paragraph.

(c) The old S5.1.6.2(c) has been renumbered S5.1.6.2(b) and has been reworded to delete references to trailer failures in a tractor requirement.

(d) The new S5.2.3.2 no longer references a ''key switch'' or an in-cab ABS malfunction lamp, because those items are not present on trailers.

(e) The new S5.2.3.3 now includes requirements for memory and check of lamp functions.

C. Tractor Trailer ABS Interface Connector

AAMA petitioned the agency to specify the electrical connector, *SAE J2272, Tractor Trailer Interface Connector,* stating that ''the industry will not be able to converge to a single solution in the absence of regulatory direction.'' AAMA claimed that without regulatory direction, the end users could prevent an industry approach from being implemented, which would result in a proliferation, rather than needed deproliferation, in connector strategies. In its petition for reconsideration, TTMA supported the J2272 connector. However, in a later submission to the docket, that organization withdrew its support of that connector. TTMA now supports a separate connector, but does not favor any one in particular. ATA supports the current seven-pin connector.

NHTSA is aware that the industry is considering several options for powering trailer antilock systems and that it is having a difficult time reaching a consensus. The agency agrees that the SAE J2272 connector is one potentially permissible approach that should be given full consideration by the industry. However, the agency is also aware that the 7-pin configuration of the SAE J2272 connector might not allow the industry to have a one-connector solution in the long term, even if some of its pins are multiplexed. It is NHTSA's belief that the industry understands and can best respond to the future electrical powering needs for trailers, such as antilock braking systems, electronic braking systems, and satellite tracking and communications network. The agency believes that obtaining compatibility provides sufficient incentive for the industry to reach a consensus to standardize on a connector to comply with the full-time power and in-cab malfunction lamp requirements without the need for an electrical connector equipment requirement mandated by NHTSA. AMA, ATA, TTMA, and brake component manufacturers have been meeting under the auspices of SAE in an effort to reach consensus on the connector issue. These meetings indicate that all parties have placed forward and backward compatibility as an important issue for the industry to resolve and reach consensus. Based on these considerations, the agency has decided to deny the petition from AAMA to specify the SAE J2272 Tractor Trailer Interface Connector (or any other specific connector) as required equipment for tractors and trailers.

IX. Applicability of Amendments and Leadtime

A. Hydraulic-Braked Vehicles

In the final rule, NHTSA stated that a March 1999 compliance date for installing antilock brake systems on hydraulic-braked single-unit trucks and buses provides sufficient time for vehicle manufacturers and ABS manufacturers to complete the development and testing of these systems. (60 FR 13250–13251) It noted that some Japanese and European manufacturers are currently marketing ABS for medium and heavy hydraulic-braked vehicles and that brake manufacturers expressed confidence that such antilock systems will be available in the United States.

In its petition, ATA expressed concern that NHTSA was requiring hydraulic-braked heavy vehicles to be equipped with antilock brake systems, even though that organization claimed that such systems are not currently commercially available for heavy vehicles sold in the United States. ATA further stated that ''different concepts are necessary for hydraulic ABS on medium and heavy vehicles because of dissimilarities'' between the braking systems of hydraulic-braked light vehicles and hydraulic-braked medium/heavy vehicles. Given these concerns, ATA and UPS petitioned the agency to postpone the compliance date for hydraulic-braked vehicles, claiming that no antilock systems are available for these vehicles and such systems, when they are available, would need time to be tested. The petitioners urged the agency to postpone the compliance date for these vehicles until 2 years after the technology is readily available. Further, UPS reiterated its request for a three-year phase-in scheme of 20 percent/50

[10] ''New'' refers to changes made in today's document; ''old'' refers to the regulatory text adopted in the March 10, 1995 final rule.

percent/100 percent for the entire ABS applicability requirement.

NHTSA continues to believe that it is appropriate to require that medium and heavy hydraulic-braked vehicles be equipped with ABS, starting in March 1999. Two leading manufacturers of medium and heavy hydraulic vehicles, Freightliner and Navistar, have announced that they will offer the AlliedSignal hydraulic antilock brake system on their hydraulic-braked vehicles in 1996. Freightliner will offer ABS as an option on its Class 5–8 hydraulic Business Class models, while Navistar will offer hydraulic ABS as standard equipment on all its medium truck chassis, including the 4000 Series.[11] Moreover, in its comments to the April 1994 SNPRM, Freightliner stated that the March 1, 1999 ABS compliance date for hydraulic-braked heavy vehicles is realistic and appropriate, but urged the agency to continue to monitor manufacturers' progress and be willing to act on short notice, if necessary, to provide additional lead time.

NHTSA disagrees with ATA's claim that there are significant differences between ABS on hydraulic-braked light vehicles compared with medium and heavy vehicles. AlliedSignal, a manufacturer of both air-braked and hydraulic-braked ABS, stated in its comments to the September 1993 NPRM that the hydraulic- braked ABS technology that will be used on heavy vehicles is the same as the technology now used on passenger cars and other light vehicles, and that the application of hydraulic-braked ABS on heavy vehicles ''should not present significant technical risk.'' That company also explicitly stated that ''components are identical or nearly identical to that used in the passenger car and light truck applications.'' It added that ''the wheel speed sensors are the same technology as used in light vehicle applications, and in fact are the same as that planned for air-braked vehicles. The electronic control unit utilizes the same components as light vehicles * * * and is planned to be the same as that supplied by our AlliedSignal Truck Brake System Company for air braked vehicle applications.'' AlliedSignal concluded their comments to the NPRM by stating that as a supplier of ABS for hydraulic-braked vehicles, the requirements can be reliably achieved with proven technology within the suggested time frame.

Such similarities are also present when comparing ABS on air braked vehicles and hydraulic-braked vehicles. In the September 1995 *Pickup & Delivery* article, a representative of AlliedSignal stated that—

> There's quite a few similarities in complexity [between hydraulic and air braked ABS]. For example, the means of sensing wheel speed is basically identical. There's a wheel speed sensor that's used to check the speed of each wheel. You also have an ECU which monitors those wheel speeds and identifies if they are remaining constant or there are differentials from one side to another or front to rear.

ATA also disagreed with NHTSA statements, claiming that ABS will not be required on European trucks until after NHTSA's requirement takes effect.

NHTSA believes that ATA's claim is based on a misinterpretation of the European type approval system as compared with the United States' self-certification system. The agency is aware that there are new European requirements pending for hydraulic-braked medium and heavy vehicles equipped with ABS, with the first compliance date of January 1999. In Europe, newly produced vehicles with old type-approvals can use their old brake system design for a period of time after the compliance dates when ABS will be required on new type-approved vehicles. Therefore, these vehicles can continue to be built and sold without ABS, even after the European compliance dates, which begin in January 1999. When a manufacturer redesigns a vehicle, however, the new design has to be typed-approved, and therefore would be required to comply with the new ABS requirements. Hence, ATA is technically correct that some hydraulic-braked heavy vehicles built for the European market will be allowed to be built without ABS even after the compliance date for the United States requirements. However, other European market vehicles with hydraulic brakes will have to have ABS before their United States counterparts. Due to the differences between the type approval and self-certification processes, there is no way to completely synchronize the introduction of ABS on hydraulic-braked heavy vehicles in the United States and in Europe, and there is no reason to delay introduction in the United States until after all European vehicles are required to have it.

Based on the above comments from manufacturers and the positive experience in other countries with ABS-equipped hydraulic-braked vehicles, NHTSA has determined that requiring hydraulic-braked vehicles to be equipped with ABS is practicable and appropriate. The agency continues to believe that four years is sufficient leadtime for vehicle manufacturers to develop and test these antilock systems, given that ABS technology has already been introduced on light vehicles equipped with hydraulic braking systems. Therefore, the agency has decided to deny ATA's petition to extend the compliance date for equipping hydraulic-braked vehicles with ABS.

AM General petitioned the agency to change the compliance date for equipping hydraulic-braked vehicles with ABS from March 1, 1999, to September 1, 1999. It claimed that the company would face complications in making such a major mid-year change.

NHTSA notes that vehicles produced on or after the specified compliance dates must comply with the new requirements. This also means that a vehicle manufacturer can comply with the new brake requirements before the compliance date of the new requirements. Hence, if AM General finds it difficult to comply with the March 1, 1999 compliance date because of the mid-year timing of the date, then it has the option of complying with the new requirements prior to that date, such as on September 1, 1998.

AM General petitioned the agency to specify a timetable for monitoring and reviewing the technical status and viability of commercially available hydraulic antilock systems.

NHTSA currently has no plans for specifying a formal timetable for monitoring and reviewing the technical status of hydraulic-braked ABS for heavy vehicles. Nevertheless, the agency plans to monitor this development closely and could modify the implementation schedule if development of antilock systems for hydraulic-braked vehicles faced unexpected development problems. As stated above, vehicle and brake manufacturers indicate that they will have hydraulic antilock systems commercially available in 1996. The agency has provided a leadtime of four years to ensure that manufacturers will have sufficient time to develop and test antilock systems for hydraulic-braked heavy vehicles. The agency believes that the fleets and users, the ABS manufacturers, and the vehicle manufacturers can work together to lay out a timetable for the industry so that antilock systems for these heavy vehicles are ready for commercial use by March 1, 1999.

B. Class 3 Vehicles

AM General petitioned that the ABS requirements not apply to vehicles with GVWRs between 10,001 and 14,000 pounds (Class 3 trucks). It argued that

[11] ''Medium-Duty ABS,'' *Pickup and Delivery* September 1995

since many of these vehicles are derived from light vehicles, and given its belief that the effectiveness of ABS on light vehicles is open to debate, the industry should be given the opportunity to review and consider comments on equipping Class 3 vehicles with ABS.

NHTSA has previously stated that excluding vehicles of certain weight classes between 10,000 and 26,000 pounds GVWR would create an uneven application of the ABS requirements and could result in an inconsistent regulatory framework that would not provide safety benefits to all vehicles. The results of the accident data analysis that examined the effectiveness of ABS on light vehicles showed that there was a net positive safety benefit from equipping vans, sport utilities, and light trucks with ABS. Since many Class 3 vehicles are derived from these light trucks, the agency anticipates that Class 3 vehicles will also experience safety benefits from being equipped with ABS. The agency therefore disagrees with AM General's conclusion and has decided to deny its petition requesting that Class 3 vehicles be excluded from applicability to the ABS requirements because of the lack of demonstrated effectiveness of ABS on passenger cars.

C. Four-Wheel Drive Vehicles

AM General also requested that the ABS requirement not apply to four-wheel drive vehicles. The company stated that it has had difficulty getting an ABS supplier to develop a system for its Hummer vehicle because of the vehicle's full-time 4WD, torque-biasing differentials on both axles, and low volume production. AM General believes that the issue of four-wheel drive ABS has been overlooked and needs to be addressed openly.

NHTSA believes that it is appropriate to apply the ABS requirements to four-wheel drive vehicles, since such vehicles can and do lose control during braking. Moreover, the agency is aware of ABS applications on current vehicles equipped with full-time four-wheel drive or with all-wheel drive, and believes that the ABS technology, to accomplish an ABS installation on AM General's Hummer vehicle, is readily available. Therefore, the agency has decided to deny AM General's petition requesting that four-wheel drive vehicles be excluded from being equipped with ABS.

D. Trailers and Dollies

UPS petitioned the agency to implement ABS on air-braked vehicles by using a three-year phase-in scheme of 20 percent/50 percent/100 percent for trailers and dollies. That company requested that in 1998, 20 percent of trailers and dollies be required to have ABS; in 1999, 50 percent be required to have ABS; and in 2000, 100 percent be required to have ABS. UPS claims that it faces critical problems regarding reliability and cost to meet the current effective dates.

NHTSA believes that such a protracted delay in the implementation of ABS on trailers and dollies is unnecessary, given the current state of development of ABS for these vehicles and given that 2S/1M and tandem control configurations on semi-trailers and dollies are being allowed. The agency further notes that no ABS or trailer manufacturer expressed concerns about the agency's timetable or ABS reliability. Moreover, in the final rule, the agency discussed in detail the issues that ATA and UPS raised about reliability of ABS on heavy vehicles. NHTSA concluded that ABSs are reliable and that maintenance costs associated with ABS are neither excessive nor unreasonable compared to other maintenance costs. The agency further stated that these costs will not be significantly reduced if the implementation dates of this rule are further delayed.

X. Miscellaneous

A. National Uniformity

ATA petitioned the agency to clarify that States may not impose compliance dates that differ from NHTSA's rules. That organization specifically requested NHTSA to ''confirm * * * that any attempt under State law to impose a retroactive ABS mandate would frustrate the significant Federal statutory purpose and, therefore, is not permitted.''

NHTSA notes that the statute (formerly known as the ''National Traffic and Motor Vehicle Safety Act of 1966'') clearly addresses the issue of preemption at 49 USC 30103(b). That provision states that when a Federal motor vehicle safety standard is in effect, a State generally may only prescribe an identical standard.

B. Publish Complete Regulatory Texts and Compliance Test Procedures

AAMA, HDBMC, and Midland-Grau requested that the agency immediately publish complete and updated versions of Standard No. 105 and Standard No. 121.

NHTSA agrees that there should be complete and updated versions of Standard No. 105 and Standard No. 121, showing all the amendments made by the ABS and Stopping Distance rulemakings. Such changes are generally reflected in the Code of Federal Regulations published annually by the National Archives and Records Administration. The agency believes that the publication of updated versions of Standard No. 105 and Standard No. 121 would be helpful to the regulated industry. Since the agency's first priority is to issue the substantive rules, it has issued today's notice first. The agency anticipates publishing the updated Standards in 1996.

AAMA, AlliedSignal, HDBMC, and Midland-Grau petitioned the agency to provide the compliance test procedures for Standard 121, TP–121, within 60 days after April 10, 1995.

NHTSA notes that these compliance test procedures are currently under development by the agency and will be made available in the near future.

C. Costs

ATA claimed that NHTSA's cost estimate for ABS ''are low by roughly a factor of two.'' That organization stated that fleets are getting bids on ABS equipment and actual quotes are running at almost $2,000 per tractor and $1,400 per trailer.

NHTSA disagrees with ATA that the agency's cost estimates for ABS are low by ''a factor of two.'' The agency conducted an in-depth study of heavy vehicle ABS cost, and the findings are reported in a final report, ''Incremental Cost, Weight, and Leadtime Impacts of Requiring Heavy Truck Tractor/Trailer ABS,'' published in June 1994. This study is based on an annual production volume of 100,000 ABS units. Hence, it is to be expected that the current prices that ATA is quoting would be higher than those provided in the agency's study, considering that current annual production of ABS units is under 10,000 units.

D. Corrections to Standard No. 101 and Standard No. 105

NHTSA has revised Table 2 of Standard No. 101, *Controls and Displays*, to correct several of the identifying symbols in Column 4, which were inadvertently changed in the regulatory text of the final rule. The attached Table 2 has been revised to include the original identifying symbols in Column 4.

NHTSA has also corrected Table II of Standard No. 105 to reflect correct positioning of footnote references.

XI. Rulemaking Analyses and Notices

A. Executive Order 12866 and DOT Regulatory Policies and Procedures

This notice was reviewed under Executive Order 12866. NHTSA has

considered the impacts of this rulemaking action and determined that it is ''significant'' within the meaning of the Department of Transportation's regulatory policies and procedures. In connection with the March 1995 final rules, the agency prepared a Final Economic Assessment (FEA) describing the economic and other effects of this rulemaking action. Summary discussions of those effects were provided in the ABS final rule. The amendments in this final rule do not make those effects any more stringent, and in some respects make it easier for a manufacturer to comply with them. For persons wishing to examine the full analysis, a copy is in the docket.

B. Regulatory Flexibility Act

NHTSA has also considered the effects of both this final rule or the original final rule under the Regulatory Flexibility Act. I hereby certify that it will not have a significant economic impact on a substantial number of small entities. Accordingly, the agency has not prepared a final regulatory flexibility analysis.

The primary cost effect of the requirements in this final rule or in the original final rules will be on manufacturers of heavy vehicles which are generally large businesses. However, final stage manufacturers are generally small businesses. A detailed discussion about the anticipated economic impact on these businesses is provided in the FEA.

C. National Environmental Policy Act

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

D. Executive Order 12612 (Federalism)

NHTSA has analyzed this action under the principles and criteria in Executive Order 12612. The agency has determined that this notice does not have sufficient Federalism implications to warrant the preparation of a Federalism Assessment. No State laws will be affected.

E. Civil Justice Reform

This final rule does 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.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles, Rubber and rubber products, Tires.

In consideration of the foregoing, the agency is amending Standard No. 101, *Controls and Displays,* Standard No. 105, *Hydraulic Brake Systems* and Standard No. 121, *Air Brake Systems,* in Title 49 of the Code of Federal Regulations at Part 571 as follows:

PART 571—[AMENDED]

1. The authority citation for Part 571 continues to read as follows:

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

2. In § 571.101, Table 2 is revised to appear as follows: § 571.101 *Standard No. 101; Controls and Displays.*

* * * * *

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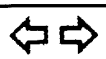
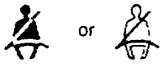
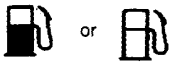
Table 2
Identification and Illustration of Displays

Column 1	Column 2	Column 3	Column 4	Column 5
Display	*Telltale Color*	*Identifying Words or Abbreviation*	*Identifying Symbol*	*Illumination*
Turn Signal Telltale	Green	Also see FMVSS 108	 [1] [6]	—
Hazard Warning Telltale		Also see FMVSS 108	 [2] [6]	—
Seat Belt Telltale	— [7]	Fasten Belts or Fasten Seat Belts Also see FMVSS 208		—
Fuel Level Telltale		Fuel		—
Gauge	—			Yes
Oil Pressure Telltale		Oil		—
Gauge	—			Yes
Coolant Temperature Telltale		Temp		—
Gauge	—			Yes
Electrical Charge Telltale		Volts, Charge or Amp		—
Gauge	—			Yes
Highbeam Telltale	Blue or Green [4]	Also see FMVSS 108	 [6]	—
Brake System [8]	Red [4]	Brake, Also see FMVSS 105 & 135	—	—
Malfunction in Anti-Lock or	Yellow	Antilock, Anti-lock, or ABS. Also see FMVSS 105 & 135	—	—
Variable Brake Proportioning System [8]	Yellow	Brake Proportioning Also see FMVSS 135	—	—
Parking Brake Applied [8]	Red [4]	Park or Parking Brake Also see FMVSS 105 & 135	—	—
Malfunction in Antilock	Yellow	ABS, or Antilock; Trailer ABS, or Trailer Antilock. Also see FMVSS 121	—	—
Brake Air Pressure Position Telltale		Brake Air, Also see FMVSS 121	—	—
Speedometer	—	MPH [5]	—	Yes
Odometer	—	— [3]	—	—
Automatic Gear Position	—	Also see FMVSS 102	—	Yes

[1] The pair of arrows is a single symbol. When the indicator for left and right turn operate independently, however, the two arrows will be considered separate symbols and may be spaced accordingly.

[2] Not required when arrows of turn signal tell-tales that otherwise operate independently flash simultaneously as hazard warning telltale.

[3] If the odometer indicates kilometers, then "KILOMETERS" or "km" shall appear, otherwise, no identification is required.

[4] Red can be red-orange. Blue can be blue-green.

[5] If the speedometer is graduated in miles per hour and in kilometers per hour, the identifying words or abbreviations shall be "MPH and km/h" in any combination of upper or lower case letters.

[6] Framed areas may be filled.

[7] The color of the telltale required by S4.5.3.3 of Standard No 208 is red; the color of the telltale required by S7.3 of Standard No. 208 is not specified.

[8] In the case where a single telltake indicates more than one brake system condition, the word for Brake System shall be used.

WSS Tables–Jobs 2b Disk

BILLING CODE 4910–59–C

2. Section 571.105 is amended by revising the definition of ''Directly controlled wheel'' in S4; by revising S5.1.1(c), S5.3.3(b); S5.5.1, S7, and S7.5 to read as follows:

§ 571.105 Standard No. 105, Hydraulic Brake Systems

* * * * *

S4.* * *

Directly Controlled Wheel means a wheel for which the degree of rotational wheel slip is sensed, either at that wheel or on the axle shaft for that wheel and corresponding signals are transmitted to one or more modulators that adjust the brake actuating forces at that wheel. Each modulator may also adjust the brake actuating forces at other wheels that are on the same axle or in the same axle set in response to the same signal or signals.

* * * * *

S5.1.1* * *

(c) The service brakes shall be capable of stopping each vehicle with a GVWR greater than 10,000 pounds in two effectiveness tests within the distances and from the speeds specified in S5.1.1.2 and S5.1.1.3. Each school bus with a GVWR greater than 10,000 pounds manufactured after January 12, 1996 and before March 1, 1999 and which is equipped with an antilock brake system may comply with paragraph S5.1.1.2 and S5.5.1 rather than the first effectiveness test, as specified in S5.1.1.1. Each school bus with a GVWR greater than 10,000 pounds manufactured on or after March 1, 1999 shall be capable of meeting the requirements of S5.1.1 through S5.1.5, under the conditions prescribed in S6, when tested according to the procedures and in the sequence set forth in S7.

* * * * *

S5.3.3* * *

(b) For vehicles with a GVWR greater than 10,000 pounds, each message about the existence of a malfunction, as described in S5.3.1(c), shall be stored in the antilock brake system after the ignition switch is turned to the ''off'' position and the indicator lamp shall be automatically reactivated when the ignition switch is again turned to the ''on'' position. The indicator lamp shall also be activated as a check of lamp function whenever the ignition is turned to the ''on'' (run) position. The indicator lamp shall be deactivated at the end of the check of lamp function unless there is a malfunction or a message about a malfunction that existed when the key switch was last turned to the ''off'' position.

* * * * *

S5.5.1 Each vehicle with a GVWR greater than 10,000 pounds, except for any vehicle that has a speed attainable in 2 miles of not more than 33 mph, shall be equipped with an antilock brake system that directly controls the wheels of at least one front axle and the wheels of at least one rear axle of the vehicle. On each vehicle with a GVWR greater than 10,000 pounds but not greater than 12,000 pounds, the antilock brake system may also directly control the wheels of the drive axle by means of a single sensor in the drive line. Wheels on other axles of the vehicle may be indirectly controlled by the antilock brake system.

* * * * *

S7. *Test procedures and sequence.* Each vehicle shall be capable of meeting all the applicable requirements of S5 when tested according to the procedures and in the sequence set forth below, without replacing any brake system part or making any adjustments to the brake system other than as permitted in the burnish and reburnish procedures and in S7.9 and S7.10. (For vehicles only having to meet the requirements of S5.1.1, S5.1.2 and S5.1.3 in section S5.1, the applicable test procedures and sequence are S7.1, S7.2, S7.4, S7.5, S7.8, S7.9, S7.10 and S7.18. However, at the option of the manufacturer, the following test procedures and sequence may be conducted: S7.1, S7.2, S7.3, S7.4, S7.5, S7.6, S7.7 S7.8, S7.9, S7.10 and S7.18. The choice of this option shall not be construed as adding to the requirements specified in S5.1.2 and S5.1.3.) Automatic adjusters must remain activated at all times. A vehicle shall be deemed to comply with the stopping distance requirements of S5.1 if at least one of the stops at each speed and load specified in each of S7.3, S7.5, S7.8, S7.9, S7.10, S7.15 and S7.17 (check stops) is made within a stopping distance that does not exceed the corresponding distance specified in Table II. When the transmission selector control is required to be in neutral for a deceleration, a stop or snub shall be obtained by the following procedures:

(a) Exceed the test speed by 4 to 8 mph;

(b) close the throttle and coast in gear to approximately 2 mph above the test speed;

(c) shift to neutral; and

(d) when the test speed is reached, apply the service brakes.

* * * * *

S7.5 Service brake system-second effectiveness test. Repeat S7.3, except for vehicles with a GVWR greater than 10,000 lbs. Then, for vehicles with a GVWR of 10,000 pounds or less, make four stops from 80 mph if the speed attainable in 2 miles is not less 84 mph.

* * * * *

3. Section 571.121 is amended by revising the definitions of ''Directly Controlled Wheel'' and ''Full-treadle brake application'' in S4; by adding the definition for ''Maximum treadle travel'' in S4; and by revising S5.1.6.2, S5.2.3.2, S5.2.3.3, S5.3.1, S5.3.6, S5.3.6.1, and S5.7.1 to read as follows:

§ 571.121 Standard No. 121; Air Brake Systems.

* * * * *

S4.* * *

Directly Controlled Wheel means a wheel for which the degree of rotational wheel slip is sensed, either at that wheel or on the axle shaft for that wheel and corresponding signals are transmitted to one or more modulators that adjust the brake actuating forces at that wheel. Each modulator may also adjust the brake actuating forces at other wheels that are on the same axle or in the same axle set in response to the same signal or signals.

* * * * *

Full-treadle brake application means a brake application in which the treadle valve pressure in any of the valve's output circuits reaches 85 psi within 0.2 seconds after the application is initiated, or in which maximum treadle travel is achieved within 0.2 seconds after the application is initiated.

* * * * *

Maximum treadle travel means the distance that the treadle moves from its position when no force is applied to its position when the treadle reaches a full stop.

* * * * *

S5.1.6.2 *Antilock Malfunction Signal.*

(a) Each truck tractor manufactured on or after March 1, 1997 and each single unit vehicle manufactured on or after March 1, 1998 shall be equipped with an indicator lamp, mounted in front of and in clear view of the driver, which is activated whenever there is a malfunction that affects the generation or transmission of response or control signals in the vehicle's antilock brake system. The indicator lamp shall remain activated as long as such a malfunction exists, whenever the ignition (start) switch is in the ''on'' (run) position, whether or not the engine is running. Each message about the existence of such a malfunction shall be stored in the antilock brake system after the ignition switch is turned to the ''off'' position and automatically reactivated when the ignition switch is again turned to the ''on'' position. The indicator lamp shall also be activated as a check of lamp function whenever the ignition is turned to the ''on'' or ''run'' position.

The indicator lamp shall be deactivated at the end of the check of lamp function unless there is a malfunction or a message about a malfunction that existed when the key switch was last turned to the ''off'' position.

(b) Each truck tractor manufactured on or after March 1, 1997, and each single unit vehicle manufactured on or after March 1, 1998 that is equipped to tow another air-braked vehicle, shall be equipped with an electrical circuit that is capable of transmitting a malfunction signal from the antilock brake system(s) on one or more towed vehicle(s) (e.g., trailer(s) and dolly(ies)) to the trailer ABS malfunction lamp in the cab of the towing vehicle, and shall have the means for connection of this electrical circuit to the towed vehicle. Each such truck tractor and single unit vehicle shall also be equipped with an indicator lamp, separate from the lamp required in S5.1.6.2(a), mounted in front of and in clear view of the driver, which is activated whenever the malfunction signal circuit described above receives a signal indicating an ABS malfunction on one or more towed vehicle(s). The indicator lamp shall remain activated as long as an ABS malfunction signal from one or more towed vehicle(s) is present, whenever the ignition (start) switch is in the ''on'' (run) position, whether or not the engine is running. The indicator lamp shall also be activated as a check of lamp function whenever the ignition is turned to the ''on'' or ''run'' position. The indicator lamp shall be deactivated at the end of the check of lamp function unless a trailer ABS malfunction signal is present.

(c) [Reserved]

* * * * *

S5.2.3.2 *Antilock Malfunction Signal.* Each trailer (including a trailer converter dolly) manufactured on or after March 1, 1998 that is equipped with an antilock brake system shall be equipped with an electrical circuit that is capable of signalling a malfunction in the trailer's antilock brake system, and shall have the means for connection of this antilock brake system malfunction signal circuit to the towing vehicle. The electrical circuit need not be separate or dedicated exclusively to this malfunction signaling function. The signal shall be present whenever there is a malfunction that affects the generation or transmission of response or control signals in the trailer's antilock brake system. The signal shall remain present as long as the malfunction exists, whenever power is supplied to the antilock brake system. Each message about the existence of such a malfunction shall be stored in the antilock brake system whenever power is no longer supplied to the system, and the malfunction signal shall be automatically reactivated whenever power is again supplied to the trailer's antilock brake system. In addition, each trailer manufactured on or after March 1, 1998, that is designed to tow another air-brake equipped trailer shall be capable of transmitting a malfunction signal from the antilock brake system(s) of additional trailers in a combination by means of its ABS malfunction signal circuit, and shall have the means for connection of its ABS malfunction signal circuit to the towed vehicle.

S5.2.3.3 *Antilock Malfunction Indicator.* In addition to the requirements of S5.2.3.2, each trailer (including a trailer converter dolly) manufactured on or after March 1, 1998 and before March 1, 2006, shall be equipped with an external indicator lamp that is activated whenever there is a malfunction that affects the generation or transmission of response or control signals in the trailer's antilock brake system. The indicator lamp shall remain activated as long as such a malfunction exists, whenever power is supplied to the antilock brake system. Each message about the existence of such a malfunction shall be stored in the antilock brake system whenever power is no longer supplied to the system, and the malfunction signal shall be automatically reactivated when power is again supplied to the trailer's antilock brake system. The indicator lamp shall also be activated as a check of lamp function whenever power is supplied to the antilock brake system and the vehicle is stationary. The indicator lamp shall be deactivated at the end of the check of lamp function unless there is a malfunction or a message about a malfunction that existed when power was last supplied to the antilock brake system.

* * * * *

S5.3.1 *Stopping distance—trucks and buses.* When stopped six times for each combination of vehicle type, weight, and speed specified in S5.3.1.1, in the sequence specified in Table I, each truck tractor manufactured on or after March 1, 1997 and each single unit vehicle manufactured on or after March 1, 1998 shall stop at least once in not more than the distance specified in Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway, and with wheel lockup permitted only as follows:

(a) At vehicle speeds above 20 mph, any wheel on a nonsteerable axle other than the two rearmost nonliftable, nonsteerable axles may lock up, for any duration. The wheels on the two rearmost nonliftable, nonsteerable axles may lock up according to (b).

(b) At vehicle speeds above 20 mph, one wheel on any axle or two wheels on any tandem may lock up for any duration.

(c) At vehicle speeds above 20 mph, any wheel not permitted to lock in (a) or (b) may lock up repeatedly, with each lockup occurring for a duration of one second or less.

(d) At vehicle speeds of 20 mph or less, any wheel may lock up for any duration.

Table I.—Stopping Sequence

1. Burnish.

2. Stops on a peak friction coefficient surface of 0.5: (a) With the vehicle at gross vehicle weight rating (GVWR), stop the vehicle from 30 mph using the service brake, for a truck tractor with a loaded unbraked control trailer. (b) With the vehicle at unloaded weight plus up to 500 lbs., stop the vehicle from 30 mph using the service brake, for a truck tractor.

3. Manual adjustment of the service brakes allowed for truck tractors, within the limits recommended by the vehicle manufacturer.

4. Other stops with vehicle at GVWR:

(a) 60 mph service brake stops on a peak friction coefficient surface of 0.9, for a truck tractor with a loaded unbraked control trailer, or for a single-unit vehicle.

(b) 60 mph emergency brake stops on a peak friction coefficient of 0.9, for a single-unit vehicle. Truck tractors are not required to be tested in the loaded condition.

5. Parking brake test with the vehicle loaded to GVWR.

6. Manual adjustment of the service brakes allowed for truck tractors and single-unit vehicles, within the limits recommended by the vehicle manufacturer.

7. Other stops with the vehicle at unloaded weight plus up to 500 lbs.

(a) 60 mph service brake stops on a peak friction coefficient surface of 0.9, for a truck tractor or for a single-unit vehicle.

(b) 60 mph emergency brake stops on a peak friction coefficient of 0.9, for a truck tractor or for a single-unit vehicle.

8. Parking brake test with the vehicle at unloaded weight plus up to 500 lbs.

9. Final inspection of service brake system for condition of adjustment.

S5.3.6 *Stability and Control During Braking-Truck Tractors.* When stopped four consecutive times for each combination of weight, speed, and road conditions specified in S5.3.6.1 and

S5.3.6.2, each truck tractor manufactured on or after March 1, 1997 shall stop at least three times within the 12-foot lane, without any part of the vehicle leaving the roadway.

S5.3.6.1 Using a full-treadle brake application for the duration of the stop, stop the vehicle from 30 mph or 75 percent of the maximum drive-through speed, whichever is less, on a 500- foot radius curved roadway with a wet level surface having a peak friction coefficient of 0.5 when measured on a straight or curved section of the curved roadway using an American Society for Testing and Materials (ASTM) E1136 standard reference tire, in accordance with ASTM Method E1337–90, at a speed of 40 mph, with water delivery.

* * * * *

S5.7.1 *Emergency brake system performance.* When stopped six times for each combination of weight and speed specified in S5.3.1.1, except for a loaded truck tractor with an unbraked control trailer, on a road surface having a PFC of 0.9, with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold, brake fluid housing, or brake chamber housing), the vehicle shall stop at least once in not more than the distance specified in Column 5 of Table II, measured from the point at which movement of the service brake control begins, except that a truck-tractor tested at its unloaded vehicle weight plus up to 500 pounds shall stop at least once in not more than the distance specified in Column 6 of Table II. The stop shall be made without any part of the vehicle leaving the roadway, and with unlimited wheel lockup permitted at any speed.

* * * * *

Issued on: December 8, 1995.

Ricardo Martinez,

Administrator.

[FR Doc. 95–30375 Filed 12–11–95; 8:45 am]

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INTERSTATE COMMERCE COMMISSION

49 CFR Parts 1043 and 1160

[Ex Parte No. 55 (Sub-No. 96)]

Freight Operations by Mexican Motor Carriers—Implementation of North American Free Trade Agreement

AGENCY: Interstate Commerce Commission.

ACTION: Final rule.

SUMMARY: This action amends Interstate Commerce Commission (ICC) regulations relating to motor carrier operating authority and insurance, in order to implement the second phase of the North American Free Trade Agreement (NAFTA) relating to land transportation. The amendments will establish procedures under which Mexican motor carriers may apply for operating authority to provide service across the United States-Mexico international boundary line to and from points in California, Arizona, New Mexico, and Texas. They will also establish procedures under which persons of Mexico who establish enterprises in the United States to distribute international cargo in this country may apply for operating authority.

EFFECTIVE DATE: December 18, 1995.

FOR FURTHER INFORMATION CONTACT: Applications for operating authority may be obtained by calling the ICC's Automated Response Capability (ARC) telephone system at (202) 927–7600 and selecting the option for how to file an application. For additional information, contact either Bernard Gaillard, (202) 927–5500 or Stanley M. Braverman, (202) 927–6316. [TDD for the hearing impaired: (202) 927–5721.] To obtain a copy of the Commission's full decision in this matter, contact D.C. News & Data Inc., ICC Building, 1201 Constitution Avenue NW., Room 2229, Washington, DC 20423.

SUPPLEMENTARY INFORMATION: The Commission published a notice of proposed rulemaking in the Federal Register on October 18, 1995 (60 FR 53894). This notice proposed changes to ICC licensing and insurance regulations, and it sought comments on a new application form created to assist in the implementation of the second phase of NAFTA. After reviewing the comments submitted, we have decided to adopt the proposed rules. We have made some changes to Form OP–1MX, ''Application for Operating Authority by Mexican Carriers,'' to correct inadvertent oversights and to address points made in the comments.

Regulatory Flexibility Act

Under the Regulatory Flexibility Act, 5 U.S.C. 601, *et seq.*, we have examined the impact of our action on small businesses and small organizations. We conclude that our action will not have a substantial impact upon a significant number of small entities, and that any impact it may have will be beneficial. We expect that the new application form designated for Mexican applicants (Form OP–1MX), and the corresponding regulations, will simplify and clarify the application process. Use of the existing Form OP–1 for these new applications, by contrast, could cause confusion and require more work on the part of Mexican carrier applicants.

Environmental and Energy Considerations

We conclude that our rules will not significantly affect either the quality of the human environment or the conservation of energy resources.

List of Subjects

49 CFR Part 1043

Insurance, Motor Carriers, Surety Bonds.

49 CFR Part 1160

Administrative practice and procedure, Brokers, Buses, Freight forwarders, Maritime carriers, Motor carriers, Moving of household goods.

Decided: November 30, 1995.

By the Commission, Chairman Morgan, Vice Chairman Owen and Commissioner Simmons.

Vernon A. Williams,

Secretary.

For the reasons set forth in the preamble, title 49, chapter X, parts 1043 and 1160 are amended as set forth below:

PART 1043—SURETY BONDS AND POLICIES OF INSURANCE

1. The authority citation for part 1043 continues to read as follows:

Authority: 49 U.S.C. 10101, 10321, 11701, 10927; 5 U.S.C. 553.

§ 1043.1 [Amended]

2. Section 1043.1, paragraphs (a)(1) and (b) are amended as follows:

a. In paragraph (a)(1) in the first sentence add the words ''or foreign (Mexican) motor private carrier or foreign motor carrier transporting exempt commodities'' after the words ''No common or contract carrier''.

b. In paragraph (b) in the first sentence add the words ''nor any foreign (Mexican) common carrier of exempt commodities'' after the words ''title 49 of the U.S. Code''.

PART 1160—RULES GOVERNING APPLICATIONS FOR OPERATING AUTHORITY

3. The authority citation for part 1160 continues to read as follows:

Authority: 5 U.S.C 553 and 559; 16 U.S.C. 1456; 49 U.S.C. 10101, 10305, 10321, 10921, 10922, 10923, 10924, 10928 and 11102.

4. In § 1160.1 a new paragraph (h) is added to read as follows: