enforce its requirements. (See section 307(b)(2).)

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Intergovernmental relations, Permitting, Reporting and recordkeeping requirements.

Dated: June 12, 2003.

Alexis Strauss,

Acting Regional Administrator, Region IX.

■ Part 52, chapter I, title 40 of the Code of Federal Regulations is amended as follows:

PART 52—[AMENDED]

■ 1. The authority citation for Part 52 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

Subpart F—California

■ 2. Section 52.220 is amended by adding paragraph (c)(231)(i)(E) to read as follows:

§ 52.220 Identification of plan.

* * * * *

(c) * * *

(231) * * *

(i) * * *

(E) Great Basin Unified Air Pollution Control District.

(*1*) Rules 218 and 219, adopted on December 4, 1995.

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[FR Doc. 03–20426 Filed 8–8–03; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 03–15277]

RIN 2127–AH16

Federal Motor Vehicle Safety Standards: Heavy Vehicle Antilock Brake System (ABS) Performance Requirement

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

ACTION: Final rule.

SUMMARY: In March 1995, NHTSA published a final rule amending the hydraulic and air brake standards to require medium and heavy vehicles (*e.g.*, truck tractors, trailers, single unit trucks, and buses) to be equipped with antilock brake systems (ABS) to improve the directional stability and control of these vehicles during braking. We supplemented the ABS requirements for truck tractors with a braking-in-a-curve performance test. The braking-in-a-curve test was not applied to single-unit trucks or buses or to air-braked trailers because we had performed only limited testing of ABS-equipped single-unit vehicles. We stated that we would continue research on dynamic performance tests for single-unit trucks, buses, and trailers, and would consider applying performance test requirements to these vehicles in the future.

After issuing the final rule, we tested several ABS-equipped single-unit trucks and buses equipped with both hydraulic and air brakes. Our testing and research indicated that the braking-in-a-curve performance test requirement is practicable for those vehicles. Accordingly, in December 1999, we proposed applying the braking-in-a-curve requirements to them to complement both the ABS equipment requirements and stopping distance requirements. This final rule extends application of the braking-in-a-curve dynamic performance test requirement to single-unit trucks and buses that are required to be equipped with ABS.

DATES: The amendments made in this rule are effective October 10, 2003. If you wish to petition for reconsideration of this rule, your petition must be received by September 25, 2003.

ADDRESSES: Any petitions for reconsideration should refer to the docket and notice number of this notice and be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: For non-legal issues, you may call Mr. Jeff Woods, Safety Standards Engineer, Office of Crash Avoidance Standards, Vehicle Dynamics Division at (202) 366–2720, and fax him at (202) 493–2739.

For legal issues, you may call: Mr. Otto Matheke, Attorney-Advisor, Office of the Chief Counsel at (202) 366–2992, and fax him at (202) 366–3820.

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

SUPPLEMENTARY INFORMATION:

I. Background

On December 18, 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA or Act), Public Law 102–240 was signed by President George H. Bush and became law. Section 4012 of the Act directed the Secretary of Transportation to initiate rulemaking for improving the braking performance of new commercial motor vehicles—defined by ISTEA as those with a GVWR of over 26,000 pounds (lbs.)—including truck tractors, trailers, and dollies. The Act directed that in that rulemaking, the agency examine antilock brake systems (ABS), means of improving brake compatibility, and methods of ensuring the effectiveness of brake timing. In response to that congressional mandate, we published a final rule requiring ABS to be installed on hydraulic and air-braked medium and heavy vehicles on March 10, 1995 (60 FR 13216) (hereinafter referred to as the stability and control final rule). For truck tractors only, the ABS requirements included a braking-in-a-curve performance test on a low-coefficient of friction surface. The test includes a full brake application in both the lightly loaded (bobtail) configuration and with the tractor loaded to its GVWR, the latter using an unbraked control trailer.

Due to limited data and concerns regarding the braking-in-a-curve test, the March 1995 Final Rule did not apply the test to single-unit trucks, buses, or air-braked trailers. We stated, however, that we would continue research on dynamic performance tests for single-unit vehicles and would consider proposing to apply performance test requirements to those vehicles at a future time.[1]

II. Single-Unit Truck and Bus ABS Performance Testing

We conducted ABS testing of single-unit trucks and buses in 1996 and 1997 at our Vehicle Research and Test Center (VRTC) in East Liberty, OH.[2] Five air-

[1] The agency published two companion final rules on the same day, one to reinstate stopping distance requirements for air-braked medium and heavy vehicles (60 FR 13286) and another to implement stopping distance requirements for hydraulic-braked medium and heavy vehicles (60 FR 13297). The cost/benefit information used for the three final rules was based on NHTSA's Final Assessment, *Final Rules, FMVSS Nos. 105 & 121, Stability and Control During Braking Requirements and Reinstatement of Stopping Distance Requirements for Medium and Heavy Vehicles,* published in February, 1995.

[2] DOT HS 808941, *Single Unit Truck and Bus ABS Braking-In-A-Curve Performance Testing,* February 1999.

braked straight trucks and two hydraulic-braked buses, all equipped with ABS, were used in the tests to aid in determining if the braking-in-a-curve performance test for tractors should be applied to single-unit vehicles. The vehicles were subjected to all the requirements of Standards No. 105 and No. 121, including the braking-in-a-curve performance tests.

The braking-in-a-curve tests began with the determination of a maximum drive-through speed, followed by the determination of the maximum brake-through speed. As defined in Standard No.121, ''maximum drive-through speed'' is the fastest constant speed that a vehicle can be driven through at least 200 feet of curve arc length without departing the lane. ''Maximum brake-through speed'' is defined as the fastest speed at which a full brake application can be made while the vehicle is in the curve, without the vehicle departing the lane. Determination of the maximum brake-through speed provided data on the potential margin of compliance or non-compliance for the test vehicles.

In the agency's testing, both trucks and school buses were tested in loaded-to-GVWR and lightly loaded conditions. The trucks were ABS equipped chassis-cabs without bodies or equipment that would normally be installed by a second-stage manufacturer. However, to simulate the lightly loaded condition of completed vehicles, a 2,500 lb load frame with an integrated roll bar was installed on the chassis cabs. Trucks tested in the loaded-to-GVWR condition were weighted to their GVWRs, with the axle loads in proportion to their GAWRs. Two ABS equipped school buses were also tested in loaded-to-GVWR and lightly loaded conditions. The loaded-to-GVWR tests on the school buses were conducted with sand bags placed on the floor and seats so the total vehicle weight was equal to its GVWR, with axle loads in proportion to their GAWRs.

The braking-in-a-curve tests were conducted on a low friction wetted surface. The test curve had a 12-foot-wide lane with a 500-foot radius of curvature (marked from the center of the lane). Traffic cones were placed on both sides of the lane at 20-foot intervals. The surface had a cross slope of one percent and approximately zero longitudinal slope. The peak coefficient of friction (PFC) of the surface during the time of the testing ranged from 0.34 to 0.41. The effect of the cross slope was such that the test condition was considered to be worst case, since it may not be possible to conduct all road testing on a completely level road surface, due to variability and water run-off design requirements. The lower end of the PFC range was also considered to be a worst-case test condition.

The results of the testing at VRTC indicated that the braking-in-a-curve test is practicable, repeatable, and safe for single unit vehicles. Six of the seven vehicles tested met the performance requirements now in effect for tractors, *i.e.*, they stayed in the lane in at least three out of four stops when subjected to maximum braking at 75 percent of the maximum drive-through speed. In fact, these six vehicles remained in the lane during all four stops at 75 percent of the drive-through speed, all with a large margin of compliance.

III. Notice of Proposed Rulemaking

On December 21, 1999, the agency published a notice of proposed rulemaking in the **Federal Register** (64 FR 71377) containing the agency's proposal for a braking-in-a-curve test for single-unit trucks and buses. NHTSA proposed that the braking-in-a-curve test be conducted in two different conditions: with the vehicle lightly loaded, and with the vehicle loaded-to-GVWR. The agency proposal also specified the same road test geometry now in effect for tractors, namely a 12-foot-wide lane with a 500-foot radius measured at the center of the lane with the test surface having a peak friction coefficient (PFC) of 0.5. The proposal also specified that the test speed is 75 percent of the maximum drive-through speed or 30 mph, whichever is lower. The brake pedal force specification proposed in the notice called for a pressure of 150 pounds to be achieved at the brake pedal within 0.2 seconds from the initial application and maintained for the duration of the stop. The proposal specified that the brake temperature at the time of testing is to be between 150 and 200° F and the test performed with the transmission in neutral or the clutch pedal depressed. Finally, the agency proposal specified that in 3 of 4 consecutive stops, the test vehicle is to remain in the 12 foot wide marked lane when tested in both the lightly loaded condition and when loaded-to-GVWR in proportion to each GAWR.

Since the braking-in-a-curve test is one brake test in a test sequence, the agency proposed that the braking-in-a-curve test for air-braked single-unit trucks and buses be conducted immediately after the burnish procedure as indicated in Table I of Standard No. 121, with the loaded-to-GVWR tests followed by the lightly loaded tests. We also proposed that the braking-in-a-curve test for hydraulic-braked single-unit trucks and buses be conducted immediately after the post-burnish brake adjustment in S7.4.2.2, with the loaded-to-GVWR tests followed by the lightly loaded tests.

In order to provide manufacturers with sufficient lead time to comply with the proposed requirements, the proposal indicated that the effective date for the braking-in-a-curve test requirements, for both air and hydraulic-braked single unit trucks and buses, be two years after publication of the final rule in the **Federal Register**.

IV. Public Comments

NHTSA received comments about its proposal from vehicle and brake manufacturers as well as safety and trade groups. Three vehicle manufacturers, DaimlerChrysler Corporation (DaimlerChrysler), Ford Motor Company (Ford) and Mitsubishi Motors R&D of America Incorporated (Mitsubishi), submitted comments. Comments were also received from Haldex Brake Products Corporation (Haldex), Bendix Commercial Vehicle Systems (BCVS) and Bosch Braking Systems Corporation (Bosch). Several trade associations, National Truck Equipment Association (NTEA), Heavy Duty Brake Manufacturers Council (HDBMC), American Trucking Associations (ATA) and Truck Manufacturers Association (TMA), offered their views. One safety group, Advocates for Highway Safety (Advocates), submitted comments as well.

With the exception of TMA and NTEA, the commenters generally supported the agency proposal. However, many of the commenters argued that requiring that the braking-in-a-curve test be run in both the loaded-to-GVWR and lightly loaded conditions was unnecessary and that the lightly loaded test alone was sufficient. In addition, a number of commenters indicated dissatisfaction with the proposed test sequence and some of the proposed test conditions. Other commenters indicated their belief that the agency's proposal underestimated the compliance burdens that the proposal, if adopted, would impose on final stage manufacturers and alterers.

One commenter addressed what it believed to be shortcomings in the configuration of the test curve. Advocates stated that the proposed test configuration—a zero longitudinal slope, 500-foot continuous curve radius, 12-foot wide lane and one percent side slope—does not approach worst-case real-world operating condition. In addition to criticizing the severity of the test, Advocates viewed the proposed test as not sufficiently demanding and

indicated that few vehicles equipped with ABS would fail the proposed test.

DaimlerChrysler disagreed with the proposed requirement that ''no part'' of the test vehicle leave the marked lane of the braking curve during a stop. Instead, DaimlerChrysler requested that this requirement be changed so that a vehicle would comply if no part of any point of contact of any tire left the lane during the stop. The company noted that the agency proposal did not clearly indicate how any departure of any part of the vehicle from the traveled lane would be detected. DaimlerChrysler further indicated that vehicles with large rear overhang would be placed at a severe disadvantage since any lateral movement of the rear wheels would result in the rear of a longer vehicle moving closer to the outside of the lane. DaimlerChrysler also requested that NHTSA delete the specification that the braking-in-a-curve test be conducted on a wet surface. In DaimlerChrysler's view, the requirement that the surface be wet is unnecessary. In the company's view, it is immaterial whether the test surface is dry or wet if the surface has the proper coefficient of friction (PFC).

The comments submitted by vehicle manufacturers and trade groups were nearly unanimous in their disapproval of the proposed requirement that testing be conducted with vehicles in both a lightly loaded condition and a loaded-to-GVWR condition. HDBMC stated that many single-unit trucks and buses have already been tested for braking-in-a-curve performance and that, with regard to loading condition, the worst-case condition is when the vehicle is lightest. HDBMC also stated that in the case of testing in the loaded-to-GVWR condition, it recommends that the center-of-gravity height for the ballast should be not more than 32 inches above the frame rails. Haldex and HDBMC also recommended that the 32-inch load height for single-unit trucks be specified for 60-mph straight-line stopping distance tests as well.

BCVS advocated deletion of the fully-loaded braking-in-a-curve test for the following reasons: A lightly-loaded test condition is the most severe condition; the SAE recommended practice (RP) J1626 ''Braking Stability and Control Performance Test Procedures for Air and Hydraulic Brake Equipped Trucks, Truck-Tractors and Buses' specifies that the braking-in-a-curve performance test be conducted in the lightly-loaded condition with the loaded-to-GVWR condition optional; loading the vehicle increases the risk of rollover; and determining an appropriate loading specification for the variety of vehicle configurations and body forms would be difficult. BCVS further stated that if NHTSA believes that the fully-loaded braking-in-a-curve test is essential, then the load center-of-gravity height should be established at a height that is not likely to lead to vehicle rollover. Concerns about vehicle rollover apparently also prompted BCVS to suggest that the allowance of 1,000 lbs. for a rollbar, and 500 lbs. for driver and instrumentation, which was proposed in the NPRM for the lightly-loaded braking-in-a-curve test for single-unit trucks and buses, be applied to other lightly-loaded road tests in FMVSS No. 121.[3]

Ford stated that it believes there is no useful information to be obtained from conducting the braking-in-a-curve test with the vehicle loaded-to-GVWR. Ford cited the fact that the SAE Truck and Bus Vehicle Deceleration and Stability Subcommittee found that 29 out of 31 single-unit vehicles tested in the braking-in-a-curve test the lightly-loaded test condition performed the same or worse than when tested in the loaded-to-GVWR test condition. Ford states that the two vehicles that performed better in the loaded-to-GVWR test condition were heavier-duty trucks and had sufficient margins of compliance in both loading conditions.

TMA stated that because of safety concerns, NHTSA should reconsider its decision to require the braking-in-a-curve test in the loaded-to-GVWR test condition. TMA believes that a loaded-to-GVWR vehicle could slide off the low coefficient test surface of the 500-foot radius curve onto a higher coefficient of friction surface and then rollover. TMA cited NHTSA statements in the NPRM that the NHTSA tests involving vehicles with a load at a high center of gravity height caused an unsettling feeling [to the test driver] with regard roll stability. TMA presented data to support its view that testing in the loaded-to-GVWR condition is less stringent than testing in the lightly-loaded condition. TMA concluded that testing in the loaded-to-GVWR condition provides no additional confirmation of vehicle performance, presents a significant safety risk of vehicle rollover, and would increase test burdens without any measurable benefit to vehicle safety.

In addition to advocating removal of the requirement that vehicles be tested in a loaded-to-GVWR condition, a number of commenters indicated that the proposed test sequence be changed.

To reduce costs associated with loading and unloading test vehicles, Bosch requested that the braking-in-a-curve test be performed following the loaded-to-GVWR parking brake test, with the loaded-to-GVWR braking-in-a-curve test followed by the lightly loaded braking-in-a-curve test, for both hydraulic- and air-braked single-unit vehicles. Bosch also stated that it appeared that the agency had not considered the costs incurred by different phases of the test sequence requiring loading and unloading of the test vehicle. Bosch requested that the test sequence be changed to eliminate the requirement that empty vehicles be loaded solely for the purpose of conducting the braking-in-a-curve test after brake burnishing. Ford requested that if the agency decided to drop the loaded-to-GVWR braking-in-a-curve test, the test sequence be changed so that burnish and loaded-to-GVWR straight-line stops be conducted first, followed by braking-in-a-curve tests in the lightly-loaded condition, followed by lightly-loaded straight-line stops. In Ford's view, this sequence would eliminate one loading and unloading cycle and improve test efficiency.

One manufacturer, Mitsubishi, commented that the requirements proposed for the force and timing of brake pedal applications during the braking-in-a-curve test are too stringent. The proposal specified that a brake pedal force of 150 lbs. be achieved within 0.2 second from the initial application of force to the brake control (brake pedal) and that this minimum force be maintained for the duration of the stop. Mitsubishi believes that this application time would be difficult to achieve. The company provided test data from tests conducted on single unit trucks showing that test drivers could achieve 150 lbs. of pedal force within 0.2 seconds in only three out of 10 sample stops.

TMA and NTEA criticized our proposal as imposing significant test burdens and costs on small businesses beyond what those entities should reasonably be expected to bear. These commenters are concerned that final stage manufacturers and alterers may not be able to rely on the certification of an incomplete vehicle manufacturer to the extent portrayed by the agency in proposing the new requirements, particularly since many trucks are configured for highly specialized applications. Moreover, TMA argued that since NHTSA is proposing performance requirements for all classes of vehicles, it should consider removing the existing ABS equipment requirements. TMA stated these equipment requirements are unduly restrictive and may impede

[3] NHTSA has published a final rule (66 FR 64154) amending FMVSS No. 121 by incorporating the 1,000 lbs. rollbar provision.

development of improved ABS systems. NTEA stated that the proposal should be abandoned on the basis that there are no additional benefits attained by adding the proposed test procedure.

In regard to costs, TMA argued that in preparing the proposal, NHTSA tested only the most common two- and three-axle truck configurations (*i.e.*, 4 x 2 and 6 x 4), and has not adequately addressed the problems posed by other axle configurations. As aftermarket axles are often added to incomplete vehicles—which can cause a vehicle to fall outside of the Incomplete Vehicle Document (IVD) parameters specified by the incomplete vehicle manufacturer—final stage manufacturers will bear additional responsibility for certification. TMA stated that low-volume, special configurations may need to be excluded from this portion of the standard, and believes that it is premature to conclude that the proposal is practicable for all single-unit trucks and buses. TMA also believes the agency has significantly underestimated the cost of performing stand-alone braking-in-a-curve tests on previously certified vehicles. TMA stated that stand-alone testing will require shipping vehicles to a test site, installation of new brake system parts, burnishing, loading and unloading, charges for facilities, drivers, mechanics and test engineers as well as instrumentation support and reporting. The organization estimated that stand-alone braking-in-a-curve testing costs will average between $4,500 and $6,000 per test and a full FMVSS No. 105 or 121 certification will cost $10,000 to $13,000.

NTEA also believes that pass-through certification requirements supplied by incomplete vehicle manufacturers will be so restrictive that pass-through certification will not be available and that small companies would not have the means to conduct certification testing. NTEA stated that a final stage manufacturer could ensure compliance only through actual testing. In NTEA's view, the added cost of this testing will be prohibitive. Therefore, NTEA contends that final stage manufacturers would be compelled either to cease operations or choose not to test and risk a host of liabilities. NTEA further argues that the agency has repeatedly taken the position that alternatives to actual compliance testing, such as engineering analyses, computer simulations, or group testing through trade associations, may not suffice as evidence of the due care required for certification.

DaimlerChrysler referred to what it believes to be errors in the agency proposed changes to FMVSS No. 105. The company stated that the proposed regulatory text deleted S7.8 from the list of test procedures and sequences, and inadvertently added S7.11. DaimlerChrysler also believes that the words ''except for vehicles with a GVWR greater than 10,000 lbs.'' were inadvertently deleted from S7.5(b), and that the word ''must''—proposed in lieu of the current ''shall'' in S7—should be retained. DaimlerChrysler also noted that the word ''control'' was deleted from the phrase ''transmission selector control'' in S7 and recommended that the word ''control'' be retained. Finally, DaimlerChrysler indicated that while it prefers retaining the existing language for S5.7(b), which governs test speeds for each category of vehicle for the second effectiveness test, that the existing language of S5.7(b) is also incorrect

V. Final Rule

This final rule adopts the amendments to FMVSS No. 105 and FMVSS No. 121 proposed in the December 21, 1999 NPRM with several modifications. First, because the agency agrees with those commenters who argued that the lightly loaded test condition is the most severe test of an ABS system in a braking-in-a-curve test, the final rule eliminates the proposed requirement that testing include braking runs by a vehicle in a loaded-to-GVWR condition. The final rule also modifies the proposed test sequence to reflect the elimination of the loaded-to-GVWR condition requirement and to simplify testing. We are also modifying the requirements for the full brake application used in the braking-in-a-curve test and making a number of corrections to the regulatory text.

The most significant modification to the proposal is our decision to eliminate the requirement that the braking-in-a-curve test be performed with the test vehicle in a lightly loaded and heavily loaded configuration. The comments submitted in response to the NPRM favored elimination of the requirement that vehicles be tested in a loaded-to-GVWR condition. These commenters argued that the brakes on a lightly loaded vehicle are generally much more likely to lock on a low friction surface than those on an identical vehicle with a heavy load.

The agency's own testing and data submitted by TMA indicate that the lightly-loaded test condition has a lower margin of compliance than tests in the loaded-to-GVWR condition. In those few cases in which the loaded-to-GVWR test condition resulted in a lower margin of compliance, the margin of compliance was still quite large for the lightly-loaded condition. These tests and data demonstrate that the loaded-to-GVWR test offers little additional information about a vehicle's ABS performance beyond what can be shown by just using the lightly-loaded test.

In addition, the agency agrees with the observations of several commenters that there is a risk of vehicle rollover while conducting the braking-in-a-curve test with a loaded-to-GVWR vehicle unless a low center-of-gravity loading scheme is required. Developing and implementing a uniform low center-of-gravity scheme for single-unit vehicles would be difficult given the large number of single-unit truck configurations. Use of a higher center-of-gravity load increases concerns about roll stability. During the maximum drive-through speed test, which determines the speed at which the braking-in-a-curve test is conducted, the test vehicle will depart from the test lane if the driver exceeds the maximum drive through speed of the vehicle for that road surface condition. If this occurs, the test vehicle may move laterally onto a wet asphalt surface with a higher coefficient of friction (PFC 0.8). In these conditions, a vehicle loaded so that it has a high center of gravity could become unstable and rollover. The HDBMC offered its view that the agency should specify a 32-inch center-of-gravity height for any ballast added to create a loaded condition for any agency braking tests, including the proposed test. We note first that as the agency is not specifying that the braking in a curve test be performed in a loaded-to-GVWR condition, this eliminates HDBMC's concerns for that test.

While the agency is not including the fully-loaded-to-GVWR braking-in-a-curve test for single-unit vehicles in this final rule, it will keep this test requirement in FMVSS No. 121 for truck tractors. Reasons for keeping this requirement include the large variation in vehicle weight of unladen tractors (bobtail) to fully-loaded-to-GVWR tractors; the large contribution of the tractor in providing braking force when a loaded semi-trailer is coupled to the tractor; and the articulated configuration of the tractor and semitrailer that results in the trailer contributing to the lateral force on the tractor drive wheels during a braking-in-a-curve test. In addition, since loading a tractor to GVWR is accomplished by coupling a loaded control trailer to the tractor, the labor effort for loading and unloading is minimal compared to single-unit vehicles.

This final rule also modifies the test sequence. We note that our proposed test sequence, which is already in effect for truck tractors, is based on several

factors. The braking-in-a-curve test is placed early in the sequence so re-running the required straight line tests need not be done if the vehicle does not pass the braking-in-a-curve test. In addition, placing the braking-in-a-curve test early in the sequence avoids performing the braking-in-a-curve test with tires that may have developed flat spots on non-ABS controlled wheels during other tests. Although these flat spots will not appear if all wheels of a vehicle are controlled by ABS, there is no requirement that vehicles be so equipped. NHTSA must assume that compliance testing may encompass vehicles that do not have ABS controlling all their wheels. However, placing the braking-in-a-curve test near the beginning of the test sequence when the vehicle has to be tested in a loaded-to-GVWR and lightly-loaded condition, requires that the vehicle be loaded, tested in the curve, unloaded, tested in the curve and then loaded again for straight line tests. Compared to tractors, where the loading and unloading involves attaching or uncoupling a trailer, the loading and unloading of vehicles is more time consuming, particularly for buses where weights have to be placed in each seating position.

Our decision to require the braking-in-a-curve test for single unit vehicles only in the lightly loaded condition eliminates the need for loading and unloading for the braking-in-a-curve test. However, as some of the commenters observed, other changes to test sequences could reduce test burdens without compromising safety. Changing the FMVSS No. 105 test sequence to perform the braking-in-a-curve after the lightly-loaded parking brake test would reduce the unloading/loading and loading/unloading cycles in the entire test sequence from four to two. Changing the test sequence for single unit vehicles in FMVSS No. 121 so that the braking-in-a-curve test is performed after the loaded-to-GVWR parking brake tests would reduce the unloading/loading and loading/unloading cycles from three to one. As these changes to the test sequences would reduce test burdens and not compromise safety, this final rule revises the test sequences in FMVSS No. 105 so the braking-in-a-curve test is performed after the lightly loaded parking brake test and incorporates a test sequence for single unit vehicles in FMVSS No. 121 specifying that the braking-in-a-curve test is performed after the loaded-to-GVWR parking brake tests.

One commenter, Mitsubishi, submitted data to support its argument that NHTSA's proposed specifications for the brake application used in the FMVSS No. 105 braking-in-a-curve test were too stringent. As indicated above, the company argued that our proposal that a brake pedal force of 150 lbs. be achieved within 0.2 second from the initial application of force would be impractical. Data from testing performed by Mitsubishi using test drivers in single unit trucks indicated that a pedal force of 150 lbs. was achieved in 0.2 seconds or less in only three out of ten stops. Mitsubishi suggested that a 0.5 second application time is more practicable.

NHTSA agrees that it is difficult to reach the required application pressure within 0.2 second with a test driver. However, the agency believes that a 0.5 second application time is too slow. The Mitsubishi data show that the application time for the ten stops ranged from 0.18 to 0.31 second. The data also show that the 150 lbs. threshold was exceeded significantly in every case within 0.5 second of the initial application. Our review of the Mitsubishi data indicates that a test driver is able to reach 150 lbs. of force within 0.3 second of the initial application. Accordingly, this final rule specifies that a full brake application for the braking-in-a-curve test consists of an application where 150 lbs. of force is applied to the brake control within 0.3 seconds of the initial application of force to the brake control.

Finally, NHTSA is making a number of changes to the regulatory text to resolve errors and clarify the new requirements. As proposed in the NPRM, S5.1.7 of FMVSS No. 105 stated that the braking-in-a-curve test must be conducted at lightly-loaded vehicle weight plus up to 500 lbs. to allow for a test driver and instrumentation. However, S4 of FMVSS No. 105 already included a definition of lightly-loaded vehicle weight (for vehicles over 10,000 lbs. GVWR) with an allowance for 500 lbs. for the test driver and instrumentation. As the definition of ''lightly-loaded'' already includes an allowance for the test driver and instrumentation, this final rule deletes the redundant language in S5.1.7. DaimlerChrysler's comments indicated that the agency inadvertently deleted S7.8 from the list of test procedures and sequences in FMVSS No. 105, and inadvertently added S7.11 to the list. NHTSA agrees and is correcting the errors in the final rule. To address other errors noted by DaimlerChrysler, the final rule inserts the phrase ''except for vehicles with a GVWR greater than 10,000 lbs.'' in S7.5(b), the words ''shall'' and ''control'' in S7, and in S5.7.(b) modifies the table or test speeds for each category of vehicle for the second effectiveness test.

The agency is making other minor technical or clarifying changes based on its own review. The first sentence of S6.1.1 referencing lightly-loaded braking tests is also amended to include a reference to the braking-in-a-curve test for vehicles over 10,000 lbs. GVWR and S6.1.2, which identifies how the 500 lbs. of weight allowed for the test driver and instrumentation is to be placed in the vehicle, is also modified from the language of the proposal. The text of S6.9.2(a), which specifies the test surface for stopping distance tests in FMVSS No. 105, is also being revised to clarify that this specification does not include the stability and control while braking test in S6.9.2(b). S7 is revised in the final rule to accommodate the insertion of the stability and control test in S7.5(a), and references to S7.5 in the test procedure and sequence are being changed to S7.5(b). The final rule also deletes the proposed language of S5.3.6.2(a) of FMVSS No. 121—indicating that the vehicle is to be loaded to its GVWR in proportion to its GAWRs —as this specification is already included in S6.1.1 under S6, Road Test Conditions.

In limiting the modifications to its original proposal to those items described above, the agency is rejecting a number of changes suggested by the commenters. Advocates stated that the characteristics of the roadway specified for the braking-in-a-curve test do not approach worst-case operating conditions and that few vehicles properly equipped with ABS would fail the proposed braking-in-a-curve test. NHTSA disagrees that the braking-in-a-curve course is not demanding, since disabling the ABS on single-unit trucks and buses would likely result in these vehicles departing the lane during a full effort brake application. The agency believes that the proposed test configuration is sufficiently rigorous to evaluate the safety performance of ABS.

DaimlerChrysler requested that compliance with the braking-in-a-curve test be determined on the basis of whether any tire point-of-road contact leaves the test lane rather than any part of the vehicle leaving the roadway. The company argued that the latter measure is unclear and should not be applied to vehicles with large rear overhangs. NHTSA believes that the measure of compliance is clear as it stands and well understood to mean that in the plan view (view from the top looking down), no part of the vehicle shall pass outside of the 12-foot lane during the stop. As currently specified in the FMVSS No.

121 test procedure, the test driver is instructed to start each braking-in-a-curve maneuver with the vehicle in the center of the lane. The test lane is marked with cones placed at 20-foot intervals that are tall enough to contact the body of the test vehicle if the body swings outside of the lane. This method has proved sufficient in determining if the vehicle remains in the lane. Moreover, agency testing on vehicles with a variety of overhangs indicates that a vehicle that is maintaining traction and control will not move laterally far enough for the rear of the vehicle to leave the traveled lane.

Most importantly, the purpose of the braking-in-a-curve test is to represent a driving situation that might be encountered on a public road during a panic brake application. We believe that no part of the vehicle including a rear overhang should encroach on another travel lane. If the agency permitted the rear wheels of a vehicle to touch the outside of the 12-foot wide lane during the braking-in-a-curve test then the rear overhang would be outside of the travel lane and could pose a crash threat to other vehicles when that vehicle is operated on public roads.

DaimlerChrysler also requested that NHTSA delete the requirement that the proposed braking-in-a-curve road surface be ''wet.'' The NPRM proposed that the braking-in-a-curve test be performed on a wet level surface having a peak friction coefficient (PFC) of 0.5. DaimlerChrysler indicated that the properties of test surface are adequately addressed by the command that it have a PFC equal to 0.5 when measured by a specific procedure. In DaimlerChrysler's view, if the PFC is correct, the pavement could be dry or wet. We do not agree with DaimlerChrysler's position. The procedure used for measuring the PFC of the test surface—ASTM Method E1337–90—requires use of a wetted surface. If the surface must be wet to determine its coefficient of friction for testing, it must also be wet when testing occurs. NHTSA also believes that deleting the word ''wet'' from FMVSS No. 105 would lead to confusion, since it would not be clear if the vehicle test should be conducted with the test surface wetted or dry.

Both NTEA and TMA voiced a number of objections to the agency proposal. As we observed above, NTEA urged the agency to terminate this rulemaking on the basis of its argument that no additional benefits are realized by adding the proposed test procedure to FMVSS No. 105 and FMVSS No. 121. Beyond that, NTEA objected to the additional costs and burdens imposed on final stage manufacturers by the proposal, arguing that pass-through certification will not be available and that their member companies do not have the means to conduct certification testing. NTEA contends that a final stage manufacturer can only be sure of compliance through actual testing. TMA raised similar objections to the costs imposed on final stage manufacturers by the proposal and argued that NHTSA has underestimated the costs and burdens that the regulations imposed on this segment of the industry. TMA also argued that adoption of the performance requirements for single unit vehicles would allow NHTSA to remove the existing equipment requirements for ABS from FMVSS No. 105 and FMVSS No. 121.

It is NHTSA's position that adding performance requirements for single unit trucks is necessary and desirable. NHTSA does not claim that additional safety benefits above those projected in the agency's Final Economic Assessment (FEA) for the 1995 final rule establishing the ABS requirements will be attained solely from implementing a braking-in-a-curve test for single-unit vehicles.[4] As detailed in that FEA, NHTSA estimated that the use of ABS on all heavy vehicles would help prevent between 320 and 506 fatalities, between 15,900 and 27,413 injuries, and between $ 458 million and $ 553 million of property damage each year. These benefits assumed that ABS units installed on single-unit vehicles, which were not then subject to the braking-in-a-curve test, would be as effective as those installed on truck tractors. Therefore, now adding the braking-in-a-curve test for single unit vehicles does not modify those benefits.

Adding this performance test is, in our view, necessary to ensure those previously calculated benefits are realized. NHTSA has encountered several instances in which ABS systems that met equipment requirements did not meet the braking-in-a-curve test. As we explained in the 1995 ABS final rule, the braking-in-a-curve test provides an important check of ABS performance. Merely requiring ABS systems to meet the ABS definition does not ensure that an ABS system will provide an acceptable level of performance.

NHTSA does not agree with TMA's contention that the adoption of the braking-in-a-curve test for single unit vehicles eliminates the need for the ABS equipment requirements. As we discussed in the 1995 ABS final rule, we regard 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 requirements such as split mu tests, surface transition tests, and stopping distance performance tests. However, 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.

The agency is not aware of, and TMA has not provided any data on, braking systems that provide stability and control during the braking-in-a-curve test that do not use a closed-loop control strategy as required by the ABS equipment requirements. Thus, the agency has decided to retain the ABS equipment requirements in FMVSS Nos. 105 and 121.

We have also concluded that these requirements do not stifle innovation. Moreover, TMA did not provide specific examples of how the existing equipment requirements would prevent the use of new technologies. The agency is aware of new technologies such as the electronically-controlled braking system (ECBS) that has been developed by the industry, and is involved through the Society of Automotive Engineers in learning more about the characteristics, mechanical and electronic design features, and performance of ECBS. If appropriate, future rulemaking efforts can be undertaken to accommodate these systems in FMVSS No. 121. However, the agency sees no reason to consider deletion or modification of the ABS equipment requirements from FMVSS Nos. 105 and 121 until it has specific knowledge on how, or if, existing requirements impact on the use of alternate braking system technologies.

TMA also stated that the proposed braking-in-a-curve test is not practicable. In TMA's view, NHTSA has not tested enough different axle combinations on single unit trucks to conclude that the proposed test is suitable for vehicles with different combinations of drive axles and ''tag'' and ''pusher'' axles. NHTSA acknowledges that it has not performed the braking-in-a-curve test with more than the most common axle combinations. However, it is the agency's position that it need not do so.

[4] It should be noted that one commenter, Advocates, performed an analysis indicating that safety benefits would accrue for the establishment of ABS performance requirements for single-unit trucks.

Testing to date indicates that as long as wheel lock-up is prevented on at least the rearmost axle and the steer axle, the vehicle will remain stable during the braking-in-a-curve maneuver. None of the commenters, including TMA, submitted data to the agency indicating that NHTSA's testing on more conventional axle configurations is not applicable to other axle arrangements. Accordingly, NHTSA believes that the braking-in-a-curve test is practicable for less common axle configurations.

TMA and NTEA both objected to the burdens that adoption of the single unit braking-in-a-curve test would allegedly impose on final stage manufacturers. The agency's February 1995 FEA contained calculations of compliance costs for both the stopping distance and ABS requirements of the 1995 Final Rule. Using these costs as a starting point, the December 1999 NPRM contained an estimate for the cost of implementing the braking-in-a-curve test for single-unit trucks and buses. A stand-alone braking-in-a-curve test was estimated to cost $1500, and the incremental cost to incorporate the braking-in-a-curve test into a complete Standard No. 105 or 121 compliance test was set at $1,000. The cost per air-braked vehicle, when distributed across the affected population, was estimated to be about $18. In the later years, it was estimated that 30 compliance tests would be required annually, for a total cost of $360,000 ($12 \times 30 \times \$1{,}000$). The cost per air-braked vehicle in those later years would be about $6.

In the case of hydraulic-braked single-unit vehicles, which were already subject to the existing test requirements of Standard No. 105, the 1995 FEA concluded that the incremental cost of a braking-in-a-curve test would be $1,000 per test. The FEA estimated that 10 manufacturers would have to complete 20 compliance tests each, the total cost for these vehicles would be approximately $200,000.00. Given annual sales of hydraulically braked medium and heavy trucks of approximately 195, 000 vehicles, we estimated the cost per vehicle for the braking-in-a-curve test for hydraulically braked vehicles at about $1. This cost per vehicle would be the same in the later years if manufacturers chose to test for each model year.

TMA estimates that stand-alone braking-in-a-curve testing costs between $4,500 and $6,000 per test. TMA states that a typical burnish alone costs approximately $1,500 while a full FMVSS No. 105 or 121 certification test costs $10,000 to $13,000. TMA did not provide a detailed breakdown of these costs, so it is difficult for NHTSA to ascertain how a braking-in-a-curve test, which is not disproportionately demanding in comparison to other tests in the sequence, could account for forty to fifty percent of the total cost of a complete FMVSS No. 105 or 121 certification test. TMA's comments also did not indicate what its members were currently expending in performing testing substantially similar to the test required by this final rule. Because, according to TMA's comments, TMA members are already using the SAE J1626 test procedure, TMA urged the agency to take steps to ensure that the FMVSS No. 121 and 105 braking-in-a-curve test conform as closely as possible to that test.

A review of the SAEJ1626 test procedure indicates that it contains a braking-in-a-curve test that is virtually identical to the braking-in-a-curve contained in this final rule. Therefore, it appears, to the extent that TMA members are already performing the SAE J1626 test, that the promulgation of this final rule should not impose additional test costs. If those manufacturers are not currently performing the SAE braking-in-a-curve test, the agency believes that TMA's claimed additional costs for adding the braking-in-a-curve test to FMVSS No. 105 and 121 are overstated.

Our own inquiries with test facilities indicate that adding the braking-in-a-curve test to the existing NHTSA test sequence should impose additional costs of approximately $1000, particularly since we are now specifying that the braking-in-a-curve test be performed only in the lightly loaded condition. In the agency's view, TMA's projected test costs of $4500 to $6000 for adding the braking in a curve test would be reasonable only in the situation where a vehicle has not been tested to SAE J1626, has already been tested to Standard No. 105 or 121, and was being transported to a test facility only for testing to the braking-in-a-curve test with newly-installed and freshly burnished brakes.

The NPRM indicated an estimated cost of $18 per air-braked single-unit vehicle for manufacturers to include stand-alone braking-in-a-curve testing in the first year and $6 in later years. In the case of hydraulically-braked vehicles, this figure is $1 per year for the first year and thereafter. As noted above, NHTSA does not agree that TMA's claimed costs are reasonable, particularly in light of the widespread use of the SAE J1626 test. However, if TMA's cost estimates were applied, then the per-vehicle cost could be as high as $54 to $72 per vehicle, provided the FEA and NPRM assumptions are valid on the number of tests to be conducted. However, as indicated above, NHTSA believes that testing costs as high as those projected by TMA represent an unlikely worst case and that the agency's projection are much more representative of actual conditions. We also note that the cost of ABS components and complete systems has declined approximately 30 percent in the 7 years since the cost-benefit analysis contained in the FEA was performed, thereby reducing the overall cost of compliance.

NTEA also commented on the costs of the agency proposal. The organization contends that the costs of complying with the braking-in-a-curve requirement would be particularly burdensome for its members. NTEA describes these members as small businesses that sell and install truck bodies on incomplete vehicles. Some of these vehicles are obtained from incomplete vehicle manufacturers in a nearly complete condition such as a chassis-cab, *i.e.*, a truck that is complete except for a body. In the case of a chassis-cab, the final stage manufacturer typically adds a body to the portion of the vehicle behind the cab to produce a completed truck. Other configurations, such as cutaways, stripped chassis or chassis cowls require substantially more work before the vehicle is complete. NTEA believes that as much as 20 percent of all single unit trucks built in multiple stages are based on cutaways, stripped chassis or chassis cowls. According to the organization, when these types of incomplete vehicles are used, the final stage manufacturer can only certify the completed vehicle through testing. NTEA also stated that even where a chassis cab or other incomplete vehicle that has been certified by the incomplete vehicle manufacturer, the particular application for the vehicle may require sufficient changes so the final stage vehicle no longer complies with the specifications contained in the incomplete vehicle manufacturer's certification. In both cases, NTEA commented that the final stage manufacturer would then face the practical and financial obstacles of obtaining and paying for the required compliance tests.

NHTSA agrees that final stage manufacturers may not be able to rely on a certification provided by an incomplete vehicle manufacturer or that such a certification may not exist. However, it is our view that NTEA's claims are overstated, and like those presented by the TMA, present a worst-case scenario as the norm. We note first that chassis-cabs, for which pass through certification is available,

represent a significant portion of the affected population. For instance, in the 1987 through 1989 model years, chassis-cabs represented 86 percent of sales of incomplete trucks with a GVWR above 10,000 pounds. Based on inquiries with manufacturers, NHTSA believes that this percentage is now much larger. Finally, even where pass-through certification is not available, incomplete vehicle manufacturers provide certification data for specific Federal motor vehicle safety standards that can be used by the final stage manufacturer to certify compliance without having to do any testing. Examination of this documentation shows that final stage manufacturers are usually provided with an envelope within which the vehicle center-of-gravity can be located and the axle loadings that can be used in order for the vehicle to meet either Standard No. 105 or Standard No. 121. Incomplete vehicle manufacturers strive to make this information as complete as possible in order to serve their customers. Therefore, NHTSA believes that occurrences where final stage manufacturers may not rely on pass-through certification or vehicle certification data from the incomplete vehicle manufacturer will be rare and would represent a significantly smaller percentage of the affected vehicles than the 20 percent claimed by NTEA.

NTEA also argues that the tremendous variety of vehicle configurations produced by its members compels the conclusion that NHTSA cannot require these member companies to perform the braking-in-a-curve test. This argument is based on two assertions. The first is that its members who do not use chassis-cabs and do not have pass-through certification have no choice but to perform compliance testing to demonstrate compliance with FMVSS Nos. 105 and 121. The second is that for those manufacturers, the costs of testing are so great as to make it impracticable. As testing must be both objective and practicable and NTEA's members have no choice but to test, the costs of the braking-in-a-curve test, in NTEA's view, preclude use of the test.

The NTEA position relies heavily on the decisions in two prior challenges the agency final rules, *Paccar, Inc.* v. *National Highway Traffic Safety Administration,* 573 F.2d 632 (9th Cir.), cert. denied, 439 U.S. 862, 99 S. Ct. 184, 58 L. Ed. 2d 172 (1978) and *NTEA* v. *National Highway Traffic Safety Administration,* 919 F.2d 1148, 1152–53 (6th Cir. 1990) where the courts rejected the agency's argument that compliance could be demonstrated by a showing of due care when tests are not performed. In both cases, NHTSA had conceded that the required tests were impracticable. This left the courts to consider the question of whether the due care standard provided sufficient guidance to manufacturers when no compliance test was available. The *Paccar* court, describing the due care standard as ''amorphous,'' found that NHTSA's ''suggestions'' of what constituted due care to be too imprecise to assist those trying to meet the standard at issue. In the *NTEA* case, the court followed the earlier *Paccar* decision and held that NHTSA could not impose a due care requirement on final stage manufacturers for whom the designated test was impracticable. NTEA argues that imposing the braking-in-a-curve test to final stage manufacturers is equally impracticable as the tests involved in both the *Paccar* and *NTEA* decisions. As the agency has not proposed any alternative to the test other than to establish compliance through due care, NTEA contends that NHTSA cannot now apply the braking-in-a-curve test to final stage manufacturers.

NHTSA does not agree with NTEA's analysis. We note first that NTEA did not provide any data supporting its position that the braking-in-a-curve test is so costly as to be impracticable. In fact, NTEA's comments do not contain any cost estimates for this test. In the absence of any cost estimates, NTEA stresses that the tremendous variety of vehicles made by final stage manufacturers who cannot rely on pass-through certification supports the premise that the braking-in-a-curve test is impracticable. According to NTEA, requiring final stage manufacturers to perform the braking-in-a-curve test is tantamount to requiring that every vehicle produced by these manufacturers must undergo this test. However, as is the case with cost estimates for the test itself, NTEA does not provide any data on the production of final stage manufacturers, including how many manufacturers produce models in extremely low volumes. In some instances, final stage manufacturers will be able to spread the cost of testing over the production run of similar vehicles. In other instances, manufacturers may have to perform testing of a single vehicle. Unlike the tests involved in both the *Paccar* and *NTEA* cases, the braking-in-a-curve test simply adds a new component to a braking test sequence that manufacturers are already required to perform. This incremental addition to the existing test sequence does not, in contrast to the test in the *NTEA* case, damage the test vehicle.

We estimate that the incremental cost of performing the braking-in-a-curve test to be approximately $1000.00. Manufacturers, even final stage manufacturers producing specialized vehicles on a bare chassis, rarely produce just one example of a particular design. The incremental cost of the braking-in-a-curve test is therefore likely to be spread over a production run of many vehicles. Even in the case of a production run of just one vehicle, we do not believe that this additional test cost is so high as to make the braking-in-a-curve test impractible, particularly since a buyer seeking a highly specialized vehicle is likely to be willing to pay more for the special features it offers.

NHTSA also believes that final stage manufacturers are capable of determining what constitutes the exercise of due care when certifying a vehicle and may rely on the exercise of that care in establishing certification without testing. While we must concede that NHTSA cannot make a single pronouncement of what constitutes due care for every circumstance in which a manufacturer certifies a vehicle, manufacturers, even final stage manufacturers, should be able to make this determination themselves. Vehicle manufacturers, both large and small, must make similar determinations for liability purposes every day. In so doing, they are aided by the application of industry and professional standards of care.

Final stage manufacturers are also provided with considerable guidance by the incomplete vehicle documents and body builder's guides provided by chassis manufacturers. Even where pass-through certification cannot be used, incomplete vehicle documents provide assurance of compliance if the completed vehicle meets the axle loading and center-of-gravity specifications provided by the incomplete vehicle manufacturer. If the final stage manufacturer stays within the guidelines provided by the incomplete vehicle manufacturer, the certification information supplied with the chassis can be used to certify compliance without doing any actual testing. Moreover, each chassis-cab manufacturer has an incentive to make the requirements for pass-through certification as broad as possible. The final stage manufacturer can then select from a variety of readily-available chassis-cab configurations and options (*e.g.*, wheelbase, front and rear axle ratings) that can predictably meet the pass-through certification criteria.

When a final stage manufacturer completes a vehicle in a way that takes

the vehicle outside the specifications of the IVD, then it cannot rely on the IVD in certifying compliance of the vehicle. Absent actual testing, alternate means of certification, such as engineering analysis or computer simulation, may be sufficient to allow a final stage manufacturer to certify compliance in good faith. For example, the manufacturer or supplier of the lift axle, upon request from a final stage manufacturer, may provide service brake retardation force characteristics for the axles it sells, based on dynamometer or other testing conducted by the axle manufacturer, which can be applied through simple calculations to determine compliance with service brake stopping distance requirements. That supplier can also provide grade-holding or drawbar test data to determine, using simple calculations, that the parking brake requirements in FMVSS No. 121, for example, are met at the increased GVWR as altered by the final stage manufacturer. Other braking requirements in the FMVSSs, including emergency brake stopping distance and brake actuation and release timing, can similarly be met by performing engineering analysis, working with chassis manufacturers and brake system and axle suppliers, and installing suitable equipment, to permit the final stage manufacturer to certify compliance with FMVSS Nos. 105 or 121. In many cases, such certification can be achieved without having to conduct actual road testing, or in some cases, with only portions of road or laboratory testing required (such as hiring a consultant to perform brake application and release timing tests at the final stage manufacturer's facilities).

NHTSA recognizes that there may be unusual vehicle configurations for which complete data are not available from vehicle or component suppliers that would enable an engineering analysis to be used for certification purposes. In such cases, computer simulations or actual road testing may be necessary for certification. Final stage manufacturers should consider these facts before deciding to build unusual vehicle configurations, since it is predictable that some vehicles cannot be certified using engineering analyses prior to purchasing a chassis, body, or other equipment.

VI. Preselection of Test Condition Option

Many FMVSSs contain alternative compliance options from which vehicle manufacturers may choose. In this final rule, there is an option to use a rollbar structure of up to 1,000 pounds for vehicles tested in the lightly-loaded condition. This has resulted in some problems when the agency conducts its compliance tests. For example, in a recent case, a vehicle was tested to FMVSS No. 135 and did not meet one of the requirements of that standard. When contacted about the non-compliance, the vehicle manufacturer stated that the vehicle should be compliance tested to FMVSS No. 105, since at that time that particular vehicle could be manufactured to either standard at the vehicle manufacturer's option. Thus, the agency was faced with having to test to two standards to determine which one applied.

To avoid confusion in the future, the agency is now conducting a review of compliance test condition options and anticipates that it will propose regulations to address this issue. However, until such rules are proposed and adopted, our practice will be to address optional test conditions in each standard. Thus, the agency is adding a statement to the general test conditions for both FMVSS No. 105 (S6.15) and 121 (S6.1.16) that directs a vehicle manufacturer to identify which option was selected for compliance test purposes. The agency does not believe that this makes any of the standard's requirements more stringent. Instead, it removes uncertainty from the compliance test program and reduces test costs to the agency.

VII. Effective Date

The amendments contained in this final rule become effective October 10, 2003. With the exception of vehicles built in two or more stages, the braking-in-a-curve test requirements contained in this final rule apply to vehicles built on or after July 1, 2005. Vehicles built in two or more stages must meet the braking-in-a-curve test's requirements on or after July 1, 2006. Single unit trucks and buses are built in a wide variety of configurations to meet a diverse array of uses and needs. Many single unit trucks and buses are built to standard designs and configurations. However, many are specialty vehicles dedicated to specific purposes. Although anti-lock brake systems suitable for use in these vehicles are readily available, adaptation of these systems for particular applications will require sufficient leadtime to allow whatever development and testing may be needed. Moreover, as many single unit trucks and buses are manufactured in two or more stages, the agency notes that many final stage manufacturers are likely to rely on incomplete vehicle manufacturers to supply chassis that meet the new requirements. The agency has determined that the approximately two-year leadtime provided in this final rule provides sufficient time for intermediate stage manufacturers to develop complying incomplete vehicles in a sufficient number of configurations to meet the needs of final stage manufacturers. Finally, this final rule will make it necessary for some small final stage manufacturers to certify their vehicles with limited assistance from the intermediate vehicle manufacturer. The compliance date chosen by the agency affords these manufacturers sufficient time to take whatever steps may be required to meet the new requirements. Accordingly, the agency finds that good cause exists to make the compliance dates in this final rule effective more than one year after issuance.

VIII. Rulemaking Analyses and Notices

A. Regulatory Policies and Procedures

Executive Order 12866, ''Regulatory Planning and Review,'' (58 FR 51735, October 4, 1993), provides for making determinations whether a regulatory action is ''significant'' and therefore subject to Office of Management and Budget (OMB) review and to the requirements of the Executive Order. The Order defines a ''significant regulatory action'' as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

We have considered the impact of this rulemaking action under Executive Order 12866 and the Department of Transportation's regulatory policies and procedures. The Office of Management and Budget did not review this rulemaking document under E.O. 12866. The document is also not considered to be significant under the Department's Regulatory Policies and Procedures (44 FR 11034; February 26, 1979).

This document amends 49 CFR Parts 571.105 and 571.121 by extending the application of the existing braking-in-a-curve performance test for anti-lock

brakes to vehicles already required to be equipped with such brakes. By providing a compliance test, this final rule assures the realization of the benefits previously calculated when the requirement for installation of anti-lock brakes was issued in 1995. The compliance test contained in this final rule, which requires a vehicle to successfully negotiate a curved lane on a wetted low-friction surface, is identical to the existing agency test applicable to truck tractors, virtually identical to an existing Society of Automotive Engineers (SAE) test, and similar to other industry tests used to evaluate anti-lock brakes. Therefore, NHTSA believes that existing ABS systems, when properly installed and configured, will allow a vehicle to meet the requirements of the braking-in-a-curve test.

By extending the braking-in-a-curve test to non-articulated trucks and buses, this final rule adds a new road test requirement to an existing sequence of road tests for those vehicles. The costs of the new additional road test required by this final rule are (because the tests are identical) identical to the costs of requiring truck tractors to meet the same test. Based on our knowledge of this braking-in-a-curve test, the agency estimated the incremental cost of adding this new road test to the existing sequence of road tests for brakes to be approximately $1,000 per test. In most cases, this additional test cost will be spread over hundreds or thousands of vehicles. In instances in which the vehicle involved is a more specialized configuration, the cost of compliance testing, including the cost of including the braking-in-a-curve test in the existing road test sequence will be spread over fewer vehicles. Overall, NHTSA estimates that approximately 250,000 single unit trucks and 7,000 single-unit buses will be affected by this final rule. Testing costs were estimated at the time of the 1995 final rule to range from $1 to $18 per vehicle, depending on whether the vehicle has air brakes or hydraulic brakes and if the braking-in-a-curve test is as part of a full brake system compliance test or is performed alone.

When we promulgated the anti-lock brake requirements in 1995, the benefits of the anti-lock brake requirements were estimated to result in as many as 506 fewer annual fatalities, 27,413 fewer injuries and a reduction of property damage by as much as $553 million each year. The increased cost, which included the cost of anti-lock brakes and testing combined, was estimated to be $692 per vehicle. Almost all of that cost is for the brakes themselves. The cost of the brakes is attributable to the March 1995 final rule, not this one.

B. Executive Order 13132 (Federalism)

The agency has analyzed this rulemaking action in accordance with the principles and criteria set forth in Executive Order 13132. This final rule does not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Accordingly, the requirements of section 6 of the Executive Order do not apply to this final rule.

C. Executive Order 13045

Executive Order 13045 (62 FR 19885, April 23, 1997) applies to any rule that: (1) is determined to be ''economically significant'' as defined under E.O. 12866, and (2) concerns an environmental, health or safety risk that NHTSA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, we must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by us.

This rule is not subject to the Executive Order because it is not economically significant as defined in E.O. 12866 and does not involve decisions based on environmental, safety or health risks having a disproportionate impact on children.

D. Executive Order 12778

Pursuant to Executive Order 12778, ''Civil Justice Reform,'' we have considered whether this final rule will have any retroactive effect. We conclude that it will not have such 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.

E. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996) whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (*i.e.*, small businesses, small organizations, and small governmental jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

The Administrator has considered the effects of this rulemaking action under the Regulatory Flexibility Act (5 U.S.C. § 601 *et seq.*) and certifies that this final rule will not have a significant economic impact on a substantial number of small entities.

This final rule extends application of an existing performance test for anti-lock brakes to a class of vehicles that are already required to have anti-lock brakes. The performance test, known as the braking-in-a-curve test, previously applied only to truck tractors and this final rule simply requires that single unit (non-articulated) trucks and buses must meet the same test. The primary cost effect of the requirements will be testing costs and will be on manufacturers of single unit (*i.e.*, non-articulated) trucks and buses. Some single unit trucks and buses are produced by large manufacturers. Other single unit trucks and buses are produced in stages. In most cases, large manufacturers provide incomplete vehicles to smaller final stage manufacturers, who then produce the finished vehicle. Final stage manufacturers, those who use incomplete vehicles produced by larger manufacturers to produce specialty products, are generally small businesses. However, NHTSA believes that this final rule is not burdensome for final stage manufacturers. As eighty to ninety percent of the affected vehicles are completed from chassis-cabs where pass through certification is available, most final stage manufacturers will be able to rely on the prior certification and testing performed by an incomplete vehicle manufacturer and thus will not

need to incur additional costs. The remaining final stage manufacturers will be required to perform testing or take other steps to ensure that the vehicles they produce will meet the new performance requirements. These manufacturers will have a variety of means available to accomplish this, including access to test and other data performed by chassis manufacturers, trade groups and equipment manufacturers. Therefore, the agency has determined that this final rule will not have a significant impact on these small entities and has not prepared a regulatory flexibility analysis.

F. National Environmental Policy Act

We have analyzed this final rule amendment for the purposes of the National Environmental Policy Act and determined that it will not have any significant impact on the quality of the human environment.

G. Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995, a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. This final rule does not contain any new information collection requirements.

H. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, section 12(d) (15 U.S.C. 272) directs us to use voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs us to provide Congress, through OMB, explanations when we decide not to use available and applicable voluntary consensus standards.

This final rule adds anti-lock brake system performance requirements and a performance test for single unit trucks to 49 CFR 571.105 and 49 CFR 571.121. The amendments add these new requirements to an existing regulatory scheme that already contains an identical test for truck tractors. The tests adopted in this final rule are identical in most respects to the provisions of Section 5.3 of the Society of Automotive Engineers (SAE) Recommended Practice J1626, Braking, Stability, and Control Performance Test Procedures for Air and Hydraulic Brake Equipped Trucks. Any differences between the provisions of this final rule and SAE J1626 are minor in nature and do not add significantly to the test burdens of manufacturers. Accordingly, to the degree that the final rule does not adopt a voluntary consensus standard, the agency believes that no explanation is necessary.

I. Unfunded Mandates Reform Act

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires Federal agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of more than $100 million in any one year (adjusted for inflation with base year of 1995). Before promulgating a NHTSA rule for which a written statement is needed, section 205 of the UMRA generally requires us to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule.

The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows us to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if we publish with the final rule an explanation why that alternative was not adopted.

This final rule will not result in costs of $100 million or more to either State, local, or tribal governments, in the aggregate, or to the private sector. Thus, this final rule is not subject to the requirements of sections 202 and 205 of the UMRA.

J. Regulation Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

List of Subjects in 49 CFR Part 571

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

■ In consideration of the foregoing, 49 CFR part 571 is amended as follows:

PART 571—[AMENDED]

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

Authority: 49 U.S.C. 322, 21411, 21415, 21417, and 21466; delegation of authority at 49 CFR 1.50.

■ 2. Section 571.105 is amended by revising S4 to add definitions of ''Full brake application'' and ''Maximum drive-through speed;'' by revising S5.1, S6.1.1, S6.1.2, S6.9.2, the introductory text of S7, S7.5, and Table 1; and by adding S5.1.7, S6.14 and S6.15, to read as follows:

§ 571.105 Standard No. 105, Hydraulic brake systems.

* * * * *

S4 Definitions.

* * * * *

Full brake application means a brake application in which the force on the brake pedal reaches 150 pounds within 0.3 seconds from the point of application of force to the brake control.

* * * * *

Maximum drive-through speed means the highest possible constant speed at which the vehicle can be driven through 200 feet of a 500-foot radius curve arc without leaving the 12-foot lane.

* * * * *

S5.1 Service brake systems. Each vehicle must be equipped with a service brake system acting on all wheels. Wear of the service brake must be compensated for by means of a system of automatic adjustment. Each passenger car and each multipurpose passenger vehicle, truck, and bus with a GVWR of 10,000 pounds or less must be capable of meeting the requirements of S5.1.1 through S5.1.6 under the conditions prescribed in S6, when tested according to the procedures and in the sequence set forth in S7. Each school bus with a GVWR greater than 10,000 pounds must be capable of meeting the requirements of S5.1.1 through S5.1.5, and S5.1.7 under the conditions specified in S6, when tested according to the procedures and in the sequence set forth in S7. Each multipurpose passenger vehicle, truck and bus (other than a school bus) with a GVWR greater than 10,000 pounds must be capable of meeting the requirements of S5.1.1, S5.1.2, S5.1.3, and S5.1.7 under the conditions specified in S6, when tested according to the procedures and in the sequence set forth in S7. Except as noted in S5.1.1.2 and S5.1.1.4, if a vehicle is incapable of attaining a speed specified in S5.1.1, S5.1.2, S5.1.3, or S5.1.6, its service brakes must be capable of stopping the vehicle from the multiple of 5 mph that is 4 to 8 mph less than

the speed attainable in 2 miles, within distances that do not exceed the corresponding distances specified in Table II. If a vehicle is incapable of attaining a speed specified in S5.1.4 in the time or distance interval set forth, it must be tested at the highest speed attainable in the time or distance interval specified.

* * * * *

S5.1.7 Stability and control during braking. When stopped four consecutive times under the conditions specified in S6, each vehicle with a GVWR greater than 10,000 pounds manufactured on or after July 1, 2005 and each vehicle with a GVWR greater than 10,000 pounds manufactured in two or more stages on or after July 1, 2006 shall stop from 30 mph or 75 percent of the maximum drive-through speed, whichever is less, at least three times within the 12-foot lane, without any part of the vehicle leaving the roadway. Stop the vehicle with the vehicle at its lightly loaded vehicle weight, or at the manufacturer's option, at its lightly loaded vehicle weight plus not more than an additional 1000 pounds for a roll bar structure on the vehicle.

* * * * *

S6.1.1 Other than tests specified at lightly loaded vehicle weight in S7.5(a), S7.7, S7.8, and S7.9, the vehicle is loaded to its GVWR such that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR, except that each fuel tank is filled to any level from 100 percent of capacity (corresponding to full GVWR) to 75 percent. However, if the weight on any axle of a vehicle at lightly loaded vehicle weight exceeds the axle's proportional share of the gross vehicle weight rating, the load required to reach GVWR is placed so that the weight on that axle remains the same as a lightly loaded vehicle weight.

* * * * *

S6.1.2 For the applicable tests specified in S7.5(a), S7.7, S7.8, and S7.9, vehicle weight is lightly loaded vehicle weight, with the added weight distributed in the front passenger seat area in passenger cars, multipurpose passenger vehicles, and trucks, and in the area adjacent to the driver's seat in buses.

* * * * *

S6.9.2(a) For vehicles with a GVWR greater than 10,000 pounds, road tests (excluding stability and control during braking tests) are conducted on a 12-foot-wide, level roadway, having a peak friction coefficient of 0.9 when measured using an American Society for Testing and Materials (ASTM) E 1136 standard reference test tire, in accordance with ASTM Method E 1337–90, at a speed of 40 mph, without water delivery. Burnish stops are conducted on any surface. The parking brake test surface is clean, dry, smooth, Portland cement concrete.

S6.9.2(b) For vehicles with a GVWR greater than 10,000 pounds, stability and control during braking tests are conducted 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.

* * * * *

S6.14 Special drive conditions. A vehicle with a GVWR greater than 10,000 pounds equipped with an interlocking axle system or a front wheel drive system that is engaged and disengaged by the driver is tested with the system disengaged.

S6.15 Selection of compliance options. Where manufacturer options are specified, the manufacturer shall select the option by the time it certifies the vehicle and may not thereafter select a different option for the vehicle. Each manufacturer shall, upon request from the National Highway Traffic Safety Administration, provide information regarding which of the compliance options it has selected for a particular vehicle or make/model.

* * * * *

S7. Test procedure and sequence. Each vehicle shall be capable of meeting all the applicable requirements of S5 when tested according to the procedures and 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, S5.1.3, and S5.1.7 in section S5.1, the applicable test procedures and sequence are S7.1, S7.2, S7.4, S7.5(b), S7.5(a), S7.8, S7.9, S7.10, and S7.18. However, at the option of the manufacturer, the following test procedure and sequence may be conducted: S7.1, S7.2, S7.3, S7.4, S7.5(b), S7.6, S7.7, S7.5(a), S7.8, S7.9, S7.10, and S7.18. The choice of this option must 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(b), 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 must 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 (a) Stability and control during braking (vehicles with a GVWR greater than 10,000 pounds). Make four stops in the lightly-loaded weight condition specified in S5.1.7. Use a full brake application for the duration of the stop, with the clutch pedal depressed or the transmission selector control in the neutral position, for the duration of each stop.

(b) Service brake system—second effectiveness test. For vehicles with a GVWR of 10,000 pounds or less, or any school bus, make six stops from 30 mph. Then, for any vehicle, make six stops from 60 mph. Then, for a vehicle 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 than 84 mph.

* * * * *

TABLE I.—BRAKE TEST PROCEDURE SEQUENCE AND REQUIREMENTS

Sequence	Test load		Test procedure	Require-ments
	Light	GVWR		
1. Instrumentation check			S7.2	
2. First (preburnish) effectiveness test		X	S7.3	S5.1.1.1
3. Burnish procedure		X	S7.4	

TABLE I.—BRAKE TEST PROCEDURE SEQUENCE AND REQUIREMENTS—Continued

Sequence	Test load		Test procedure	Requirements
	Light	GVWR		
4. Second effectiveness test	.....	X	S7.5(b)	S5.1.1.2
5. First reburnish	.....	X	S7.6	
6. Parking brake	X	X	S7.7	S5.2
7. Stability and control during braking (braking-in-a-curve test)	X	.....	S7.5(a)	S5.1.7
8. Third effectiveness (lightly loaded vehicle)	X	.....	S7.8	S5.1.1.3
9. Partial failure	X	X	S7.9	S5.1.2
10. Inoperative brake power and power assist units	.....	X	S7.10	S5.1.3
11. First fade and recovery	.....	X	S7.11	S5.1.4
12. Second reburnish	.....	X	S7.12	
13. Second fade and recovery	.....	X	S7.13	S5.1.4
14. Third reburnish	.....	X	S7.14	
15. Fourth effectiveness	.....	X	S7.15	S5.1.1.4
16. Water recovery	.....	X	S7.16	S5.1.5
17. Spike stops	.....	X	S7.17	S5.1.6
18. Final inspection	.....	.....	S7.18	S5.6
19. Moving barrier test	.....	X	S7.19	S5.2.2.3

* * * * *

■ 3. Section 571.121 is amended by revising S5.3, S5.3.6, S5.3.6.2 and Table 1; and by adding S6.1.17, to read as follows:

§ 571.121 Air brake systems

* * * * *

S5.3 Service brakes—road tests. The service brake system on each truck tractor shall, under the conditions of S6, meet the requirements of S5.3.1, S5.3.3, S5.3.4, and S5.3.6, when tested without adjustments other than those specified in this standard. The service brake system on each bus and truck (other than a truck tractor shall) manufactured before July 1, 2005 and each bus and truck (other than a truck tractor) manufactured in two or more stages shall, under the conditions of S6, meet the requirements of S5.3.1, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. The service brake system on each bus and truck (other than a truck tractor) manufactured on or after July 1, 2005 and each bus and truck (other than a truck tractor) manufactured in two or more stages on or after July 1, 2006 shall, under the conditions of S6, meet the requirements of S5.3.1, S5.3.3, S5.3.4, and S5.3.6, when tested without adjustments other than those specified in this standard. The service brake system on each trailer shall, under the conditions of S6, meet the requirements of S5.3.3, S5.3.4, and S5.3.5 when tested without adjustments other than those specified in this standard. However, a heavy hauler trailer and the truck and trailer portions of an auto transporter need not met the requirements of S5.3.

* * * * *

S5.3.6 Stability and control during braking—trucks and buses. 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 shall stop at least three times within the 12-foot lane, without any part of the vehicle leaving the roadway. 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 bus and truck (other than a truck tractor) manufactured on or after July 1, 2005, and each bus and truck (other than a truck tractor) manufactured in two or more stages on or after July 1, 2006, shall stop at least three times within the 12-foot lane, without any part of the vehicle leaving the roadway.

* * * * *

S5.3.6.2 Stop the vehicle, with the vehicle:

(a) Loaded to its GVWR, for a truck tractor, and

(b) At its unloaded weight plus up to 500 pounds (including driver and instrumentation), or at the manufacturer's option, at its unloaded weight plus up to 500 pounds (including driver and instrumentation) and plus not more than an additional 1000 pounds for a roll bar structure on the vehicle, for a truck, bus, or truck tractor.

* * * * *

S6.1.17 Selection of compliance options. Where manufacturer options are specified, the manufacturer shall select the option by the time it certifies the vehicle and may not thereafter select a different option for the vehicle. Each manufacturer shall, upon request from the National Highway Traffic Safety Administration, provide information regarding which of the compliance options it has selected for a particular vehicle or make/model.

* * * * *

TABLE I.—STOPPING SEQUENCE

	Truck tractors	Single unit trucks and buses
Burnish	1	1
Stability and Control at GVWR (PFC 0.5)	2	N/A
Stability and Control at LLVW (PFC 0.5)	3	5
Manual Adjustment of Brakes	4	N/A
60 mph Service Brake Stops at GVWR (PFC 0.9)	5	2
60 mph Emergency Service Brake Stops at GVWR (PFC 0.9)	N/A	3
Parking Brake Test at GVWR	6	4
Manual Adjustment of Brakes	7	6
60 mph Service Brake Stops at LLVW (PFC 0.9)	8	7
60 mph Emergency Service Brake Stops at LLVW (PFC 0.9)	9	8
Parking Brake Test at LLVW	10	9
Final Inspection	11	10

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Issued on July 31, 2003.

Jeffrey W. Runge,

Administrator.

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