

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.