

of the brake chambers rather than on the volume of the brake chambers at the maximum travel of the brake pistons or push rods. The agency tentatively agreed with the petitioner that the proposed amendments would make it easier for vehicle manufacturers to install long-stroke brake chambers on air-braked vehicles, because extremely large reservoirs would no longer be required. The agency stated that it believed that long-stroke chambers would help improve the braking efficiency of vehicles, significantly increase the reserve stroke, reduce the number of brakes found to be out of adjustment during inspections, and reduce the incidence of dragging brakes. NHTSA referenced the Safety Board report, which concluded that “* * * combining a properly installed and maintained automatic slack adjuster with a long-stroke chamber could reduce the percentage of brakes at or past the limit of adjustment from the 26 percent figure for the manual slack adjusters on a regular stroke chamber to the 4 percent figure for the automatic adjusters installed on a long-stroke chamber.”

In the NPRM, NHTSA explained its tentative determination that there would be no safety problem with the amended reservoir requirements. The agency cited tests conducted at NHTSA's Vehicle Research and Test Center (VRTC) that indicated that there is sufficient reserve volume to stop an air-braked vehicle even under worst-case conditions (i.e., the engine was stalled so the compressor was not adding replacement air to the system, the vehicle was equipped with long-stroke brake chambers and antilock brake systems (ABS), and the vehicle was stopped on a very low friction surface). The VRTC tests further indicated that while multiple combination vehicles would experience an additional 10 psi drop in air pressure because of the compressor's need to fill a greater volume when the vehicle is equipped with long-stroke chambers, there would still be adequate air pressure to safely stop a triple trailer combination vehicle with ABS on a wet Jennite surface. The rapid cycling produced by the ABS under this condition places severe demands on reservoir capacity and is therefore a good measure of the reserve pressure available from reservoirs meeting the revised volumes proposed in the NPRM. Notwithstanding its tentative findings, NHTSA requested comment about any potential safety problems that might result from amending the reservoir requirements to

facilitate the introduction of long-stroke brake chambers.

IV. Comments to the NPRM

NHTSA received 15 comments in response to the NPRM. Commenters included vehicle manufacturers, brake manufacturers, truck equipment suppliers, ATA, the Heavy Duty Brake Manufacturers Council (HDBMC) and Advocates for Highway and Auto Safety (Advocates).

Commenters addressed both the need for the proposal and recommended various modifications to the proposed regulations.

Midland-Grau, Rockwell, Allied Signal, HDBMC, Freightliner, International Transquip Industries (ITI), MGM Brakes, Ford, and ATA generally believed that the proposal to facilitate the use of long stroke brake chambers is in the interest of safety. In contrast, while WhiteGMC/Volvo, Haldex, Eaton, and Advocates, agreed that long stroke brake chambers could enhance safety, they opposed the agency's specific proposal which they believed would reduce the stringency of the reservoir requirements and thus result in detriment to safety.

V. Agency Determination

A. Overview

After reviewing the comments in light of the available information, NHTSA has decided to amend Standard No. 121's reservoir requirements for trucks, buses, and trailers to facilitate the introduction of long-stroke brake chambers. Specifically, under today's amendments, the method for calculating air reservoir requirements is now based on either the “rated volume” of the brake chambers or the volume of the brake chambers at the maximum travel of the brake pistons or push rods, whichever is less. As a result of these amendments, it will be easier for vehicle manufacturers to install long-stroke brake chambers on air-braked vehicles, because extremely large reservoirs will no longer be required to meet the reservoir requirements. The agency has determined that long-stroke chambers will help improve the braking efficiency of vehicles, increase the reserve stroke, reduce the number of brakes found to be out of adjustment during inspections, and reduce the incidence of dragging brakes.

NHTSA has decided to modify the proposed Table V “Brake Chamber Rated Volumes” by specifying upper limits to the stroke lengths for which rated volumes may be used. As explained below, the agency has determined that specifying an upper

limit is necessary to preclude manufacturers from extending stroke lengths beyond the point at which adequate air pressure reserves are available to bring a vehicle to a complete stop. Accordingly, the amendment would not affect extremely long stroke chambers, the use of which could adversely affect air reservoir capacity. Specifically, Table V has been modified such that a vehicle manufacturer can use the “rated volume” rather than the actual brake chamber volume, when determining minimum reservoir volume, only when the maximum strokes for long stroke chambers are no more than 20 percent longer than the nominal stroke for standard stroke chambers. In addition, the rated volumes have been increased to reflect the largest volumes of standard stroke air brake chambers that are available.

B. Safety Consequences

In the NPRM, NHTSA considered the safety implications of amending the reservoir requirements to facilitate the installation of long-stroke brake chambers. The agency had tentatively determined that relaxing the current reservoir volume requirements would not result in any safety problems. Notwithstanding its tentative findings, the agency requested comment about potential safety problems that might result from decreasing the stringency of the reservoir requirements.

Midland-Grau, Rockwell, Allied Signal, HDBMC, Freightliner, ITI, MGM Brakes, Ford, and ATA generally believed that the proposal to facilitate the use of long stroke brake chambers would have no corresponding safety problems. HDBMC stated that long stroke brake chambers will provide a significant improvement in maintaining a more reliable level of automatic brake adjustment. Freightliner stated that long stroke chambers will improve highway safety by providing additional reserve stroke at force levels that will maintain brake performances under extreme operating conditions. ATA stated that the use of long stroke brake chambers will decrease the number of vehicles with defective brakes and provide for more effective brakes, especially when they are hot. Rockwell stated that the current regulations unnecessarily impede the adoption of long stroke chambers and the potential benefits they offer. It further stated that long stroke chambers would keep the useful stroke of a vehicle's slack adjuster within the acceptable stroke limits, reduce the number of out-of adjustment vehicles, and the number of incidents of dragging brakes.