

(ii) Installed in a bus, truck, or truck tractor manufactured after February 28, 1975; or

(iii) Used in the reduced mode except when the vehicle is operating under adverse conditions such as wet, snowy, or icy roads.

(2) *Automatic devices.* An automatic device to reduce the front-wheel braking effort by up to 50 percent of the normal braking force, regardless of whether or not antilock system failure has occurred on any axle, must not—

(i) Be operable by the driver except upon application of the control that activates the braking system; and

(ii) Be operable when the pressure that transmits brake control application force exceeds—

(A) 85 psig on air-mechanical braking systems; or

(B) 85 percent of the maximum system pressure in the case of vehicles utilizing other than compressed air.

(c) *Towed vehicle.* Paragraph (a) of this section does not apply to—

(1) A disabled vehicle being towed; or

(2) A vehicle being towed in a driveway-towaway operation which is exempt from the general rule of § 393.42 under paragraph (b) of that section.

[39 FR 26907, July 24, 1974, as amended at 41 FR 29130, July 15, 1976; 41 FR 53031, Dec. 3, 1976; 67 FR 61824, Oct. 2, 2002]

§ 393.49 Single valve to operate all brakes.

Every motor vehicle, the date of manufacture of which is subsequent to June 30, 1953, which is equipped with power brakes, shall have the braking system so arranged that one application valve shall when applied operate all the service brakes on the motor vehicle or combination of motor vehicles. This requirement shall not be construed to prohibit motor vehicles from being equipped with an additional valve to be used to operate the brakes on a trailer or trailers or as provided in § 393.44. This section shall not be applicable to driveway-towaway operations unless the brakes on such operations are designed to be operated by a single valve.

§ 393.50 Reservoirs required.

(a) *General.* Every commercial motor vehicle using air or vacuum for break-

ing shall be equipped with reserve capacity or a reservoir sufficient to ensure a full service brake application with the engine stopped without depleting the air pressure or vacuum below 70 percent of that pressure or degree of vacuum indicated by the gauge immediately before the brake application is made. For purposes of this section, a full service brake application is considered to be made when the service brake pedal is pushed to the limit of its travel.

(b) *Safeguarding of air and vacuum.* (1) Every bus, truck, and truck tractor, when equipped with air or vacuum reservoirs and regardless of date of manufacture, shall have such reservoirs so safeguarded by a check valve or equivalent device that in the event of failure or leakage in its connection to the source of compressed air or vacuum the air or vacuum supply in the reservoir shall not be depleted by the leak or failure.

(2) Means shall be provided to establish the check valve to be in working order. On and after May 1, 1966, means other than loosening or disconnection of any connection between the source of compressed air or vacuum and the check valve, and necessary tools for operation of such means, shall be provided to prove that the check valve is in working order. The means shall be readily accessible either from the front, side, or rear of the vehicle, or from the driver's compartment.

(i) In air brake systems with one reservoir, the means shall be a cock, valve, plug, or equivalent device arranged to vent a cavity having free communication with the connection between the check valve and the source of compressed air or vacuum.

(ii) Where air is delivered by a compressor into one tank or compartment (wet tank), and air for braking is taken directly from another tank or compartment (dry tank) only, with the required check valve between the tanks or compartments, a manually operated drain cock on the first (wet) tank or compartment will serve as a means herein required if it conforms to the requirements herein.

(iii) In vacuum systems stopping the engine will serve as the required

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means, the system remaining evacuated as indicated by the vacuum gauge.

[33 FR 19735, Dec. 25, 1968, as amended at 53 FR 49400, Dec. 7, 1988]

§ 393.51 Warning devices and gauges.

(a) *General.* In the manner and to the extent specified in paragraphs (b), (c), (d), and (e) of this section, a bus, truck, or truck tractor must be equipped with a signal that provides a warning to the driver when a failure occurs in the vehicle's service brake system.

(b) *Hydraulic brakes.* A vehicle manufactured on or after July 1, 1973, and having service brakes activated by hydraulic fluid must be equipped with a warning signal that performs as follows:

(1) If Federal Motor Vehicle Safety Standard No. 105 (§571.105 of this title) was applicable to the vehicle at the time it was manufactured, the warning signal must conform to the requirements of that standard.

(2) If Federal Motor Vehicle Safety Standard No. 105 (§571.105) was not applicable to the vehicle at the time it was manufactured, the warning signal must become operative, before or upon application of the brakes in the event of a hydraulic-type complete failure of a partial system. The signal must be readily audible or visible to the driver.

(c) *Air brakes.* A vehicle (regardless of the date it was manufactured) having service brakes activated by compressed air (air-mechanical brakes) or a vehicle towing a vehicle having service brakes activated by compressed air (air-mechanical brakes) must be equipped, and perform, as follows:

(1) The vehicle must have a low air pressure warning device that conforms to the requirements of either paragraph (c)(1) (i) or (ii) of this section.

(i) If Federal Motor Vehicle Safety Standard No. 121 (§571.121 of this title) was applicable to the vehicle at the time it was manufactured, the warning device must conform to the requirements of that standard.

(ii) If Federal Motor Vehicle Safety Standard No. 121 (§571.121) was not applicable to the vehicle at the time it was manufactured, the vehicle must have a device that provides a readily audible or visible continuous warning to the driver whenever the pressure of

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the compressed air in the braking system is below a specified pressure, which must be at least one-half of the compressor governor cutout pressure.

(2) The vehicle must have a pressure gauge which indicates to the driver the pressure in pounds per square inch available for braking.

(d) *Vacuum brakes.* A vehicle (regardless of the date it was manufactured) having service brakes activated by vacuum or a vehicle towing a vehicle having service brakes activated by vacuum must be equipped with—

(1) A device that provides a readily audible or visible continuous warning to the driver whenever the vacuum in the vehicle's supply reservoir is less than 8 inches of mercury; and

(2) A vacuum gauge which indicates to the driver the vacuum in inches of mercury available for braking.

(e) *Hydraulic brakes applied or assisted by air or vacuum.* A vehicle having a braking system in which hydraulically activated service brakes are applied or assisted by compressed air or vacuum must be equipped with both a warning signal that conforms to the requirements of paragraph (b) of this section and a warning device that conforms to the requirements of either paragraph (c) or paragraph (d) of this section.

(f) *Maintenance.* The warning signals, devices, and gauges required by this section must be maintained in operative condition.

[37 FR 5251, Mar. 11, 1972, as amended at 53 FR 49400, Dec. 7, 1988]

§ 393.52 Brake performance.

(a) Upon application of its service brakes, a motor vehicle or combination of motor vehicles must under any condition of loading in which it is found on a public highway, be capable of—

(1) Developing a braking force at least equal to the percentage of its gross weight specified in the table in paragraph (d) of this section;

(2) Decelerating to a stop from 20 miles per hour at not less than the rate specified in the table in paragraph (d) of this section; and

(3) Stopping from 20 miles per hour in a distance, measured from the point at which movement of the service brake pedal or control begins, that is not greater than the distance specified in