(b) Waiver approvals. The Secretary may grant a State a waiver if the State demonstrates that it has an alternative approach to a requirement in this chapter that will safeguard the State and Federal governments’ interest and that enables the State to be in substantial compliance with the other requirements of this chapter.

(c) Contents of waiver request. The State’s request for approval of an alternative approach or waiver of a requirement in this chapter must demonstrate why meeting the condition is unnecessary, diminishes the State’s ability to meet program requirements, or that the alternative approach leads to a more efficient, economical, and effective administration of the programs for which Federal financial participation is provided, benefiting both the State and Federal Governments.

(d) Review of waiver requests. The Secretary, or his or her designee, will review waiver requests to assure that all necessary information is provided, that all processes provide for effective economical and effective program operation, and that the conditions for waiver in this section are met.

(e) Agency’s response to a waiver request. When a waiver is approved by an agency, it becomes part of the State’s approved ITD and is applicable to the approving agency. A waiver is subject to the ITD suspension provisions in §95.611(c)(3). When a waiver is disapproved, the entire ITD will be disapproved. The ITD disapproval is a final administrative decision and is not subject to administrative appeal.

17. Amend §95.631 by removing “ADP” appearing in its place “ITD” in the introductory text, and by revising paragraph (a) to read as follows:

§95.631 Cost identification for purpose of FFP claims.

(a) Development costs. (1) Using its normal departmental accounting system to the extent consistent with the cost principles set forth in OMB Circular A–87, the State agency shall specifically identify what items of costs constitute development costs, assign these costs to specific project cost centers, and distribute these costs to funding sources based on the specific identification, assignment and distribution outlined in the approved ITD;

(2) The methods for distributing costs set forth in the ITD should provide for assigning identifiable costs, to the extent practicable, directly to program/ functions. The State agency shall amend the cost allocation plan required by subpart E of this part to include the approved ITD methodology for the identification, assignment and distribution of the development costs.

18. Add new §95.635 to read as follows:

§95.635 Disallowance of Federal financial participation automated systems that failed to comply substantially with requirements.

(a) Federal financial participation at the applicable matching rate is available for automated data processing (ADP) system expenditures that meet the requirements specified under the approved ITD including the approved cost allocation plan.

(b) All or part of any costs for system projects that fail to comply substantially with an ITD approved under applicable regulation at 45 CFR part 95.611, or for the Title IV–D program contained in 45 CFR part 307, the applicable regulations for the Title IV–E and Title IV–B programs contained in Chapter 13, subchapter C, 45 CFR 1355.55, or the applicable regulations for the Title XIX program contained in 42 CFR chapter 4 subchapter C, part 433, are subject to disallowance by the Department.

19. Amend §95.641 by removing “ADP” and adding in its place “ITD” wherever it appears.

Subpart G—Equipment Acquired Under Public Assistance Programs

20. Revise paragraph (a) of §95.705 to read as follows:

§95.705 Equipment costs—Federal financial participation.

(a) General rule. In computing claims for Federal financial participation, equipment having a unit acquisition cost of $25,000 or less may be claimed for Federal financial participation, equipment having a unit acquisition cost of $25,000 or less may be depreciated. For purposes of this section, the term depreciate also includes use allowances computed in accordance with the cost principles prescribed in 45 CFR part 92.

21. Revise paragraph (a) and the introductory text of paragraph (b) of §95.707 to read as follows:

§95.707 Equipment management and disposition.

(a) Once equipment, whose costs are claimed for Federal financial participation (i.e., equipment that is capitalized and depreciated or is claimed in the period acquired), has reached the end of its useful life (as defined in an approved ITD), the equipment shall be subject to the property disposal rules in 45 CFR 92.32.

(b) The State agency is responsible for adequately managing the equipment, maintaining records on the equipment, and taking periodic physical inventories. Physical inventories may be made on the basis of statistical sampling.

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I. Background

The agency received a petition for rulemaking dated October 20, 2006, from Mr. Wayne Walsh of TP Trucking, located in Eagle Point, Oregon. The petitioner suggested three improvements related to the air compressor operation and low air pressure warning system, which he believed would make air brake systems safer, and requested that Federal Motor Vehicle Safety Standard (FMVSS) No. 121, Air brake systems, be changed accordingly. These suggestions include:

- A warning device that would activate when the air compressor begins a new cycle.
- A warning device that would activate if the air compressor exceeds a predetermined amount of time to reach the cut-out pressure.
- A warning device that would activate just before the beginning of the air compressor cycle.

In his petition, Mr. Walsh describes the typical operation of a low pressure warning system in which an audible warning signal is activated when the reservoir pressure is at 55 pounds per square inch (psi) or below, or one half of the compressor governor cutout pressure, whichever is less. The petitioner states that he believes this system is not robust as it provides no indication of continual air loss or when the compressor is constantly running and this can result in a dangerous situation.

In arguing the merits of the petition, the petitioner describes several scenarios in which the recommended systems would operate. First, the petitioner describes a scenario in which a system has an air leak and the compressor keeps running continuously. As the driver applies the brakes, the compressor cannot maintain the needed pressure, and the driver loses his brakes. If the truck is traveling down hill, the driver could have a serious crash in this situation. The petitioner states that even if the spring-operated parking brakes activate, they do not have the stopping efficiency as the normal service brakes. The petitioner further states that if the parking brakes activate due to that condition, the vehicle could stop in an unsafe area, and that most drivers will not know how to release the spring parking brakes. As such, the petition asks for the above three changes to FMVSS No. 121 to make air brakes safer. They are as follows:

1. Provide an indication to the driver upon air compressor cut-in. Thus if the driver is aware that the air compressor is cycling but the brakes aren’t being used, the driver would be alerted to air system leakage.
2. Set the time on new vehicles for the air compressor to increase system pressure from cut-in to cut-out pressure. If the system is taking too long to build pressure, then a warning needs to be displayed to the driver.
3. Require a low air pressure warning device that activates just before the start of the air compressor cycle. Items 1 and 2 above will prevent this.

II. General Description of Air Brake Systems and FMVSS No. 121 Requirements

The operation of an air brake system relies on compressed air stored in reservoirs (tanks) mounted on the vehicle (truck, bus, or trailer). By storing compressed air in the reservoirs, the air is readily available to make rapid application of the brakes possible. When the driver applies the service brakes, the compressed air flows from the reservoirs into the service brake chambers that actuate the brake mechanism at each wheel. The air in the reservoirs is replenished by an air compressor on the engine of the truck or bus, which is controlled by a governor that activates the air compressor (cut-in pressure) and then turns off the air compressor once the reservoirs are fully charged (cut-out pressure). Trailers are also equipped with reservoirs, which receive their air supply from a towing vehicle that is typically a truck or truck tractor. In the case of multiple trailer combination vehicles, the tractor supplies air to all of the trailers in the combination.

As the driver applies the brakes, the air flows from the reservoirs into the service brake chambers at a pressure corresponding to the position of the brake pedal (treadle valve). Therefore, a light brake application would typically result in 10 to 20 psi of compressed air in the brake chambers, and a hard brake application would typically result in 40 psi or higher pressures in the brake chambers. Since the brake chambers are filled with compressed air taken from the reservoirs and upon releasing the service brakes the air is vented to the atmosphere, the air pressure in the reservoirs becomes slightly depleted whenever the brakes are applied. When the reservoir pressure drops to cut-in pressure, the governor activates the air compressor to build the system pressure back up to the cut-out pressure.

The process of the air compressor activating at reservoir cut-in pressure, then building to reservoir cut-out pressure, is known as compressor cycling. Items 1 through 3 can vary greatly among vehicle types and the type of driving that is experienced. The most frequent compressor cycling occurs in stop-and-go operations, such as experienced by transit buses and refuse trucks, whereas the least frequent compressor cycling would typically be on a tractor trailer combination vehicle being operated at highway speeds with infrequent brake applications.

The service brake system on air braked vehicles is typically split into a primary and a secondary air system. The primary system usually controls the brakes on the drive axle(s) and the secondary system controls the brakes on the steer axle. Both systems have their own reservoirs that are typically fed by a supply reservoir that receives air directly from the air compressor. The primary and secondary air reservoirs are equipped with check valves for isolation so that a loss of pressure in one system does not cause a loss of pressure in the other system. In case one system loses pressure, the remaining system still provides an emergency braking capability on the vehicle, as well as continuing to operate any trailer service brakes, and keeps the parking brakes in the released position. Most parking brakes on heavy vehicles are of the spring brake design that require adequate brake system air pressure in order to release them so the vehicle can be moved.

FMVSS No. 121 has several requirements relating to the reservoirs and air compressor systems on trucks, buses, and trailers. The minimum size of the reservoirs is specified in FMVSS No. 121 so that an adequate reserve of air is available to repeatedly apply the brakes without an excessive loss of system air pressure. For trucks and buses, S5.1.2.1 requires that the total reservoir volume (combined volume of primary, secondary, and supply reservoirs) is at least 12 times the combined volume of all of the service brake chambers on the vehicle. Slight exceptions are provided in Table V—Brake Chamber Rated Volumes, so that vehicle manufacturers can install long-stroke brake chambers in place of standard-stroke brake chambers without having to increase the size of the reservoirs. For trailers, S5.2.1.1 requires that trailers have a reservoir capacity that is at least eight times the combined volume of the brake chambers, and again an exception is provided via Table V for the use of long-stroke brake chambers.

S3.1.1 Air compressor requires that an air compressor has sufficient capacity to increase the pressure in the reservoirs from 85 psi to 100 psi within the time, in seconds, expressed by the equation: [Actual reservoir capacity ×
Standard Out-of-Service Criteria for the low pressure warning device published by the Commercial Vehicle Safety Alliance and these air pressure values are slightly lower than required by FMVSS No. 121 that applies to the manufacturers of new vehicles. To ensure compliance with the “below 60 psi” requirement in FMVSS No. 121, the actual low pressure warning typically activates slightly above 60 psi when measured on vehicles.

There are several common types of brake system failures that can cause the low pressure warning signal to activate. To begin, minor leaks in the system can often be overcome by the capacity of the air compressor to re-supply air to the brake system. However, this discussion focuses on substantial leaks and failures that the air compressor cannot overcome, as well as failures of the air compressor itself.

A substantial leak in a brake hose supplying a service brake chamber, or in a service brake chamber (e.g., due to a failed cam drum brake leak in lead or whenever the brake pedal is applied. If the leak is sufficiently large and the brake pedal is applied for a long duration, the pressure in either the primary or secondary reservoir may become sufficiently low to activate the warning signal, which is required to activate when the air pressure in the service reservoir system is below 60 psi. However, the remaining service brake system (secondary or primary) will remain intact and provide for an emergency braking capability, and will continue to keep the parking brakes released. The driver would be able to determine by viewing the air pressure gauges the rate of pressure loss and whether the loss was in the primary or secondary system.

Failures or leaks can also occur in the air supply portion of the system, including the governor, air compressor, governor cut-out pressure, whichever is less). The petitioner cited the North American

There needs to be a way to make the driver aware of when the air compressor is starting a new cycle. This lets the driver know there is a loss of air in the system. If the driver is not using the air brakes and the air compressor is cycling he should stop the vehicle and do an inspection for an air leak or call for repairs to the air system before continuing on or before a possible accident on a downhill grade.

V. Agency Analysis and Decision

The petitioner was a truck stopping in an unsafe area because of an air leak that caused the parking brakes to apply and the truck was in an unsafe area because of an air leak that ran away. The petitioner provided no data to support this conclusion.

Similarly, the agency is not aware that runaway truck crashes are being caused by air leaks or contributed to by inadequate low pressure warning systems.

The other crash scenario presented by the petitioner was a truck stopping in an unsafe area because of an air leak that caused the parking brakes to apply and the truck was in an unsafe area due to loss of air pressure in the brake system and being involved in crashes. The petitioner also did not provide such data. Additionally, as we have previously stated, the current low-pressure warning system already alerts the driver of a substantial loss of air pressure in the brake system and the truck’s braking system can be operating in the emergency braking mode. As such, the driver can still make several brake applications to safely bring the truck to a stop off of a travel lane.
The agency believes that this change would mean that a lamp on the instrument panel would illuminate (or some other type of indicator would signal) every time that the air compressor cycled on at cut-in pressure. Since cycling of the compressor occurs during normal operation of a vehicle equipped with an air brake system, the agency believes that most truck drivers would find this to be a nuisance, particularly when driving at night. The agency’s fleet evaluation experience in the early 1990’s with antilock brake systems (ABS) warning lamps was that drivers would sometimes remove the bulb or cover it with opaque tape because of a perceived nuisance (when in fact it was indicating a malfunction in the ABS that, under hard braking, could result in a loss-of-control crash). A warning system that activates during normal operation may have a limited safety benefit, and activations are more effective when they only occur when there is a condition that warrants some type of intervention by the driver. Therefore, we do not believe it would be appropriate to adopt the petitioner’s first request. However, we note that neither FMVSS No. 101, Controls and Displays, nor FMVSS No. 121 prohibits the addition of a compressor cycling lamp, if a truck operator chooses to have such a system installed.

The second requested change is:

They need to set the time on new vehicles at the factory on how long it takes the air compressor at the start of its cycle to meet the cut off pressure. If it is taking too long or continuous running occurs there needs to be something to warn the driver there is a major problem. This is a very unsafe situation and should have a priority warning to the driver.

Regarding the requested change by the petitioner to set the required time for air pressure build time, we note that this facet of air brake systems is addressed in the previously discussed section S5.1.1 in FMVSS No. 121, which requires the air compressor to have sufficient capacity to increase the air system pressure from 85 to 100 psi in the specified amount of time. However, this requirement allows for some variation in the amount of time needed to charge the air system. Under FMVSS No. 121, the time for charging the air system is measured with the engine at maximum rated speed, so the actual charging time during normal driving can vary based upon actual engine speed and gear selection. Compared to charging time with the engine at maximum rated speed, the charging time would be longer when the truck is sitting at idle. Other factors, such as the frequency of brake application, number of towed units, air being supplied to increase air suspension pressure, etc., would cause air to be depleted at the same time the air compressor is charging the system. Therefore, these would also affect the charging time, and we believe that requiring a warning to activate when a constant time period has elapsed is an impracticable requirement, given the variable nature of the charging period under the current regulatory scheme. We note that our safety standard already regulates performance in the area of air pressure charging time, but we believe that it does so more appropriately than the proposed change. For this reason, we are not adopting the petitioner’s second request.

The final requested change is:

It would be some help to have a low air pressure warning device that comes on just before the start of the air compressor cycle. When this low air warning comes on the vehicle is in a dangerous situation. Number 1 and 2 will prevent this.

The third requested change in the petition is not clearly defined for the agency to fully evaluate. The statement “just before the start of the air compressor cycle” has two meanings. The first meaning is a pressure slightly above the cut-in pressure, e.g., approximately 105 to 110 psi. The second meaning is a pressure slightly below the cut-in pressure, e.g., approximately 90 to 95 psi. Based upon the information in the petition, the agency does not understand the concept of this warning lamp, and how its operation differs from the currently-required low pressure warning signal required in FMVSS No. 121, other than being set to activate at a higher air pressure. It also seems nearly identical to/redundant with the petitioner’s first requested change, as this warning would activate just before the start of a new air compressor cycle, and then the warning from the first request would activate when the compressor began that new cycle. Furthermore, we note that activation of a warning signal at either of these pressures would result in the warning being extremely frequently, including during normal driving operations. Given these reasons, we are denying the petitioner’s third requested change.

VI. Conclusion

Based upon this review of the petition, the agency is denying it. In summary, it appears that one or two warning lamps would be required to activate upon each cut-in of the compressor cycle, and this would not provide additional information to the driver beyond the information that is already available from the existing air pressure gauges. In addition, we believe that warning systems that activate frequently during normal driving conditions can be perceived as a nuisance, and may have limited safety effect. Finally, we are not aware of any known safety problems not addressed by the existing low pressure warning signal requirements in FMVSS No. 121.

Stephen R. Kratzke,
Associate Administrator for Rulemaking.