

## § 232.309

this section, or if FRA does not issue a written objection to the requested modification, the modification will become effective 15 days after the close of the 60-day comment period.

(2) If an objection is raised by an interested party, during the 60-day comment period, or if FRA issues a written objection to the requested modification, the requested modification will be handled as follows:

(i) If FRA finds that the request complies with the requirements of this section and that the proposed modification is acceptable and justified, the request will be granted, normally within 90 days of its receipt. If the request for modification is neither granted nor denied within 90 days, the request remains pending for decision. FRA may attach special conditions to the approval of any request for modification. Following the approval of a request for modification, FRA may reopen consideration of the request for cause.

(ii) If FRA finds that the request does not comply with the requirements of this section and that the proposed modification is not acceptable or justified, the requested modification will be denied, normally within 90 days of its receipt.

(iii) When FRA grants or denies a request for modification, or reopens consideration of the request, written notice is sent to the requesting party and other interested parties.

[66 FR 39688, Aug. 1, 2001, as amended at 74 FR 25174, May 27, 2009]

## § 232.309 Equipment and devices used to perform single car air brake tests.

(a) Equipment and devices used to perform single car air brake tests shall be tested for correct operation at least once each calendar day of use.

(b) Except for single car test devices, mechanical test devices such as pressure gauges, flow meters, orifices, etc. shall be calibrated once every 92 days.

(c) Electronic test devices shall be calibrated at least once every 365 days.

(d) Test equipment and single car test devices placed in service shall be tagged or labeled with the date its next calibration is due.

(e) Each single car test device shall be tested not less frequently than

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every 92 days after being placed in service and may not continue in service if more than one year has passed since its last 92-day test.

(f) Each single car test device shall be disassembled and cleaned not less frequently than every 365 days after being placed in service.

[66 FR 4193, Jan. 17, 2001, as amended at 66 FR 39689, Aug. 1, 2001]

## Subpart E—End-of-Train Devices

### § 232.401 Scope.

This subpart contains the requirements related to the performance, operation, and testing of end-of-train devices. Unless expressly excepted in this subpart, the requirements of this subpart apply to all trains operating on track which is part of the general railroad system of transportation.

### § 232.403 Design standards for one-way end-of-train devices.

(a) *General.* A one-way end-of-train device shall be comprised of a rear-of-train unit (rear unit) located on the last car of a train and a front-of-train unit (front unit) located in the cab of the locomotive controlling the train.

(b) *Rear unit.* The rear unit shall be capable of determining the brake pipe pressure on the rear car and transmitting that information to the front unit for display to the locomotive engineer. The rear unit shall be—

(1) Capable of measuring the brake pipe pressure on the rear car with an accuracy of  $\pm 3$  pounds per square inch (psig) and brake pipe pressure variations of  $\pm 1$  psig;

(2) Equipped with a “bleeder valve” that permits the release of any air under pressure from the rear of train unit or the associated air hoses prior to detaching the rear unit from the brake pipe;

(3) Designed so that an internal failure will not cause an undesired emergency brake application;

(4) Equipped with either an air gauge or a means of visually displaying the rear unit's brake pipe pressure measurement; and

(5) Equipped with a pressure relief safety valve to prevent explosion from a high pressure air leak inside the rear unit.

(c) *Reporting rate.* Multiple data transmissions from the rear unit shall occur immediately after a variation in the rear car brake pipe pressure of  $\pm 2$  psig and at intervals of not greater than 70 seconds when the variation in the rear car brake pipe pressure over the 70-second interval is less than  $\pm 2$  psig.

(d) *Operating environment.* The rear unit shall be designed to meet the performance requirements of paragraphs (b) and (c) of this section under the following environmental conditions:

(1) At temperatures from  $-40$  °C to  $60$  °C;

(2) At a relative humidity of 95% non-condensing at  $50$  °C;

(3) At altitudes of zero to 12,000 feet mean sea level;

(4) During vertical and lateral vibrations of 1 to 15 Hz., with 0.5 g. peak to peak, and 15 to 500 Hz., with 5 g. peak to peak;

(5) During the longitudinal vibrations of 1 to 15 Hz., with 3 g. peak to peak, and 15 to 500 Hz., with 5 g. peak to peak; and

(6) During a shock of 10 g. peak for 0.1 second in any axis.

(e) *Unique code.* Each rear unit shall have a unique and permanent identification code that is transmitted along with the pressure message to the front-of-train unit. A code obtained from the Association of American Railroads, 50 F Street, NW., Washington, DC 20036 shall be deemed to be a unique code for purposes of this section. A unique code also may be obtained from the Office of Safety Assurance and Compliance (RRS-10), Federal Railroad Administration, Washington, DC 20590.

(f) *Front unit.* (1) The front unit shall be designed to receive data messages from the rear unit and shall be capable of displaying the rear car brake pipe pressure in increments not to exceed one pound.

(2) The display shall be clearly visible and legible in daylight and darkness from the engineer's normal operating position.

(3) The front device shall have a means for entry of the unique identification code of the rear unit being used. The front unit shall be designed so that it will display a message only

from the rear unit with the same code as entered into the front unit.

(4) The front unit shall be designed to meet the requirements of paragraphs (d)(2), (3), (4), and (5) of this section. It shall also be designed to meet the performance requirements in this paragraph under the following environmental conditions:

(i) At temperatures from  $0$  °C to  $60$  °C;

(ii) During a vertical or lateral shock of 2 g. peak for 0.1 second; and

(iii) During a longitudinal shock of 5 g. peak for 0.1 second.

(g) *Radio equipment.* (1) The radio transmitter in the rear unit and the radio receiver in the front unit shall comply with the applicable regulatory requirements of the Federal Communications Commission (FCC) and use of a transmission format acceptable to the FCC.

(2) If power is supplied by one or more batteries, the operating life shall be a minimum of 36 hours at  $0$  °C.

#### **§ 232.405 Design and performance standards for two-way end-of-train devices.**

Two-way end-of-train devices shall be designed and perform with the features applicable to one-way end-of-train devices described in § 232.403, except those included in § 232.403(b)(3). In addition, a two-way end-of-train device shall be designed and perform with the following features:

(a) An emergency brake application command from the front unit of the device shall activate the emergency air valve at the rear of the train within one second.

(b) The rear unit of the device shall send an acknowledgment message to the front unit immediately upon receipt of an emergency brake application command. The front unit shall listen for this acknowledgment and repeat the brake application command if the acknowledgment is not correctly received.

(c) The rear unit, on receipt of a properly coded command, shall open a valve in the brake line and hold it open for a minimum of 15 seconds. This opening of the valve shall cause the brake line to vent to the exterior.

(d) The valve opening shall have a minimum diameter of  $\frac{3}{4}$  inch and the