

§ 238.227

Current-carrying capacity shall be derated for grouping and for operating temperature.

(b) *Main battery system.* (1) The main battery compartment shall be isolated from the cab and passenger seating areas by a non-combustible barrier.

(2) Battery chargers shall be designed to protect against overcharging.

(3) If batteries are of the type to potentially vent explosive gases, the battery compartment shall be adequately ventilated to prevent the accumulation of explosive concentrations of these gases.

(c) *Power dissipation resistors.* (1) Power dissipating resistors shall be adequately ventilated to prevent overheating under worst-case operating conditions as determined by the railroad.

(2) Power dissipation grids shall be designed and installed with sufficient isolation to prevent combustion.

(3) Resistor elements shall be electrically insulated from resistor frames, and the frames shall be electrically insulated from the supports that hold them.

(d) *Electromagnetic interference and compatibility.* (1) The operating railroad shall ensure electromagnetic compatibility of the safety-critical equipment systems with their environment. Electromagnetic compatibility may be achieved through equipment design or changes to the operating environment.

(2) The electronic equipment shall not produce electrical noise that affects the safe performance of train line control and communications or way-side signaling systems.

(3) To contain electromagnetic interference emissions, suppression of transients shall be at the source wherever possible.

(4) All electronic equipment shall be self-protected from damage or improper operation, or both, due to high voltage transients and long-term over-voltage or under-voltage conditions. This includes protection from both power frequency and harmonic effects as well as protection from radio frequency signals into the microwave frequency range.

§ 238.227 Suspension system.

On or after November 8, 1999—

49 CFR Ch. II (10–1–10 Edition)

(a) All passenger equipment shall exhibit freedom from hunting oscillations at all operating speeds. If hunting oscillations do occur, a railroad shall immediately take appropriate action to prevent derailment. For purposes of this paragraph, hunting oscillations shall be considered lateral oscillations of trucks that could lead to a dangerous instability.

(b) All passenger equipment intended for service above 110 mph shall demonstrate stable operation during pre-revenue service qualification tests at all operating speeds up to 5 mph in excess of the maximum intended operating speed under worst-case conditions—including component wear—as determined by the operating railroad.

(c) Nothing in this section shall affect the requirements of part 213 of this chapter as they apply to passenger equipment as provided in that part.

§ 238.229 Safety appliances—general.

(a) Except as provided in this part, all passenger equipment continues to be subject to the safety appliance requirements contained in Federal statute at 49 U.S.C. chapter 203 and in Federal regulations at part 231 of this chapter.

(b) Except as provided in this part, FRA interprets the provisions in part 231 of this chapter that expressly mandate that the manner of application of a safety appliance be a bolt, rivet, or screw to mean that the safety appliance and any related bracket or support used to attach that safety appliance to the equipment shall be so affixed to the equipment. Specifically, FRA prohibits the use of welding as a method of attachment of any such safety appliance or related bracket or support. A “safety appliance bracket or support” means a component or part attached to the equipment for the sole purpose of securing or attaching of the safety appliance. FRA does allow the welded attachment of a brace or stiffener used in connection with a mechanically fastened safety appliance. In order to be considered a “brace” or “stiffener,” the component or part shall not be necessary for the attachment of the safety appliance to the equipment and is used solely to provide

extra strength or steadiness to the safety appliance.

(c) *Welded safety appliances.* (1) Passenger equipment placed in service prior to January 1, 2007, that is equipped with a safety appliance, required by the “manner of application” provisions in part 231 of this chapter to be attached by a mechanical fastener (*i.e.*, bolts, rivets, or screws), and the safety appliance is mechanically fastened to a bracket or support that is attached to the equipment by welding may continue to be used in service provided all of the requirements in paragraphs (e) through (k) of this section are met. The welded safety appliance bracket or support only needs to receive the initial visual inspection required under paragraph (g)(1) of this section if all of the following conditions are met:

(i) The welded safety appliance bracket or support meets all of the conditions contained in §238.230(b)(1) for being considered part of the car body;

(ii) The weld on the safety appliance bracket or support does not contain any defect as defined in paragraph (d) of this section; and

(iii) The railroad submits a written list to FRA identifying each piece of passenger equipment equipped with a welded safety appliance bracket or support as described in paragraph (c)(1)(i) and (c)(1)(ii) of this section and provides a description of the specific safety appliance bracket or support.

(2) Passenger equipment placed in service prior to January 1, 2007, that is equipped with a safety appliance that is directly attached to the equipment by welding (*i.e.*, no mechanical fastening of any kind) shall be considered defective and immediately handled for repair pursuant to the requirements contained in §238.17(e) unless the railroad meets the following:

(i) The railroad submits a written list to FRA that identifies each piece of passenger equipment equipped with a welded safety appliance as described in paragraph (c)(2) of this section and provides a description of the specific safety appliance; and

(ii) The involved safety appliance(s) on such equipment are inspected and handled pursuant to the requirements

contained in paragraphs (g) through (k) of this section.

(d) *Defective welded safety appliance or welded safety appliance bracket or support.* Passenger equipment with a welded safety appliance or a welded safety appliance bracket or support will be considered defective and shall be handled in accordance with §238.17(e) if any part or portion of the weld contains a defect. Any repairs made to such equipment shall be in accordance with the inspection plan required in paragraph (g) of this section and the remedial actions identified in paragraph (j) of this section. A defect for the purposes of this section means a crack or fracture of any visibly discernible length or width. When appropriate, civil penalties for improperly using or hauling a piece of equipment with a defective welded safety appliance or safety appliance bracket or support addressed in this section will be assessed as an improperly applied safety appliance pursuant to the penalty schedule contained in Appendix A to part 231 of this chapter under the appropriate defect code contained therein.

(e) *Identification of equipment.* The railroad shall submit a written list to FRA that identifies each piece of passenger equipment equipped with a welded safety appliance bracket or support by January 1, 2007. Passenger equipment placed in service prior to January 1, 2007, but not discovered until after January 1, 2007, shall be immediately added to the railroad’s written list and shall be immediately inspected in accordance with paragraph (g) through (k) of this section. The written list submitted by the railroad shall contain the following:

(1) The equipment number;

(2) The equipment type;

(3) The safety appliance bracket(s) or support(s) affected;

(4) Any equipment and any specific safety appliance bracket(s) or support(s) on the equipment that will not be subject to the inspection plan required in paragraph (g) of this section;

(5) A detailed explanation for any such exclusion recommended in paragraph (e)(4) of this section;

(f) FRA's Associate Administrator for Safety reserves the right to disapprove any exclusion recommended by the railroad in paragraphs (c)(2)(i) and (d)(4) of this section and will provide written notification to the railroad of any such determination.

(g) *Inspection plans.* The railroad shall adopt and comply with and submit to FRA upon request a written safety appliance inspection plan. At a minimum, the plan shall include the following:

(1) Except as provided in paragraph (c)(1) of this section, an initial visual inspection (within 1 year of date of publication) and periodic re-inspections (at intervals not to exceed 6 years) of each welded safety appliance bracket or support identified in paragraph (e) of this section. If significant disassembly of a car is necessary to visually inspect the involved safety appliance bracket or support, the initial visual inspection may be conducted at the equipment's first periodic brake equipment maintenance interval pursuant to § 238.309 occurring after January 1, 2007.

(2) Identify the personnel that will conduct the initial and periodic inspections and any training those individuals are required to receive in accordance with the criteria contained in paragraph (h) of this section.

(3) Identify the specific procedures and criteria for conducting the initial and periodic safety appliance inspections in accordance with the requirements and criteria contained in paragraph (i) of this section.

(4) Identify when and what type of potential repairs or potential remedial action will be required for any defective welded safety appliance bracket or support discovered during the initial or periodic safety appliance inspection in accordance with paragraph (j) of this section.

(5) Identify the records that will be maintained that are related to the initial and periodic safety appliance inspections in accordance with the requirements contained in paragraph (k) of this section.

(h) *Inspection personnel.* The initial and periodic safety appliance inspections shall be performed by individuals properly trained and qualified to iden-

tify defective weld conditions. At a minimum, these personnel include the following:

(1) A qualified maintenance person (QMP) with at least 4 hours of training specific to the identification of weld defects and the railroad's weld inspection procedures;

(2) A current certified welding inspector (CWI) pursuant to American Welding Society Standard—AWS QC-1, Standard for AWS Certification of Welding Inspectors (1996) or its current revised equivalent;

(3) A person possessing a current Canadian Welding Bureau (CWB) certification pursuant to the Canadian Standards Association Standard W59 (2003) or its current revised equivalent;

(4) A person possessing a current level II or level III visual inspector certification from the American Society for Non-destructive Testing pursuant to Recommended Practice SNT-TC-1A—Personnel Qualification and Certification in Nondestructive Testing (2001) or its current revised equivalent; or

(5) A person possessing a current certification under any other nationally or internationally recognized welding qualification standard that is equivalent to those identified in paragraphs (h)(2) through (h)(4) of this section.

(i) *Inspection procedures.* The initial and periodic safety appliance inspections shall be conducted in accordance with the procedures and criteria established in the railroad's inspection plan. At a minimum, these procedures and criteria shall include:

(1) A complete visual inspection of the entire welded surface of any safety appliance bracket or support identified in paragraph (e) of this section.

(2) The visual inspection shall occur after the complete removal of any dirt, grease, rust, or any other foreign matter from the welded portion of the involved safety appliance bracket or support. Removal of paint is not required.

(3) The railroad shall disassemble any equipment necessary to permit full visual inspection of the involved weld.

(4) Any materials necessary to conduct a complete inspection must be made available to the inspection personnel throughout the inspection process. These include but are not limited

to such items as mirrors, magnifying glasses, or other location specific inspection aids. Remote viewing aids possessing equivalent sensitivity are permissible for restricted areas.

(5) Any weld found with a defect as defined in paragraph (d) of this section during the initial or periodic safety appliance inspection shall be inspected by either a certified weld inspector identified in paragraphs (h)(2) through (h)(5) of this section or a welding or materials engineer possessing a professional engineer's license for a final determination. No car with a defect in the weld of a safety appliance or its attachment may continue in use until a final determination as to the existence of a defect is made by the personnel identified in this paragraph.

(6) A weld finally determined to contain a defect shall be handled for repair in accordance with §238.17(e) and repaired in accordance with the remedial action criteria contained in paragraph (j) of this section.

(j) *Remedial action.* Unless a defect in a weld is known to have been caused by crash damage, the railroad shall conduct a failure and engineering analysis of any weld identified in paragraph (e) of this section determined to have a break or crack either during the initial or periodic safety appliance inspection or while otherwise in service to determine if the break or crack is the result of crash damage, improper construction, or inadequate design. Based on the results of the analysis, the repair of the involved safety appliance bracket or support shall be handled as follows:

(1) A defect in a weld due to crash damage (*i.e.*, impact of the safety appliance by an outside force during service or an accident) or improper construction (*i.e.*, the weld did not conform to the engineered design) shall be reattached by either mechanically fastening the safety appliance or the safety appliance bracket or support to the equipment or welding the safety appliance bracket or support to the equipment in a manner that is at least as strong as the original design or at least twice the strength of a bolted mechanical attachment, whichever is greater. If welding is used to repair the dam-

aged appliance, bracket, or support the following requirements shall be met:

(i) The repair shall be conducted in accordance with the welding procedures contained in APTA Standard SS-C&S-020-03—Standard for Passenger Rail Vehicle Structural Repair (September 2003); or an alternative procedure approved by FRA pursuant to §238.21. The Director of the Federal Register approves incorporation by reference of the APTA Standard SS-C&S-020-03 (September 2003), “Standard for Passenger Rail Vehicle Structural Repair,” in this section in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy of the incorporated standard from the American Public Transportation Association, 1666 K Street, Washington, DC 20006. You may inspect a copy of the incorporated standard at the Federal Railroad Administration, Docket Clerk, 1200 New Jersey Avenue, SE., Washington, DC 20590 or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html;

(ii) A qualified individual under paragraph (h) of this section shall inspect the weld to ensure it is free of any cracks or fractures prior to the equipment being placed in-service;

(iii) The welded safety appliance bracket or support shall receive a periodic safety appliance inspection pursuant to the requirements contained in paragraphs (g) through (i) of this section; and

(iv) A record of the welded repair pursuant to the requirements of paragraph (k) of this section shall be maintained by the railroad.

(2) A defect in the weld that is due to inadequate design (*i.e.*, unanticipated stresses or loads during service) shall be handled in accordance with the following:

(i) The railroad must immediately notify FRA's Associate Administrator for Safety in writing of its discovery of a defective weld that is due to inadequate design;

(ii) The involved safety appliance or the safety appliance bracket or support

§ 238.230

shall be reattached to the equipment by mechanically fastening the safety appliance or the safety appliance bracket or support to the equipment unless such mechanical fastening is impractical due to the design of the equipment;

(iii) The railroad shall develop and comply with a written plan submitted to and approved by FRA's Associate Administrator for Safety detailing a schedule for all passenger equipment in that series of cars with a similar welded safety appliance bracket or support to have the involved safety appliance or the safety appliance bracket or support mechanically fastened to the equipment; and

(iv) If a railroad determines that the design of the equipment makes it impractical to mechanically fasten the safety appliance or the safety appliance bracket or support to the equipment, then the railroad shall submit a request to FRA for special approval of alternative compliance pursuant to § 238.21. Such a request shall explain the necessity for any relief sought and shall contain appropriate data and analysis supporting its determination that any alternative method of attachment provides at least an equivalent level of safety.

(k) *Records.* Railroads shall maintain written or electronic records of the inspection and repair of the welded safety appliance brackets or supports on any equipment identified in paragraph (e) of this section. The records shall be made available to FRA upon request. At a minimum, these records shall include all of the following:

(1) Training or certification records for any person performing any of the inspections or repairs required in this section.

(2) The date, time, location, and identification of the person performing the initial and periodic safety appliance inspections for each piece of equipment identified in paragraph (e) of this section. This includes the identification of the person making any final determination as to the existence of a defect under paragraph (i)(5) of this section.

(3) A record of all passenger equipment found with a safety appliance weldment that is defective either during the initial or periodic safety appli-

49 CFR Ch. II (10–1–10 Edition)

ance inspection or while the equipment is in-service. This record shall also identify the cause of the crack or fracture.

(4) The date, time, location, identification of the person making the repair, and the nature of the repair to any welded safety appliance bracket or support identified in paragraph (e) of this section.

[71 FR 61858, Oct. 19, 2006, as amended at 74 FR 25174, May 27, 2009]

§ 238.230 Safety appliances—new equipment.

(a) *Applicability.* This section applies to passenger equipment placed in service on or after January 1, 2007.

(b) *Welded safety appliances.* Except as provided in this section, all passenger equipment placed into service on or after January 1, 2007, that is equipped with a safety appliance, required by the "manner of application" provisions in part 231 of this chapter to be attached by a mechanical fastener (*i.e.*, bolts, rivets, or screws), shall have the safety appliance and any bracket or support necessary to attach the safety appliance to the piece of equipment mechanically fastened to the piece of equipment.

(1) *Safety appliance brackets or supports considered part of the car body.* Safety appliance brackets or supports will be considered part of the car body and will not be required to be mechanically fastened to the piece of passenger equipment if all of the following are met:

(i) The bracket or support is welded to a surface of the equipment's body that is at a minimum 3/16-inch sheet steel or structurally reinforced to provide the equivalent strength and rigidity of 3/16-inch sheet steel;

(ii) The area of the weld is sufficient to ensure a minimum weld strength, based on yield, of three times the strength of the number of SAE grade 2, ½ inch diameter bolts that would be required for each attachment;

(iii) Except for any access required for attachment of the safety appliance, the weld is continuous around the perimeter of the surface of the bracket or support;

(iv) The attachment is made with fillet welds at least 3/16-inch in size;