

# TITLE 49--TRANSPORTATION

## CHAPTER II--FEDERAL RAILROAD ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

### PART 223--SAFETY GLAZING STANDARDS--LOCOMOTIVES, PASSENGER CARS AND CABOOSES

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#### Subpart A--General

##### Sec. 223.1 Scope.

This part provides minimum requirements for glazing materials in order to protect railroad employees and railroad passengers from injury as a result of objects striking the windows of locomotives, caboose and passenger cars.

[44 FR 77352, Dec. 31, 1979]

##### Sec. 223.3 Application.

- (a) This part applies to railroads that operate rolling equipment on standard gauge track that is a part of the general railroad system of transportation.
- (b) This part does not apply to--
  - (1) Locomotives, cabooses, and passenger cars that operate only on track inside an installation that is not part of the general railroad system of transportation;
  - (2) Rapid transit operations in an urban area that are not connected with the general railroad system of transportation.
  - (3) Locomotives, passenger cars and cabooses that are historical or antiquated equipment and are used only for excursion, educational, recreational purposes or private transportation purposes.
  - (4) Locomotives that are used exclusively in designated service as defined in Sec. 223.5(m).

[44 FR 77352, Dec. 31, 1979, as amended at 53 FR 28600, July 28, 1988]

## Sec. 223.5 Definitions.

As used in this part--

Administrator means the Administrator of the Federal Railroad Administration or the Administrator's delegate.

Caboose means a car in a freight train intended to provide transportation for crewmembers.

Certified glazing means a glazing material that has been certified by the manufacturer as having met the testing requirements set forth in Appendix A of this part and that has been installed in such a manner that it will perform its intended function.

Designated service means exclusive operation of a locomotive under the following conditions:

- (1) The locomotive is not used as an independent unit or the controlling unit is a consist of locomotives except when moving for the purpose of servicing or repair within a single yard area;
- (2) The locomotive is not occupied by operating or deadhead crews outside a single yard area; and
- (3) The locomotive is stenciled ``Designated Service--DO NOT OCCUPY''.

Emergency responder means a member of a police or fire department, or other organization involved with public safety charged with providing or coordinating emergency services, who responds to a passenger train emergency.

Emergency window means that segment of a side facing glazing location which has been designed to permit rapid and easy removal during a crisis situation.

End facing glazing location means any location where a line perpendicular to the plane of the glazing material makes a horizontal angle of 50 degrees or less with the centerline of the locomotive, caboose or passenger car. Any location which, due to curvature of the glazing material, can meet the criteria for either a front facing location or a side facing location shall be considered a front facing location.

FRA means the Federal Railroad Administration.

Locomotive means a self-propelled unit of equipment designed primarily for moving other equipment. It does not include self-propelled passenger cars.

Locomotive cab means that portion of the superstructure designed to be occupied by the crew while operating the locomotive.

Passenger car means a unit of rail rolling equipment intended to provide transportation for members of the general public and includes self-propelled cars designed to carry baggage, mail, express or passengers. This term includes a passenger coach, cab car, and an MU locomotive. This term does not include a private car.

Passenger train service means the transportation of persons (other than employees, contractors, or persons riding equipment to observe or monitor railroad operations) in intercity passenger service or commuter or other short-haul passenger service in a metropolitan or suburban area.

Person includes all categories of entities covered under 1 U.S.C. 1, including, but not limited to, a railroad; any manager, supervisor, official, or other employee or agent of a railroad; any owner, manufacturer, lessor, or lessee of railroad equipment, track, or facilities; any passenger, any trespasser or nontrespasser; any independent contractor providing goods or services to a railroad; and any employee of such owner, manufacturer, lessor, lessee, or independent contractor.

Railroad means:

- (1) Any form of non-highway ground transportation that runs on rails or electromagnetic guideways, including
- (i) Commuter or other short-haul rail passenger service in a metropolitan or suburban area and commuter railroad service that was

- operated by the Consolidated Rail Corporation on January 1, 1979, and
- (ii) High speed ground transportation systems that connect metropolitan areas, without regard to whether those systems use new technologies not associated with traditional railroads, but does not include rapid transit operations in an urban area that are not connected to the general railroad system of transportation and
- (2) A person that provides railroad transportation, whether directly or by contracting out operation of the railroad to another person. Rebuilt locomotive, caboose or passenger car means a locomotive, caboose or passenger car that has undergone overhaul which has been identified by the railroad as a capital expense under Surface Transportation Board accounting standards.

Side facing glazing location means any location where a line perpendicular to the plane of the glazing material makes an angle of more than 50 degrees with the centerline of the locomotive, caboose or passenger car.

Windshield means the combination of individual units of glazing material of the locomotive, passenger car, or caboose that are positioned in an end facing glazing location.

Yard is a system of auxiliary tracks used exclusively for the classification of passenger or freight cars according to commodity or destination; assembling of cars for train movement; storage of cars; or repair of equipment.

Yard caboose means a caboose that is used exclusively in a single yard area.

Yard locomotive means a locomotive that is operated only to perform switching functions within a single yard area.

[63 FR 24675, May 4, 1998; 63 FR 36376, July 6, 1998]

#### **Sec. 223.7 Responsibility.**

Any person (an entity of any type covered under 1 U.S.C. 1, including but not limited to the following: a railroad; a manager, supervisor, official, or other employee or agent of a railroad; any owner, manufacturer, lessor, or lessee of railroad equipment, track, or facilities; any independent contractor providing goods or services to a railroad; and any employee of such owner, manufacturer, lessor, lessee, or independent contractor) who violates any requirement of this part or causes the violation of any such requirement is subject to a civil penalty of at least \$500 and not more than \$11,000 per violation, except that: Penalties may be assessed against individuals only for willful violations, and, where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury to persons, or has caused death or injury, a penalty not to exceed \$22,000 per violation may be assessed. Each day a violation continues shall constitute a separate offense. See appendix B to this part for a statement of agency civil penalty policy.

[53 FR 28601, July 28, 1988, as amended at 53 FR 52930, Dec. 29, 1988; 63 FR 11621, Mar. 10, 1998]

#### **Sec. 223.8 Additional requirements for passenger equipment.**

In addition to the requirements contained in this part, requirements for emergency window exits and window safety glazing on passenger equipment, as defined in Sec. 238.5 of this chapter, are also found in part 238 of this chapter.

[64 FR 25659, May 12, 1999]

## Subpart B--Specific Requirements

### Sec. 223.9 Requirements for new or rebuilt equipment.

- (a) Locomotives, including yard locomotives, built or rebuilt after June 30, 1980, must be equipped with certified glazing in all locomotive cab windows.
- (b) Cabooses, including yard cabooses, built or rebuilt after June 30, 1980, must be equipped with certified glazing in all windows.
- (c) Passenger cars, including self-propelled passenger cars, built or rebuilt after June 30, 1980, must be equipped with certified glazing in all windows and at least four emergency opening windows.
- (d) Marking. Each railroad providing passenger train service shall ensure that for each passenger car, except for self-propelled cars designed to carry baggage, mail, or express:
  - (1) Each emergency window is conspicuously and legibly marked with luminescent material on the inside of each car to facilitate passenger egress. Each such railroad shall post clear and legible operating instructions at or near each such exit.
  - (2) Each window intended for emergency access by emergency responders for extrication of passengers is marked with a retroreflective, unique, and easily recognizable symbol or other clear marking. Each such railroad shall post clear and understandable window-access instructions either at each such window or at each end of the car.

[44 FR 77352, Dec. 31, 1979, as amended at 45 FR 49271, July 24, 1980; 63 FR 24675, May 4, 1998]

### Sec. 223.11 Requirements for existing locomotives.

- (a) Locomotives, other than yard locomotives, built or rebuilt prior to July 1, 1980, which are equipped in the forward and rearward end facing glazing locations of the locomotive cab windshield with a glazing material that meets the criteria for either portion of the impact testing required for a Type I test under the provisions of appendix A of this part, will not require the installation of certified glazing in the windshield location except to replace windshield glazing material that is broken or damaged.
- (b) Locomotives, other than yard locomotives, built or rebuilt prior to July 1, 1980, which are equipped in all locomotive cab side facing glazing locations with a glazing material that meets the criteria for either portion of the impact testing required for a Type II test under the provisions of appendix A of this part, will not require the installation of certified glazing in the sidefacing glazing location except to replace sidefacing glazing material that is broken or damaged.
- (c) Except for yard locomotives and locomotives equipped as described in paragraphs (a) and (b), of this section, locomotives built or rebuilt prior to July 1, 1980, shall be equipped with certified glazing in all locomotive cab windows after June 30, 1984.
- (d) Each locomotive subject to the provisions of paragraph (c) of this section which, as a result of an act of vandalism has a locomotive cab window that is broken or damaged so that the window fails to permit good visibility--
  - (1) Shall be placed in Designated Service within 48 hours of the time of breakage or damage or
  - (2) Shall be removed from service until equipped with certified glazing in the following manner:
    - (i) If the broken or damaged window is a part of the windshield of the locomotive cab, all of the forward and rearward end facing glazing locations of the locomotive cab must be replaced with certified glazing.
    - (ii) If the broken or damaged window is a part of the sidefacing window of the locomotive cab, all of the sidefacing glazing locations of the locomotive cab must be replaced with certified glazing.

(Sec. 209 of the Federal Railroad Safety Act, 94 Stat. 957 (45 U.S.C. 438); sec. 1.49(m) of the regulations of the Office of the Secretary of Transportation, 49 CFR 1.49(m))

[45 FR 49271, July 24, 1980, as amended at 48 FR 24083, May 31, 1983; 48 FR 56956, Dec. 27, 1983]

**Sec. 223.13 Requirements for existing cabooses.**

- (a) Cabooses, other than yard cabooses, built or rebuilt prior to July 1, 1980, which are equipped in the forward and rearward end facing glazing locations of the windshield with a glazing material that meets the criteria for either portion of the impact testing required for a Type I test under the provisions of appendix A of this part, will not require the installation of certified glazing in the windshield location except to replace windshield glazing material that is broken or damaged.
- (b) Cabooses, other than yard cabooses, built or rebuilt prior to July 1, 1980, which are equipped in all side facing glazing locations with a glazing material that meets the criteria for either portion of the impact testing required for a Type II test under the provisions of appendix A of this part, will not require the installation of certified glazing in the sidefacing glazing locations except to replace sidefacing glazing material that is broken or damaged.
- (c) Except for yard cabooses and cabooses equipped as described in paragraphs (a) and (b), cabooses built or rebuilt prior to July 1, 1980, shall be equipped with certified glazing in all windows after June 30, 1984.
- (d) Each caboose subject to the provision of paragraph (c) of this section, which, as a result of an act of vandalism, has a window that is broken or damaged so that the window fails to permit good visibility shall be equipped with certified glazing in the following manner:
  - (1) If the broken window is a part of the windshield, all of the forward and rearward end facing glazing locations must be replaced with certified glazing within 30 days of the date of breakage or damage.
  - (2) If the broken window is a part of the sidefacing window, all of the sidefacing glazing locations must be replaced with certified glazing within 30 days of the date of breakage.

(Sec. 209 of the Federal Railroad Safety Act, 94 Stat. 957 (45 U.S.C. 438); Sec. 1.49(m) of the regulations of the Office of the Secretary of Transportation, 49 CFR 1.49(m))

[44 FR 77352, Dec. 31, 1979, as amended at 48 FR 24083, May 31, 1983; 48 FR 56956, Dec. 27, 1983]

**Sec. 223.15 Requirements for existing passenger cars.**

- (a) Passenger cars built or rebuilt prior to July 1, 1980, which are equipped in the forward and rearward end facing glazing locations of the windshield with a glazing material that meets the criteria for either portion of the impact testing required for a Type I test under the provisions of appendix A of this part will not require the installation of certified glazing in the windshield location except to replace windshield glazing material that is broken or damaged.
- (b) Passenger cars built or rebuilt prior to July 1, 1980, which are equipped in the sidefacing glazing locations with a glazing material that meets the criteria for either portion of the impact testing required for a Type II test under the provisions of appendix A of this part, will not require the installation of certified glazing except to replace sidefacing glazing material that is broken or damaged.
- (c) Except for passenger cars described in paragraphs (a) and (b), passenger cars built or rebuilt prior to July 1, 1980, shall be equipped

with certified glazing in all windows and a minimum of four emergency windows after June 30, 1984.

- (d) Each passenger car subject to the provisions of paragraph (c) of this section which as a result of an act of vandalism, has a window that is broken or damaged so that the window fails to permit good visibility shall be equipped with certified glazing in the following manner:
- (1) When the broken window is a part of the windshield, all of the forward and rearward end facing glazing locations shall be replaced with certified glazing within 30 days of breakage.
  - (2) When the broken window is a part of the sidefacing window, the glazing in that individual sidefacing glazing location shall be replaced with certified glazing within 30 days of the date of breakage.

(Sec. 209 of the Federal Railroad Safety Act, 94 Stat. 957 (45 U.S.C. 438); sec. 1.49(m) of the regulations of the Office of the Secretary of Transportation, 49 CFR 1.49(m))

[44 FR 77352, Dec. 31, 1979, as amended at 48 FR 24083, May 31, 1983; 48 FR 56956, Dec. 27, 1983]

### **Sec. 223.17 Identification of equipped locomotives, passenger cars and cabooses.**

Each locomotive, passenger car and caboose that is fully equipped with glazing materials that meet the requirements of this part shall be stencilled on an interior wall as follows:

``Fully Equipped FRA Part 223 glazing'' or similar words conveying that meaning in letters at least  $\frac{3}{8}$  inch high.

[45 FR 49271, July 24, 1980]

#### Appendix A to Part 223--Certification of Glazing Materials

As provided in this part, certified glazing materials installed in locomotives, passenger cars, or cabooses must be certified by the glazing manufacturer in accordance with the following procedures:

##### a. General Requirements

- (1) Each manufacturer that provides glazing materials, intended by the manufacturer for use in achieving compliance with the requirements of this part, shall certify that each type of glazing material being supplied for this purpose has been successfully tested in accordance with this appendix and that test verification data is available to a railroad or to FRA upon request.
- (2) The test verification data shall contain all pertinent original data logs and documentation that the selection of material samples, test set-ups, test measuring devices, and test procedures were performed by qualified personnel using recognized and acceptable practices and in accordance with this appendix.

##### b. Testing Requirements

- (1) The material to be tested (Target Material) shall be a full scale sample of the largest dimension intended to be produced and installed.
- (2) The Target Material shall be representative of production material and shall be selected on a documented random choice basis.
- (3) The Target Material shall be securely and rigidly attached in a fixture so that the fixture's own characteristics will not induce test errors.
- (4) The Target Material so selected and attached shall constitute a Test Specimen.
- (5) The Test Specimen will then be equipped with a Witness Plate that shall be mounted parallel to and at a distance of six inches in back of the Target Material. The Witness Plate shall have at least an area which will cover the full map of the Target Material.
- (6) The Witness Plate shall be an unbacked sheet of maximum 0.006

inch, alloy 1100 temper O, aluminum stretched within the perimeter of a suitable frame to provide a taut surface.

- (7) The Test Specimen will be positioned so that the defined projectile impacts it at an angle of 90 degrees to the Test Specimen surface.
- (8) The point of impact of the defined projectile will be within a radius of 3 of the centroid of the Target Material.
- (9) Velocity screens or other suitable velocity measuring devices will be positioned so as to measure the impact velocity of the defined projectile within a 10% accuracy tolerance, with test modifications made to guarantee that the stipulated minimum velocity requirements are met.
- (10) The Test Specimen for glazing material that is intended for use in end facing glazing locations shall be subjected to a Type I test regimen consisting of the following tests:
  - (i) Ballistic Impact in which a standard 22 caliber long rifle lead bullet of 40 grains in weight impacts at a minimum of 960 feet per second velocity.
  - (ii) Large Object Impact in which a cinder block of 24 lbs minimum weight with dimensions of 8 inches by 8 inches by 16 inches nominally impacts at the corner of the block at a minimum of 44 feet per second velocity. The cinder block must be of composition referenced in American Society for Testing and Materials (ASTM) Specification C33L or ASTM C90.
- (11) The Test Specimen for glazing material that is intended for use only in side facing glazing locations shall be subjected to a Type II test regimen consisting of the following tests:
  - (i) Ballistic Impact in which a standard 22 caliber long rifle lead bullet of 40 grains in weight impacts at a minimum of 960 feet per second velocity.
  - (ii) Large Object Impact in which a cinder block of 24 lbs minimum weight with dimensions of 8 inches by 8 inches by 16 inches nominally impacts at the corner of the block at a minimum of 12 feet per second velocity. The cinder block must be of the composition referenced in ASTM C33L or ASTM C90.
- (12) Three different test specimens must be subjected to the ballistic impact portion of these tests.
- (13) Two different test specimens must be subjected to the large object impact portion of these tests.
- (14) A material so tested must perform so that:
  - (i) there shall be no penetration of the back surfaces (side closest to Witness Plate) of the Target Material by the projectile. Partial penetration of the impact (front) surface of the Target Material does not constitute a failure; and
  - (ii) there shall be no penetration of particles from the back side of the Target Material through the back side of the prescribed Witness Plate.
- (15) Test specimens must consecutively pass the required number of tests at the required minimum velocities. Individual tests resulting in failures at greater than the required minimum velocities may be repeated but a failure of an individual test at less than the minimum velocity shall result in termination of the total test and failure of the material.
- (16) After successful completion of the prescribed set of required consecutive tests, a manufacturer may certify in writing that a particular glazing material meets the requirements of these standards.

c. Material Identification

- (1) Each individual unit of glazing material shall be permanently marked, prior to installation, to indicate that this type of material has been successfully tested as set forth in this appendix and that marking shall be done in such a manner that it is clearly visible after the material has been installed.
- (2) Each individual unit of a glazing material that has successfully passed the Type I testing regimen shall be marked to indicate:
  - (i) ``FRA Type I'' material;
  - (ii) the manufacturer of the material;

- (iii) the type or brand identification of the material.
- (3) Each individual unit of a glazing material that has successfully passed the Type II testing regimen shall be marked to indicate:
  - (i) ``FRA Type II'' material;
  - (ii) the manufacturer of the material;
  - (iii) the type or brand identification of the material.

Appendix B to Part 223--Schedule of Civil Penalties \1\  
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\1\ A penalty may be assessed against an individual only for a willful violation. The Administrator reserves the right to assess a penalty of up to \$22,000 for any violation where circumstances warrant. See 49 U.S.C. 21301, 21304, and 49 CFR part 209, appendix A. Further designations, not found in the CFR citation for certain provisions are FRA Office of Chief Counsel computer codes added as a suffix to the CFR citation and used to expedite imposition of civil penalties for violations. FRA reserves the right, should litigation become necessary, to substitute in its complaint the CFR citation in place of the combined designation cited in the penalty demand letter.

Section	Violation	Willful Violation
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223.9 New or rebuilt Equipment:		
(a) Locomotives.....	\$2,500	\$5,000
(b) Cabooses.....	2,500	5,000
(c) Passenger cars.....	2,500	5,000
(d) (1), (d)(2):.....		
(i) Window not marked or instructions not posted.....	2,500	5,000
(ii) Window improperly marked or instructions improperly posted.....	1,000	2,000
223.11(c) Existing locomotives.....	2,500	5,000
(d) Repair of window.....	1,000	2,000
223.13(c) Existing cabooses.....	2,500	5,000
(d) Repair of window.....	1,000	2,000
223.15(c) Existing passenger cars.....	2,500	5,000
(d) Repair of window.....	1,000	2,000
223.17 Identification of units.....	1,000	1,500
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