

## REQUIREMENTS FOR FREIGHT CAR SAFETY APPLIANCES

Standard

S-2044

Adopted 0000

### 1.0 SCOPE

**1.1** This standard establishes requirements for safety appliance arrangements applied to railroad rolling stock built new on or after the date specified in paragraph 1.2 for the particular car type. Cars built prior to that date may be equipped in accordance with this standard. The appendices to this standard establish the required arrangements for individual car types. In the event of discrepancy between the requirements of this base standard and the appendices, the requirements of the appendices shall govern. This document is intended to ensure compliance with United States Code of Federal Regulations Title 49, Part 231, “Railroad Safety Appliance Standards” and Transport Canada’s “Railway Safety Appliance Standards Regulations” and to enhance the safety of rolling stock. In the event of discrepancy between the text of this standard and the illustrations, the text shall govern.

**1.2** Safety appliance requirements for the following car types are incorporated in the appendices to this standard. Cars that do not conform to any of the following car types are to be equipped with safety appliances conforming to the requirements of the Federal Railroad Administration safety appliance standards, CFR Title 49, Part 231 and Transport Canada’s “Railway Safety Appliance Standards Regulations”.

<b>Appendix</b>	<b>Car Type</b>	<b>Effective for Cars Built New on or after</b>
A	Box cars and other house cars without roof hatches	1-01-2007
B	Covered hopper and other house cars with roof hatches	1-01-2007
C	Bulkhead flat cars	1-01-2007

**1.3** Revisions or additions to this standard must be approved by the Equipment Engineering Committee of the Association of American Railroads and must be submitted for review by the United States Federal Railroad Administration and Transport Canada.

### 2.0 APPLICABLE AAR STANDARDS AND SPECIFICATIONS FOR SAFETY APPLIANCE COMPONENTS

The following standards and specifications, which are located in the stated section of the *Manual of Standards and Recommended Practices* (MSRP) of the Association of American Railroads, are applicable to the safety appliance components referred to in this standard.

<b>Standard or Specification</b>	<b>MSRP Section</b>	<b>Covering</b>
S-129	B	Arrangement of coupler operating devices

S-131	B	Rotary operating rod for use with type E60 coupler
S-133	B	Rotary operating rod for use with type F70 coupler
S-134	B	Rotary operating rod for use with type E60, E67 and F70 couplers
S-224	C	Handhold and ladder tread material and design
S-226	C	Running boards, brake steps and end platforms
S-475	E	Geared hand brakes
S-2042	C	Sill step performance specification
M-961	B	Special uncoupling devices

### 3.0 MANUFACTURE OF SAFETY APPLIANCES

Any of the above components applied to cars must be manufactured in accordance with the requirements of the above standards or specifications.

### 4.0 MANNER OF APPLICATION OF SAFETY APPLIANCES

**4.1** When terms listed below are used in this standard and its appendices and are printed in italics, they shall have the meanings stated herein.

**4.2** The term “Securely Fastened”, as applied to handholds, sill steps, end-platform mounting brackets, and hand brake housings, means applied with bolts not less than ½ in. (0.5 in.) diameter with the nuts facing out when possible and with the nuts riveted over. Acceptable alternatives to threaded bolts with the nuts riveted over include one-piece rivets, two-piece rivets, tack welding the bolt to the nut so as to deform them, and chisel checking the thread of the bolt over the nut at two locations. The checking is to be applied to the depth of the thread immediately adjacent to the nut so that it cannot back off and in such a manner that the threads are deformed to prevent the fastener from becoming insecure.

**4.3** The term “Mechanically Fastened” means applied with bolts with the nuts facing out when possible and with the nuts riveted over. Acceptable alternatives to threaded bolts with the nuts riveted over include one-piece rivets, two-piece rivets, tack welding the bolt to the nut so as to deform them, and chisel checking the thread of the bolt over the nut at two locations. The checking is to be applied to the depth of the thread immediately adjacent to the nut so that it cannot back off and in such a manner that the threads are deformed to prevent the fastener from becoming insecure.

**4.4** Except where specifically permitted in individual appendices, all brackets and supports that are applied to car structure solely for the purpose of supporting a safety appliance are to be *Securely Fastened* or *Mechanically Fastened*.

**4.5** The “Clear Length” of handholds is that length about which 2 in. clearance exists in all directions around the handhold. The *Clear Length* of one portion of a handhold does not include handhold portions in other directions or bend radii connecting non-continuous portions of a handhold. Intermediate supports may be considered part of the *Clear Length*. Unless otherwise stated, limitations on handhold length apply to the *Clear Length*. (See Fig. 1.)

**4.6** The “Clearance Points” of handholds are the ends of the *Clear Length*, as defined above. (See Fig. 1.)

**4.7** When handholds or ladder treads are required to have foot guards or upward projections, handhold or ladder stiles projecting 2 in. or more at the inboard end from any obstruction behind the handhold or ladder

tread may serve as foot guards. Other obstructions may serve as foot guards provided that they comply with the dimensional requirements for foot guards. Foot guards shall be no less than 2 in. high. (See Fig. 2.)

**4.8** The “Useable Length” of sill steps and step treads is the straight length, not including bend radii, above which the specified minimum *Clear Depth*, as defined in paragraph 4.9, exists. Unless otherwise stated, limitations on the length of sill steps and step treads apply to the *Useable Length*. (See Fig. 3.)

**4.9** All heights, vertical depths, and spacings relative to step treads, ladder treads, horizontal handholds, and running boards are measured to or from the top of the tread surface, handhold, or running board. The “Clear Depth” above such appliances shall be unobstructed. (*Clear Depth* for sill steps is illustrated in Fig. 3.) Heights defined relative to the top of rail are to be based on new, empty car conditions.

**4.10** The “Clear Width” of step treads, ladder treads, and horizontal handholds shall be measured from the outside surface to the closest inboard obstruction anywhere within the specified minimum *Clear Depth* and *Useable Length*. (See Fig. 3.)

**4.11** The application of sill steps shall be such that a box with length equal to the specified minimum *Useable Length* of the step, with height equal to the specified minimum *Clear Depth*, and with width equal to the specified minimum *Clear Width* can pass through the opening above the sill step. (See Fig. 3.)

**4.12** For sill steps with vertical legs that are angled toward the center of the step, dimensions defined relative to the vertical leg shall be measured from the adjacent end of the *Useable Length*. (See Fig. 3) For sill steps with vertical legs that are angled away from the center of the step, dimensions defined relative to the vertical leg shall be measured from the lowest portion of the leg, not including bend radii.

**4.13** Where minimum dimensions are specified for brake steps, end platforms, or running boards formed from sheet metal, the length or width is measured over the vertical flanges at the edges. The length or width of the horizontal surface between the tangent points of the bend radii of vertical flanges is to be no less than 95% of the specified minimum dimension. (See Fig. 4.)

**4.14** Where multiple panels of running boards or walkways are used, the facing ends of adjacent panels shall be no further apart than 3/4 in. (0.75 in.) and their adjacent top surfaces shall not vary in height by more than 1/4 in. (0.25 in.).

**4.15** Unless otherwise specified, *Longitudinal* is defined as parallel to the centerline of track and *Transverse* is defined as perpendicular in the horizontal plane to the centerline of track.

**4.16** The portions of the hand brake system that are considered safety appliances, and are therefore required to be *Securely Fastened* as defined in paragraph 4.2, are hand brake housings, hand brake wheels, and hand brake operating levers. Hand brake mounting brackets are to be *Mechanically Fastened* as defined in paragraph 4.3 unless the use of mechanical fasteners is not feasible for the particular application. Bell crank mounting brackets, sheave wheel mounting brackets, brake rod supports and guides, and chain supports and guides are not considered safety appliances. They need not necessarily be *Mechanically Fastened* and may be applied by welding.

**4.17** To allow for manufacturing tolerances, actual sizes of components may be 5% below the nominal sizes.

**4.18** The condemning diameter for handholds in operation and maintenance is 1/8 in. (0.125 in.) less than the minimum diameter specified for new construction in the appendices to this standard.

## 5.0 HAND BRAKE IDENTIFICATION

5.1 Cars equipped with more than one hand brake shall be marked as follows adjacent to each hand brake in letters no less than 1 ½ in. (1.5 in.) high:

CAR EQUIPPED WITH (TWO, THREE, etc.) HAND BRAKES  
APPLY/RELEASE HAND BRAKES AT (BOTH ENDS OF CAR, EACH UNIT, etc.)

5.2 The hand brakes of cars with multiple hand brakes shall be painted orange. An example of an acceptable color is one that matches Munsell color notation 10.0R5/14, which measures  $L^*=54.49$ ,  $a^*=45.57$ ,  $b^*=41.67$  on the CIE scale.

5.3 The hand brake of cars whose car body is painted orange adjacent to the hand brake and that have only one hand brake shall be painted a color other than orange.

## 6.0 ELECTIVE SAFETY APPLIANCES

Safety appliances applied to the exterior of cars in addition to those required by this standard are defined as “Elective Safety Appliances” and shall comply with the requirements of this standard that are applicable to similar safety appliances, except for their quantity and location.

## 7.0 MULTI-UNIT CARS

Articulated and drawbar-connected cars need not be equipped with safety appliances for the use of railroad operating crews at the articulated or drawbar connections between adjacent car bodies. However, when *Elective Safety Appliances* are applied at such locations, they shall comply with the requirements of paragraph 6.0 of this standard.

8/15/05

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