

## APPENDIX C

### SAFETY APPLIANCES FOR BULKHEAD FLAT CARS

Adopted 0000

#### 1.0 SCOPE

This appendix to Standard S-2044 defines the safety appliance requirements that apply specifically to bulkhead flat cars with bulkheads higher than 52 in. above the deck, including center partition cars. Except as stated herein, the requirements of the base standard apply to the cars covered by this appendix. These requirements are illustrated in Figs. C1 and C2. In the event of discrepancy between the text of this appendix and the illustrations, the text shall govern.

#### 2.0 HAND BRAKE

##### 2.1 General

**2.1.1** Each car shall have an AAR-approved hand brake that complies with the *AAR Manual of Standards and Recommended Practices* (MSRP), Section E, Standard S-475 and that operates in harmony with the power brake equipment on the car. Total braking force applied to the brake shoes by the hand brake shall comply with the requirements of the *MSRP*, Section E, Standard S-401, but in any event shall be no less than that developed by 50 psi brake cylinder pressure. The hand brake wheel and chain drum of vertical-wheel hand brakes shall be arranged so that both will revolve when applying and gradually releasing the hand brake. The hand brake shall be provided with means to prevent application of the brake by turning the brake wheel in a counterclockwise direction.

**2.1.2** The hand brake wheel shall have a nominal diameter of 22 in. The brake wheel shall be of shallow configuration and shall be of steel or other material of equivalent strength.

**2.1.3** The hub of the hand brake wheel shall be 2 5/8 in. (2.625 in.) deep with a square tapered fit to the shaft. The taper on the brake wheel hub and shaft shall be 1 in. in 12 in. on each side, or 2 in. in 12 in. total, with the small end of the shaft opening 7/8 in. (0.875 in.) square. The brake wheel shall be secured to the brake shaft with an American National Standard 7/8 - 9 heavy hex nut and 3/16 in. by 1 1/2 in. (0.1875 in. by 1.5 in.) cotter, or their equivalent.

##### 2.2 Location

**2.2.1** The hand brake shall be located so that it can be safely operated from the horizontal end platform while the car is in motion. The center of the hand brake shaft shall be located on the end of the car to the left of, and not less than 17 in. nor more than 22 in. from, the centerline of the car and shall be not less than 28 in. nor more than 40 3/8 in. (40.375 in.) above the platform-support surface of the end-platform mounting brackets.

**2.2.2** Clearance around the rim of the hand brake wheel shall be no less than 4 in. Clearance between the grip portion of the release lever, if used, and any part of the car shall be no less than 2 1/2 in. (2.5 in.).

**2.2.3** The outside edge of the hand brake wheel shall not extend more than 8 in. beyond the striker or end of the center sill. The outside edge of the hand brake wheel shall be no less than 1 in. outboard of the inside surface of the horizontal end-platform handhold.

**2.2.4** If the hand brake application is such that the requirements of paragraph 2.2.2 can be met only with hand brakes having short hand brake release levers or only with long release levers, but not both, the car shall be marked adjacent to the hand brake in 1 ½ in. (1.5 in.) high letters “SHORT (LONG) RELEASE LEVER BRAKE ONLY”.

### **2.3 Manner of Application**

**2.3.1** The hand brake housing shall be *Securely Fastened* to the car and the hand brake application, including bolt hole pattern, shall conform to the *AAR Manual of Standards and Recommended Practices*, Section E, Standards S-475 and S-401.

**2.3.2** The hand brake chain must have minimum working load of 5875 lb and minimum proof test of 11,750 lb.

**2.3.3** Hand brake rods shall be no less than ¾ in. (0.75 in.) diameter.

## **3.0 SILL STEPS**

### **3.1 Number**

There shall be four sill steps.

### **3.2 Dimensions**

**3.2.1** Sill steps shall conform to the requirements of the *AAR Manual of Standards and Recommended Practices*, Section C, Standard S-2042. Minimum *Useable Length* of tread shall be not less than 12 in.

**3.2.2** Sill steps shall be of steel no less than ½ in. (0.5 in.) thick and no less than 2 in. wide.

**3.2.3** Sill steps with tread more than 21 in. below the lowest adjacent side handhold shall have an additional tread.

**3.2.4** The *Clear Depth* above the entire *Useable Length* of all sill step treads shall be no less than 8 in. and the *Clear Width* of the lowest sill step tread shall be no less than 6 in. with the trucks rotated to simulate the maximum curvature specified for the uncoupled car.

### **3.3 Location**

**3.3.1** One sill step shall be applied near each end of each side of the car. The sill steps shall be located in the *Longitudinal* direction such that the inside face of the outboard vertical leg of the sill step is no more than 2 in. inboard of the outboard *Clearance Point* of any side handhold. The inside face of the inboard vertical leg of the sill step shall be no less than 10 in. from the outboard *Clearance Point* of any side handhold. (See Figs. C1 and C2.)

**3.3.2** In the *Transverse* direction, the outside edge of any sill step tread shall be not more than 6 in. inboard or outboard of the inside surface of the lowest adjacent side handhold. In addition, the outside edge of any sill step tread shall be no more than 4 in. inboard of any car structure below the lowest adjacent side handhold in the area from the inboard *Clearance Point* of the handhold to the outboard vertical leg of the sill step.

**3.3.3** The lowest tread shall be not more than 24 in., preferably not more than 22 in., above the top of rail.

### **3.4 Manner of Application**

Sill steps shall be *Securely Fastened* to the car.

## **4.0 SIDE HANDHOLDS**

### **4.1 Number**

When the end platforms are aligned with the lowest end handholds, there shall be 16 side handholds, four near each end on each side of the car. When the end platforms are aligned with the second lowest end handholds, there shall be 20 side handholds, five near each end on each side of the car.

### **4.2 Dimensions**

Handholds shall be of steel no less than  $\frac{3}{4}$  in. (0.75 in.) diameter and shall conform to the requirements of the *AAR Manual of Standards and Recommended Practices*, Section C, Standard S-224. Minimum *Clear Length* of the lowest side handhold at each corner shall be 16 in. Minimum *Clear Length* of the upper three side handholds at each corner shall be 16 in. if the bulkhead is wide enough to permit their use. If the bulkhead does not have sufficient width, handholds having *Clear Length* less than 16 in., but no less than 12 in., may be applied. Minimum clearance shall be 2 in., preferably 2  $\frac{1}{2}$  in. (2.5 in.). The side handhold at each corner aligned with the end platform, and any side handholds located below them, shall have foot guards or upward projections not less than 2 in. in height at their inboard ends.

### **4.3 Location**

**4.3.1** The side handholds shall be oriented horizontally and spaced vertically not more than 19 in. apart, with the lowest handhold located not more than 21 in. above the top tread of the sill step. Vertical spacing between side handholds shall be uniform within a maximum variation of 2 in.

**4.3.2** There shall be a side handhold aligned with each end handhold, up to and including the end handhold at each corner aligned with the end-platform handhold. Individual side handholds shall coincide in height with corresponding end handholds within a maximum variation of 2 in.

**4.3.3** The *Clearance Points* of the outboard end of the side handholds shall be not more than 10 in. inboard of, and no farther outboard than, the inside surface of the end handholds.

### **4.4 Manner of Application**

Side handholds shall be *Securely Fastened* to the car.

## 5.0 END HANDHOLDS

### 5.1 Number

When the end platforms are aligned with the lowest end handholds, there shall be 16 end handholds, four near each side on each end of the car. When the end platforms are aligned with the second lowest end handholds, there shall be 20 end handholds, five near each side on each end of the car.

### 5.2 Dimensions

Handholds shall be of steel no less than  $\frac{3}{4}$  in. (0.75 in.) diameter and shall conform to the requirements of the *AAR Manual of Standards and Recommended Practices*, Section C, Standard S-224. Minimum *Clear Length* shall be 16 in. Minimum clearance shall be 2 in., preferably 2  $\frac{1}{2}$  in. (2.5 in.). The end handhold at each corner aligned with the end platform, and any end handholds located below them, shall have foot guards or upward projections no less than 2 in. in height at their inboard ends.

### 5.3 Location

**5.3.1** The end handholds shall be oriented horizontally and spaced vertically not more than 19 in. apart, with the lowest handhold located not more than 21 in. above the top tread of the sill step nor more than 45 in. above the top of rail. Vertical spacing between end handholds shall be uniform within a maximum variation of 2 in.

**5.3.2** There shall be an end handhold aligned with each side handhold. Individual end handholds shall coincide in height with corresponding side handholds within a maximum variation of 2 in.

**5.3.3** The *Clearance Points* of the outboard end of the end handholds shall be not more than 10 in. from the inside surface of the side handholds.

### 5.4 Manner of Application

End handholds shall be *Securely Fastened* to the car.

## 6.0 LADDERS

### 6.1 Number

When access to the top of the bulkhead is provided, there shall be two ladders, one on each end of the car.

### 6.2 Dimensions

Ladder treads shall be of steel no less than  $\frac{3}{4}$  in. (0.75 in.) diameter and shall conform to the requirements of the *AAR Manual of Standards and Recommended Practices*, Section C, Standard S-224. Minimum *Clear Length* shall be 16 in. Minimum clearance shall be 2 in., preferably 2  $\frac{1}{2}$  in. (2.5 in.).

### 6.3 Location

**6.3.1** The ladders shall be located on the ends of the car above the end handholds on the left side, as viewed when facing the end of the car.

**6.3.2** The ladder treads shall be oriented horizontally and spaced vertically not more than 19 in. apart. Vertical spacing between ladder treads and end handholds shall be uniform within a maximum variation of 2 in.

**6.3.3** The top ladder tread shall be no less than 12 in. nor more than 18 in. below the mounting surface of the bulkhead top handhold.

**6.3.4** The *Clearance Points* of the outboard end of the ladder treads shall be not more than 10 in. from the inside surface of the side handholds. The *Clearance Points* of the inboard ends of the ladder treads and the end handholds beneath them shall be in vertical alignment in the *Transverse* direction. .

#### **6.4 Manner of Application**

Ladders shall be *Securely Fastened* to the car.

### **7.0 BULKHEAD TOP HANDHOLDS**

#### **7.1 Number**

When access to the top of the bulkhead is provided, there shall be two bulkhead top handholds, one over each ladder.

#### **7.2 Dimensions**

Bulkhead top handholds shall be of steel no less than  $\frac{3}{4}$  in. (0.75 in.) diameter and shall conform to the requirements of the *AAR Manual of Standards and Recommended Practices*, Section C, Standard S-224. Minimum *Clear Length* shall be 16 in.. Minimum clearance shall be 2 in., preferably 2  $\frac{1}{2}$  in. (2.5 in.).

#### **7.3 Location**

**7.3.1** Bulkhead top handholds shall be mounted on the top surface of the end bulkheads and shall be parallel to the top ladder treads below them.

**7.3.2** In the *Transverse* direction, the *Clearance Points* of the inboard end of the bulkhead top handholds shall be no more than 8 in. inboard from and no further outboard than the *Clearance Point* of the inboard end of the top ladder tread.

**7.3.3** In the *Longitudinal* direction, the inside surface of the bulkhead top handholds shall be no less than 8 in. from the outboard edge of the bulkhead top surface and no more than 15 in. from the inside surface of the top ladder tread.

#### **7.4 Manner of Application**

Bulkhead top handholds shall be *Securely Fastened* to the end bulkheads.

## 8.0 END PLATFORMS

### 8.1 Number

There shall be two end platforms.

### 8.2 Dimensions

End platforms shall conform to the requirements of the *AAR Manual of Standards and Recommended Practices*, Section C, Standard S-226. The platform material shall provide an equal or greater degree of safety than 1 1/8 in. (1.125 in.) thick wood, shall have uniform antiskid surfaces, and shall be of construction to provide at least 50% clear opening in a representative area to permit elimination of accumulated snow and ice. The thickness from the mounting surface to the top of tread shall be no less than 3/8 in. (0.375 in.) and no more than 2 in. The width shall be no less than 8 in. and the length no less than 60 in. Where car dimensions permit, 60 in. long platforms are preferred.

### 8.3 Location

**8.3.1** One end platform shall be applied on each end of the car between end handholds. The center of the outer mounting holes shall be no more than 7 3/4 in. (7.75 in.) from the *Clearance Points* of the nearest end handholds. The transverse center of the end platform mounting brackets shall be at the center of the distance between the end handholds and, where practicable, at the center of the car end.

**8.3.2** Where conventional draft gears or cushioning devices having less than 6 in. *Longitudinal* coupler travel in buff are used, the outside edge of the end platforms shall extend no farther from the end of the car than the striker or end of the center sill. Where draft gears or cushioning devices having 6 in. or greater *Longitudinal* coupler travel in buff are used, the outside edge of the end platforms shall extend no more than 6 in. beyond the striker or end of the center sill with the cushioning device (if used) at full buff.

**8.3.3** The platform-support surface of the mounting brackets shall be no more than 2 in. above nor more than 4 3/8 in. (4.375 in.) below the top surface of the nearest end handhold.

**8.3.4** Minimum vertical clearance above the end platform mounting brackets shall be no less than 7 in. Where possible, no part of the car end or fixture on the car end above the end platform, other than the hand brake, hand brake rod, hand brake chain, bell crank, and horizontal end-platform handhold, shall extend closer to the outside edge of the end platforms than 8 in. When car construction does not permit 8 in. clearance to be provided, no less than 5 in. clearance shall be provided.

### 8.4 Manner of Application

Each end platform shall be supported by four mounting brackets. The mounting brackets shall be of steel no less than 3/8 in. (0.375 in.) thick nor less than 2 in. wide and shall conform to the *AAR Manual of Standards and Recommended Practices*, Section C, Standard S-226. The mounting brackets shall be *Securely Fastened* to the car body. The end platforms shall be *Securely Fastened* with two fasteners at each mounting bracket.

## 9.0 HORIZONTAL END-PLATFORM HANDHOLDS

## 9.1 Number

There shall be two horizontal end-platform handholds.

## 9.2 Dimensions

Handholds shall be of steel no less than  $\frac{3}{4}$  in. (0.75 in.) diameter and shall conform to the requirements of the *AAR Manual of Standards and Recommended Practices*, Section C, Standard S-224. Handholds with unsupported length greater than 36 in. shall be no less than 1 in. diameter. It is preferred that the *Clear Length* of the end-platform handholds be no less than 60 in. Minimum clearance shall be 2 in., preferably  $2\frac{1}{2}$  in. (2.5 in.).

## 9.3 Location

**9.3.1** One horizontal end-platform handhold shall be applied on each end of the car above the end platform and between end handholds. The *Transverse* distance between the *Clearance Points* at the ends of the end-platform handholds and the *Clearance Points* at the ends of the corresponding end handholds shall not exceed 6 in.

**9.3.2** Horizontal end-platform handholds shall preferably coincide in height with the corresponding end handholds but shall be within a maximum variation of 2 in. Height from the top of the end-platform handhold to the platform-support surface of the end-platform mounting brackets shall be not less than 50 in. nor more than  $60\frac{3}{8}$  in. (60.375 in.).

**9.3.3** Horizontal end-platform handholds shall be located no farther than 6 in. in the *Longitudinal* direction from the corresponding end handholds, measuring from inside surface to inside surface. This requirement applies to the entire length of end-platform handholds and end handholds.

## 9.4 Manner of Application

Horizontal end-platform handholds shall be *Securely Fastened* to the car.

## 10.0 END LADDER (APPLIANCES) CLEARANCE

No part of the car above the end sill within 33 in. from the inside of the side handholds, except the hand brake wheel, hand brake shaft, end platform, horizontal end handholds, or uncoupling device, shall extend beyond the striker or end of the center sill with the draft gear or cushioning device (if used) at full buff. No other part of the car end or fixtures on the end above the end sill, other than the exceptions herein noted, shall extend beyond the outer face of the striker.

## 11.0 UNCOUPLING DEVICES

### 11.1 General

Uncoupling devices and their application shall conform to the *AAR Manual of Standards and Recommended Practices*, Section B, Standards S-129, S-131, S-133, or S-134 or Specification M-961.

## 11.2 Number

There shall be a minimum of two uncoupling devices.

## 11.3 Location

**11.3.1** There shall be at least one uncoupling device at each end of the car. When only one uncoupling device is applied at an end, it shall be applied at the left side of the car, as viewed when facing the end of the car.

**11.3.2** Under all operating conditions, the outside surface of the uncoupling device handles shall be no more than 14 in. closer to the car center than the inside surface of the adjacent side handholds.

**11.3.3** The ends of the uncoupling device handles shall extend not less than 4 in. below the bottom of the end sills or shall provide no less than 2 in. clearance around the handles. The lower ends of the handles shall be no less than 12 in. nor more than 15 in. below the top of the handle at the handle support.

## 12.0 PAINTING AND MARKING

**12.1** Cars with maximum height 16 ft 10 in. or more above the top of rail shall be painted and marked as follows:

**12.2** No less than 80% of that portion of each end of the car that is more than 15 ft above the top of rail shall be painted with reflectorized paint of a contrasting color, or other material providing reflectivity equal to or greater than reflectorized paint, and shall bear the words "EXCESS HEIGHT CAR" in letters no less than 3 in. high.

**12.3** On each side sill, or as close to the side sill as practicable, near each lower end corner there shall be painted or otherwise displayed a yellow rectangular area with a  $\frac{3}{4}$  in. (0.75 in.) border of a contrasting color containing the words "THIS CAR EXCESS HEIGHT" in lettering no less than 1  $\frac{1}{2}$  in. (1.5 in.) high.

8/30/05