RAILROAD SAFETY APPLIANCE STANDARDS

Motive Power and Equipment Enforcement Manual

United States
Department of Transportation

Federal Railroad Administration

Office of Safety Assurance and Compliance

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Authority; 49 U.S.C. 20102-03, 20131, 20301-03, 21301-2, 21034:
49 CFR 1.49(c),(m).
Source; 33 FR 19663, Dec. 25, 1968, unless otherwise noted.

Note: Where rivets or bolts are required in this part 231 a two-piece steel rivet maybe used consisting of:
(a) A solid shank of one-half (1/2) inch minimum diameter steel or material of equal or greater strength having cold forged head on one end, a shank length for material thickness fastened, locking grooves, breakneck groove and pull grooves (all annular grooves) on the opposite end.
(b) A collar of similar material, which is cold, swaged into the locking grooves, for the opposite end of item (a) after the pull groove section has been removed.

Note: Former TB *MP&E-98-14* The Railroad Safety Appliance Standards, 49 CFR §231, requires that Railroad Safety Appliances and their brackets be secured by ½ inch bolts with nuts outside (when possible) and riveted over, or with not less than ½ inch rivets. There must be a deformation of the threads of the fastener from becoming insecure. This can be accomplished by one of the following methods; rivet the fastener, chisel to a 1 inch depth at the threaded portion of the bolt nearest the fastener or apply weld to the threads. Additional approved securement methods are; 1 and 2 piece rivets, bolts, huck bolts, and unilock and disc lock fasteners when properly applied.

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Chapter 11

Railroad Safety Appliance Standards

Introduction

The purpose of this chapter is to promote safety in every area of railroad operations related to Railroad Safety Appliance Standards and reduce railroad-related accidents and incidents, i.e. handholds, sill steps, grates, walkways, railings, ladders, handbrakes, uncoupling levers, etc.

This chapter prescribes the manner in which Federal and State railroad inspectors shall engage in investigation design monitoring, location, sacrament and inspection of Railroad Safety Appliance Standards to assure railroad compliance with rules, regulations, orders, and standards issued by the Federal Railroad Administration (FRA). It is an instrument of program management issued solely for the guidance of FRA and State personnel.

It neither creates nor abridges any private right or obligation. The guidance provided by this chapter might be revoked or modified without prior notice by memorandum.

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Railroad Safety Appliance Standards Inspection Procedure

49 CFR Part §231 RAILROAD SAFETY APPLIANCE STANDARDS (Sections 231.0 - 231.30; 238.329 and 238.429)

The minimum requirements for **Railroad Safety Appliance Standards** are prescribed in 49 CFR §231; as of October 05. 1966

This part describes minimum requirements for railroad standards rules and practices. Each railroad may prescribe additional and/or more stringent requirements in its mechanical maintenance, inspection standards, operating rules, and other special instructions. This Part also requires a railroad to take certain measures to ensure Railroad Safety Appliance Standards compliance when engaged in movement, inspection and testing of rolling stock.

On the following pages Motive Power & Equipment (MP&E) personnel will find the regulation and any related information needed to perform Railroad Safety Appliance Standards inspections. The actual regulation will be stated first, following application and guidance that is prepared by the MP&E staff of the Office of Safety Assurance and Compliance. Following the listed Code of Federal Regulations (CFR) part, starting on page 11-13 and each page thereafter, an application and guidance can be followed that will assist the MP&E inspector to conduct an effective Railroad Safety Appliance Standards inspection. Notes will also be included that denote deviations and/or technical bulletins and/or existing fleet modifications.

Description of FRA's Sample Car Inspection process is provided in section 3-6 of this manual. Reporting codes MP&E inspectors are to use for inspection are defined in the Penalty Schedule of 49 CFR §231, page 11-135.

Reports of safety appliance standards are made on the Motive Power and Equipment Inspection Report, F6180.29 and 29.A.

MP&E inspector(s) should incorporate railroad safety appliance standards inspections into their routine inspection activities.

Before conducting any Railroad Safety Appliance Standards inspection, it will be necessary for the MP&E inspector to familiarize him or herself with the regulation. Also, MP&E inspector(s) will need knowledge of any permissible alternative methods providing the required compliance. Before entering a particular location for inspection purposes, railroads are responsible for producing any waivers of the CFR, which have been duly granted. If a waiver document is not readily produced, corrective action should be pursued. See Waivers pg. 11-06 of this part.

It is the railroad's obligation to adhere to, and comply with all safety appliance standards. The MP&E inspector's responsibility is to monitor if compliance has been met. If not, the MP&E inspector must take corrective action with the operating railroad to comply with current regulations.

The Railroad Safety Appliance Standards contained herein were verified complete when this manual was compiled and is inclusive of all applicable Technical Bulletins (TB's) up to January 1, 2002. It is the MP&E inspector's responsibility to update this information whenever changes in the regulation and/or FRA's policy are made.

MP&E inspector(s) engaged in Railroad Safety Appliance Standards investigation activities should refer to this chapter as often as necessary to obtain a clear understanding of their roles in the implementation of 49 CFR §231 Railroad Safety Appliance Standards. If in doubt as to the meaning of any paragraph in the chapter, an MP&E inspector must promptly apply to his/ her Supervisor for an explanation.

This manual gives an interpretation of each section for MP&E application and guidance, but is not to be construed as a modification, alteration, or revision of the public standards or law.

This manual will serve as the guideline for effective MP&E inspection and compliance activities related to CFR 49 §231 Railroad Safety Appliance Standards. In conjunction with this manual an MP&E Inspector must utilize basic knowledge and language related to the railroad industry and exercise good judgement as it applies to inspection, safety and compliance with 49 CFR §231 for the railroad industry in its entirety.

MP&E inspector(s) must familiarize themselves with, and be able to identify the common types of rail cars and their unique characteristics prior to performing inspections. MP&E inspector(s) should learn the types of cars to be inspected as a result of the many complexities of different cars of special construction.

Prior to performing inspections of 49 CFR §231 for compliance, requirements should include a job briefing review. At that time, the MP&E inspector should proceed with appropriate caution when entering live or unsecured tracks i.e. insure that blue signal protection is in place, if needed.

There are very specific Railroad Safety Appliance Standards that apply to each type of rail car. All rail cars that are considered to be in revenue service unless on a shop track and repairs are being made to railroad safety appliance arrangements in which case, all repairs must be complete. At times, a carrier inspector may shop a car, and defects will be identified by the use of a Bad Order Tag with the appropriate information regarding the known defect and action to be taken.

Railroad Safety Appliance Standards for compliance must be met prior to car or train movement. After a mechanical inspection of the train has been performed, any Railroad Safety Appliance Standard that is non-compliant with 49 CFR §231 can be subject to violation of this part. MP&E inspector(s) should be governed by leniency and/or strictness when conducting investigations with regards to: history of compliance, commodities transported, train location, mechanical forces, and/or duty of the Carrier to make a proper repair for compliance. The existing conditions, which warrant removal of a rail car from service, vary greatly. Conditions are broad in regard to examination of Railroad Safety Appliance Standards, and can appear less than definitive. In such cases, this manual and direction of the Regional Supervisor, and/or the Headquarters MP&E Staff Director, should guide the MP&E inspectors' discretion, if necessary.

49 CFR §231 contains specific detailed dimensions, specifications and guide for each type rail car. Submission for new car designs will be received on a regular basis some are classified as " Cars of Special Construction", and are generally non-compliant with some Part of the Railroad Safety Appliances Standards in their design. These cars are then required to comply with the Railroad Safety Appliance Standards for the car type that it most closely resembles. When inspecting cars of special construction and relief of compliance is requested by the carrier, it may be necessary to contact the cars' manufacturer for proof of relief by specific mention of a letter from the Office of Safety Assurance and Compliance. This letter must indicate that waiver of relief was provided or no exceptions were taken to the specific deviation of the Railroad Safety Appliance Standard.

Note: Former TB *MP&E-98-36-* There have been recent exceptions taken by FRA's MP&E inspector's with **minimal deviations from the measurements** specified in the Railroad Safety Appliance Standards on cars that have been in service with these conditions for a long period of time without any known incident or casualty. Although these civil penalty citations are valid from a technical and legal point of view, from a common sense point of view the cars have operated safely for years, so these minimal deviations did not reduce safety.

MP&E inspector(s) tend to view railroad safety appliance standards as requiring the issuance of civil penalty citations if strict adherence to each number, dimension, location, and manner of application not maintained. The railroad operating environment has drastically changed: in so much as, crews are smaller, flat switching is rare and the number of run-through trains is much greater, all decreasing the use of Railroad Safety Appliances.

Most of the Railroad Safety Appliance Standards were developed nearly 100 years ago and cars were mostly of standard design. Today most cars are " Cars of Special Construction ", (see 49 CFR §231.18). The Railroad Safety Appliance Standards for such cars must be determined from the "nearest approximate type" of an identified standard car.

The Railroad Safety Appliance Standards cannot be applied to these cars without exercising good judgment. MP&E inspector(s) must exercise this judgment, not just take exceptions for minimal deviations. An exception should be taken when the condition of the Railroad Safety Appliance materially reduces safety. Exactly, what materially reduces safety is not always clear, it is a judgment call often dependant on the unique set of conditions covering the operations at that time. Guidance for Railroad Safety Appliance Standards are as follows: don't take exception to non-complying design feature of a type of car that has a long and continuous, safe service history. When a Railroad Safety Appliance moves easily to the touch (not secure), exception should be taken. If a significant force greater, which would be encountered in normal use or operation of the Railroad Safety Appliance, is required, exceptions should generally not be taken.

The enforcement of the Railroad Safety Appliance Standards needs to be determined by exercising good judgement, so that scarce FRA railroad resources are not consumed pursuing minor infractions that do not materially reduce safety.

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WAVIERS

When rolling stock is not in compliance as identified in the drawing plates in this chapter, a waiver request must be submitted to the FRA to grant revenue use of the equipment. Many possibilities may be used to determine if rolling stock will be allowed to continue in revenue service with a non-compliant condition. FRA potentially may use enforcement measures to gain compliance through regulatory measures or FRA may require the car owner or carrier to comply as determined by the FRA Safety Board through the "Request for Waiver" process. Special circumstances are required to apply for a wavier. Some examples are to "meet the needs of industry or customer use" and "new cars of special construction" that have no regulatory guidance as outlined in part §231". Each non-conforming safety appliance on a car that has been granted a waiver will have certain outlined requirements stipulated by the FRA Safety Board. Waivers may be permanent as a result of a known long duration of a non-compliant condition with no potential of ever compliant or a waiver may be granted within specified time constraints (usually five (5) years). The Car Owner or Carrier must seek the application for continuation of a waiver before expiration of a specified time waiver for continued use of the rolling stock. For specified time waiver cases that are close to expiration, continuation of the waiver will be reviewed for previous stipulations that were outlined for granting the original waiver and, to ensure, all those requirements were met. The Car Owner or Carrier must provide circumstances that may or may not have changed, and rational for continued use to the FRA Safety Board before granting or denial a continuation of a new waiver.

MP&E inspector(s) should look at the date(s) and condition(s) met when performing an inspection to determine if the Car Owner or Carrier meets the requirements for the granting the waiver. The requirements must be met before the car can be used in revenue service. In the event a waiver was not in conformity as outlined in the granting of the waiver, the MP&E inspector should take exception to all or any parts that were not met. MP&E inspector(s) should take specific notes, photographs and compile any related information of the non-compliant safety appliance or deviation and forward all the information to their Regional Supervisor or Headquarters MP&E Staff Director. In some cases, deviations on drawing plates on safety appliance arrangements that are considered out of the plate drawing or non-compliant with minor or minimal infractions are to be considered safe for use. If in doubt, the MP&E inspector should notify his/her Regional Supervisor or Headquarters MP&E Staff Director. The MP&E Headquarters Staff Director will determine if the infraction was noted and not taken exception on the sample car inspection and if request for waiver should be sought, if not in already in place. MP&E inspector(s) should be cautious in their approach and guidance for any waiver, and at times, should be coordinated with their Regional Supervisor or MP&E Headquarters Staff Director.

Authority and Basis for Regulation and Inspection

The authority to establish Railroad Safety Appliance Standards are contained in the Code of Federal Regulations 49 CFR §231, were first established under Public Law 89-670.
Public Law 89-670, approved October 1966 (49 U.S.C. 1651-9), established the United States Department of Transportation. Pursuant to that law, certain functions, powers, and duties of the Interstate Commerce Commission were transferred to and vested in the Secretary of Transportation, including the following laws relating generally to safety appliances and equipment on railroad engines and cars, and protection of employees and travelers:

(A) The Act of March 2, 1893, as amended, (27 Stat. 531; 45 U.S.C. 1 et seq.).
(B) The Act of March 2, 1903, as amended, (32 Stat. 943; 45 U.S.C. 8 et seq.).
(C) The Act of April 14, 1910, as amended, (35 Stat. 298; 45 U.S.C. 11 et seq.).
(D) The Act of July 5, 1994, as amended, (108 Stat. 864, Public Law 103-272, Chapter 203, Sec. 20301, Safety Appliances.

Public Law 89-670 (49 U.S.C. 1655 (f) (3) (a)) further provided that the Federal Railroad Administrator shall carry out the functions powers, and duties of the Secretary pertaining to railroad safety as set forth in the statues transferred to the Secretary.

Also included in this publication are Part §231, Railroad Safety Appliance Standards, and Part §232, Railroad Power Brakes and Drawbars.

These Parts are codified under title 49 of the Code of Federal Regulations.
Plates A through V are provided to show safety appliance arrangements. For specific details see appropriate text. The U.S. Safety Appliance Standards are administered by the Federal Railroad Administration, U.S. Department of Transportation, Washington, DC 20590.
Submission for sample Car inspection and/ or foe new car or series of cars are regularly requested and typically do not meet some of the requirements of 49 CFR 231. In those instances, cars are considered Cars of Special Construction (re) 49 CFR 231.18, and may remain in service.

Definitions or Clarifications

(Definitions or Clarification: as used in this Part- Definitions described in this manual are generalized; however, each definition, herein is specific to all Parts when applied.)

Adjustable Handhold Ladder Tread – Handhold Ladder Tread will be ¾- inch in diameter. The length may be adjusted as needed by application of a ¼ inch roll pin into desired hole. The remaining portion is to be cut off, leaving a smooth surface. If any deficiency is found concerning this safety appliance, such as substitution of roll pin, improper securement, etc. it should be reported to the Regional Supervisor or Headquarters MP&E Staff Director with all pertinent information, including photographs.

Aluminum Alloy Handholds – Handholds that have a circular cross-section, 13/16-inch diameter when constructed of 6061-T6 exceeds the current FRA requirements.

Bottom of Caboose cars with platforms – means the "bottom of side-sill or sheathing over side-sill."

Brake Shaft – Arrangements should have a square fit at its upper end to secure the handbrake wheel and be securely fastened with bolts or rivets. The lower end of brake shaft should be secured with a trunnion extending through brake shaft step and secured with a cotter or ring. The brake shaft drum will be the prescribed diameter. A key should secure the brake ratchet wheel or square fit and has the required number of teeth. There will be a rigid metal connection between the brake pawl and brakeshaft with the pivot pawl secured by a bolt or rivet. The brake wheel will be held in position on the brakeshaft by a nut on a threaded extended end, secured by a nut riveted over or by the use of a lock nut or cotter and will be arranged with a square fit for brake shaft taper as required.

Brake Step - Will be of required clear depth, running parallel to the car.

Brake Wheel – Must be constructed of malleable iron, wrought iron or steel and located where it can be safely operated while car is in motion.

Clearance - Two inches is required in all directions or 360 degrees around the handhold or ladder

Clear Depth - A vertical space, the width of, and above, the sill step material or strap, and the vertical space shall be clear and unobstructed for 8 inches with minimum clearance of 2 inches.

Corner of car - (Bottom of caboose cars with platforms) is used to mean the "line at inner edge of platform formed by the intersection of the side and end of car."

End Ladder Clearance - Except for buffer block, brake shaft, brake wheel, brake step, running board or uncoupling lever should extend within 12" of the end of the car. No part of the car above the end sills should be within 30" from the side of the car.

FRA Approved Fasteners - Where rivets or bolts are required in this part §231 a two-piece steel rivet maybe used consisting of:
(a) A solid shank of one-half (1/2) inch minimum diameter steel or material of equal or greater strength having cold forged head on one end, a shank length for material thickness fastened, locking grooves, breakneck groove and pull grooves (all annular grooves) on the opposite end.
(b) A collar of similar material, which is cold, swaged into the locking grooves, for the opposite end of item (a) after the pull groove section has been removed.

Note: Former TB *MP&E-98-14* The Railroad Safety Appliance Standards, 49 CFR §231, requires that Railroad Safety Appliances and their brackets be secured by ½ inch bolts with nuts outside (when possible) and riveted over, or with not less than ½ inch rivets. There must be a deformation of the threads of the fastener from becoming insecure. This can be accomplished by one of the following methods; rivet the fastener, chisel to a 1-inch depth at the threaded portion of the bolt nearest the fastener or apply weld to the threads. Additional approved securement methods are: 1 and 2 piece rivets, bolts, huck bolts, and unilock and disc-lock fasteners when properly applied.

Hand Brake – The Hand Brake shall operate in harmony with the power brake installed on the car. Each such handbrake shall provide the same degree of safety as the design shown on plate A. The minimum-braking ratio of 11% at the brake shoes with a specific force output at the handbrake (equivalent to 125 pounds on the rim of the wheel). The handbrake force must act on one-half of the axles including the "B" end truck as outlined by AAR.

Handholds/Grab Irons – Must have proper diameter and are secure with FRA approved fasteners in the required manner. There must be a minimum clear useable length with proper clearance.

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Handhold Securely Fastened – Means free from danger or risk of loss; free from fear or doubt; and not likely to give way. All safety appliances, supports and brackets must be mechanically fastened to car structure other than a tank car tank supports and brackets only. Safety appliances and their brackets be secured by ½ inch bolts with nuts outside (when possible) and riveted over, or with not less than ½ inch rivets.

There must be a deformation of threads to prevent fastener from becoming insecure.

This can be accomplished by riveting the fastener, check the threaded portion of the bolt nearest the fastener with a chisel to inch depth at the two locations or applying weld to the threaded portion of the threads. Additional approved fasteners are one and two piece rivets, bolts, Huck bolts, and Unilock and Disc-lock fasteners when properly applied. See FRA approved fasteners.

Horizontal End Handholds – The prescribed distance above centerline and one near each end of rail car, and securely fastened with nuts and bolts and riveted over.

Ladders – Will be minimum clear length of tread, proper placement on side and end of car. Top ladders must be located the required space from the roofs at eaves. When rail car construction prohibits required application of tread location of the first tread, requirements will be applied to the second tread from the side of the ladder. The location should be measured from the inside edge of the ladder stile. Foot guards or upward projections are required on metal ladders. At no time should any part of a rail car above end sills or fixtures exceed required placement. The Radial door and its application to auto rack cars have the following FRA requirements due to variations of misalignment of 5 to 13 inches that have been adapted:

Standard Level Cars- Relationship of Sill Step to Side Ladder

All Cars- 2- 3/16 inch maximum

Low Level Cars:

Built 1978 & prior- 5 inch maximum

Built after 1978- 4 inch maximum

Locomotive Switching Safety Tread Surface - means that portion of anti-skid surface of a switching step that actually is contacted by a shoe or boot.

Locomotive Switching Uncoupling Mechanism - means the arrangement for operating the coupler lock lift, including the uncoupling lever and all other appurtenances that facilitate operation of the coupler.

Minimum Braking Ratio – The Association of American Railroads (AAR) is specific in their requirements that the minimum braking ratio of 11% at the brake shoes with a specific force output at the handbrake (equivalent to 125 pounds on the rim of the wheel).

Minimum Clearance – Two inches in all directions or 360 degrees around the handhold or ladder, on tank car vertical, locomotive 2 ½" and caboose 4".

Roof Handholds – One roof handhold over each ladder, one right–angled handhold may take the place of two adjacent roof handholds provided it has the required location, specifications and will be secured with nuts and bolts and riveted over.

They should be located on the roof of rail car; except on refrigerator rail cars, which can be, mounted closer to the end of the roof, securely fastened with nuts and bolts, and riveted. Treads of circular cross-section, 13/16 inch diameter when constructed of 6061-T6 aluminum alloy, exceed the current FRA requirements.

Running Board – One longitudinal running board, with two latitudinal extensions on outside metal roof cars, (may be made of wood) and will run the full length of the car, located at the center of the roof, be continuous from end to end except when numerous pieces are securely joined.

Running Board Extensions on Covered Hopper Cars - Running board end extension is not required if the end of the longitudinal running board is at least 6 inches from the vertical plane and the longitudinal running board extends at least the entire length of the roof. In other words, if the longitudinal roof running board does not extend at least the entire length of the roof, a running board extension is required.

Side Handholds – Must have proper diameter and are secured with appropriate fasteners in the required manner. There must be a minimum clear useable length of 16 inches with proper clearance.

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Sill Steps – located on each end of the car. Not more than 22 inches above the rail with not more than 18 inches from the end of the car to the center of the sill step and outside edge is not to exceed 4 inches with clear depth. Sill Steps, 5/8- inch thick and 2 inches wide when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements. Radial door and its application to auto rack cars have the following requirements due to variations of misalignment of 5 to 13 inches have been adapted:
Standard Level Cars- Relationship of Sill Step to Side Ladder
All Cars- 2- 3/16 inch maximum
Low Level Cars:
Built 1978 & prior- 5 inch maximum
Built after 1978- 4 inch maximum

Uncoupling Levers – Requires two single or double uncoupling levers of any efficient design allowing for free travel of lever that are located one on each end of rail car. When single levers are used, they will be located on the left side of the end of the rail car. All uncoupler handles and center lift arms will meet prescribed requirements. Uncoupling lever handles should be have a suitable stop. Uncoupler handle will be within 6 inches from the car. The center of the eye at the end of the center lift arm is not to exceed 3.5 inches of the eye of the uncoupling pin when horn of coupler is against the buffer block of the end sill. Proper clearance of 2 inches is required around the handle. On bottom operated uncoupling levers more than 6 inches from the side of the car as shown in Plate "B".
The handles of uncoupling levers should not be more than 6 inches from the car, also shown are the uncoupler handles shall be not more than 12 inches, preferably 9 inches from the side of car. Center lift arms shall not be less than 7 inches long. The top and bottom uncoupling levers are fundamentally the same and operated in the same manner by an upward lift of the uncoupler handle. Uncoupler levers other than Plate "B" design requires that the uncoupler lever handle not be more than 6 inches from the side of the car. This type of uncoupler lever could be operated from the side ladder while the car is in motion. No exception to bottom operated uncoupler levers that are similar in design to that shown in Plate "B", unless the uncoupler lever handle is more than 12 inches from the side of the car, as requires by AAR rule 22.

Vertical End Handholds – End handholds, one located on each end of rail car opposite ladder and securely fastened with nuts and bolts riveted over.

Application of Regulation and Inspection

231.0 Applicability and penalties.

(a) Except as provided in paragraphs (b) and (c) of this section, this part applies to all standard gage railroads.
(b) This part does not apply to:
(1) A railroad that operates only on track inside an installation which is not part of the general railroad system of transportation; or
(2) Rapid transit operations in an urban area that are not connected with the general railroad system of transportation.
(c) Except for the provisions governing uncoupling devices, this part does not apply to Tier II passenger equipment as defined in §238.5 of this chapter (*i.e.,* passenger equipment operating at speeds exceeding 125 mph but not exceeding 150 mph).
(d) As used in this part, *carrier* means "railroad," as that term is defined below.
(e) *Railroad* means all forms of non-highway ground transportation that run on rails or electromagnetic guideways, including (1) commuter or other short-haul rail passenger service in a metropolitan or suburban area, and (2) high speed ground transportation systems that connect metropolitan areas, without regard to whether they use new technologies not associated with traditional railroads. Such term does not include rapid transit operations within an urban area that are not connected to the general railroad system of transportation.
(f) 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 A to this part for a statement of agency civil penalty policy.

[54 FR 33229, Aug. 14, 1989, as amended at 63 FR 11623, Mar. 10, 1998; 64 FR 25660, May **12, 1999],** **Link to an amendment published at 66 FR 4192, Jan. 17, 2001.**
This amendment was delayed until May 31, 2001, at 66 FR 9906, Feb. 12, 2001.

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Part 231.0 Application and Guidance

This part applies to railroads that operate rolling equipment on standard gauge track that is part of the general railroad system of transportation. It does not apply to a railroad that operates only on a track inside an installation which is not part of the general railroad system of transportation, or a railroad that operates only on a track used exclusively for rapid transit, commuter, or other short haul passenger service in a metropolitan or suburban area. At a minimum, a railroad that participates in interchange with another railroad is considered to be a part of the general railroad system of transportation for purposes of this part.

Provisions in this Part apply to all uncoupling devices except those on Tier II passenger equipment.

This part applies to any person or entity of any type as described in (f), which violates any requirement of this part or causes the violation of any such requirement. Any person who knowingly and willfully commits a violation, or a pattern of repeated violations are grossly negligent and and/or caused injury or death are subject to assessment of additional civil penalties. Each day of violation constitutes a separate offence. Reference schedule of civil penalties to this part 11-135 for a statement of agency penalty policy and when violations are subject to a civil penalty of at least $500 and not more than $11,000 per violation 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 A to this part for a statement of agency civil penalty policy.

§231.1 Box and other house cars built or placed in service before October 1, 1966.

Except for box and other house cars that comply with either §231.27 or §231.28, each box and other house car shall be equipped to meet the following specifications:

(a) *Handbrake* – (1) *Number.* One efficient handbrake which shall operate in harmony with the power brake installed on the car. Each such handbrake shall (i) provide the same degree of safety as the design shown on plate A, or (ii) provide the same degree of safety as that specified in §231.27.

(2) *Dimensions.* (i) The brake shaft shall be not less than 1 1/4 inches in diameter, of wrought iron or steel without weld.

(ii) The brake wheel may be flat or dished, not less than 15, preferably 16, inches in diameter, of malleable iron, wrought iron, or steel.

(3) *Location.* (i) The hand brake shall be so located that it can be safely operated while car is in motion.

(ii) The brake shaft shall be located on end of car, to the left of and not less than 17 nor more than 22 inches from center.

(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.

(iv) Carriers are not required to change the location of brake wheels and brake shafts on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.

(4) *Manner of application.* (i) There shall be not less than 4 inches clearance around rim of brake wheel.

(ii) Outside edge of brake wheel shall be not less than 4 inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill.

(iii) Top brake-shaft support shall be fastened with not less than 1/2-inch bolts or rivets. (See plate A.)

(iv) A brake-shaft step shall support the lower end of brake shaft. A brake-shaft step which will permit the brake chain to drop under the brake shaft shall not be used. U-shaped form of brakeshaft step is preferred. (See plate A.)

(v) Brake shaft shall be arranged with a square fit at its upper end to secure the hand-brake wheel; said square fit shall be not less than seven-eighths of an inch square. Square-fit taper, nominally 2 in 12 inches. (See plate A.)

(vi) Brake chain shall be of not less than 3/8-, preferably 7/16-, inch wrought iron or steel, with a link on the brakerod end of not less than 7/16-, preferably 1/2-, inch wrought iron or steel, and shall be secured to brake-shaft drum by not less than 1/2-inch hexagon or square-headed bolt. Nut on said bolt shall be secured by riveting end of bolt over nut. (See plate A.)

(vii) Lower end of brake shaft shall be provided with a trunnion of not less than 3/4-, preferably 1, inch in diameter extending through brake-shaft step and held in operating position by a suitable cotter or ring. (See plate A.)

(viii) Brake-shaft drum shall be not less than 1 1/2 inches in diameter. (See plate A.)
(ix) Brake ratchet wheel shall be secured to brake shaft by a key or square fit; said square fit shall be not less than 1 5/16 inches square. When ratchet wheel with square fit is used, provision shall be made to prevent ratchet wheel from rising on shaft to disengage brake pawl. (See plate A.)
(x) Brake ratchet wheel shall be not less than 5 1/4, preferably 5 1/2, inches in diameter and shall have not less than 14, preferably 16, teeth. (See plate A.)
(xi) If brake ratchet wheel is more than 36 inches from brake wheel, a brake-shaft support shall be provided to support this extended upper portion of brake shaft; said brake-shaft support shall be fastened with not less than 1/2-inch bolts or rivets.
(xii) The brake pawl shall be pivoted upon a bolt or rivet not less than five-eighths of an inch in diameter, or upon a trunnion secured by not less than 1/2-inch bolt or rivet, and there shall be a rigid metal connection between brake shaft and pivot of pawl.
(xiii) Brake wheel shall be held in position on brake shaft by a nut on a threaded extended end of brake shaft; said threaded portion shall be not less than three-fourths of an inch in diameter; said nut shall be secured by riveting over or by the use of a lock nut or suitable cotter.
(xiv) Brake wheel shall be arranged with a square fit for brake shaft in hub of said wheel; taper of said fit, nominally 2 in 12 inches. (See plate A.)
(b) *Brake step.* If brake step is used, it shall be not less than 28 inches in length. Outside edge shall be not less than 8 inches from face of car and not less than 4 inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill.
(1) *Manner of application.* Brake step shall be supported by not less than two metal braces having a minimum cross-sectional area 3/8 by 1 1/2 inches or equivalent, which shall be securely fastened to body of car with not less than 1/2-inch bolts or rivets.
© *Running boards* – (1) *Number.* One longitudinal running board. On outside-metal-roof cars two latitudinal extensions.
(2) *Dimensions.* Longitudinal running board shall be not less than 18 and preferably 20 inches in width. Latitudinal extensions shall be not less than 24 inches in width. Wooden running boards or extensions hereafter installed shall be constructed of wood not less than 1 1/8 inches in thickness.
(3) *Location.* Full length of car, center of roof. On outside-metal-roof cars there shall be two latitudinal extensions from longitudinal running board to ladder locations, except on refrigerator cars where such latitudinal extensions cannot be applied on account of ice hatches.
(4) *Manner of application.* (i) Running board shall be continuous from end to end and not cut or hinged at any point: *Provided,* That the length and width of running board may be made up of a number of pieces securely fastened to saddle-blocks with screws, bolts, or rivets.
(ii) The ends of longitudinal running board shall be not less than 6 nor more than 10 inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler-horn against the buffer-block or endsill; and if more than 4 inches from edge of roof of car, shall be securely supported their full width by substantial metal braces.

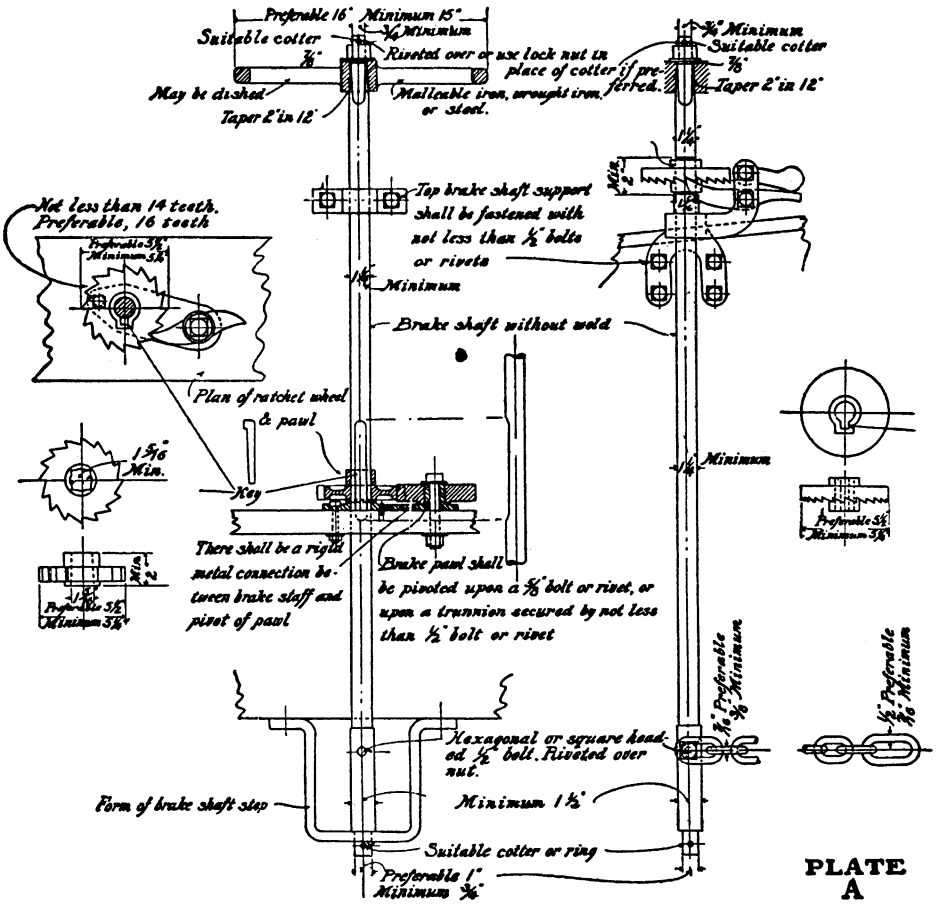
(iii) Running board shall be securely fastened to car and be made of wood or of material which provides the same as or a greater degree of safety than wood of 1 1/8 inches thickness. When made of material other than wood the tread surface shall be of anti-skid design and constructed with sufficient open space to permit the elimination of snow and ice from the tread surface.
(d) *Sill steps* – (1) *Number.* Four.
(2) *Dimensions.* Minimum cross-sectional area 1/2 by 1 1/2 inches, or equivalent, of wrought iron or steel. Minimum length of tread, 10, preferably 12, inches. Minimum clear depth, 8 inches.
(3) *Location.* (i) One near each end of each side of car, so that there shall be not more than 18 inches from end of car to center of tread of sill step.
(ii) Outside edge of tread of step shall be not more than 4 inches inside of face of side of car, preferably flush with side of car.
(iii) Tread shall be not more than 24, preferably not more than 22, inches above the top of rail.
(iv) Carriers are not required to change location of sill steps on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* (i) Sill steps exceeding 21 inches in depth shall have an additional tread.
(ii) Sill steps shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets.
(e) *Ladders* – (1) *Number.* Four.
(2) *Dimensions.* (i) Minimum clear length of tread: Side ladders 16 inches; end ladders 14 inches. Maximum spacing between ladder treads, 19 inches.
(ii) Top ladder tread shall be located not less than 12 nor more than 18 inches from roof at eaves.
(iii) Spacing of side ladder treads shall be uniform within a limit of 2 inches from top ladder tread to bottom tread of ladder.
(iv) Maximum distance from bottom tread of side ladder to top tread of sill step, 21 inches.
(v) End ladder treads shall be spaced to coincide with treads of side ladders, a variation of 2 inches being allowed. Where construction of car will not permit the application of a tread of end ladder to coincide with bottom tread of side ladder, the bottom tread of end ladder must coincide with second tread from bottom of side ladder.
(vi) Hardwood treads, minimum dimensions 1 1/2 by 2 inches.
(vii) Iron or steel treads, minimum diameter five-eighths of an inch.
(viii) Minimum clearance of treads, 2, preferably 2 1/2 inches.
(3) *Location.* (i) One on each side, not more than 8 inches from right end of car; one on each end, not more than 8 inches from left side of car; measured from inside edge of ladder stile or clearance of ladder treads to corner of car.
(ii) Carriers are not required to change the location of ladders on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(iii) Carriers are not required to change the end ladders on steel or steel underframe cars with platform end sill, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.

(4) *Manner of application.* (i) Metal ladders without stiles near corners of cars shall have foot guards or upward projections not less than 2 inches in height near inside end of bottom treads.
(ii) Stiles of ladders, projecting 2 or more inches from face of car, will serve as foot guards.
(iii) Ladders shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets. Three-eighths-inch bolts may be used for wooden treads which are gained into stiles.
(f) *End ladder clearance.* (1) No part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake wheel, brake step, running board or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same above end sills, other than exceptions herein noted, shall extend beyond the outer face of buffer block.
(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance, within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.
(g) *Roof handholds* – (1) *Number.* (i) One over each ladder.
(ii) One right-angle handhold may take the place of two adjacent specified roof handholds, provided the dimensions and locations coincide, and that an extra leg is securely fastened to car at point of angle.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 16 inches. Minimum clearance, 2, preferably 2 1/2 inches.
(3) *Location.* (i) On roof of car, one parallel to treads of each ladder, not less than 8 nor more than 15 inches from edge of roof, except on refrigerator cars where ice hatches prevent, when location may be nearer edge of roof.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handhold under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Roof handholds shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets.
(h) *Side handholds* – (1) *Number.* Four. (Tread of side ladder is a side handhold.)
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 16 inches, preferably 24 inches. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* (i) Horizontal, one near each end on each side of car. Side handholds shall be not less than 24 nor more than 30 inches above center line of coupler, except as provided above, where tread of ladder is a handhold. Clearance of outer end of handhold shall be not more than 8 inches from end of car.
(ii) Carriers are not required to change the location of handholds, on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.

(4) *Manner of application.* Side handholds shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets.
(i) *Horizontal end handholds* – (1) *Number.* Eight or more, four on each end of car. (Tread of end ladder is an end handhold.)
(2) *Dimensions.* (i) Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 16 inches, preferably 24 inches.
(ii) A handhold 14 inches in length may be used where it is impossible to use one 16 inches in length.
(iii) Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* (i) One near each side on each end of car, not less than 24 nor more than 30 inches above center line of coupler, except as provided above, when tread of end ladder is an end handhold. Clearance of outer end of handhold shall be not more than 8 inches from side of car.
(ii) One near each side of each end of car on face of end sill or sheathing over end sill, projecting outward or downward. Clearance of outer end of handhold shall be not more than 16 inches from side of car.
(iii) On each end of cars with platform end sills 6 or more inches in width, measured from end post or siding and extending entirely across end of car, there shall be one additional end handhold not less than 24 inches in length, located near center of car, not less than 30 nor more than 60 inches above platform end sill.
(iv) Carriers are not required to change the location of handholds, on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Horizontal end handholds shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets.
(j) *Vertical end handholds* – (1) *Number.* Two on full-width platform end-sill cars, as heretofore described.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 18, preferably 24, inches. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* (i) One on each end of car opposite ladder, not more than 8 inches from side of car; clearance of bottom end of handhold shall be not less than 24 nor more than 30 inches above center line of coupler.
(ii) Carriers are not required to change the location of handholds, on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Vertical end handholds shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets.
(k) *Uncoupling levers* – (1) *Number.* Two. Uncoupling levers may be either single or double, and of any efficient design.

(2) *Dimensions.* (i) Handles of uncoupling levers, except those shown on plate B or of similar designs, shall be not more than 6 inches from sides of car.
(ii) Uncoupling levers of design shown on plate B and of similar designs shall conform to the following prescribed limits:
(iii) Handles shall be not more than 12, preferably 9, inches from sides of cars. Center lift arms shall be not less than 7 inches long.
(iv) Center of eye at end of center lift arm shall be not more than 3 1/2 inches beyond center of eye of uncoupling pin of coupler when horn of coupler is against the buffer block or end sill. (See plate B.)
(v) Ends of handles shall extend not less than 4 inches below bottom of end sill or shall be so constructed as to give a minimum clearance of 2 inches around handle. Minimum drop of handles shall be 12 inches; maximum, 15 inches over all. (See plate B.)
(vi) Handles of uncoupling levers of the "rocking" or "push-down" type shall be not less than 18 inches from top of rail when lock block has released knuckle, and a suitable stop shall be provided to prevent inside arm from flying up in case of breakage.
(3) *Location.* One on each end of car. When single lever is used, it shall be placed on left side of end of car. (Secs. 2, 4, and 6, 27 Stat. 531, as amended; secs, 1 and 3, 32 Stat. 943, as amended; sec. 6(e) and (f), 80 Stat. 939 (45 U.S.C. 2, 4, 6, 8, and 10, 11-16 and 49 U.S.C. 103(c)(1))

[33 FR 19663, Dec. 25, 1968, as amended at 49 FR 26745, June 29, 1984]



[*Any efficient arrangement of ratchet-wheel and pawl may be used.*]

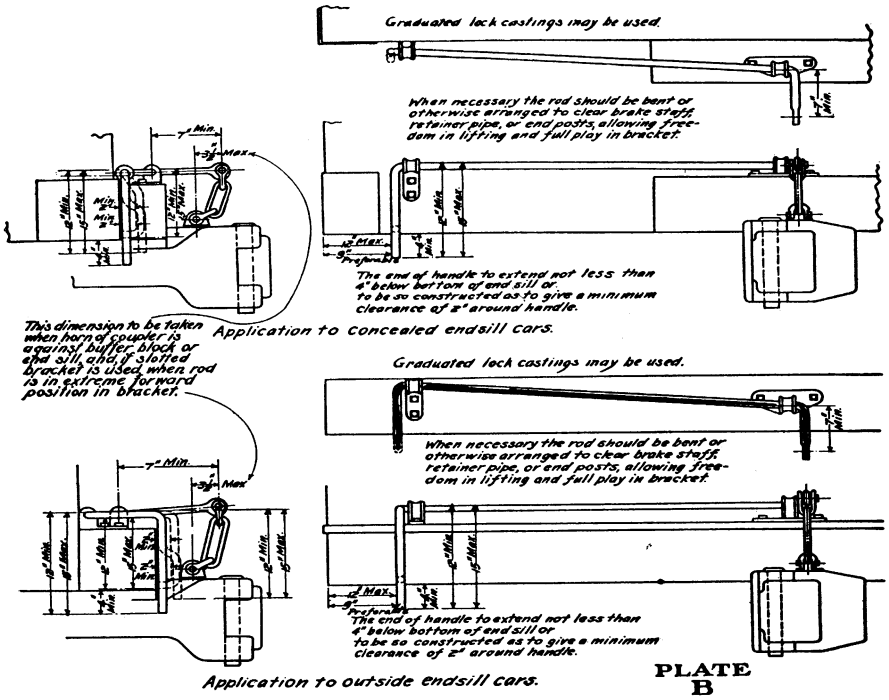

Graduated lock castings may be used.
When necessary the rod should be bent or otherwise arranged to clear brake staff, retainer pipe, or end posts, allowing freedom in lifting and full play in bracket.
The end of handle to extend not less than 4" below bottom of end sill or, to be so constructed as to give a minimum clearance of 2" around handle.
This dimension to be taken when horn of coupler is against buffer block or end sill, also if slotted bracket is used, when rod is in extreme forward position in bracket.
Application to concealed endsill cars.
Graduated lock castings may be used.
When necessary the rod should be bent or otherwise arranged to clear brake staff, retainer pipe, or end posts, allowing freedom in lifting and full play in bracket.
The end of handle to extend not less than 4" below bottom of end sill or to be so constructed as to give a minimum clearance of 2" around handle.
Application to outside endsill cars.

PLATE B

§231.1 Application and Guidance

(a) Handbrakes: One effective handbrake is required that meets 49 CFR §231 standards and provides the same degree of safety as shown in the design plate A, and/or as specified in §231.27. The brake wheel must be constructed of malleable iron, wrought iron or steel and located where it can safely be operated while car is in motion. The brake shaft step will support the lower end of brake shaft and a brake shaft step that permits the brake chain to drop under the brake shaft will not be used, use of a U-shaped form of brake shaft step is preferred. The brake shaft arrangement should have a square fit at its upper end to secure the handbrake wheel and be fastened with FRA approved fasteners. The lower end of brake shaft should be secured with a trunnion extending through brake shaft step and secured with cotter or ring. The brake shaft drum will be prescribed diameter. A key should secure the brake ratchet wheel or square fit and has the required number of teeth. There will be a rigid metal connection between the brake pawl and brakeshaft with the pivot pawl secured by a bolt or rivet. The brake wheel will be held in position on the brakeshaft by a nut on a threaded extended end, secured by a nut riveted over or by the use of a lock nut or cotter and will be arranged with a square fit for brake shaft taper as required. When performing a car inspection focus attention to unattached, broken or unsecured and/or improperly attached chains. The brake wheel may be bent or the wrong diameter and appear to be attached properly. Inspect for loose or worn movable components throughout the arrangement.

Note: Former TB *MP&E-98-26-* The Association Of American Railroads (AAR) is specific in their requirements that the minimum braking ratio of 11% at the brake shoes with a specific force output at the handbrake (equivalent to 125 pounds on the rim of the wheel). The handbrake force must act on one-half of the axles including the "B" end truck, If not, a second handbrake must be applied with the appropriate stenciling at each handbrake location. On some Articulated Cars it is not feasible to apply the handbrake force to half the axles with one handbrake, and a second handbrake has been applied at the opposite end ("A " end) of car. The FRA takes no exception to this practice if these following conditions are met: Stencils must be placed adjacent to each handbrake indicating that the car is equipped with two handbrakes and the handbrake force should comply with AAR Standards.

Note: Former TB *MP&E-98-35-* Multi-Unit Articulated Flat Cars- TTAX 5 unit all purpose Spine Cars are equipped with handbrakes which face outward at each end of the five unit consist. The handbrake arrangement is designed so that it can be operated while standing on the sill step or from the ground. When a 48-foot container is placed on the "A" end unit, the crossover platform is partially covered by the container and has only 10 inches exposed. The "crossover" platforms on these TTAX cars and/or platform extensions on other multi- unit articulated "flat cars" are not a requirement of the current safety appliance standards.

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The FRA will not take exception to these TTAX 5 units All-Purpose Spine Cars when loaded on the "A" and "B" units with 48-foot containers that partially cover the end "crossover" platforms. The FRA requires that all safety appliances, brackets or supports be mechanically fastened to the car structure.

(b) *Brake Steps*: When a brake step is used, it will be of required clear depth, running parallel to the car. The brake step will be supported by not less than two metal braces, 3/8" X 1 1/2 " and riveted or bolted to the car securely. Dry rotted, splintered, rusted, loose and/or damaged brake steps which compromise user safety will not be permitted. Examination for elongated holes in nut/bolt areas, twisted metal, obstructed brake steps and brake steps not secured horizontally to the rail. The brake step support may be broken or improperly secured.

(c) *Running Boards*: One longitudinal running board, with two latitudinal extensions on outside metal roof cars is required. Wooden running boards and/or extensions should monitored for indications of safety compromising deterioration and all means of securement should not be loose or broken. Running Boards will run the full length of the car, located at the center of the roof, be continuous from end to end except when numerous pieces are securely joined. Running Boards must be appropriately fastened to saddle blocks with screws, bolts or rivets in a manner, which provides the same or greater degree of safety. The two required latitudinal extensions will run from longitudinal running boards to ladder locations, refrigerator cars are excepted. At no time will inspection of tops of this type of rail car be performed in electrified territories. Most Carriers will not require mechanical forces to inspect top running boards and frequently are loose. Then Carrier inspector will determine if repairs can be made in a car repair shop and in most cases, rip tracks are excluded an unacceptable area for repairs of this type.

(d) *Sill Steps*: Inspection of sill steps should ensure that four sill steps are located on each end of the car not more than 22 inches above the rail with not more than 18 inches from the end of the car to the center of the sill step. When in doubt of the outside edge of the side step, the use of a ruler, plumb bob, or an equivalent means of measurement to determine distance from the side of the car to the edge of the sill step, which is not to exceed 4 inches. Sill steps exceeding requirements must have an additional tread. When physically inspecting sill steps, grab each step to insure proper and tight securement. Check for obstruction of steps such as air hoses etc., preventing a foothold within the clear depth. Sill steps on cars in service July 11, 1911, are not required to change location of appliances, but must be within 3 inches of the required location. When these cars undergo repairs they must be made compliant with 49 CFR part §231.1(d) at that time.

Note: Former TB *MP&E-98-5-* Since the origination of the radial door and its application to auto rack cars, many clearance problems have developed. The vertical relationship of side ladders and sill steps has been altered in such a manner that there are variations of misalignment of 5 to 13 inches. The following dimensions will be adapted:
Standard Level Cars- Relationship of Sill Step to Side Ladder
All Cars- 2- 3/16 inch maximum
Low Level Cars:
Built 1978 & prior- 5 inch maximum
Built after 1978- 4 inch maximum
Note: Former TB *MP&E-98-13-* The minimum standard for clear depth is 8 inches, minimum clearance is 2 inches.
Note: Former TB *MP&E-98-18-* Sill Steps, 5/8- inch thick and 2 inches wide when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements.

(e*) Ladders*: There will be four, with minimum clear length of tread, proper required placement of side and end ladders. Top ladders should be specifically located the required space from the roofs at eaves. When rail car construction prohibits required application of tread location of the first tread, requirements will be applied to the second tread from the side of the ladder. Ladder location should be measured from the inside edge of the ladder stile. Foot guards or upward projections are required on metal ladders. At no time should any part of a rail car above end sills or fixtures exceed required placement. Examine ladders for damage, proper clearance, and bracket location and securement. Vertical supports for treads should be straight with minimal variation or bends. Each rung should be visually inspected. Those that appear damaged or loose should require physical examination.

Note: Former TB *MP&E-98-5-* Since the origination of the radial door and its application to auto rack cars, many clearance problems have developed. The vertical relationship of side ladders and sill steps has been altered in such a manner that there are variations of misalignment of 5 to 13 inches. The following dimensions will be adapted:
Standard Level Cars- Relationship of Sill Step to Side Ladder
All Cars- 2- 3/16 inch maximum
Low Level Cars:
Built 1978 & prior- 5 inch maximum
Built after 1978- 4 inch maximum

Note: Former TB *MP&E-98-18-* Ladder treads of circular cross-section, 13/16- inch diameter when constructed of 6061-T6 aluminum alloy, exceeds the current FRA requirements.

(f) *End Ladder Clearance*: Except for buffer block, brakseshaft, brake wheel, brake step, running board or uncoupling lever should extend within 12" of the end of the car. No part of the car above the end sills should be within 30" from the side of the car except buffer block, brake shaft, brake wheel, brake step, running board or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill.

(g) *Roof Handholds*: There will be one roof handhold over each ladder, one right–angled handhold may take the place of two adjacent roof handholds provided it has the required location and specifications and will be secured with nuts, bolts and riveted over. They should be located on the roof of rail car; except on refrigerator rail cars, which can be, mounted closer to the end of the roof, and securely fastened with nuts, bolts, and riveted. Physically inspect roof handholds not in plain view. All inspected roof handholds warrant further physical examination to determine proper securement as per requirements.

Note: Former TB *MP&E-98-18*- Handholds of circular cross-section, 13/16- inch diameter when constructed of 6061-T6-aluminum alloy exceed the current FRA requirements.
(h) *Side Hand Holds*: Inspect car for 4 side handholds that are the proper diameter and are secure with appropriate fasteners in the required manner. There must be a minimum clear useable length of 16 inches with proper clearance.

Note: Former TB *MP&E-98-18-* Handholds of circular cross-section, 13/16- inch diameter when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements.

(I)*Horizontal End Handholds*: There will be eight or more horizontal end handholds with at least four located on each end of the rail car and the prescribed distance above center line and one near each end of rail car, and securely fastened with nuts, bolts and riveted over.

Note: Former TB *MP&E-98-18-* Handholds of circular cross-section, 13/16- inch diameter when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements.

(j) *Vertical End Handholds*: Two vertical end handholds, one located on each end of rail car opposite ladder and securely fastened with nuts, bolts riveted over.

Note: Former TB *MP&E-98-18-* Handholds of circular cross-section, 13/16- inch diameter when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements.

(k) *Uncoupling levers:* Two single or double uncoupling levers of any efficient design which allow for free travel of lever will be located one on each end of rail car, when single levers are used they will be located on the left side of the end of the rail car.

At no time will uncoupling levers be inspected between cars. Handles and center lift arms will meet prescribed requirements. Uncoupling lever handles should be constructed with a suitable stop to prevent inside arm from flying up if breakage occurs. Examine Plate " B '', ensure that there is no binding of movement by slightly raising the lever of the uncoupling handle.

If uncoupling lever is of the telescope design, ensure that side supports and stops are not damaged. Inspect uncoupler handle for bends not within 6 inches from the car. The center of the eye at the end of the center lift arm is not to exceed 3.5 inches of the eye of the uncoupling pin when horn of coupler is against the buffer block of the end sill. Inspect for proper clearance of 2 inches around the handle.

Note: Former TB *MP&E-98-49-* Exceptions have been taken to the handles of the bottom operated uncoupling levers more than 6 inches from the side of the car as shown in Plate "B". The handles of uncoupling levers should not be more than 6 inches from the car, also shown are the uncoupler handles shall be not more than 12 inches, preferably 9 inches from the side of car. Center lift arms shall not be less than 7 inches long. The top and bottom uncoupling levers are fundamentally the same and operated in the same manner by an upward lift of the uncoupler handle.

Uncoupler levers other than Plate "B" design requires that the uncoupler lever handle not be more than 6 inches from the side of the car. This type of uncoupler lever could be operated from the side ladder while the car is in motion. No exception to bottom operated uncoupler levers that are similar in design to that shown in Plate "B", unless the uncoupler lever handle is more than 12 inches from the side of the car, as requires by AAR rule 22.

General Note: Former TB *MP&E-98-7-* There are two textual errors in the September 1977 reprint of the Railroad Safety Appliances and Power Brake Requirements (orange) Booklet. On page 9, lines 12 through 23 should read as follows: After December 31, 1976, cars of this type built on or before April 1, 1966 or under construction to the date and placed in service before October 1, 1966 must be equipped as nearly as possible with the same compliment of safety appliances, depending on type, as specified in part §231.27 for box and other house cars without roof hatches, or in Part §231.28 for box and other house cars with roof hatches. Cars built after April 1, 1966 or under construction prior there to, and placed in service after October 1, 1966, must be equipped, depending on type as specified in part §231.27 for box and other house cars without roof hatches or, in part §231.28 for box and other house cars with roof hatches. There is an omission of two lines after line 12, page 64, in Part 231.30(a) The two omitted lines should read as follows: … 1977, seventy percent (70) by October 1, 1978 and all such locomotives by October 1, 1979.

General Note: Former TB *MP&E-98-13-* Clearance of 2 inches is required in all directions or 360 degrees around the handhold or ladder

General Note: Former TB *MP&E-98-14-* Part 231 is explicit in requiring that handholds be securely fastened. Secure means, free from danger or risk of loss; free from fear or doubt; and not likely to give way. All safety appliances, supports and brackets must be mechanically fastened to car structure (other than a tank car tank). Safety appliances and their brackets be secured by ½ inch bolts with nuts outside (when possible) and riveted over, or with not less than ½ inch rivets. There must be a deformation of threads to prevent fastener from becoming insecure. This can be accomplished by: riveting the fastener, check the threaded portion of the bolt nearest the fastener with a chisel to inch depth at the two locations or applying weld to the threaded portion of the threads. Additional approved securements are: one and two piece rivets, bolts, Huck bolts, and Unilock and Disclock fasteners when properly applied

General Note: Former TB *MP&E-98-22-* The adjustable handhold ladder tread is ¾- inch in diameter. Its length may be adjusted as needed by application of a ¼ inch roll pin into desired hole. The remaining portion is to be cut off, leaving a smooth surface. If any deficiency is found concerning this safety appliance, such as substitution of roll pin, improper securement, etc. it should be reported to the regional MP&E Specialist with all pertinent information, including photographs.

§231.2 Hopper cars and high-side gondolas with fixed ends.

(Cars with sides more than 36 inches above the floor are high-side cars.)
(a) *Hand brakes* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1).
(2) *Dimensions* Same as specified for "Box and other house cars" (see §231.1(a)(2).
(3) *Location* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft shall be located on end of car to the left of, and not more than 22 inches from, center.
(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(iv) Carriers are not required to change the location of brake wheels and brake shafts on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Brake step.* Same as specified for "Box and other house cars" (see §231.1 (b)).
(c) *Sill steps.* Same as specified for "Box and other house cars" (see §231.1(d)).

(d) *Ladders* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(e)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(e)(2)), except that top ladder tread shall be located not more than 4 inches from top of car.
(3) *Location.* Same as specified for "Box and other house cars" (see §231.1(e)(3)).
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(e)(4)).
(e) *Side handholds.* Same as specified for "Box and other house cars" (see §231.1(h)).
(f) *Horizontal end handholds.* Same as specified for "Box and other house cars" (see §231.1(i)).
(g) *Vertical end handholds.* Same as specified for "Box and other house cars" (see §231.1(j)).
(h) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).
(i) *End-ladder clearance.* (1) No part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake wheel, brake step, or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same above end sills, other than exceptions herein noted, shall extend beyond the outer face of buffer block.
(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.

§231.2 Application and Guidance

Cars will have one hand brake with the same specifications as 49 CFR §231.1 Box and Other House Cars. The brake will be located where it can be safely operated while the car is in motion. The brake steps, sill steps, ladder, horizontal handholds and vertical end handholds will be positioned in the same manner and location as specified for “Box and other house cars” §231.1. Cars of this type having damaged structures on upright supports on ends will not be taken exception to unless they are on corner end post structures or have a direct safety effect on car construction. This type of car that have support members on opposite sides of safety appliance locations may appear to be similar to safety appliance construction, but are not required, although they may have bends or are damaged they are not regulatory and exception should not be taken. Inspect this type of car with attention in areas of the upper location of safety appliance arrangements to ensure integrity of ladders and that ladder treads are secure. MP&E inspectors should physically examine the brake step for broken or cracks at the fastener location and debris on the brake step. Brake steps have been found with bent supports causing the step to be bent slanting in a downward position and if excessive, should be taken exception to. Physical examination of components and operation of the handbrake to ensure brake rigging does not bind the brake step and operates properly. At times, a ladder tread or support bracket and are found bent or loose on this type of car.

Note: Former TB *MP&E-98-23-* Subject: Covered Hopper Cars Running Board Extensions Running board end extension is not required if the end of the longitudinal running board is at least 6 inches from the vertical plane and the longitudinal running board extends at least the entire length of the roof. In other words, if the longitudinal roof running board does not extend at least the entire length of the roof, a running board extension is required.

§231.3 Drop-end high-side gondola cars.

(a) *Hand brakes* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(a)(2)).
(3) *Location.* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft shall be located on end of car to the left of center.
(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Sill steps.* Same as specified for "Box and other house cars" (see §231.1(d)).
(c) *Ladders* -- (1) *Number.* Two.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(e)(2)), except that top ladder tread shall be located not more than 4 inches from top of car.
(3) *Location.* (i) One on each side, not more than 8 inches from right end of car, measured from inside edge of ladder stile or clearance of ladder treads to corner of car.
(ii) Carriers are not required to change the location of ladders on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(e)(4)).
(d) *Side handholds.* Same as specified for "Box and other house cars" (see §231.1(h)).
(e) *Horizontal end handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* (i) One near each side of each end of car on face of end sill. Clearance of outer end of handhold shall be not more than 16 inches from side of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).

(f) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).
(g) *End ladder clearance.* (1) No part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake wheel or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same above end sills, other than exceptions noted in this subparagraph, shall extend beyond the outer face or buffer block.
(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance, within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.

§231.3 Application and Guidance

There will be one efficient hand brake at each end of the car to the left of the center and located that it can be properly operated while the car is in motion.
There will be 4 sill steps applied in the same manner as §231.1(d).
Two ladders will be located, one on each side as specified in 213.1(e) except that top ladder tread shall be located not more than 4 inches from the top of the car. Ladder placement is measured from the inside edge of ladder stile or clearance of ladder treads to the corner of car.
Side Handholds: same as specified in §231.1(h).
There will be four horizontal end handholds as specified in §231.1(I) located one near each side of the car on face end of the sill, with no more than 16 inch clearance from the outer end of handhold.
Uncoupling Levers: same as specified in §231.1(k).
End Ladder Clearance: refer to Plate “H” for proper guidance.
Cars of this type that have support members on opposite sides of safety appliance locations may appear to be similar to safety appliance construction, but are not required, although they may have bends or damaged they are not regulatory and exception should not be taken. Inspect this type of car with attention in areas of the upper location of safety appliances to ensure integrity of ladders and that ladder treads are secure. MP&E inspector(s) should physically examine the brake step for broken or cracks at the fastener location and debris on the brake step. Brake steps have been found with bent supports causing the step to be bent slanting in a downward position and if excessive should be taken exception to.
Physically examination of components and operation of the handbrake to ensure brake rigging does not foul the brake step and operates properly. At times a ladder tread or support bracket and are found bent or loose on this type of car.

§231.4 Fixed-end low-side gondola and low-side hopper cars.

(Cars with sides 36 inches or less above the floor are low-side cars.)
(a) *Hand brakes* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(a)(2)).
(3) *Location.* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft shall be located on end of car, to the left of and not more than 22 inches from center.
(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(iv) Carriers are not required to change the location of brake wheels and brake shafts on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Brake step.* Same as specified for "Box and other house cars" (see §231.1(b)).
(c) *Sill steps.* Same as specified for "Box and other house cars" (see §231.1(d)).
(d) *Side handholds* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(h)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(h)(2)).
(3) *Location.* (i) Horizontal, one near each end on each side of car, not less than 24 nor more than 30 inches above center line of coupler, if car construction will permit, but handhold shall not project above top of side. Clearance of outer end of handhold shall be not more than 8 inches from end of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(h)(4)).
(e) *Horizontal end handholds* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(i)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* (i) One near each side on each end of car, not less than 24 nor more than 30 inches above center line of coupler, if car construction will permit. Clearance of outer end of handhold shall be not more than 8 inches from side of car.
(ii) One near each side of each end of car on face of end sill, projecting outward or downward. Clearance of outer end of handhold shall be not more than 16 inches from side of car.

(iii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(f) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).
(g) *End-ladder clearance.* (1) No part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake step, brake wheel or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same above end sills, other than exceptions noted in this subparagraph, shall extend beyond the outer face of buffer block.
(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance, within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.

§231.4 Application and Guidance

Hand Brake: dimensions and application are the same as specified in §213.1(a). Each handbrake will be so located that it can be safely operated while car is in motion.
Brake Step: same as specified in §231.1(b).
Sill Steps: number, dimension and manner of application are the same as specified in §231.1(d).
Side Handholds: number, dimension and manner of application are same as specified in 231.1(h). They will be horizontally located, one on each end on each side of the car. There should be no more than 8 inches of clearance from handhold to the end of car.
Horizontal Handholds: number, dimensions and application will be the same as specified in §213.1(I), and be located one near each side on each end of the car, not less than 24 and not more than 30 inches above center line of coupler.
Uncoupling levers are same as specified for "Box and other house cars" in 49 CFR §231.1(k).
End-ladder clearance, except for buffer block, brakeshaft, brake wheel, brake step, or uncoupling lever should extend within 12" of the end of the car. No part of the car above the end sills should be within 30" from the side of the car.

Cars of this type that have support members on opposite sides of safety appliance locations may appear to be similar to safety appliance construction, but are not required, although they may have bends or damaged they are not regulatory and exception should not be taken. MP&E inspectors should physically examine the brake step for broken or cracks at the fastener location and debris on the brake step. Brake steps have been found with bent supports causing the step to be bent slanting in a downward position and if excessive, should be taken exception to.
Physical examination of components and operation of the handbrake to ensure brake rigging does not bind the brake step and operates properly. At times, a ladder tread or support bracket and are found bent or loose on this type of car.

§231.5 Drop-end low-side gondola cars.

(a) *Hand brakes* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(a)(2)).
(3) *Location.* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft shall be located on end of car to the left of center.
(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)), provided that top brake-shaft support may be omitted.
(b) *Sill steps.* Same as specified for "Box and other house cars" (see §231.1(d)).
(c) *Side handholds* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(h)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(h)(2)).
(3) *Location.* (i) Horizontal, one near each end on each side of car, not less than 24 nor more than 30 inches above center line of coupler, if car construction will permit, but handhold shall not project above top of side. Clearance of outer end of handhold shall be no more than 8 inches from end of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(h)(4)).
(d) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* (i) Horizontal, one near each side of each end of car on face of end sill. Clearance of outer end of handhold shall be not more than 16 inches from side of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(e) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).
(f) *End-ladder clearance.* (1) No part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake wheel or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same above end sills, other than exceptions noted in this subparagraph shall extend beyond the outer face of buffer block.

(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance, within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.

§231.5 Application and Guidance

One handbrake is required that are the same as specified for "Box and other house cars" (see §231.1(a)(1)).
The dimensions are the same as specified for "Box and other house cars" (see §231.1(a)(2)) and the brake shaft will be located on the end of the car to the left of center.
The application is the same as specified for "Box and other house cars" (see §231.1(a)(4)).
Provided that top brakeshaft support may be omitted.
Sill steps are the same as specified for "Box and other house cars" (see §231.1(a)(d)).
Side handholds are the same as specified for "Box and other house cars" (see §231.1(h)(1)).
The dimensions are the same as specified for "Box and other house cars" (see §231.1(h)(2)).
The side handhold (horizontal) location, will have one near each end on each side of car, not less than 24 nor more than 30 inches above center line of coupler, if car construction will permit, but handhold shall not project above top of side. Clearance of outer end of handhold shall be no more than 8 inches from end of car.
Note: Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.

Cars of this type that have support members on opposite sides of safety appliance locations may appear to be similar to safety appliance construction, but are not required, although they may have bends or are damaged they are not regulatory, and exception should not be taken. MP&E inspectors should physically examine the brake step for broken or cracks at the fastener location and debris on the brake step. Brake steps have been found with bent supports causing the step to be bent slanting in a downward position and if excessive should be taken exception to.
Physically examination of components and operation of the handbrake to ensure brake rigging does not bind the brake step and operates properly. At times a ladder tread or support bracket and are found bent or loose on this type of car.

§231.6 Flat cars.

(Cars with sides 12 inches or less above the floor may be equipped the same as flat cars.)
(a) *Hand brakes* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231(a)(2)).

(3) *Location.* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft shall be located on the end of car to the left of center, or on side of car not more than 36 inches from right-hand end thereof.
(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(iv) Carriers are not required to change the location of brake wheels and brake shafts on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Sill steps.* Same as specified for "Box and other house cars" (see §231.1(d)).
(c) *Side handholds* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(h)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(h)(2)).
(3) *Location.* (i) Horizontal, one on face of each side sill near each end. Clearance of outer end of handhold shall be not more than 12 inches from end of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(h)(4)).
(d) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* (i) Horizontal, one near each side of each end of car on face of end sill. Clearance of outer end of handhold shall be not more than 16 inches from side of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(e) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).

§231.6 Application and Guidance

Each handbrake is the same as specified for "Box and other house cars" (see §231.1(a)(1)) with dimensions are the same as specified for "Box and other house cars" (see §231(a)(2)), and will be so located that it can be safely operated while car is in motion.

The brake shaft shall be located on the end of car to the left of center, or on side of car not more than 36 inches from right-hand end thereof.
Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
Carriers are not required to change the location of brake wheels and brake shafts on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed. The hand brake wheel will not have less than 4 inches clearance around rim of brake wheel.
The Sill steps are the same as specified for "Box and other house cars" (see §231.1(d)).
The side handholds are the same as specified for "Box and other house cars" (see §231.1(h)(1)).
The dimensions are the same as specified for "Box and other house cars" (see §231.1(h)(2)).
The Horizontal handholds will have one on face of each side sill near each end. Clearance of outer end of handhold shall be not more than 12 inches from end of car.
Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
The manner of application will be the same as specified for "Box and other house cars" (see §231.1(h)(4)).
There will be four end handholds with the same dimensions as specified for "Box and other house cars" (see §231.1(i)(2)) located Horizontal, one near each side of each end of car on face of end sill. Clearance of outer end of handhold shall be not more than 16 inches from side of car.
Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs, then they must then be made to comply with the standards prescribed. The application is the same as specified for "Box and other house cars" (see §231.1(i)(4)).
The uncoupling lever are the same as specified for "Box and other house cars" (see §231.1(k)).

Former TB *MP&E-98-16-* DODX 4000 series flat cars are in compliance with Title 49, CFR, Section §231.6(a)(3)(I), which requires that "Each handbrake shall be so located that it can be safely operated while the car is in motion". These cars are designed to have a 2 ½ by 8 inch slot in the car floor near each corner. These slots are considered by the FRA as "grab holes", so that the handbrake can be safely operated using this "grab hole" when the car is in motion.

Cars with sides 12 inch or less above the floor may be equipped the same as flat cars. In some cases, cars of special construction may exceed 12 inched but still closely resemble a flat car even though the car closest to construction may indeed be a low side gondola.

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MP&E inspector(s) should use discretion and check to ensure the car's construction as outlined in the Carrier's umbler system or car history information, (i.e.) a steel coil car.
Also, it has been reported that these cars have a missing bottom rod safety support that are only required on the handbrake truck. There are two bottom rods. One is equipped with two safety supports, while the other has only one. The truck, as designed measures 35 inches between pivot points. The loss of a connecting pin at the unsupported end of the rod would still meet the minimum clearance above the rail and would still be more than 2 ½ inches.

There are many cars considered "Cars of Special Construction" that are considered flat cars. These include Spine, Auto Rack & Double Stack, Bulk-Head Flat, and Steel Coil Cars, etc.

When inspecting this type of car, MP&E inspector(s) should look for many insecure accessories loading devices such as, hold downs, cables, chocks, tools and blocks not properly stowed on top of the floor of the car. Many cars have specific locations for these types of accessories and it may create a safety hazard if not properly place. Load shifts maybe taken exception to if the cabling holding commodities are excessively loose or have moved causing the car to lean. Reports of this type should be at the first opportunity to rectify this type of problem (particularly if the train has completed its initial terminal test). Inspect older flat cars closely, as they tend to have many more safety appliance defects than newer cars with sill steps and side mounted hand brakes etc.

Generally, auto rack and double stack cars are usually specific to the routes on railroads and have specific component problems rather than an array of failures. A car inspector is usually assigned to inspect these types of cars on a regular basis, and inspectors tend to look at specific components that normally wear or fail rather then inspect the whole car. Safety Appliance arrangements get little or no attention and should be routinely inspected when approaching a facility that has many of the same type cars. Uncoupling levers have been installed on auto rack and double stack cars occasionally have a longer telescopic lever than required. Exceptions should be made if the uncoupler lever has loose or broken attachments, is bent, broken welds or supports on the telescopic arms and if the lock lift mechanism operates abnormally.

Note: Former TB *MP&E-98-35-* Multi-Unit Articulated Flat Cars- TTAX 5 unit, all-purpose Spine Cars are equipped with handbrakes which face outward at each end of the five unit consist. The handbrake arrangement is designed so that it can be operated while standing on the sill step or from the ground. When a 48-foot container is placed on the "A" end unit, the crossover platform is partially covered by the container and has only 10 inches exposed. The "crossover" platforms on these TTAX cars and/or platform extensions on other multi- unit articulated "flat cars" is not a requirement of the current safety appliance standards.

Note: Former TB *MP&E-98-69-* Subject: §231.6 Safety Appliance Arrangements on Flat Cars

§231.6 specifies the minimum requirements for safety appliance arrangements on flat cars. For many years, other safety appliance arrangements have been incorporated into the standards by agreement. New and reassigned employees, as well as new car builders, may not be aware of such agreements.

One revised safety appliance arrangement is the horizontal side handhold Trailer Train Company eliminated is the vertical handhold on long bridge plates. The side handhold safety appliance arrangement is that Side Handholds have a dimension same as specified for flat cars, except length not less than eighteen (18) inches, and diameter not less than one (1) inch when legs are extra long. The manner of application is the same as specified for "Box and Other House Cars." The location is One (1) over each sill step on top of rub rail projecting upward, not less than twenty-seven (27) nor more than thirty-four (34) inches above tread of sill step. Clearance at outer end should not be more than eight (8) inches from end of car.

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All other safety appliances on piggy-back cars should conform to those specified for flat cars. Also, additional handholds provided to facilitate use of handbrakes, including handholds on stub bridge plates, should be retained.

Any flat car that has a low mounted side handbrake, should be equipped with a second handhold at the hand brake corner fifteen (15) to sixteen (16) inches above the handhold described previously. The tread of the sill step at this location should be widened to not less than four (4) inches and be provided with an anti-skid surface. When possible the length of such sill step should be increased to not less than fourteen (14) inches.

The additional handholds and wider sill step to facilitate the use of the low mounted side hand brake were agreed upon because of the requirement in §231.6(a)(3)(i), "Each hand brake shall be so located that it can be safely operated while the car is in motion."

The MP&E inspector should become familiar with these arrangements.

§231.7 Tank cars with side platforms.

(a) *Hand brakes* – (1) *Number.* Same as specified for “Box and other house cars” (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for “Box and other house cars” (see §231.1(a)(2)).
(3) *Location.* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft shall be located on end of car to the left of center.

(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Sill steps.* Same as specified for "Box and other house cars" (see §231.1(d)).

(c) *Side handholds* – (1) *Number.* Four or more.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(h)(2)).
(3) *Location.* (i) Horizontal, one on face of each side sill near each end. Clearance of outer end of handhold shall be not more than 12 inches from end of car.
(ii) If side safety railings are attached to tank or tank bands, four additional vertical handholds shall be applied, one as nearly as possible over each sill step and securely fastened to tank or tankband.
(iii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(h)(4)).
(d) *End handholds* – (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* (i) Horizontal, one near each side of each end of car on face of end sill. Clearance of outer end of handhold shall be not more than 16 inches from side of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(e) *Tank-head handholds* – (1) *Number.* Two. (Not required if safety railing runs around ends of tank.)
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clearance, 2, preferably 2 1/2, inches. Clear length of handholds shall extend to within 6 inches of outer diameter of tank at point of application.
(3) *Location.* (i) Horizontal, one across each head of tank not less than 30 nor more than 60 inches above platform.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Tankhead handholds shall be securely fastened.

(f) *Safety railings* -- (1) *Number.* One continuous safety railing running around sides and ends of tank, securely fastened to tank or tank bands at ends and sides of tank; or two running full length of tank at sides of cars supported by posts.
(2) *Dimensions.* Not less than three-fourths of an inch, iron.
(3) *Location.* Running full length of tank either at side supported by posts or securely fastened to tank or tank bands, not less than 30 nor more than 60 inches above platform.
(4) *Manner of application.* Safety railings shall be securely fastened to tank body, tank bands, or posts.
(g) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).
(h) *End-ladder clearance.* (1) No part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake-shaft brackets, brake wheel or uncoupling level shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same above end sills, other than exceptions noted in this subparagraph, shall extend beyond the outer face of buffer block.
(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance, within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.

§231.7 Application and Guidance
There will be one handbrake of the same dimension and application as specified for " Box and Other House Cars " (see §231.1 (a) (1), and should be located in a manner that handbrakes can be safely operated while car is in motion.
Sill Steps will be the same as specified for "Box and Other House Cars " (see §231.1(d)).
There will be four (4) or more Side Handholds having the same dimensions as specified for " Box and Other House Cars " (see §231.1 (h) (2)). Handholds will be horizontally located, one on each side sill near each end with outer end of handhold having a clearance of not more than twelve (12) inches. Four additional vertical handholds will be applied if side safety railings are attached to tank or tankbands one as nearly as possible over each sill step and securely fastened to tank or tankband applied as specified in " Box and Other Tank Cars " (see §231.1 (h) (4)).
There will be four (4) End Handholds applied the same as specified for " Box and Other House Cars " (see §231.1 (I) (2)) and securely fastened with FRA approved fasteners. End handholds will be horizontally located, one near each side of each end of car on face of end sill with a maximum clearance of sixteen (16) inches from side of car and applied as specified for " Box and Other House Cars " (see §231.1 (I) (4)).

There will be two (2) Tank-head Handholds required unless safety railing runs around ends of tank, with a minimum diameter of five-eighths (5/8) of an inch with a clearance of two (2), but not more than two and one half (21/2) inches, of wrought iron or steel.

Horizontally located, one across each head of tank not less than thirty (30) or more than sixty (60) inches above platform. Clear length of tank-head handholds should extend to within six (6) inches of outer diameter of tank at application point.
There should be one continuous Safety Railing running around sides and ends of tanks or tank-bands at ends and sides of tank, or two Safety Railings running the full length of tank at sides of cars supported by posts, not more than three-fourths (3/4) inch iron and securely fastened. Both applications of Safety Railings shall run full length of tank not less than sixty (60) inches above platform.
There will be the same number of, application, dimensions and location of Uncoupling Levers as specified for " Box and Other House Cars " (see §231.1 (k)).
End Ladder clearance should be thirty (30) inches from side of car and at no time will part of car be above end sills except for buffer block, brake shaft brackets, brake wheel, uncoupling lever which shall extend to within twelve (12) inches of a vertical plane parallel with end of car. Uncoupling Lever shall pass through the inside face of knuckle when closed with coupler horn against buffer block or end sill and shall extend beyond the outer face of buffer block except for exceptions noted in subparagraph for this part.

Generally, all tank cars are in a category of their own pertaining to the safety appliance arrangements. Tank cars have welding of safety appliance brackets or supports on many different locations throughout each type of car. A tank car container cannot be penetrated and the car essentially has to be welded on the exterior of its containment skin instead of using mechanical fasteners. This presents a dilemma to the MP&E inspector who has been taught that no welding of any kind is allowed to the safety appliance arrangements and can be only mechanical fastened. MP&E inspector(s) should be aware of the many different applications that have been provided relief as a result of this car unique structure.

MP&E inspector(s) should examine closely, all welded locations and take exception to any crack or break that occurs that has any contact to the mechanical fastened safety appliance. Repair of factory welds of supports and brackets of any safety appliance arrangement should only be done at a location where a proper factory weld can be performed or preferably, must be mechanically fastened. A tank car safety appliance arrangement defect will be mechanically fastened wherever possible or moved to the next forward location where a controlled factory repair can be made by use of the one time move.

There are tank car modifications from factory welds that have been identified that are considered to be defective and brought to the attention of the MP&E Staff Director, Office of Safety, Assurance and Compliance. These programs are on going and considered to be effective, as the cars are identified to be repaired by schedule with a time restraint that produce a satisfactory safety factor to reduce potential incidents that could have occurred.

When an MP&E inspector has an exception to a tank car with defective welds to safety appliance arrangements, he/she should inform the Regional Supervisor or the MP&E Staff Director.

Each tank car weld defect must be determined if this particular car is currently on a program or potentially another location with a valid weld problem affecting the whole series built of that type of tank cars.

When a weld defect on an inspection report is made, when possible, provide all detailed data to include photographs to help assistance the MP&E Office of Safety and Compliance. The defect will be brought to the attention of the tank car owner or carrier to determine the required course of action necessary to comply with FRA.

§231.8 Tank cars without side sills and tank cars with short side sills and end platforms.

(a) *Hand brakes* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(a)(2)).
(3) *Location.* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft shall be located on end of car to the left of center.
(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Running boards* -- (1) *Number.* One continuous running board around sides and ends; or two running full length of tank, one on each side.
(2) *Dimensions.* Minimum width on sides, 10 inches. Minimum width on ends, 6 inches.
(3) *Location.* Continuous around sides and ends of cars. On tank cars having end platforms extending to bolsters, running boards shall extend from center to center of bolsters, one on each side.
(4) *Manner of application.* (i) If side running boards are applied below center of tank, outside edge of running boards shall extend not less than 7 inches beyond bulge of tank.
(ii) The running boards at ends of car shall be not less than 6 inches from a point vertically above the inside face of knuckle when closed with coupler horn against the buffer block, end sill or back stop.
(iii) Running boards shall be securely fastened to tank or tank bands.
(c) *Sill steps* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(d)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(d)(2)).
(3) *Location.* (i) One near each end on each side under side handhold.
(ii) Outside edge of tread of step shall be not more than 4 inches inside of face of side of car, preferably flush with side of car.
(iii) Tread shall be not more than 24, preferably not more than 22, inches above the top of rail.
(iv) Carriers are not required to change the location of sill steps on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed in said order.

(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(d)(4)).
(d) *Ladders.* (If running boards are so located as to make ladders necessary.)
(1) *Number.* Two on cars with continuous running boards. Four on cars with side running boards.
(2) *Dimensions.* (i) Minimum clear length of tread, 10 inches. Maximum spacing of treads, 19 inches. Hardwood treads, minimum dimensions, 1 1/2 by 2 inches.
(ii) Wrought iron or steel treads, minimum diameter five-eighths of an inch. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* On cars with continuous running boards, one at right end of each side. On cars with side running boards, one at each end of each running board.
(4) *Manner of application.* Ladders shall be securely fastened with not less than 1/2-inch bolts or rivets.
(e) *Side handholds* -- (1) *Number.* Four or more.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(h)(2)).
(3) *Location.* (i) Horizontal, one on face of each side sill near each end on tank cars with short side sills, or one attached to top of running board projecting outward above sill steps or ladders on tank cars without side sills. Clearance of outer end of handhold shall be not more than 12 inches from end of car.
(ii) If side safety railings are attached to tank or tank bands four additional vertical handholds shall be applied, one as nearly as possible over each sill step and securely fastened to tank or tank bands.
(iii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(h)(4)).
(f) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* (i) Horizontal, one near each side of each end of car on face of end sill. Clearance of outer end of handhold shall be not more than 16 inches from side of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(g) *Tank-head handholds* -- (1) *Number.* Two. (Not required if safety railing runs around ends of tank.)
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* (i) Horizontal, one across each head of tank not less than 30 nor more than 60 inches above platform on running board. Clear length of handholds shall extend to within 6 inches of outer diameter of tank at point of application.

(ii) Carriers are not required to change the location of handholds on cars in service July 7, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Tankhead handholds shall be securely fastened.
(h) *Safety railings* -- (1) *Number.* One running around sides and ends of tank or two running full length of tank.
(2) *Dimensions.* Minimum diameter, seven-eighths of an inch, wrought iron or steel. Minimum clearance, 2 1/2 inches.
(3) *Location.* Running full length of tank, not less than 30 nor more than 60 inches above platform or running board.
(4) *Manner of application.* Safety railings shall be securely fastened to tank or tank bands and secured against end shifting.
(i) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).
(j) *End-ladder clearance.* (1) No part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake-shaft brackets, brake wheel, running boards or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same, above end sills, other than exceptions herein noted, shall extend beyond the outer face of buffer block.
(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance, within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.

§231.8 Application and Guidance

There will be one handbrake, with the same dimensions and manner of application as specified for " Box and Other House Cars " (see §231.1 (a) (1)). Each handbrake will be located so that it can be safely operated while car is in motion.
There should be one continuous Running Board around sides and end or two (2) Running Boards running the full length of tank, one on each side. Running Boards will be continuous, or must extend to bolsters on tanks with end platforms; running boards should extend from center to center of bolsters, one on each side. If running boards are applied below the center of tank, the outside edge of Running Board should not extend more than seven (7) inches beyond bulge of tank.
Running Boards should not less than six (6) inches from the point vertically above the inside face of the knuckle when closed with coupler horn against the buffer block, end sill or back stop. All Running boards will be securely fastened to tank or tank bands.

There will be one Sill Step with the same dimensions as specified for " Box and Other House Cars " (see §231.1 (d) (1)), located one near each end on each side under side handhold.
The outside edge of tread step should be not more than four (4) inches inside face of side of car, preferably flush with side of car, and not less than twenty-four (24), but not more than twenty-two (22) inches above top of rail. Tread on Sill Steps should be as applied specified for " Box and Other House Cars " (see §231.1 (d) (4)).
If Running Boards are located as to make Ladders necessary there will be two (2) on cars with continuous running boards, four (4) on cars with side Running Boards. Location will be one on each end on each side of continuous running boards and one at each end of each running board on cars with side running boards. Clear length of tread will be ten- (10) inches minimum with nineteen inches maximum spacing of treads. Hardwood treads have minimum dimensions of one and one-half (1 ½) by two (2) inches, wrought iron or steel treads will have minimum diameter of five-eighths (5/8) of an inch, with minimum clearance of two (2) inches, maximum clearance of two and one-half (2 ½) inches.
Ladders will be applied with not less than one-half (1/2) inch bolts or rivets and securely fastened.
There will be four (4) or more Side Handholds with the same dimensions as specified for " Box and Other House Cars " (see 231.1 (h) (2)). One will be located horizontally across each head of tank not less than thirty (30), not more than sixty (60) inches above platform on the running board. Clear length of handholds will extend to within six (6) inches of outer diameter of tank at application point.
There will be one Safety Railing running around sides and ends of tank or two (2) running full length of tank with minimum diameter of seven- eighths (7/8) of an inch wrought iron or steel With minimum clearance of two and one-half (2 ½) inches. Safety railing will run full length of car, not less than thirty (30) inches and not more than sixty (60) inches above platform or running board. Safety Railings will be securely fastened with FRA approved fasteners to tank or tank band and secured against end shifting.
Uncoupling levers are same as specified for " Box and Other House Cars " (see §231.1 (k)).
End Ladder Clearance should be within thirty (30) inches from side of car and at no time will any part of car be above end sills except buffer block, brake shaft, brake-shaft brackets, brake wheel, running boards or uncoupling lever shall extend to within twelve (12) inches of a vertical plane parallel with end sill and no other part of end of car of fixtures on same.

Generally, all tank cars are in a category of their own pertaining to the safety appliance arrangements. Tank cars have welding of safety appliance brackets or supports on many different locations throughout each type of car. A tank car container cannot be penetrated and the car essentially has to be welded on the exterior of its containment skin instead of using mechanical fasteners. This presents a dilemma to the MP&E inspector who has been taught that no welding of any kind is allowed to the safety appliance arrangements and can be only mechanically fastened. MP&E inspectors should be aware of the many different applications that have been provided relief as a result of this car unique structure.

MP&E inspector(s) should examine closely, all welded locations and take exception to any crack or break that occurs that has any contact to the mechanical fastened safety appliance.
Repair of factory welds of supports and brackets of any safety appliance arrangement should only be done at a location where a proper factory weld can be performed or preferably, must be mechanically fastened. A tank car safety appliance arrangement defect will be mechanically fastened wherever possible or moved to the next forward location where a controlled factory repair can be made by use of the one time move.

There are tank car modifications from factory welds that have been identified that are considered to be defective and brought to the attention of the MP&E Staff Director, Office of Safety, Assurance and Compliance. These programs are on going and considered to be effective, as the cars are identified to be repaired by schedule with a time restraint that produce a satisfactory safety factor to reduce potential incidents that could have occurred.

When an MP&E inspector has an exception to a tank car with defective welds to safety appliance arrangements, he/she should inform the Regional Supervisor or the MP&E Staff Director.

Each tank car weld defect must be determined if this particular car is currently on a program or potentially another location with a valid weld problem affecting the whole series built of that type of tank cars.

When a weld defect on an inspection report is made, when possible, provide all detailed data to include photographs to assist the MP&E Office of Safety and Compliance. The defect will be brought to the attention of the tank car owner or carrier to determine the required course of action necessary to comply with FRA.

§231.9 Tank cars without end sills.

(a) *Hand brakes* – (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(a)(2)).
(3) *Location.* Each hand brake shall be so located that it can be safely operated while car is in motion. The brake shaft shall be located on end of car to the left of center.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Brake step.* Same as specified for "Box and other house cars" (see §231.1(b)).
(c) *Running boards* – (1) *Number.* One.
(2) *Dimensions.* Minimum width on sides, 10 inches. Minimum width on ends, 6 inches.

(3) *Location.* Continuous around sides and ends of tank.
(4) *Manner of application.* (I) If running boards are applied below center of tank, outside edge of running boards shall extend not less than 7 inches beyond bulge of tank.
(ii) Running boards at ends of car shall be not less than 6 inches from a point vertically above the inside face of knuckle when closed with coupler horn against the buffer block, end sill or back stop.
(iii) Running boards shall be securely fastened to tank or tank bands.
(d) *Sill steps* – (1) *Number.* Four. (If tank has high running boards, making ladders necessary, sill steps must meet ladder requirements.)
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(d)(2)).
(3) *Location.* (I) One near each end on each side, flush with outside edge of running board as near end of car as practicable.
(ii) Tread not more than 24, preferably not more than 22, inches above the top of rail.
(iii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* (I) Steps exceeding 18 inches in depth shall have an additional tread and be laterally braced.
(ii) Sill steps shall be securely fastened with not less than ½-inch bolts with nuts outside (when possible) and, riveted over, or with ½-inch rivets.
(e) *Side handholds* – (1) *Number.* Four or more.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(h)(2)).
(3) Location. (I) *Horizontal,* one near each end on each side of car over sill step on running board, not more than 2 inches back from outside edge of running board, projecting downward or outward.
(ii) Where such side handholds are more than 18 inches from end of car, an additional handhold must be placed near each end on each side not more than 30 inches above center line of coupler.
(iii) Clearance of outer end of handhold shall be not more than 12 inches from end of car.
(iv) If safety railings are on tank, four additional vertical handholds shall be applied, one over each sill step on tank.
(v) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(h)(4)).
(f) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* (i) Horizontal, one near each side on each end of car on running board, not more than 2 inches back from edge of running board projecting downward or outward, or on end of tank not more than 30 inches above center line of coupler.

(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(g) *Safety railings* -- (1) *Number.* One.
(2) *Dimensions.* Minimum diameter, seven-eighths of an inch, wrought iron or steel. Minimum clearance, 2 1/2 inches.
(3) *Location.* Safety railings shall be continuous around sides and ends of car, not less than 30 nor more than 60 inches above running board.
(4) *Manner of application.* Safety railings shall be securely fastened to tank or tank bands, and secured against end shifting.
(h) *Uncoupling levers* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(k)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(k)(2)), except that minimum length of uncoupling lever shall be 42 inches, measured from center line of end of car to handle of lever.
(3) *Location.* Same as specified for "Box and other house cars" (see §231.1(k)(3)), except that uncoupling lever shall be not more than 30 inches above center line of coupler.
(i) *End-ladder clearance.* (1) No part of car above buffer block within 30 inches from side of car, except brake shaft, brake-shaft brackets, brake wheel or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or back stop, and no other part of end of car or fixtures on same, above buffer block, other than exceptions herein noted, shall extend beyond the face of buffer block.
(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance, within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.

§231.9 Application and Guidance
There will be one handbrake same as specified for " Box and Other House cars " (see §231.1 (a) (1)), with the same dimensions as specified for " House and Other House Cars " (see §231.1 (a) (2)), and applied in the same manner as specified for " Box and Other House Cars " (see §231.1 (a) (4)). Each handbrake will be located so that it can be safely operated while car is in motion, the brake shaft will be located on end of car to the left of center.
Brake Step will be same as specified for " Box and Other House Cars " (see §231.1 (b)).
There will be one Running Board with ten (10) inch minimum clearance, minimum width on ends of six (6) inches. At the ends of cars, running boards will not less than six (6) inches from a vertical point above inside face of knuckle when closed with coupler horn against the buffer block, end sill or back stop and securely fastened with FRA approved fasteners.

If running boards are applied below center of tank outside edge of running boards should extend not less than 7 inches beyond bulge of tank.
There will be 4 Sill Steps with the same dimensions as specified for " Box and Other House Cars " (see §231.1 (d) (2)). If tank has high running boards making ladders necessary, sill steps must meet ladder requirements. One sill step will be located on each end on each side, flush with outside edge of running board as near to end of car as practical. Tread may not exceed twenty-four and be not less than twenty-six (260 inches above top of rail. Sill steps exceeding 18 inches in depth will be laterally braced and have an additional tread. Sill steps will be securely fastened with FRA approved fasteners.
There will be four or more Side Handholds with the same dimensions as specified for " Box and Other House Cars " (see §231.1 (2)), horizontally located one near each end on each side of car. Handholds will be applied not more than two (2) inches back from outside edge of running board projecting downward or outward.
If side handholds are more than 18 inches from end of car, an additional handhold must be placed near each side not more than 30 inches above centerline of coupler. Outer end clearance of handhold will be a maximum of 12. Four additional vertical handholds will be applied if safety railings are on tank, one over each sill step on tank and will be applied as specified for ' Box and Other House Cars " (see §231.1 (h) (4)), and securely fastened with FRA approved fasteners.
There will be 4 End Handholds with dimensions same as specified for " Box and Other House Cars " (see §231.1 (i) (2)) and applied as specified for " Box and Other House Cars " (see §231.1 (h) (4)). One will be located horizontally near each side on end of car on running board, not more than 2 inches back from edge of running board projecting downward or outward, or on end of tank no more than 30 inches above center line of coupler.
There will be one Safety Railing with minimum diameter of seven-eighths (7/8) inch wrought iron or steel securely fastened with FRA approved fasteners to tank or tank bands and secured from shifting. Safety railings will be continuous around sides and ends of car.

There will be one Uncoupling Lever same as specified for " Box and Other House Cars " (see §231.10(k) (1)) with dimensions same as specified for " Box and Other House Cars " (see §213.1 (k) (2)), except that uncoupling lever will be 42 inches minimum length, measured from center line of end of car to handle of lever. Location will be same as specified for " Box and Other House Cars " (see §231.1 (k) (3)), except that uncoupling lever will be no more than 30 inches above center line of coupler.
End Ladder Clearance should be within 30 inches from side of car and at no time will any part of car be above end sills except buffer block, brake shaft, brake-shaft brackets, brake wheel, running boards or uncoupling lever shall extend to within 12 inches of a vertical plane parallel with end sill and no other part of end of car of fixtures on same.

Generally, all tank cars are in a category of their own pertaining to the safety appliance arrangements. Tank cars have welding of safety appliance brackets or supports on many different locations throughout each type of car.

A tank car container cannot be penetrated and the car essentially has to be welded on the exterior of its containment skin instead of using mechanical fasteners. This presents a dilemma to the MP&E inspector who has been taught that no welding of any kind is allowed to the safety appliance arrangements and can be only mechanical fastened. MP&E inspectors should be aware of the many different applications that have been provided relief as a result of this car unique structure.

MP&E inspectors should examine closely, all welded locations and take exception to any crack or break that occurs that has any contact to the mechanical fastened safety appliance. Repair of factory welds of supports and brackets of any safety appliance arrangement should only be done at a location where a proper factory weld can be performed or preferably, must be mechanically fastened. A tank car safety appliance arrangement defect will be mechanically fastened wherever possible or moved to the next forward location where a controlled factory repair can be made by use of the one time move.

There are tank car modifications from factory welds that have been identified that are considered to be defective and brought to the attention of the MP&E Staff Director, Office of Safety, Assurance and Compliance. These programs are on going and considered to be effective, as the cars are identified to be repaired by schedule with a time restraint that produce a satisfactory safety factor to reduce potential incidents that could have occurred.

When an MP&E inspector has an exception to a tank car with defective welds to safety appliance arrangements, he/she should inform the Regional Supervisor or the MP&E Staff Director.

Each tank car weld defect must be determined if this particular car is currently on a program or potentially another location with a valid weld problem affecting the whole series built of that type of tank cars.

When a weld defect on a inspection report is made, when possible, provide all detailed data to include photographs to help assistance the MP&E Office of Safety and Compliance. The defect will be brought to the attention of the tank car owner or carrier to determine the required course of action necessary to comply with FRA.

§231.10 Caboose cars with platforms.

Note: a. The term "bottom of car" as used in §231.10 is construed to mean "bottom of side-sill or sheathing over side-sill."
b. The term "corner of car" as used in §231.10 is construed to mean the "line at inner edge of platform formed by the intersection of the side and end of car."
(a) *Hand brakes* -- (1) *Number.* (i) Each caboose car shall be equipped with an efficient hand brake which shall operate in harmony with the power brake thereon.

(ii) The hand brake may be of any efficient design, but must provide the same degree of safety as the design shown on plate A.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(a)(2)).
(3) *Location.* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft on caboose cars with platforms shall be located on platform to the left of center.
(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Running boards* -- (1) *Number.* One longitudinal running board.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(c)(2)).
(3) *Location.* (i) Full length of car, center of roof. (On caboose cars with cupolas, longitudinal running boards shall extend from cupola to ends of roof.)
(ii) Outside - metal - roof - cars shall have latitudinal extensions leading to ladder locations.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(c)(4)). See note below.
(c) *Ladders* -- (1) *Number.* Two.
(2) *Dimensions.* None specified.
(3) *Location.* One on each end.
(4) *Manner of application.* Same as (see §231.1(e)(4)). See note below.
(d) *Roof handholds* -- (1) *Number.* One over each ladder. Where stiles of ladders extend 12 inches or more above roof, no other roof handholds are required.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(g)(2)).
(3) *Location.* (i) On roof of caboose in line with and running parallel to treads of ladder, not less than 8 nor more than 15 inches from edge of roof.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(g)(4)). See note below.
(e) *Cupola handholds* -- (1) *Number.* One or more.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clearance, 2, preferably 2 1/2 inches.

(3) *Location.* (i) One continuous handhold extending around top of cupola not more than 3 inches from edge of cupola roof.
(ii) Four right-angle handholds, one at each corner, not less than 16 inches in clear length from point of angle, may take the place of the one continuous handhold specified, if locations coincide.
(iii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Cupola handholds shall be securely fastened with not less than 1/2-inch bolts with nuts outside and riveted over or with not less than 1/2-inch rivets. See note below.
(f) *Side handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 36 inches. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* (i) One near each end on each side of car, curving downward toward center of car from a point not less than 30 inches above platform to a point not more than 8 inches from bottom of car. Top end of handhold shall be not more than 8 inches from outside face of end sheathing.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(h)(4)).
(g) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* (i) Horizontal, one near each side on each end of car on face of platform end sill. Clearance of outer end of handhold shall be not more than 16 inches from end of platform end sill.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(h) *End-platform handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clearance, 2, preferably 2 1/2 inches.

(3) *Location.* (i) One right-angle handhold on each side of each end extending horizontally from door post to corner of car at approximate height of platform rail, then downward to within 12 inches of bottom of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Handholds shall be securely fastened with bolts, screws, or rivets.
(i) *Caboose-platform steps.* Safe and suitable box steps leading to caboose platforms shall be provided at each corner of caboose. Lower tread of step shall be not more than 24 inches above top of rail.
(j) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).
NOTE: Running boards may be omitted from Caboose Cars with platforms built after June 1, 1970, when each of the following conditions have been met:
(1) That ladders, roof handholds (including ladder extensions) and cupola handholds as specified in paragraphs (c), (d), and (e) of this §231.10 are also omitted.
(2) That an appropriate notice be posted in protective manner or stenciled on interior of caboose stating "operating employees are prohibited under all conditions from occupying the roof of this caboose."
(3) That a safe means must be provided to assure the safety of an operating employee when required to clean or maintain windows of a caboose without running boards.
(4) That the following additional safety appliances as specified be securely installed at the outer edge of each platform:
(a) Safety railing
(i) Number:
Horizontal -- Four (4), two (2) upper and two (2) lower.
Vertical -- Four (4).
(ii) Dimensions:
Minimum diameter -- One (1) inch wrought iron, steel, or other material of equivalent strength.
Minimum clearance -- Four (4), preferably six (6) inches except at brace and fastening locations.
(iii) Location:
Vertical -- One (1) at each corner of car extending from platform end sill to level of lower horizontal safety railing or to suitable bracket at roof.
Horizontal -- Upper: Across each end of car near outer edge securely braced with vertical supports not less than 48 nor more than 54 inches above top of platform extending not less than full width of platform excluding hand brake stanchion area.

Horizontal -- Lower: Across each end of car near outer edge securely braced with vertical supports not less than 36 nor more than 42 inches above top of platform excluding hand brake stanchion area. An opening may be provided near center. Such opening shall be provided with a secure safety chain(s) not less than 1/4-inch diameter wrought iron, or steel, or other secure suitable closure.
(iv) Manner of application:
Safety railing shall be securely fastened with 1/2-inch bolts or rivets when possible and securely supported. A weld at connection of vertical and horizontal safety railing and vertical supports is permissible when those appliances are fabricated as a single unit.
(b) Kick plates
(i) Number: Four (4).
(ii) Dimensions:
Minimum thickness 10-gauge wrought iron, steel or other material of equivalent strength.
Width -- Minimum 24 inches.
Height -- Minimum 24 inches.
(iii) Location: One near each side on each and. Outer edge not more than 12 inches from adjacent vertical safety railing with bottom edge near top of platform. Hand brake stand may serve as part of kick plate.
(iv) Manner of application: Securely fastened by 1/2-inch bolts or rivets, or weld.
(v) Vertical hand rail supports spaced not more than eighteen (18) inches apart may be used in lieu of kick plates.
(5) That stove pipe shall be secured to prevent turning.
(6) That windows shall be laminated safety-type glass or equivalent.
Existing caboose cars with platforms. Running boards may be removed from Caboose Cars with Platforms built or under construction on or before June 1, 1970, when each of the following conditions have been met:
(1) That ladder treads above safety railing, roof handholds including ladder extensions, and cupola handholds specified in paragraphs (c), (d), and (e) of this §231.10 are removed.
(2) That an appropriate notice be posted in protective manner or stenciled in interior of caboose stating "operating employees are prohibited under all conditions from occupying the roof of this caboose."
(3) That a safe means must be provided to assure the safety of an operating employee when required to clean or maintain windows of a caboose without running boards.
(4) That end platform safety railing and handhold arrangement will be deemed to meet requirements except as to upper safety railing and kick plates, when those appliances are not provided. When vertical supports are not more than twenty-four (24) inches apart, such supports may be used in lieu of kick plates.
(5) That the following additional safety appliances (when not so provided) shall be securely installed at outer edge of each platform:
(a) Safety railing.

(i) Number:
Horizontal upper -- Two (2).
(ii) Dimensions:
Minimum diameter -- One (1) inch wrought iron, steel, or other material of equivalent strength.
Minimum clearance -- Four (4), preferably six (6) inches except at brace and fastening locations.
(iii) Location:
Horizontal -- Upper: Across each end of car near outer edge securely braced with vertical supports not less than 48 nor more than 54 inches above top of platform extending not less than full width of platform excluding hand brake stanchion area. Ladder tread not more than two (2) inches below level of upper safety railing may serve as a portion of said safety railing.
(b) Kick plates or vertical supports -- Same as provided for caboose cars with platforms built after June 1, 1970, this note. See above.
(6) That stove pipe should be secured to prevent turning.
(7) Cupola or bay windows shall be laminated safety-type glass or equivalent and all other caboose windows shall be so provided on or before June 1, 1975.
[33 FR 19663, Dec. 25, 1968, as amended at 35 FR 10149, June 20, 1970]

231.10 Application and Guidance

See Note at top of §231.10 Regulation for term “bottom of car”
Each Caboose Car will be equipped with an efficient handbrake, which will operate in harmony with the power brake. The handbrake will provide the same degree of safety as the design shown in Plate A. The dimensions will be the same as specified for “ Box and other house cars “, (§231.1(a) (2)) and will be located so that it can be safely operated while car is in motion. The brake shaft will be located on the platform to the left of the center and applied the same as specified for “ Box and other house cars “ (§231.1-(a) (4)).
There will be one longitudinal running board with same dimensions as specified for “ Box and other house cars,“ (§231.1 (c) (2)). Running board will run the full length of car, center of roof. (On caboose cars with cupolas, longitudinal running boards will extend from cupola to ends of roof.) Outside metal roof cars will latitudinal extensions leading to ladder locations.
There will be one roof handhold over each ladder, when stiles of ladders extend 12 inches or more above roof, no other handholds are required. Application of which will be the same as specified for “ Box and other house cars “ (See §231.1 (c) (4)).
There will be two ladders, one on each end of car with no specified dimensions and applied same as specified for “ Box and other house cars “ (See §231.1 (c) (4)).
There will be one Handhold over each ladder. When stiles of ladders extend 12 inches or more above roof no other handholds are required. Handholds will be same as specified for “ Box and other house cars “ (See §231.1(g) (4)).

One or more Cupola handholds are required with a minimum diameter of 5/8 of an inch, wrought iron or steel. A minimum clearance of 2, preferably 2 1/2 inches is required and will run continuous extending around top of cupola, not more than 3 inches from edge of cupola roof. Four right angle handholds are required, one at each corner, not less than 16 inches in clear length from point of angle and may take the place of one continuous handhold as specified above, if locations coincide. Cupola handholds will be securely fastened with ½ inch bolts with outside bolts and riveted over.
There will be four Side Handholds with minimum diameter of 5/8 of an inch, wrought iron or steel. Minimum clear length 36 inches with minimum clearance of 2, preferably 2 ½ inches. Side handholds will be located one near each end on side of car curving downward toward center of car not less than 30 inches above platform, and not more than 8 inches from bottom of car. Side Handholds will be applied same as specified for " Box and other house cars " (see §231.1 (h) (4)).
There will be four End Handholds with same dimensions as specified for " Box and other house cars ", and located horizontally one near each side on each end of car. End Handholds will be applied same as specified for ""Box and other house cars " (See §231.1 (i)(4)) and will be securely fastened with FRA approved fasteners.
Caboose- platform steps will be safe and suitable box steps leading to caboose platforms, lower tread of step shall be no more than 24 inches above top rail.
Uncoupling Levers will be same as specified as for " Box and other house cars "(See §231.1 (k)).
Note: Prior to inspection carefully review all notes for each subsection of this section for deviations and exceptions to the regulation.

The two-way end of train device and heavy duty platform cars has replaced most of the cabooses in the past. There are still many in use today since many cabooses have platforms assist train crews in their daily duties. Most cabooses are used in limited revenue service but still have a benefit for railroad carriers. MP&E inspector(s) should be aware most cabooses have either been completely restored or neglected in one form or another. Those in regular service and used daily should be of great concern. The safety appliance arrangements had particular attention since crews used them in the past on a daily basis. This equipment will show wear from use and most safety appliance mechanical fasteners need to be inspected closely. Some components of safety appliance arrangements are hard to get today and either missing or forged as close as possible to the original safety appliance and should be inspected. Most cabooses have two uncoupling levers and the MP&E inspector should inspect to ensure all of the components are in place and in good working condition. If caboose structures are made of wood, the MP&E inspector(s) should examine the mechanical fasteners and safety appliance for rust or failed components.

§231.11 Caboose cars without platforms.

(a) *Hand brakes* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(a)(2)).
(3) *Location.* (i) Each hand brake shall be so located that it can be safely operated while car is in motion.
(ii) The brake shaft on caboose cars without platforms shall be located on end of car to the left of center.
(iii) Carriers are not required to change the brakes from right to left side on steel or steel-underframe cars with platform end sills, in service July 1, 1911, except when such appliances are renewed, at which time they must be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *Brake step.* Same as specified for "Box and other house cars" (see §231.1(b)).
(c) *Running boards* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(c)(1)).
(2) *Dimension.* Same as specified for "Box and other house cars" (see §231.1(c)(2)).
(3) *Location.* (i) Full length of car, center of roof. (On caboose cars with cupolas, longitudinal running boards shall extend from cupola to ends of roof.)
(ii) Outside-metal-roof cars shall have latitudinal extensions leading to ladder locations.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(c)(4)).
(d) *Sill steps.* Same as specified for "Box and other house cars" (see §231.1(d)).
(e) *Side-door steps* -- (1) *Number.* Two. (If caboose has side doors.)
(2) *Dimensions.* Minimum length, 5 feet. Minimum width, 6 inches. Minimum thickness of tread, 1 1/2 inches. Minimum height of back stop, 3 inches. Maximum height from top of rail to top of tread, 24 inches.
(3) *Location.* One under each side door.
(4) *Manner of application.* Side-door steps shall be supported by 2 iron brackets having a minimum cross-sectional area 7/8 by 3 inches or equivalent, each of which shall be securely fastened to car by not less than two 3/4-inch bolts.
(f) *Ladders* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(e)(2)).
(3) *Location.* Same as specified for "Box and other house cars" (see §231.1(e)(3)), except when caboose has side doors, then side ladders shall be located not more than 8 inches from doors.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(e)(4)).
(g) *End-ladder clearance.* (1) No part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake wheel, brake step, running board, or uncoupling lever shall extend to within 12 inches of a vertical plane, parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same above end sills, other than exceptions noted in this subparagraph, shall extend beyond the outer face of buffer block.

(2) Carriers are not required to make changes to secure additional end-ladder clearance on cars in service July 1, 1911, that have 10 or more inches end-ladder clearance, within 30 inches of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed.
(h) *Roof handholds* – (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(g)(2)).
(3) *Location.* (i) One over each ladder, on roof in line with and running parallel to treads of ladder, not less than 8 nor more than 15 inches from edge of roof.
(ii) Where stiles of ladders extend 12 inches or more above roof, no other roof handholds are required.
(iii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Roof handholds shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets.
(i) *Cupola handholds* – (1) *Number.* One or more.
(2) *Dimensions.* Minimum diameter, five-eights of an inch, wrought iron or steel. Minimum clearance, 2, preferably 2 1/2 inches.
(3) *Location.* (i) One continuous cupola handhold extending around top of cupola, not more than 3 inches from edge of cupola roof.
(ii) Four right-angle handholds, one at each corner, not less than 16 inches in clear length from point of angle, may take the place of the one continuous handhold specified, if locations coincide.
(iii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Cupola handholds shall be securely fastened with not less than 1/2-inch bolts with nuts outside and riveted over or with not less than 1/2-inch rivets.
(j) *Side handholds* – (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(h)(2)).
(3) *Location.* (i) Horizontal, one near each end on each side of car, not less than 24 nor more than 30 inches above center line of coupler. Clearance of outer end of handhold shall be not more than 8 inches from end of car.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.(h)(4)).

(k) *Side-door handholds* -- (1) *Number.* Four: Two curved, two straight.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clearance, 2, preferably 2 1/2 inches.
(3) *Location.* (i) One curved handhold, from a point at side of each door opposite ladder, not less than 36 inches above bottom of car, curving away from door downward to a point not more than 6 inches above bottom of car.
(ii) One vertical handhold at ladder side of each door from a point not less than 36 inches above bottom of car to a point not more than 6 inches above level of bottom of door.
(iii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed.
(4) *Manner of application.* Side-door handholds shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over or with not less than 1/2-inch rivets.
(l) *Horizontal end handholds* -- (1) *Number.* Same as specified for "Box and other house cars." (See §231.1(i)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars." (see §231.1(i)(2)).
(3) *Location.* (i) Same as specified for "Box and other house cars" (see §231.1(i)(3)), except that one additional end handhold shall be on each end of cars with platform end sills as heretofore described, unless car has door in center of end. Said handhold shall be not less than 24 inches in length, located near center of car, not less than 30 nor more than 60 inches above platform end sill.
(ii) Carriers are not required to change the location of handholds on cars in service July 1, 1911, except end handholds under end sills, where the appliances are within 3 inches of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed in said order.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(m) *Vertical end handholds.* Same as specified for "Box and other house cars" (see §231.1(j)).
(n) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k).

§231.11 Application and Guidance

There will be one Handbrake same as specified for “Box and other house cars“ §231.1(a)(1), with the same dimensions as specified for “Box and other house cars“ §231.1 (a) (2).
Each Handbrake will be located so that it can be safely operated while car is in motion and applied same as specified for §231.1 (a) (4).
The Brake step will be same as specified for “Box and other house cars“ §231.1(b).
There will be one running board same as specified for “Box and other house cars“§231.1(b) with the same dimensions as specified for “Box and other house cars“ §231.1(c)(2) located full length of car, center of roof.

Outside-metal-roof cars shall have latitudinal extensions leading to ladder locations and applied same as specified for "Box and other house cars"§231.1(c)(4).
Sill Steps will be same as specified for "Box and other house cars"§231.1(d).
There will be one Side-door step, two if caboose has side doors with minimum length of 5 feet, minimum width of 6 inches. Clearance tread will have minimum thickness of tread 1 ½ inches, maximum height from top of rail tread of 24 inches and located one under each side door. Side door steps will be supported by 2 iron brackets with minimum cross sectional area 7/8 by 3 inches and securely fastened to car with FRA approved fasteners.
There will be four Ladders with same dimensions as specified for "Box and other house cars"§231.1(e) (2) and applied same as specified for "Box and other house cars"§231.1(e) (4).
They will be located same as specified for "Box and other house cars"§231.1(e)(3) except when caboose has side doors, then side ladders will be located no more than 8 inches from doors.
End Ladder clearance: no part of car above end sills within 30 inches from side of car except buffer block, brake shaft, brake wheel, brake step, running board, or uncoupling lever will extend to within 12 inches of vertical plane parallel with end of car.
Note: Prior to inspection carefully read subsection of this part for exceptions.
There will be four Roof Handholds with same dimensions specified for "Box and other house cars"§231.1(g)(2) and located one over each ladder on roof line with and running parallel to treads of ladder no less than 8 and no more than 15 inches from edge of roof.
Roof Handholds will be securely fastened with no less than ½ inch bolts with outside nuts and riveted over with no less than ½ inch rivets.
There will be one or more Cupola Handholds with minimum diameter of 5/8 inch wrought iron or steel with minimum clearance of 2 preferably 2 ½ inches.
One continuous cupola handhold will extend around top of cupola no more than 3 inches from roof.
Four right angle handholds, one at each corner may take the place of one continuous one and securely fastened with ½ inch bolts with outside nuts riveted over with no less than ½ inch rivets.
There will be four Side handholds with same dimensions as specified for "Box and other house cars"§231.1 (h)(2). One side handhold will be horizontally located one near each end on each side of car and applied same as specified for "Box and other house cars"§231.1 (h)(4).
There will be four Side-door handholds, 2 curved and 2 straight with minimum diameter 5/8 of an inch wrought iron or steel, minimum clearance of 2 ½ inches. One curved handhold will be located on each door opposite the ladder curving away downward toward bottom of car and one will be vertical at ladder side of each door. Side handholds will be securely fastened with no less than ½ inch bolts with outside nuts and riveted over with no less than ½ inch rivets.
Horizontal Handholds will be the same as specified for "Box and other house cars"§231.1 (i)(1), with same dimensions as specified for "Box and other house cars"§231.1 (i)(2). Location will be the same as specified for "Box and other house cars"§231.1(i)(3) except that one additional end handhold will be on each end of cars with platform end sills unless the car has a door in center on end. Horizontal handholds will be applied same as specified for "Box and other house cars" §231.1(I)(4).

Vertical End Handholds will be the same as specified for "Box and other house cars" §231.1(j). Uncoupling levers will be the same as specified for "Box and other house cars" §231.1(K).

The two-way end of train device and heavy duty platform cars has replaced most of the cabooses in the past. There are still many in use today since many cabooses have platforms assist train crews in their daily duties. Most cabooses are used in limited revenue service but still have a benefit for railroad carriers. MP&E inspector(s) should be aware most cabooses have either been completely restored or neglected in one form or another. Those in regular service and used daily should be of great concern. The safety appliance arrangements had particular attention since crews used them in the past on a daily basis. This equipment will show wear from use and most safety appliance mechanical fasteners need to be inspected closely. Some components of safety appliance arrangements are hard to get today and either missing or forged as close as possible to the original safety appliance and should be inspected. Most cabooses have two uncoupling levers and the MP&E inspector(s) should inspect to ensure all of the components are in place and in good working condition. If caboose structures are made of wood, the MP&E inspector(s) should examine the mechanical fasteners and safety appliance for rust or failed components.

§231.12 Passenger-train cars with wide vestibules.

(a) *Hand brakes* -- (1) *Number.* Each passenger-train car shall be equipped with an efficient hand brake, which shall operate in harmony with the power brake thereon.
(2) *Location.* Each hand brake shall be so located that it can be safely operated while car is in motion.
(b) *Side handholds* -- (1) *Number.* Eight.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, metal. Minimum clear length, 16 inches. Minimum clearance, 1 1/4, preferably 1 1/2 inches.
(3) *Location.* Vertical, one on each vestibule door post.
(4) *Manner of application.* Side handholds shall be securely fastened with bolts, rivets, or screws.
(c) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* (i) Minimum diameters, five-eighths of an inch, wrought iron or steel. Minimum clear length, 16 inches. Minimum clearance, 2, preferably 2 1/2 inches.
(ii) Handholds shall be flush with or project not more than 1 inch beyond vestibule face.
(3) *Location.* Horizontal, one near each side on each end projecting downward from face of vestibule end sill. Clearance of outer end of handhold shall be not more than 16 inches from side of car.
(4) *Manner of application.* End handholds shall be securely fastened with bolts or rivets. When marker sockets or brackets are located so that they can not be conveniently reached from platforms, suitable steps and handholds shall be provided for men to reach such sockets or brackets.

(d) *Uncoupling levers.* (1) Uncoupling attachments shall be applied so they can be operated by a person standing on the ground.
(2) Minimum length of ground uncoupling attachment, 42 inches, measured from center line of end of car to handle of attachment.
(3) On passenger-train cars used in freight or mixed-train service, the uncoupling attachment shall be so applied that the coupler can be operated from left side of car.

§231.12 Application and Guidance

One efficient Hand brake will be located on the car so that it can be safely operated when the car is in motion and shall operate in harmony with the power brake. There will be eight side handholds with a minimum diameter of 5/8" of an inch of metal with a minimum clear length of 16 inches and minimum clearance of, 1 ¼", preferably 1 ½". A vertical handhold will be mounted on each vestibule door post. All side handholds will be properly secured with FRA approved fasteners. Four end handholds, with a minimum diameter of 5/8" of wrought iron or steel with a minimum clear length of 16 inches that has a minimum clearance of 2 preferably 2 1/2 inches. All handholds shall be flush with, or project not more than 1 inch beyond vestibule face.

One horizontal handhold near each side, on each end, projecting downward from the face of vestibule end sill with clearance of outer end will be not more than 16 inches from side of car. Each handhold will be securely fastened with approved FRA fasteners and when marker sockets or brackets are so located that they can not be conveniently reached from platforms, suitable steps and handholds will be provided for men to reach such sockets or brackets. One Uncoupler lever attachment on each end shall be applied so that a person standing on the ground can operate them. The minimum length of the ground uncoupling attachment is 42 inches (measured from centerline of end of car to handle of attachment). When passenger cars are used in mixed freight service the uncoupling attachment will be applied so that the coupler can be operated from the left side of car.

MP&E inspector(s) should closely examine the fastener hardware, as the approved fastener type may differ as in freight service. The fastener application may vary on safety appliance arrangements and most are considered to be compliant; however, at times, use of the wrong hardware or repairs to the car have compromised the integrity of the original as built fastener system. MP&E inspector(s) should physically inspect all safety appliance fasteners, as a visual inspection cannot validate that the handhold is properly secure. MP&E inspector(s) should take exception to any minimally loose handhold since the public use handholds on a regular basis. Contrasting colors from carbody to handholds also apply. Vertical handholds (2) leading into the interior of the passenger car from the vestibule area may appear to have minimum clearance, however, no exception should be taken to these handholds, as they are considered compliant.

The knuckle thrower on most passenger cars only disengages knuckle may not always throw open all the way. This type of knuckle thrower operation should not be taken exception to unless no movement of the knuckle occurs. Where locomotives coupled to passenger cars are used in push/pull service, where a continuous barrier has been compromised for ease of use. MP&E inspectors should take exception to this condition, as a continuous barrier is required between the locomotive and car. At times courtesy handholds are located on the topside on each end of the passenger car. This handhold gets very little attention and is often found to have loose fasteners and an exception should be taken. MP&E inspector(s) should be aware that courtesy safety appliances are not required, but if a courtesy handhold is found to be non-compliant, the MP&E inspector(s) should take the position, although not required, still have to meet the safety appliance standards if installed on the car. Clearance problems may appear to exist in the location of the handbrake arrangement due to interference. No exception should be taken to this arrangement, if in doubt, contact your Regional Supervisor or Headquarters MP&E Staff Director. Any Safety appliance that has two safety appliance arrangements fastened at one end held together by use of one fastener are prone to looseness and should be physically inspected for tightness. Low platform cars that have retractable steps should be examined for operation and proper securement to determine step integrity. Any components found to be missing, insecure or broken should be taken as an exception.

Approval of the use welded blocks or similar welded configurations to support safety appliance arrangements that are fastened with FRA approved mechanical fasteners on passenger cars have yet to be determined by the Office of Safety. Any safety appliance arrangement found to have a defective weld is defective and non-compliant. These cars should be reported to your Regional Supervisor or Headquarters MP&E Staff Director.

§231.13 Passenger-train cars with open-end platforms.

(a) *Hand brakes* -- (1) *Number.* Each passenger-train car shall be equipped with an efficient hand brake, which shall operate in harmony with the power brake thereon.
(2) *Location.* Each hand brake shall be so located that it can be safely operated while car is in motion.
(b) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 16 inches. Minimum clearance, 2, preferably 2 1/2 inches. Handholds shall be flush with or project not more than 1 inch beyond surface of end sill.
(3) *Location.* Horizontal, one near each side of each end on face of platform end sill, projecting downward. Clearance of outer end of handhold shall be not more than 16 inches from end of end sill.
(4) *Manner of application.* End-handholds shall be securely fastened with bolts or rivets.

(c) *End-platform handholds* -- (1) *Number.* Four. (Cars equipped with safety gates do not require end-platform handholds.)
(2) *Dimensions.* Minimum clearance, 2, preferably 2 1/2 inches, metal.
(3) *Location.* Horizontal from or near door post to a point not more than 12 inches from corner of car, then approximately vertical to a point not more than 6 inches from top of platform. Horizontal portion shall be not less than 24 inches in length nor more than 40 inches above platform.
(4) *Manner of application.* End-platform handholds shall be securely fastened with bolts, rivets, or screws.
(d) *Uncoupling levers.* (1) Uncoupling attachments shall be applied so they can be operated by a person standing on the ground.
(2) Minimum length of ground uncoupling attachment, 42 inches, measured from center of end of car to handle of attachment.
(3) On passenger-train cars used in freight or mixed-train service the uncoupling attachments shall be so applied that the coupler can be operated from left side of car.

§231.13 Application and Guidance

One efficient Hand brake will be located on the car that can be safely operated when the car is in motion and shall operate in harmony with the power brake. Four end handholds with a minimum diameter of 5/8" of wrought iron or steel with a minimum clear length of 16 inches that has a minimum clearance of 2 preferably 2 1/2 inches. Each handhold shall be flush with or project not more than 1 inch beyond surface of end sill. One end handholds will be horizontal located near each side of each end on face of platform end sill, projecting downward. A clearance of outer end of handhold will not be more than 16 inches from end of end sill. End handholds will be properly fastened with a FRA approved fastening system. Four end platform handholds are required except those with safety gates.

End platform handholds have a minimum of 2, preferably 2½ inches clearance located horizontally from or near door post to a point not more than 12 inches from corner of car, then approximately vertical to a point not more than 6 inches from top of platform. Horizontal portion will be not less than 24 inches in length nor more than 40 inches above platform. End platform handholds will be properly fastened with a FRA approved fastening system. One Uncoupler lever attachment on each end shall be applied so a person standing on the ground can operate them. The minimum length of ground uncoupling attachment is 42 inches (measured from centerline of end of car to handle of attachment). When passenger cars are used in mixed freight service the uncoupling attachment will be applied that the coupler can be operated from left side of car.

MP&E inspector(s) should closely examine the fastener hardware, as the approved fastener type may differ as in freight service.

The fastener application may vary on safety appliance arrangements and most are considered to be compliant; however, at times, use of the wrong hardware or repairs to the car have compromised the integrity of the original as built fastener system. MP&E inspectors should physically inspect all safety appliance fasteners, as a visual inspection cannot validate that the handhold is properly secure. MP&E inspector(s) should take exception to any minimally loose handhold since the public use handholds on a regular basis. Contrasting colors from carbody to handholds also apply. Vertical handholds (2) leading into the interior of the passenger car from the vestibule area may appear to have minimum clearance, however, no exception should be taken to these handholds, as they are considered compliant. The knuckle thrower on most passenger cars only disengages knuckle may not always throw open all the way. This type of knuckle thrower operation should not be taken exception to unless no movement of the knuckle occurs. MP&E inspector(s) should examine all gates for proper operation and to insure that weld was not used to permanently create a continuous barrier. MP&E inspector(s) should take exception to these types of conditions. At times, courtesy handholds are located on the topside on each end of the passenger car. This handhold gets very little attention and is often found to have loose fasteners and an exception should be taken. MP&E inspector(s) should be aware that courtesy safety appliances, although not required, still have to meet the safety appliance standards if installed on the car. Clearance problems may appear to exist in the location of the handbrake arrangement due to interference. No exception should be taken to this arrangement, if in doubt please contact your Regional Supervisor or MP&E Headquarters Staff Director. Any Safety appliance that has two safety appliance arrangements fastened at one end held together by use of one fastener are prone to looseness and should be physically inspected for tightness. Low platform cars that have retractable steps should be examined for operation and proper securement to determine step integrity. Any components found to be missing, insecure or broken should be taken as an exception.

Approval of the use welded blocks or similar welded configurations to support safety appliance arrangements that are fastened with FRA approved mechanical fasteners on passenger cars have yet to be determined by the Office of Safety. Any safety appliance arrangement found to have a defective weld is defective and non-compliant. These cars should be reported to your Regional Supervisor or Headquarters MP&E Staff Director.

§231.14 Passenger-train cars without end platforms.

(a) *Handbrakes* -- (1) *Number.* Each passenger-train car shall be equipped with an efficient hand brake which shall operate in harmony with the power brake thereon.
(2) *Location.* Each hand brake shall be so located that it can be safely operated while car is in motion.
(b) *Sill steps* -- (1) *Number.* Four.
(2) *Dimensions.* Minimum length of tread, 10, preferably 12, inches. Minimum cross-sectional area, 1/2 by 1 1/2 inches or equivalent, wrought iron or steel. Minimum clear depth, 8 inches.
(3) *Location.* (i) One near each end on each side not more than 24 inches from corner of car to center of tread of sill step.
(ii) Outside edge of tread of step shall be not more than 2 inches inside of face of side of car.
(iii) Tread shall be not more than 24, preferably not more than 22, inches above the top of rail.
(4) *Manner of application.* (i) Steps exceeding 18 inches in depth shall have an additional tread and be laterally braced.
(ii) Sill steps shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets.
(c) *Side handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 16, preferably 24, inches. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* Horizontal or vertical, one near each end on each side of car over sill step.
(i) If horizontal, not less than 24 nor more than 30 inches above center line of coupler.
(ii) If vertical, lower end not less than 18 nor more than 24 inches above center line of coupler.
(4) *Manner of application.* Side handholds shall be securely fastened with bolts, rivets or screws.
(d) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 16 inches. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* Horizontal, one near each side on each end projecting downward from face of end sill or sheathing. Clearance of outer end of handholds shall be not more than 16 inches from side of car.
(4) *Manner of application.* (i) Handholds shall be flush with or project not more than 1 inch beyond face of end sill.
(ii) End handholds shall be securely fastened with bolts or rivets.
(iii) When marker sockets or brackets are located so that they can not be conveniently reached from platforms, suitable steps and handholds shall be provided for men to reach such sockets or brackets.
(e) *End handrails.* (On cars with projecting end sills.)
(1) *Number.* Four.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clearance, 2, preferably 2 1/2, inches.

(3) *Location.* One on each side of each end, extending horizontally from door post or vestibule frame to a point not more than 6 inches from corner of car, then approximately vertical to a point not more than 6 inches from top of platform end sill; horizontal portion shall be not less than 30 nor more than 60 inches above platform end sill.
(4) *Manner of application.* End handrails shall be securely fastened with bolts, rivets or screws.
(f) *Side-door steps* -- (1) *Number.* One under each door.
(2) *Dimensions.* Minimum length of tread, 10, preferably 12, inches. Minimum cross-sectional area, 1/2 by 1 1/2 inches or equivalent, wrought iron or steel. Minimum clear depth, 8 inches.
(3) *Location.* Outside edge of tread of step not more than 2 inches inside of face of side of car. Tread not more than 24, preferably not more than 22, inches above the top of rail.
(4) *Manner of application.* (i) Steps exceeding 18 inches in depth shall have an additional tread and be laterally braced.
(ii) Side-door steps shall be securely fastened with not less than 1/2-inch bolts with nuts outside (when possible) and riveted over, or with not less than 1/2-inch rivets.
(iii) A vertical handhold not less than 24 inches in clear length shall be applied above each side-door step on door post.
(g) *Uncoupling levers.* (1) Uncoupling attachments shall be applied so they can be operated by a person standing on the ground.
(2) Minimum length of ground uncoupling attachment, 42 inches, measured from center line of end of car to handle of attachment.
(3) On passenger-train cars used in freight or mixed-train service, the uncoupling attachment shall be so applied that the coupler can be operated from the left side of car.

§231.14 Application and Guidance
One efficient Hand brake will be located on the car that can be safely operated when the car is in motion and shall operate in harmony with the power brake. Four sill steps are required with a minimum of length of tread of 10 preferably 12 inches and made of wrought iron or steel. All sill steps will be properly fastened with a FRA approved fastening system. There will be four side handholds, one side handhold can be mounted vertical or horizontally located near each side of car over the sill step. If a horizontal side handhold is used it must be not less than 24 nor more than 30 inches from the centerline of coupler. If a vertical side handhold is used, the lower end will not be less than 18 nor more than 24 inches above center line of coupler. All Side handholds will be properly fastened with a FRA approved fastening system.

Four end handholds will be required and made of wrought iron or steel, each end handhold will be located near each side on each end projecting downward from face of end sill or sheathing. The end handhold clearance of the outer end of handholds will not be more than 16 inches from side of car and flush with or project not more than 1 inch beyond face of end sill. All end handholds will be properly fastened with a FRA approved fastening system and when marker sockets or brackets are located so that they can not be conveniently reached from platforms, suitable steps and handholds shall be provided for men to reach such sockets or brackets.
Four end handrails will be provided (for cars that has projected end sills) and made of wrought iron or steel with minimum clearance of 2, preferably 4 inches. Each end handrail will be located on one side of each end, extending horizontally from the door post or vestibule frame to a point not more than 6 inches from corner of car, then approximately vertical to a point not more than 6 inches from top of platform end sill; horizontal portion will not be less than 30 nor more than 60 inches above platform end sill. The end handrail will be properly fastened with a FRA approved fastening system.
There will be one side-door step under each door with a minimum length of tread, 10 preferably 12 inches that is made of wrought iron or steel. Side-door steps that exceed 18 inches in depth shall have an additional tread and be laterally braced. Side-door steps will be properly fastened with a FRA approved fastening system.
A vertical handhold not less than 24 inches in clear length will be applied above each side-door step on the door post. One Uncoupler lever attachment on each end shall be applied so a person standing on the ground can operate them. The minimum length of ground uncoupling attachment is 42 inches (measured from centerline of end of car to handle of attachment).
When passenger cars are used in mixed freight service the uncoupling attachment will be applied that the coupler can be operated from left side of car.

MP&E inspector(s) should closely examine the fastener hardware, as the approved fastener type may differ as in freight service. The fastener application may vary on safety appliance arrangements and most are considered to be compliant; however, at times, use of the wrong hardware or repairs to the car have compromised the integrity of the original as built fastener system. Inspectors should physically inspect all safety appliance fasteners, as a visual inspection cannot validate that the handhold is properly secure. Inspectors should take exception to any minimally loose handhold since the public use handholds on a regular basis. Contrasting colors from carbody to handholds also apply. Vertical handholds (2) leading into the interior of the passenger car from the vestibule area may appear to have minimum clearance, however, no exception should be taken to these handholds, as they are considered compliant. The knuckle thrower on most passenger cars only disengages knuckle may not always throw open all the way.

This type of knuckle thrower operation should not be taken exception to unless no movement of the knuckle occurs. Where locomotives coupled to passenger cars are used in push/pull service, where a continuous barrier has been compromised for ease of use.

MP&E inspector(s) should take exception to this condition, as a continuous barrier is required between the locomotive and car. At times courtesy handholds are located on the topside on each end of the passenger car. This handhold gets very little attention and is often found to have loose fasteners and an exception should be taken. MP&E inspector(s) should be aware that courtesy safety appliances, although not required, still have to meet the safety appliance standards if installed on the car. Clearance problems may appear to exist in the location of the handbrake arrangement due to interference. No exception should be taken to this arrangement, if in doubt please contact your Regional Supervisor or MP&E Headquarters Staff Director. Any Safety appliance that has two (2) safety appliance arrangements fastened at one end held together by use of one (1) fastener are prone to looseness and should be physically inspected for tightness. Low platform cars that have retractable steps should be examined for operation and proper securement to determine step integrity. Any components found to be missing, insecure or broken should be taken as an exception.

Approval of the use welded blocks or similar welded configurations to support safety appliance arrangements that are fastened with FRA approved mechanical fasteners on passenger cars have yet to be determined by the Office of Safety. Any safety appliance arrangement found to have a defective weld is defective and non-compliant. These cars should be reported to your Regional Supervisor or Headquarters MP&E Staff Director.

§231.15 Steam locomotives used in road service.

(a) *Tender till-steps* -- (1) *Number.* Four on tender.
(2) *Dimensions.* (i) Bottom tread not less than 8 by 12 inches, metal. (May have wooden treads.)
(ii) If stirrup steps are used, clear length of tread shall be not less than 10, preferably 12, inches.
(3) *Location.* One near each corner of tender on sides.
(4) *Manner of application.* Tender sill-steps shall be securely fastened with bolts or rivets.
(b) *Pilot sill-steps* -- (1) *Number.* Two.
(2) *Dimensions.* Tread not less than 8 inches in width by 10 inches in length, metal. (May have wooden treads.)
(3) *Location.* One on or near each end of buffer-beam outside of rail and not more than 16 inches above rail.
(4) *Manner of application.* Pilot sill-steps shall be securely fastened with bolts or rivets.
(c) *Pilot-beam handholds* -- (1) *Number.* Two.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 14, preferably 16, inches. Minimum clearance, 2 1/2 inches.

(3) *Location.* One on each end of buffer-beam. If uncoupling lever extends across front end of locomotive to within 8 inches of end of buffer-beam, and is seven-eighths of an inch or more in diameter, securely fastened, with a clearance of 2 1/2 inches, it is a handhold.)
(4) *Manner of application.* Pilot-beam handholds shall be securely fastened with bolts or rivets.
(d) *Side handholds* -- (1) *Number.* Six.
(2) *Dimensions.* Minimum diameter, if horizontal, five-eighths of an inch; if vertical, seven-eighths of an inch, wrought iron or steel. Horizontal, minimum clear length, 16 inches. Vertical, clear length equal to approximate height of tank. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* (i) Horizontal or vertical. If vertical, one on each side of tender within 6 inches of rear or on corner; if horizontal, same as specified for "Box and other house cars" (see §231.1(h)(3)).
(ii) One on each side of tender near gangway; 1 on each side of locomotive at gangway; applied vertically.
(4) *Manner of application.* Side handholds shall be securely fastened with not less than 1/2-inch bolts or rivets.
(e) *Rear-end handholds* -- (1) *Number.* Two.
(2) *Dimensions.* Minimum diameter, five-eighths of an inch, wrought iron or steel. Minimum clear length, 14 inches. Minimum clearance, 2, preferably 2 1/2, inches.
(3) *Location.* Horizontal, one near each side of rear end of tender on face of end sill. Clearance of outer end of handhold shall be not more than 16 inches from side of tender.
(4) *Manner of application.* Rear-end handholds shall be securely fastened with not less than 1/2-inch bolts or rivets.
(f) *Uncoupling levers* -- (1) *Number.* Two double levers, operative from either side.
(2) *Dimensions.* Rear-end levers shall extend across end of tender with handles not more than 12, preferably 9, inches from side of tender with a guard bent on handle to give not less than 2 inches clearance around handle.
(3) *Location.* One on rear end of tender and one on front end of locomotive. Handles of front-end levers shall be not more than 12, preferably 9, inches from ends of buffer-beam, and shall be so constructed as to give a minimum clearance of 2 inches around handle.
(4) *Manner of application.* Uncoupling levers shall be securely fastened with bolts or rivets.
(g) *Couplers.* Locomotives shall be equipped with automatic couplers at rear of tender and front of locomotive.

§231.15 Application and Guidance

There will be four Tender Sill-steps with bottom tread no less than 8 by12 inches and metal, may have wooden treads. If stirrup steps are used clear length of tread will be no less than 10, preferably 12 inches.
Tender sill-steps will be located one near each corner of tender on sides, and will be securely fastened with approved FRA fasteners.

There will be two Pilot Sill-steps with a tread no less than 8 inches wide by 10 inches long and metal. May have wooden treads and will be securely fastened with approved FRA fasteners.
Two Pilot-Beam Handholds will have a minimum diameter of 5/8 inch wrought iron or steel. One will be located on each end of buffer beam unless uncoupling lever extends across front end of locomotive to within 8 inches of end of buffer beam and will be securely fastened with FRA approved fasteners.
There will be six Side Handholds with minimum diameter 5/8 inch if horizontal and 7/8 inch if vertical.
Horizontal Side Handholds will be same as specified in "Box and other house cars" 231.1(h)(3) and vertical side handholds one will be located on each side of tender and will be securely fastened with approved FRA fasteners.
Two Rear-end Handholds with minimum diameter of 5/8 inch wrought iron or steel and minimum clear length of 14 inches.
Rear-End handholds will be located one near each end of tender on face of end sill and applied with approved FRA fasteners.
Two double Uncoupling Levers operative from either side will extend across end of tender with handles no more than 12, preferably 9 inches from side of tender with a guard bent on handle to give no less than 2 inches clearance around handle. They will be located one on rear end of tender and one on front end of locomotive and must be securely fastened with approved FRA fasteners.
Locomotives will be equipped with automatic couplers at rear of tender and front of locomotive.

The vast majority if not all steam locomotives in use today is used in Tourist and Excursion road service. The focus of safety appliance inspection on steam locomotives should be directed at whether or not, the appliance is structurally sound, securely fastened and located, provides proper clearance, is unobstructed, and is safe to use.

Refer to Locomotive Plates "S-3" and "S-4" below for additional application and interpretative information.

Note: Former TB *MP&E-98-64-* Subject: Auxiliary Lights Interfering With Safety Appliances

Some railroads have had the auxiliary lights (ditch lights) installed in a manner which covers a portion of the uncoupling levers, which serve as the end handhold on a locomotive.

Locomotives found in non-compliance should be taken out of service for corrective action.

Plate "S-4"

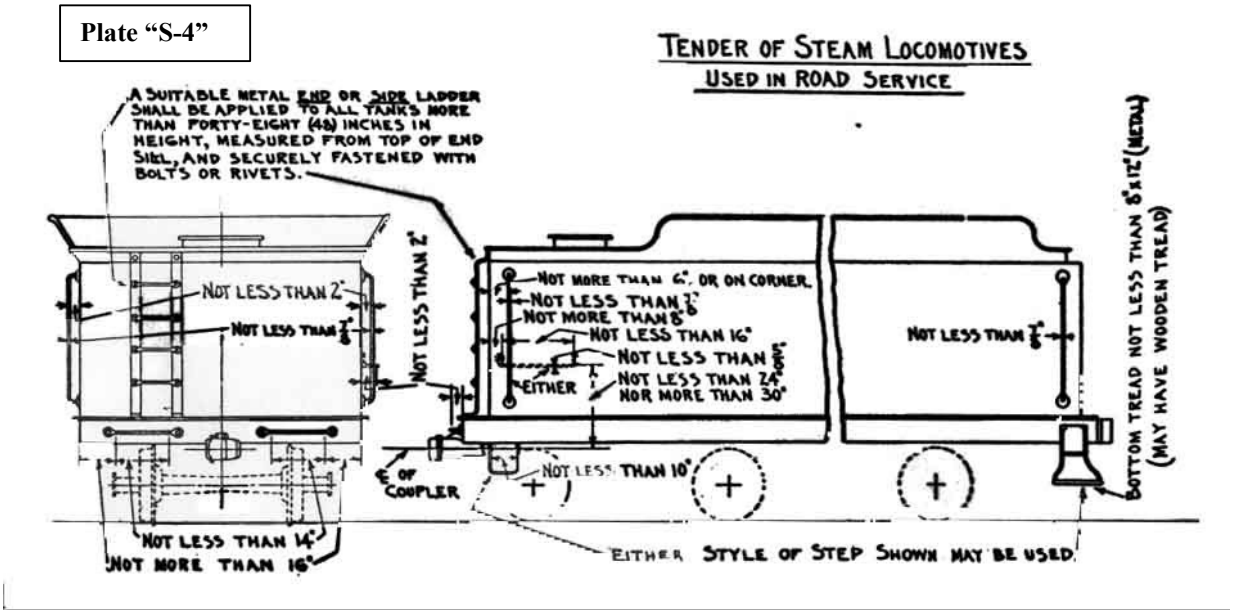
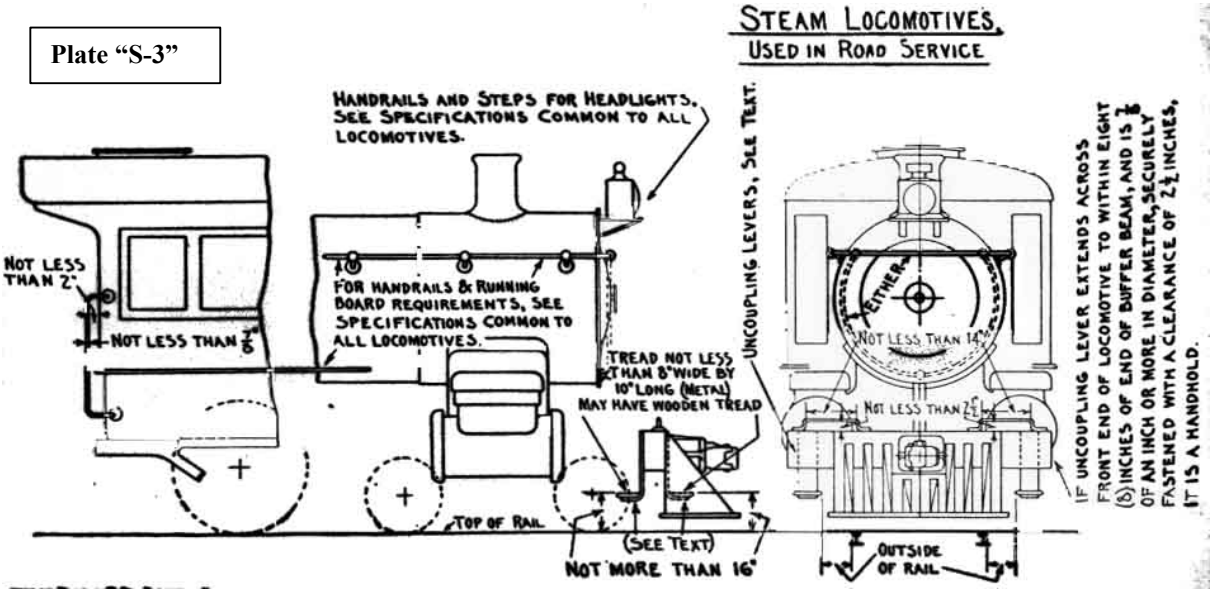

TENDER OF STEAM LOCOMOTIVES
USED IN ROAD SERVICE
A SUITABLE METAL END OR SIDE LADDER SHALL BE APPLIED TO ALL TANKS MORE THAN FORTY-EIGHT (48) INCHES IN HEIGHT, MEASURED FROM TOP OF END SILL, AND SECURELY FASTENED WITH BOLTS OR RIVETS.
NOT LESS THAN 2"
NOT LESS THAN 2"
NOT MORE THAN 6", OR ON CORNER
NOT LESS THAN 7"
NOT MORE THAN 8"
NOT LESS THAN 16"
NOT LESS THAN
EITHER
NOR MORE THAN 30"
NOT LESS THAN 10"
℄ OF COUPLER
NOT LESS THAN 14"
NOT MORE THAN 16"
EITHER STYLE OF STEP SHOWN MAY BE USED
BOTTOM TREAD NOT LESS THAN 8"x12" (METAL) (MAY HAVE WOODEN TREAD)

Plate "S-3"


STEAM LOCOMOTIVES.
USED IN ROAD SERVICE
HANDRAILS AND STEPS FOR HEADLIGHTS. SEE SPECIFICATIONS COMMON TO ALL LOCOMOTIVES.
NOT LESS THAN 2"
NOT LESS THAN 5/8"
FOR HANDRAILS & RUNNING BOARD REQUIREMENTS, SEE SPECIFICATIONS COMMON TO ALL LOCOMOTIVES.
TREAD NOT LESS THAN 8" WIDE BY 10" LONG (METAL) MAY HAVE WOODEN TREAD
UNCOUPLING LEVERS, SEE TEXT.
TOP OF RAIL
(SEE TEXT)
NOT MORE THAN 16"
EITHER
NOT LESS THAN 14"
NOT LESS THAN 2 1/2"
OUTSIDE OF RAIL
IF UNCOUPLING LEVER EXTENDS ACROSS FRONT END OF LOCOMOTIVE TO WITHIN EIGHT (8) INCHES OF END OF BUFFER BEAM, AND IS 7/8 OF AN INCH OR MORE IN DIAMETER, SECURELY FASTENED WITH A CLEARANCE OF 2 1/2 INCHES, IT IS A HANDHOLD.

§231.16 Steam locomotives used in switching service.

(a) *Footboards* -- (1) *Number.* Two or more.
(2) *Dimensions.* (i) Minimum width of tread, 10 inches.
(ii) Minimum height of back stop, 4 inches above tread.
(iii) Height from top of rail to top of tread, not more than 12 nor less than 9 inches.
(iv) If made of wood, minimum thickness of tread shall be 1 1/2, preferably 2 inches.
(v) Footboards may be made of material other than wood which provides the same as or a greater degree of safety than wood of 1 1/2 inches thickness. When made of material other than wood, the tread surface shall be of antiskid design and constructed with sufficient open space to permit the elimination of snow and ice from the tread surface.
(3) *Location.* Ends or sides. If on ends, they shall extend not less than 18 inches outside of guage of straight track, and shall be not more than 12 inches shorter than buffer-beam at each end.
(4) *Manner of application.* (i) End footboards may be constructed in two sections, provided that practically all space on each side of coupler is filled; each section shall be not less than 3 feet in length.
(ii) Footboards shall be securely bolted to two 1- by 4-inch metal brackets, provided footboard is not cut or notched at any point.
(iii) If footboard is cut or notched or in two sections, not less than four 1- by 3-inch metal brackets shall be used, two located on each side of coupler. Each bracket shall be securely bolted to buffer-beam, end sill or tank frame by not less than two 7/8-inch bolts.
(iv) If side footboards are used, a substantial handhold or rail shall be applied not less than 30 inches nor more than 60 inches above tread or footboard.
(b) *Sill steps* -- (1) *Number.* Two or more.
(2) *Dimensions.* (i) Lower tread of step shall be not less than 8 by 12 inches, metal. (May have wooden treads.)
(ii) If stirrup steps are used, clear length of tread shall be not less than 10, preferably 12, inches.
(3) *Location.* One or more on each side at gangway secured to locomotive or tender.
(4) *Manner of application.* Sill steps shall be securely fastened with bolts or rivets.
(c) *End handholds* -- (1) *Number.* Two.
(2) *Dimensions.* Minimum diameter, 1 inch, wrought iron or steel. Minimum clearance, 4 inches, except at coupler casting or braces when minimum clearance shall be 2 inches.
(3) *Location.* One on pilot, buffer-beam; one on rear end of tender, extending across front end of locomotive and rear end of tender. Ends of handholds shall be not more than 6 inches from ends of buffer-beam or end sill, securely fastened at ends.
(4) *Manner of application.* End handholds shall be securely fastened with bolts or rivets.

(d) *Side handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Minimum diameter, seven-eighths of an inch, wrought iron or steel. Clear length equal to approximate height of tank. Minimum clearance, 2, preferably 2 1/2 inches.
(3) *Location.* Vertical. One on each side of tender near front corner; one on each side of locomotive at gangway.
(4) *Manner of application.* Side handholds shall be securely fastened with bolts or rivets.
(e) *Uncoupling levers* -- (1) *Number.* Two double levers, operative from either side.
(2) *Dimensions.* (i) Handles of front-end levers shall be not more than 12, preferably 9, inches from ends of buffer-beam, and shall be so constructed as to give a minimum clearance of 2 inches around handle.
(ii) Rear-end levers shall extend across end of tender with handles not more than 12, preferably 9, inches from side of tender, with a guard bent on handle to give not less than 2 inches clearance around handle.
(3) *Location.* One on rear end of tender and one on front end of locomotive.
(f) *Handrails and steps for headlights.* Switching locomotives with sloping tenders with manhole or headlight located on sloping portion of tender shall be equipped with secure steps and handrail or with platform and handrail leading to such manhole or headlight.
(g) *End-ladder clearance.* No part of locomotive or tender except draft rigging, coupler and attachments, safety chains, buffer block, footboard, brake pipe, signal pipe, steam-heat pipe or arms of uncoupling lever shall extend to within 14 inches of a vertical plane passing through the inside face of knuckle when closed with horn of coupler against buffer block or end sill.
(h) *Couplers.* Locomotives shall be equipped with automatic couplers at rear of tender and front of locomotive.

§231.16 Application and Guidance

Two or more Footboards with minimum tread width of 10 inches and minimum height of backstop 4 inches above tread, height from top of rail to top of tread will be no more than 12 and no less than 9 inches will be applied to Steam Locomotives. Wood Footboards will be 1 ½, preferably 2 inches.
(Note: Footboards may be made of material other than wood which provides the same as or greater degree of safety than wood of 1 ½ inches thickness. Refer to regulation subsections for this part prior to inspection.)
Footboards may be located on ends or sides and applied with FRA approved fasteners.
There will be two or more Sill Steps with lower tread of no less than 8 by 12 inches and metal. If stirrup steps are used clear length of tread will be no less than 10, preferably 12 inches.
Sill steps will be located, one or more on each side of gateway and secured to locomotive at ender with FRA approved fasteners.
Two End Handholds with minimum diameter of 1 inch wrought iron or steel, located one on pilot buffer beam, one on rear of tender extending across front of locomotive and rear end of tender. Ends of handholds will be no more than 6 inches from ends of buffer-beam or end sill securely fastened with FRA approved fasteners.

There will be four Side Handholds with minimum diameter 7/8-inch wrought iron or steel and clear length equal to approximate height of tank.
They will be vertically located, one on each side of tender near front corner and one on each side of locomotive at gangway and securely fastened with FRA approved fasteners.
Two double Uncoupling Levers will operate from either side.
Handles of front levers will be no more than 12, preferably 9 inches from ends of buffer-beam and constructed as to give minimum clearance of 2 inches around handle. Rear end levers will extend across end of tender with handles no more than 12, preferably 9 inches from side of tender with a guard bent on handle to give no less than 2 inches clearance around handle.
One uncoupling lever will be located on rear end of tender and one on front end of locomotive.
Handrails and steps for headlights on switching locomotives with sloping tenders with manhole headlight located on slopping portion of tender will be equipped with secure steps and handrail or with a platform and handrail leading to the manhole or headlight.
End Ladder clearance: No part of locomotive or tender except draft rigging, coupler and attachments, safety chains, buffer block, footboard, brake pipe signal pipe, steam heat pipe or arms of uncoupling lever will extend to within 14 inches of a vertical plane passing through the inside face of knuckle when closed with horn of coupler against buffer block or end sill.
Locomotives will be equipped with automatic couplers at rear end of tender and front of locomotive.

The regulations pertaining to steam locomotives in switching service require footboards. However, MP&E inspector(s) should not take exception to steam locomotives that have had the footboards removed. Conversely, many steam locomotive owners/operators have elected not to remove the footboards from their locomotives for historical purposes, but may prohibit railroad personnel from occupying the footboard while the locomotive is moving. In either case, the focus of safety appliance inspection on steam locomotives should be directed at whether or not, the appliance is structurally sound, securely fastened and located, provides proper clearance, is unobstructed, and is safe to use.

Refer to Locomotive Plates “S-1” and “S-2” for additional application and interpretative information.

Note: Former TB *MP&E-98-64-* Subject: Auxiliary Lights Interfering With Safety Appliances

Some railroads have had the auxiliary lights (ditch lights) installed in a manner which covers a portion of the uncoupling levers, which serve as the end handhold on a locomotive.

Locomotives found in non-compliance should be should be taken out of service for corrective action.

Plate "S-1"

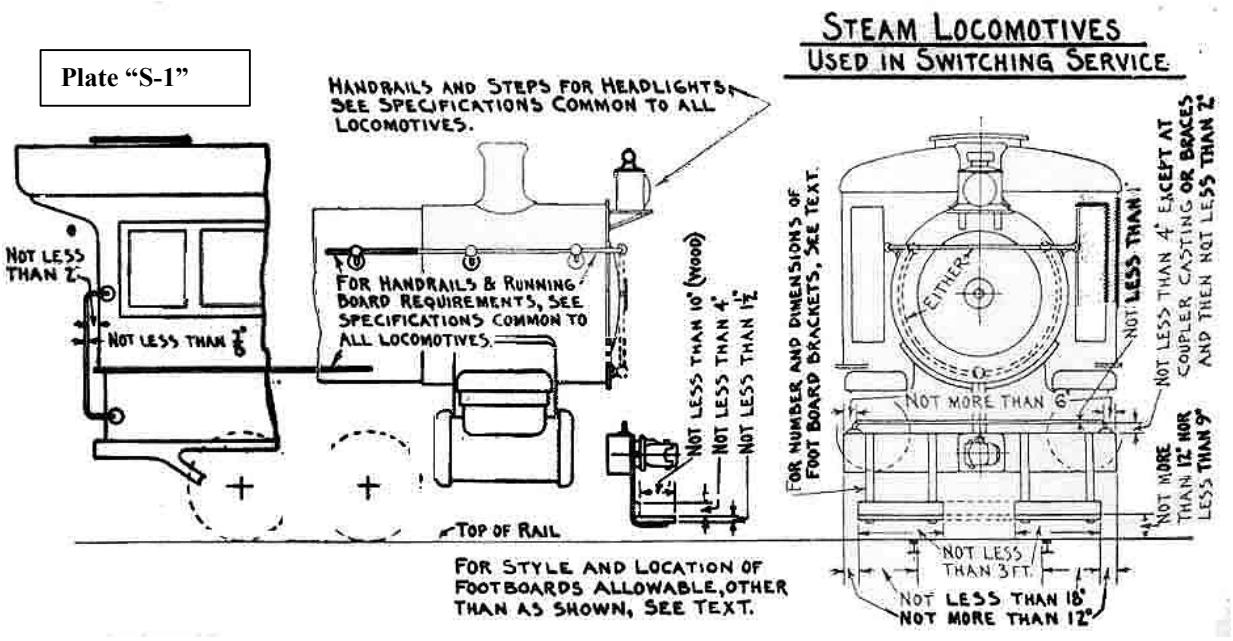
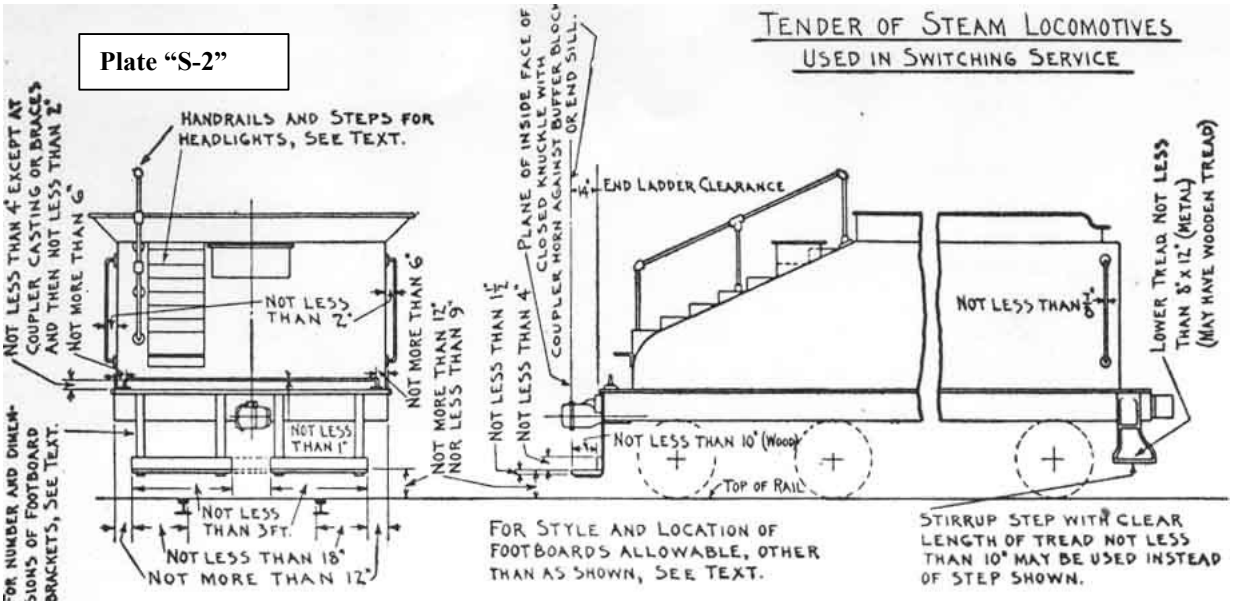

STEAM LOCOMOTIVES
USED IN SWITCHING SERVICE
HANDRAILS AND STEPS FOR HEADLIGHTS, SEE SPECIFICATIONS COMMON TO ALL LOCOMOTIVES.
NOT LESS THAN 2"
NOT LESS THAN 3/8"
FOR HANDRAILS & RUNNING BOARD REQUIREMENTS, SEE SPECIFICATIONS COMMON TO ALL LOCOMOTIVES.
NOT LESS THAN 10" (WOOD)
NOT LESS THAN 4"
NOT LESS THAN 1½"
TOP OF RAIL
FOR STYLE AND LOCATION OF FOOTBOARDS ALLOWABLE, OTHER THAN AS SHOWN, SEE TEXT.
FOR NUMBER AND DIMENSIONS OF FOOT BOARD BRACKETS, SEE TEXT.
EITHER
NOT LESS THAN 1"
NOT MORE THAN 6"
NOT LESS THAN 4" EXCEPT AT COUPLER CASTING OR BRACES AND THEN NOT LESS THAN 2"
NOT MORE THAN 12" NOR LESS THAN 9"
NOT LESS THAN 3 FT.
NOT LESS THAN 18"
NOT MORE THAN 12"

Plate "S-2"


TENDER OF STEAM LOCOMOTIVES
USED IN SWITCHING SERVICE
HANDRAILS AND STEPS FOR HEADLIGHTS, SEE TEXT.
NOT LESS THAN 4" EXCEPT AT COUPLER CASTING OR BRACES AND THEN NOT LESS THAN 2"
NOT MORE THAN 6"
NOT LESS THAN 2"
NOT MORE THAN 6"
NOT LESS THAN 1"
NOT MORE THAN 12" NOR LESS THAN 9"
NOT LESS THAN 1½"
NOT LESS THAN 4"
PLANE OF INSIDE FACE OF CLOSED KNUCKLE WITH COUPLER HORN AGAINST BUFFER BLOCK OR END SILL.
END LADDER CLEARANCE
NOT LESS THAN 10" (WOOD)
TOP OF RAIL
NOT LESS THAN 3FT.
NOT LESS THAN 18"
NOT MORE THAN 12"
FOR STYLE AND LOCATION OF FOOTBOARDS ALLOWABLE, OTHER THAN AS SHOWN, SEE TEXT.
NOT LESS THAN 6"
LOWER TREAD NOT LESS THAN 8" x 12" (METAL) (MAY HAVE WOODEN TREAD)
STIRRUP STEP WITH CLEAR LENGTH OF TREAD NOT LESS THAN 10" MAY BE USED INSTEAD OF STEP SHOWN.

§231.17 Specifications common to all steam locomotives.

(a) *Hand brakes.* (1) Hand brakes will not be required on locomotives nor on tenders when attached to locomotives.
(2) If tenders are detached from locomotives and used in special service, they shall be equipped with efficient hand brakes.
(b) *Running boards* -- (1) *Number.* Two.
(2) *Dimensions.* Not less than 10 inches wide. If of wood, not less than 1 1/2 inches in thickness; if of metal, not less than three-sixteenths of an inch, properly supported.
(3) *Location.* One on each side of boiler extending from cab to front end near pilot-beam. (Running boards may be in sections. Flat-top steamchests may form section of running board.)
(4) *Manner of application.* (i) Running boards shall be securely fastened with bolts, rivets, or studs.
(ii) Locomotives having Wootten type boilers with cab located on top of boiler more than 12 inches forward from boiler head shall have suitable running boards running from cab to rear of locomotive, with handrailings not less than 20 nor more than 48 inches above outside edge of running boards, securely fastened with bolts, rivets, or studs.
(c) *Handrails* -- (1) *Number.* Two or more.
(2) *Dimensions.* Not less than 1 inch in diameter, wrought iron or steel.
(3) *Location.* One on each side of boiler extending from near cab to near front end of boiler, and extending across front end of boiler, not less than 24 nor more than 66 inches above running board.
(4) *Manner of application.* Handrails shall be securely fastened to boiler.
(d) *Tenders of Vanderbilt type.* (1) Tenders known as the Vanderbilt type shall be equipped with running boards; one on each side of tender not less than 10 inches in width and one on top of tender not less than 48 inches in width, extending from coal space to rear of tender.
(2) There shall be a handrail on each side of top running board, extending from coal space to rear of tank, not less than 1 inch in diameter and not less than 20 inches in height above running board from coal space to manhole.
(3) There shall be a handrail extending from coal space to within 12 inches of rear of tank, attached to each side of tank above side running board not less than 30 nor more than 66 inches above running board.
(4) There shall be one vertical end handhold on each side of Vanderbilt type of tender, located within 8 inches of rear of tank extending from within 8 inches of top of end sill to within 8 inches of side handrail. Post supporting rear end of side running board, if not more than 2 inches in diameter and properly located, may form section of handhold.
(5) An additional horizontal end handhold shall be applied on rear end of all Vanderbilt type of tenders which are not equipped with vestibules. Handhold to be located not less than 30 nor more than 66 inches above top of end sill. Clear length of handhold to be not less than 48 inches.
(6) Ladders shall be applied at forward ends of side running boards.

(e) *Handrails and steps for headlights.* (1) Locomotives having headlights which can not be safely and conveniently reached from pilot-beam or steam chests shall be equipped with secure handrails and steps suitable for the use of men in getting to and from such headlights.
(2) A suitable metal end or side ladder shall be applied to all tanks more than 48 inches in height, measured from the top of end sill, and securely fastened with bolts or rivets.
(f) *Couplers.* Locomotives shall be equipped with automatic couplers at rear of tender and front of locomotive.

§231.17 Application and Guidance

Steam locomotives with Vanderbilt type tenders require additional handrails, running boards and handholds that vary from other tenders.

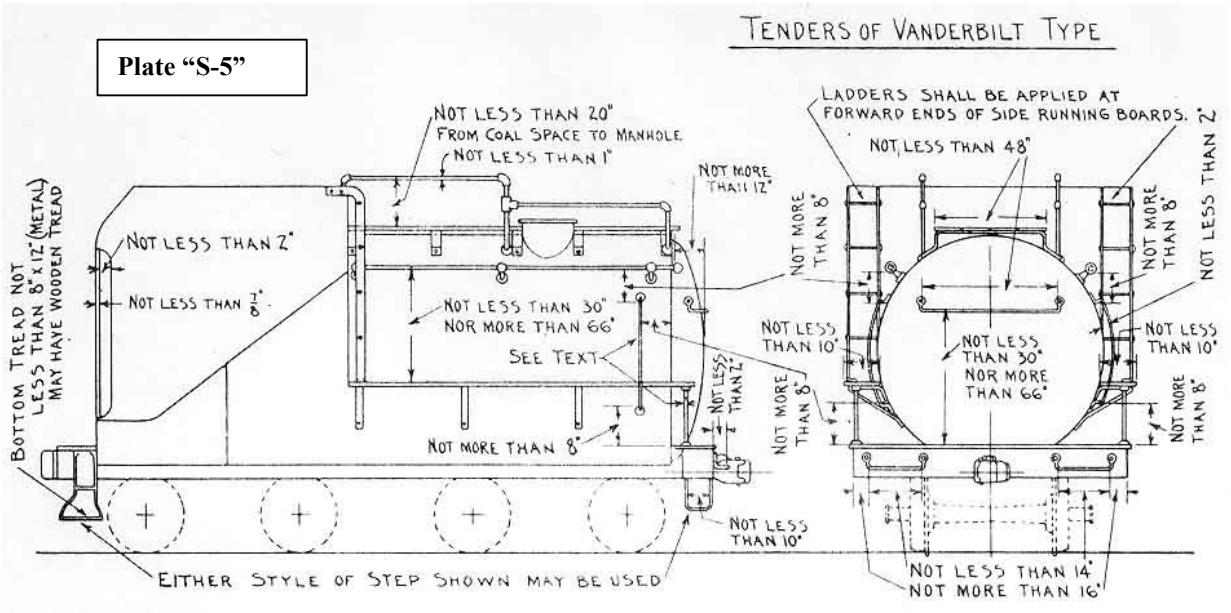
Refer to the Locomotive Plate "S-5" for additional application and interpretative information.

Note: Former TB *MP&E-98-64-* Subject: Auxiliary Lights Interfering With Safety Appliances

Some railroads have had the auxiliary lights (ditch lights) installed in a manner which covers a portion of the uncoupling levers, which serve as the end handhold on a locomotive.

Locomotives found in non-compliance should be taken out of service for corrective action.

Plate "S-5"


TENDERS OF VANDERBILT TYPE
NOT LESS THAN 20" FROM COAL SPACE TO MANHOLE
NOT LESS THAN 1"
NOT MORE THAN 12"
LADDERS SHALL BE APPLIED AT FORWARD ENDS OF SIDE RUNNING BOARDS.
NOT LESS THAN 48"
NOT LESS THAN 2"
BOTTOM TREAD NOT LESS THAN 8"x12" (METAL) MAY HAVE WOODEN TREAD
NOT LESS THAN 2"
NOT LESS THAN 7/8"
NOT LESS THAN 30" NOR MORE THAN 66"
SEE TEXT
NOT LESS THAN 12"
NOT MORE THAN 8"
NOT LESS THAN 10"
NOT LESS THAN 30" NOR MORE THAN 66"
NOT LESS THAN 14"
NOT MORE THAN 16"
EITHER STYLE OF STEP SHOWN MAY BE USED

§231.18 Cars of special construction.

Cars of construction not covered specifically in the foregoing sections in this part, relative to handholds, sill steps, ladders, hand brakes and running boards may be considered as of special construction, but shall have, as nearly as possible, the same complement of handholds, sill steps, ladders, handbrakes and running boards as are required for cars of the nearest approximate type.

§231.18 Application and Guidance
Cars of construction not covered specifically in the foregoing sections in this part, relative to handholds, sill steps, ladders, hand brakes and running boards may be considered as of special construction, but shall have, as nearly as possible, the same complement of handholds, sill steps, ladders, hand brakes, and running boards as are required for cars of the nearest approximate type.

Cars of this type are unique from the original designed car types noted in part §231 and are to be considered "cars of special construction". The MP&E inspector(s) should look closely to examine each section of part §231 to identify the car of the closet construction. Many times support from the Regional Supervisor or Headquarters MP&E Staff Director will help determine the closet approximate of nearest car and that was previously identified. Car builders may have records that indicate this special car of construction was identified in the past and will supply the MP&E inspector(s) information that indicates the history of the car previous closely constructed car through the sample car process. At times, questions arise as to the type of car the closet to construction will comply to several different types of cars that meet the interpretation and for each region, the car that is built at that location may differ in another location depending upon the car construction. In this case, the MP&E inspector(s) should contact the Regional Supervisor or Headquarters Staff Director with the MP&E Staff Headquarters Safety Appliance Specialist to determine the type car that meets the requirements of part §231. At times, while inspecting similar cars in the field a car of the same appearance outlined in part §231 but has several different cars types based on the need of the cars requirement when built. These types of cars should be checked using a railroad system (i.e. an umbler) or similar system to identify the type car of closest to construction when the sample car inspection was performed. This information is helpful to determine the car construction and assist the inspector to determine the closest of the car construction. In these special instances, the MP&E inspector(s) should use good judgement and use the information supplied by the carrier as to the type of car that is applied before taking exceptions to safety appliance or construction requirements. The best solution is the FRA sample car inspection letter owners have in their possession that identifies the car, and if in fact, a sample car inspection was ever performed.

Former TB *MP&E-98-17-* Bulkhead flat cars are considered a car of special construction (§231.18). FRA is of the opinion that this car, with fixed ends above the floor, most closely resembles cars described in Part §231.27, "House and other box cars without hatch covers built or put in service after October 1, 1966", therefore, should comply as nearly as possible with all sections of this part.

Federal Railroad Administration

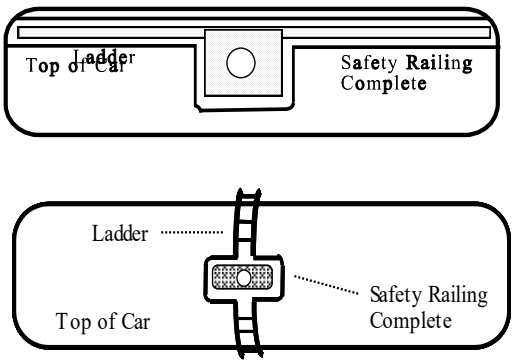
Former TB *MP&E-98-31-* Subject: §231.21(j)(3) §231.18 Safety Chains on Tank Cars
Operating platforms must be of sufficient length to provide access to all operating fittings. Ladder to be located on sides of car at center.

The safety railing shall enclose the operating platform, manway and fittings used in the loading and unloading of the tank. Railing shall be open only at the ladders where it shall extend in a vertical direction down to, and be securely attached to the platform. Maximum width of opening, twenty-four inches.
Tank cars constructed with top operating platforms which have end ladders at each end of the tank car, rather than side ladders, in accordance with Section 231.18, Cars of special construction.

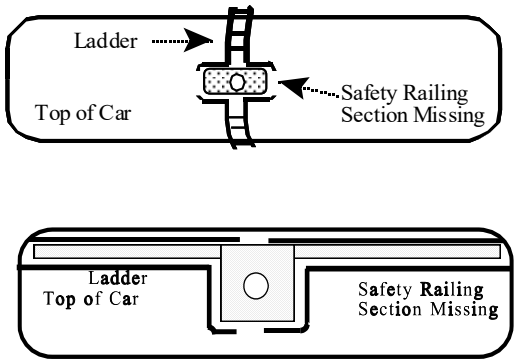
Openings in the operating platform allowing access to the ladders do not require safety railing (safety chain) enclosure. All other openings of the operating platform require enclosure.

Sketch attached:

In Compliance



Not in Compliance



Former TB *MP&E-98-19-* On "pressure differential" 100-Ton Covered Hopper Cars, built by the Thrall Car Manufacturing Company, the end platform and end platform handholds are less than 60 inches long because of structural considerations. A letter was sent to the Thrall Car Manufacturing Company, General Electric, and Rail Car Services that no exception would be taken by FRA on end platforms and horizontal end platform handholds having a length of less than 60 inches due to the structural design of these cars (curved sided). FRA would consider these cars to be of special construction §231.18.

§231.19 Definition of "Right" and "Left."

Right or *Left* refers to side of person when facing end or side of car from ground.

Application

Note: Former TB *MP&E-98-51-* Subject: §231.19 Definition of Left and Right

The MP&E Technical Resolution Committee interpretation, for determining and reporting the location of non-complying and/or defective railroad car components.
"Right or Left refers to the side of person when facing end or side of car from ground"

This bulletin identifies the "A" and "B" end of the car from which the definition will be applied and provides additional guidance for uniformly identifying various components on a car.

The railroad industry's generally established and accepted practice for determining the location of applicable components on rail cars equipped with four, six, or eight wheel trucks is as follows:

The "B" end of a car is determined by the location of the hand brake. The end of the car on which the hand brake is located is the "B" end. The opposite end of the car is known as the "A" end. On cars equipped with hand brakes on both ends, the "A" and "B" end shall be determined as stenciled.

When facing the "B" end of the car, the car is divided into four sections known as BR, BL, AR, and AL. The order of applicable components on the right side of the car shall be known as R1, R2, R3, etc... The order of applicable components on the left side of the car shall be known as L1, L2, L3, etc... See Figure A.

- Beginning at the **"B" end** of the car, brake beams shall be numbered consecutively, see Figure B

The railroad industry's generally established and accepted practice for determining the location of applicable components on articulated and multi-level cars is as follows:

- The **"B" end** of the car is determined by the location of the hand brake. The end of the car on which the hand brake is located and stenciled as "B end", is the **"B" end**. The end unit opposite the **"B" end,** is the **"A" end**. The unit adjacent to the "B" end will be known as the "C" unit and each additional unit will be stenciled consecutively and alphabetically from the "B" end toward the "A" end, see Figure C. For cars equipped with multiple hand brakes, report the unit location.

- When facing the **"B" end** of the car, the right side is known as the **"R" side** and the left side is known as the **"L" side**. Wheel sets and applicable components will be numbered consecutively from the "B" end to the "A" end, 1 through 9. Applicable components above 9 will be identified alphabetically in reverse order from Z (e.g., Z, Y, X, W, etc.) until the last wheel set on the **"A" unit** is identified, see Figure C.

The above guidance should be applied when reporting the location of applicable non-complying components under the provisions of Parts 215, 231 and 232. It can also be applied to passenger cars unless the passenger railroad utilizes some other generally accepted method of identifying the location of passenger car components (e.g., No 1 end, No. 2 end, etc.).

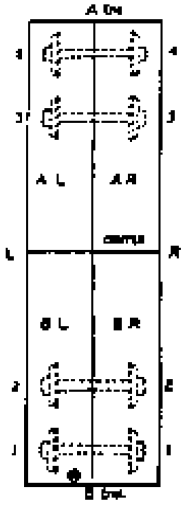


Figure A

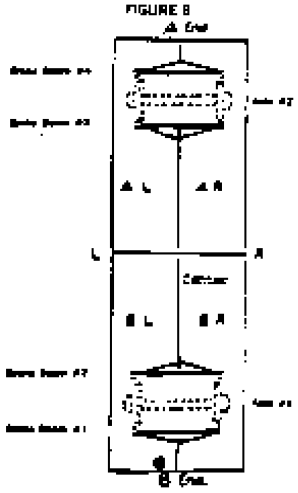


Figure B

§231.20 Variation in size permitted.

To provide for the usual inaccuracies of manufacturing and for wear, where sizes of metal are specified, a total variation of 5 percent below size given is permitted.

§231.21 Tank cars without underframes.

(a) *Hand brakes* -- (1) *Number.* Same as specified for "Box and other house cars" (see §231.1(a)(1)).
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(a)(2)).
(3) *Location.* Each hand brake shall be so located that it can be safely operated while car is in motion. The brake shaft shall be located on end of car to the left of center.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(a)(4)).
(b) *End platforms* -- (1) *Number.* Two.
(2) *Dimensions.* Minimum width, ten inches. Minimum thickness, one and three-quarters inches.
(3) *Location.* One on each end extending across car a distance equal to or greater than any other portion of car. Outside edge of end platform shall extend not less than seven inches beyond bulge of tank head and safety railing.
(4) *Manner of application.* End platforms shall be securely fastened to the draft sills and be sufficiently rigid to prevent sagging.
(c) *Sill steps.* Same as specified for "Box and other house cars" (see §231.1(d)).
(d) *End platform safety railing* -- (1) *Number.* Two.
(2) *Dimensions.* Minimum of seven-eighths inch diameter, wrought iron or steel, or one and one-quarter inch pipe. Minimum clearance, two and one-half inches.
(3) *Location.* One safety railing at each end of car shall extend horizontally across car not less than thirty-six inches nor more than fifty-four inches above end platform and extend downward within three inches of the end of the platform. The safety railing shall be located not more than six inches from the inside edge of the platform.
(4) *Manner of application.* Safety railings shall be supported at center of car and at each end by extending downward at the ends and attaching to the platform.
(e) *Side railing* -- (1) *Number.* Two.
(2) *Dimensions.* One and one-quarter inch pipe. Minimum clearance two and one-half inches.
(3) *Location.* One on each side of car, extending from end platform to end platform at a distance of not less than 51 inches from centerline of car, except that where break in side railing is necessary for side ladder or operating cabinet, the side railing shall be securely attached to such ladder and/or cabinet.
(4) *Manner of application.* Safety railings shall be securely attached to end platforms and supported from the car at intervals not exceeding ten feet.

(f) *Side handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(h)(2)).
(3) *Location.* Four horizontal; one on face of end platform end, over sill step, projecting downward or outward. Clearance of outer end of handhold shall be not more than twelve inches from end of car. Vertical portion of end platform safety railing shall be considered as a side vertical handhold.
(4) *Manner of application.* Same as prescribed for "Box and other house cars" (see §231.1(h)(4)).
(g) *End handholds* -- (1) *Number.* Four.
(2) *Dimensions.* Same as specified for "Box and other house cars" (see §231.1(i)(2)).
(3) *Location.* Horizontal, one near each side of each end of car on face of end sill. Clearance of outer end of handhold shall not be more than sixteen inches from side of car.
(4) *Manner of application.* Same as specified for "Box and other house cars" (see §231.1(i)(4)).
(h) *Uncoupling levers.* Same as specified for "Box and other house cars" (see §231.1(k)).
(i) *End ladder clearance.* No part of car above end sills within thirty inches from side of car, except buffer block, brake shaft, brake-shaft brackets, brake wheel, running boards or uncoupling lever shall extend to within twelve inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill, and no other part of end of car or fixtures on same, above end sills, other than exceptions herein noted, shall extend beyond the outer face of the buffer block.
(j) *Operating platform, ladder and safety railing* -- (1) *Number.* One operating platform, two ladders and safety railing. Not required if all fittings used in the loading or unloading of the tank car are accessible from ground or end platform.
(2) *Dimensions.* (i) Ladder: Ladder stiles, three-eighths by two inches or equivalent, wrought iron or steel. One and one-quarter inch extra strong pipe will be considered equivalent.
(ii) Ladder treads minimum diameter, five-eighths of an inch, wrought iron or steel.
(iii) Minimum clear length of treads, fourteen inches.
(iv) Maximum spacing of treads, nineteen inches.
(v) Minimum clearance of treads and ladder stiles, two inches, preferably two and one-half inches.
(vi) Operating platform, minimum width, seven inches; minimum thickness, one and three-quarters inches.
(vii) Safety railing, one and one-quarter inch wrought iron or steel pipe.
(3) *Location.* (i) Operating platform to be of sufficient length to provide access to all operating fittings. Ladder to be located on sides of car at center.
(ii) The safety railing shall enclose the operating platform, manway and fittings used in the loading and unloading of the tank. Railing shall be open only at the ladders where it shall extend in a vertical direction down to, and be securely attached to the platform. Maximum width of opening, twenty-four inches.

(4) *Manner of application.* (i) The ladders shall be securely fastened to the operating platform. The lower portion of ladder shall be braced in such a manner as to prevent any movement.
(ii) The operating platforms shall be supported to prevent sagging and be securely attached to the tank.
(iii) The safety railing shall be securely attached to four stanchions or corner posts, which shall be securely attached to the tank or operating platform.
(k) *Manner of application of safety appliances on tank cars covered with jackets.* On tanks covered with jackets, metal pads shall be securely attached to the shell proper, to which brackets shall be fastened for securing the safety appliances attached to the tanks; or, the safety appliances (with the exception of the operating platform brackets) may be secured to the jackets reinforced with metal pads at the point of attachment, which pads shall extend at least two inches from the center line of rivet holes. The operating platform brackets shall be secured to the jacket reinforced with suitable bands. When the safety appliances are attached to the jacket covering of the tank, the jacket shall be tightened so that there will be no danger of its slipping around.
[33 FR 19663, Dec. 25, 1968, as amended at 34 FR 11974, July 16, 1969]

§231.21 Application and Guidance

Hand Brakes as same as specified for "Box and other house cars" §231.1(a)(1), with the same dimensions as specified for "Box and other house cars" §231.1 (a)(2).
Each handbrake will be located so it can be safely operated while car is in motion. The brake shaft will be located on end of car to the left of center and applied same as specified for "Box and other house cars"§231.1 (a)(4).
There will be two End Platforms, minimum width ten inches, minimum thickness, one and ¾ inches. End platforms will be located one on each end extending across car a distance equal to or greater than any portion of the car and securely fastened with FRA approved fasteners to the draft sills and be sufficiently rigid to prevent sagging.
Sill Steps will be same as specified for "Box and other house cars" §231.1 (d).
There will be two Safety Railings.
There will be two End Platform Railings, 7/8 inch diameter, wrought iron or steel, or one 1 ¼ inch pipe with minimum clearance of 2 ½ inches.
One safety railing located at each end of car extending horizontally across car and extend downward to the end of the platform and securely applied with FRA approved fasteners.
Two Side Railings, 1 ¼ inch pipe minimum clearance 2 ½ inches. Side railings located, one on each side of car extending from end platform to end platform at a distance of no less than 51 inches from centerline of car, except where break in side railing is necessary for side ladder or operating cabinet and securely fastened with FRA approved fasteners.
There will be four SideHandholds with the same dimensions as specified for "Box and other house cars" §231.1 (h)(2).

They will be horizontally located, one on face of end platform end, over sill step projecting downward or outward. Vertical portion of end platform safety railing will be considered as a side vertical hand hold and securely fastened with FRA approved fasteners.
Four End Hand holds same as specified for "Box and other house cars" §231.1 (i)(4), will be located horizontally one near each end of car on face of sill and securely fastened with FRA approved fasteners.
Uncoupling Levers will be same as specified for "Box and other house cars" §231.1 (k).
End Ladder Clearance: no part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake shaft brackets, brake wheel, running boards or uncoupling lever will extend to within 12 inches of vertical plane parallel with end of car passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill.
There will be one Operating Platform, two Ladders and Safety Railings. These are not required if all fittings used in the loading and unloading of the car tank are accessible from ground or end platform. Operating platforms to be sufficient length to provide access to all operating fittings. Ladder will be located on sides of car at center. The safety railing will enclose the operating platform, manway and fittings used in the loading and unloading of the tank, Railing will be open only at the ladders where it shall extend in a vertical direction down to and be securely fastened with FRA approved fasteners. The lower portion of ladder will be braced as to prevent any movement, they will be securely attached to 4 stanchions or corner posts and securely attached to tank or operating platform.
Safety Appliances on tank cars with jackets will be securely fastened to the shell proper to which brackets will be securely attached to tanks. The operating platform brackets will be securely attached to the jacket and reinforced with suitable bands when safety appliances are attached to the jacket covering of the tank.

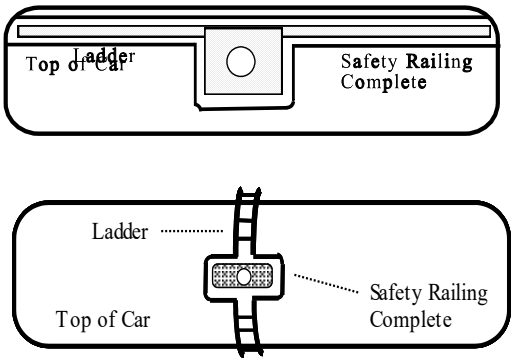
Former TB *MP&E-98-31-* Subject: §231.21(j)(3) §231.18 Safety Chains on Tank Cars
Operating platforms must be of sufficient length to provide access to all operating fittings. Ladder to be located on sides of car at center.

The safety railing shall enclose the operating platform, manway and fittings used in the loading and unloading of the tank. Railing shall be open only at the ladders where it shall extend in a vertical direction down to, and be securely attached to the platform. Maximum width of opening, twenty-four inches.
Tank cars constructed with top operating platforms which have end ladders at each end of the tank car, rather than side ladders, in accordance with Section §231.18, Cars of special construction.

Openings in the operating platform allowing access to the ladders do not require safety railing (safety chain) enclosure. All other openings of the operating platform require enclosure.

See Sketch:

In Compliance



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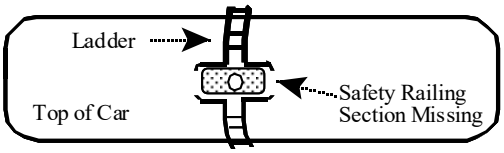

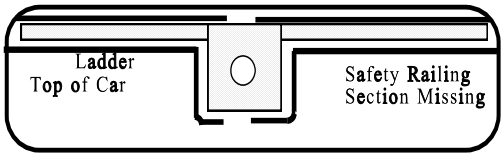

Note: Former TB *MP&E-00-06-* Manufacture and repair of operating platform safety railings 49 CFR§231.21(j) specifies the minimum requirement for operating platforms on tank cars without underframes. Although variations in manufacture or repair of safety platform and railings have been in use for years, confusion among FRA and Manufactures as to which methods comply with regulations.

A tank car task committee was formed to determine guidance for various methods of manufacture and repair for operating platforms and safety railings acceptable to the FRA.

Part §231.21(j) requires operating platform and safety railing to be secured with FRA approved fasteners. FRA believes to be consistent to exercise discretion and continue to allow weldment of certain portions of operating platforms and not take exception to existing equipment but will require FRA approved fasteners on these safety appliance arrangements built after January 1, 2000. Refer to Exhibit G, figures 17 & 18 when repairs are required prior to January 1, 2000. FRA has allowed welding to repair safety railings under controlled conditions. FRA believes for fabrication and repair related to handrails as shown in exhibits A and F, figures 13 thru 16, as acceptable and the railing is mechanically fastened at end locations of the operating platform stanchions.

FRA will not take exception to factory weldments of safety appliance brackets at intermediate locations on gratings of operating platforms as shown in exhibit A and D, figures 7 thru 9. All platform attachments at end supports will have FRA approved fasteners as shown in exhibits A & C, figures 6 & 6A. The only field repair that will be permitted on intermediate brackets will be to replace the grating assembly with factory weld assembly or apply FRA approved fasteners as shown in exhibit A & D figures 7 thru 9. This TB refers to only operating platforms subject to part 231.21(j) and not intended to apply to safety appliance arrangements at other locations of the car. Refer to MP&E TB 00-06 for diagrams or drawings related to the TB.

§231.22 Operation of track motor cars.

On and after August 1, 1963, it shall be unlawful for any railroad subject to the requirements of the Safety Appliance Acts to operate or permit to be operated on its line track motor cars to pull or haul trailers, push trucks, hand cars, or similar cars or equipment.
Effective Date Note: At 28 FR 7839, Aug. 1, 1963, the effective date of §231.22 was stayed until further notice.

§231.22 Application and Guidance

On and after August 1, 1963, it shall be unlawful for any railroad subject to the requirements of the Safety Appliance Acts to operate or permit to be operated on its line track motor cars to pull or haul trailers, push trucks, hand cars, or similar cars or equipment.
Effective Date Note: At 28 FR 7839, Aug. 1, 1963, the effective date of §231.22 was stayed until further notice.

§231.23 Unidirectional passenger-train cars adaptable to van-type semi-trailer use.

(a) *Hand brakes* -- (1) *Number.* Same as specified for "Passenger-Train Cars Without End-Platforms."
(2) *Location.* Each hand brake shall be so located that it can be safely operated while car is in motion. The hand brake operating device shall be located on the end of car to the left of center.
(b) *Brake step* -- (1) *Number.* One (1).
(2) *Dimensions.* Not less than twenty-eight (28) inches in length. Outside edge not less than eight (8) inches from face of car, except when "A" frame is used and extends beyond end of car, a platform of anti-skid design covering the extended portion of the "A" frame may be used as brake step.
(3) *Manner of application.* Brake step shall be securely fastened to car and when additional support is necessary, metal braces having a minimum cross-sectional area three-eighths (3/8) by one and one-half (1 1/2) inches or equivalent shall be securely fastened to body of car with not less than one-half (1/2) inch bolts or rivets.
(c) *Sill steps* -- (1) *Number.* Two (2).
(2) *Dimensions.* Minimum length of tread, ten (10) preferably twelve (12) inches. Minimum cross-sectional area, one-half (1/2) by one and one-half (1 1/2) inches, or equivalent, wrought iron, steel or other metal of equivalent strength. Minimum clear depth, eight (8) inches.
(3) *Location.* One (1) near the rear or trailing end of the car on each side, not more than twenty-four (24) inches from corner of car to center of tread of sill step.
(4) *Manner of application.* Same as specified for "Passenger-Train Cars Without End-Platforms."

(d) *End-clearance.* No part of car above end sills except the brake step shall extend to within twenty (20) inches of a vertical plane parallel with end of car and passing through the outside edge of any part of an adjoining car.
(e) *Side handholds* -- (1) *Number.* Four (4).
(2) *Dimensions.* Minimum diameter, five-eighths (5/8) of an inch, wrought iron, steel or metal of equivalent strength. Minimum clear length, sixteen (16) preferably twenty-four (24) inches. Minimum clearance, two (2) preferably two and one-half (2 1/2) inches.
(3) *Location.* Horizontal, two (2) over each sill step. Lower handhold shall be not less than twenty-four (24) nor more than thirty (30) inches above center line of coupler. Upper handhold shall be not less than fifteen (15) nor more than nineteen (19) inches above lower handhold. Clearance of outer end of handhold shall be not more than eight (8) inches from end of car.
(4) *Manner of application.* Side handholds shall be securely fastened with not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets.
(f) *Horizontal end-handholds* -- (1) *Number.* Seven (7).
(2) *Dimensions.* Minimum diameter, five-eighths (5/8) of an inch, wrought iron, steel or other metal of equivalent strength. Minimum clear length, sixteen (16) inches. Minimum clearance, two (2) preferably two and one-half (2 1/2) inches.
(3) *Location.* End-sill: One (1) near each side at the rear or trailing end of car on face of end-sill or sheathing over end-sill, projecting outward or downward. Clearance of outer end of handhold shall be not more than sixteen (16) inches from side of car.
(i) Lower: One near each side of the rear or trailing end of car, not less than twenty-four (24) nor more than thirty (30) inches above center line of coupler.
(ii) Upper: One (1) near each side at the rear or trailing end of car not less than fifteen (15) nor more than nineteen (19) inches above lower handholds. Clearance of outer ends of lower and upper handholds shall be not more than eight (8) inches from side of car. Lower and upper handholds shall be spaced to coincide with corresponding side handholds, a variation of two (2) inches being allowed. On front end of car there shall be one (1) additional end handhold full length of car not less than forty (40) nor more than fifty (50) inches above center line of coupler. Clearance of each end of handhold shall be not more than eight (8) inches from side of car. When construction will not permit the use of a single handhold, four (4) handholds, each not less than sixteen (16) inches in length may be used, provided dimensions and location coincide.
(4) *Manner of application.* End handholds shall be securely fastened with not less than one-half (1/2) inch bolts with the nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets. When marker sockets or brackets are located so that they cannot be conveniently reached, suitable steps and handholds shall be provided for men to reach such sockets or brackets.
(g) *Uncoupling levers.* Each car shall be equipped to provide means of coupling and uncoupling without the necessity of men going between the cars.

Federal Railroad Administration

§231.23 Application and Guidance

One efficient Hand brake will be located on the car that can be safely operated when the car is in motion and shall operate in harmony with the power brake as specified for "Passenger-Train Cars Without End-Platforms §231.14(a)." The hand brake operating device is located on the end of car to the left of center. One brake step will be securely fastened with FRA approved fasteners to the car and when additional support is necessary, metal braces that have a minimal cross-sectional area of 3/8 inch by 11/2 inch or equal will be fastened with approved FRA fasteners. Two sill steps are required with a minimum of length of tread of 10 preferably 12 inches and made of wrought iron or steel with clear depth of 8 inches and located near the rear or trailing end of the car. Application of Sill Steps is same as specified for “Passenger Train Cars Without End-Platforms” §231.14. Sill Steps will be located on the trailing end of car on each side. End-clearance: no part of the car above the end sills except the brake step will extend to 20 inches of a vertical plane parallel with end of car and passed through the outside edge of any part of an adjoining car.

Four side handholds will be required that have a minimum diameter of 5/8” wrought iron or steel.

Two horizontal handholds will be required over each sill step. The lower handhold will not be less than 24 nor more than 30 inches above centerline of coupler. The upper handhold will not be less than 15 or more than 19 inches above lower handhold with clearance of outer end of handhold more than 8 inches from end of car. All side handholds will be securely fastened with FRA approved fasteners.

Seven horizontal end-handholds will be required near each side at the rear or trailing end of the car or sheathing over the end-sill projecting outward or downward. The horizontal handhold not be less than 24 nor more than 30 inches above centerline of coupler. The upper handhold will not be less than 15 or more than 19 inches above lower handhold with clearance of outer end of handhold more than 8 inches from end of car. All side handholds will be securely fastened with FRA approved fasteners. One side handhold can be mounted vertical or horizontally, located near each side of car over the sill step. If a horizontal side handhold is used it must be not less than 24 nor more than 30 inches from the centerline of coupler. If a vertical side handhold is used, the lower end will not be less than 18 nor more than 24 inches above centerline of coupler. When car construction will not permit the use of a single handhold, 4 handholds may be used, provided dimensions and locations coincide. End handholds and all Side handholds will be properly fastened with a FRA approved fastening system.

When marker sockets or brackets are located so they cannot be conveniently reached, suitable steps will be provided for men to reach them.

Uncoupling Levers: each car will be equipped to provide means of coupling and uncoupling without the necessity of men going between cars.

MP&E inspector(s) should closely examine the fastener hardware, as the FRA approved fastener type may be different in freight service. The fastener application may vary on safety appliance arrangements and most are considered to be compliant; however, at times, use of the wrong hardware or repairs to the car have compromised the integrity of the original as built fastener system. MP&E inspector(s) should physically inspect all safety appliance arrangements, as a visual inspection cannot validate that the handhold is properly secure. MP&E inspector(s) should take exception to any loose safety appliance arrangement since the public use handholds on a regular basis. Contrasting colors from car body to handholds also apply. Vertical handholds (2) leading into the interior of the passenger car from the vestibule area may appear to have minimum clearance, however, no exception should be taken to these handholds, as they are considered compliant.
The knuckle thrower on most passenger cars only disengages knuckle may not always throw completely open. This type of knuckle thrower operation should not be taken exception to unless no movement of the knuckle occurs.

MP&E inspector(s) should inspect for a continuous barrier is completed when locomotives coupled to passenger cars are used in push/pull service.

At times, courtesy handholds are located on the topside end of the passenger car. This handhold gets very little attention and is often found to have loose fasteners and an exception should be taken. MP&E inspector(s) should be aware that courtesy safety appliances are not required, but if a courtesy handhold is found to be non-compliant, the MP&E inspector(s) should take a position, , although not required, still have to meet the safety appliance standards if installed on the car.

Any Safety appliance that has 2 safety appliance arrangements fastened at one end held together by use of 1 fastener are prone to looseness and should be physically inspected for tightness. Low platform cars that have retractable steps should be examined for operation and proper securement to determine step integrity. Any components found to be missing, insecure or broken should be taken as an exception.

Approval of the use welded blocks or similar welded configurations to support safety appliance arrangements that are fastened with FRA approved mechanical fasteners on passenger cars have yet to be determined by the Office of Safety. Any safety appliance arrangement found to have a defective weld is defective and non-compliant. These cars should be reported to your Regional Supervisor or Headquarters MP&E Staff Director.

§231.24 Box and other house cars with roofs, 16 feet 10 inches or more above top of rail.
1(a) Each car of this type built or rebuilt after (January 1, 1976) or under construction prior thereto and placed in service after (effective date) shall be equipped as specified in §231.27(a) through (h) and (j) or, if it has roof hatches, as specified in §231.28.
(b) Each car of this type placed in service after November 23, 1964 and before (effective date) shall be equipped –
(1) As specified in §231.24; or
(2) As specified in §231.27(a) through (h) and (j); or
(3) If it has roof hatches, as specified in §231.28.
(c) Each car of this type placed in service before October 22, 1964, or under construction on October 22, 1964 and placed in service before November 23, 1964, shall be equipped –
(1) As specified in §231.1; or
(2) As specified in §231.1 and §231.27(i); or
(3) As specified in §231.27(a) through (h) and (j); or
(4) If it has roof hatches, as specified in §231.28.
(a) *Hand brakes* – (1) *Number.* Same as specified for "Box and Other House Cars."
(2) *Dimensions.* Same as specified for "Box and Other House Cars."
(3) *Location.* Each hand brake shall be located so that it can be safely operated from the end-platform. Each brake shaft shall be located on end of car to left of center and not more than twenty-four (24) inches from left side of car.
(4) *Manner of application.* Same as specified for "Box and Other House Cars."
(b) *End-platforms* – (1) *Number.* Two (2).
(2) *Dimensions.* Width, not less than ten (10) inches. Length, full width of car.
(3) *Location.* One (1) on each end of car not more than eight (8) inches above center sill.
(4) *Manner of application.* Each end-platform shall be securely supported by not less than four (4) metal braces having a minimum cross sectional area three-eighths (3/8) by one and one-half (1 1/2) inches or equivalent which shall be securely fastened to body of car with not less than one-half (1/2) inch bolts or rivets. The outside edge of each end-platform shall be not less than six (6) inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler-horn against the buffer-block or end sill and cushioning device (if used) at full buff. End-platform shall be made of running board material as specified for "Box and Other House Cars."
(c) *Sill steps.* Same as specified for "Box and Other House Cars."
(d) *End-ladder clearance.* No part of car above end-sills within thirty (30) inches from side of car, except buffer block brake-shaft, brake wheel, end-platform, horizontal end handholds, or coupling lever shall extend to within twelve (12) inches of a vertical plane parallel with end of car and passing through the inside face of knuckle, when closed with the coupler horn against the buffer block or end-sill and cushioning device (if used) at full buff, and no other part of end of car or fixtures on same above end-sill, other than exceptions herein noted, shall extend beyond outer face of buffer block.

(e) *Side handholds* -- (1) *Number.* Sixteen (16).
(2) *Dimensions.* Same as specified for "Box and Other House Cars."
(3) *Location.* Horizontal: Four (4) near each end and on each side of car spaced not more than nineteen (19) inches apart and with the bottom handhold located not more than twenty-one (21) inches from top tread of sill step, and top handhold shall coincide in height with horizontal end-platform handhold, a variation of two (2) inches being allowed. Spacing of side handholds shall be uniform within a limit of two (2) inches from top handhold to bottom handhold. Clearance of outer ends of handholds shall be not more than eight (8) inches from end of car.
(4) *Manner of application.* Same as specified for "Box and Other House Cars," except each bottom handhold shall have foot guard or upward projection not less than two (2) inches in height near inside end.
(f) *Horizontal end handholds* -- (1) *Number.* Four (4).
(2) *Dimension.* Same as specified for "Box and Other House Cars."
(3) *Location.* One (1) near each side of each end of car on outer edge of end platform, projecting downward with clearance of outer end not more than sixteen (16) inches from side of car.
(4) *Manner of application.* Same as specified for "Box and Other House Cars."
(g) *Horizontal end-platform handholds* -- (1) *Number.* Two (2).
(2) *Dimensions.* Same as specified for "Horizontal End Handholds" for "Box and Other House Cars," except length shall extend across end of car.
(3) *Location.* Extending across each end of car, not less than forty-eight (48) nor more than sixty (60) inches above tread of end-platform with clearance at each end of not more than four (4) inches from side of car, supported by an extra leg near center of handholds.
(4) *Manner of application.* Same as specified for "Horizontal End Handholds" for "Box and Other House Cars."
(h) *Vertical end-handholds* -- (1) *Number.* Four (4).
(2) *Dimensions.* Minimum diameter five-eighths (5/8) of an inch, wrought iron or steel. Minimum clearance, two (2), preferably two and one-half (2 1/2) inches.
(3) *Location.* One (1) on each side of each end of car, not more than four (4) inches from side of car, extending downward from end of horizontal end-platform handhold to within eight (8) inches above tread of end-platform. One (1) continuous handhold with two (2) right angles, or two (2) right angle handholds, may take the place of two (2) specified vertical end-handholds and one (1) horizontal end-platform handhold, provided the dimensions and locations coincide, and extra legs at points of angle and center are provided and securely fastened to car.
(4) *Manner of application.* Same as specified for "Box and Other House Cars."
(i) *Uncoupling levers.* Same as specified for "Box and Other House Cars."
(j) *Painting and stenciling.* (1) That portion of each end of car more than fifteen (15) feet above top of rail shall be painted with contrasting reflectorized paint and shall bear the words "No running board" to the left of center and "Excess height car" to the right of center.

(2) Lettering to be not less than three (3) inches high. On each side-sill near end corner there shall be painted a yellow rectangular area with a three-fourths (3/4) inch black border containing the words "This car excess height -- no running board." Lettering to be not less than one and one-half (1 1/2) inches high.
When car is equipped with center sill or underframe cushioning device having more than twelve (12) inches longitudinal impact absorbing travel, and a part of the uncoupling device and/or brake pipe is located parallel to the exposed end of the center sill, such part shall provide at least two (2) inches of clearance near the coupler of sufficient length to permit use as an emergency handhold during air hose coupling operation and the top of exposed ends of sliding center sill shall be coated with anti-skid paint.
[33 FR 19663, Dec. 25, 1968, as amended at 40 FR 34347, Aug. 15, 1975]

231.24 Application and Guidance

Note: Prior to inspection of this type of car, carefully review subsections for this Part.

Hand Brakes and hand brake dimensions are same as specified for “Box and other house cars” §231.1. Each handbrake will be located so that it can be safely operated from the end platform. Each brake shaft will be located on end of car to left center and no more than 24 inches from left side of car. Handbrakes will be applied same as specified for “Box and other house cars”
Two end platforms no less than 10 inches, full width of car and located one on each end of car no more than 8 inches above center sill. End platform will be made of running board material as specified for “Box and other house cars”
End Ladder Clearance: no part of car above end sills within 30 inches from side of car, except buffer block, brake shaft, brake wheel, end-platform, horizontal end handholds or uncoupling levers will extend to within 12 inches of a vertical plane parallel with end of car passing through the inside face of knuckle, when closed with the coupler horn against the buffer block or end sill and cushioning device (if Used) at full buff, and no other part of end of car or fixtures on same above end-sill.
There will be sixteen Side Handholds with same dimensions as specified for “Box and other house cars”. Side handholds will be located horizontally, four on each end and on each side of car spaced no more than 19 inches apart and with the bottom handhold located no more than 21 inches from top tread of sill step, and top handhold will coincide in height with horizontal end platform handhold with a variation of 2 inches allowed. Side handholds will be uniform within a limit of 2 inches from top handhold to bottom handhold.. Side Handholds will be applied same as specified for “Box and other house cars” except each bottom handhold will have a foot guard or upward projection no less than 2 inches high near inside of car.
There will be four Horizontal End Handholds with the same dimensions as specified for “Box and other house cars”. Horizontal end handholds will be located one near each side of each end of car on outer edge of end platform, projecting downward and applied same as specified for “Box and other house cars”.

Two Horizontal End Platform Handholds will have the same dimensions as specified for "Box and other house cars", except length will extend across end of car.
Horizontal end platform handholds will extend across end of car no less than 48 nor more than 60 inches above tread of end platform with clearance at each end of no more than 4 inches from side of car, supported by an extra leg near center of handholds.

There will be 4 Vertical end handholds with minimum diameter of 5/8 inch wrought iron or steel with minimum clearance of 2, preferably 2 ½ inches.
One vertical end handhold will be located on each side of each end of car no more than 4 inches from side of car extending downward from end of horizontal end platform handhold to within 8 inches above tread of end platform. One continuous handhold with 2 right angles or 2 right angle handholds may take the place of 2 specified vertical end handholds and 1 horizontal end platform handhold, provided the dimensions coincide, and extra legs at points of angle and center are provided and securely fastened to car. Vertical end handholds will be securely fastened with FRA approved fasteners.
Uncoupling levers are same as specified for "Box and other house cars".

MP&E inspectors should be aware that §231.24(j) require paint to meet the requirement of the part. A waiver has been issued that indicates that use other than paint can be used to meet the requirement such as reflectorized tape as long as it is equal or greater that the paint requirement. At this time a industry waiver is not in place, however, FRA is examining the possibility of allowing the use of this application in the near future.

§231.25 Track motorcars (self-propelled 4-wheel cars which can be removed from the rails by men).

(a) *Handbrakes* (*includes foot operated brake*). Each track motorcar shall be equipped with an efficient handbrake so located that it can be safely operated while the car is in motion. Each handbrake shall be equipped with a ratchet or other suitable device which will provide a means of keeping the brake applied when car is not in motion.
Note: The requirements of this rule will be satisfied if the ratchet or other suitable device operates in connection with at least one handbrake on track motorcars that may be equipped with more than one such brake.
(b) *Handholds.* One or more safe and suitable handholds conveniently located shall be provided. Each handhold shall be securely fastened to car.
(c) *Sill steps or footboards.* Each track motorcar shall be equipped with safe and suitable sill steps or footboards conveniently located and securely fastened to car when bed or deck of track motorcar is more than 24 inches above top of rail.

(d) *Couplers.* When used to haul other cars, each track motorcar shall be equipped with a coupler at each end where such cars are coupled (1) which provides a safe and secure attachment, (2) which can be coupled or uncoupled without the necessity of men going between the ends of the cars.

§231.25 Application and Guidance

Each tank car motor car will be equipped with an efficient handbrake (includes foot operated brake) located that it can be safely operated while car is in motion. Each handbrake will be equipped with a ratchet or other suitable device, which will provide means of keeping the brake applied when car is not in motion.
One or more safe and suitable Handhold will be conveniently located and securely fastened to car with FRA approved fasteners.
There will be safe and suitable sill steps or footboards conveniently located and securely fastened to car when bed or deck of track with FRA approved fasteners.
When used to haul other cars, each car will be equipped with a Coupler at each end where such cars are coupled. Couplers must provide safe and secure attachment, which can be coupled or uncoupled without the necessity of men going between the ends of cars.

The MP&E Inspector(s) should ensure of the operation of handbrakes on this equipment. All handhold and sill steps fasteners should physically inspected to ensure each fastener is properly secure to the arrangement. Couplers are self-explanatory.

§231.26 Pushcars.

(a) *Handbrakes.* When used to transport persons, each pushcar shall be equipped with an efficient handbrake so located that it can be safely operated while the car is in motion.
(b) *Handholds* (*includes handles*). Each pushcar shall be provided with one or more secure handholds. When used to transport persons, each pushcar shall be provided with one or more safe and suitable handholds conveniently located above the top of the bed of each pushcar.
(c) *Sill steps or footboards.* When used to transport persons, each pushcar shall be equipped with safe and suitable sillsteps or footboards conveniently located and securely fastened to car, when bed or deck of pushcar is more than 24 inches above top of rail.
(d) *Couplers.* When moved together with other vehicles, each pushcar shall be equipped with a coupler at each end where such vehicles are coupled (1) which provides a safe and secure attachment, and (2) which can be coupled or uncoupled without the necessity of men going between the ends of the cars.
Note: Sections §231.25 and §231.26 are applicable only when the vehicles governed thereby are coupled together and moved together.

§231.26 Application and Guidance

When used to transport persons, each pushcar will be equipped with an efficient handbrake located so that it can be safely operated while car is in motion.
Each pushcar will have one or more secure handholds (includes Handles). When used as a person transport each pushcar will have one or more safe and suitable handholds conveniently located above the top of the bed of each pushcar.
When used as a person transport each pushcar will be equipped with safe and suitable Sill Steps or footboards conveniently located and securely fastened to car with FRA approved fasteners.
When moved together with other vehicles, each pushcar will be equipped with a coupler at each end of car, which provides safe and secure attachment and which can be coupled or uncoupled without the necessity of men going between ends of cars.

The MP&E inspector(s) should ensure of the operation of handbrakes on this equipment. All applicable handholds, footguards and sill steps fasteners should physically inspected to ensure each fastener is properly secure to the arrangement. Couplers are self-explanatory.

§231.27 Box and other house cars without roof hatches or placed in service after October 1, 1966.

(a) *Handbrakes.* The handbrake may be of any efficient design, but must provide the same degree of safety as, or a greater degree of safety than, the following specifications:
(1) *Number.* (i) Each box or other house car without roof hatches shall be equipped with an efficient vertical wheel handbrake which shall operate in harmony with the power brake thereon.
(ii) The handbrake may be of any efficient design, but must provide a total braking force applied to brake shoes not less than the total force applied to the brake shoes by the brake cylinders at 50 pounds per square inch.
(2) *Dimensions.* (i) The brake wheel may be deep or shallow, of malleable iron, wrought iron, steel, or other material of equivalent strength.
(ii) Overall diameter of brake wheel nominally twenty-two (22) inches.
(iii) Depth of brake wheel hub shall be two and five-eighths (2 5/8) inches with square taper shaft fit, taper two (2) inches in twelve (12) inches with small end of taper fit seven-eighths (7/8) inches.
(iv) Brake wheel and drum shall be arranged so that both will revolve when applying and gradually releasing the handbrake. Handbrake shall be provided with means to prevent application of the brake by winding in a counterclockwise direction.
(v) Brake shaft shall be arranged with a square fit at its outer end to secure the handbrake wheel; said square fit shall be not less than seven-eighths (7/8) of an inch square. Square-fit taper: Nominally two (2) in twelve (12) inches (see Plate A).
(vi) All chains shall be not less than nine-sixteenths (9/16) inch BBB coil chain.
(vii) All handbrake rods shall be not less than three-fourths (3/4) inch diameter.

(3) *Location.* (i) The handbrake shall be so located that it can be safely operated from horizontal end platform while car is in motion.
(ii) The brake shaft shall be located on end of car, to the left of and not less than seventeen (17) nor more than twenty-two (22) inches from center and not less than twenty-six (26) nor more than forty (40) inches above top of end-platform tread.
(4) *Manner of application.* (i) Brake wheel shall be held in position on brake shaft by a nut on a threaded extended end of brake shaft; said thread portion shall be not less than three-fourths (3/4) of an inch in diameter; said nut shall be secured by riveting over or by the use of a locknut or suitable cotter.
(ii) Outside edge of brake wheel shall be not less than four (4) inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against the buffer block or end sill.
(iii) Handbrake housing shall be securely fastened to car.
(b) *End platforms* -- (1) *Number.* Two (2).
(2) *Dimensions.* Width not less than eight (8) inches; length, not less than sixty (60) inches.
(3) *Location.* One (1) centered on each end of car between inner ends of handholds not more than eight (8) inches above top of center sill.
(4) *Manner of application.* (i) Each end platform shall be securely supported by not less than three (3) metal braces having a minimum cross sectional area of three-eighths (3/8) by one and one-half (1 1/2) inches or equivalent, which shall be securely fastened to body of car with not less than one-half (1/2) inch bolts or rivets.
(ii) Where conventional draft gear or cushioning device having longitudinal travel less than six (6) inches is used the outside edge of each end platform shall be not less than twelve (12) inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against buffer block. Where cushioning device having longitudinal travel six (6) inches or more is used the outside edge of each end platform shall be not less than six (6) inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with end sill and cushioning device at full buff. End platform shall be made of wood or of material which provides the same as or a greater degree of safety than wood of 1 1/8 inches thickness. When made of material other than wood the tread surface shall be of anti-skid design and constructed with sufficient open space to permit the elimination of snow and ice from the tread surface.
(c) *Sill steps* -- (1) *Number.* Four (4).
(2) *Dimensions.* Minimum cross-sectional area one-half (1/2) by one and one-half (1 1/2) inches, or equivalent, of wrought iron, steel, or other material of equivalent strength. Minimum length of tread, ten (10), preferably twelve (12) inches. Minimum clear depth, eight (8) inches.
(3) *Location.* (i) One (1) near each end of each side car, so that there shall be no more than eighteen (18) inches from end of car to center of tread of sill step.
(ii) Outside edge of tread of step shall be not more than four (4) inches inside of face of side of car, preferably flush with side of car.

(iii) Tread shall be not more than twenty-four (24), preferably not more than twenty-two (22) inches above the top of rail.
(4) *Manner of application.* (i) Sill steps exceeding twenty-one (21) inches in depth shall have an additional tread.
(ii) Sill steps shall be securely fastened with not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets.
(d) *End ladder* (*appliances*) *clearance.* No part of car above end sills within thirty (30) inches from side of car, except buffer block, brake shaft, brake wheel, end platform, horizontal end handholds, or uncoupling lever shall extend to within twelve (12) inches of a vertical plane parallel with end of car and passing through the inside face of knuckle, when closed with the coupler horn against the buffer block or end sill and cushioning device (if used) at full buff, and no other part of end of car or fixtures on same above end sill, other than exceptions herein noted, shall extend beyond outer face of buffer block.
(e) *Side handholds* -- (1) *Number.* Sixteen (16).
(2) *Dimensions.* Minimum diameter, five-eighths (5/8) of an inch, wrought iron, steel, or other material of equivalent strength. Minimum clear length, sixteen (16) inches, preferably twenty-four (24) inches. Minimum clearance, two (2), preferably two and one-half (2 1/2) inches.
(3) *Location.* Horizontal; four (4) near each end and on each side of car spaced not more than nineteen (19) inches apart and with the bottom handhold located not more than twenty-one (21) inches from top tread of sill step, and top handhold shall coincide in height with top end handhold, a variation of two (2) inches being allowed. Spacing of side handholds shall be uniform within a limit of two (2) inches from top handhold to bottom handhold. Clearance of outer ends of handholds shall be not more than eight (8) inches from end of car.
(4) *Manner of application.* Side handholds shall be securely fastened with not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets. Each bottom handhold shall have foot guard or upward projection not less than two (2) inches in height near inside end.
(f) *End handholds* -- (1) *Number.* Sixteen (16).
(2) *Dimensions.* (i) Minimum diameter, five-eighths (5/8) of an inch, wrought iron, steel, or other material of equivalent strength.
(ii) Minimum clear length, sixteen (16) inches, preferably twenty-four (24) inches.
(iii) Minimum clearance, two (2) preferably two and one-half (2 1/2) inches.
(3) *Location.* Horizontal: Four (4) near each side and on each end of car spaced not more than nineteen (19) inches apart and with the bottom handhold located not more than twenty-one (21) inches from top tread of sill step, and top handhold shall coincide in height with end platform handholds, a variation of two (2) inches being allowed. Clearance of outer ends of handholds shall be not more than eight (8) inches from side of car.
(4) *Manner of application.* End handholds shall be securely fastened with not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets. Each bottom handhold shall have foot guard or upward projection not less than two (2) inches in height near inside end.

(g) *Horizontal end-platform handholds* -- (1) *Number.* Two (2).
(2) *Dimensions.* (i) Minimum diameter, five-eighths (5/8) of an inch, wrought iron, steel, or other material of equivalent strength.
(ii) Minimum clearance, two (2) preferably two and one-half (2 1/2) inches.
(iii) Minimum clear length sixty (60) inches. When security of attachment requires, an extra supporting leg may be applied near center of clear length.
(3) *Location.* One (1) on each end of car above end platform. Outer legs shall be not more than six (6) inches from inner legs of top end handholds. Height above tread of end platform: Not less than forty-eight (48) nor more than sixty (60) inches.
(4) *Manner of application.* End-platform handholds shall be securely fastened with not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets.
(h) *Uncoupling levers* -- (1) *Number.* Two (2).
(2) *Dimensions.* (i) Handles of uncoupling levers, except those shown on Plate B or of similar designs, shall be not more than six (6) inches from side of car.
(ii) Uncoupling levers of design shown on Plate B and of similar designs shall conform to the following prescribed limits:
(*a*) Handles shall be not more than twelve (12), preferably nine (9) inches from sides of car. Center lift arms shall be not less than seven (7) inches long.
(*b*) Center of eye at end of center lift arm shall be not more than three and one-half (3 1/2) inches beyond center of eye of uncoupling pin of coupler when horn of coupler is against the buffer block or end sill (see Plate B).
(*c*) End of handles shall extend not less than four (4) inches below bottom of end sill or shall be so constructed as to give a minimum clearance of two (2) inches around handle. Minimum drop of handles shall be twelve (12) inches; maximum, fifteen (15) inches overall (see Plate B).
(iii) Handles of uncoupling levers of the "rocking" or "push-down" type shall be not less than eighteen (18) inches from top of rail when lockblock has released knuckle, and a suitable stop shall be provided to prevent inside arm from flying up in case of breakage.
(3) *Location.* One (1) on each end of car. When single lever is used, it shall be placed on left side of end of car.
(i) *Existing box and other house cars without roof hatches.* (1) Box and other house cars without roof hatches built on or before April 1, 1966, or under construction prior thereto and placed in service before October 1, 1966, shall be deemed equipped as nearly as possible within the intent of §231.1 and of this section when:
(i) The running board, roof handholds over side and end ladders at "A" end of car and ladder treads above the fourth tread from bottom of side and end ladder at "A" end are removed;

(ii) One (1) horizontal end-platform handhold is applied on each end of car as specified in this section except the right hand end shall be not more than eight (8) inches from side of car, or where car end contour makes impractical the use of a single continuous end handhold, there is applied the equivalent consisting of two (2) handholds, the center handhold to be a minimum of thirty (30) inches in clear length and the handhold to the right to be a minimum of nineteen (19) inches in clear length and to extend to within eight (8) inches of the right side of the car, such handholds to be not more than twelve (12) inches apart; and
(iii) With handbrake operated near roof of car: a brake step shall be provided as specified in §231.1 and lettering one and one-half (1 1/2) inches high shall be painted on a yellow background on side sill near "B" end of car with a three-fourths (3/4) inch black border containing the words "Keep Off Roof -- No Running Board," or with handbrake operated from approximate level of top of end sill: roof handholds and side and end ladder treads above the fourth tread from the bottom of ladders at "B" end of car shall be removed and a brake step as specified by §231.1 shall be used with top of tread surface being level with or not more than four (4) inches below adjacent end handhold.
(2) Paragraph (i)(1)(ii) of this section shall not apply to cars equipped with end platforms and end platform handholds.
(j) *Painting and marking.* Box and other house cars with roofs 16 feet and 10 inches or more above top of rail shall be painted and marked as follows:
(1) That portion of each end of the car which is more than fifteen (15) feet above top of rail shall be painted with contrasting reflectorized paint and bear the words "excess height car" in lettering not less than three (3) inches high; and
(2) On each side sill near end corner there shall be painted or otherwise displayed a yellow rectangular area with a three-fourths (3/4) inch black border containing the words "this car excess height" in lettering not less than one and one-half (1 1/2) inches high. (Secs. 2, 4, and 6, 27 Stat. 531, as amended; secs, 1 and 3, 32 Stat. 943, as amended; sec. 6(e) and (f), 80 Stat. 939 (45 U.S.C. 2, 4, 6, 8, and 10, 11-16 and 49 U.S.C. 103(c)(1))
[33 FR 19663, Dec. 25, 1968, as amended at 40 FR 34347, Aug. 15, 1975; 49 FR 26745, June 29, 1984]

§231.27 Application and Guidance
One effective handbrake is required that meets the safety appliance standards and provides the same or greater degree of safety than as described in §231(a)(1)). The handbrake may be of any efficient design, which will operate with the power brake, but must provide a total braking force applied to the brake shoes by the brake cylinders at 50 pounds per square inch. The Brake wheel maybe deep or shallow of malleable iron, wrought iron, steel, or other material of equivalent strength. The brake wheel and drum will be arranged so that both will revolve when applying or gradually reducing releasing the handbrake.

The handbrake will be located that it can safely be operated from horizontal end platform while car is in motion. The brake shaft shall be located to the left on the end of the car. The brake wheel shall be held in position on the brake shaft by a nut or on a threaded extended end of the brake shaft, and shall be secured by riveting over or by the use of a locknut or suitable cotter. Each box or other house car without roof hatches shall be equipped with an efficient vertical wheel handbrake which shall operate in harmony with the power brake thereon. The handbrake may be of any efficient design, but must provide a total braking force applied to brake shoes not less than the total force applied to the brake shoes by the brake cylinders at 50 pounds per square inch. The brake wheel may be deep or shallow, of malleable iron, wrought iron, steel, or other material of equivalent strength.
The brake wheel and drum shall be arranged so that both will revolve when applying and gradually releasing the handbrake. The handbrake will be provided with means to prevent application of the brake by winding in a counterclockwise direction. The brake shaft shall be arranged with a square fit at its outer end to secure the handbrake wheel.

Note: Former TB *MP&E 98-53* states, in part: "It has been determined that both 3/8 inch alloy chain and the ½-inch steel alloy chain currently being used by new car manufacturers exceeds the specifications for the 9/16-inch BBB coil chain.

All handbrake rods will be not less than three-fourths (3/4)-inch diameter. The handbrake will be located so that it can be safely operated from the horizontal end platform while car is in motion. The brake shaft shall be located on end of car. The brake wheel will be held in position on brake shaft by a nut on a threaded extended end of brake shaft and secured by riveting over or by the use of a locknut or suitable cotter. The handbrake housing shall be securely fastened to car and if the purpose of the handbrake bracket is solely to support the handbrake, it must be mechanically affixed.

There will be two end platforms one located and one centered on each end of car between inner ends of handholds.

Note: Former TB MP&E *TB 98-19* states, in part: "On 'pressure differential' covered hoppers the end platforms and end platform handholds are less than 60 inches long because of structural considerations. Accordingly, the FRA will not take exception to end platforms and end platform handholds less than 60 inches in length."

The manner of application of each end platform shall be securely supported by not less than three (3) metal braces having a minimum cross sectional area of three-eighths (3/8) by one and one-half (11/2) inches or equivalent, which shall be securely fastened to body of car with not less than one-half (1/2) inch bolts or rivets. Where conventional draft gear or cushioning device having longitudinal travel less than six (6) inches is used the outside edge of each end platform shall be not less than twelve (12) inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against buffer block. Where cushioning device having longitudinal travel six (6) inches or more is used the outside edge of each end platform shall be not less than six (6) inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with end sill and cushioning device at full buff. End platform shall be made of wood or of material which provides the same as or a greater degree of safety than wood of 11/8 inches thickness. When made of material other than wood the tread surface shall be of anti-skid design and constructed with sufficient open space to permit the elimination of snow and ice from the tread surface.

(c) There will be Four (4) Sill Steps that will have dimensions with a minimum cross-sectional area one-half (½) by one and one-half (1-½) inches, or equivalent, of wrought iron, steel, or other material of equivalent strength

Note: Former TB *MP&E-98-18* states, in part: "The FRA's Office of Research and Development has confirmed that sill steps, 13/16-inch thick and two inches wide, when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements."

There will be a minimum length of tread, ten (10), preferably twelve (12) inches. Minimum clear depth, eight (8) inches.

Note: Former TB *MP&E-98-13* states, in part: "Please not the words "*clear depth*." Clear depth should be understood as meaning a vertical space the width of, and above, the sill step material or strap, and that vertical space shall be clear and unobstructed for 8 inches."

There will be one (1) sill steps located near each end of each side car, so that there shall be no more than eighteen (18) inches from end of car to center of tread of sill step.

The outside edge of tread of step shall be not more than four (4) inches inside of face of side of car, preferably flush with side of car. The tread will be not more than twenty-four (24), preferably not more than twenty-two (22) inches above the top of rail.

The manner of application for sill steps exceeding twenty-one (21) inches in depth will have an additional tread. Sill steps will be securely fastened with FRA approved fasteners not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets.

(d) End ladder (appliances) clearance will have no part of car above end sills within thirty (30) inches from side of car, except buffer block, brake shaft, brake wheel, end platform, horizontal end handholds, or uncoupling lever shall extend to within twelve (12) inches of a vertical plane parallel with end of car and passing through the inside face of knuckle, when closed with the coupler horn against the buffer block or end sill and cushioning device (if used) at full buff, and no other part of end of car or fixtures on same above end sill, other than exceptions herein noted, shall extend beyond outer face of buffer block.

(e) Sixteen (16) Side handholds with a minimum dimension of diameter, five-eighths (5/8) of an inch, wrought iron, steel, or other material of equivalent strength.

Note: Former TB *MP&E-98-18* states, in part: "The FRA's Office of Research and Development has confirmed that ladder treads and handholds or circular cross-section, 13/16-inch diameter, when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements."

A minimum clear length, sixteen (16) inches, preferably twenty-four (24) inches. Minimum clearance, two (2), preferably two and one-half (21/2) inches located horizontal; four (4) near each end and on each side of car spaced not more than nineteen (19) inches apart and with the bottom handhold located not more than twenty-one (21) inches from top tread of sill step, and top handhold shall coincide in height with top end handhold, a variation of two (2) inches being allowed. Spacing of side handholds shall be uniform within a limit of two (2) inches from top handhold to bottom handhold. Clearance of outer ends of handholds shall be not more than eight (8) inches from end of car.

Note: When measuring the distance between the bottom side handhold and the top tread of the sill step, it should not be measured on an angle. The measurement should be the actual vertical rise between these appliances. Combine the distance from the sill step tread surface to the underside of the side sill and the distance (vertical rise) from the underside of the side sill to the top of the bottom side handhold. Note that the only requirement FRA has is for the top end and side handholds to coincide in height, a variation of two inches being allowed.

The manner of application of side handholds shall be securely fastened with not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets. Each bottom handhold shall have foot guard or upward projection not less than two (2) inches in height near inside end.

Note: The foot guard or upward projection is not required at both the inside and outside ends, only the inside.

(f) There will be sixteen (16) End handholds with minimum dimensions of a minimum diameter, five-eighths (5/8) of an inch, wrought iron, steel, or other material of equivalent strength.

Note: Former TB *MP&E-98-18* states, in part: "The FRA's Office of Research and Development has confirmed that ladder treads and handholds or circular cross-section, 13/16-inch diameter, when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements."

End handholds will have a minimum clear length, sixteen (16) inches, preferably twenty-four (24) inches with a minimum clearance of, two (2) preferably two and one-half (21/2) inches. The location of handholds will be horizontal: Four (4) near each side and on each end of car spaced not more than nineteen (19) inches apart and with the bottom handhold located not more than twenty-one (21) inches from top tread of sill step, and top handhold shall coincide in height with end platform handholds, a variation of two (2) inches being allowed. Clearance of outer ends of handholds shall be not more than eight (8) inches from side of car.

Note: When measuring the distance between the bottom side handhold and the top tread of the sill step, it should not be measured on an angle. The measurement should be the actual vertical rise between these appliances. Combine the distance from the sill step tread surface to the underside of the side sill and combine it with the distance from the underside of the side sill to the top of the bottom side handhold. Note that the only requirement FRA has is for the top end and end platform handholds to coincide in height, a variation of two inches being allowed. The manner of application of end handholds will be securely fastened with FRA approved fasteners not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets. Each bottom handhold shall have foot guard or upward projection not less than two (2) inches in height near inside end.

Note: The foot guard or upward projection is not required at both the inside and outside ends, only the inside.

(g) The will be 2 horizontal end-platform handholds with a minimum dimension of diameter, five-eighths (5/8) of an inch, wrought iron, steel, or other material of equivalent strength

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Note: Former TB *MP&E-98-18* states, in part: "The FRA's Office of Research and Development has confirmed that ladder treads and handholds or circular cross-section, 13/16-inch diameter, when constructed of 6061-T6 aluminum alloy exceeds the current FRA requirements."

Horizontal end-platform handholds will have a minimum clearance of two, (2) preferably two and one-half (21/2) inches with minimum clear length sixty (60) inches. When security of attachment requires, an extra supporting leg may be applied near center of clear length. The will be one (1) located on each end of car above end platform. Outer legs shall be not more than six (6) inches from inner legs of top end handholds. Height above tread of end platform: Not less than forty-eight (48) nor more than sixty (60) inches.

Note: Over the past several years many cars have been discovered where the dimension between the tread of the end platform and the top of the end platform handholds did not meet the, "not less than 48 nor more than 60-inch requirement."

The manner of application of each end-platform handholds shall be securely fastened with FRA approved fasteners not less than one-half (1/2) inch bolts with nuts outside (when possible) and riveted over, or with not less than one-half (1/2) inch rivets.

(h) There will be two (2) Uncoupling levers with the dimension of handles of uncoupling levers, (except those shown on Plate B or of similar designs) will be not more than six (6) inches from side of car.

Note: Former *TB MP&E 98-49* states, in part: "This refers primarily to those uncoupling levers which are operated by a downward motion of the uncoupling lever either by hand or foot. Therefore, FRA will not take exception to bottom operated uncoupling levers that are similar in design to that shown in Plate B, unless the uncoupling lever handle is more than 12 inches from the side of the car." Uncoupling levers of design shown on Plate B and of similar designs will conform to the following prescribed limits: The handles shall be not more than twelve (12), preferably nine (9) inches from sides of car. Center lift arms shall be not less than seven (7) inches long. The center of eye at end of center lift arm shall be not more than three and one-half (31/2) inches beyond center of eye of uncoupling pin of coupler when horn of coupler is against the buffer block or end sill (see Plate B). The end of handles shall extend not less than four (4) inches below bottom of end sill or shall be so constructed as to give a minimum clearance of two (2) inches around handle. A minimum drop of handles shall be twelve (12) inches; maximum, fifteen (15) inches overall (see Plate B). Handles of uncoupling levers of the "rocking" or "push-down" type shall be not less than eighteen (18) inches from top of rail when lockblock has released knuckle, and a suitable stop shall be provided to prevent inside arm from flying up in case of breakage. One (1)-uncoupling lever will be located on each end of car. When single lever is used, it shall be placed on left side of end of car.

(i) On Existing box and other house cars without roof hatches built on or before April 1, 1966, or under construction prior thereto and placed in service before October 1, 1966, will be deemed equipped as nearly as possible within the intent of §231.1 and of this section when:
The running board, roof handholds over side and end ladders at "A" end of car and ladder treads above the fourth tread from bottom of side and end ladder at "A" end are removed; One (1) horizontal end-platform handhold is applied on each end of car as specified in this section except the right hand end will be not more than eight (8) inches from side of car, or where car end contour makes impractical the use of a single continuous end handhold, there is applied the equivalent consisting of two (2) handholds, the center handhold to be a minimum of thirty (30) inches in clear length and the handhold to the right to be a minimum of nineteen (19) inches in clear length and to extend to within eight (8) inches of the right side of the car, such handholds to be not more than twelve (12) inches apart; and with a handbrake operated near roof of car: a brake step shall be provided as specified in §231.1 and lettering one and one-half (11/2) inches high shall be painted on a yellow background on side sill near "B" end of car with a three-fourths (3/4) inch black border containing the words "Keep Off Roof-No Running Board," or with handbrake operated from approximate level of top of end sill: roof handholds and side and end ladder treads above the fourth tread from the bottom of ladders at "B" end of car shall be removed and a brake step as specified by §231.1 shall be used with top of tread surface being level with or not more than four (4) inches below adjacent end handhold.

Note: §231.27(i)(2) Paragraph (i)(1)(ii) of this section shall not apply to cars equipped with end platforms and end platform handholds.

(j) **Painting and marking**. Box and other house cars with roofs 16 feet and 10 inches or more above top of rail will be painted and marked as follows: That portion of each end of the car which is more than fifteen (15) feet above top of rail shall be painted with contrasting reflectorized paint and bear the words "excess height car" in lettering not less than three (3) inches high. In some cases a waiver has been issued allowing the use of relectorized tape instead of paint if the requirement meets or exceeds the requirement. On each side sill near end corner there shall be painted or otherwise displayed a yellow rectangular area with a three-fourths (3/4) inch black border containing the words "this car excess height" in lettering

General Note: Former TB *MP&E-98-7-* There are two textual errors in the September 1977 reprint of the Railroad Safety Appliances and Power Brake Requirements (orange) Booklet. On page 9, lines 12 through 23 should read as follows: After December 31, 1976, cars of this type built on or before April 1, 1966 or under construction to the date and placed in service before October 1, 1966 must be equipped as nearly as possible with the same compliment of safety appliances, depending on type, as specified in part §231.27 for box and other house cars without roof hatches, or in Part §231.28 for box and other house cars with roof hatches. Cars built after

April 1, 1966 or under construction prior there to, and placed in service after October 1, 1966, must be equipped, depending on type as specified in part §231.27 for box and other house cars without roof hatches or, in part §231.28 for box and other house cars with roof hatches. There is an omission of two lines after line 12, page 64, in Part §231.30(a) The two omitted lines should read as follows: … 1977, seventy percent (70) by October 1, 1978 and all such locomotives by October 1, 1979.

Note: Former TB *MP&E-98-13-* The minimum standard for clear depth is 8 inches, minimum clearance is 2 inches.

Former TB *MP&E-98-17-* Bulkhead flat cars are considered a car of special construction (§231.18). FRA is of the opinion that this car, with fixed ends above the floor, most closely resembles cars described in Part 231.27, "House and other box cars without hatch covers built or put in service after October 1, 1966", therefore, should comply as nearly as possible with all sections of this part.

§231.28 Box and other house cars with roof hatches built or placed in service after October 1, 1966.

The specifications of §231.27 shall apply except as to the following:
(a) *Running boards.* Same as specified in §231.1, except: the end of longitudinal running board shall be not less than six (6) inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against buffer block or end sill.
(b) *Ladders* -- (1) *Number.* Two (2).
(2) *Dimensions.* (i) Minimum clear length of tread: Sixteen (16) inches.
(ii) Maximum spacing between treads nineteen (19) inches.
(3) *Location.* One (1) on each end of car not more than eight (8) inches from left-hand side.
(4) *Manner of application.* Same as specified in §231.1.
(c) *Roof handholds* -- (1) *Number.* Two (2), one (1) over each ladder.
(2) *Dimensions.* Same as specified in §231.1.
(3) *Location.* On roof of car. One (1) parallel to treads of each ladder, not less than eight (8) nor more than fifteen (15) inches from edge of roof, except on refrigerator cars where ice hatches prevent, when location may be nearer edge of roof.
(4) *Manner of application.* Same as specified in §231.1.
(d) *End handholds.* (Treads of end ladders are end handholds.) Same as specified for §231.27.
(e) *Existing box and other house cars with roof hatches.* Box and other house cars with roof hatches built on or before April 1, 1966, or under construction prior thereto and placed in service before October 1, 1966, shall be deemed equipped as nearly as possible within the intent of §231.1 and of this section when: Equipped as specified in §231.1, except (1) the side ladder

treads above the fourth tread from bottom of side ladder near "A" end of car and roof handhold over the side ladder near "A" end shall be removed; (2) and (1) end platform handhold shall be provided on each end of car as specified in §231.27(i); and when handbrake is operated near roof of car a brake step shall be provided as specified by §231.1 or when handbrake is operated from approximate level of top of end sill the roof handhold over side ladder near "B" end and treads above the fourth tread from bottom of side ladder near "B" end shall be removed and a brake step as specified in §231.1 shall be used with top of tread surface level with or not more than [33 FR 19663, Dec. 25, 1968, as amended at 49 FR 26745, June 29, 1984]

§231.28 Application and Guidance

The specifications of §231.27 will apply except the following:
Running Boards are same as specified for §231.1 except: the end of longitudinal running board will be less than 6 inches from a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler horn against buffer block or end sill.
There will be two ladders with minimum clear length of tread 16 inches and located one each end of car, no more than 8 inches from left hand side, and applied same as specified for §231.1.
There will be 2 Roof Handholds over each ladder with same dimensions as specified for §231.1.
Roof Handholds will be located on roof of car, one parallel to treads of each ladder except on refrigerator cars where ice hatches prevent then location may be nearer the edge of roof and applied same as specified for §231.27.
End Handholds: treads of ladders are end handholds, same as specified for §231.27.

General Note: Former TB *MP&E-98-7-* There are two textual errors in the September 1977 reprint of the Railroad Safety Appliances and Power Brake Requirements (orange) Booklet. On page 9, lines 12 through 23 should read as follows: After December 31, 1976, cars of this type built on or before April 1, 1966 or under construction to the date and placed in service before October 1, 1966 must be equipped as nearly as possible with the same compliment of safety appliances, depending on type, as specified in part §231.27 for box and other house cars without roof hatches, or in Part §231.28 for box and other house cars with roof hatches. Cars built after April 1, 1966 or under construction prior there to, and placed in service after October 1, 1966, must be equipped, depending on type as specified in part §231.27 for box and other house cars without roof hatches or, in part §231.28 for box and other house cars with roof hatches. There is an omission of two lines after line 12, page 64, in Part 231.30(a) The two omitted lines should read as follows: … 1977, seventy percent (70) by October 1, 1978 and all such locomotives by October 1, 1979.

Federal Railroad Administration

§231.29 Road locomotives with corner stairways.

After September 30, 1979, road locomotives with corner stairway openings must be equipped with (a) uncoupling mechanisms that can be operated safely from the bottom stairway opening step as well as ground level, and (b) the vertical handholds and horizontal end handholds prescribed in §231.30(e) and in §231.30 (g). No part of the uncoupling mechanism may extend into the stairway opening or end platform area when the mechanism is in its normal position or when it is operated. Each carrier shall so equip forty percent (40 percent) of its road locomotives by October 1, 1977, seventy percent (70 percent) by October 1, 1978, and all its road locomotives by October 1, 1979. [41 FR 37783, Sept. 8, 1976]

§231.29 Application and Guidance

Road locomotives without corner stairways may not be used in switching service after September 30, 1979, except for passenger cars switching service at passenger stations, (*see* 231.30 (a)(3)).

Note: Former TB *MP&E-98-64-* Subject: Auxiliary Lights Interfering With Safety Appliances

Some railroads have had the auxiliary lights (ditch lights) installed in a manner which covers a portion of the uncoupling levers, which serve as the end handhold on a locomotive.

Locomotives found in non-compliance should be handled for correction.

§231.30 Locomotives used in switching service.

(a) *General requirements.* (1) Except for steam locomotives equipped as provided in §231.16 of this part, all locomotives used in switching service built after March 31, 1977, must be equipped as provided in this section.
(2) Except for steam locomotives equipped as prescribed in §231.16 of this part, all locomotives built prior to April 1, 1977, used in switching service after September 30, 1979, shall be equipped as provided in this section. Each carrier shall so equip forty percent (40 percent) of such locomotives by October 1, 1977, seventy percent (70 percent) by October 1, 1978, and all such locomotives by October 1, 1979.
(3) Locomotives without corner stairway openings may not be used to perform any switching service after September 30, 1979 except passenger car switching service at passenger stations.
(b) *Definitions.* (1) *Locomotive used in switching service* means a locomotive regularly assigned to perform yard switching service.

(2) *Switching service* means the classification of cars according to commodity or destination; assembling of cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing, placing of locomotives and cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a road movement. However, this term does not include movement of a train or part of a train within yard limits by the road locomotive and the placement of locomotives or cars in a train or their removal from a train by the road locomotive while en route to the train's destination.
(3) *Safety tread surface* means that portion of anti-skid surface of a switching step that actually is contacted by a shoe or boot.
(4) *Uncoupling mechanism* means the arrangement for operating the coupler lock lift, including the uncoupling lever and all other appurtenances that facilitate operation of the coupler.
(c) *Switching step* -- (1) *Number.* Each locomotive used in switching service must have four (4) switching steps. (See Plate A)
(2) *Dimensions.* Each such switching step must have --
(i) On locomotives built after March 31, 1977, a minimum width of twenty-four (24) inches and a minimum depth of twelve (12) inches, except when necessary to accommodate the turning arc of a six-wheel truck and its appurtenances, the inside edge of the switching step shall have a minimum width of seventeen (17) inches (See Plate B);
(ii) On locomotives built prior to April 1, 1977, a minimum width of eighteen (18) inches, and a minimum depth of eight (8) inches;
(iii) A backstop, solid or perforated, with minimum height of backstop of six (6) inches above the safety tread surface; and
(iv) A height of not more than nineteen (19) inches, preferably fifteen (15) inches, measured from top of rail to the safety tread surface.
(3) *Location.* Switching steps must be located on each side near each end of a locomotive used in switching service. The bottom step of the stairway at these locations may also serve as a switching step if it meets all of the requirements of this section.
(4) *Manner of application.* (i) Switching steps must be supported by a bracket at each end and fastened to the bracket by two bolts or rivets of at least one-half (1/2) inch diameter or by a weldment of at least twice the strength of a bolted attachment.
(ii) Vertical clearance must be unobstructed, except for minor intrusions created by mechanical fasteners or a small triangular gusset plate at the platform level walkway, and free for use for at least a distance of eighty-four (84) inches over a portion of the switching step that is not less than seven (7) inches deep by eighteen (18) inches wide on locomotives built prior to April 1, 1977, and of not less than seven (7) inches deep by twenty-four (24) inches wide on locomotives built after March 31, 1977.
(5) *Material.* (i) Steel or other material of equivalent or better strength and deflection characteristics, anti-skid, safety design, having at least fifty percent (50%) of the tread surface as open space must be used.

(ii) When the step material creates a second level safety tread surface, the maximum difference in surface levels may not exceed three-eighths (3/8) of an inch.
(iii) The safety tread surface must extend to within one-half (1/2) inch of each edge of the step.
(6) *Visibility.* The outer edge of each switching step that is not illuminated must be painted a contrasting color. On locomotives built after March 31, 1977, switching steps shall be illuminated; on multiple-unit locomotive consists used in switching service, only the front switching steps of the leading unit and the rear switching steps of the trailing unit must be illuminated.
(d) *End footboards and pilot steps.* (1) Except for steam locomotives equipped as provided in §231.16, locomotives used in switching service built after March 31, 1975, may not be equipped with end footboards or pilot steps.
(2) Except for steam locomotives equipped as provided in §231.16, locomotives used in switching service built before April 1, 1975, may not be equipped with end footboards or pilot steps after September 30, 1978. Whenever end footboards or pilot steps are removed from a locomotive, the uncoupling mechanism and horizontal end handholds of the locomotive must be modified to comply with paragraphs (f) and (g) of this section.
(e) *Vertical handholds.* Each switching step must be provided with two (2) vertical handholds or handrails, one on each side of the switching step stairway.
(1) On locomotives built after March 31, 1977, each vertical handhold must --
(i) Be constructed of wrought iron, steel or other material of equivalent strength and durability that is at least one (1) inch diameter and be securely fastened to the locomotive with one-half (1/2) inch or larger bolts or rivets;
(ii) Begin not less than six (6) inches nor more than thirty-two (32) inches above the safety tread surface of the switching step; on units with high snowplows, each must begin not more than thirty-six (36) inches above the safety tread surface of the switching step;
(iii) Extend upward from switching step surface at least forty-eight (48) inches;
(iv) Be painted in a contrasting color to a height of at least forty-eight (48) inches above the safety tread surface of the switching step; and
(v) Provide at least two and one-half (2 1/2) inches of usable hand clearance throughout its entire length.
(2) On locomotives built before April 1, 1977, each vertical handhold must --
(i) Be constructed of wrought iron, steel or other material of equivalent strength and durability that is at least seven-eighths (7/8) inch in diameter and be securely fastened with one-half (1/2) inch or larger bolts or rivets;
(ii) Begin not less than five (5) inches nor more than thirty-two (32) inches above the safety tread surface; on units with high snowplows, each must begin not more than thirty-six (36) inches above the safety tread surface;
(iii) Extend upward from safety tread surface of the switching step at least forty-eight (48) inches;

(iv) Be painted in a contrasting color to a height of at least forty-eight (48) inches above the safety tread surface of the switching step; and
(v) Provide at least two and one-half (2 1/2) inches usable hand clearance throughout its entire length.
(f) *Uncoupling mechanisms.* Each locomotive used in switching service must have means for operating the uncoupling mechanism safely from the switching step as well as from ground level. No part of the uncoupling mechanism may extend into the switching step or stairway opening or end platform area when the mechanism is in its normal position or when it is operated. (See Plate A)
(g) *Horizontal end handholds.* Each locomotive used in switching service must have four (4) horizontal end handholds.
(1) Each horizontal end handhold must --
(i) Be constructed of wrought iron, steel or other material of equivalent strength and durability that is at least five-eighths (5/8) inch in diameter and be securely fastened to the locomotive with one-half (1/2) inch or larger bolts or rivets;
(ii) Be located not less than thirty (30) inches nor more than fifty (50) inches above the top of rail with its outer end not more than 16 inches from the side of the locomotive; on units with a high snowplow that makes normal end handhold location inaccessible, end handhold shall be located on top of plow blade, with the center of the handhold not more than fifty-three (53) inches above the top of rail, and be in line with the slope of the plow blade;
(iii) Be at least fourteen (14) inches long; and
(iv) Provide at least two (2) inches, preferably two and one-half (2 1/2) inches, usable hand clearance throughout its entire length.
(2) An uncoupling lever may also serve as a horizontal end handhold if it complies with the requirements of this paragraph. When an uncoupling lever also serves as the horizontal end handhold, it is considered to be securely fastened if its securement brackets are attached to the locomotive by one-half (1/2) inch or larger bolts or rivets and its movement between those brackets is limited to the rotation necessary for performance of the uncoupling function.

Federal Railroad Administration

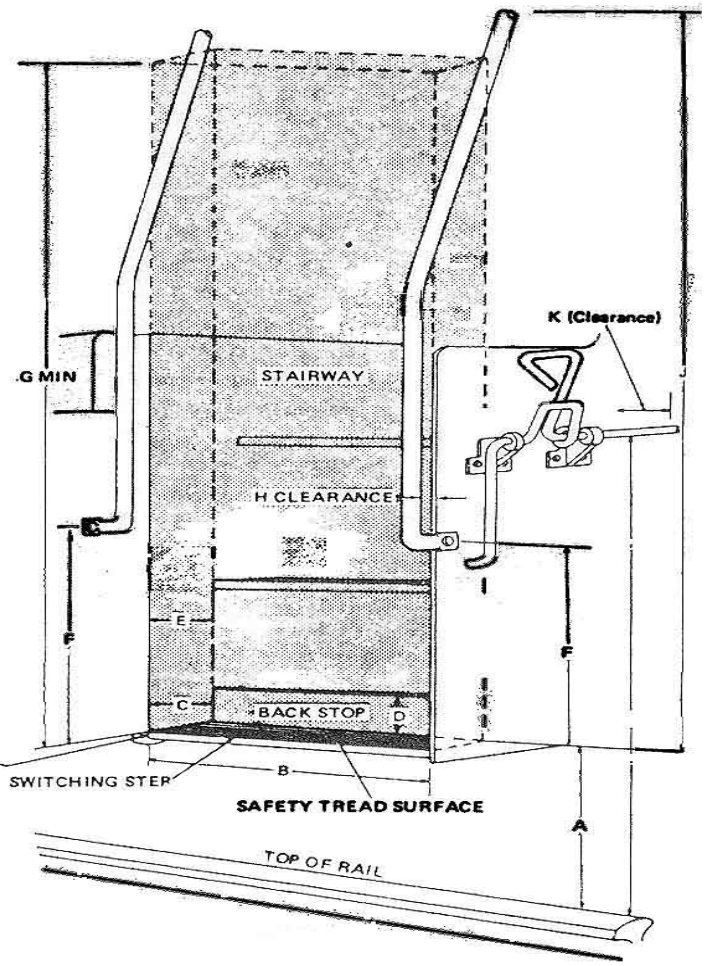
ITEM	DIMENSION NEW UNITS	DIMENSION EXISTING UNITS
A. Height of switching step above rail	15" preferred 19" maximum	15" preferred 19" maximum
B. Minimum width of switching step (between stairway supports)	24"	18"
C. Minimum depth of switching step	12"	8"
D. Minimum height of backstop	6"	6"
E. Minimum distance from front edge of switching step to front edge of first step above	7"	7"
F. Distance above switching step for start of vertical handholds Minimum-Maximum EXCEPTION Maximum for units with high snowplows	6"-32" 36"	5"-32" 36"
G. Clear height above switching step	84"	84"
H. Vertical handhold clearance	2½" minimum	2½" minimum
I. Height above top of rail for horizontal handhold or uncoupling lever if used as horizontal handhold EXCEPTION: Maximum for units with high snowplow	30"-50" 53"	30"-50" 53"
J. Minimum height above switching step of vertical handhold	48"	48"
K. Horizontal handhold clearance or uncoupling lever clearance if used as horizontal handhold	2"-2½"	2"-2½"

NOTES:

1. Switching steps must be supported by a bracket at each end and fastened to the bracket by two bolts or rivets of at least one-half (½) inch diameter or by a weldment of at least twice the strength of a bolted attachment.

2. The outer edge of each switching step that is not illuminated must be painted a contrasting color.

3. Vertical handholds must be painted in a contrasting color to a height of at least forty-eight (48) inches above the safety tread surface of the switching step.



Locomotive Plate "A"

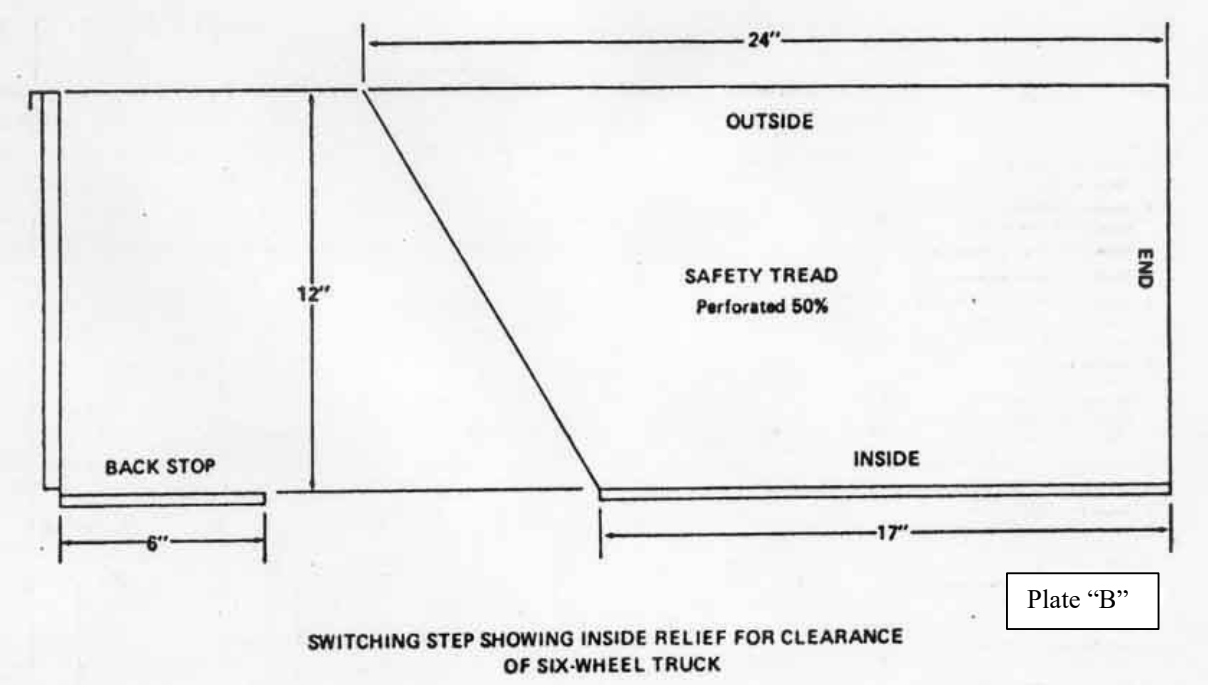


Plate "B"

SWITCHING STEP SHOWING INSIDE RELIEF FOR CLEARANCE OF SIX-WHEEL TRUCK

Federal Railroad Administration

§231.30 Application and Guidance

General requirements: except for steam locomotives equipped as provided in §231.16 of this part, all locomotives used in switching service built after March 31, 1977, must be equipped as provided in this section.
Except for steam locomotives equipped as prescribed in §231.16 of this part, all locomotives built prior to April 1, 1977, used in switching service after September 30, 1979, shall be equipped as provided in this section. Each carrier shall so equip forty percent (40 percent) of such locomotives by October 1, 1977, 70 by October 1, 1978, and all such locomotives by October 1, 1979.
Locomotives without corner stairway openings may not be used to perform any switching service after September 30, 1979 except passenger car switching service at passenger stations.
Definitions: locomotives used in switching service, means a locomotive regularly assigned to perform yard switching service.
“Switching service”, means the classification of cars according to commodity or destination; assembling of cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing, placing of locomotives and cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a road movement. However, this term does not include movement of a train or part of a train within yard limits by the road locomotive and the placement of locomotives or cars in a train or their removal from a train by the road locomotive while en route to the train's destination.
“Safety tread surface”, a shoe or boot actually contacts means that portion of anti-skid surface of a switching step that.
“Uncoupling mechanism”, means the arrangement for operating the coupler lock lift, including the uncoupling lever and all other appurtenances that facilitate operation of the coupler.
“ Switching step”, each locomotive used in switching service must have 4 switching steps (See Plate A) each such switching step must have 4 switching steps.
Locomotives built after March 31, 1977, a minimum width of 24 inches and a minimum depth of 12 inches, except when necessary to accommodate the turning arc of a six-wheel truck and its appurtenances, the inside edge of the switching step shall have a minimum width of seventeen 17 inches (See Plate B).
Locomotives built prior to April 1, 1977, a minimum width of 18 inches, and a minimum depth of 8 inches.
A backstop, solid or perforated, with minimum height of backstop of 6 inches above the safety tread surface; and a height of not more than 19 inches, preferably 15 inches, measured from top of rail to the safety tread surface.
Switching steps must be located on each side near each end of a locomotive used in switching service. The bottom step of the stairway at these locations may also serve as a switching step if it meets all of the requirements of this section. Switching steps must be supported by a bracket at each end and fastened to the bracket by two bolts or rivets of at least ½-inch diameter or by a weldment of at least twice the strength of a bolted attachment.

Vertical clearance must be unobstructed, except for minor intrusions created by mechanical fasteners or a small triangular gusset plate at the platform level walkway, and free for use for at least a distance of 84 inches over a portion of the switching step that is not less than 7 inches deep by 18 inches wide on locomotives built prior to April 1, 1977, and of not less than 7 inches deep by 24 inches wide on locomotives built after March 31, 1977.

Steel or other material of equivalent or better strength and deflection characteristics, anti-skid, safety design, having at least 50% of the tread surface as open space must be used.

When the step material creates a second level safety tread surface, the maximum difference in surface levels may not exceed 3/8 of an inch.

The safety tread surface must extend to within 1/2 inch of each edge of the step. The outer edge of each switching step that is not illuminated must be painted a contrasting color. On locomotives built after March 31, 1977, switching steps shall be illuminated; on multiple-unit locomotive consists used in switching service, only the front switching steps of the leading unit and the rear switching steps of the trailing unit must be illuminated.

Except for steam locomotives equipped as provided in §231.16, locomotives used in switching service built after March 31, 1975, may not be equipped with end footboards or pilot steps.

Except for steam locomotives equipped as provided in §231.16, locomotives used in switching service built before April 1, 1975 may not be equipped with end footboards or pilot steps after September 30, 1978. Whenever end footboards or pilot steps are removed from a locomotive, the uncoupling mechanism and horizontal end handholds of the locomotive must be modified to comply with paragraphs (f) and (g) of this section.

Each switching step must be provided with two 2 vertical handholds or handrails, one on each side of the switching step stairway.

On locomotives built after March 31, 1977, each vertical handhold must be constructed of wrought iron, steel or other material of equivalent strength and durability that is at least 1 inch diameter and be securely fastened to the locomotive with 1/2 inch or larger bolts or rivets; begin not less than 6 inches nor more than 32 inches above the safety tread surface of the switching step, on units with high snowplows, each must begin not more than 36 inches above the safety tread surface of the switching step extend upward from switching step surface at least 48 inches, be painted in a contrasting color to a height of at least 48 inches above the safety tread surface of the switching step, and provide at least 2 1/2 inches of usable hand clearance throughout its entire length.

On locomotives built before April 1, 1977, each vertical handhold must be constructed of wrought iron, steel or other material of equivalent strength and durability that is at least 7/8 inch in diameter and be securely fastened with 1/2 inch or larger bolts or rivets and begin not less than 5 inches nor more than 32 inches above the safety tread surface. On units with high snowplows, each must begin not more than 36 inches above the safety tread surface and extend upward from safety tread surface of the switching step at least 48 inches and be painted in a contrasting color to a height of at least 48 inches above the safety tread surface of the switching step and provide at least 2 1/2 inches usable hand clearance throughout its entire length.

Each locomotive used in switching service must have means for operating the uncoupling mechanism safely from the switching step as well as from ground level.

No part of the uncoupling mechanism may extend into the switching step or stairway opening or end platform area when the mechanism is in its normal position or when it is operated. (See Plate A)
Each locomotive used in switching service must have 4 horizontal end handholds.
Each horizontal end handhold must be constructed of wrought iron, steel or other material of equivalent strength and durability that is at least 5/8 inch in diameter and be securely fastened to the locomotive with 1/2 inch or larger bolts or rivets and be located not less than 30 inches nor more than 50 inches above the top of rail with its outer end not more than 16 inches from the side of the locomotive, on units with a high snowplow that makes normal end handhold location inaccessible, end handhold shall be located on top of plow blade, with the center of the handhold not more than 53 inches above the top of rail, and be in line with the slope of the plow blade and must be at least 14 inches long; and provide at least 2 inches, preferably 2 1/2 inches, usable hand clearance throughout its entire length.
An uncoupling lever may also serve as a horizontal end handhold if it complies with the requirements of this paragraph. When an uncoupling lever also serves as the horizontal end handhold, it is considered to be securely fastened if its securement brackets are attached to the locomotive by 1/2 inch or larger bolts or rivets and its movement between those brackets is limited to the rotation necessary for performance of the uncoupling function.

Locomotives used in switching service regardless of built date must be in full compliance with 49 CFR Part §231.30. However, some relaxation of the regulations is allowed with respect to switching step height and width for six axle locomotives in switching service, built prior to April 1, 1977.

It should be noted that this section specifically allows for the fastening of the switching step to the switching step bracket by weld, provided the weld is at least twice the strength of a bolted attachment.
Since this issue can obviously be subjective and open to interpretation, inspectors should exercise discretion. Generally speaking, most welds applied during manufacture are as strong or stronger than any mechanical fastener made. Welding by the manufacturer is typically performed under controlled circumstances and in accordance with strict Weld Procedure Specification (WPS). The problems associated with welding occurs when no WPS exists, as in the case in most railroad locomotive shops. When inspecting switching steps that have been applied be weld, carefully inspect the weld for discontinuities such as incomplete fusion, undercut, overlap, porosity or inclusions. If any of these defects exist in the weld, the integrity of the weld should be questioned.

The outer edge of the bottom switching step must be illuminated on all locomotives built after March 31, 1977. Locomotives built prior to March 31, 1977 may be illuminated, or have the outer edge of the switching step painted a contrasting color.

If multiple locomotives (two or more), are used in switching service, only the front switching steps of the leading locomotive and the rear switching steps of the trailing locomotive must be illuminated or painted a contrasting color, depending on built date. Vertical handholds must also be painted a contrasting color. In addition, a minimum of 2 ½ inches must maintained the entire length of the vertical handhold.

General Note: Former TB *MP&E-98-7-* There are two textual errors in the September 1977 reprint of the Railroad Safety Appliances and Power Brake Requirements (orange) Booklet. On page 9, lines 12 through 23 should read as follows: After December 31, 1976, cars of this type built on or before April 1, 1966 or under construction to the date and placed in service before October 1, 1966 must be equipped as nearly as possible with the same compliment of safety appliances, depending on type, as specified in part §231.27 for box and other house cars without roof hatches, or in Part §231.28 for box and other house cars with roof hatches. Cars built after April 1, 1966 or under construction prior there to, and placed in service after October 1, 1966, must be equipped, depending on type as specified in part §231.27 for box and other house cars without roof hatches or, in part §231.28 for box and other house cars with roof hatches. There is an omission of two lines after line 12, page 64, in Part 231.30(a) The two omitted lines should read as follows: … 1977, seventy percent (70) by October 1, 1978 and all such locomotives by October 1, 1979.

Note: Former TB *MP&E-98-64-* Subject: Auxiliary Lights Interfering With Safety Appliances

Some railroads have had the auxiliary lights (ditch lights) installed in a manner which covers a portion of the uncoupling levers, which serve as the end handhold on a locomotive.

Locomotives found in non-compliance should be handled for correction.

Note: Former TB *MP&E-98-68-* Subject: §231.30(g) Locomotives Used in Switching Service - Location End Handhold

This addresses placement of horizontal end handholds relative to the side of locomotive as referenced in Section 231.30(g)(1)(ii). When the switching step regulation was developed, handholds were installed by measuring from the side of the locomotive and from the side of the end plate. Most end handholds are measured from the side of the end plate. Electro-Motive and General Electric have been and are presently applying subject handholds in relation to the side of the end plate. The Federal Railroad Administration will not take exception, if application of horizontal end handhold placement is measured from either the side of the locomotive or side of the end plate.

Federal Railroad Administration

Former TB *MP&E-98-25-* Buro Crane interpretation of the Federal regulations regarding the operation of burro cranes should be used for consistent compliance and enforcement guidelines:

1. Chapter 203-Safety Appliances, §20302. General requirements (a)(4), which requires power driving-wheel brakes on locomotives, applies to a Burro Crane being used to pull or push cars on tracks that are part of the general rail system.

2. Railroad Power Brakes and Drawbars, 49CFR Part 232, states that power brakes are not required to be installed on "locomotive cranes" built prior to September 21, 1945. By implication, power brakes are required on all locomotive cranes, including Burro Cranes, built on or after September 21, 1945.

3. Chapter 203-Safety Appliances, §20302. General requirements (a)(1)(A) which requires automatic couplers; (a)(1)(B) secure sill steps and hand brakes; and (a)(2) grab irons or handholds; all of which apply to a Burro Crane.

4. If the Burro Crane is used as a road locomotive, §231.29 of the Safety Appliance Standards, a road locomotive with corner stairways apply.

5. If the Burro Crane is used as a locomotive in switching operations as defined in §231.30(b)(2), the requirements of §231.30 of the Safety Appliance Standards apply.

6. Other sections of the Safety Appliance Standards do not appear to apply.

7. Despite the fact that the Burro Crane is excluded from the definition of "locomotive" under §229.5(I) of the Locomotive Safety Standards as a piece of specialized maintenance equipment and is not subject to those Standards, the Burro Crane is nevertheless subject to the statutory requirements of the Locomotive Inspection Act, in particular, the requirement that it be safe. In the preamble to the final locomotive rules, FRA explicitly recognizes the applicability of the Act by stating that "FRA will continue to implement the basic statutory safety requirements with respect to such work equipment by using the Special Notice For Repair when appropriate." 45FR21093.

Note: Former TB *MP&E-98-48-* Subject: §231.30(e)(1)
Securement of Handrail to the Locomotive Carbody North American Cab Structure

Some wide body North American cab configuration locomotives have the upper end of the front vertical handrail improperly secured to the carbody as required in §231.30(e) (1) (i) that requires each vertical handhold be securely fastened… to the locomotive with one half (½) inch or larger bolts or rivets....

Some locomotives have this arrangement bolted to a bracket, welded to that section of the carbody that comprises the outside of the front sand reservoir. There appears to be adequate strength in the welded bracket, but not permitted as the regulation specifically requires safety appliance arrangements must be securely fastened with a FRA approved mechanical fasteners.

FRA has permitted factory controlled welding that provides full strength of some permanent fixtures on locomotives to which safety appliances are mechanically fastened.

If this condition is found, do not take exception, but condition should be brought to the railroad's attention for corrective action.

Note: Former TB *MP&E-98-71-* Subject: §229 §231 §232 §223
Self Propelled Vehicles Considered to Be Locomotives

This information provided in this TB reflects only the safety appliance arrangement only and any other requirement should be addressed in each appropriate section.

Several inquiries concerning equipment requirements for self propelled vehicles used to haul revenue freight on the main line has come to light. Self propelled vehicles are used in a variety of railroad functions. These vehicles include those built by Trackmobile Inc., Shuttle Wagon, Mitchell Equipment Corporation and Brandt Roadrailer.

Section §229.5 (k) states:
Locomotive means a piece of on-track equipment other than hi-rail, specialized maintenance, or other similar equipment
(1) With one or more propelling motors designed for moving other equipment;
(2) With one or more propelling motors designed to carry freight or passenger traffic or both; or
(3) Without propelling motors but with one or more control stands.

A hi-rail vehicle is defined as a truck or automobile with retractable flanged wheels so it may be used on either the highway or track. Specialized maintenance or other similar equipment includes track motor cars, cranes, derricks, pile drivers, ballast cleaners, etc. When self propelled vehicles are used only in the performance of typical maintenance-of-way functions, or if they are used to move cars or equipment within the confines of repair facilities, they are to be considered specialized maintenance equipment and are exempt from many Federal Railroad Administration (FRA) regulations.

When a self propelled vehicle is used to move freight over the railroad, outside the limits established for maintenance-of-way operations and repair facilities, it will be considered a locomotive and must comply with applicable regulations.

Even though these vehicles do not resemble a standard locomotive, the purpose for which they are being used requires compliance with 49 CFR Sections §223, §229, §231 and §232.

The self-propelled vehicles are unique in construction, appearance and use. Many of these vehicles currently being used have already been modified by the manufacturers (as closely as construction would permit) to bring them into compliance with FRA. The FRA acknowledges that this equipment has a place in a well-rounded rail transportation system. In an effort to recognize the unique characteristics of these vehicles, MP&E inspector(s) should exercise enforcement discretion and good judgement in analyzing an operation where self-propelled vehicles are used for train movements.

The following specifications should be used by MP&E inspector(s) for enforcement guidance as provided in this section (§231.30): The Switching steps; Four horizontal handholds secured to the back and front ends of the vehicle, secured by bolts or other acceptable mechanical fastener; vertical handholds painted in contrasting colors and secured by bolts or other acceptable fasteners; and must be equipped with automatic couplers, to prevent the necessity of a someone going between the vehicle and car for the purpose of coupling or uncoupling.

Items deemed to be safety related, that cannot meet specified requirements, will be required to seek a Request for Waiver.

§231.31 XXX

Link to an amendment published at 66 FR 4192, Jan. 17, 2001.
This amendment was delayed until May 31, 2001, at 66 FR 9906, Feb. 12, 2001.

Appendix A to Part 231 -- Schedule of Civil Penalties [1]

[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 CFR part 209, appendix A.
[2]This schedule uses section numbers from FRA's Safety Appliance Defect Code, a restatement of the CFR text in a reorganized format. For convenience, and as an exception to FRA's general policy, penalty citations will cite the defect code rather than the CFR. FRA reserves the right, should litigation become necessary, to substitute in its complaint the CFR and/or statutory citation in place of the defect code section cited in the penalty demand letter.
Link to an amendment published at 66 FR 4193, Jan. 17, 2001.
This amendment was delayed until May 31, 2001, at 66 FR 9906, Feb. 12, 2001.

§238.229 Safety appliances. 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 and Sec. §232.2 of this chapter.

§238.229 Application and Guidance

All Passenger equipment will be held to Safety Appliance Standards compliance contained in Federal statute at 49 U.S.C., chapter 203 and FRA, 49 CFR regulations. As per part §231, Safety Appliance Standards requirements apply to all standard gauge railroads. It does not apply to a railroad, which operates only on track inside an installation, which is not part of the general railroad system of transportation, or Rapid Transit systems in urban areas that are not connected with the general railroad system of transportation. Except for provisions governing Uncoupling devices, this part does not apply to Tier II Passenger equipment as defined in part §238.5 of this chapter, (passenger equipment operating at speeds exceeding 125 mph but not exceeding 150 mph).
Except on cars specified in the provisions in section 6 of the Safety Appliance Act of March 2,1893 (sec 6, 27 Stat. 532, U.S.C. 6) as the same as amended April 1, 1896 (29 Stat. 85; 45 U.S.C. 6) the standard height of Drawbars designated there in compliance with law is modified as prescribed: the maximum height of drawbars for freight cars measured perpendicularly from the level of the tops of rails to the centers of drawbars for standard gauge railroads will be 34 ½ inches, and minimum height of drawbars for freight cars on standard gauge railroads measured in the same manner will be 31 ½ inches. Narrow gauge railroads in the United States are subject to a maximum height of drawbars for freight cars measured from the level of the tops of rails to the centers of drawbars will be 26 inches. The minimum height if drawbars for freight cars on narrow gauge railroads measured in the same manner will be 23 inches. Two-foot gauge railroads in the United States are subject to a maximum height of drawbars for freight cars measured from the level of the tops of rails to the center of drawbars will be 17 ½ inches. The minimum height of drawbars for freight cars on 2-foot gauge railroads measured in the same manner will be 14 ½ inches.

MP&E inspector(s) should not take exception to passenger cars that have safety appliances attached with bolt that do not have threads exposed on cars built in the past. There are no external means to examine deformed threads and have a long-standing application with the bolt head exposed that secures the safety appliance. MP&E inspector(s) should follow the existing part §231 of related to passenger cars as guidance.

Sec. 238.429 Safety Appliances as Applied to Tier 2 Equipment.

(a) Couplers.

(1) The leading and the trailing ends of a semi-permanently coupled trainset shall each be equipped with an automatic coupler that couples on impact and uncouples by either activation of a traditional uncoupling lever or some other type of uncoupling mechanism that does not require a person to go between the equipment units.

(2) The automatic coupler and uncoupling device on the leading and trailing ends of a semi-permanently coupled trainset may be stored within a removable shrouded housing. (3) If the units in a train are not semi-permanently coupled, both ends of each unit shall be equipped with an automatic coupler that couples on impact and uncouples by either activation of a traditional uncoupling lever or some other type of uncoupling mechanism that does not require a person to go between the equipment units.

(b) Hand brakes. Except as provided in paragraph (f) of this section, Tier II trains shall be equipped with a parking or hand brake that can be applied and released manually and that is capable of holding the train on a 3-percent grade.

(c) Safety appliance mechanical strength and fasteners.

(1) All handrails, handholds, and sill steps shall be made of 1-inch diameter steel pipe, 5/8-inch thickness steel, or a material of equal or greater mechanical strength.

(2) All safety appliances shall be securely fastened to the car body structure with mechanical fasteners that have mechanical strength greater than or equal to that of a 1/2-inch diameter SAE grade steel bolt mechanical fastener.

(i) Safety appliance mechanical fasteners shall have mechanical strength and fatigue resistance equal to or greater than a 1/2-inch diameter SAE steel bolt.

(ii) Mechanical fasteners shall be installed with a positive means to prevent unauthorized removal. Self-locking threaded fasteners do not meet this requirement.

(iii) Mechanical fasteners shall be installed to facilitate inspection.

(d) Handrails and handholds. Except as provided in paragraph (f) of this section:

(1) Handrails shall be provided for passengers on both sides of all steps used to board or depart the train.

(2) Exits on a power vehicle shall be equipped with handrails and handholds so that crewmembers can get on and off the vehicle safely.

(3) Throughout their entire length, handrails and handholds shall be a color that contrasts with the color of the vehicle body to which they are fastened.

(4) The maximum distance above the top of the rail to the bottom of vertical handrails and handholds shall be 51 inches, and the minimum distance shall be 21 inches.

(5) Vertical handrails and handholds shall be installed to continue to a point at least equal to the height of the top edge of the control cab door.

(6) The minimum hand clearance distance between a vertical handrail or handhold and the vehicle body shall be 21/2 inches for the entire length.

(7) All vertical handrails and handholds shall be securely fastened to the vehicle body.

(8) If the length of the handrail exceeds 60 inches, it shall be securely fastened to the power vehicle body with two fasteners at each end.

(e) Sill steps. Except as provided in paragraph (f) of this section, each power vehicle shall be equipped with a sill step below each exterior door as follows:
(1) The sill step shall have a minimum cross-sectional area of 1/2 by 3 inches;
(2) The sill step shall be made of steel or a material of equal or greater strength and fatigue resistance;
(3) The minimum tread length of the sill step shall be 10 inches;
(4) The minimum clear depth of the sill step shall be 8 inches;
(5) The outside edge of the tread of the sill step shall be flush with the side of the car body structure;
(6) Sill steps shall not have a vertical rise between treads exceeding 18 inches;
(7) The lowest sill step tread shall be not more than 24, preferably not more than 22, inches above the top of the track rail;
(8) Sill steps shall be a color that contrasts with the color of the power vehicle body to which they are fastened;
(9) Sill steps shall be securely fastened;
(10) At least 50 percent of the tread surface area of each sill step shall be open space; and
(11) The portion of the tread surface area of each sill step which is not open space and is normally contacted by the foot shall be treated with an anti-skid material.
(f) Exceptions.
(1) If the units of the equipment are semi-permanently coupled, with uncoupling done only at maintenance facilities, the equipment units that are not required by paragraph (a) of this section to be equipped with automatic couplers need not be equipped with sill steps or end or side handholds that would normally be used to safely perform coupling and uncoupling operations.
(2) If the units of the equipment are not semi-permanently coupled, the units shall be equipped with hand brakes, sill steps, end handholds, and side handholds that meet the requirements contained in Sec. §231.14 of this chapter.
(3) If two trainsets are coupled to form a single train that is not semi-permanently coupled (i.e., that is coupled by an automatic coupler), the automatically coupled ends shall be equipped with hand brakes, sill steps, end handholds, and side handholds that meet the requirements contained in Sec. §231.14 of this chapter. If the trainsets are semi-permanently coupled, these safety appliances are not required.
(g) Optional safety appliances. Safety appliances installed at the option of the railroad shall be firmly attached with mechanical fasteners and shall meet the design and installation requirements provided in this section.

§238.429 Application and Guidance

The leading and trailing ends of semi-permanently coupled trainset will be equipped with an automatic coupler that couples on impact and uncouples by activation of a traditional uncoupling lever or some other type of uncoupling mechanism that does not require a person to go between the equipment units.

The automatic coupler and uncoupling device on the leading and trailing ends of a semi-permanently coupled trainset may be stored within a removable shrouded housing. If the units in a train are not semi-permanently coupled, both ends of each unit shall be equipped with an automatic coupler that couples on impact and uncouples by either activation of a traditional uncoupling lever or some other type of uncoupling mechanism that does not require a person to go between the equipment units.
Tier II trains will be equipped with a parking or hand brake that can be applied and released manually and that is capable of holding the train on a 3-percent grade.
All safety appliances will be securely fastened to the car body structure with mechanical fasteners that have mechanical strength greater than or equal to that of a 1/2-inch diameter SAE grade steel bolt mechanical fastener.
Safety appliance mechanical fasteners will have mechanical strength and fatigue resistance equal to or greater than a 1/2-inch diameter SAE steel bolt.
Mechanical fasteners will be installed with a positive means to prevent unauthorized removal. Self-locking threaded fasteners do not meet this requirement.
Mechanical fasteners will be installed to facilitate inspection.
Handrails and handholds.: except as provided in paragraph (f) of this section:
handrails will be provided for passengers on both sides of all steps used to board or depart the train.
Exits on a power vehicle will be equipped with handrails and handholds so that crewmembers can get on and off the vehicle safely.
Throughout their entire length, handrails and handholds will be a color that contrasts with the color of the vehicle body to which they are fastened.
The maximum distance above the top of the rail to the bottom of vertical handrails and handholds will be 51 inches, and the minimum distance shall be 21 inches.
Vertical handrails and handholds will be installed to continue to a point at least equal to the height of the top edge of the control cab door.
The minimum hand clearance distance between a vertical handrail or handhold and the vehicle body will be 21/2 inches for the entire length.
All vertical handrails and handholds will be securely fastened to the vehicle body.
If the length of the handrail exceeds 60 inches, it shall be securely fastened to the power vehicle body with two fasteners at each end.
Each power vehicle will be equipped with a sill step below each exterior door and will have a minimum cross-sectional area of 1/2 by 3 inches.
The sill step will be made of steel or a material of equal or greater strength and fatigue resistance with a minimum tread length of the sill step shall be 10 inches.
The minimum clear depth of the sill step will be 8 inches.
The outside edge of the tread of the sill step will be flush with the side of the car body structure;
Sill steps will not have a vertical rise between treads exceeding 18 inches.
The lowest sill step tread shall be not more than 24, preferably not more than 22, inches above the top of the track rail.

Sill steps will be a color that contrasts with the color of the power vehicle body to which they are fastened.
Sill steps shall be securely fastened with FRA approved fasteners.
At least 50 percent of the tread surface area of each sill step will be open space.
The portion of the tread surface area of each sill step which is not open space and is normally contacted by the foot shall be treated with an anti-skid material.
Exceptions: if the units of the equipment are semi-permanently coupled, with uncoupling done only at maintenance facilities, the equipment units that are not required by paragraph (a) of this section to be equipped with automatic couplers need not be equipped with sill steps or end or side handholds that would normally be used to safely perform coupling and uncoupling operations. If the units of the equipment are not semi-permanently coupled, the units shall be equipped with hand brakes, sill steps, end handholds, and side handholds that meet the requirements contained in Sec. §231.14 of this chapter.
If two trainsets are coupled to form a single train that is not semi-permanently coupled the automatically coupled ends shall be equipped with hand brakes, sill steps, end handholds, and side handholds that meet the requirements contained in Sec. §231.14 of this chapter. If the trainsets are semi-permanently coupled, these safety appliances are not required.
Optional safety appliances: Safety appliances installed at the option of the railroad shall be firmly attached with mechanical fasteners and shall meet the design and installation requirements provided in this section.

FRA safety appliance defect code section\2\	Violation	Willful violation
110.A1 Hand Brake or Hand Brake Part Missing	$ 5,000	$7,500
110.A2 Hand Brake or Hand Brake Part Broken	5,000	7,500
110.A3 Hand Brake or Hand Brake Part Loose or Worn	2,500	5,000
110.B1 Hand Brake Inoperative	5,000	7,500
110.B2 Hand Brake Inefficient	2,500	5,000
110.B3 Hand Brake Improperly Applied	2,500	5,000
110.B4 Hand Brake Incorrectly located	2,500	5,000
110.B5 Hand Brake Shaft Welded or Wrong Dimension	2,500	5,000
110.B6 Hand Brake Shaft Not Retained in Operating Position	2,500	5,000
110.B8 Hand Brake or Hand Brake Parts Wrong Design	2,500	5,000
114.B2 Hand Brake Wheel or Lever Has Insufficient Clearance Around Rim or Handle	2,500	5,000
114.B3 Hand Brake Wheel/Lever Clearance Insufficient to Vertical Plane Through Inside Face of Knuckle	2,500	5,000
120.A1 Brake Step Missing Except by Design	5,000	7,500
120.A2 Brake Step or Brace Broken or Decayed	2,500	5,000
120.A3 Brake Step or Brace Loose	2,500	5,000
120.B1 Brake Step or Brace Bent	2,500	5,000
120.B2 Brake Step or Wrong Dimensions	2,500	5,000
120.C1 Brake Step Improperly Applied	2,500	5,000
120.C2 Brake Step Improperly Located	2,500	5,000
120.C3 Brake Step With Less Than 4 Clearance to Vertical Plane Through Inside Face of Knuckle	2,500	5,000
120.C4 Brake Step Obstructed or Otherwise Unsafe	2,500	5,000
124.A1 Running Board Missing or Part Missing Except By Design	5,000	7,500
124.A2 Running Board Broken or Decayed	5,000	7,500
124.A3 Running Board Loose Presents a Tripping Hazard or Other Unsafe Condition	2,500	7,500
124.A4 Running Board Wrong Material	2,500	5,000
124.B1 Running Board Bent to the Extent that It is Unsafe	2,500	5,000
124.B2 Running Board Wrong Dimensions	2,500	5,000
124.B3 Running Board Wrong Location	2,500	5,000
124.C1 Running Board Improperly Applied	2,500	5,000
124.C2 Running Board Obstructed	2,500	5,000

FRA safety appliance defect code section\2\	Violation	Willful violation
126.A1 End Platform Missing or Part Except By Design	5,000	7,500
126.A2 End Platform Broken or Decayed	5,000	7,500
126.A3 End Platform Loose	2,500	5,000
126.B1 End Platform or Brace Bent	2,500	5,000
126.B2 End Platform Wrong Dimensions	2,500	5,000
126.C1 End Platform Improperly Applied	2,500	5,000
126.C2 End Platform With Less Than Required Clearance to Vertical Plane Through Inside Knuckle	2,500	5,000
126.C3 End Platform Improperly Located	2,500	5,000
126.C4 End Platform Obstructed	5,000	7,500
128.A1 Platform or Switching Step Missing	5,000	7,500
128.A2 Platform or Switching Step Broken or Decayed	5,000	7,500
128.A3 Platform or Switching Step Loose	2,500	5,000
128.B1 Platform or Switching Step Bent	2,500	5,000
128.B2 Platform or Switching Step Does Not Meet the Required Location or Dimensions	2,500	5,000
128.C1 Platform or Switching Step Improperly Applied or Repaired	2,500	5,000
128.C2 Platform or Switching Step Obstructed	2,500	5,000
128.D1 Switching Step Back Stop or Kick Plate Missing	2,500	5,000
128.D2 Switching Step Not Illuminated When Required	2,500	5,000
128.D3 Non-Illuminated Step Not Painted Contrasting Color	1,000	2,000
130.A1 Sill Step or Additional Tread, Missing	5,000	7,500
130.A2 Sill Step or Additional Tread, Broken	5,000	7,500
130.A3 Sill Step or Additional Tread, Loose	2,500	5,000
130.B1 Sill Step or Additional Tread, Bent	2,500	5,000
130.B2 Sill Step or Additional Tread, Having Wrong Dimensions or Improperly Located	2,500	5,000
130.B3 Sill Step Improperly Applied	2,500	5,000
132.A1 Side Missing Step	5,000	7,500
132.A2 Side Door Step Broken	5,000	7,500

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FRA safety appliance defect code section\2\	Violation	Willful violation
132.A3 Side Door Step Loose	2,500	5,000
132.B1 Side Door Step Bent	2,500	5,000
132.B2 Side Door Step Having Wrong Dimensions	2,500	5,000
134.A1 Ladder Missing	5,000	7,500
134.A2 Ladder Broken	5,000	7,500
134.A3 Ladder Loose	2,500	5,000
134.B1 Ladder Bent	2,500	5,000
134.B2 Ladder Having Wrong Dimensions	2,500	5,000
134.C1 Ladder Improperly Applied	2,500	5,000
134.C2 Ladder Having Insufficient Clearance or Improperly Located	2,500	5,000
134.C3 Ladder Wrong Design	2,500	5,000
134.C4 Ladder Wrong Material	2,500	5,000
134.D1 End Clearance Insufficient	2,500	5,000
136.A1 Ladder Tread or Handholds Missing	5,000	7,500
136.A2 Ladder Tread or Handhold Broken	5,000	7,500
136.A3 Ladder Tread or Handhold Loose Except By Design	2,500	5,000
136.B1 Ladder Tread or Handhold Bent to The Extent That It May Be Unsafe	2,500	5,000
136.B2 Ladder Tread or Handhold Wrong Dimensions	2,500	5,000
136.C1 Ladder Tread or Handhold Improperly Applied	2,500	5,000
136.C2 Ladder Tread or Handhold Having Wrong Clearance	2,500	5,000
136.C3 Ladder or Handhold Improperly Located	2,500	5,000
136.C4 Ladder Tread or Handhold Obstructed	2,500	5,000
136.C5 Ladder Tread Without Footguards	2,500	5,000
138.A1 Hand or Safety Railing Missing	5,000	7,500
138.A2 Hand or Safety Railing Broken	5,000	7,500
138.A3 Hand or Safety Railing Loose Except by Design	2,500	5,000
138.B1 Hand or Safety Railing Bent	2,500	5,000
138.B2 Hand or Safety Railing Wrong Dimensions	2,500	5,000
138.C1 Hand or Safety Railing Improperly Applied	2,500	5,000
138.C2 Hand or Safety Railing Having Less Than the Required Clearance	2,500	5,000
138.C3 Hand or Safety Railing Improperly Located	2,500	5,000
140.A1 Uncoupling Lever Missing	2,500	5,000
140.A2 Uncoupling Lever Broken or Disconnected	2,500	5,000

FRA safety appliance defect code section\2\……	Violation	Willful violation
140.B1 Uncoupling Lever Bent Will not Safely and Reasonably Function As Intended…….	2,500	5,000
140.C1 Uncoupling Lever Bracket Bent Lever Will Not Function Properly.....……..	2,500	5,000
140.C2 Uncoupling Lever Bracket Broken or Missing…….	2,500	5,000
140.D1 Uncoupling Lever Wrong Dimension....……..	2,500	5,000
140.D2 Uncoupling Lever With Improper Handle Clearance……..	2,500	5,000
144.A1 Coupler Missing.....……..	5,000	7,500
144.B1 Coupler Height Incorrect.....……..	2,500	5,000
144.C1 Coupler Inoperative……..	2,500	5,000
145.A1 Kick Plates Missing……..	2,500	5,000
145.A2 Kick Plates Broken……	2,500	5,000
145.B1 Kick Plates Wrong Dimensions…….	2,500	5,000
145.B2 Kick Plates Improper Clearance……	2,500	5,000
145.B3 Kick Plates Insecure Or Improperly Applied……	2,500	5,000
146.A Notice or Stencil not Posted on Cabooses with Running Boards Removed…….	500	1,000
146.B Safe Means not Provided to Clean or Maintain Windows of Caboose……..	1,000 1,000	2,000 2,000

Federal Railroad Administration

MPE-98-5
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-5
Subject: §231.1
Standard Level and Low Level Auto Rack Cars - Safety Appliance Arrangements
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Since the origination of the radial door and its application to auto rack cars, many clearance problems have developed. Because of the nature of these problems, the vertical relationship of the side ladders and sill steps has been altered in such a manner that there are variations of misalignment from 5 to 13 inches. The Federal Railroad Administration (FRA) feels that this has created a potential safety hazard and that FRA needs to establish guidelines to implement improvement in this area.

FRA and the Car Manufacturers determined that the following dimensions be adopted:

	Relationship of Sill Step to Side Ladder
Standard Level Cars	
All cars	2-3/16 inch maximum
Low Level Cars	
Built 1978 & prior	5- inch maximum
Built after 1978	4- inch maximum

Please be governed accordingly.

MPE-98-7
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-7
Subject: §231.1 §231.30 §231.27 §231.28
Errors in U.S. DOT Safety Appliances Standards Booklet, Published September 1977
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

There are two textual errors in the September 1977 reprint of the Safety Appliances and Power Brake Requirements (orange) Booklet. The first is in the "Note" to 231.1 on page 9, lines 12 through 23. The correct text should read as follows, with the portions associated with the error underlined:

Note: After December 31, 1976, cars of this type built on or before April 1, 1966 or under construction prior to that date and placed in service before October 1, 1966 must be equipped as nearly as possible with the same complement of safety appliances, depending upon type, as specified in 231.27 for box and other house cars without roof hatches, or in 231.28 for box and other house cars with roof hatches . Cars built after April 1, 1966 or under construction prior thereto and placed in service after October 1, 1966, must be equipped, depending upon type as specified in 231.27 for box and other house cars without roof hatches, or in 231.28 for box and other house cars with roof hatches.

The second textual error involves the omission of two lines after line 12, page 64 in 231.30 (a-) (2). The two lines omitted should read as follows:

…1977, seventy percent (70 percent) by October 1, 1978 and all such locomotives by October1, 1979.

Please be governed accordingly.

Federal Railroad Administration

MPE-98-11
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-11
Subject: Testing of Handbrakes on Locomotives Equipped with an Air Release Valve

From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

On some locomotives, the application of the handbrake actuates an air release valve to the brake cylinder on the side of the truck where the handbrake functions. This system is necessary because the brake cylinder body has to be moved by the application of the handbrake and if the piston is extended, the cylinder body cannot be moved. When the release valve is functioning properly, it will relieve the pressure and allow the piston to retract so that the application of the handbrake will force the cylinder body toward the wheel.

If the release valve does not function as intended and the handbrake is applied with the piston extended, the locomotive will not have any holding brakes when the air leaks off.

The Federal Railroad Administration (FRA) has been advised that there have been incidents of rollaway locomotives because of the failure of this release valve. In many cases, employees have applied the handbrake and shut locomotives, only to discover later that the handbrake was not applied after the air leaked off.

All FRA inspectors are reminded that they are not to involve themselves in the manipulation of any apparatus that may in any way cause or allow an adverse condition. Testing for the above described condition must be done only by carrier personnel.

MPE-98-13
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-13
Subject: 231.1(d)(2), 231.27©(2)
Interpretation of Sill Step Application, 49 CFR Parts 231.1(d)(2) and 231.27©(2)
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

It has been brought to the Office of Safety's attention that some sill step applications on certain types of cars are being considered by field forces as non-complying conditions under the Railroad Safety Appliance Standards when in fact, the sill steps are in compliance. To minimize confusion in this area, the following guidelines should be used when considering sill step applications.

49 CFR, Parts 231.1(d)(2) and 231.27©(2) address both, Sill Steps Dimensions and provide the minimum standards for cross-sectional area, material, length and clear depth. The minimum standard for clear depth is 8 inches. Please note carefully the words, "clear depth". Clear depth should be understood as meaning a vertical space the width of, and above, the sill step material or strap, and that vertical space shall be clear and unobstructed for 8 inches.

Note how this differs fundamentally from the dimensions requirements for handholds and ladder treads in the Safety Appliance Standards which stipulate, "minimum clearance…, 2 inches …." No limiting direction orientation for clear space is provided, therefore clearance of 2 inches is required in all directions or 360 degrees around the handhold or ladder tread.

As in all considerations of safety appliances, whether or not the appliance can be used "safely" must be considered along with the clearances and dimensions.

Federal Railroad Administration

MPE-98-14
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-14
Subject: §231.1
Safety Appliance Securement
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

The Railroad Safety Appliance Standards, 49 CFR Part 231, requires that safety appliances and their brackets be secured by ½ inch bolts with nuts outside (when possible) and riveted over, or with not less than ½ inch rivets. Additionally, in order to comply with the Safety Appliance Regulations, there must be a deformation of the threads to prevent the fastener from becoming insecure. This can be accomplished by one of the following methods:

1. .Rivet the fastener;

2. .Check the threaded portion of the bolt nearest the fastener with a chisel to inch depth at two locations; or

3. .Apply weld to the threaded portion of the threads, so as to deform them.

Additional approved safety appliance securement are: one and two piece rivets, bolts, Huck bolts, and Unilock and Disclock fasteners when properly applied.

Part 231 is explicit in requiring that handholds be securely fastened. By definition, secure means free from danger or risk of loss; free from fear or doubt; and not likely to fail or give way.

The Federal Railroad Administration's (FRA) longstanding policy concerning the securement of all safety appliances requires that safety appliances or supports for safety appliances must be mechanically fastened. Brackets or supports that are applied to a car structure (other than a tank car tank) solely for the securement of safety appliances are to be mechanically fastened to the car structure.

Many years of railroading experience has shown that welds are not uniform and are subject to failure, despite improvements in welding procedures. Cracks and breaks in welds are difficult to detect during inspections. Therefore, welding is not considered to meet the definition of secure. This is particularly evident at repair facilities, where quality of workmanship is not always assured.

Safety appliances for other than steam locomotives are not addressed in Part 231, with the exception of 231.29, "Road locomotives with corner stairways" and 231.30 "Locomotives used in switching service". This does not mean that non-steam locomotives are not required to have proper safety appliances. It is FRA's position that other than steam locomotives must have proper safety appliances and are covered as cars of special construction.

This requires that locomotives other than steam have as nearly as possible the same complement of safety appliances as contained in the categories governing steam locomotives.

However, the FRA has not enforced the deformation of threads of bolts used to secure safety appliances on locomotives. These appliances are usually secured by self locking nuts and or lock washers, and to our knowledge has not presented a safety problem.

Exception should only be taken when the safety appliances on other than steam locomotives are insecure or presenting a potential safety hazard to railroad employees. Out of service form F6180.8 should only be issued if the safety appliance is defective to the extent it creates an immediate unsafe condition.

Federal Railroad Administration

MPE-98-16
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-16
Subject: §231.6
DODX 4000 Series Flat Cars
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

In the past, inspectors have questioned whether DODX 4000 series flat cars are in compliance with Title 49, CFR, Section 231.6(a)(3)(I), which requires that "Each handbrake shall be so located that it can be safely operated while the car is in motion".
These cars are designed to have a 2 ½ by 8 inch slot in the car floor near each corner. These slots are considered by the FRA as "grab holes", so that the handbrake can be safely operated using this "grab hole" when the car is in motion.

These cars were built primarily to haul M-1 tanks, which are 12 feet wide. The car floor is only 10 feet - 8 inches wide. The handbrake is located so that the tanks can be loaded or unloaded.

Also, it has been reported that these cars have a missing bottom rod safety support.

These cars are equipped with Buckeye 6-wheel trucks with truck mounted brakes. Because of the truck mounted brakes, bottom rods requiring safety supports are found only on the handbrake truck. There are two bottom rods. One is equipped with two safety supports, while the other has only one. The truck, as designed, lacks a bracket or other location to which an effective fourth safety support can be attached. The brake rod in question measures 35 inches between pivot points. The loss of a connecting pin at the unsupported end of the rod would cause the rod to drop ½ inch over a distance of 7 inches before it encountered the existing safety support. The minimum clearance above the rail would still be more than 2 ½ inches.

Inspectors should take no exception to cars so equipped. Please be governed accordingly.

MPE-98-17
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-17
Subject: §231.18 §231.27
Applicable Safety Appliance Regulation Governing Bulkhead Flat Cars
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

There have been several inquiries concerning the applicable safety appliance regulation governing bulkhead flat cars.

Although the Safety Appliance Standards do not specifically address bulkhead flatcars, these cars would be considered a car of special construction. The Code of Federal Regulations 49, Part 231.18 states that cars-of special construction must have as nearly as possible, the same complement of handholds, sill steps, ladders, handbrakes, and running boards that are required for cars of the nearest approximate type.

FRA is of the opinion that this car, with fixed ends above the floor, most closely resembles cars described in Part 231.27, “House and other box cars without hatch covers built or put in service after October 1, 1966”.

Therefore, bulkhead flat cars built or placed in service after October 1, 1966 should comply as nearly as possible with all sections of this part.

Federal Railroad Administration

MPE-98-18
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-18
Subject: §231
Aluminum Safety Appliances
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

In the past, exception has been taken to various cars equipped with aluminum safety appliances; ladder treads, handholds and sill steps.

Our Office of Research and Development has confirmed that the ladder treads, handholds of circular cross-section , 13/16-inch diameter and sill steps, 5/8-inch thick and 2 inches wide, when constructed of 6061-T6 aluminum alloy exceeds the current Federal Railroad Administration's requirements.

Please be governed accordingly.

MPE-98-19
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-19
Subject: §231.18
Safety Appliance Arrangement on "Differential" 100-Ton Covered Hopper Cars Built By the Thrall Car Manufacturing Company
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

On "pressure differential" 100-Ton Covered Hopper Cars, built by the Thrall Car Manufacturing Company, the end platform and end platform handholds are less than 60 inches long because of structural considerations.

Structural justification for the design is to place supports on the flat end sheet, at locations that will prevent over stressing the sheet when the car is pressurized.

A letter was sent to the Thrall Car Manufacturing Company, General Electric, and Rail Car Services with the following information:

Concerning the safety appliance arrangement on "Differential" 100-ton covered hopper cars. Specifically, the end platforms and horizontal end platform handholds having a length of less than 60 inches.

Please be advised that due to the structural design of these cars (curved sided), the Federal Railroad Administration (FRA) will not take exception to the end platforms and horizontal end platform handholds having a length of less than 60 inches. FRA will consider these cars to be of special construction and conform to those requirements as specified in Title 49, CFR, Section 231.18.

Please be governed accordingly.

Federal Railroad Administration

MPE-98-22
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-22
Subject: §231.1
Adjustable Handhold / Ladder Tread
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

The adjustable handhold/ladder tread is ¾ inch in diameter. Its length may be adjusted as needed, by the application of a ¼ inch roll pin into the desired hole. The remaining portion is to be cut off, leaving a smooth surface.

In 1988 the Federal Railroad Administration (FRA) ruled that this adjustable safety appliance meets the specified requirements, if properly applied. However, FRA expressed concern of the possibility of improper application, such as the substitution of the roll pin, improper securement, etc.

If any deficiency is found concerning this safety appliance, such as substitution of the roll pin, improper securement, etc. it should be reported to the regional MP&E Specialist with all pertinent information, including photographs. The specialist is to promptly advise the MP&E Division Chief.

MPE-98-23
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-23
Subject: Covered Hopper Cars Running Board Extensions

From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

There have been several inquiries concerning running board extensions.

The Federal Railroad Administration's position is that a running board end extension is not required if the end of the longitudinal running board is at least 6 inches from the vertical plane and the longitudinal running board extends at least the entire length of the roof. In other words, if the longitudinal roof running board does not extend at least the entire length of the roof, a running board extension is required.

Federal Railroad Administration

MPE-98-25
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-25
Subject: §229.5 §231.29 §231.30
Buro Crane Requirements
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

The following interpretations of the Federal regulations regarding the operation of burro cranes should be used for consistent compliance and enforcement guidelines:

1. Chapter 203-Safety Appliances, §20302. General requirements (a)(4), which requires power driving-wheel brakes on locomotives, applies to a Burro Crane being used to pull or push cars on tracks that are part of the general rail system.

2. Railroad Power Brakes and Drawbars, 49CFR Part 232, states that power brakes are not required to be installed on "locomotive cranes" built prior to September 21, 1945. By implication, power brakes are required on all locomotive cranes, including Burro Cranes, built on or after September 21, 1945.

3. Chapter 203-Safety Appliances, §20302. General requirements (a)(1)(A) which requires automatic couplers; (a)(1)(B) secure sill steps and hand brakes; and (a)(2) grab irons or handholds; all of which apply to a Burro Crane.

4. If the Burro Crane is used as a road locomotive, §231.29 of the Safety Appliance Standards, a road locomotive with corner stairways apply.

5. If the Burro Crane is used as a locomotive in switching operations as defined in §231.30(b)(2), the requirements of §231.30 of the Safety Appliance Standards apply.

6. Other sections of the Safety Appliance Standards do not appear to apply.

7. Despite the fact that the Burro Crane is excluded from the definition of "locomotive" under §229.5(I) of the Locomotive Safety Standards as a piece of specialized maintenance equipment and is not subject to those Standards, the Burro Crane is nevertheless subject to the statutory requirements of the Locomotive Inspection Act, in particular, the requirement that it be safe. In the preamble to the final locomotive rules, FRA explicitly recognizes the applicability of the Act by stating that "FRA will continue to implement the basic statutory safety requirements with respect to such work equipment by using the Special Notice For Repair when appropriate." 45FR21093.

Federal Railroad Administration

MPE-98-26
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-26
Subject: §231.1
Handbrakes - Articulated Cars
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Handbrake performance requirements as specified in Title 49 CFR Part 231 include the following:

Must be an efficient design;

Must operate in harmony with the power brake;

Must provide equal or greater total force on the brake shoes as the brake cylinder with 50psi air pressure;

One handbrake per car.

The Association of American Railroads (AAR) is more specific in their requirements in that a minimum braking ration of 11 percent must be achieved at the brake shoes with a specified force output at the handbrake (equivalent to 125 pounds on the rim of the wheel). Further, the handbrake force must act on one-half of the axles including the "B" end truck. If these requirements cannot be met with a single handbrake, a second handbrake must be applied with appropriate stenciling at each handbrake location.

On some articulated multi-platform cars, it is not feasible to apply the handbrake force to half the axles with one handbrake and a second handbrake has been applied at the opposite end ("A" end) of car.
The Federal Railroad Administration takes no exception to this practice if thee following conditions are met:

Stencils must be placed adjacent to each handbrake advising that the car is equipped with two handbrakes.

Each handbrake shall be so located that it can be safety operated while car is in motion.

The handbrake force should comply with AAR Standards.

Please be governed accordingly.

Federal Railroad Administration

MPE-98-28
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-28
Subject: Handling of Special Car Inspections

From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

In an effort to improve our handling of "special car inspections", the Federal Railroad Administration (FRA) has implemented the following procedures.

The FRA requests that car builders adhere to the following conditions:

Car builders that desire to have the FRA review their equipment for compliance with safety appliance standards are to submit their safety appliance arrangement drawings, prints, etc. to the FRA Office of Safety Assurance and Compliance for review, at least 60 days prior to construction;

FRA will review the documents submitted and advise the builder as the status;

The builder should then notify the Office of Safety Assurance and Compliance at least 30 days in advance of when the freight car will be ready for inspection;

The Office of Safety Assurance and Compliance will notify the appropriate regional office as to the place and date the inspection is to be conducted;

The Office of Safety Assurance and Compliance will provide the car builder, in writing, the results of the special car inspection.

MPE-98-31
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-31
Subject: §231.21(j)(3) §231.18
Safety Chains on Tank Cars
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Operating platforms on tank cars without underframes are addressed in 49 CFR Part 231.21(j)(3) which states:

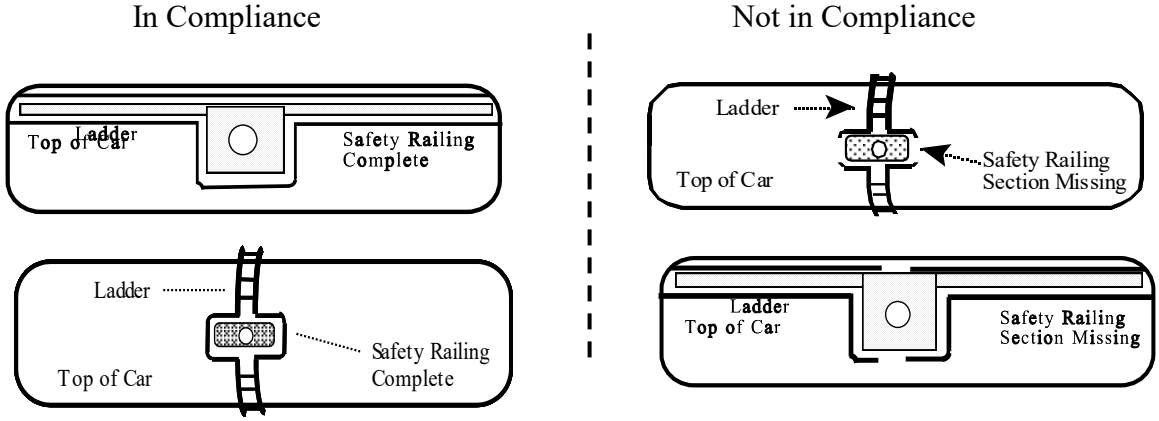
(3) Location.(I)Operating platform to be of sufficient length to provide access to all operating fittings. Ladder to be located on sides of car at center.

(ii) The safety railing shall enclose the operating platform, manway and fittings used in the loading and unloading of the tank. Railing shall be open only at the ladders where it shall extend in a vertical direction down to, and be securely attached to the platform. Maximum width of opening, twenty-four inches.

Additionally, there are tank cars constructed with top operating platforms which have end ladders at each end of the tank car, rather than side ladders, in accordance with Section 231.18, Cars of special construction.

Therefore, openings in the operating platform allowing access to the ladders do not require safety railing (safety chain) enclosure. All other openings of the operating platform require enclosure.

Sketch attached



Federal Railroad Administration

MPE-98-35
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-35
Subject: §231.1
Multi-Unit Articulated Flat Cars - Crossover Platforms
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

TTAX 5 unit All Purpose Spine Cars are equipped with handbrakes which face outward at each end of the five unit consist. The handbrake arrangement is designed so that it can be operated while standing on the sill step or from the ground.

When a 48 foot container is placed on the "A" end unit, the end "crossover" platform is partially covered by the container and has only 10 inches exposed. The "crossover" platforms on these TTAX cars and/or platform extensions on other multi-unit articulated flat cars is not a requirement of the current safety appliance standards. Additionally, they are not used for the proper operation of the handbrakes.

Therefore, the FRA will not take exception to these TTAX 5 unit All Purpose Spine Cars when loaded on the A and B units with 48 foot containers that partially cover the end "crossover" platforms.

However, FRA requires that safety appliances or supports for safety appliances must be mechanically fastened. Brackets that are applied to a car structure other than a tank car, solely for the securement of safety appliances are to be mechanically fastened to the car structure.

Please be governed accordingly.

MPE-98-36
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-36
Subject: §231
Judgement in Enforcement of the Safety Appliance Standards – 49 CFR Part 231
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Recently, FRA inspectors took exception to minimal deviations from the measurements specified in the Safety Appliance Standards on cars that have been in service with this condition for a long period of time without any known incident or casualty. Although these civil penalty citations are valid from a strictly technical and legal point of view, from a common sense point of view the cars operated safely for years, so these minimal deviations did not materially reduce safety.

Inspectors tend to view the Safety Appliance Standards as requiring the issuance of civil penalty citations if strict adherence to each clearance, size, or placement dimension is not maintained (i.e., either the clearance, placement, or size of each safety appliance is within the exact dimensions required by the regulation, or it is not). Our world has changed and is no longer that simple. The railroad operating environment has drastically changed. Crews are smaller, flat switching is rare and the number run-through trains is much greater—all decreasing the use of safety appliances. In addition, the limited resources available to both FRA and the railroads require that care be taken to avoid the frivolous use of these resources pursuing minor infractions that do not materially reduce safety.

Most of the Safety Appliance Standards were developed nearly 100 years ago in a time when almost all cars were of a standard design. Application of the regulations to these cars was simple and required little if any judgment on the part of the inspector. Today most new cars are "Cars of special construction." See 49 CFR §231.18. The Safety Appliance Standards for such cars must be determined from the "nearest approximate type" of a standard car. Id. As a result, the Safety Appliance Standards can not be applied directly to these cars without exercising good judgment.

Today, inspectors must exercise this judgment, not just take measurements and file exceptions for minimal deviations. An exception should be taken when the condition of the safety appliance materially reduces safety. For example, a safety appliance with a slight looseness that is still firmly fastened with all of the securing bolts in place, or a safety appliance with a slightly reduced clearance that is still more than adequate for its intended use does not materially reduce safety. However, one court found that a handhold moving as little as ½ inch was not "firmly fastened." See Roe v. Port Terminal R.R. Ass'n, 620 S.W. 2d. 870 (Tex. Civ. App. 1981). Therefore, exactly what materially reduces safety is not always clear—it is a judgment call often dependent on the unique set of conditions governing the operation at the time.

Some general guidance for exercising judgment in the enforcement of the Safety Appliance Standards is as follows: 1) Do not take exception to a non-complying design feature of a type of car that has a long and continuous, safe service history. However, if individual cars of that type or class have another non-complying condition, an exception may be taken. 2) If exertion of a significant force (a force greater than that which would be encountered in the normal use or operation of the appliance) is required to move a safety appliance, exception should generally not be taken. 3) On the other hand, if the safety appliance moves easily to the touch, exception certainly should be taken.

Although safety appliances remain an extremely important part of railroad safety and the standards pertaining to these appliances must continue to be enforced, the enforcement of the Standards needs to be determined through the exercise of good judgment so that scarce FRA and railroad resources are not consumed pursuing minor infractions that do not materially reduce safety.

A thorough sample-car inspection—performed in accordance with the procedures described on pages 3-6 of the Motive Power and Equipment Manual—is the proper time to enforce the Safety Appliance Standards strictly. An excellent sample-car inspection will ensure safety appliance compliance before that type of car is placed in service.

I request that Regional Directors and Regional MP&E Specialists pass this guidance along to all MP&E Inspectors.

MPE-98-48
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-48
Subject: §231.30(e)(1)
Securement of Handrail to the Locomotive Carbody North American Cab Structure
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Some locomotives having the wide body North American cab configuration has the upper end of the front vertical handrail not properly secured to the carbody. The Safety Appliance regulation, Section 231.30(e) (1) (I) states in part that each vertical handhold... be securely fastened to the locomotive with one half (½) inch or larger bolts or rivets....

Some locomotives have the upper end of the front vertical handhold bolted to a bracket, welded to that section of the carbody that comprises the outside of the front sand reservoir. Although there appears to be adequate strength in the welded bracket, this is not permitted because the regulation specifically requires that the handhold be securely fastened with a bolt or rivet.

However, FRA has permitted welding of some permanent fixtures on locomotives to which safety appliances are mechanically fastened. The welding was made under quality controlled conditions with a full enclosure penetration weld of the fixture to the locomotive, using modern shop welding practices which provide 100 percent full strength requirements of the joint.

This condition, if found, is not to be taken as a defective condition, but should be brought to the railroad’s attention for corrective action.

Federal Railroad Administration

MPE-98-49
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-49
Subject: §231.1(k)
Dimensions Applicable to Handles of Uncoupling Levers
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

In the past some of our inspectors have taken exception to the handles of bottom operated uncoupling levers being more than 6 inches from the side of the car.

Section 231.1(k)(2) states in relevant part: (I) Handles of uncoupling levers, except those shown in Plate B or of similar designs, shall be not more than 6 inches from sides of car. (ii) Uncoupling levers of design shown on Plate B and of similar designs shall conform to the following prescribed limits: (iii) Handles shall be not more than 12, preferably 9, inches from sides of cars. Center lift arms shall be not less than 7 inches long. The top operated uncoupling lever shown in Plate B is similar in design to bottom operated uncoupling levers and are fundamentally the same, as both are operated in the same manner by an upward lift of the uncoupling lever handle to disengage the coupler lock block.

The reference in 231.1(k)(2)(I) to uncoupling levers of other than Plate B design requires that the uncoupling lever handle be not more than 6 inches from side of car. This refers primarily to those uncoupling levers which are operated by a downward motion of the uncoupling lever either by hand or foot. This type of uncoupling lever could be operated from the side ladder while the car was in motion.

Therefore, FRA will not take exception to bottom operated uncoupling levers that are similar in design to that shown in Plate B, unless the uncoupling lever handle is more than 12 inches from the side of the car.

Also, for your information, the Association of American Railroad's (AAR) Rule 22 for bottom operated uncoupling levers show the maximum distance of the uncoupling lever handle to be 12 inches from the side of the car.

MPE-98-51
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-51
Subject: §231.19
Definition of Left and Right
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

The purpose of this bulletin is to provide Railroad Safety Inspectors with the position the Federal Railroad Administration has adopted, as a result of an MP&E Technical Resolution Committee interpretation, for determining and reporting the location of non-complying and/or defective railroad car components. The definition of "left" and "right" is defined in §231.19 ,

"Right or Left refers to the side of person when facing end or side of car from ground"

This bulletin further identifies the "A" and "B" end of the car from which the definition will be applied and provides additional guidance for uniformly identifying various components on a car.

The railroad industry's generally established and accepted practice for determining the location of applicable components on rail cars equipped with four, six, or eight wheel trucks is as follows:

The "B" end of a car is determined by the location of the hand brake. The end of the car on which the hand brake is located is the "B" end. The opposite end of the car is known as the "A" end. On cars equipped with hand brakes on both ends, the "A" and "B" end shall be determined as stenciled.

When facing the "B" end of the car, the car is divided into four sections known as BR, BL, AR, and AL. The order of applicable components on the right side of the car shall be known as R1, R2, R3, etc… The order of applicable components on the left side of the car shall be known as L1, L2, L3, etc… See Figure A.

- Beginning at the **"B" end** of the car, brake beams shall be numbered consecutively, see Figure B

The railroad industry's generally established and accepted practice for determining the location of applicable components on articulated and multi-level cars is as follows:

- **The "B" end** of the car is determined by the location of the hand brake. The end of the car on which the hand brake is located and stenciled as "B end", is the **"B" end** The end unit opposite the **"B" end,** is the **"A" end**. The unit adjacent to the "B" end will be known as the "C" unit and each additional unit will be stenciled consecutively and alphabetically from the "B" end toward the "A" end, see Figure C. For cars equipped with multiple hand brakes, report the unit location.

- When facing the **"B" end** of the car, the right side is known as the **"R" side** and the left side is known as the **"L" side**. Wheel sets and applicable components will be numbered consecutively from the "B" end to the "A" end, 1 through 9 Applicable components above 9 will be identified alphabetically in reverse order from Z (e.g., Z, Y, X, W, etc.) until the last wheel set on the **"A" unit** is identified, see Figure C.

The above guidance should be applied when reporting the location of applicable non-complying components under the provisions of Parts 215, 231 and 232 It can also be applied to passenger cars unless the passenger railroad utilizes some other generally accepted method of identifying the location of passenger car components (e.g., No 1 end, No. 2 end, etc).

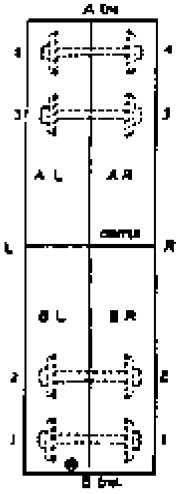


Figure A

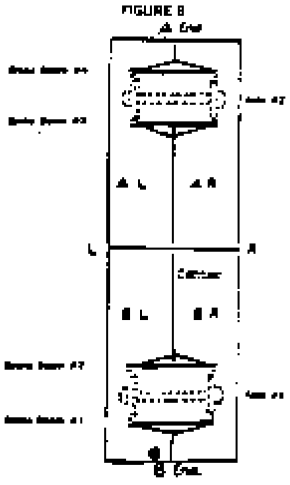


Figure B

MPE-98-53
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-53
Subject: §231.27
Handbrake Chains
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

It has been brought to our attention that freight cars of recent construction are being equipped with handbrake chains that are not in compliance with Federal Railroad Administration regulations. Handbrake chains are described in the present Safety Appliance Standard Regulation, Section 231.27(a)(2)(vi), as follows:

All chains shall be not less than nine-sixteenths (9/16) inch BBB coil chain.

The Association of American Railroads (AAR) Manual of Standards S-404-74, 2.1.9, has the following requirements for handbrake chains:

Handbrake power chain shall be 9/16 inch BBB coil chain or meet the minimum specification (working load 5875 lbs., proof test of 11,750 lbs.) of sufficient length so that the distance from center line of lower attaching rivet hole in housing to center line clevis rivet is 21- 9/16 inches.

It has been determined that both the three-eighths (3/8) inch alloy chain and the ½ inch steel alloy chain currently being used by new car manufacturers exceeds the specifications for the 9/16 inch BBB coil chain.

Therefore, in accordance with Section 231.27 (a), exception should not be taken to handbrake chains that provide the same degree of safety, or a greater degree of safety, as the 9/16 inch BBB coil chain.

The 9/16 inch BBB coil chain is no longer being used by handbrake manufacturers.

Federal Railroad Administration

MPE-98-64
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-64
Subject: Auxiliary Lights Interfering With Safety Appliances

From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

It has recently been brought to our attention that some railroads have had the auxiliary lights (ditch lights) installed in a manner which covers a portion of the uncoupling levers, which serve as the end handhold on a locomotive.

Locomotives found in non-compliance should be handled for correction.

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MPE-98-68
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-68
Subject: §231.30(g)
Locomotives Used in Switching Service – Location End Handhold
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Questions have been raised regarding the placement of horizontal end handholds relative to the side of locomotive as referenced in Section 231.30(g)(1)(ii).

When the switching step regulation was developed, some handholds were installed by measuring from the side of the locomotive and some from the side of the end plate. The placement of the preponderance of end handholds is measured from the side of the end plate. Electro-Motive and General Electric have been and are presently applying subject handholds in relation to the side of the end plate.

The Federal Railroad Administration will not take exception, if application of horizontal end handhold placement is measured from either the side of the locomotive or side of the end plate.

Please be governed accordingly.
#

Federal Railroad Administration

MPE-98-69
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-69
Subject: §231.6
Safety Appliance Arrangements on Flat Cars
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Title Section 231.6 specifies the minimum requirements for safety appliance on flat cars. However, over the years, other arrangements have been agreed upon without being incorporated into the standards. Therefore, new and reassigned employees, as well as new car builders, may not be aware of such agreements.

One revised arrangement of horizontal side handholds occurred when the Trailer Train Company decided to eliminate the vertical handhold on long bridge plates. This side handhold arrangement follows:

Side Handholds
1. Dimensions:
Same as specified for flat cars, except length not less than eighteen (18) inches, and diameter not less than one (1) inch when legs are extra long.

2. Manner of Application:
Same as specified for "Box and Other House Cars."

3. Location:
One (1) over each sill step on top of rub rail projecting upward, not less than twenty-seven (27) nor more than thirty-four (34) inches above tread of sill step. Clearance at outer end should not be more than eight (8) inches from end of car.

.

All other safety appliances on piggy-back cars should conform to those specified for flat cars. Also, additional handholds provided to facilitate use of handbrakes, including handholds on stub bridge plates, should be retained.

Any flat car that has a low mounted side handbrake, should be equipped with a second handhold at the hand brake corner fifteen (15) to sixteen (16) inches above the handhold described previously. The tread of the sill step at this location should be widened to not less than four (4) inches and be provided with an anti-skid surface. When possible the length of such sill step should be increased to not less than fourteen (14) inches.

The additional handholds and wider sill step to facilitate the use of the low mounted side hand brake were agreed upon because of the requirement in §231.6(a)(3)(I), "Each hand brake shall be so located that it can be safely operated while the car is in motion."
The Motive Power and Equipment Inspector should become familiar with these arrangements. It is anticipated that the Safety Appliance Standards will be revised in the near future, at which time these arrangements will be incorporated into the requirements.

Federal Railroad Administration

MPE-98-70
Federal Railroad Administration
Technical Bulletin
Date: June 15, 1998
Reply to the Attention of: MPE-98-70
Subject: MP&E Technical Bulletins – Rescind / Re-issue

From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Earlier this year, the Motive Power and Equipment (MP&E) Specialists and Headquarters Staff convened to review and update all outstanding MP&E Technical Bulletins (some 283 in number.)

As a result of this extensive review, effective immediately, all MP&E Technical Bulletins issued prior to 1998 are rescinded and should be discarded. Attached are 69 MP&E Technical Bulletins, dated June 15, 1998, that have been revised and renumbered. An index is also provided that lists the TB numbers and topics. The bulletins are to assist FRA personnel in the performance of their duties. Therefore, it is imperative that they be distributed to all Motive Power and Equipment Inspectors (both Federal and State) and Principle Regional Inspectors in your region as quickly as possible.

As an additional new feature, these and future MP&E Technical Bulletins will be placed on FRA's Internet Web Page and can be accessed through the Internet at:

http://www.fra.dot.gov/safetyw/mpe/tb.htm

As an additional enhancement, these Technical Bulletins will be placed in the next update of TEXT-Trieve.

MPE-98-71
Federal Railroad Administration
Technical Bulletin
Date: August 3, 1998
Reply to the Attention of: MPE-98-71
Subject: §229 §231 §232 §223
Self Propelled Vehicles Considered to Be Locomotives
From: E. R. English
Director, Office of Safety Assurance and Compliance
To: All Regional Administrators, Deputy Administrators,
Motive Power & Equipment Specialists and MP&E Inspectors

Recently, we have had several inquiries about equipment requirements for self propelled vehicles used to haul revenue freight on the main line. Self propelled vehicles are used in a variety of railroad functions. These vehicles include those built by Trackmobile Inc., Shuttle Wagon, Mitchell Equipment Corporation and Brandt Roadrailer.

Section 229.5 (k) states:
Locomotive means a piece of on-track equipment other than hi-rail, specialized maintenance, or other similar equipment
(1) With one or more propelling motors designed for moving other equipment;
(2) With one or more propelling motors designed to carry freight or passenger traffic or both; or
(3) Without propelling motors but with one or more control stands.

A hi-rail vehicle is defined as a truck or automobile with retractable flanged wheels so it may be used on either the highway or track. Specialized maintenance or other similar equipment includes track motor cars, cranes, derricks, pile drivers, ballast cleaners, etc. When self propelled vehicles are used only in the performance of typical maintenance-of-way functions, or if they are used to move cars or equipment within the confines of repair facilities, they are to be considered specialized maintenance equipment and are exempt from many Federal Railroad Administration (FRA) regulations.

When a self propelled vehicle is used to move freight over the railroad, outside the limits established for maintenance-of-way operations and repair facilities, it will be considered a locomotive and must comply with applicable regulations. Even though these vehicles do not resemble a standard locomotive, the purpose for which they are being used requires compliance with 49 CFR Sections 223, 229, 231 and 232.

The self propelled vehicles are unique in construction, appearance and use. Many of these vehicles currently being used have already been modified by the manufacturers (as closely as construction would permit) to bring them into compliance with Federal regulations. FRA acknowledges that this equipment has a place in a well rounded rail transportation system. In an effort to recognize the unique characteristics of these vehicles, FRA inspectors should exercise enforcement discretion and good judgement in analyzing an operation where self propelled vehicles are used for train movements.

The following specifications should be used by inspectors for enforcement guidance:

1. .The vehicle glazing material must comply with Part 223.

2. .Each self propelled vehicle shall be inspected each calendar day when used and an inspection report and record shall be completed as described in Section 229.21.

3. .Each self propelled vehicle shall receive a periodic inspection as described in Section 229.23, and all pertinent data is to be entered on a F6180.49A Locomotive Inspection and Repair Report, which shall be displayed under a transparent cover in a conspicuous place in the cab of the vehicle.

4. .The vehicle's air brake equipment must be cleaned and tested as often as conditions require, but not less frequently than required in Sections 229.25, 229.27 and 229.29.

5. .The main air reservoir must comply with Section 229.31 regarding either hammer and hydrostatic testing or pre-drilling of the reservoir.

6. .Vehicle must meet general Safety Requirements of Section 229.41, 229.43 and 229.45.

7. .Fuel safety cut off devices, Section 229.93.

8. .The vehicle must have a speed indicator if it is operated at a speed that exceeds 20 mph. Section 229.117.

9. .Interior cab noise must comply with Section 229.121.

10. .Vehicle headlights must be fully functional and if operated at speeds in excess of 20 mph over one or more public highway-rail crossings, must comply with auxiliary light requirements Section 229.129.

11. .Vehicle must be equipped with an audible warning device, Section 229.129.

12. .If operated at speeds in excess of 30 mph while hauling cars, vehicle must be equipped with working event recorder in compliance with Section 229.135.

13. .Switching steps as defined in Section 231.30.

14. .Four horizontal handholds secured to the back and front ends of the vehicle, secured by bolts or other acceptable mechanical fastener. Section 231.30.

15. .Vertical handholds painted in contrasting colors and secured by bolts or other

acceptable fasteners, Section 231.30.

16. .Must be equipped with automatic couplers, to prevent the necessity of a someone going between the vehicle and car for the purpose of coupling or uncoupling, Section 231.30.

17. .If conditions warrant, a two-way end-of-train device must be used, Section 232.19 - 25.

18. .As with any train movement, the vehicle must be equipped with a brake system that permits the operator to apply and release the brakes on cars being hauled. The brake equipment must also be arranged so that proper air brake leakage tests can be conducted as applicable, Sections 232.12 and 232.13.

Items deemed to be safety related, that can not meet specified requirements, will have to be addressed

Federal Railroad Administration

Memorandum

U.S. Department
of Transportation
Federal Railroad
Administration

Date: August 7, 2000 Reply to Attn of: MP& E 00-06

Subject: Manufacture and repair of operating platforms and operating platform safety railings on tank cars without underframes.

From: Edward E. English
Director, Office of Safety Assurance and Compliance

To: Regional Administrators, Deputy Regional Administrators, Motive Power and Equipment Specialists and Inspectors

Section 231.21(j) of title 49, Code of Federal Regulations specifies the minimum requirements for operating platforms on tank cars without underframes. However, many variations in the manufacture and repair of these platforms and the platform safety railings have been in use for a number of years, causing confusion among FRA inspectors and manufacturers as to which methods comply with Federal regulations.

In order to establish consistency within the industry, FRA hosted a committee comprised of representatives from FRA, the Association of American Railroads, Railway Progress Institute, and several major tank car manufacturers. Based on the information provided at the committee meetings and FRA's prior enforcement of the requirements pertaining to operating platforms on these tank cars, this technical bulletin and its attachments provide guidance regarding the various methods of manufacture and repair of operating platforms and operating platform safety railings on these tank cars that are acceptable to FRA.

Section 231.21(j) requires the operating platforms and related safety railings on tank cars without underframes to be "securely attached" or "securely fastened." FRA has a longstanding interpretation of these phrases which requires that the safety appliances be mechanically fastened. See MP&E Technical Bulletin 98-14. However, FRA believes it is necessary and consistent with both safety and FRA's previous enforcement of part 231

to exercise its enforcement discretion and continue to allow the weldment of certain portions of the safety appliances on these operating platforms. Tank cars have been manufactured for numerous years with operating platforms that have handrails welded to stanchions and stanchions welded to car body brackets. Tank cars built in this manner

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