US Department of Transportation
Federal Railroad Administration

Sample Car Inspection Checklist For: S-2044 Appendix D-2
Safety Appliances for Cars of Well or Spine Construction
with Side Mounted Hand Brakes

OMB No. 2130-0565
FRA F6180.161 D

Inspector(s):	Inspection Location:	Date:	Region:
Builder:	Car Initial and Number:	Car Type:	No. of cars to be Built:	Builder Job No.

ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Hand Brake	☐ Each car shall have at least one AAR-approved vertical-wheel or lever hand brake that complies with MSRP Section E, Standard S-475 and that operates in harmony with the power brake equipment on the car. Total braking force applied to the brake shoes by the hand brake shall comply with the requirements of MSRP Section E, Standard S-401, but in any event shall be not less than that developed by 50 psi brake cylinder pressure. The hand brake wheel and chain drum of vertical-wheel hand brakes shall be arranged so that both will revolve when applying and gradually releasing the hand brake. The hand brake shall be provided with means to prevent application of the brake by turning the brake wheel in a counterclockwise direction.	Appendix D2, 2.1.1	
	☐ The brake wheel of vertical-wheel hand brakes shall have a nominal diameter of 22 in. The brake wheel shall be of shallow configuration and shall be of steel or other material of equivalent strength.	Appendix D2, 2.1.2	
	☐ The hub of the hand brake wheel shall be 2 5/8 in. deep with a square tapered fit to the shaft. The taper on the brake wheel hub and shaft shall be 1 in. in 12 in. on each side, or 2 in. in 12 in. total, with the small end of the shaft opening 7/8 in. square. The brake wheel shall be secured to the brake shaft with an American National Standard 7/8—9 heavy hex nut and 3/16 in. × 1 1/2 in. cotter, or their equivalent.	Appendix D2, 2.1.3	
Location	☐ The hand brake shall be located so that it can be safely operated from the car while the car is in motion and safely operated from the ground while the car is stationary. The hand brake on cars equipped with one hand brake shall be applied on the left side of the car at the B end. The hand brakes on cars equipped with more than one hand brake shall be located as specified in paragraph 9.0 of the base standard.	Appendix D2, 2.2.1	
	☐ When the tip of the operating lever of lever hand brakes is swung through its arc of travel, the closest point of that arc shall be located in the longitudinal direction not less than 4 in. nor more than 12 in. inboard of the inside surface of the inboard vertical leg of the sill step. When in the released position, the tip of the lever shall be not less than 4 in. above the lowest sill step tread nor more than 48 in. above the top of rail. On cars built prior to January 1, 2017, the tip of the lever shall be not more than 56 in. above the top of rail when in the released position.	Appendix D2, 2.2.2	

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	☐ The center of the hand brake shaft of vertical-wheel hand brakes shall be located in the longitudinal direction not more than 21 in. from the inside face of the inboard vertical leg of the sill step and shall be not less than 26 in. above the lowest sill step tread nor more than 46 in. above the highest sill step tread. In addition, the center of the hand brake shaft shall be not more than 61 in. above the top of rail.	Appendix D2, 2.2.3	
	☐ Clearance around the rim of the hand brake wheel or the grip portion of the hand brake operating lever throughout its full range of travel shall be not less than 4 in. Clearance between the grip portion of the release lever, if used, throughout its full range of travel and any part of the car shall be not less than 2 1/2 in.	Appendix D2, 2.2.4	
	☐ If the hand brake application is such that the requirements of paragraph 2.2.4 can be met only with hand brakes having short hand brake release levers or only with long release levers, but not both, the car shall be marked adjacent to the hand brake in 1 1/2 in. high letters “SHORT (LONG) RELEASE LEVER BRAKE ONLY.”	Appendix D2, 2.2.5	
Manner of Application	☐ The hand brake housing shall be securely fastened. The hand brake application, including bolt hole pattern, shall conform to MSRP Section E, Standard S-475.	Appendix D2, 2.3.1	
	☐ The hand brake chain shall conform to the requirements of S-475, but in any event shall have minimum working load of 5,875 lb and minimum proof test of 11,750 lb.	Appendix D2, 2.3.2	
	☐ Hand brake rods shall be not less than 3/4 in. diameter.	Appendix D2, 2.3.3	
Sill Steps	☐ There shall be four sill steps.	Appendix D2, 3.1	
Dimensions	☐ Sill steps shall conform to the requirements of Standard S-2042. Minimum usable length of tread shall be 14 in.	Appendix D2, 3.2.1	
	☐ Sill steps shall be of steel not less than ½ in. thick, shall be not less than 4 in. wide, and shall be provided with an antiskid surface.	Appendix D2, 3.2.2	

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	☐	Sill steps shall have sufficient treads such that the top tread is not more than 21 in. below the lowest adjacent horizontal side handhold, if the car is so equipped. If there are no horizontal side handholds, sill steps shall have sufficient treads such that the top tread is not more than 21 in. below the walking surface of the adjacent walkway, if the car is equipped with an adjacent walkway, and not more than 21 in. below the deck of the car. Sill step treads shall be spaced not more than 21 in. apart.	Appendix D2, 3.2.3	
	☐	The clear depth above the entire usable length of all sill step treads shall be not less than 8 in. and the clear width of the lowest sill step tread shall be not less than 6 in. for both loaded and empty conditions with the trucks rotated to simulate the maximum curvature specified for the uncoupled car.	Appendix D2, 3.2.4	
Location	☐	One sill step shall be applied near each end of each side of the car. The sill steps shall be located in the longitudinal direction such that the inside face of neither vertical leg of the sill step extends more than 2 in. into the space between the vertical side handholds or the space between the vertical handhold supports, whichever space is smaller.	Appendix D2, 3.3.1	
	☐	In the transverse direction, the outside edge of any sill step tread shall be not more than 6 in. inboard or outboard of the inside surface of the adjacent side handholds. In addition, the outside edge of any sill step tread shall be no more than 4 in. inboard of any car structure below the adjacent side handholds in the area between the side handholds. With the exception of the side handholds and their supports, no part of the car below 66 in. above the top of the rail shall extend farther than 6 in. outboard of the outboard edge of the lowest sill step tread.	Appendix D2, 3.3.2	
	☐	The lowest tread shall be not more than 20 in. above the top of rail.	Appendix D2, 3.3.3	
	☐	When applied, sill steps adjacent to articulated connectors or drawbar connections of multi-unit cars shall conform to the requirements of paragraphs 3.2.1, 3.2.3, and 3.2.4. These sill steps shall be of steel not less than ½ in. thick and shall be not less than 2 in. wide. The sill steps shall be located in a longitudinal direction such that the inside face of neither vertical leg of the sill step extends more than 2 in. into the space between the vertical side handholds or the space between the vertical handhold supports, whichever space is smaller. Sill steps adjacent to hand brakes shall also comply with the requirements of paragraph 3.2.2.	Appendix D2, 3.3.4	
Manner of Application	☐	Sill steps shall be securely fastened.	Appendix D2, 3.4	

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ITEM		Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Side Handholds	☐	There shall be not less than eight side handholds, two at each corner.	Appendix D2, 4.1	
Dimensions	☐	Handholds shall be of steel not less than ¾ in. diameter or pipe of 1 ¼ in. nominal pipe size with Schedule 40 minimum wall thickness. Handhold material shall conform to the requirements of Standard S-224. Minimum clear length shall be 16 in. Minimum clearance shall be 2 in., preferably 2 ½ in.	Appendix D2, 4.2.1	
	☐	Vertical side handholds shall have an uninterrupted span between the upper and lower clearance points.	Appendix D2, 4.2.2	
	☐	Horizontal side handholds below the car deck or adjacent running board, if applied, shall have foot guards or upward projections not less than 2 in. in height at both ends.	Appendix D2, 4.2.3	
	☐	When applied, elective vertical handholds adjacent to the outboard vertical side handholds shall conform to the requirements of Standard S-224, shall be of steel not less than 3/4 in. diameter, shall have clearance not less than 2 in., preferably 2 1/2 in., and shall have clear length not less than 8 in.	Appendix D2, 4.2.4	
Location	☐	Two vertical handholds, one at either end of each sill step, shall be applied.	Appendix D2, 4.3.1	
	☐	The inside surface of the outboard vertical handhold shall be not more than 14 in. from the inside surface of the nearest end handhold. The clear opening between the inside surfaces of the vertical handholds and their supports shall be not less than 18 in. The width over the outside surfaces of the vertical handholds shall be not more than 30 in.	Appendix D2, 4.3.2	
	☐	The clearance points of the bottom end of the vertical handholds shall be not more than 42 in. above the top of rail. The clearance points of the top end shall be not less than 33 in. above the adjacent walking surface of the running board, if so equipped. If not equipped with an adjacent running board, the clearance points of the top end shall be not less than 33 in. above the car deck.	Appendix D2, 4.3.3	
	☐	Spacing between horizontal side handholds, if applied, shall be not more than 19 in. Spacing from the highest horizontal side handhold to the adjacent walking surface of the running board, if so equipped, shall be not more than 19 in. If not equipped with an adjacent running board, spacing from the highest horizontal side handhold to the car deck shall be not more than 19 in.	Appendix D2, 4.3.4	

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	☐ If car is equipped with horizontal side handholds, the outboard clearance points of the handholds shall be not more than 2 in. inboard of the inside surface of the outboard vertical leg of the sill step, and the inboard clearance points of the handholds shall be not more than 2 in. outboard of the inside surface of the inboard vertical leg of the sill step. The requirements of this paragraph do not apply to cars built prior to January 1, 2017.	Appendix D2, 4.3.5	
Manner of Application	☐ Side handholds shall be securely fastened.	Appendix D2, 4.4	
Side Handholds Adjacent to the Articulated Connectors or Drawbar Connections of Multi-Unit Cars	☐ When side handholds are applied adjacent to articulated connectors or drawbar connections of multi-unit cars, sufficient vertical and horizontal handholds shall be applied to provide access from the ground to the deck or adjacent running boards.	Appendix D2, 5.1	
Dimensions	☐ Handholds shall be of steel not less than 3/4 in. diameter or pipe of 1 1/4 in. nominal pipe size with Schedule 40 minimum wall thickness. Handhold material shall conform to the requirements of Standard S-224. Minimum clear length shall be 16 in. Minimum clearance shall be 2 in., preferably 2 1/2 in.	Appendix D2, 5.2.1	
	☐ Vertical side handholds shall have an uninterrupted span between the upper and lower clearance points.	Appendix D2, 5.2.2	
	☐ Horizontal side handholds below the car deck or adjacent running board, if applied, shall have foot guards or upward projections not less than 2 in. in height at both ends.	Appendix D2, 5.2.3	
Location	☐ Two vertical handholds, one at either end of the sill step, shall be applied.	Appendix D2, 5.3.1	
	☐ The clear opening between the surfaces of the vertical handholds and their supports shall be not less than 18 in. The width over the outside surfaces of the vertical handholds shall be not more than 32 in.	Appendix D2, 5.3.2	
	☐ The clearance points of the bottom ends of vertical handholds shall be not more than 16 in. above the highest horizontal side handhold. If there are no horizontal handholds, the clearance points shall be not more than 16 in. above the highest sill step tread. The clearance points at the top ends shall be not less than 33 in. above the walking surface of the adjacent running board.	Appendix D2, 5.3.3	
	☐ Spacing between horizontal side handholds, if applied, shall be not more than 19 in. Spacing from the highest horizontal side handhold to the adjacent walking surface of the running board, if so equipped, shall be not more than 19 in. If not equipped with an adjacent running board, spacing from the highest horizontal side handhold to the car deck shall be not more than 19 in	Appendix D2, 5.3.4	

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	☐ If car is equipped with horizontal side handholds, the outboard clearance points of the handholds shall be not more than 2 in. inboard of the inside surface of the outboard vertical leg of the sill step, and the inboard clearance points of the handholds shall be not more than 2 in. outboard of the inside surface of the inboard vertical leg of the sill step. The requirements of this paragraph do not apply to cars built prior to January 1, 2017.	Appendix D2, 5.3.5	
	☐ Handholds adjacent to articulated connectors of cars equipped to carry both highway trailers and double-stacked intermodal containers need not extend higher than the top of the adjacent running boards.	Appendix D2, 5.3.6	
Manner of Application	☐ Side handholds shall be securely fastened	Appendix D2, 5.4	
End Handholds	☐ There shall be four end handholds.	Appendix D2, 6.1	
Dimensions	☐ Handholds shall be of steel not less than 3/4 in. diameter and shall conform to the requirements of Standard S-224. Minimum clear length shall be 16 in. Minimum clearance shall be 2 in., preferably 2 1/2 in.	Appendix D2, 6.2	
Location	☐ The end handholds shall be oriented horizontally, one near each side of each end of the car on the face of the end sill.	Appendix D2, 6.3.1	
	☐ The clearance points of the outer end of the end handholds shall be not more than 16 in. from the inside surface of the nearest side handhold.	Appendix D2, 6.3.2	
	☐ The end handholds shall be not more than 45 in. above the top of rail.	Appendix D2, 6.3.3	
Manner of Application	☐ End handholds shall be securely fastened.	Appendix D2, 6.4	
Clearance at End of Car	☐ No part of the car above the end sill more than 30 in. from the longitudinal centerline of the car, except the hand brake wheel, hand brake shaft, bell crank, sheave wheel, end platform, or horizontal end handholds, shall extend beyond the striker or end of the center sill with the draft gear or cushioning device (if used) at full buff. No other part of the car end or fixtures on the end above the end sill and less than 84 in. above the car deck or walking surface of the end running board, if the car is so equipped, other than the exceptions herein noted, shall extend beyond the outer face of the striker or end of the center sill.	Appendix D2, 7.0	
Running Boards	☐ Cars not having full-width flooring at ends of the car adjacent to a coupler shall be equipped with transverse running boards at those locations.	Appendix D2, 8.1.1	

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	☐ Cars having full-width metal flooring and no transverse running boards adjacent to the couplers shall be provided with a slip-resistant surface on the flooring.	Appendix D2, 8.1.2	
Dimensions	☐ Running board used for access to interbox connectors at the sides of double-stack wells shall comply with the requirements of Standard S-226 or S-227. All other running boards shall comply with the requirements of Standard S-226.	Appendix D2, 8.2.1	
	☐ All running boards shall be not less than 18 in. wide, except longitudinal running boards at the sides of double-stack wells used for access to interbox connectors shall be not less than 10 in. wide. The 10 in. minimum width does not include side guards, if applied. Top edges of side guards shall be not more than 1/4 in. above the walking surface of the running board.	Appendix D2, 8.2.2	
Location	☐ The gap between the transverse edges of transverse running boards at vertical side handholds and the nearest surfaces of the vertical handholds or their supports, whichever limits the clear opening between the vertical handholds or their supports, shall not exceed 4 in.	Appendix D2, 8.3.1	
	☐ The outboard edge of the slip-resistant surface shall be not more than 4 in. from the facing surface of the outboard vertical handhold or its support, whichever is farther from the end of the car. The inboard edge shall be not more than 4 in. from the facing surface of the inboard vertical handhold or its support, whichever is closer to the end of the car, for the entire width of the flooring.	Appendix D2, 8.3.2	
	☐ The ends of transverse running boards at locations where access to the ground is provided shall not be outboard of, and shall be not more than 2 in. inboard from, the outside surface of the sides of the car directly below the running board ends.	Appendix D2, 8.3.3	
	☐ When intermodal containers or highway trailers of sizes for which the car is designed are loaded on the car, there shall be not less than 18 in. unobstructed width over transverse running boards at ends of the car adjacent to a coupler. This requirement does not apply to refrigeration units, heater units, or generators mounted on and extending beyond the end of the container or trailer body.	Appendix D2, 8.3.4	
	☐ When running boards are provided to permit passage from one car body to another of multi-unit cars, the separation between the running boards of adjacent units shall be not more than 20 in. .	Appendix D2, 8.3.5	
Manner of Application	☐ Running boards shall be securely fastened to the car with not less than 3/8 in. diameter fasteners, except that running board supports may be welded to closed tube or box sections of car structure. Running boards conforming to the requirements of Standard S-227 and their supports used for access to interbox connectors at the sides of double-stack wells may be welded to the car structure.	Appendix D2, 8.4	

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Ground Access	☐	Transverse running boards at ends of the car adjacent to a coupler shall provide access to the ground at both sides of the car. When transverse running boards are applied to the car bodies at both ends of articulated or drawbar connections, access to the ground shall be provided on both sides of the car from the left-hand side of the connection as viewed from the side of the car.	Appendix D2, 8.5	
Uncoupling Devices	☐	There shall be a minimum of two uncoupling devices that conform to the requirements of the base standard.	Appendix D2, 9.0	
	☐	Uncoupling devices and their application shall conform to MSRP Section S, Part III, Standard S-129, S-131, S-133, or S-134; or Specification M-961.	S-2044 6.1 (Base Standard)	
	☐	One uncoupling device shall be applied at the left side of the B end of the car (BL corner) and one at the right side of the A end of the car (AR corner).	S-2044 6.2	
	☐	Under all operating conditions, the outside surface of the uncoupling device handles shall be not more than 12 in. closer to the car center than the inside surface of the adjacent side handholds.	S-2044 6.3	
	☐	There shall be not less than 2 in. clearance, preferably 2 ½ in., around the uncoupling device handles for a length not less than the lowest 4 in. of straight handles and not less than 4 in. in the grip portion of handles having clearly defined grip portions. The lower ends of the handles shall be not less than 12 in. nor more than 15 in. below the top surface of the uncoupling device at the device support and not less than 15 in. above the top of rail.	S-2044 6.4	
	☐	Uncoupling device mounting brackets shall be securely fastened to the car with fasteners not less than 5/8 in. diameter.	S-2044 6.5	
Stenciling	☐	Car initial, numbers and built date stenciled on the car.	49 CFR Part 215.301	
Reflectorization.	☐	Reflectorization must meet all requirements. Attached Drawing	49 CFR Part 224	
Coupler Height	☐	Verify coupler height 31½ inch minimum, 34½ inch maximum.	49 CFR Part 231.31(a)(1)	
Power Brakes	☐	Except for cars equipped with nominal 12-inch stroke (8 ½ and 10-inch diameters) brake cylinders, all cars shall have a legible decal, stencil, or sticker affixed to the car or shall be equipped with a badge plate displaying the permissible brake cylinder piston travel range for the car at Class I brake tests and the length at which the piston travel renders the brake ineffective, if different from Class I brake test limits. The decal, stencil, sticker, or badge plate shall be located so that it may be easily read and understood by a person positioned safely beside the car.	49 CFR Part 232. 103	

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	☐ All equipment ordered on or after August 1, 2002, or placed in service for the first time on or after April 1, 2004, shall have train brake systems designed so that an inspector can observe from a safe position either the piston travel, an accurate indicator which shows piston travel, or any other means by which the brake system is actuated. The design shall not require the inspector to place himself or herself on, under, or between components of the equipment to observe brake actuation or release.		
SCT	☐ A single car air brake test shall be performed on each new car prior to placing or using the car in revenue service.	49 CFR Part 232.305	

Miscellaneous	Check for any sharp or protruding objects or areas on the equipment that may create a safety concern or personal injury.
	Check for potential pinch points at all safety appliance arrangements.
Digital Photos	General Arrangement Photo Sheet (six photos minimum, A & B ends, each corner at 45 degree angle)
	Deviation Photo Sheet ~As many photos as necessary to fully depict, document and illustrate deviations of S-2044 Appendix D2 or CFR Parts (e.g. 215, 224 & 232)

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