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	US Department of Transportation Federal Railroad Administration	Sample Car Inspection Checklist for S-2044 Appendix F3 Safety Appliances for Cars with Recessed Car Body Ends	OMB No. 2130-0565 FRA F6180.161 O	
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	<p>Each car shall have at least one AAR-approved vertical-wheel 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 counter-clockwise direction.</p>		Appendix F3, 2.1.1	
	<p>The brake wheel shall have a nominal diameter of 22 in. The brake wheel shall be of shallow configuration and shall be of steel or other material of equivalent strength.</p>		Appendix F3, 2.1.2	
	<p>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. x 1 1/2 in. cotter, or their equivalent.</p>		Appendix F3, 2.1.3	
Location	<p>The hand brake shall be located outboard of the end sill such 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 shall be applied at the B end of the car.</p>		Appendix F3, 2.2.1	
	<p>The center of the hand brake shaft shall be located in the transverse direction not less than 12 in., nor more than 22 in., from the inside surface of the nearest side handhold at the left side of the car 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 65 in. above the top of rail.</p>		Appendix F3, 2.2.2	
	<p>The outside face of the hand brake wheel shall be no more than 36 in. in the longitudinal direction from the outside surface of the inboard vertical side handhold. The outside face of the hand brake wheel shall be not more than 16 in. in the longitudinal direction from the inside surface of the outboard vertical leg of the sill step and shall not extend more than 8 in. beyond the striker or end of the center sill, whichever extends farther.</p>		Appendix F3, 2.2.3	



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Manner of Application	<p>Clearance around the rim of the hand brake wheel shall be not less than 4 in. Clearance between the grip portion of the release lever, if used, throughout its range of travel and any part of the car shall be not less than 2 1/2 in.</p> <p>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.</p> <p>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.</p>	<p>Appendix F3, 2.2.4</p> <p>Appendix F3, 2.2.5</p> <p>Appendix F3, 2.3.1</p>	
Sill Steps	<p>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.</p> <p>Hand brake rods shall be not less than 3/4 in. diameter.</p> <p>There shall be four sill steps.</p>	<p>Appendix F3, 2.3.2</p> <p>Appendix F3, 2.3.3</p> <p>Appendix F3, 3.1</p>	
Dimensions	<p>Sill steps shall conform to the requirements of Standard S-2042. Minimum usable length of tread shall be 14 in.</p> <p>Sill steps shall be of steel not less than 1/2 in. thick, shall be not less than 4 in. wide, and shall be provided with a slip-resistant surface.</p> <p>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 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 running board, if the car is equipped with an adjacent running board, and not more than 21 in. below the deck of the car. Sill step treads shall be spaced not more than 21 in. apart.</p> <p>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.</p>	<p>Appendix F3, 3.2.1</p> <p>Appendix F3, 3.2.2</p> <p>Appendix F3, 3.2.3</p> <p>Appendix F3, 3.2.4</p>	



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Location	<p>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.</p> <p>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 transverse end running board or car deck in the area between the side handholds. With the exception of the side handholds, 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.</p> <p>The lowest tread shall be not more than 24 in., preferably not more than 22 in., above the top of rail.</p>	<p>Appendix F3, 3.3.1</p> <p>Appendix F3, 3.3.2</p> <p>Appendix F3, 3.3.3</p>	
Manner of Application	Sill steps shall be securely fastened.	Appendix F3, 3.4	
Side Handholds	There shall be not less than eight side handholds, two at each corner.	Appendix F3, 4.1	
Dimensions	<p>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.</p> <p>Vertical side handholds shall have an uninterrupted span between the upper and lower clearance points.</p> <p>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.</p>	<p>Appendix F3, 4.2.1</p> <p>Appendix F3, 4.2.2</p> <p>Appendix F3, 4.2.3</p>	
Location	<p>Two vertical handholds, one at either end of each sill step, shall be applied.</p> <p>The inside surface of the outboard vertical handhold shall be not more than 14 in. from the inside surface of the nearest end handhold in the longitudinal direction. At corners of the car where a hand brake is located, the 14 in. limit shall be measured to the end handhold at the opposite side of the car from the hand brake. 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 30 in.</p>	<p>Appendix F3, 4.3.1</p> <p>Appendix F3, 4.3.2</p>	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Manner of Application End Handholds Dimensions Location	<p>The clearance points of the bottom end of the vertical handholds shall be not more than 42 in. above the top of rail, and the clearance points of the top end shall be not less than 33 in. above the car deck or the walking surface of the adjacent running board, if the car is so equipped.</p>	Appendix F3, 4.3.3	
	<p>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.</p>	Appendix F3, 4.3.4	
	<p>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.</p>	Appendix F3, 4.3.5	
	<p>The vertical legs of safety railings that comply with the requirements of paragraphs 4.2.1 through 4.3.3 shall be considered vertical side handholds.</p>	Appendix F3, 4.3.6	
	<p>Side handholds shall be securely fastened.</p>	Appendix F3, 4.4	
	<p>There shall be four end handholds.</p>	Appendix F3, 5.1	
	<p>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.</p>	Appendix F3, 5.2	
	<p>The end handholds shall be oriented horizontally, one near each side of each end of the car on the face of the end sill.</p> <p>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.</p>	Appendix F3, 5.3.1 Appendix F3, 5.3.2	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Manner of Application	<p>Unless protected by a guard around the chain, handholds shall have not less than 5 in. clearance from the hand brake chain throughout the entire range of chain travel. Guards shall be provided around hand brake shock retarders, if used, that are closer to the handhold than 5 in.</p> <p>End handholds shall not extend more than 8 in. beyond the striker or end of the center sill.</p> <p>The end handholds shall be not more than 45 in. above the top of rail.</p> <p>End handholds shall be securely fastened.</p>	<p>Appendix F3, 5.3.3</p> <p>Appendix F3, 5.3.4</p> <p>Appendix F3, 5.3.5</p> <p>Appendix F3, 5.4</p>	
Safety Railings	<p>One transverse safety railing shall be applied at each end of the car adjacent to the end sill. One safety railing shall be applied at one side of each running board extending from the transverse end running board to the base of a ladder providing access to the top of the car body.</p>	<p>Appendix F3, 6.1</p>	
Dimensions	<p>Safety railings shall be of solid steel not less than 1 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. Safety railings shall be supported at each end and at a minimum of two intermediate locations along their horizontal span. The clear length between any two supports shall be not less than 24 in. Safety railings extending between the inboard vertical side handhold and the corner of the upper car body shall be supported at their ends and at intermediate locations as required such that the unsupported span does not exceed 72 in. Minimum clearance of safety railings shall be 2 in., preferably 2 1/2 in.</p>	<p>Appendix F3, 6.2</p>	
Location	<p>Safety railings shall be oriented horizontally and located such that a vertical plane extending down from the nearest surface of the railing shall be not more than 4 in. from the adjacent edge of the transverse end running board, if the car is so equipped.</p> <p>The height from the top of the safety railings shall be not less than 42 in. nor more than 46 in. above the car deck or, if the car is so equipped, above the walking surface of the adjacent running board.</p> <p>If the safety railings have vertical legs at their ends, the inboard surface of the vertical legs shall be not more than 8 in. in the transverse direction from the inside surface of the outboard side handhold. If the end safety railings do not have vertical legs at their ends, the clearance points at the ends of the safety railings shall be not more than 8 in. in the transverse direction from the inside surface of the outboard side handhold.</p>	<p>Appendix F3, 6.3.1</p> <p>Appendix F3, 6.3.2</p> <p>Appendix F3, 6.3.3</p>	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Manner of Application	End safety railings and their supports shall be securely fastened	Appendix F3, 6.4	
Running Boards	<p>Cars not having full-width flooring between the ends of the car body and the ends of the underframe shall be equipped with transverse running boards adjacent to the ends of the underframe. If the car is equipped with ladders and the distance from the outside surface of the lowest ladder treads to the transverse end running boards exceeds 4 in., additional running boards shall extend from the transverse end running boards to the base of the ladders.</p> <p>Cars having full-width metal flooring and no running boards shall be provided with a slip-resistant surface on the flooring adjacent to the ends of the underframe and extending from the ends to the ladders, if applied.</p>	<p>Appendix F3, 7.1.1</p> <p>Appendix F3, 7.1.2</p>	
Dimensions	<p>All running boards shall conform to the requirements of Standard S-226.</p> <p>All running boards shall be not less than 18 in. wide.</p> <p>Slip-resistant surfaces shall be not less than 18 in. wide.</p>	<p>Appendix F3, 7.2.1</p> <p>Appendix F3, 7.2.2</p> <p>Appendix F3, 7.2.3</p>	
Location	<p>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.</p> <p>The gap in the longitudinal direction between the edge of the running board adjacent to a ladder and the outside surface of the lowest ladder tread shall not exceed 4 in.</p> <p>The outboard edge of the slip-resistant surface shall be no more than 4 in. from a vertical plane extending down from the inboard surface of the safety railings, and the inboard edge shall be no 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.</p> <p>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.</p>	<p>Appendix F3, 7.3.1</p> <p>Appendix F3, 7.3.2</p> <p>Appendix F3, 7.3.3</p> <p>Appendix F3, 7.3.4</p>	
Manner of Application	Running boards shall be securely fastened 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.	Appendix F3, 7.4	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Ladders	Access to the top of the car body may be provided at either or both ends of the car, but is not required.	Appendix F3, 8.1	
Dimensions	Ladder treads 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. Ladder treads other than those within 4 in. of the underside of the end top chords shall incorporate foot guards not less than 2 in. high at both ends.	Appendix F3, 8.2	
Location	When applied, the ladders shall be located at either or both ends of the car above the deck or running board.	Appendix F3, 8.3.1	
	The ladder treads shall be oriented horizontally and spaced not more than 19 in. apart. Spacing between ladder treads shall be uniform within a maximum variation of 2 in.	Appendix F3, 8.3.2	
	The highest ladder tread shall be not less than 2 1/2 in. below the underside of the end top chord and not more than 12 in. below the top of the end top chord.	Appendix F3, 8.3.3	
	Spacing from the lowest ladder tread to the walking surface of the adjacent running board, if so equipped, shall be not more than 19 in. If not equipped with an adjacent running board, spacing from the lowest ladder tread to the car deck shall be not more than 19 in.	Appendix F3, 8.3.4	
	The clearance points of the inboard ends of the ladder treads shall be in vertical alignment in the transverse direction.	Appendix F3, 8.3.5	
	Each ladder tread shall be not more than 3 in. inboard of a plane extending from the lowest to the highest ladder tread. Each ladder tread shall be not more than 3 1/2 in. inboard or outboard of the ladder treads immediately above and below it. No ladder tread shall be more than 3 in. outboard of the lowest ladder tread.	Appendix F3, 8.3.6	
Manner of Application	Ladders and ladder treads shall be securely fastened.	Appendix F3, 8.4	
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 running board, 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 F3, 9.0	



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Uncoupling Devices	<p>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.</p> <p>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).</p> <p>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.</p> <p>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.</p> <p>Uncoupling device mounting brackets shall be securely fastened to the car with fasteners not less than 5/8 in. diameter.</p>	<p>S-2044 6.1 (Base Standard)</p> <p>S-2044 6.2</p> <p>S-2044 6.3</p> <p>S-2044 6.4</p> <p>S-2044 6.5</p>	
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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SCT	<p>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.</p> <p>A single car air brake test shall be performed on each new car prior to placing or using the car in revenue service.</p>	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 ~ No Deviations Noted (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 F3 or CFR Parts (e.g. 215, 224 & 232)