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 US Department of Transportation Federal Railroad Administration		Sample Car Inspection Checklist For: S-2044 Appendix E-2 Safety Appliances for Tank Cars with End Ladders and High End-Mounted Hand Brakes		OMB No. 2130-0565 FRA F6180.161 H	
Inspector(s):		Inspection Location:		Date:	
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 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.	Append E2, 2.1.1			
Hand Brake Wheel	The hand brake wheel shall have a nominal diameter of 22 in. The brake wheel shall be of shallow configuration and shall be of steel or other material of equivalent strength.	Appendix E2, 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 E2, 2.1.3			
Location	The hand brake shall be located so that it can be safely operated from the horizontal end platform while the car is in motion. The center of the hand brake shaft on cars equipped with one hand brake shall be located on the B-end of the car to the left of, and not less than 17 in. nor more than 24 in. from, the centerline of the car and shall be not less than 26 in. nor more than 40 in. above the walking surface of the end-platform. 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 E2, 2.2.1			
	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 full range of travel and any part of the car shall be not less than 2 ½ in.	Appendix E2, 2.2.2			



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Manner of Application	<p>No part of the car that is more than 24 in. or less above the walking surface of the end running board shall encroach into a vertical column extending above the end running board and defined by the plane of the face of the hand brake wheel, and vertical planes defined by lines extending longitudinally inboard from the right and left edges of the hand brake wheel to the vertical plane of the outside edge of the end running board safety railing or the end ladder, and extending 18 in. out from these planes.</p>	Appendix E2, 2.2.3	
	<p>No part of the car that is 24 in. or less above the walking surface of the end running board shall encroach into a vertical column extending above the end running board and defined by the plane of the face of the hand brake wheel, and vertical planes defined by lines extending longitudinally back from the right and left edges of the hand brake wheel to the vertical plane of the outside edge of the end running board safety railing or the end ladder, and extending 10 in. out from these planes.</p>	Appendix E2, 2.2.4	
	<p>The outside edge of the hand brake wheel shall not extend more than 8 in. beyond the striker or end of the center sill and not more than 8 in. beyond the outboard edge of the end running board. The outside edge of the hand brake wheel shall be no less than 1 in. and not more than 18 in. outboard of that portion of the inboard surface of the horizontal end running board safety railing that is closest to the striker.</p>	Appendix E2, 2.2.5	
	<p>If the hand brake application is such that the requirements of paragraph 2.2.2 can be met only with hand brakes having short hand brake release levers or only with long release levers, but not both, the car shall be marked adjacent to the hand brake in 1 1/2 in. high letters "SHORT (LONG) RELEASE LEVER BRAKE ONLY."</p>	Appendix E2, 2.2.6	
	<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. Hand brake mounting brackets may be welded to pads applied to the tank or tank jacket or welded directly to the draft sill or a head shield.</p>	Appendix E2, 2.3.1	
	<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>	Appendix E2, 2.3.2 Appendix E2, 2.3.3	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Sill Steps	There shall be four sill steps.	Appendix E2, 3.1	
Dimensions	Sill steps shall conform to the requirements of Standard S-2042. Minimum usable length of tread shall be not less than 18 in.	Appendix E2, 3.2.1	
	Sill steps shall be of steel not less than 1/2 in. thick and not less than 2 in. wide.	Appendix E2, 3.2.2	
	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 end running board. Sill step treads shall be spaced not more than 21 in. apart.	Appendix E2, 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 E2, 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 the outboard vertical leg of the sill step is no more than 2 in. inboard of the inside surface of the outboard side handhold. The inside face of the inboard vertical leg of the sill step shall be not less than 16 in. from the inboard side of the outboard side handhold.	Appendix E2, 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. With the exception of the side handholds, side safety railings, 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. The outside edge of any sill step tread shall be not more than 4 in. inboard of any car structure at or below the end running board in the area between the side handholds.	Appendix E2, 3.3.2	
	The lowest tread shall be not more than 17 in. above the top of rail.	Appendix E2, 3.3.3	
Manner of Application	Sill steps shall be securely fastened.	Appendix E2, 3.4	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Side Handholds	There shall be eight vertical side handholds, two at each corner on each side of the car.	Appendix E2, 4.1	
Dimensions	<p>Side handholds shall conform to the requirements of Standard S-224 and shall be of solid steel not less than 1 in. diameter or pipe of 1 ¼ in. nominal pipe size with Schedule 40 minimum wall thickness. Minimum clearance shall be 2 in., preferably 2 ½ in.</p> <p>Side handholds shall have an uninterrupted span between the upper and lower clearance points.</p> <p>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 ¾ 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.</p>	<p>Appendix E2, 4.2.1</p> <p>Appendix E2, 4.2.2</p> <p>Appendix E2, 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. 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.</p> <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 adjacent walking surface of the end running board.</p>	<p>Appendix E2, 4.3.1</p> <p>Appendix E2, 4.3.2</p> <p>Appendix E2, 4.3.3</p>	
Manner of Application	Side handholds shall be securely fastened.	Appendix E2, 4.4	
End Handholds	There shall be four end handholds, one near each side on each end of the car.	Appendix E2, 5.1	
Dimensions	Handholds shall be of steel not less than ¾ 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 E2, 5.2	
Location	The end handholds shall be oriented horizontally and located not more than 45 in. above the top of rail.	Appendix E2, 5.3.1	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
<p>Manner of Application</p> <p>Transverse End Running Boards</p> <p>Dimensions</p> <p>Location</p>	<p>The clearance points of the outboard end of the end handholds shall be not more than 14 in. from the inside surface of the outboard side handholds.</p> <p>End handholds shall be securely fastened.</p> <p>There shall be two transverse end running boards, one on each end of the car.</p> <p>End running boards shall conform to the requirements of Standard S-226. The running boards shall have uniform slip-resistant surfaces and shall be of construction to provide sufficient clear opening to permit elimination of accumulated snow and ice.</p> <p>The running boards shall have a minimum width not less than 10 in. anywhere along its length. End running boards shall have a transverse length not less than 110 in. and shall be centered on the car.</p> <p>At each end, the running board shall be not less than 18 in. wide. The 18 in. width shall be maintained for a length of 12 in., or the running board shall taper from 18 in. to the narrowest width over a length not less than 24 in.</p> <p>Transverse end running boards shall be continuous across the end of the car and may be made up of several pieces secured to mounting brackets.</p> <p>Where conventional draft gears or cushioning devices having less than 6 in. longitudinal coupler travel in buff are used, the outside edge of the end running boards shall extend no farther from the end of the car than the striker or end of the center sill. Where draft gears or cushioning devices having 6 in. or greater longitudinal coupler travel in buff are used, the outside edge of the end running boards shall extend no more than 6 in. beyond the striker or end of the center sill with the cushioning device (if used) at full buff. The inboard edge of the end running board shall be no more than 1 in. outboard of the inboard edge of the horizontal end running board safety railing at any point.</p> <p>The ends of end running boards shall not be outboard of, and shall be not more than 2 in. inboard from, the outboard surface of the sides of the car directly below the running board ends.</p>	<p>Appendix E2, 5.3.2</p> <p>Appendix E2, 5.4</p> <p>Appendix E2, 6.1</p> <p>Appendix E2, 6.2.1</p> <p>Appendix E2, 6.2.2</p> <p>Appendix E2, 6.2.3</p> <p>Appendix E2, 6.2.4</p> <p>Appendix E2, 6.3.1</p> <p>Appendix E2, 6.3.2</p>	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
<p>Manner of Application</p> <p>Horizontal End Running Board Safety Railings</p> <p>Dimensions</p> <p>Location</p>	<p>Minimum vertical clearance above the end running board, measured from the walking surface of the end running board, shall be not less than 5 in., except for the hand brake rod, hand brake chain, bell crank, and sheave wheel. No part of the car end or fixture on the car end above the end running board and less than 84 in. above the walking surface of the end running board, other than the side handholds, side handhold mounting brackets, hand brake, hand brake mounting brackets, hand brake rod, hand brake chain, bell crank, and sheave wheel, shall extend closer to the outboard edge of the end running boards than 7 in.</p>	<p>Appendix E2, 6.3.3</p>	
	<p>Clearance between a vertical surface extending outboard up and down from the outside surface of the end running board safety railing and any part of the car more than 24 in. but less than 84 in. above the walking surface of the end running board, other than the hand brake and the hand brake mounting brackets, shall be not less than 15 in., preferably 18 in. Clearance between a vertical surface extending down from the outside surface of the end running board safety railing and any part of the car 24 in. or less above the walking surface of the end running board shall be not less than 10 in.</p>	<p>Appendix E2, 6.3.4</p>	
	<p>The end running boards shall be securely fastened with not less than 3/8 in. diameter fasteners.</p>	<p>Appendix E2, 6.4</p>	
	<p>There shall be two horizontal end running board safety railings. One horizontal end running board safety railing shall be applied on each end of the car above the end running board.</p>	<p>Appendix E2, 7.1</p>	
	<p>Horizontal end running board safety railings shall conform to the requirements of Standard S-224 and 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. Minimum clearance shall be 2 1/2 in.</p>	<p>Appendix E2, 7.2</p>	
	<p>The height from the top of the end running board safety railing to the walking surface of the end running board shall be not less than 36 in. nor more than 54 in.</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. from the inside surface of the inboard side handhold. If the 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. from the inside surface of the inboard side handhold.</p>	<p>Appendix E2, 7.3.1</p> <p>Appendix E2, 7.3.2</p>	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Manner of Application	<p>Horizontal end running board safety railings shall be securely fastened.</p> <p>Horizontal end running board safety railings shall be supported at each end. Safety railings not interrupted at ladders shall be supported at a minimum of two intermediate locations along their horizontal span. The spacing between centerlines of any two supports shall be not less than 24 in. Mounting brackets shall be not less than 3/8 in. thick and not less than 2 in. wide and may be welded to the tank, head shield, or tank jacket. Brackets welded to head shields or jackets less than 3/8 in. thick or to the tank shall be welded to reinforcing pads on the tank, head shield, or jacket. When the mounting brackets are welded to reinforcing pads on the jacket, there shall be supports attached to the tank located beneath the jacket pads.</p> <p>When end running board safety railings are interrupted at the ladders, each portion of the safety railings shall be supported at each end and at a minimum of one intermediate location. The 24 in. minimum spacing does not apply between intermediate supports and the ladder stiles.</p>	<p>Appendix E2, 7.4.1</p> <p>Appendix E2, 7.4.2</p> <p>Appendix E2, 7.4.3</p>	
Side Safety Railings	<p>There shall be two side safety railings.</p>	<p>Appendix E2, 8.1</p>	
Dimensions	<p>Side safety railings shall conform to the requirements of Standard S-224 and shall be of pipe of 1 1/4 in. nominal pipe size with Schedule 40 minimum wall thickness. Minimum clearance shall be 2 1/2 in.</p>	<p>Appendix E2, 8.2</p>	
Location	<p>There shall be side safety railings on each side of the car, extending between the body bolsters. Car structure or a continuation of the safety railings shall be applied between the end running boards and the body bolsters. The top of the side safety railing shall be not more than 45 in. above the top of rail. The inboard surface of the side safety railing shall be not less than 51 in. from the centerline of the car in the transverse direction.</p>	<p>Appendix E2, 8.3</p>	
Manner of Application	<p>Side safety railings shall not be interrupted or obstructed between body bolsters except at safety railing support brackets and operating cabinets. Side safety railings shall be supported at the ends, and operating cabinets if interrupted, and at intervals as required, not to exceed 10 ft between support centerlines. Each section of side safety railing shall be securely fastened at not less than one location. Welding is permitted on the support brackets and associated parts. Welding is not permitted on side safety railings except as provided in the base standard.</p>	<p>Appendix E2, 8.4</p>	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Ladders	Two ladders shall be applied to any tank car with top fittings used in loading or unloading, one at each end of the car. Ladders are not required if all fittings used in loading and unloading the tank are accessible from ground or end running board.	Appendix E2, 9.1	
Dimensions	Ladder stiles shall be of steel not less than 3/8 thick and not less than 2 in. wide or other section of equivalent strength and stiffness. 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 14 in. Minimum clearance shall be 2 in., preferably 2 1/2 in.	Appendix E2, 9.2	
Locations	<p>The ladder treads shall be oriented horizontally with the actual distance between them not more than 19 in. The actual distance between the top ladder tread and the top of the longitudinal running board shall be not more than 19 in. The actual distance between ladder treads and from the top ladder tread to the top of the longitudinal running board shall be uniform within a maximum variation of 2 in. The horizontal end running board safety railing may be used as a ladder tread.</p> <p>The bottom ladder tread shall be not more than 19 inches above the walking surface of the end running board.</p>	<p>Appendix E2, 9.3.1</p> <p>Appendix E2, 9.3.2</p>	
Manner of Application	<p>Ladder treads shall be securely fastened to the ladder stiles.</p> <p>Ladders shall be securely fastened at their top and bottom ends.</p> <p>Ladder support brackets shall be securely fastened. Mounting brackets shall be not less than 3/8 in. thick and not less than 2 in. wide and may be welded to the tank, head shield, or tank jacket. Brackets welded to head shields or jackets less than 3/8 in. thick or to the tank shall be welded to reinforcing pads on the tank, head shield, or jacket. When the mounting brackets are welded to reinforcing pads on the jacket, there shall be supports attached to the tank located beneath the jacket pads.</p> <p>On each end of the car, each ladder tread shall be not more than 3 in. inboard of a plane extending from the lowest ladder tread 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.</p>	<p>Appendix E2, 9.4.1</p> <p>Appendix E2, 9.4.2</p> <p>Appendix E2, 9.4.3</p> <p>Appendix E2, 9.4.4</p>	
Ladder Transition Handholds	There shall be a transition handhold extending up from each side of each end ladder.	Appendix E2, 10.1	





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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Dimensions	<p>Transition handholds shall conform to the requirements of Standard S-224 and shall be of solid steel not less than 3/4 in. diameter or pipe of 1 1/4 in. nominal pipe size with Schedule 40 minimum wall thickness. Minimum clearance shall be 2 in., preferably 2 1/2 in.</p>	Appendix E2, 10.2	
Location	<p>When the clearance plate limit to which the car is designed permits, the top surface of each transition handhold shall be not less than 40 in. and not more than 44 in. above the walking surface of the longitudinal running board. If the clearance limit does not permit a 44 in. height, the top surface of each transition handhold shall be not more than 4 in. below the maximum height permitted by the clearance limit. The clear width between the transition handholds adjacent to the ladder shall be not less than 18 in. and not more than 24 in.</p> <p>The inside surface of each transition handhold shall not infringe on the clear width of the ladder treads and shall be not more than 5 in. outboard in the transverse direction from the clearance point of the adjacent ladder tread. The inside surface of each transition handhold shall be not more than 2 in. outboard of the adjacent edge of the running board. When longitudinal running board safety railings are applied, the adjacent transition handhold extending from the ladder shall terminate within 4 in. of the safety railing. Each transition handhold shall extend not less than 12 in. in the longitudinal direction from the end of the running board.</p>	<p>Appendix E2, 10.3.1</p> <p>Appendix E2, 10.3.2</p>	
Manner of Application	<p>Transition handholds shall be securely fastened at their ends.</p>	Appendix E2, 10.4	
Longitudinal Running Boards	<p>Longitudinal running boards shall be applied to any tank car with top fittings used in loading or unloading the tank. Longitudinal running boards are not required if all fittings used in loading and unloading the tank are accessible from the ground or end running board.</p>	Appendix E2, 11.1	
Dimensions	<p>The longitudinal running boards shall conform to the requirements of Standard S-226. The running boards shall have uniform slip-resistant surfaces and shall be of construction to provide sufficient clear opening to permit elimination of accumulated snow and ice.</p> <p>Longitudinal running boards shall be not less than 7 in. wide. At the ladders, there shall be a section of running board not less than 18 in. wide in the transverse direction and not less than 12 in. long in the longitudinal direction.</p>	<p>Appendix E2, 11.2.1</p> <p>Appendix E2, 11.2.2</p>	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Location	<p>Longitudinal running boards shall extend from the operating platform to the end ladders on each end of the car. When running boards are not located on the centerline of the car, the running boards at the two ends of the car may be on the same side of the car or located at diagonal corners.</p> <p>The facing surfaces of running boards and adjacent operating platform boards that are nominally at the same height shall not be farther apart than 3/8 in., and their walking surfaces shall not vary in height by more than 1/4 in.</p> <p>When running boards and adjacent operating platform boards are not at the same height, they shall conform to the requirements of the base standard.</p> <p>When running boards are not adjacent to the nearest operating platform boards, the ends of the running boards shall be not more than 2 in. in the longitudinal direction from the outboard surface of the operating platform safety railing.</p>	<p>Appendix E2, 11.3.1</p> <p>Appendix E2, 11.3.2</p> <p>Appendix E2, 11.3.3</p> <p>Appendix E2, 11.3.4</p>	
Manner of Application	<p>Longitudinal running boards shall be securely fastened to the car with not less than 3/8 in. diameter fasteners. Mounting brackets shall be not less than 3/8 in. thick and not less than 2 in. wide and may be welded to reinforcing pads on the tank or tank jacket. When the mounting brackets are welded to reinforcing pads on the jacket, there shall be supports attached to the tank located beneath the jacket pads.</p>	<p>Appendix E2, 11.4</p>	
Longitudinal Running Board Safety Railing	<p>One running board safety railing shall extend along the outboard edge of all longitudinal running boards that are less than 24 in. wide.</p>	<p>Appendix E2, 12.1</p>	
Dimensions	<p>Running board safety railings shall conform to the requirements of Standard S-224 and shall be of pipe of 1 1/4 in. nominal pipe size with Schedule 40 minimum wall thickness. Minimum clearance shall be 2 1/2 in.</p>	<p>Appendix E2, 12.2</p>	
Location	<p>When the clearance plate limit to which the car is designed permits, the top of the running board safety railings shall be not less than 40 in. and not more than 44 in. above the walking surface of the running boards. If the clearance limit does not permit a 44 in. height, the top of the running board safety railings shall be not more than 4 in. below the maximum height permitted by the clearance limit. In any event, the height of the safety railings above the walking surface of the running boards shall be not less than 24 in. If the clearance limit does not permit safety railings 24 in. high or greater, safety railings shall not be applied and the running boards shall be not less than 24 in. wide.</p>	<p>Appendix E2, 12.3.1</p>	



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Manner of Application	<p>The planes extending down from the inboard surfaces of the longitudinal running board safety railings shall be not more than 2 in. from the outboard edge of the running boards.</p> <p>Running board safety railings shall extend from the ladder transition handholds at the ends of the car to the operating platform safety railing.</p> <p>Longitudinal running board safety railings shall be supported at each end and at intermediate locations as required such that the spans between support centerlines do not exceed 10 ft. The ends of the safety railing shall be securely fastened to the operating platform, operating platform safety railing, or platform supports at one end; to the running board or running board supports at the other end; and/or to separate mounting brackets.</p> <p>Where the safety railings are supported by mounting brackets separate from the operating platform, operating platform safety railing, operating platform supports, running boards, or running board supports, the safety railings and their supports shall be securely fastened to the mounting brackets, which shall be attached to metal pads welded to the tank shell or jacket. When the mounting brackets are welded to reinforcing pads on the jacket, there shall be supports attached to the tank located beneath the jacket pads.</p>	<p>Appendix E2, 12.3.2</p> <p>Appendix E2, 12.3.3</p> <p>Appendix E2, 12.4.1</p> <p>Appendix E2, 12.4.2</p>	
Operating Platform	<p>Operating platform(s) shall be applied to any tank car with top fittings used in loading or unloading the tank. An operating platform is not required if all fittings used in loading and unloading the tank are accessible from the ground or end platform.</p> <p>The working area of the operating platform is that portion of the platform that extends from the closest transverse section of the safety railing to the center of the top loading or unloading fittings and/or manways and for an equal distance toward the other end of the car beyond the fittings and/or manways.</p>	<p>Appendix E2, 13.1.1</p> <p>Appendix E2, 13.1.2</p>	
Dimensions	<p>The operating platform boards shall be considered running boards under Standard S-226 and shall conform to the design, manufacturing, and test requirements of Standard S-226 applicable to running boards. The platform boards shall have uniform slip-resistant surfaces and shall be of construction to provide sufficient clear opening to permit elimination of accumulated snow and ice. Platform boards shall be not less than 7 in. wide and shall extend to within 2 in. of the planes extending down from the inboard surfaces of the operating platform safety railing and running board safety railing.</p>	<p>Appendix E2, 13.2</p>	



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Sample Car Inspection Checklist For: S-2044 Appendix E-2  
Safety Appliances for Tank Cars with End Ladders and  
High End-Mounted Hand Brakes

OMB No. 2130-0565  
FRA F6180.161 H

ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Location	Operating platforms shall be located such that they provide access to all fittings used in the top loading or top unloading of the tank and/or manways.	Appendix E2, 13.3	
Manner of Application	The operating platform boards shall be securely fastened with not less than 3/8 in. diameter fasteners. Mounting brackets shall be not less than 3/8 in. thick and not less than 2 in. wide and may be welded to reinforcing pads on the tank or tank jacket. When the mounting brackets are welded to reinforcing pads on the jacket, there shall be supports attached to the tank located beneath the jacket pads.	Appendix E2, 13.4	
Operating Platform Filler Plates (Optional)	When filler plates are applied, there shall be one filler plate at the inboard edge of each longitudinal operating platform board.	Appendix E2, 14.1	
Dimensions	<p>Filler plates shall be of steel or other material of equivalent strength and shall have uniform antiskid surfaces. Flat filler plates shall be not less than 1/4 in. thick, and filler plates with a longitudinal flange shall be not less than 11 gauge (0.12 in.) thick.</p> <p>When filler plates do not extend for the full length of the platform boards, there shall be sloped transitions from the ends of the filler plates to the surface of the tank or jacket. The slope shall be not more than 30° from the horizontal.</p>	<p>Appendix E2, 14.2.1</p> <p>Appendix E2, 14.2.2</p>	
Location	<p>Filler plates shall be oriented horizontally and shall be applied for the full length of the working area of the operating platform boards.</p> <p>The horizontal space between adjacent sections of filler plates, and between filler plates and the adjacent operating platform boards, shall not exceed 3/4 in. The distance between the tank, tank jacket, or mounting pad and the closest edge of the filler plate, measured perpendicular to the tank, shall not exceed 3/4 in.</p> <p>The difference in height of the top surfaces of adjacent sections of filler plates and of the top surfaces of the filler plates and the adjacent operating platform boards shall not exceed 1/4 in.</p>	<p>Appendix E2, 14.3.1</p> <p>Appendix E2, 14.3.2</p> <p>Appendix E2, 14.3.3</p>	
Manner of Application	Filler plates applied to mounting brackets shall be applied with not less than 3/8 in. diameter fasteners. Filler plate mounting brackets, and filler plates applied directly to the car without separate mounting brackets, shall be welded to pads on the tank or tank jacket. Filler plates shall be supported at spacings not greater than 30 in.	Appendix E2, 14.4	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Operating Platform Vertical Toe Boards (Optional)	When toe boards are applied, there shall be one toe board along the outboard edge of each platform board.	Appendix E2, 15.1	
Dimensions	Toe boards shall be of any combination of material grade, thickness, and support structure that will prevent more than 1/4 in. horizontal deflection in response to a 100 lb horizontal load applied at any point along the toe board.	Appendix E2, 15.2.1	
Location	The height from the top of the operating platform boards to the top of the toe boards shall be not less than 4 in. nor more than 6 in. The height above the top of the operating platform boards to the bottom of the toe boards shall be no greater than 1/4 in.	Appendix E2, 15.2.2	
Manner of Application	Toe boards shall extend vertically for the full length and width of the working area of the operating platform boards except at openings in the operating platform safety railing.  Toe boards shall not be applied at openings in the operating platform safety railing.	Appendix E2, 15.3.1  Appendix E2, 15.3.2	
Operating Platform Safety Railing	One operating platform safety railing shall be applied surrounding the working area of the operating platform.	Appendix E2, 16.1.1	
Dimensions	Intermediate safety railings are optional. When applied, they shall be applied at those locations of the working area of the operating platform where there is an operating platform safety railing.  Operating platform safety railings, including intermediate safety railings, shall conform to the requirements of Standard S-224 and shall be pipe of 1 1/4 in. nominal pipe size with Schedule 40 minimum wall thickness. Minimum clearance shall be 2 1/2 in.	Appendix E2, 16.1.2  Appendix E2, 16.2.1	
	Openings in the safety railing at running boards shall be not less than 18 in. and not more than 24 in.	Appendix E2, 16.2.2	
	Openings in the safety railing other than those at running boards shall be no wider than 36 in.	Appendix E2, 16.2.3	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
Location	<p>When horizontal intermediate safety railings are applied, the top of the intermediate safety railing shall be not more than 21 in. above the top of the operating platform surface.</p> <p>Safety chains, when applied, shall be of steel and shall have link thickness not less than 1/4 in. Safety chain fastening components shall be securely fastened with fasteners not less than 1/4 in. diameter. The length of safety chains shall not exceed by more than 4 in. the minimum chain length that will enable the chain to be attached at its free end when pulled tight.</p> <p>The operating platform safety railing shall enclose the operating platform and all fittings used in loading and unloading the tank. Safety railings at running boards shall extend vertically down to the running board or running board supports.</p> <p>When the clearance plate limit to which the car is designed permits, the top of the operating platform safety railing shall be not less than 40 in. and not more than 44 in. above the walking surface of the operating platform. If the clearance limit does not permit a 44 in. height, the top of the operating platform safety railing shall be not more than 4 in. below the maximum height permitted by the clearance limit.</p> <p>Openings in the safety railing other than those at the running boards shall have safety chains fastened to each side of the opening. Safety chains shall not be applied at openings in the safety railing at running boards. Safety chains shall be applied in line with the top safety railing only. No intermediate safety chains shall be applied.</p>	<p>Appendix E2, 16.2.4</p> <p>Appendix E2, 16.2.5</p> <p>Appendix E2, 16.3.1</p> <p>Appendix E2, 16.3.2</p> <p>Appendix E2, 16.3.3</p>	
Manner of Application	<p>Operating platform safety railings shall be supported at or near every corner of the operating platform and at intervals as required, such that the spans between support centerlines do not exceed 10 ft. The requirement for unsupported length not to exceed 10 ft does not apply to cars built prior to January 1, 2017. The ends of the safety railing shall be securely fastened to the operating platform or platform supports.</p> <p>Where the safety railing is supported by mounting brackets separate from the operating platform or operating platform supports, it shall be securely fastened to the mounting brackets, which shall be attached to metal pads welded to the tank shell or jacket. When the mounting brackets are welded to reinforcing pads on the jacket, there shall be supports attached to the tank located beneath the jacket pads.</p>	<p>Appendix E2, 16.4.1</p> <p>Appendix E2, 16.4.2</p>	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
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, transverse end running boards, 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 walking surface of the end running board, other than the exceptions herein noted, shall extend beyond the outer face of the striker or end of the center sill.	Appendix E2, 17.0	
Uncoupling Devices	There shall be a minimum of two uncoupling devices that conform to the requirements of the base standard.	Appendix E2, 18.0	



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ITEM	Number - Dimensions - Location - Manner of Application	Appendix Reference	Notes
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	<p>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.</p> <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>	49 CFR Part 232. 103	
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 A1 or CFR Parts (e.g. 215, 224, & 232)