US Department of Transportation
Federal Railroad Administration

Sample Car Inspection Checklist for: S-2044 Appendix D-1
Safety Appliances for Flatcars with Full Decks

OMB No. 2130-0565
FRA F6180.161 L

| 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 D1, 2.1.1 | |
| | ☐ The brake wheel of vertical-wheel hand brakes shall have a nominal diameter of 16 in., 18 in., 20 in., or 22 in. The brake wheel shall be of shallow configuration and shall be of steel or other material of equivalent strength. | Appendix D1, 2.1.2 | |
| | ☐ The hubs of 22 in. hand brake wheels 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 D1, 2.1.3 | |
| | ☐ The attachment of hand brake wheels to the shaft shall be such that only wheels of the same nominal diameter and depth can be applied. The attachment of brake wheels of 16 in., 18 in., or 20 in. nominal diameter shall provide an equal or greater degree of safety as that required in paragraph 2.1.3. | Appendix D1, 2.1.4 | |
| 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 D1, 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. In addition, the closest point of the arc of travel shall be not more than 16 in. inboard of the inboard clearance point of the side handhold closest to 46 in. above the lowest sill step tread. | Appendix D1, 2.2.2 | |

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| | ☐ It is preferred that the hand brake is located such that the hand brake housing and arc of travel of the release lever do not project above the deck of the car. In any event, the tip of the operating lever, when in the released position, shall be not less than 4 in. above the lowest sill step tread nor more than 48 in. above the top of rail. The tip of the hand brake lever on flatcars equipped for the application of vehicle superstructures shall be not more than 56 in. above the top of rail. | | |
| | ☐ 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 D1, 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 ½ in. | Appendix D1, 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 ½ in. high letters “SHORT (LONG) RELEASE LEVER BRAKE ONLY”. | Appendix D1, 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 D1, 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 D1, 2.3.2 | |
| | ☐ Hand brake rods shall be not less than ¾ in. diameter. | Appendix D1, 2.3.3 | |
| Sill Steps | ☐ There shall be four sill steps. | Appendix D1, 3.1 | |
| Dimensions | ☐ Sill steps shall conform to the requirements of Standard S-2042. Minimum usable length of tread shall be 14 in. | Appendix D1, 3.2.1 | |

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|---|---|---|---|
| | ☐ 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. | Appendix D1, 3.2.2 | |
| | ☐ Sill steps shall have sufficient treads such that the top tread is not more than 21 in. below a side handhold having foot guards at both ends. If there is no side handhold having foot guards above the sill step at both ends, the top sill step tread shall be not more than 21 in. below the deck of the car. Sill step treads shall be spaced not more than 21 in. apart. | Appendix D1, 3.2.3 | |
| | ☐ The clear depth above the entire usable length of all sill step treads shall be not less than 8 in. | Appendix D1, 3.2.4 | |
| | The minimum clear width of the lowest tread shall taper uniformly from 6 in. at the tread surface to 4 in. at 8 in. above the tread. The clear width so specified shall apply for both loaded and empty conditions with the trucks rotated to simulate the maximum curvature specified for the uncoupled car. | Appendix D1, 3.2.5 | |
| 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 not more than 2 in. inboard of the outboard clearance point of any side handhold. The inside face of the inboard vertical leg of the sill step shall be not less than 16 in. from the outboard clearance point of any horizontal side handhold. These requirements do not apply to additional handholds applied in accordance with the requirements of paragraph 4.3.2. | Appendix D1, 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 lowest adjacent side handhold. In addition, the outside edge of any sill step tread shall be not more than 4 in. inboard of any car structure below the clear length of the lowest adjacent side handhold. | Appendix D1, 3.3.2 | |
| | ☐ The lowest tread shall be not more than 24 in. above the top of rail. | Appendix D1, 3.3.3 | |
| Manner of Application | ☐ Sill steps shall be securely fastened to the car. | Appendix D1, 3.4 | |
| Side Handholds | ☐ There shall be not less than six side handholds, two at each corner of the car at which a hand brake is located, two at the diagonally opposite corner, and one at each of the other corners. | Appendix D1, 4.1 | |
| 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 D1, 4.2 | |

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| ITEM | Number - Dimensions - Location - Manner of Application | Appendix Reference | Notes |
|---|---|---|---|
| Location | ☐ The side handholds shall be oriented horizontally near each end on each side of the car. One side handhold shall be located at each corner of the car not more than 48 in. above the top of rail. A second side handhold shall be located at each corner of the car at which a hand brake is located and at the diagonally opposite corner located not less than 42 in. nor more than 57 in. above the lowest sill step tread. | Appendix D1, 4.3.1 | |
| | ☐ The clearance points of the outboard end of the side handholds shall be not more than 40 in., preferably not more than 12 in., from the inside surface of the nearest end handhold. If the outboard clearance point of the lowest side handhold at any corner is more than 12 in. from the inside surface of the nearest end handhold, an additional side handhold conforming to the requirements of paragraph 4.3.3 shall be applied. | Appendix D1, 4.3.2 | |
| | ☐ If additional handholds are applied to conform to the requirements of paragraph 4.3.2, their outboard clearance points shall be not more than 12 in. from the inside surface of the nearest end handhold, they shall have clear length not less than 10 in., and they shall be not less than 22 in. and not more than 45 in. above the top of rail. No part of the additional side handholds may extend beneath the clear length of the other side handholds. | Appendix D1, 4.3.3 | |
| | ☐ Transverse handholds may be applied in place of the second side handholds of paragraph 4.3.1. The transverse handholds shall be located with the inside surface of the horizontal portion not more than 30 in. in the longitudinal direction from the tip of the hand brake operating lever when the lever is located as in paragraph 2.2.2 and not more than 2 in. from the inside face of the outboard leg of the sill step. The handhold shall be of solid steel not less than 1 in. diameter with the length between the vertical legs not less than 18 in. The inside surface of the outboard vertical leg shall be not less than 4 in. nor more than 7 in. in the transverse direction from the inside surface of the side handhold and the top of the horizontal portion shall be not less than 40 in. nor more than 50 in. above the lowest sill step tread. | Appendix D1, 4.3.4 | |
| | ☐ When applied, side handholds adjacent to articulated connectors or drawbar connections of multi-unit cars shall conform to the requirements of paragraph 4.2. | Appendix D1, 4.3.5 | |
| Manner of Application | ☐ Side handholds and transverse handholds shall be securely fastened. | Appendix D1, 4.4 | |

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| ITEM | | Number - Dimensions - Location - Manner of Application | Appendix Reference | Notes |
|---|---|---|---|---|
| End Handholds | ☐ | There shall be four end handholds. | Appendix D1, 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 ½ in. | Appendix D1, 5.2 | |
| Location | ☐ | The end handholds shall be oriented horizontally, one near each side of each end of the car on the end sill. | Appendix D1, 5.3.1 | |
| | ☐ | The clearance points of the outboard end of the end handholds shall be not more than 18 in. from the inside surface of the nearest side handhold at its outboard end and in addition shall be not more than 16 in. from the car structure adjacent to the side handhold. | Appendix D1, 5.3.2 | |
| | ☐ | The end handholds shall be not more than 45 in. above the top of rail. | Appendix D1, 5.3.3 | |
| Manner of Application | ☐ | End handholds shall be securely fastened. | Appendix D1, 5.4 | |
| Deck Slots | ☐ | Deck slots are not required, but when applied, there shall be four pair, one pair at each corner of the car. | Appendix D1, 6.1 | |
| Dimensions | ☐ | Deck slots shall be not less than 2 ½ in. nor more than 3 in. wide. Each pair of slots shall consist of two slots in line longitudinally, each slot having straight edges not less than 6 in. long. The longitudinal distance between the ends of the two slots shall be not less than 6 in. and not more than 16 in., measured between the ends of the straight edges. The corners of all edges of the slots shall be rounded, and the slots shall have corner radii not less than ½ in. | Appendix D1, 6.2.1 | |
| | ☐ | The thickness of the deck at the straight edge of the deck slots closest to the side of the car shall be not less than ¾ in. but not greater than 1 5/8 in. The ¾ in. minimum thickness shall extend not less than 1 in. beyond the straight portion of the edge of each slot in each direction. | Appendix D1, 6.2.2 | |

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| | ☐ The space under the deck within 4 in. from the outboard longitudinal edge of the slot shall have not less than 2 1/2 in. vertical clearance for the entire length of the slot. This clearance shall exist for all conditions, including wear, spring deflection from empty car to loaded car, and truck rotation for the tightest horizontal and vertical curves for which the car is constructed to negotiate when coupled to another car. | Appendix D1, 6.2.3 | |
| Location | ☐ The long direction of the deck slots shall be parallel to the side of the car. | Appendix D1, 6.3.1 | |
| | In the transverse direction, the edge of the deck slot closest to the side of the car shall be not less than 8 in. nor more than 25 in. from the widest part of the car above the adjacent sill step. | Appendix D1, 6.3.2 | |
| | ☐ In the longitudinal direction, the end of the deck slot closest to the end of the car shall be not more than 2 in. inboard of the inside face of the outboard leg of the adjacent sill step. | Appendix D1, 6.3.3 | |
| Uncoupling Device | ☐ There shall be a minimum of two uncoupling devices that conform to the requirements of the base standard. | Appendix D1, 7.0 | |

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| ITEM | | Number - Dimensions - Location - Manner of Application | Appendix Reference | Notes |
|---|---|---|---|---|
| Uncoupling Devices | ☐ | 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 (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 | |
| | ☐ | 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 | |
| | ☐ | 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 | |
| | ☐ | Uncoupling device mounting brackets shall be securely fastened to the car with fasteners not less than 5/8 in. diameter. | S-2044 | |
| 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 ~ 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 D1 or CFR Parts (e.g. 215, 224 & 232)