

Rolling Equipment Standards

2.0 General

2.01 Any locomotive or cars which consistently fails to operate satisfactorily may, at the discretion of the **Rolling Equipment Committee**, be disqualified from operation indefinitely pending modifications satisfactory to the committee even though it meets all other **Standards**.

2.02 All rolling equipment used during operation shall be registered with and inspected by a member of the committee before being placed in service and at such other times as may be directed by the committee to ensure compliance with these standards.

2.1 Dimensions

2.11 All rolling equipment shall measure not more than **1-21/32 in. (12 scale ft.)** in width and not more than **2-3/4 in. (20 scale ft.)** in height. Minimum clearance above the tops of the running rails shall measure not less than **1/32 in. (2-1/2 scale in.)** except the wheels. All wheel flanges shall conform to applicable NMRA standards.

2.12 Combinations of more than one locomotive unit semi-permanently coupled shall not exceed four units in number. Self-propelled passenger equipment shall comply with this standards.

2.2 Operation On Curves

2.21 Locomotives: All locomotives shall be able to operate satisfactorily on a curve of **42 in. radius** when coupled between cars of 50 foot nominal length. In addition, locomotives in the following categories shall be able to operate satisfactorily on a curve of **22 in. radius** when coupled between cars of 36 foot nominal length; all diesels and electric locomotives up to a 55 foot nominal length inclusive having two 4-wheel trucks; all steam locomotives not equipped with engine trucks; all locomotives having a switching pilot.

2.22 Passenger cars: all passenger cars shall be able to operate satisfactorily on a curve of **42 in. radius** when coupled between similar passenger cars and when coupled between freight cars of 50 foot nominal length.

2.23 Freight Cars Intended for Passenger Service: All freight cars whose prototypes were intended of equipped for passenger service shall be able to operate satisfactorily on a curve of **42 in. radius** when coupled between similar cars and when coupled between standard length passenger cars.

2.24 Other Freight Cars: All other freight cars shall be able to operate satisfactorily on a curve of **33 in. radius** when coupled between cars of similar length. In addition, all freight cars of up to 50 foot nominal length inclusive shall be able to operate satisfactorily on a curve of **22 in. radius** when coupled between cars similar in length.

2.3 Operation on Grades

2.31 Locomotives: all powered locomotive units shall be able to pull smoothly a load of **80 oz.** down a grade of 2-1/2 % when track is connected to a source of 6 volts DC.

2.32 Self-Propelled Passenger Equipment: All self-propelled passenger equipment shall be able to move smoothly down a grade of 2-1/2% and shall be able to maintain a speed of 30 scale miles per hour when moving up a grade of 2-1/2%.

2.33 Other Equipment: All other equipment shall be able to roll down a grade of 2% from a standing start and shall be able to stand on a grade of .25%.

Note: This requirement applies to all equipment, except for Locomotives, and Self-propelled Equipment. If the **Rolling Equipment** fails the roll down test, there is only one option that is to **re truck** the equipment in question. **Examples** of poor rolling equipment are as follows: **Train Miniature**, and **Stewart Hobbies, Inc.**

2.331 Self Rolling Test: To insure good rolling quality, once trucks are assembled and or attached to the **Rolling Equipment**. Invert the car and give the **axles** a turn. Time the **Axle's** for about **5 seconds**, if the axle stops spinning before that time period, you need to check the journal for flash or burs. If the journal appears to be free of such then lubricate with Labelle **106, 111, or 134**. Do not use graphite, because it conducts. If this doesn't solve the problem, the only answer is to **Re Truck** the car.

2.4 Electrical

2.41 Powered Locomotives Units: All powered locomotive units shall be able to operate satisfactorily when properly connected to **12 Volt Full Wave DC**, and shall comply with provisions of NMRA standard S-9. No locomotive or semi-permanently coupled combination of locomotives shall be able to draw a current of more than 3 Amperes at 12 Volts DC with all powered wheels stalled. Each locomotive unit shall have at least one half of its driving axles powered.

2.42 Self-Propelled Passenger Equipment: All self-propelled passenger equipment shall be able to comply with the requirements of **2.41** above, except the last sentence shall not apply.

2.43 Other Equipment: All other equipment shall have the wheel of one side of the outside axles electrically connected to the wheel of the other side of that axle via a 10K ohm +/- 10% resistor. The inside axles of this equipment shall have the wheel of one side electrically insulated from the wheel of the other side axle.

2.431 Wheel sets: All other equipment is required to have wheel sets made of either brass or nickel silver on all inboard axles.

2.44 Couplers: All equipment shall have the couplers electrically insulated from each other and the body of the equipment.

2.45 Prohibited Equipment: All self-propelled equipment whose prototype was not self-propelled is prohibited. Locomotives controlled by means other than track voltage and polarity are prohibited. Equipment with working smoke generators is prohibited.

2.46 Headlights: All Locomotives must have one or a bi-directional headlight. **Ex.** Steam locomotives should have one operational headlight, or if it is possible should also have a back up light on the tender. Diesels, depending on the type: EMD E and F units have one operational headlight, and Alco F and P units have one operational headlight. All road and yard switchers should have operational bi-directional headlights

2.5 Weight

2.51 Locomotives and Self-Propelled Passenger Equipment: Each unit of a semi-permanently coupled combinations of locomotive units or self-propelled passenger equipment shall weight within **10%** of the average weight-per-unit of the entire combination.

2.52 Non Powered Equipment: All non-powered equipment shall weight **one ounce per 10 Ft.** of nominal length if equipped with two 4-wheel or two 6-wheel trucks. Tolerance shall be .5 ounce.

2.53 Exceptional Equipment: Equipment with other wheel arrangements or having special weight problems will be considered by the committee on an individual basis.

2.54 Passenger Equipment: All passenger equipment exceeding 60Ft. In length shall weight no more than 6.5 +/- .5 oz's.

2.55 Hopper Cars: All open top hopper cars shall be weighted as if the car is to be run empty. The only time the load should be included as part of the weight, is when the proper weight cannot be achieved when the car is empty. **(Example of this is the Stewart Hobbies 70Ton three bay hopper)**

2.6 Couplers

2.61 General: All equipment except that specified in **2.62** shall be equipped with KADEE MKD- series couplers or with couplers fully compatible with KADEE MKD-series couplers. Couplers shall be securely mounted to the body according to the manufacturer's instructions. Couplers shall be able to withstand a tension of 36 ounces applied coupler to coupler for a period of 10 seconds without uncoupling or causing damage. Couplers shall be electrically insulated from the wheels.

2.612 Each coupler and its housing shall be mounted in such a way as to prevent rotation of the coupler housing and fastened with a screw.

2.62 Exceptions

2.621 A maximum of four locomotive units or self-propelled passenger cars may be semi-permanently coupled using rigid drawbars between units and standard couplers at the ends. The entire combination shall comply with **2.61** as though it were one unit.

2.622 Truck-mounted couplers will be considered by the Committee for use on locomotives only and after all other means to bring the unit into compliance with **2.61** have been exhausted.

2.623 The use of Mc Henry or Intermountain Couplers will only be allowed upon the discretion of the Master Mechanic or until these couplers prove themselves unsatisfactory. From there these couplers should be replaced with **Kadee MKD** couplers.

2.6231 The use of hard wire 10 K ohm resistors will only be allowed upon the discretion of the Master Mechanic or until these resistors become an operational hazard. From there, these hard wire resistors should be replaced with chip resistors mounted on the back of the insulated wheel, or **Jaybee** resistored wheel sets.

2.7 Required Modifications to Equipment

2.71 Identification: All equipment shall have applied to an inner axle of one truck, or the gear case cover, of each unit, the members assigned ownership designation. Such designation is to be applied to permit reading it **left-to-right** when the unit is held with the end bearing the designation pointing away from the reader and the axle with the designation closer to the reader than the axle which is closer to the end of the unit.

2.72 Decoration: All equipment decorated for the **Club Railroads** shall comply to the standard painting and lettering diagrams.

2.721 In addition to the standard painting and lettering diagrams, a class painting and lettering diagram is required for each class of equipment. These class painting and lettering diagrams shall be of quality comparable to the existing drawings.

2.722 All class painting and lettering diagrams shall be submitted to the [**Rolling Equipment Committee**] who will review and approve or disapprove the diagrams by signing and dating them as such.

2.723 Conflicts resulting from **2.722** should be resolved by interested parties whenever possible.

2.724 The Department Head should resolve Conflicts not resolved in 2.723.

2.725 Conflicts not resolved in **2.724** be overridden by a two/ third majority of the members voting at the following department meeting. Equipment painted and lettered prior to the following department meeting will not be grandfathered in the event the diagram is disapproved.

2.726 All equipment, which typically ran in the same geographical region as the club's railroads and in the same **ERA** of time as set forth by the HO department shall be lettered as it was typically, lettered.

2.727 All equipment not governed by **2.72** through **2.726** is not governed by the equipment standards but shall be eligible for inspection and allowed on the layout at all times other than operating sessions.

2.73 Provision for Waybills:

2.731 Enclosed Freight Cars: All enclosed freight cars and permanently-loaded open-top cars including permanently-loaded flat cars shall have a piece of ferromagnetic material so located on or in the car as to hold standard waybills placed at the center of the top of the car or load while the car is inverted.

2.7311 Tank Cars: All tank cars shall have a piece of ferromagnetic material located on each side of the center dome of the car so as to hold standard waybills in place while the car is inverted.

2.732 Flatcar Without Permanent Loads: Empty flat cars shall have ferromagnetic material on, in or under the floor to hold standard waybills placed at the center of the floor while the car is inverted.

2.733 Other Equipment: All passenger cars shall have a piece of ferromagnetic material so located on or in the car as to hold standard waybills placed at the center of the top of the cars.

2.7331 Open Top Hopper Loads: All open top hopper loads shall have a piece of ferromagnetic material located in the center of the load as to hold a standard waybill, and necessitate removal of the load at the cars destination.

2.734 All Cabin cars (caboose) shall have a piece of ferromagnetic material so located on or in the car as to hold standard waybills placed at the center of the top of the car.

2.735 No modifications to equipment to meet these standards shall adversely impact the appearance or operation of the equipment

2.736 Except as specified above no modifications for the purpose of holding waybills need be made to any equipment.

2.74 Optional Cabin Cars (Caboose) and Tail Cars (Passenger) should have some type of marker lights for the purpose of running in the dark. (During the annual show, and for the purpose of filming the layout.)