

Burlington County Model Railroad Club

Rolling Stock and Locomotive Certification STANDARDS

(Revised 10/30/2024)

This document is comprised of the rolling stock and locomotive standards for the Burlington County Model Railroad Club (BCMRC). Many of our standards have been adopted from National Model Railroad Association (NMRA) Recommended Practices (RP). Please use an HO Scale NMRA, Mark IV Gauge or above to check standards. We require that the membership bench-test their own equipment before being certified by a qualified Standards Committee member. Once a piece of rolling stock is certified, a colored dot will be placed under the equipment with the initials of the certifier. The information will be recorded in a database kept at the club for reference. The database will be used to maintain maintenance and certification records. All equipment must be certified at every twelve (12) months. If a member's equipment is removed during an operating session for cause, the rolling stock must be recertified before being placed back on the layout. Please see Appendix A for the current list of qualified certifiers.

General

Appearance

Models displayed or running on the BCMRC layout are expected to have a good appearance. They should be what you would normally expect to see on a prototype railroad. Models including engines are expected to be painted. Unpainted brass, plastic locomotives and rolling stock can be run for test and run-in purposes only. They must meet the club standards before operation. Exception can be given by the Board of Directors.

Rolling Stock

Weight

The chart at Appendix B, has been derived from the NMRA, RP-20.1, Car Weight, Revised: January 1990. An exception on overweight and light cars may be given by the Board of Directors if there is no way to lighten or weight a car. The car will be carefully tested for performance. An example would be the Alexander Cast Metal Car Kits. Carloads must not cause the weight to be above the maximum standard.

Wheels

Metal wheels are required utilizing NMRA, RP-25, Wheel Contour, Approved: March 1997. Axles manufacturers utilizing RP-25 standard are Intermountain, Proto 2000, Kadee, etc. The rolling stock should undergo an inspection and wheel cleaning annually to ensure trouble free performance. New wheel standards will be considered only after testing on the club layout.

Couplers

Couplers must be metal standard head knuckle style (e.g. Kadee or Proto Max) at heights as measured by the Kadee HO - Coupler Height Gauge. Couplers and glad hands must be properly adjusted and clear the gauge without moving.

Free Rolling

Cars must be able to roll freely down a 2.5% grade with no assistance.

Flat Tracking

On a flat track the car must not have bolster wobble. Trucks must be square to the car body and the wheel axle must be parallel to each other. If not, the bolster must be filed or milled to make the trucks square

Free Turning Trucks

Trucks must be free turning but not loose. Cars must be well constructed, have no loose parts and meet tunnel clearances of 26 scale feet.

Resistor Wheel Sets

Some cars in a train, as prescribed under the Certification heading below, must either have two resistor wheelsets (one axle in leading truck and one axle in trailing truck), or have some kind of electronic circuitry (marker lights, FRED, etc.) that derives power from the track (if they are battery operated then they do not count) in order for the train to be detectable by the CMRI/JMRI detection system. This holds true for passenger trains as well, however if a passenger car has interior lighting (that derives power from the track) then that car counts as a resistor equipped car. Resistor wheelsets should use a nominal resistance of 10K Ω .

Certification

The Standards Chairman will appoint a number of members to certify rolling stock to be operated on the layout. Training will be provided to qualify certifiers. For a specified period a color dot will be affixed to the car before it can be used on the layout. Cars must be certified by one of the certifiers. Certifiers cannot certify their own equipment. Members can certify their own equipment with a certifier looking on. The following are criteria that must be met in order to be compliant:

1. Car weighted properly
2. Metal Wheels are installed and Wheels are in gauge
3. Metal Coupler Installed and Coupler height is correct
4. Resistor wheelset/equivalent cars placed so that there is no more than 4' of train length between them
5. Rolling down a 2.5% grade
6. Trucks are square to the car
7. Free turning trucks
8. No loose parts
9. Meet tunnel clearances of 26 scale feet
10. Member ownership identification
11. All certifications are subject to a successful test run

Certifiers will be available to help members get their equipment to pass certification. If it is not possible for equipment to pass certification, the member can request an exception from the board of directors. An example might be a passenger car that has a special truck that will not roll down a 2.5% grade and a replacement truck is not available. Exceptions will be based on the possible effect the equipment may have on the layout.

A unit train is one that a member wishes to run without being broken up. In most cases unit trains require special handling such as a passenger, truck trailer, container or single type of car trains. There must be a reason for a unit train. Unit trains are not a way to get around the coupler requirements of the Club's standards. The Dispatcher will determine if the train is a unit train. During show operations the number of unit or extra length trains on the layout is restricted IAW Operation Policies and Rules. An extra length train must fit in an available siding. The member must inform the dispatcher of the extra length train. When the unit train is not running it will be stored in our staging yard or another yard space if available during a prototype operating or show sessions. At the end of the operating session the train must be removed from the layout and taken home. **(Unit trains do not need to be removed during the show season.)**

Motive Power

Locomotives

The term locomotive refers to any model that is self-propelled and generally falls into the descriptive categories of steam, diesel, or traction. Locomotives should meet the following criteria:

1. Couplers properly installed/maintained IAW Kadee height gauge.
2. Weighting: The weight of the locomotive should be noted by the member as a rough idea of what its tractive effort might be, which translates into how many cars the locomotive can pull. If information on the locomotive's drawbar pull has been published (e.g. Model Railroader, Railroad Model Craftsman) that indicates how many cars the locomotive can pull (on straight and level track), this information should also be noted by the member as a benchmark so that the member acting as yard master can make informed decisions as to what locomotive can do what, particularly if the train is to be run in the westbound direction, or if the locomotive should be double-headed with another one, etc. As a rule of thumb, the rated number of cars that the locomotive can pull should be reduced by 50% if run westbound, and by 33% if run eastbound due to prevailing grades in each direction.
3. In lieu of the above information, the member should run the locomotive in the westbound direction with a cut of 10 to 12 properly weighted cars that are 40 to 50 scale feet in length, and add cars one at a time to the point that the locomotive just barely slips going up the prevailing grade. Subtract one car, and you have the total number of cars that the locomotive can pull around the layout.
4. Wheels should be free of excessive dirt.
5. Drive train mechanisms should be free of excess lubrication, as this excess can seep out on to the wheels and/or rails, causing reduced traction and increased dirt pickup.
6. Minimum operating radius noted, particularly for six axle diesels and large articulated steam locomotives.
7. Knowledge of what type of DCC decoder is installed in the locomotive. The club should attempt to maintain a database of manufacturer's decoder brochures so that quick reference can be made to them in case of running troubles.
8. DCC programming of the locomotive's decoder should preferably not be done during a show, as the person doing the programming is usually the dispatcher and is tied up with other tasks.
9. The locomotive shall undergo an inspection and wheel cleaning on an annual basis to ensure trouble free performance.

Couplers

The criteria for Locomotive couplers shall be the same as Rolling Stock. Couplers are optional on the front of steam engines except where the engines are to be run in multiple units or are switchers.

Drawbars are acceptable where the set of engines is to be treated as one single engine. It is preferred that one end of the draw bar must be removable. As an example an F unit ABBA set with drawbars would be considered one single engine.

DCC Standards

All decoders must be 28/128 steps. The old 14 step decoders are not acceptable. No units can have the address of "3" for normal service on the layout.

Appendix A

Train Certification/Standards Committee: 10/30/2024

Mario Leone – Chairman Certification Committee
Rick Stoneking

Appendix B: Optimum Car Weights: Date Mar 2011

Optimum Car Weights Chart									
<u>Using Actual Car Length to Calculate Required Weight</u>					<u>Using Scale Car Length to Calculate Required Weight</u>				
<u>Actual Inches</u>	<u>Scale Feet</u>	<u>Min Weight</u>	<u>Max Weight</u>	<u>Weight Variance</u>	<u>Scale Feet</u>	<u>Actual Inches</u>	<u>Min Weight</u>	<u>Max Weight</u>	<u>Weight Variance</u>
5.00	36	3.50	4.50	1.00	36	5.00	3.50	4.50	1.00
5.25	38	3.75	4.75	1.00	40	5.50	3.75	4.75	1.00
5.50	40	3.75	4.75	1.00	42	5.80	4.00	5.00	1.00
5.75	42	4.00	5.00	1.00	50	6.90	4.50	5.75	1.25
6.00	44	4.00	5.00	1.00	52	7.20	4.50	5.75	1.25
6.25	45	4.25	5.25	1.00	55	7.60	4.75	6.00	1.25
6.50	47	4.25	5.25	1.00	60	8.30	5.25	6.50	1.25
6.75	49	4.50	5.75	1.25	62	8.60	5.25	6.50	1.25
7.00	51	4.50	5.75	1.25	65	9.00	5.50	7.00	1.50
7.25	53	4.75	6.00	1.25	70	9.70	5.75	7.25	1.50
7.50	54	4.75	6.00	1.25	72	9.90	6.00	7.50	1.50
7.75	56	5.00	6.25	1.25	75	10.30	6.25	7.75	1.50
8.00	58	5.00	6.25	1.25	80	11.00	6.50	8.25	1.75
8.25	60	5.25	6.50	1.25	85	11.70	6.75	8.50	1.75
8.50	62	5.25	6.50	1.25	86	11.90	7.00	8.75	1.75
8.75	63	5.50	7.00	1.50	89	12.30	7.25	9.00	1.75
9.00	65	5.50	7.00	1.50	90	12.40	7.25	9.00	1.75
9.25	67	5.75	7.25	1.50	95	13.10	7.50	9.50	2.00
9.50	69	5.75	7.25	1.50	100	13.80	8.00	10.00	2.00
9.75	71	6.00	7.50	1.50					
10.00	73	6.00	7.50	1.50					
10.25	74	6.25	7.75	1.50					
10.50	76	6.25	7.75	1.50					
10.75	78	6.50	8.25	1.75					
11.00	80	6.50	8.25	1.75					
11.25	82	6.75	8.50	1.75					
11.50	83	6.75	8.50	1.75					
11.75	85	7.00	8.75	1.75					
12.00	87	7.00	8.75	1.75					
12.25	89	7.25	9.00	1.75					

Notes:

1. All weight should be placed as low in the car as possible to minimize high centers of gravity, to reduce car tilt and derailment possibilities.
2. Weights have been calculated using the formula from the NMRA RP 20.1, Car Weight, for HO scale. Calculation are as follows, initial weight of 1 ounces, plus .5 ounces for every actual inch of car length.
3. Max car weights were calculated by adding 25% to the Min weight. Adding weight will not ensure the rolling stock will track any better. Many aspects of car maintenance need to be taken into consideration to include, free rolling wheel sets, minimum bolster wobble, free bolster movement, car sitting square on all wheel flanges, etc.