



North Raleigh Model Railroad Club

Standards and Recommended Practices

Equipment Standards & Procedures (Locomotives and Rolling Stock)

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Questions, comments, corrections and suggestions should be addressed to the NRMRC Standards Committee at wallisjm@att.net

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Introduction

This publication was authorized by the Standards Committee on June 1, 2011, and proposed to the general membership. The Club ratified it on June 1, 2011. It is updated from time-to-time.

This publication sets forth standards, recommended practices and procedures for N Scale model railroading equipment operated on the North Raleigh Railroad and other layouts in which the North Raleigh Model Railroad Club participates.

Any corrections or suggestions for changes or improvements should be directed to the Chairman, Standards Committee, North Raleigh Model Railroad Club.

Purpose

The purpose of these standards, recommended practices and procedures is:

- To provide members of the NRMRC with specific guidelines which can be used in construction, maintenance and operation of their equipment, and which will encourage them to adopt and maintain high equipment standards.
- To ensure that equipment operated on the North Raleigh Railroad and other layouts in which the NRMRC participates is of the highest quality achievable in N scale so that the operation and appearance of that equipment is trouble-free and prototypically correct.

Definitions

Motive Power

The term "Motive Power" is defined as any equipment which is prototypically self-propelled.

- Examples of motive power include steam, steam-turbine, diesel (diesel-electric and diesel-hydraulic) locomotives, electric, rail diesel cars, gas-electric cars, electric or diesel Multiple-Unit (MU) cars, interurbans, trolleys, snowplows, cranes, etc.
- Model railroading equipment which represents motive power will be considered as such even though it may be an unpowered (dummy) unit.
- Auxiliary equipment such as tenders, fuel/water cars and slugs which are prototypically associated with a given unit of motive power shall be considered a part of the basic motive power equipment for modeling purposes.

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Rolling Stock

The term "Rolling Stock" is defined as any equipment which is not motive power, and which prototypically requires separate motive power to move it over the rails — e.g. passenger, freight and MOW cars.

Equipment Standards

General

Although this does not affect the technical performance of equipment, all equipment must be painted and lettered for some railroad or owner, and appearance must be maintained.

- There should be no broken or missing parts — this includes such items as missing brake wheels, broken ladder stirrups, broken roof walks, missing horns/whistles, etc.
- Remove dirt and dust — some may consider this 'natural' weathering, but there is a limit. Equipment which has sat idle for an extended period of time will collect dust. A soft tooth brush and some soapy water will do wonders to bring back the original appearance.
- Avoid poor painting and decaling — a poor paint job will stand out and be noticed quicker than any defect. If an experiment doesn't turn out; set that car aside to be stripped and done over. Seek advice from the experts.
- Be careful not to use excessive glue — there is nothing more disappointing than equipment or a load that has huge globs of glue visible. When gluing ensure that parts fit and are to scale, and parts sit flush and don't overhang, etc.
- Eliminate Shimmy — equipment that appears to vibrate as it rolls along in a train.
- Cosmetic flaws (not to be confused with legitimate weathering effects) are cause for prohibition from operation on the North Raleigh Railroad and other layouts in shows in which the NRMRC participates. Cosmetic flaws include damaged bodies, misaligned bodies, badly damaged paint and missing parts.

Wheels must be clean, concentric and wobble-free.

- The gauge of all wheels shall conform to the NMRA N Scale standards gauge. Conformance is defined as the centerline of the wheel flanges centered in the gauge notches. The importance of proper wheel gauging cannot be overemphasized.
- First check the gauge of the wheel sets; this is important as any defect in manufacturing will show up at this time. This is also a good time to look for flash and stubs where the plastic item was separated from the sprue. Replace any wheel sets which do not spin freely. This can be easily checked by

spinning the wheels in the truck or letting the truck roll down a slight grade.

The underbody of all equipment shall be securely attached to the frame.

All equipment should track smoothly on the rails of the North Raleigh Railroad.

Operation of non-North American prototype equipment on the North Raleigh Railroad (or other layouts in which the NRMRC participates) is not authorized without prior approval of the Show Superintendent. North America is defined as the USA, Canada and Mexico.

Because the layout is not properly equipped, operation of electric, trolley or traction equipment on the North Raleigh Railroad is not authorized without prior approval of the Show Superintendent. The model owner assumes all responsibility for any damage to pantographs or trolley poles that extend higher than the normal NTRAK clearance of 1.75 inches.

Motive Power

Since the intent of operations at Train Shows is to run trains in an orderly, professional manner, the smooth operation of trains is of high priority, and thus smooth running locomotives are highly important to this purpose.

- Operation should be smooth. Starting and running speeds under normal train loads should as close as possible simulate the operating characteristics of their prototypes.

"Proven" locomotives only are to be used at Shows. The running in or breaking in of new locomotives during shows is not allowed.

Non-stock locomotives, locomotives that have been re-motored, locomotives with modified frames and/or mechanisms and locomotives with wired decoders must be demonstrated to be good performers. See the Inspection procedure below.

- The speed of multiple power lash-ups should be compatible.
- In addition to proper wheel gauging, the flanges of geared wheelsets shall be longitudinally aligned, when checked with a straightedge against the bottom plate of the truck. This requirement implies the following:

Flanges aligned
Gears centered in bottom plate
Even spacing between gears and wheels

- Equipment scale dimensions for Motive Power shall not exceed a scale 13½ feet wide by 23 feet high (1.0125 inches wide by 1.725 inches high).

Rolling Stock

Many train show problems occur with rolling stock derailments or break-aways, either truck and/or coupler problems, track problems or a combination of both. So-called ready-to-run cars still need some adjustments to give reliable operation. As the average train length increases the need to test and adjust each car becomes more important.

- Wheels must rotate freely.
- Rolling stock must run freely and unaided down a 3% grade on a test track, except for those cars equipped with axle restraining springs which are designated as last-car-in-train units by the owner.
- Rolling stock shall weigh no less than ½ ounce; however, see the section on Recommended Practices later in this document for recommended weights.
- Equipment scale dimensions for Rolling Stock shall not exceed a scale 11 feet wide by 23 feet high (0.825 inches wide by 1.725 inches high).

Member-Owned Equipment

All equipment shall be marked with the owner's personal identification mark(s).

Except for unit-trains or other cars normally permanently coupled, all equipment shall be equipped with functional automatic couplers, either Micro-Trains (or functional equivalents such as Accumate, McHenry or Kato) or Rapido couplers, but also see the section on Recommended Practices.

- Couplers may be body-mounted or truck-mounted.
- When equipped, the height of Micro-Trains or equivalent (Accumate, McHenry, Kato) couplers must conform to the Micro-Trains #1055 Coupler Height Gauge.

Inspect the trip pin with the trucks mounted to the car pulling slightly, with the Coupler Gauge, to put some pressure on the knuckles. This action should show if the coupler tends to ride up or down. If you suspect a problem then it will probably require that the entire coupler be disassembled and rebuilt.

For Rapido style couplers, there is no height gauge available, so make one by taking an Atlas truck and hot gluing or ACC gluing it down to a section of flex track. Inspect the truck coupler for any flash or casting defects. Use a small file to clean up the flat surfaces on the coupler. With the truck attached to the car body, check to see that the coupler rides up (or down) over the gauge coupler and drops into a good joint. A slight tug on the coupler will indicate a good connection. If the two couplers tend to ride up and appear to want to separate, then there is a problem which may require complete disassembly and coupler replacement.

- When equipped with Micro-Trains or equivalent (Accumate, McHenry, Kato) couplers trip pins shall be adjusted to .010 inches minimum above the rail head. This is the thickness of the Micro-Trains Trip Pin Gauge #1058 or the NMRA N Scale standards gauge. Pins should be adjusted by bending and never pushed or pulled through the coupler knuckle. The pin should fit snugly in the coupler knuckle so that it cannot drop. The trip pin should be flush with the top of the coupler.
- Micro-Trains or equivalent couplers (Accumate, McHenry, Kato) shall operate as described in the Micro-Trains installation instructions and, when problems are encountered during use, to the satisfaction of an inspector appointed by the Standards Committee.

It is always a good idea to take a small needle file to clean up the knuckle so that the coupler does not ride up or down when under a load. A little Micro-Trains #231 Greas'em Dry Lubricant (powdered graphite) in the pocket is a good idea, even for Rapido style couplers.

Functional automatic couplers are not required for steam locomotive pilots but must be installed on the tender for that locomotive.

Coupling between diesel units is at the owner's discretion. Diesel locomotive ends that couple to rolling stock must be equipped with functional automatic couplers.

Club-Owned Equipment

Equipment (locomotives and rolling stock) owned by the North Raleigh Model Railroad Club and operated in normal trains on a show layout must meet the same requirements as Member-Owned Equipment. The Standards Committee is responsible for the overall care of Club-Owned Equipment with the Show Superintendent responsible during a train show.

Specialized locomotives and rolling stock, such as track-cleaning cars, clearance cars, etc. that may operate in a normal train but are usually operated in a special train must meet the above requirements to the extent consistent with their purpose.

Recommended Practices

The following practices are highly recommended:

- Functional Micro-Trains or equivalent (Accumate, McHenry, Kato) couplers on all equipment.
- Functional Micro-Trains or equivalent (Accumate, McHenry, Kato) couplers on steam locomotive pilots.
- Functional locomotive headlights (directional if possible), white or warm white instead of amber.
- Functional details such as FRED's, marker lights, etc. on end-of-train rolling stock.

- Identical equipment units should have different reporting numbers.
- Weathering.
- Micro-Trains #1008 or equivalent low profile wheels or current 00-312-000 standard wheels on rolling stock, especially if couplers are body-mounted.
- Axle restraining springs in the last car in a train.
- Rolling stock (cars) should be weighted according to NMRA Recommended Practices 20.1 "Car Weight"; which provides a consistent guideline for weighting cars that contributes to a better running model railroad. To summarize, for N scale the recommended weight is an initial weight of 0.5 ounce (14.2 grams) + 0.15 ounces (4.3 grams) per inch of car length. For example, a 40' box car is 3" long so it should weigh 0.5oz + (3 x 0.15)oz = 0.95oz. Because these end up as odd weights, it is frequently more convenient to work in grams. The following table provides recommended weights for various car lengths:

Length Feet	Weight Grams	Weight Ounces
20	20.5	0.725
30	24	0.84
33	24.7	0.85
35	25.2	0.89
40	27	0.95
45	28.4	1.00
50	30	1.06
55	31.8	1.12
57	32.3	1.14
60	33.5	1.17
65	34.8	1.23
70	36.5	1.29
75	38	1.34
80	39.7	1.4
85	41	1.46
90	43	1.51

A postal scale can be used as a weighing device especially if it weighs in the ¼ ounce range, or in grams. As well, a simple-to-make balance scale can be used. For balance weights you can use lead sinkers (which come in 1/8, ¼ and ½ ounce sizes), or coins (dime – 2 grams, cent – 3 grams, nickel – 5 grams, quarter – 6 grams). Car weights need only approximate the recommended value.

The best way to add weight is by using fishing weights and hot glue or ACC. The location to place the weight varies widely from car to car but it is a good idea to work with several small weights rather than one large weight. It is very

important to keep the car balanced and always add the weight as close to the bottom of the car as possible.

Other Standards

Any standards not specifically stated in this publication should conform to the latest edition of the NTRAK Manual and/or the NMRA Standards and Recommended Practices, whichever is the more stringent.

Equipment Inspection & Bad Order Procedures

Equipment Inspections

When equipment gives problems on a show layout it should be inspected to identify the problem area and then repaired. The "tools" needed are the following:

- NMRA N Scale Standards Gauge and/or NTRAK Gauge and/or Micro-Trains #1055 Coupler Gauge to check that the wheels are in gauge.
- Micro-Trains #1055 Coupler Gauge to check coupler height and operation
- Micro-Trains #1156 Trip Pin Gauge or NMRA N Scale Standards Gauge to check to height of the coupler trip pin.
- DC or DCC power as appropriate to test locomotive operation

No special gauges are needed to check the ability of trucks to swivel freely and swing vertically or horizontally.

Testing with the appropriate gauges can be done on a separate piece of track, a free track in Raleigh Yard (with track power turned off), on the DCC Test Layout (with track power turned off), or at the Inspection Station (preferred). Locomotive testing should preferably be done on the DCC Test Layout or it can be done on a free track in Raleigh Yard.

Once equipment passes the inspection it can be placed in a train on the layout to verify the problem(s) has been resolved.

Special note for "new" locomotives": "Proven" locomotives only are to be used at Train Shows. The running in or breaking in of new locomotives during shows is not permitted.

Bad Order Procedures

Equipment submitted for inspection which fails the inspection will be identified as Bad-Ordered by the inspector.

If equipment malfunctions while operating on the North Raleigh Railroad its owner will be given two (2) opportunities to correct the problem. Equipment which malfunctions a third time will automatically be removed from the layout and Bad-Ordered.

- During operating sessions the Show Superintendent or Dispatcher is authorized to request that malfunctioning equipment be Bad-Ordered and removed.

- All members are expected to abide by this code.
- The equipment that was Bad-Ordered must be inspected to clear the Bad Order.

Once equipment is Bad-Ordered, it will not be operated on the layout until it is inspected and approved for use.

If the owner of the Bad-Ordered locomotive(s) and/or rolling stock is not present when the item(s) is bad-ordered, the problem will be documented on a piece of paper, attached to the equipment and given to the owner at the first opportunity. The following information should be included:

- Type of equipment — locomotive or rolling stock, manufacturer.
- Reporting marks — road name and number.
- Problem encountered with the equipment.
- Specific description of faulty component(s) on the equipment.
- Description of what is required to repair and make compliant.

The responsibility for clearing any Bad Order equipment rests with the owner.

Inspection Station

The Club owns a portable inspection station that will be used during train shows or other meetings. It will have all the necessary equipment (see list below) and documentation to perform N-scale motive power and rolling stock inspections per this document. It will also include some tune-up, cleaning

components and a small selection of spare parts since they typically go hand in hand with the inspections and should aid in the repair/re-inspection.

- Digital scale
- Coupler height gauge
- NMRA N-scale gauge
- NTRAK clearance gauge
- Powered test tracks (code 80 & 55)
- DCC connections
- Wheel cleaning brush
- Peco turnout (code 80)
- Lubrication kit
- Spare parts (wheel sets, trucks, couplers, truck pins, etc.)

This inspection station will be available at most train shows and, on request, at club meetings.

References

- NTRAK Manual, Current edition, NTRAK Publishing, Templeton, CA.
- National Model Railroad Association (NMRA) Standards and Recommended Practices for N Scale.
- San Diego Society of N Scale, "Equipment Standards and Procedures", January 1991.