



All Points North Model Railroad Club

Car Inspection Standards

Date: June 16, 2006

Revision #: 4

Purpose:

To set a minimum standard for all motive power & rolling stock used during operating sessions, as well as all equipment owned by the club for general use. Cars operate better, derail less often, and otherwise cause fewer problems if they meet standards for wheels, couplers, and other operating parameters. For operating sessions every car used must meet the same minimum set of standards. To that end, each car is to be inspected before it enters service, and is to be re-inspected periodically. Cars that are removed from the layout must be deleted from inventory and re-inspected before returning to operational use on the layout. Cars that develop operational problems are to be removed from the layout and may not be returned until they are repaired and re-inspected against standards. Cars are inspected for conformance of their wheel sets, couplers, weight, under-frame clearance and safety appliances. They are *not* inspected for aesthetic appearance. Any car that fails inspection is removed from the layout and remains so until the deficiency is repaired and the car passes a re-inspection.

Cars vs. Locomotives:

Locomotives are required to meet safety appliance, clearance, coupler, and wheel characteristic standards, but not weight and free-rolling standards. Cars are required to meet all described standards.

Safety Appliances:

Although not operational, safety appliances such as brake wheels, box car doors, ladders, etc, must be present. Any safety appliance that the absence of which, would lead to a bad order car on a prototype must be present on the car.

Weight:

The minimum weight of a car or locomotive shall conform to NMRA RP 20.1

The NMRA formulae are for determining the minimum weight are:

HO: one ounce plus one-half ounce per inch of car length.

HOn3: three-quarter ounce plus three-eighths ounce per inch of car length.

Where only the length of the car body is measured (couplers are excluded).

All cars must meet or exceed the minimum weight for a given car length. Waivers for overweight cars will be allowed if the excess does not interfere with normal railroad operations and if the weight cannot be accomplished without damaging the car or its load.

Under-Frame Clearance:

Cars must comply with the NMRA recommended practice that no equipment between the wheels hangs below rail height.

Couplers:

All rolling stock and the rear of locomotives will be equipped with Kadee compatible, magnetic-type couplers. The *only* exception would be a self contained train that will be run as a unit throughout an operating session, i.e. a passenger train, or a coal train. Their only standard would be their ability remain coupled together and not uncouple during operation. Couplers must be at the proper height to match a Kadee coupler height gage and must be properly configured for automatic uncoupling (coupler “hoses” must be intact and clear the top of the Kadee hose height gage). Couplers must move freely and center properly and automatically. It is preferred that all couplers be body mounted.

Trucks:

Trucks must seat axles so as to be free rolling, and must sit square to truck frames. Wheels must be in gauge and equally spaced from the ends of the axles to prevent trucks from skewing.

Wheels:

All wheels shall have metal treads (nickel-silver is preferred; however brass meets the requirements of metal but are harder to keep clean). Blackened treads such as Kadees are acceptable, however painted and/or weathered treads are not. All cars must be fitted with two club approved (10K ohm) resistors, installed on one axle per truck. There must be good conductivity between the rails through the axle, and wheels must be clean at the time of inspection.

All axles must be in gauge in keeping with NMRA standards gauge.

Wheel Cleaning:

Each car/locomotive will under go a wheel cleaning during the yearly inspection, or as needed, and so noted on their respective car card.

Rolling Characteristics:

Cars should roll freely on any grade above 1%.

Loads:

Loads on cars shall be securely fastened to their cars. At a minimum they shall be contained by a lip or angled floor such that the effect of gravity acts to prevent the load from rolling or slipping off of the car.

Loads consisting of materials that are smaller in diameter than ¼” must be securely affixed with an adhesive that prevents spillage in the case of a derailment.

All cars with loads must have outside dimensions that are not in excess of the clearances built into the APN layout. The maximum width the Association of American Railroad (AAR) allows for all prototype cars is 10’ 8”. The AAR has different cross-sectional area diagrams, called Plates, for different series of railcars. The tallest of these, Plate H, sets the maximum height dimensions at 20’ 8” from the top of the railhead. These should be the guideline for the absolute maximum dimensions of your load, but compliance with these does not guarantee that a load will clear every obstruction along the APN right-of-way, as the cross sectional area of Plate H exceeds the outside dimensions on the NMRA clearance gage. Cars with large loads must be tested by running them across the length of the layout, and if found to exceed the clearance of the layout at any location, such car cannot be included in an operating session.

Electrical isolation:

No car will be allowed on the layout that causes shorting across the rails, either when the car is set out alone or when coupled to any other car.

Initial Inspection:

All cars/locomotives will be inspected prior to being placed on the layout and must be added to the inventory.

On-Going Inspections:

Every car/locomotive must be inspected periodically. While the layout is under construction, cars should be inspected every six months. When there is no extensive layout construction, cars/locomotives should be inspected yearly and noted on the back of their respective car card.

Re-inspection will be done on a rotating yearly cycle based on the initial in service, or re-inspection date.

Trouble-free operation:

During an operating session, any car that fails to operate reliably will be immediately inspected for the cause. If the repair can be made within a few minutes the repair will be allowed to be made on the spot. If the repair would take longer, or if the cause of the operational irregularity cannot be readily determined, the car will be taken off of the layout and placed on “bad order” status.

Bad Order Cars:

Bad order cars are documented by a “Bad Order Tag”. All cars placed on “bad order” status, must be re-inspected prior to returning to operational use.

A. P. N. RR Rolling Stock		BAD ORDER TAG	
Car Initials:		Car No:	
Car Type:			
Defect (note here or on the reverse side):		<input type="checkbox"/> A End	<input type="checkbox"/> B End
Inspector:		Date:	
Repaired By:		Return to Service Date:	

Form BOT-RS Rev 7/06

“Bad Order Tag” front and rear.
Use this form to document rolling stock that fails inspection, or that is subsequently found to be in bad working order.

End		Defect Checklist check all that apply
A	B	
Couplers		
<input type="checkbox"/>	<input type="checkbox"/>	Malfunctions
<input type="checkbox"/>	<input type="checkbox"/>	Hose height
<input type="checkbox"/>	<input type="checkbox"/>	Knuckle height
<input type="checkbox"/>	<input type="checkbox"/>	Knuckle spring/action
<input type="checkbox"/>	<input type="checkbox"/>	Won't center or pivot free
<input type="checkbox"/>	<input type="checkbox"/>	Excess up & down play
Trucks / wheels ets		
<input type="checkbox"/>	<input type="checkbox"/>	Loose or Wobbles
<input type="checkbox"/>	<input type="checkbox"/>	Doesn't roll freely
<input type="checkbox"/>	<input type="checkbox"/>	Mis-aligned/tracks bad
<input type="checkbox"/>	<input type="checkbox"/>	Resistors
<input type="checkbox"/>	<input type="checkbox"/>	Treads need cleaning
<input type="checkbox"/>		Safety Appliances
<input type="checkbox"/>		Car weight wrong
<input type="checkbox"/>		Loose load
<input type="checkbox"/>		Underframe clearance

Car Pre-inspection Check List

Here is a handy check list to use before submitting cars and locomotives to the car inspector.

1. Coupler height matches Kadee coupler gage
2. Coupler "hose" must clear top of Kadee hose height gage.
3. Coupler moves freely and centers properly and automatically.
4. Coupler knuckle opens and closes easily without binding.
5. Coupler works with layout automatic uncouplers.
6. All wheel sets have metal treads.
7. All wheel set are properly gauged.
8. Wheel treads must be clean and free from paint and weathering.
9. One axle per truck must be fitted with approved resistors.
10. Axles must be free rolling, equally spaced from the ends of the axles, and sit square to truck frame.
11. Under-frame clearance requirements must be met.
12. Outside dimension clearances must be met
13. All cars must meet the minimum weight requirements based on car length, as outlined in the inspection requirements.
14. Cars must have all safety appliances in good repair.
15. Cars must meet rolling characteristics, as outlined in the inspection requirements.
16. Loads containing particles less than ¼" diameter must be glued in place, larger loads must be glued or be contained by car sides, a lip or a curb that prevents the load from shifting off-center or from falling off the car.