

LA MESA MODEL RAILROAD CLUB, INC.
REGULATIONS FOR ROLLING STOCK
February, 2008

These regulations are intended to ensure that all rolling stock on the railroad operates reliably and is realistic in appearance. This document defines classes of equipment and requirements that apply to each class.

I. UNREGISTERED EQUIPMENT: Equipment that is normally operated only by (or under the close supervision of) the owner, and is removed from the railroad when not in use. This equipment must not be operated in trains longer than the siding at Caliente (2400 scale ft).

A. Inspected: Members' personal equipment, normally removed from the layout when not in use.

1. Equipment in this category will be inspected by the Car Department, which may inspect any or all equipment that a member intends to run on the railroad. The decision whether to inspect all, or a sample, may be based on:
 - a. Prior experience with this particular equipment.
 - b. Prior experience with a member's equipment generally.
2. Equipment may be operated pending inspection but is subject to inspection by the Car Department whenever it is on the layout, and to Bad Order (Section IV, Part B) and removal from the railroad if not in compliance with any applicable requirement.
3. Inspected equipment must conform to applicable requirements detailed in Section III, except for those requirements deemed not applicable by the Car Department Foreman, as recorded in the inspection record.
4. This equipment must not be operated in mixed trains with 'Display Registration' equipment without approval of the General Manager or Car Department Foreman and may only be operated in mixed trains with 'Regular Registration' equipment with the specific consent of the owners of the involved equipment.
5. Members noticing problems with inspected equipment should bring them to the attention of the Operator in Charge, the General Manager, or the Car Department Foreman who should investigate and determine whether it should be removed from the railroad. If a specific defect is apparent, a 'Bad Order' card should be completed and the piece of equipment removed from the railroad per Section IV, Part B.

B. Un-inspected: A Visitor's personal equipment, may be operated on the railroad on a one time basis only with the approval of the Operator in Charge, the General Manager or the Car Department Foreman.

1. This equipment must not be operated in mixed trains with 'Display Registration' equipment without the above approval and may only be operated in mixed trains with 'Regular Registration' equipment with the specific consent of the registered car owner(s) of the equipment involved.
2. Un-inspected equipment causing ANY operating problems must be removed from the railroad immediately.
3. Members noticing problems with visitor equipment should bring them to the attention of the appropriate authority, as in item 5 above- who should investigate and determine whether the equipment should be removed from the railroad.
4. Un-inspected equipment must be removed from the railroad immediately at the close of the day's operation, except with the permission of the Operator in Charge for the following day.
5. In the absence of the equipment owner or his designated representative, ANY Regular member may remove any "un-inspected equipment" from the railroad at any time, exercising care to avoid damage.
6. Visitors operate their equipment on the club railroad at their own risk. The club will not be responsible for damage to visitor's equipment. Visitors may be held responsible for damage to the display or to Club equipment attributed to the operation of "un-inspected" equipment.

II. REGISTERED EQUIPMENT- Equipment that meets all applicable requirements in Section III below and which is normally left on the layout for use by specified members during public operation or club operating sessions.

A. Display Registration – Equipment that is normally left on the railroad for use by qualified members in good standing for service in the daily public operation. This equipment must meet all the same Section III requirements as the 'Regular Registration' equipment, below. Currently this "Display Fleet" is composed of post steam era 1960's-1970's equipment.

B. Regular Registration –Equipment that meets all applicable requirements detailed below in Section III and is dedicated for use in Club sanctioned Prototype Operating Sessions. This equipment may ONLY be used in daily public operation by members which are “bone fide” owners of equipment in this pool. This equipment is subject to any restrictions which the owners and the Operating Department agree to impose. “The Steam Era” fleet operates in club “Timetable and Train Order” sessions. The “Modern Fleet” is used for more modern “Track Warrant” operating sessions.

III. STANDARDS AND REQUIREMENTS

A. General

1. All equipment must be completed models, in generally good condition and realistically, solidly and properly constructed, with all parts securely attached, and must not detract from the appearance /operation of the railroad.
2. All equipment must have standard safety appliances appropriate to the period being modeled, ie: diaphragms, ladders, roof-walks, brake wheels, grab irons, markers, etc.
3. Equipment owners shall provide all repairs/maintenance to their own equipment.
4. Each absentee equipment owner must name a designee (Designated Operator) in writing, who has agreed to maintain the equipment left on the railroad in the owner’s absence.
- [5.] All equipment must be of a type which might be found in regular service on a post 1940 era North American Railroad . (Items in brackets do not apply to item I, “**Unregistered Equipment**”, above).
- [6.] All equipment must be marked with the owners name or designated three initials on file in the Car Department. Such marks shall be permanently attached to the underside of the equipment (preferably by engraving). The Car Department and/or owners may also apply additional markings or labels as needed for fleet management or security purposes. These markings shall not be visible when the equipment is on the railroad. Reasonable efforts will me made to identify owners of unmarked equipment and return it to them. However, unclaimed equipment left on the railroad may ultimately be deemed “abandoned,” and become the property of the club.

B. NMRA Standards and Recommended Practices

1. All equipment must meet the following NMRA Recommended Practices: RP-2 (wheel gauge), RP-20.1 (weight & center of gravity), RP-25 (wheel contour & tread width) and RP-23 (bolster).
2. Members owning or maintaining Inspected or Registered Equipment should own both an NMRA Standards Gauge and a Kadee Coupler Height Gauge. These gauges must be checked against the appropriate Club reference gauge for calibration and/or adjustment and be certified by the Car Department to be accurate and correct. Members must demonstrate proper use of their gauges to the Car Dept.
- [3.]All Registered Equipment (Display and Regular) must meet the NMRA Recommended Practices specified above, as well as all the club standards which supersede them, below.

C. Wheels/Trucks

1. All rolling stock must have metal wheels of RP-25 (tread, width and contour),or its equivalent, free from run-out or wobble and the trucks should be of rigid construction.
2. Sprung (and/or equalized) trucks will only be allowed on the railroad on a “proof” basis and must be removed if they cause problems.
3. All trucks having single insulated metal axles (wheelsets), where the insulation cannot be readily seen without truck disassembly, will have said insulation “identified” by a band of red paint applied to the back of the insulated wheel, around the axle.
4. All cars having single insulated metal axles (wheelsets) , will have every axle of that car installed so that said insulation is located on the same side of the car. Locomotives or other track powered rolling stock (ie: lighted cars) excepted.
5. Trucks equipped with single insulated axles (wheelsets) must be mechanically prevented from reverse (180%) truck rotation to avoid short circuit of track power.
6. Single insulated axles in metal side-frame trucks must either have clearances such that: the insulated wheel does not contact the metal side-frame OR it must have insulating washers installed on the face of the wheel or truck side-frame to prevent such contact.

7. Rolling stock with one piece metal underframes (or metal weights secured by metal truck and/or coupler screws) AND metal sideframe trucks MUST: be equipped with double insulated wheelsets or insulated truck screws or have insulated coupler pockets.
8. All trucks must be secured to the car body by means of a non magnetic metal screw of any type (machine, sheet metal, wood), size (No. 1 or 2 or metric equivalent), thread (coarse or fine) or head (round or wedge) appropriate to the application (NMRA RP 23). Non metallic screws (i.e., plastic) must not be applied without special consideration for cold flow, bloom locking, head shear, and other soft material problems.
9. Wheel treads should be smooth or polished, not roughened or abraded. A shiny, steely or silvery finish is preferred. A 'brassy' appearance is to be avoided.
10. All equipment must pass a surface plate test, with trucks screwed snug to reveal mis-aligned wheels or trucks. The car must sit square and straight, with all wheels in contact with the surface plate. After this test, truck screws will be 'backed off' and trucks properly adjusted for "drag" and rotation before entering service.
11. All equipment becoming "Bad Order" must pass a thorough Car Department inspection before being returned to service. This inspection should confirm or update every aspect of the equipment, its' ownership, the data base, and all items repaired, replaced or updated.
12. Older equipment in need of update to current standards will not be returned to service until properly updated to the current standard and approved by the Car Department.

D. Detection

1. All rolling stock, except self-detecting equipment (locomotives or other track powered equipment) must be equipped to activate any signals, as follows.
2. Each of the two outboard wheelsets on every car shall be equipped to provide a minimum of 24,000 and a maximum of 50,000 ohms resistance across the rails. The detector resistor must be a surface mount (chip) type rated at 1/8 or 1/10 Watt. A value of 27,000 (27K) ohms is preferred, having not more than a +/- 10% tolerance.
3. Additionally, Multiple-platform (articulated) cars with fixed internal couplings shall have one resistance wheelset on each intermediate truck.
4. Cars having a continuous connection to the rails for lighting or other purposes must have detection resistors installed when that connection does not include the outboard axles.
5. If resistance across the rails is provided by paint or other non-visible means, said axles will be center marked by a contrasting band of paint other than red around the axle.
6. The Car Department will provide the use of detection wheelsets to owners of registered equipment on a one-for-one exchange basis (It MAY also provide the same service to owners of non-registered equipment).

E. Couplers

1. All rolling stock must be equipped with operating Kadee-compatible magnetically activated metal couplers, on both ends (unit train blocks and steam locomotive pilots MAY be equipped with non-operating Kadee compatible couplers).
2. Truck mounted (Talگو) or other pivoting draft gear type couplers are prohibited.
3. Couplers must center, be in gauge and couple with others without excessive force.
4. Coupler faces at rest must be aligned vertically within $\pm .010$ " (one washer) of the knuckle position of a standard gauge.
5. Coupler shank vertical free play must be limited to $\pm .015$ " (.030" Over All) from its position of rest, using shims if necessary. Small-body couplers (ie:#58) are limited to vertical free-play of $\pm .010$ " (.020" O.A.).
6. Couplers MUST NOT: sag or have excessive draft gear free play or excessive knuckle free play. Underframes must be made sufficiently rigid to resist nominal bending moments, securing them to the floor or car body if necessary.
7. Coupler head will be crimped to limit excessive knuckle free play and/or sag, as necessary.
8. Non-magnetic metal screws, size No. 2 (or smaller) of any thread, length or head type appropriate to the particular application are required to secure couplers to the car. Non metallic screws to be used at the discretion of the Car Department Foreman.
- [9]. Couplers must have polished, unpainted knuckle faces, but all other visible parts must be appropriately painted or weathered.
- [10]. Extended (ie: Duryea or Hydra-Cushion) type draft gear will be fitted to rolling stock where prototypical.
- [11]. Coupler glad hands (operating levers) MUST NOT be shortened or cut, but MAY be re-bent or re-formed (Locomotive pilots, passenger cars and unit train cars MAY be excepted).

- [12].To prevent undersired uncoupling against helper locomotive pilots; freight car gladhands (operating levers) will be rotated from their standard 15 degree centerline offset(45 degrees with knuckle open) an additional amount not to exceed 85 degrees when knuckle is fully open (modified couplers will be provided on an exchange basis by the Car Department).
- [13].Non-Kadee coupler pockets must be properly shimmed inside to eliminate ANY movement or binding of the spring other than that which centers the spring. Test the movement with lid removed, install lid and retest.
- [14].Coupler centering springs must be scissor trimmed to properly fit shallow (non-Kadee) draft gear boxes.

F. Weight

- 1. The minimum weight for any car is 3.25 oz. 'Inspected' rolling stock (excepting Locomotives) must conform to NMRA Recommended practice RP20.1, with an absolute minimum weight of 1/4 oz. below or 1/2 oz. above the calculated recommended practice (see two weight tables, next page).
- 2. Track slider (cleaner) cars should be weighted to the maximum weight for their car length and rollability category, and roll (bench tested) with track slider disengaged from rail contact. Finally, they must be successfully track tested on the railroad with the track slider (cleaner) fully engaged with the railheads.
- [3]. 'Registered' equipment must be weighted according to the appropriate weight/body length/rollability/ tables below. The table tolerance is stated in F.1, above. Further allowances should be made according to paragraph 'G', below. Every effort should be made to construct equipment to its table 'target' weight. Category I Freight cars regularly used in passenger service with predominately Cat II equipment (e.g., express cars), MAY be required to conform to the Category II weight requirement to ensure reliable operation.
- [4].Model loads added to rolling stock should weigh as little as possible, and be removable, except as provided in paragraph 'M' below.

G. Allowances to weight

- 1. Weight allowances to equipment may be made from the referenced weight tables (see page 5) at the discretion of the Car Department Foreman, on a 'proof' basis- as follows:
 - a. Cars having a 'Center of Gravity Index' (CGI) LESS than 35 degrees (CG35), NO weight reduction.
 - b. Cars having a CGI of 35 (CG35) or MORE: allow 0.25 oz. (1/4 oz) reduction to the charted weight requirement for every full 5 degree increment to the CG Index above 35 degrees (ie:CG40, CG45, etc).
- 2. There is no limit to the maximum weight allowances applied under this formula as long as the car meets all other requirements of Section III. This MAY even be applied to the point where the formula brings the car below the 3.25 minimum weight requirement- subject to testing and approval by the Car Dept Foreman.

[H.] Rollability

- 1. Rolling stock (excluding locomotives and other track powered equipment) must initiate spontaneous motion on a grade of 2.5 % or LESS and have a smooth, steady, uninterrupted roll for at least one full car body length.
- 2. There is no rollability allowance/exemption for freight cars in regular interchange service.
- 3. Cabooses, passenger cars, unit trains and MoW cars are not in regular interchange service and MAY be exempted at the discretion of the Car Department Foreman.

I. Center of Gravity

- 1. Cars should be constructed to obtain the lowest center of gravity. (NMRA RP 20.1)
- 2. ANY weight added to a car to make its' required weight should be kept as low as possible (RP 20.1).
- [3.] The center of gravity of each piece of rolling stock (locomotives excepted) shall be determined on a Protractor or Tilt Table and noted as its Center of Gravity Index, expressed in degrees, i.e., CG35 (orCGI-35). This shall be the farthest deflection from the normal upright (0 degree or vertical) position to which the car can be tilted, from a flat, level, horizontal surface (90 degrees) on which it stands without tipping over. This will be determined by using a vertical protractor arm moving against the flat vertical side of the car, as the car is tipped sideways, the protractor pivot point coincident with said horizontal flat surface. Adapter blocks shall be used to establish a flat plane for the measurement of equipment not having flat sides. A high CG index number indicates a low center of gravity, i.e: CG90 (or CGI-90, alt CG=90). Confusing notations like CGI90 are to be avoided.

- [4.] Rolling stock will be tilt (protractor) tested on both sides of car to establish the CG Index. The poorest of the two readings (the lowest reading) will become the CG Index for that car. Side to side differences exceeding 5 degrees should be corrected with counterweights.
- [5.] Cars with hollow underframes may be required to have them filled with weight to achieve optimum weight or center of gravity.
- [6.] The MINIMUM center of gravity index for any NEW registration car shall be 30 degrees (CG30), brass models MAY be exempted if modification ruins their value and they cause no operating problems.
- [7.] Existing equipment registered before the establishment of the CGI will not be exempted, except on a “proof” basis, and will need to be upgraded to the current standard when repaired.

Category I: Cars of predominantly Non-Metal construction

Table of car Weights (ounces) by carbody Length (scale feet), versus Roll-ability (Percent of Grade).

| % grade > | 1/2 % | 1 % | 1-1/2 % | 2 % | 2-1/2 % | Max. |
|------------|---------|------|---------|------|---------|------|
| Car length | | | | | | |
| 30' | 3.25 oz | 3.25 | 3.25 | 3.5 | 3.75 | 4.0 |
| 35' | 3.5 | 3.5 | 3.5 | 3.75 | 4.0 | 4.25 |
| 40' | 3.5 | 3.5 | 3.75 | 4.0 | 4.25 | 4.5 |
| 45' | 4.0 | 4.25 | 4.5 | 4.75 | 5.0 | 5.25 |
| 50' | 4.5 | 4.75 | 5.0 | 5.25 | 5.5 | 5.75 |
| 55' | 4.75 | 5.0 | 5.25 | 5.5 | 5.75 | 6.0 |
| 60' | 5.0 | 5.25 | 5.5 | 5.75 | 6.0 | 6.25 |
| 65' | 5.25 | 5.5 | 5.75 | 6.0 | 6.25 | 6.5 |
| 70' | 5.75 | 6.0 | 6.25 | 6.5 | 7.0 | 7.25 |
| 75' | 6.0 | 6.25 | 6.5 | 6.75 | 7.25 | 7.5 |
| 80' | 6.25 | 6.5 | 6.75 | 7.25 | 7.5 | 7.75 |
| 85' | 6.5 | 6.75 | 7.25 | 7.5 | 7.75 | 8.0 |
| 90' | 7.0 | 7.25 | 7.5 | 7.75 | 8.0 | 8.25 |
| 95' | 7.25 | 7.5 | 7.75 | 8.0 | 8.25 | 8.5 |
| 100' | 7.5 | 7.75 | 8.0 | 8.25 | 8.5 | 8.75 |

Category II: Cars of Predominately Metal Construction(Brass Passenger Cars)

Table of car Weights (ounces), by car body Length(scale feet), versus Roll-ability (percent of grade).

| %grade> | 1 / 2 % | 1% | 1-1 / 2% | 2% | 2-1/2% | 3 % | 3 1 / 2 % |
|----------|---------|------|----------|------|--------|------|-----------|
| Scale ft | | | | | | | |
| 40 | 5.0 oz. | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 |
| 45 | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 |
| 50 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 |
| 55 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 |
| 60 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 |
| 65 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 | 10.5 |
| 70 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 | 10.5 | 11.0 |
| 75 | 8.5 | 9.0 | 9.5 | 10.0 | 10.5 | 11.0 | 11.5 |
| 80 | 9.0 | 9.5 | 10.0 | 10.5 | 11.0 | 11.5 | 12.0 |
| 85 | 9.5 | 10.0 | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 |
| 90 | 10.0 | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 |
| 95 | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | 13.5 |
| 100 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | 13.5 | 14.0 |

J. Lettering/Numbering and Paint

1. The paint scheme will conform to that of the railroad or private car company being modeled in regard to color, lettering style and placement, reporting marks, and other miscellaneous stencils or markings. Colors will match prototype practice.

2. All items such as couplers, springs, axles, screws, etc., will be appropriately painted or weathered.
3. Decals must be correctly aligned and applied so as to minimize the visibility of any film and must be covered with a protective coating that blends with the adjacent surfaces. When decals or dry transfers are used to change a number on a pre-painted piece of equipment, type style, size and color of the decal digits must match the painted digits; otherwise the entire number must be replaced.
- [4.] Reporting marks must conform to those listed in an issue of "The Official Railway Equipment Register" appropriate to the time period of the model. .
- [5.] No equipment may be registered with "reporting marks" (car initial AND number) which duplicate that of existing registered equipment of the same time period. Note: ATSF 1234 does not duplicate FGEX 1234.
- [6.] Equipment lettered for fictitious companies will be so noted on the registration record. Such equipment will conform to the lettering and painting practices typical of the period the model represents. Initials representing fictitious railroads must not be the same as those of any other railroad companies, real or fictitious, EXCEPT: equipment bearing the initials of private car companies may be lettered for fictitious lessors.

K. Markers

1. Cars used at the rear of trains must be equipped to comply with Operating Department Rule 19. If a caboose is used, markers MAY be lighted. If end of train device is used, they MUST be lighted.

[L.] Diaphragms

1. All equipment for which the prototype is or would be equipped with diaphragms must be so equipped.
2. Except when used between permanently coupled units, diaphragms must meet the following specifications:
 - a. Face plates of diaphragms must be in alignment with or protrude no more than 3/32 inch beyond the inside surface of the coupler knuckle.
 - b. Tabs or other protrusions on the face of the diaphragm are prohibited.
 - c. Diaphragms may be mated with others of any prototypical dimensions as long as they do not cause operating problems.

[M]. Other Equipment

1. Piggyback trailers/containers, passenger cars, cabooses, non-revenue (maintenance of way) cars and all on and off-rail (Hi-Rail) equipment must meet the applicable Car Department Regulations and be Registered.
2. TOFC/COFC trailers/containers or any other loads shall NOT be weighted, EXCEPT when they are mounted on the lower level of double-stack cars.

IV. POLICIES AND PROCEDURES

A. Lubrication

1. The ONLY items to be lubricated are those for which a lubrication policy has been established.
2. The following items MAY be lubricated: gears, shafts, couplers, axles, journals, bolsters.
3. Couplers (or parts thereof) will be lubricated with DRY type lubricants ONLY.
4. Plastic trucks and axles will be lubricated with DRY type lubricants ONLY.
5. Liquid, paste, or oil type lubricants may ONLY be used in gearboxes, journals or similar enclosures and must be applied carefully to avoid fouling rail or roadbed.

B. Bad Orders

1. Defective or broken equipment MUST have a "Bad Order" card (N&G form 18-A Std) or facsimile thereof, COMPLETED and SIGNED as the inspector by any member finding such equipment. Such card to be completed in duplicate (forms and carbons are provided).
2. Bad Ordered equipment WITH completed copy of form should then be placed in the 'Bad Order' cabinet. The "copy" of the form is to remain with the equipment. The Car Dept. will return these cars to their owners for repairs. The original "Bad Order" card must be placed in the special section designated in the "Bad Order" cabinet or in the separate drop box when provided. Club owned or operated equipment will be repaired only by those authorized by the Car Dept.

3. Rolling stock made “Bad Order” for ANY reason must have ALL other defects (chipped paint, or broken parts, etc.) repaired before being returned to service. This includes defective items NOT cited on ‘Bad Order’ card, but found to be present upon physical inspection by the Car Inspector..
4. Bad Order rolling stock must have Car Dept. inspection/approval BEFORE being returned to service.
5. Rolling stock not complying with rule 4, above, maybe displaced from the roster by compliant equipment of the same reporting mark.

C. Removal of Equipment by Owner

1. Members removing their registered equipment from the Club premises for any reason except repair under an issued ‘Bad Order’ are required to notify the Car Department in writing of all equipment removed. Show: initial, number, car type, description and owner name. Home Shop Card form C-22 is available for this purpose, but any list may be used. Car department MUST approve all equipment BEFORE it’s return to the layout.

D. Tolerances, Allowances and Exemptions

These issues are dealt with in the applicable sections of this document. See the pertinent sections or direct inquiries to the Car Foreman.

E. Enforcement

1. Repeated abuse or ignorance of any Car Department Regulations may result in loss of privilege as specified in the By-Laws.

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