

SAMRA Clinic: Give your cars a physical exam.

In order to maximize performance of your rolling stock bring it into compliance with NMRA standards by checking the car's appearance, weight, couplers, trucks, wheels, and free rolling quality.

You will need:

Safe workplace. Safe for the car. Foam pad.

Scale

Screwdrivers, small slot and phillips

Flat pliers

X-acto knives, new #11, dull #11, chisel.

Dry lubricant: Kadee Greas'em or equivalent

Light oil: Labelle 108

Liquid plastic cement such as Testor's, Tenax 7R, MicroMark Same Stuff.

Testor's plastic glue

Silicone adhesive: clear Liquid Nails

Kadee coupler gauge

NMRA standards gauge

1. **Examine the car's physical appearance.** (A end, B end, left side, right side. Look at the car from the brake end—that's the B end. Left side is on the left and right side on the right, and the A end is the non-brake end.) Are there any missing, broken or loose parts? Put it on the track and look for what's wrong. Is it tilting? Is it riding evenly on all wheels? Are the wheels correct for the car? Is there a recent history of derailment or coupler failure?
2. **Check weight** using a good scale. The NMRA weight standard is one ounce plus one half ounce per inch of car length. SAMRA

allows one half ounce deviation. The tracking of a car that's too light will be affected when entrained, particularly when shoved with cars ahead of it. The locomotive may push it right off the rails. A too heavy car will affect train handling when it's at the rear of the train and the excessive drag may cause a stringline derailment in a curve as the cars ahead of it are pulled off the rails to the inside. Add weight to a car in way that it does not show: inside car body, underneath car, or by adding a load. Weight can be any material. Does not have to be made for the purpose or pre-measured with double stick tape. Some modelers use pennies. Some use automobile wheel balancing weights. I use lead fishing weights from WalMart that are already measured. Weight should be placed as low as possible, centered, and glued down. (No maracas.) Silicone adhesive such as clear Liquid Nails is ideal.

3. **Check coupler action** on the track and over an uncoupling magnet. The magnet should open the knuckle and pull coupler to right for "delay". If it doesn't then it's "sticky" or tight. If coupler is screw mounted back the screw off until coupler swings freely. If that causes coupler box to loosen or open up then the problem is friction inside the coupler box. Try dry lubricant first. Remove the coupler box cover. Use a #2 pencil to add a smooth sheen of graphite to the inside of the box and cover. Add graphite such as Kadee Greas'Em. Reassemble and test. If still sticky check inside the box and on the inside of the cover for flash or rough spot. The shank may be sticking between the box and cover. Carefully shave the inside of the coupler box and/or cover by scraping lightly with a #11 blade. You can also sand the coupler box cover to improve clearance of the shank. Check the action of the coupler box spring and replace if necessary. Also check the "whiskers". Sometimes they break off leaving a spring on only one side. Check the height of the trip pin and adjust up or down.

Check trip pin clearance over the wood walkways at Clarke Center station. If your car is equipped with diaphragms you may need to use long shank couplers to prevent diaphragms from binding with adjacent cars in curves and causing a derailment. Long shank couplers may also solve problems with long cars. The SAMRA standard coupler is the Kadee metal standard head. (KD5 or KD148) No scale heads allowed—they do couple but they're hard to manually uncouple and generally do not play well with others.

4. **Check coupler height** with Kadee gauge on the track. Kadee offers a plastic gauge so you can use it on powered track. To raise height add Kadee fiber washers. Gray = .01", red = .015". If you need more than two reds then use an underset shank coupler instead. To lower coupler height insert a shim between car floor and coupler box or use an overset shank coupler. Kadee also offers a shim that fits inside the coupler box. This corrects sagging coupler shanks if that's the problem, but it's not recommended to adjust coupler height because it may cause the shank to bind.

5. **Check trucks and wheels.** Wheels must be in gauge. Use an NMRA standards gauge to check 'em. The club keeps one pinned to the wall by the big track plan across from Clarke Center. If not in gauge you can usually correct with a gentle twist of one wheel while firmly holding the other. Wheels should be free of dirt and spin freely. Accumulated gunk can be removed by gently pushing it off the wheel with a small flat screwdriver or dull #11 blade. Be careful not to scratch the wheel or it will create a place for dirt to begin accumulating again. Finish with a wipe of a bent pipe cleaner dipped in alcohol. If a wheel is not spinning freely remove the wheels from the trucks and gently spread the truck frames outward a bit. Use a MicroMark "truck tuner" to ream the journals. Apply dry lubricant to journals. Dry lubricant or light oil can be used in metal truck journals. Oil will attract dirt so if

wheels can be tuned to spin freely with dry lubricant don't use oil. Are wheel flanges rubbing the frame or floor? You may hear it rubbing. You should be able to find the marks under the car where the flanges are contacting the body or frame. Check the wheel diameter. The wheels may be too large; ie 36" diameter when they should be 33". If wheel size is correct but still rubbing then raise the car with fiber washers and make adjustment to resulting change in coupler height. Start with a gray .01"—may solve problem without materially affecting coupler height. Or carve away the area of the underframe where flange is rubbing. This is a common fault when you upgrade wheels to correct 36" diameter and the car came with 33" because that's what the manufacturer uses on all its cars. Generally a 70 ton capacity car uses 33" wheels. 100 ton and higher capacity cars use 36" wheels. Well cars may use 28" wheels to gain clearance. Check prototype.

- 6. Trucks should not be too tight.** They should swivel freely and must rock a little or will cause derailments. Some modelers like one truck to be square to the bolster and not rock, but the other truck to rock freely. (They "Tri-cycle".) Tighten the screw gently until the truck does not swivel, then back off until you get the desired degree of swivel and/or rocking motion. Using pins to mount trucks, often seen in Accurail and Atlas cars, is not recommended. They eventually loosen and cause excessive rocking or they can actually fall out. Replace pins with screws. If the car is tilting, check for loose floor and frame jammed up into the car, and for very loose trucks. Also check for loose weight and the height of bolster pin. Truck should fit square with bolster and even with or lower than bolster pin, if any. A too high bolster pin will leave too much space between the bolster pin and screw head and thus allow the car to rock too much or even tilt to one side. This is common in Athearn blue box cars. Sand or shave the

pin until it is just barely below the level of the truck frame. This will allow you to properly control the swivel and rocking motion of the truck by adjusting the mounting screw.

- 7. Car should be free rolling.** Wheels should spin fast with the flick of a finger. Or you can check the car on SAMRA's test ramp in the loft. From the top of the ramp the car should roll freely to the bottom and bump the end. If it doesn't, check trucks and wheels as above. Note that some wheels are more free rolling than others. Some journals are too narrow, some axle needle points are too large or too small; ie they're not interchangeable between manufacturers. Trucks and wheelsets do not always go together. This may affect free rolling and coupler height. Also note that some modelers prefer their cabooses not to be so free rolling so that they anchor the end of the train and take out the slack. That's personal preference. Cars equipped with wheel wipers to power lighting or sound will also be less free rolling.
- 8. Repair broken or missing parts** using appropriate cement or adhesive depending on the material. Cement may damage paint finish so test it on paint where it won't show such as inside or under the car or under the roofwalk. Broken or missing stirrup steps are a common problem. Replace them with A-Line metal parts available from Walthers in styles A, B, and C. Touch up the paint and unpainted parts, like brake wheels. Consider painting the underframe. Check prototype photos. Underframe color may match carbody or be flat black in which case it can be sprayed with Dullcote. Don't paint couplers. Remove or mask them. And paint the wheels and trucks! Only brand new cars are shiny. Tone it down with a spray of Dullcote. Shiny metal axles ruin the appearance of a great model. Some trucks match carbody color. Check prototype. Most are a weathered black/rail brown. Hump yards started appearing in the mid-fifties. If that's your era or

later then scrape the paint off the wheel web where the hump yard's wheel retarders polished them. A dull #11 blade works well and follow up with a wipe of paint thinner on a bent pipe cleaner to remove paint from the wheel tread and web.

9. Now do the rest of your cars. When they all meet standard the performance and appearance of your trains will be noticeably improved.