Helping Your Rolling Stock Behave Properly

(Not Mandatory Standards - Just Best Practices Based Upon Experience)

Useful Tools:

Axle Journal Pocket Tool: Exxact Socket Tool (T-100)
For: A smooth 60 degree conical side frame journal to the NMRA standard.
Manufacturer: Reboxx, Inc.
List Price: 12.00

Coupler Height Gauge:
For: Knuckle face and pin height check
Manufacturer: Kadee Quality Products
List Price: 5.95

Coupler Trip Pin Pliers:
For: Coupler trip pin adjustment
Manufacturer: Kadee Quality Products
List Price: 12.95

HO Standards Gauge: Mark IV or IVb (RP-25 Contour)
For: Wheels, Track, Clearance, Trolley Wire.
Manufacturer: National Model Railroad Association
List Price: 12.00

Postal Scale: Mechanical or digital
For: Weighing Rolling Stock
Manufacturer: Numerous
Sources: Business supply stores
List Price: 19.95 and up

Wheel Sets:

Composition:

Wheels: Metal (Plastic NOT acceptable)

Axles: Metal or Plastic are both acceptable

Wheel Diameter:

33" and 36" most common

Other sizes unusual but available

Passenger Cars: most are 36"

but IHC, AHM, few others: 33"

Freight Cars: most are 33"

some large prototypes are 36"

Spine cars (for containers): 30" or 33"

Manufacturers:

Kadee Quality Products: 33" flat back; 33" ribbed back; 36" flat back

Life Like Products (Proto 2000): 33" flat back; 33" ribbed back; 36" flat back

Northwest Short Line: Many diameters and axle end types.

All are high quality

Trucks:

Composition: Plastic or metal equally acceptable.

Metal Trucks:

Advantages:

Adds weight

Lowers center of gravity

Disadvantages:

Adds weight

Higher relative cost

Lubrication critical

Plastic Trucks:

Advantages:

Doesn't add weight

Lower relative cost

Lubrication important, but not critical - plastic is "slippery"

Disadvantages:

Doesn't add weight

Comparative Cost/Benefit Analysis:

For a particular application - up to you! ;-)

Truck / Wheel Set Combinations: Wheel sets must spin freely in truck frame

Lubrication: Powdered graphite on tips of axles and axle pocket on truck.

Do not use grease or oil.

Trouble Shooting: Wheel sets bind up - don't spin?

Cures:

Check for proper diameter wheel sets

Check axle tips for flash, debris

Ream out axle pockets in truck with an Exxact Socket Tool

Throw away trucks

Or - use as scrap load

Don't throw away good wheel sets

Truck / Car Body Interface:

Free rotation:

Mounting may be with screws, pins, or integral split pin

Very slight wobble side-to-side is actually a good thing

Not so loose that truck drops to floor when car is lifted.

Lubrication: Powdered graphite on tips of axles and axle pocket on truck.

Do not use grease or oil.

Trouble Shooting: Pin/screw keeps falling out of the bolster.

Cures:

Hole enlarged?

Glue plastic or wood solid rod into hole

Drill out with proper sized hole.

Use screw to mount truck.

Lost pin?

Use screw.

Screw loose?

Back screw out

Use thin sliver of plastic in hole

Run screw back in

Check axle tips for flash, debris

Ream out axle pockets in truck with an Exxact Socket Tool

Throw away trucks

Or - use as scrap load

Don't throw away good wheel sets

Trouble Shooting: Car derails on same end, at same place, repeatedly

Wheels on one side of truck lift clear of rail head.

Note: Could also be Track issue, or a combination

Cures:

Check to see if truck has the necessary "wobble" from side to side

Loosen screw slightly (½ turn)

Repeat until "wobble" restored

Trouble Shooting: Car repeatedly derails on same end or both ends, but different locations, repeatedly

Cures:

Check for dirt on tread of wheel sets

Dirt on wheel tread reduces effective depth of flanges

Clean wheels

Use NMRA standards gauge to check tread width of all wheels

Use NMRA standards gauge to check flange depth of all wheels

Couplers:

Absolutes:

Body mounted: (Not truck mounted!)

Truck-mounted couplers cause huge operational performance problems

Like derailments! Lots of derailments!

Cut coupler draft gear from Talgo Trucks

You can still use trucks

Metal: (Not Plastic!)

Plastic deforms under load

Causes unplanned train separations

Knuckle type:

Never use X2F (Budget Train set) couplers

Basically very poor performers

Cause huge operational performance problems

Causes unplanned train separations

Derailments! Lots of derailments!

Cars 60' and shorter:

Kadee #5's (conventional knuckle)

Cars 60' and longer:

Kadee #118 (shelf coupler)

Wide Variety for special applications:

Locomotives

Short shanks

Long Shanks

Drop knuckles

Draft Gear Box / Coupler Assembly:

Holds coupler

Mount with machine screws and nuts

Forces are “shear”

Mechanical joint pretty much failure proof

Glue alone is subject to shear stress and may fail

May use glue to keep draft gear from “spinning”

Use shims to raise or lower coupler knuckle to NMRA standard for height

Use coupler height gauge

Shims may be of whatever substance you have at hand that works.

Shims may be glued as they are not under shear force

Ensure proper location of draft gear / coupler box

Centered at end of car

Square with car body

Lubricate interior with powdered graphite

Adjust the Coupler trip pin for proper clearance of rail head

Use the trip pin pliers and the coupler height gauge

Ensure trip pin has a slight up curl at end

This is critical

Allows coupler to slide over any minor track imperfections

Knuckle coil spring

Place tiny drop of ACC glue at end of coil

Prevents spring from going astray

Trouble Shooting: Coupler binds in draft gear / coupler box

Cures:

Check for overly tight mounting screw

Back out 1/4 turn

Retest

Check for lubrication

Shoot powdered graphite into interior of draft gear

Check for glue in interior of draft gear

Replace draft gear box

Trouble Shooting: Coupler fails to remain coupled

Cures:

Check for missing coil spring on knuckle
Replace if missing
Check for proper knuckle height
If too low . . .
Remove some shims, or
Insert thin washers between bolster and truck
If too high . . .
Add shims. or
Remove truck, file bolster, replace truck
This is a drastic step, a last resort.

Car Weight:

Critical - This is what the Postal Scale is for . . .
Often ignored
Many ready to run cars are light
AHM / IHC passenger cars are notorious for being several ounces light
One Ounce plus an additional ½ ounce per inch of car length (NMRA RP)
Measure from coupler knuckle face to coupler knuckle face
Ensures a consistent measurement standard
Mount weight inside car
Keep weight as low as possible
Keep weight centered from end to end and side to side
Use screws, double sided mounting tape, or a good glue
E6000, Gorilla Glue, etc.

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Convenient and Easy to Use Check List:

Car Number / Name: _____ Reporting Marks / Railroad: _____

Item:	Recommended Practice:	Pass:	Fail:
Wheels:	Metal		
Wheels:	Proper diameter		
Wheels:	Meet NMRA Standards: Tread width		
Wheels:	Meet NMRA Standards: Flange Depth		
Wheel sets:	Free spinning		
Axle ends:	Lubricated with graphite		
Trucks:	Secured properly, with slight side-to-side wobble		
Trucks:	Lubricated with graphite at bolster interface		
Trucks:	Free rolling		
Couplers:	Body mounted		
Couplers:	Metal		
Couplers:	Knuckle type (conventional for cars 60' or less)		
Couplers:	Knuckle type (shelf type for cars 60' or more)		
Draft Gear Box:	Secured with screw(s)		
Draft Gear Box:	Centered on end of car		
Draft Gear Box:	Square with end of car		
Draft Gear Box:	Lubricated with Graphite		
Coupler Knuckle:	Proper height		
Coupler Knuckle:	Coil spring secured w/ ACC		
Coupler Trip Pin:	Proper height to clear rail head		
Coupler Trip Pin:	Slight curl at end to slide over imperfections		
Car weight:	1 Oz plus ½ Oz per inch		
Car Weight:	Secured mechanically or with appropriate glue		
Car Weight:	centered within car body, as low as possible		