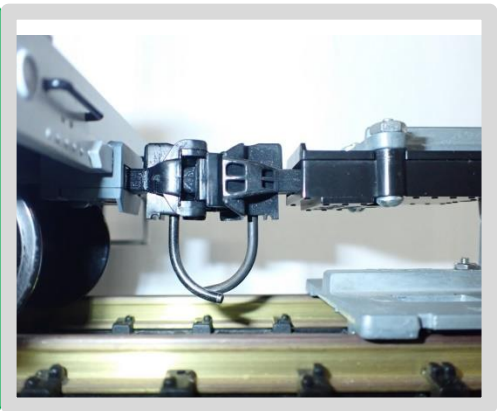
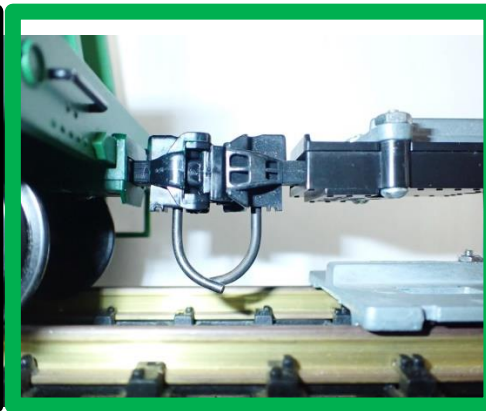
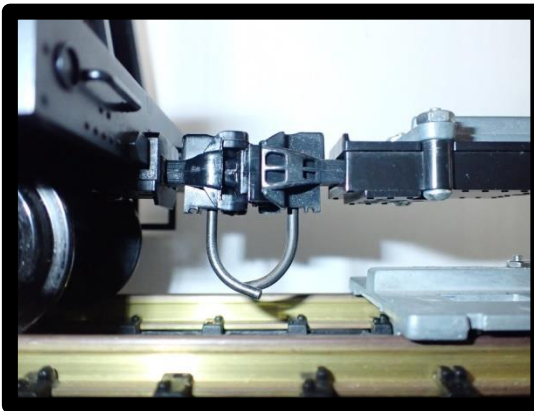


USA Trains American Series Flat Car CamPac Box™ Install Guide

Ted Doskaris, 2/20/2024, *Revised 3/12/2023 to include Appendix A for optional Hydra-Shock box*

Example USA Trains American Series Flatcars Equipped with Body Mount CamPac Boxes. fitted with Kadee Centerset Couplers



Preface

The USA Trains American Series Flatcar Chassis is the common basis for several product applications intended to accept the CamPac Box™, including the following: *Plain Flat Car Chassis* (not known if car offered without add on's); *"Bulkend" (bulkhead ends) Flat Car*, including with loads; *Center Beam Flat Car*, including with loads; *Auto Load Flat Car*; *Piggy Back Flat Car*; *Two Tier Auto Carrier Car*; *Various Flat Cars with Military loads*; *Work Train Series Cars*, including: *Work Flat Car With Load*; *Wheel Car*; *Truck Car*; *Rail & Tie Car*; *Derrick Car With Brass Boom*; *Crane Tender*. The cars shown / described in this Installation Guide represent a variety of differences that an installer will confront. These cars include the early production run DRGW black *"Bulkend"* car with Arch bar trucks having smooth top bolsters which comparatively lower the car. And the BN green *Center Beam* car with Bettendorf trucks with current ribbed top bolsters that presents a CamPac box mounting screw depth limitation. And the DRGW gray *Rail & Tie* car with a center superstructure with Arch bar trucks having ribbed top bolsters. (Typically, the stake pockets on the sides of the car are used to attach specific superstructures for a given factory application.)

The cars' Arch bar or Bettendorf trucks are to be fitted with USA Trains Metal Wheels.

The factory truck mount hook & loop couplers are to be eliminated - being replaced by direct fit body mount 3-D printed CamPac coupler boxes which accept more realistic Kadee centerset (no offset) "G" scale AAR E type knuckle couplers.

Note: An optional CamPac Hydra-Shock box with extended coupler pocket for "Cushioned Cars" is now available, [See Appendix A beginning at page 12](#)

The installer is to obtain one [Kadee 907 kit](#) and [USA Trains metal wheels](#), (may require 2 sets to get 4 axles) P/N R2093

CamPac Kit Parts

The CamPac kit includes two (2) 3-D printed direct fit (no spacers needed) CamPac coupler boxes along with several screws described and shown in the below illustration. The installer is to assemble the boxes.

CamPac Box™ for USA Trains American Series Flatcar Chassis

USAT Flat Chassis
Rev 4
CamPac

Lid

Front Lid screw is flathead #2-56, 5/16 inch long

Box mounting screws are pan head, #2-56 1/2 inch long

Rear Lid screw is pan head #2-56, 5/16 inch long

Only the springs, coupler and lid from the Kadee 907 kit are installed on the CamPac Box™.

Kadee is a registered trademark of Kadee Quality Products Co., White City, Oregon, USA

Ted Doskaris, 2-2-2024

Assembled boxes can be pre painted to desired color (ensure paint doesn't get into box mouth) – examples shown below.

Example painted Tamiya Flat Black, XF-1



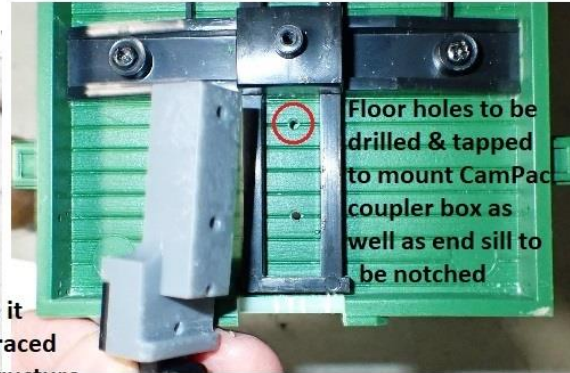
Example painted Testors Baret Green, 1171 (close match to BN green)



The CamPac assembled coupler boxes will be installed later. **Note:** For optional CamPac “Hydra-Shock” box see [Appendix A](#)



The center beam flatcar is chosen to use in this Installation Guide to demonstrate the most likely worst case issues to confront the installer because the inboard hole needed to be drilled & tapped thru the floor to mount the CamPac Box™ is located right under the base of the beam.

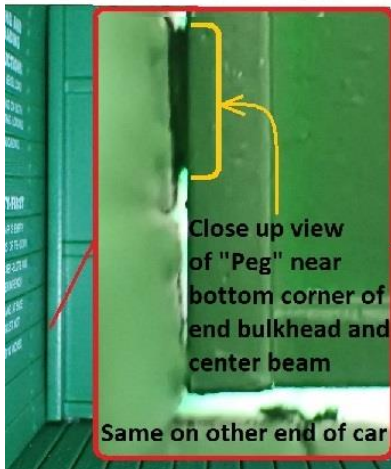


Floor holes to be drilled & tapped to mount CamPac coupler box as well as end sill to be notched

When working on the car, place it on its back. It may need to be braced depending on the car's super structure.



The center beam top plank may be twisted across the top and should be straightened after all work is done to the car. The plank ends may need to be glued to the bulkheads to keep it in place.



Close up view of "Peg" near bottom corner of end bulkhead and center beam

Same on other end of car



Center beam has peg that engages the bulkheads at lower part near floor

The lower part of center beam near floor is kept straight all across the floor because of pegs. The flat area sides of the center beam are wider at its bottom compared to its top.

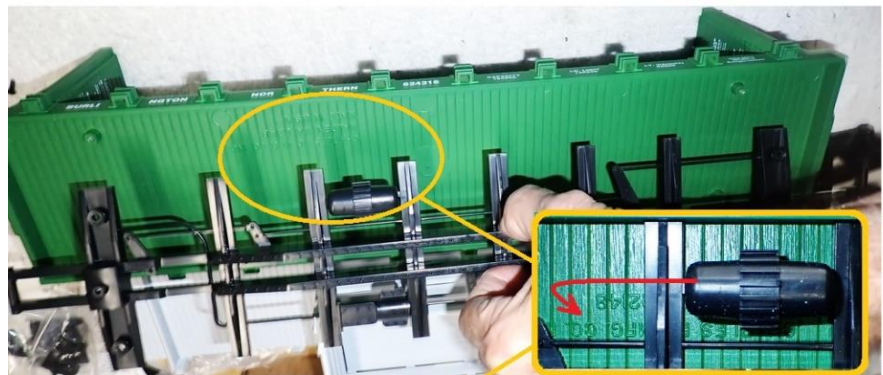
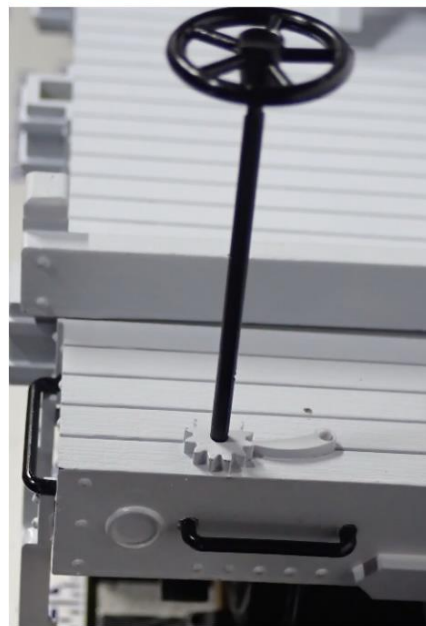
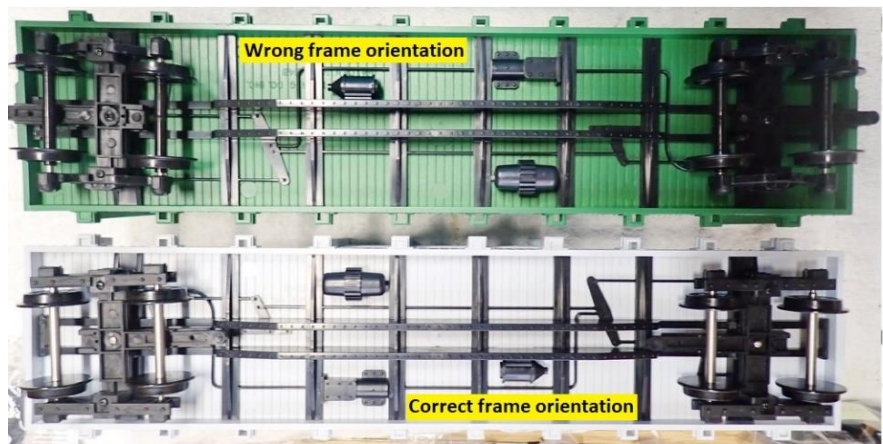
Ted Doskaris, 2-27-2025

Car Preparation – Under frame

Check the under frame orientation with respect to the brake wheel end of the car.

The under frame is not keyed and the factory has been inconsistent as to its installation. This is shown here, including remedy - which entails removing the trucks, and then unfastening the 2 screws from each of the bolsters, and then lifting out the under frame and turning it around and then refastening it.

Advisory: The under frame may fit tight and take some manipulation to remove it, and then reinstall it - making sure it's fully seated flat against the chassis floor along its entirety before refastening it.



When frame properly oriented, the air tank covers over area at embossed Charles Roe script



Frame now re-installed with proper orientation with respect to brake wheel end of car

Ted Doskaris, 1-21-2024

Car Preparation – Truck Wheels

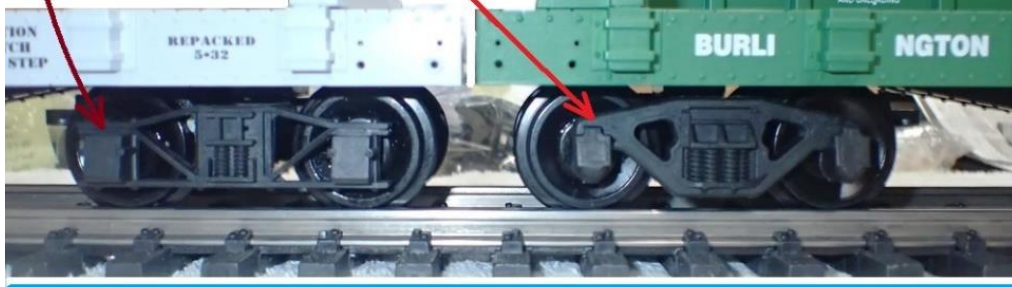
The American Series flatcar can be factory equipped with Arch bar or Bettendorf trucks. Both truck types can have truck bolsters with smooth tops or ribbed tops. The ribbed top bolster is the newer of the two. However, flatcars with smooth top bolsters will be slightly lower to the railhead. (*Arch bar or Bettendorf side frames in of themselves do not affect car height from the railhead.*)

Wheel diameters can differ, too, affecting car height from the railhead. Consequently, to allow for using the same body mount CamPac coupler box fitted with Kadee centerset couplers on various cars, USA Trains metal wheels, PN R2093, are to replace plastic wheels or other aftermarket wheels having a different tread diameter when compared to the USAT metal wheels.

In this regard, see the next page illustration.



Both example cars have trucks with ribbed top bolsters



Older production run cars have trucks with a smooth top bolster compared to newer cars having ribbed top bolster, so older cars are lower to the railhead. To accommodate a common CamPac Box[®] for both car applications, a 0.050 inch thick spacer washer is to be placed over older car chassis mounting posts.



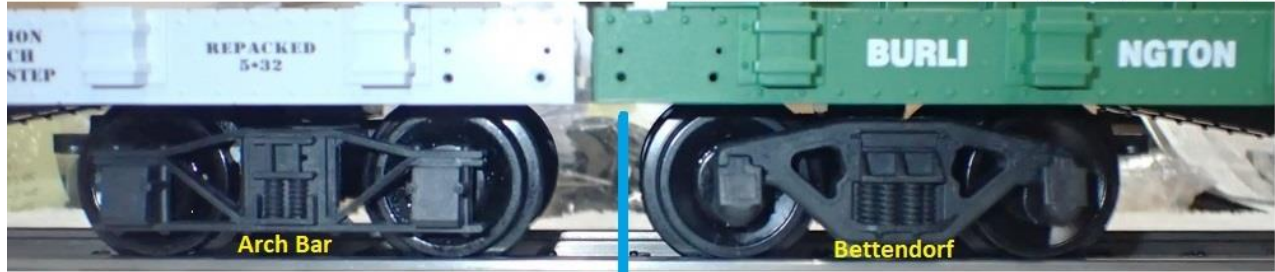
Important USA Trains Truck Issues

Note: When ordering CamPac boxes[®] for the USA Trains American Series Flatcar Chassis, determine which type truck is on the car, particularly important is which type bolster is on the trucks (smooth top or ribbed top).

The USA Trains American Series Flatcar chassis can have factory truck sideframes of Arch Bar (at below left) or Bettendorf (at below right)



USA Trains American Series Flatcar Truck Examples (Removing Couplers and Replacing Wheels)



Arch Bar

Bettendorf



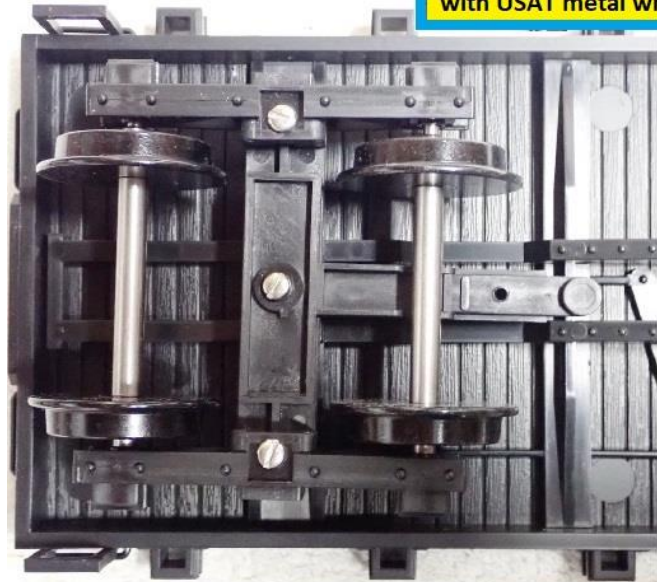
Example early production run car arch bar truck having slotted screws and customer fitted aftermarket undersized metal wheels



Example late production run car Bettendorf truck having Phillips screws and factory fitted plastic wheels



Remove couplers from truck tangs and plastic (or under/over sized aftermarket wheels compared to USA Trains metal wheels). Replace with USAT metal wheels, PN R2093



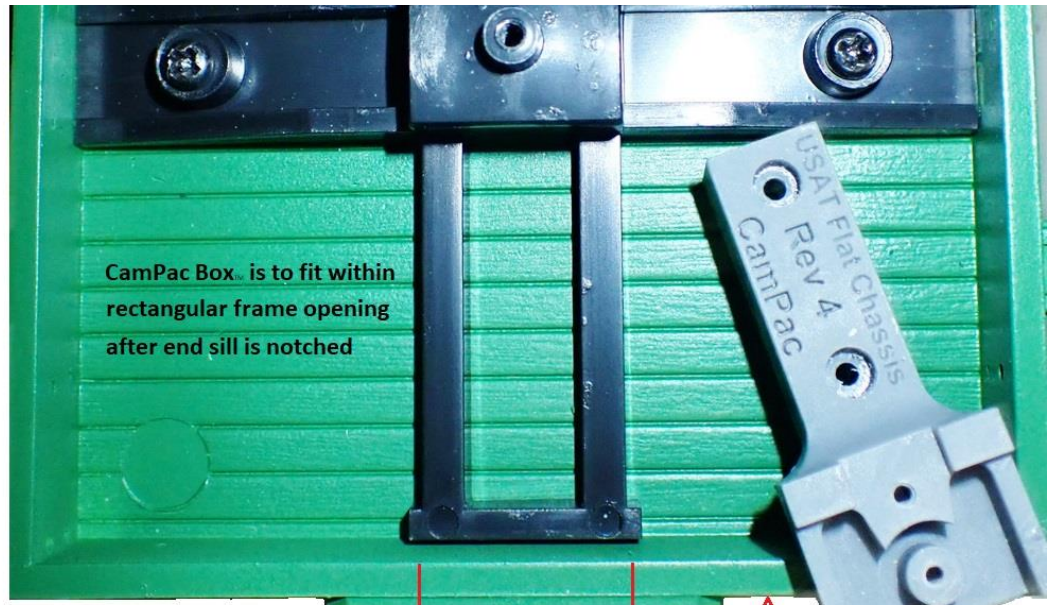
When trucks are remounted on chassis bolsters after CamPac boxes are installed, position them so the coupler tang is facing inboard. (Trucks will typically be able to rotate without interference, so the tang need not be cut off unless preference for better appearance.)

Ted Doskaris, 2-3-2024

**Draft Gear Cutout (Notch)
to Accept CamPac Boxes™**

Illustrated is what is to be done to fit the CamPac coupler boxes at both ends of the car.

An example method to do this is shown on the next page.



CamPac Box™ is to fit within rectangular frame opening after end sill is notched

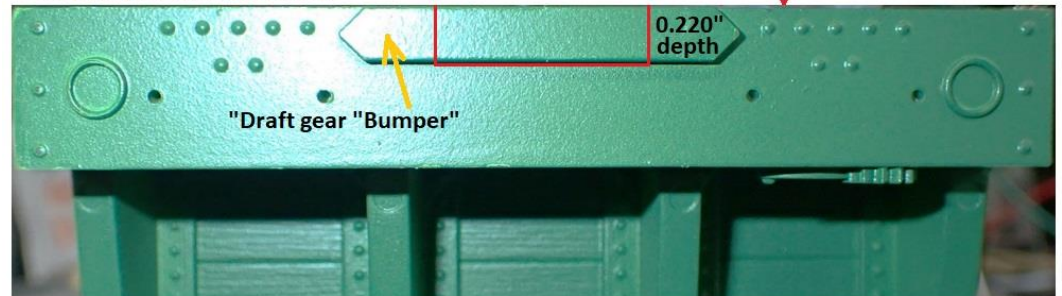
End sill cutout (Notch) target value is 0.820 inch wide, centered, by 0.220 inch deep

0.820" centered

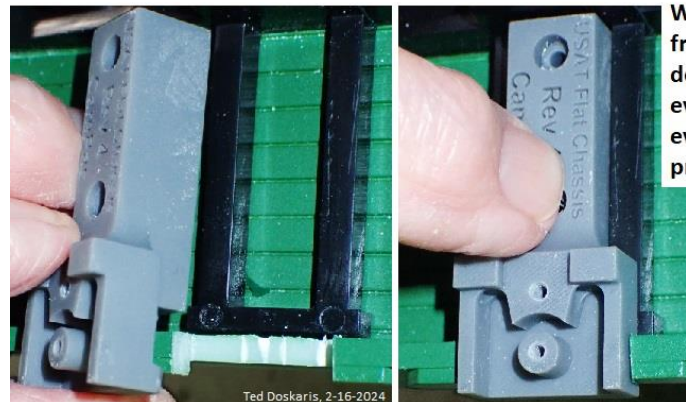
End Sill

0.220" depth

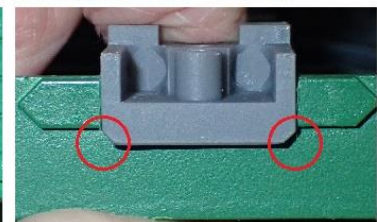
"Draft gear "Bumper"



Resultant notch depth is to be slightly below protruding "bumper" with no left over flashing residue



When CamPac Box™ is test fit within frame opening (whilst held pressed down & seated), the box face is to be even across bottom with "bevels" evenly extended below corners of protruding draft gear "bumper"

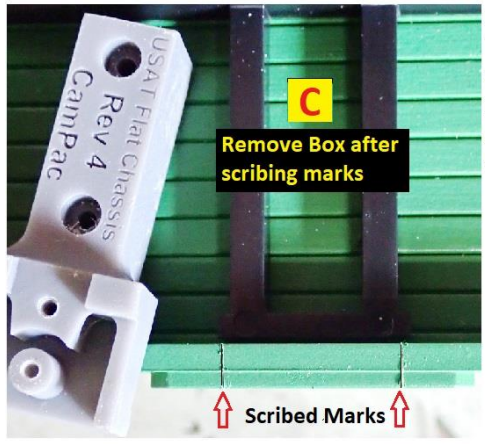
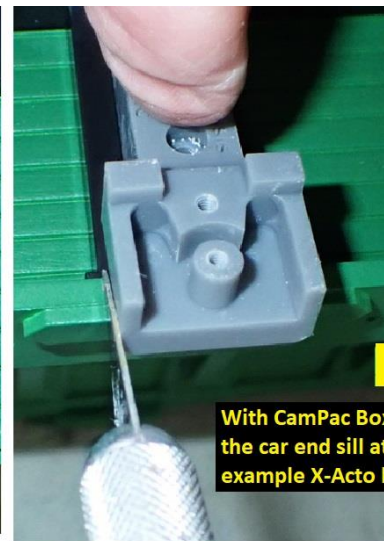


Ted Doskaris, 2-16-2024

**Draft Gear Cutout –
Example Method**

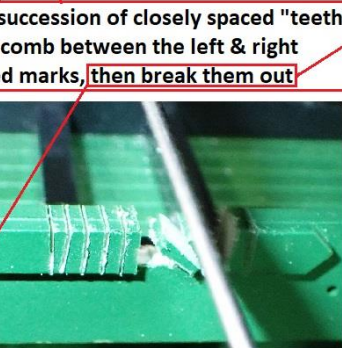
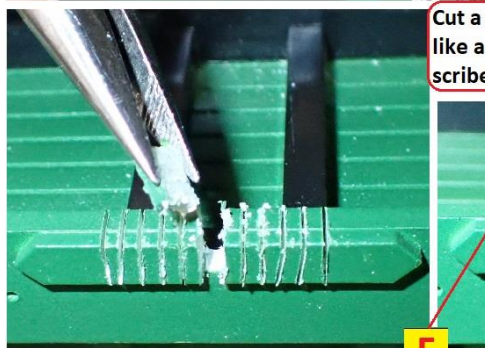
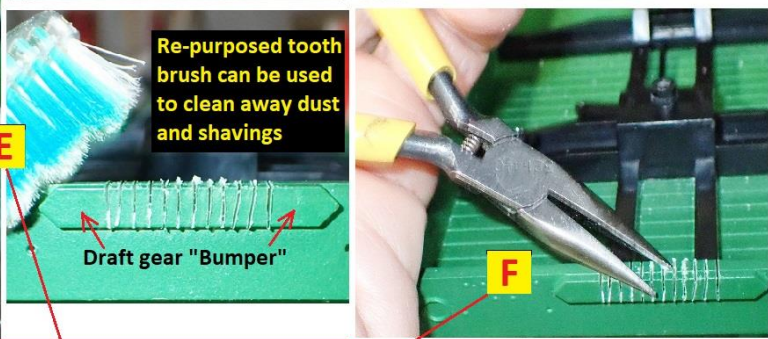
Follow steps A – G
as illustrated.

Refer to previous
page illustration for
target values



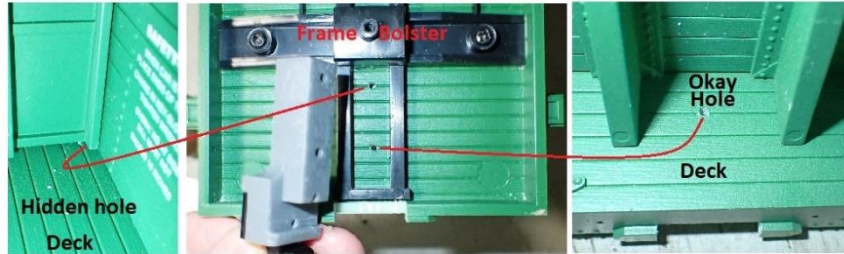
Use the CamPac Box as a template to establish where the cutout notch is to be located on the car's end sill. Because the notch is yet to be cutout, the box will be at a tilt when held in the frame's rectangular opening, but this is okay for scribing marks as shown above.

At left & right scribed marks shown at the left & below, make first cuts vertically down to the bottom of the draft gear "bumper".



Advisory

The American Series Flatcar versions can include models having a super structure with center portion going down the middle length of the car deck. The Center Beam car is an example. The base of the center beam can be at risk of damage when drilling a thru hole in the deck to mount the CamPac box in the chassis. In this case, only the hole closest to the frame bolster has this issue. (Holes shown for understanding - to be drilled later)



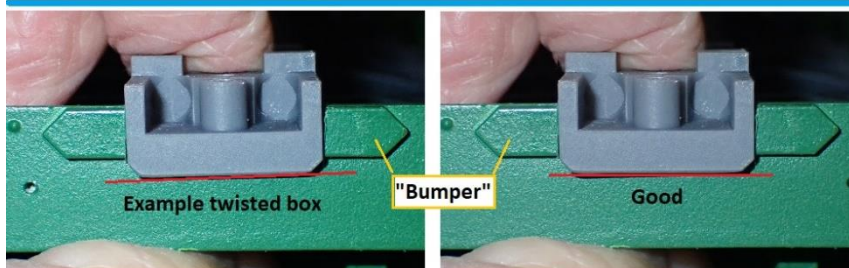
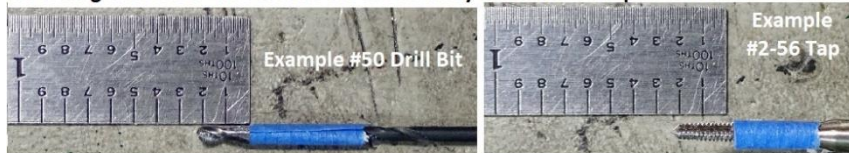
The following 3 example ways can be used to avoid damage to the center beam:

(1) Remove the superstructure - this could be very difficult to do because of tight fitting parts. Moreover, the center beam has a peg near its bottom that goes into the end bulkheads, consequently, the end bulkheads with the center beam will need to be removed all together.

(2) If room permits, slide a thin piece of metal plate under the bottom of the center beam (adjacent to the end bulkhead) that can be felt when drilling too deep.



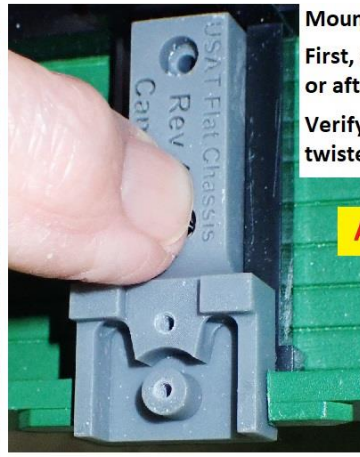
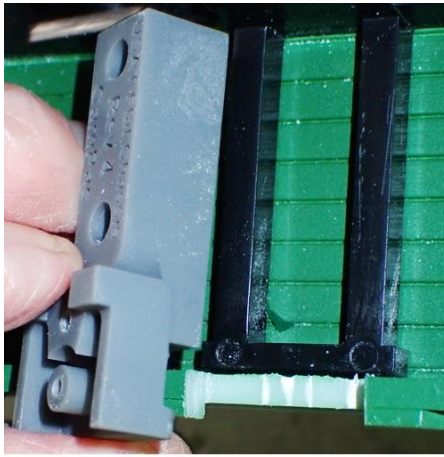
(3) Mark the drill bit depth limit to about 0.200 inch by wrapping it with a piece of tape that can be observed when plunging the drill bit. The same can be done to the tap when threading the holes. This will be the chosen way shown in examples to follow.



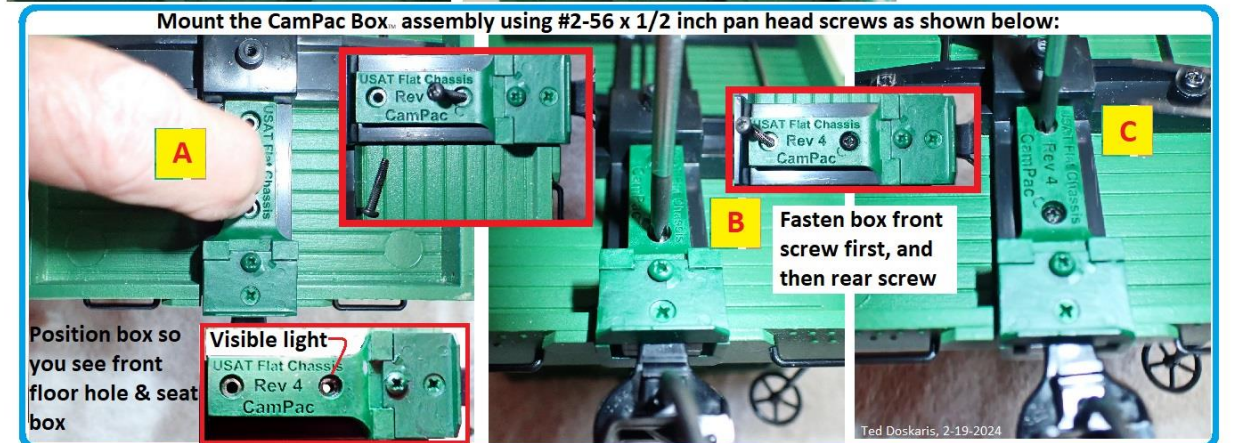
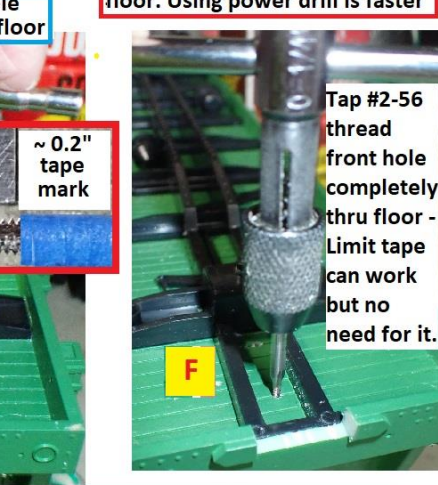
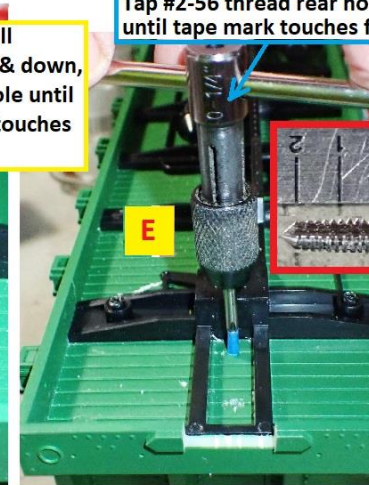
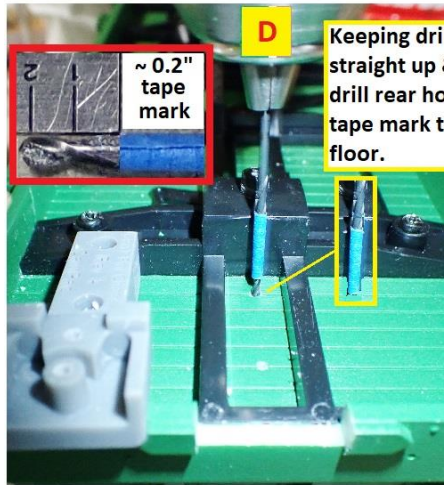
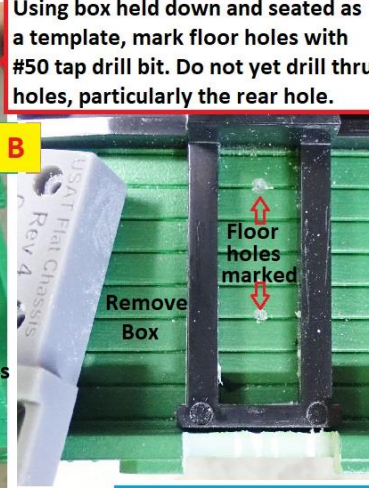
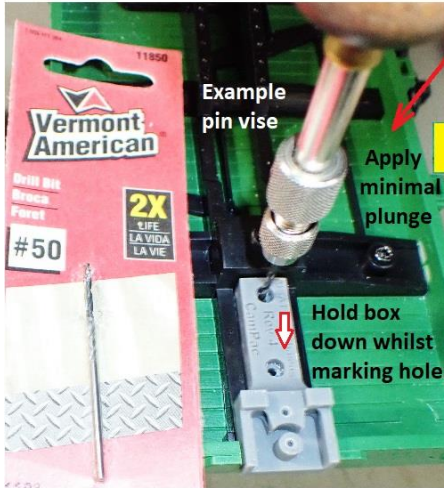
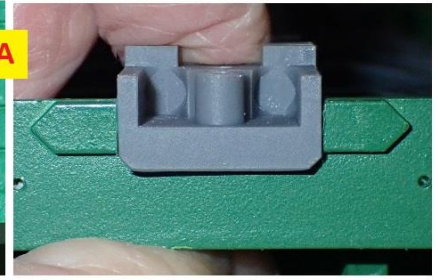
When CamPac Box is test fit within frame opening before mounting holes are drilled (whilst held pressed down & seated), verify the box face is straight across bottom with "bevels" evenly extended below corners of protruding draft gear "bumper". If not, the notch width may need to be widened on one side.

Ted Doskaris, 2-18-2024

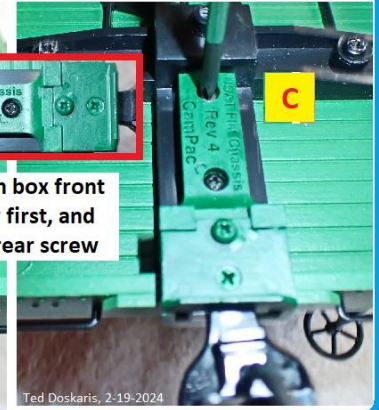
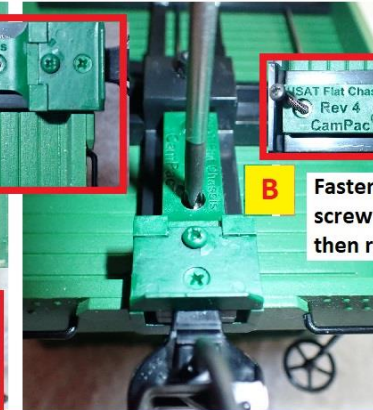
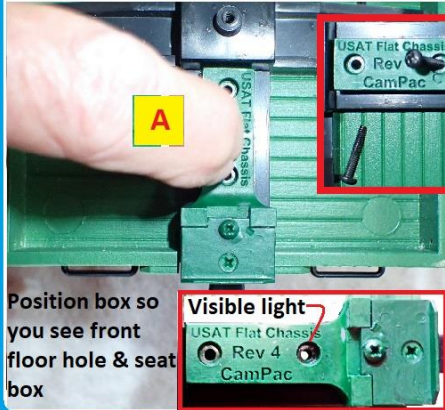
Install CamPac Box™
 - on both ends of car
 the same way
 following lettered
 Steps



Mounting Procedure for CamPac Box™ Assembly
 First, seat the box. The box used can be before or after its assembled with coupler or painted.
 Verify when seated the box face is straight, not twisted. If not, see prior pages for remedy.



Mount the CamPac Box™ assembly using #2-56 x 1/2 inch pan head screws as shown below:



Position box so you see front floor hole & seat box

Visible light

Fasten box front screw first, and then rear screw

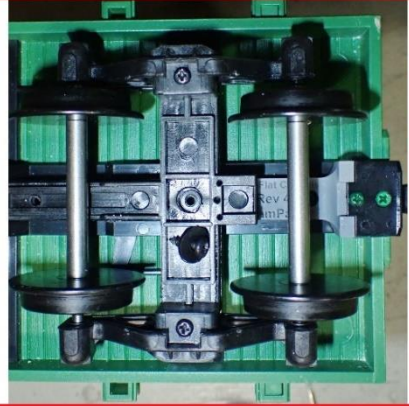
Ted Doskaris, 2-19-2024



Mount trucks having ribbed top bolster on car as shown here

Ribbed top bolster

Mount trucks on the car (The American Series flatcar can be factory equipped with Arch bar or Bettendorf trucks. Both truck types can have truck bolsters with smooth tops or ribbed tops. The ribbed top bolster is the newer of the two. Flatcars with smooth top bolsters will be slightly lower to the railhead, consequently, a car with trucks having smooth top bolsters will need spacer washers to bring the car height up to cars with ribbed top bolsters for using the same CamPac Box.)



Fasten down truck to frame bolster post with factory screw & washer



Truck mounting example below

Smooth top bolster

Ribbed top bolster

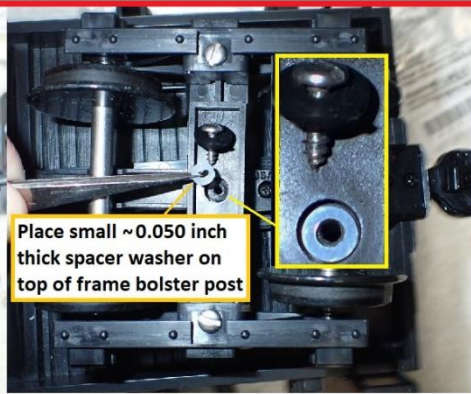
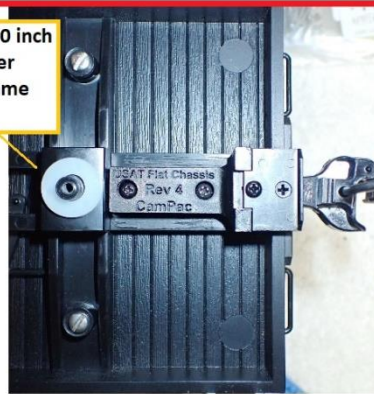
Truck mounting example above

Note: Trucks can have smooth or ribbed top bolsters irrespective of side frame types

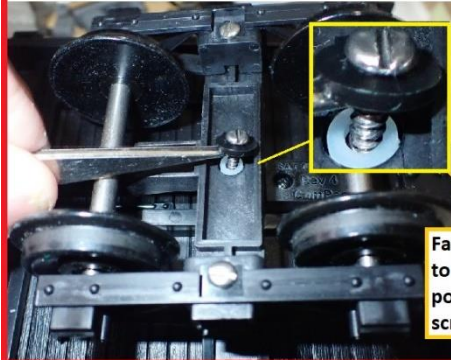


Place large 0.050 inch thick truck spacer washer over frame bolster post

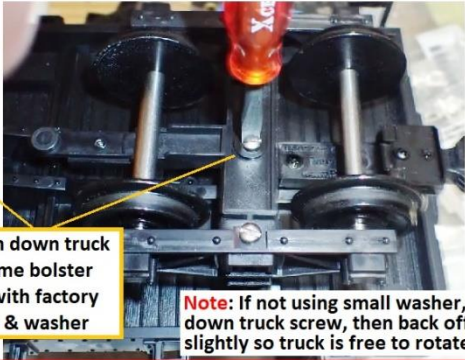
Mount trucks having smooth top bolster on car as shown here



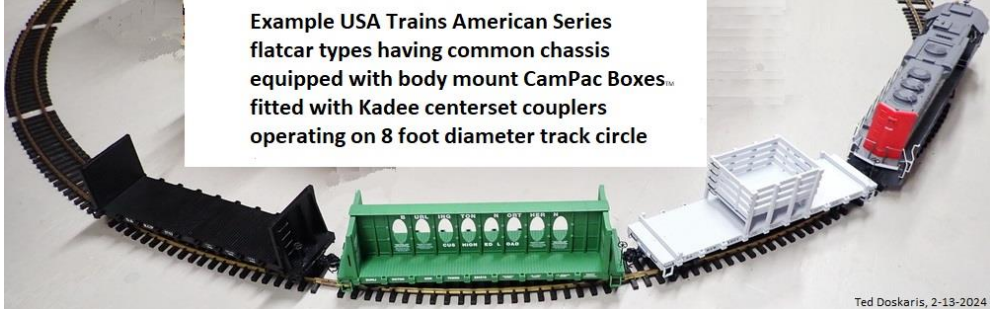
Place small ~0.050 inch thick spacer washer on top of frame bolster post



Fasten down truck to frame bolster post with factory screw & washer



Note: If not using small washer, tighten down truck screw, then back off screw slightly so truck is free to rotate & rock.



Example USA Trains American Series flatcar types having common chassis equipped with body mount CamPac Boxes, fitted with Kadee centerset couplers operating on 8 foot diameter track circle

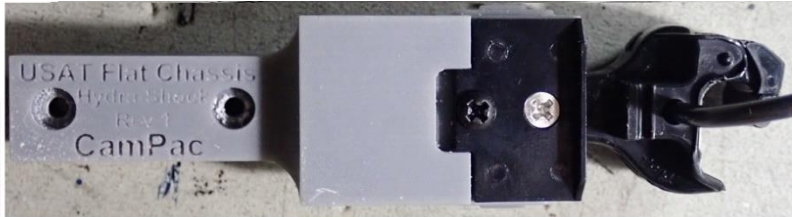
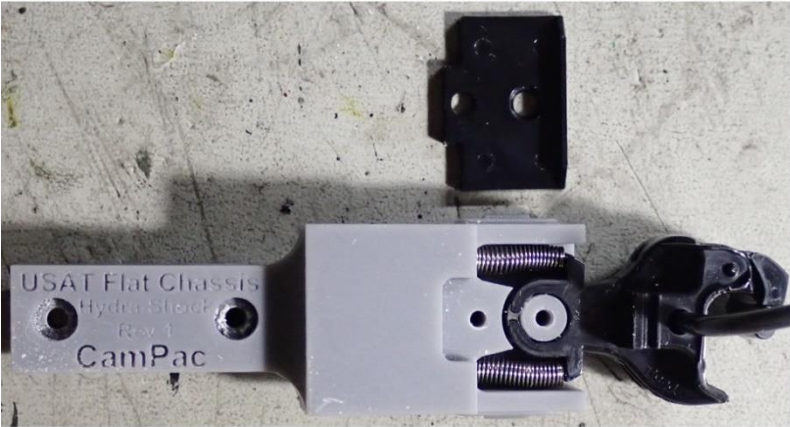
Ted Doskaris, 2-13-2024

Appendix A

Optional CamPac Hydra-Shock box with extended coupler pocket for "Cushioned Load" cars

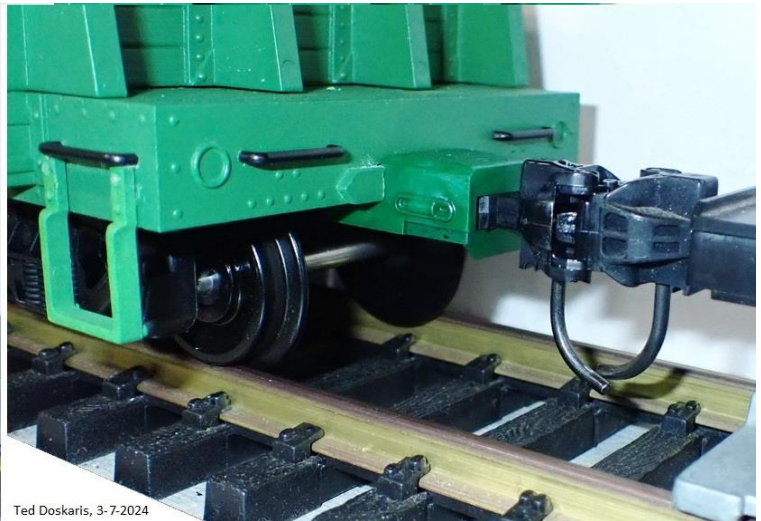
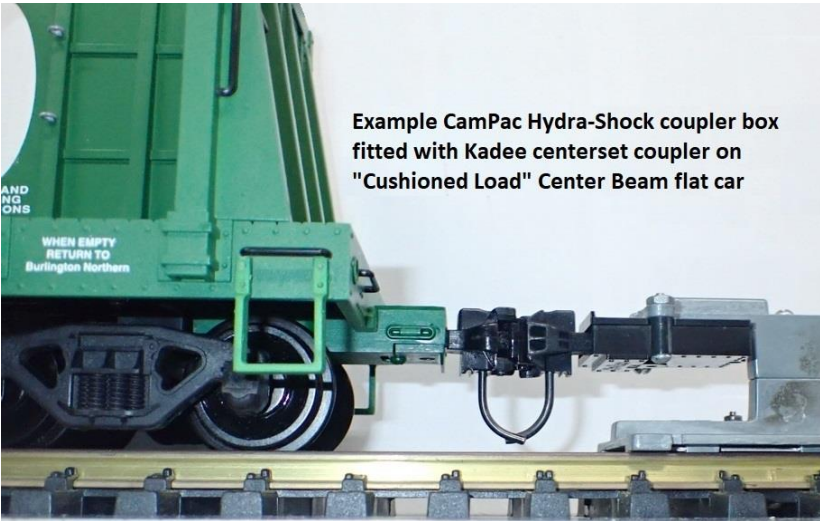


To emulate a prototype "Cushioned Load" Car with projected draft gear coupler, request the optional CamPac Hydra-Shock coupler box which uses same CamPac supplied screws, Kadee springs, couplers and lid as the conventional CamPac Box.



Ted Doskaris, 3-7-2024

Example CamPac Hydra-Shock coupler box fitted with Kadee center set coupler on "Cushioned Load" Center Beam flat car



Ted Doskaris, 3-7-2024

The following page will describe & show how to install the CamPac Hydra-Shock coupler box assembly with screw holes drilled & tapped and end sill notched like done for the conventional CamPac Box™.

Install the CamPac Hydra-Shock coupler box assembly following illustrated steps A thru E

See prior pages 7 thru 10 for same techniques used for installing the conventional CamPac Box™

CamPac Hydra-Shock box installation
 Assemble box using same machine screws just like the conventional box (Do not use Kadee self threading lid screw or box will be damaged)

Lid

Paint assembled coupler box to desired color
 Example Green

A
 Cut 0.010 thick shim from Kadee kit capsule to about the width of the box tail

B
 Place shim as shown
 Note: Holes are drilled and tapped for #2-56 thread and located just like conventional box

C
 Press down & seat box, ensuring it's not twisted

D
 Forward screw
 Partially thread-in both screws using same #2-56 x 1/2 inch screws as conventional box, then tighten forward screw first, and then rear screw last

E
 Rear screw
 Wiggle box to make sure it's snug fitting

Example coupler alignment with Kadee 980 coupler height gauge

Ted Doskaris, 3-5-2024

Alternative Trucks: Because prototype cars with a "Cushioned Loaded" feature will have some type of draft gear Hydra-Cushion / Shock Control, it's virtually certain the car will also be equipped with roller bearing trucks. Such a car is the USA Trains Center Beam car factory equipped with Bettendorf friction bearing trucks. If desiring to better emulate a prototype car with roller bearing trucks, two options will be described. **Option 1 using USA Trains Intermodal trucks** (though its bearing caps do **not** rotate) is the least expensive, whereas, **Option 2 slightly costlier (approx. 8 USD) using Kadee all metal trucks** is much better.

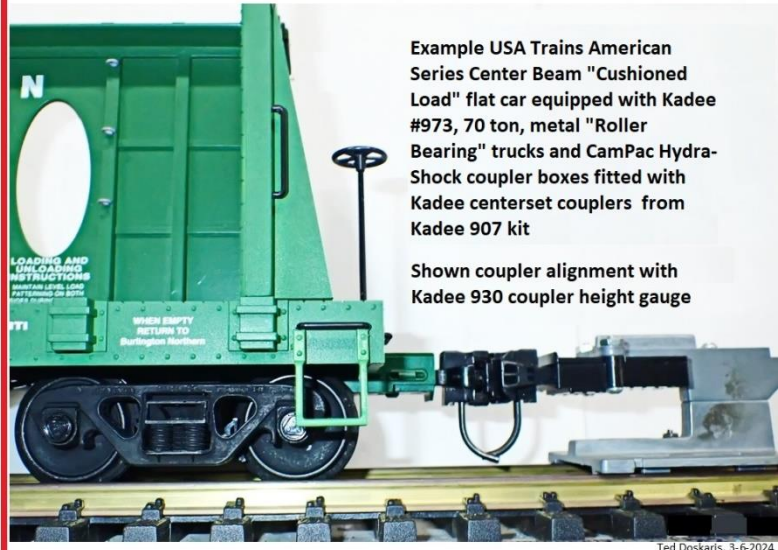
OPTION 1: "Roller Bearing" Trucks

Example USA Trains American Series Center Beam "Cushion Load" flat car equipped with USA Trains plastic Intermodal "roller bearing" trucks with USAT metal wheels **needing truck spacer washer**



OPTION 2: "Roller Bearing" Trucks

When car equipped with Kadee trucks and Kadee parts for USAT adapter, **no** spacer washer used



Example USA Trains American Series Center Beam "Cushioned Load" flat car equipped with Kadee #973, 70 ton, metal "Roller Bearing" trucks and CamPac Hydra-Shock coupler boxes fitted with Kadee centerset couplers from Kadee 907 kit

Shown coupler alignment with Kadee 930 coupler height gauge

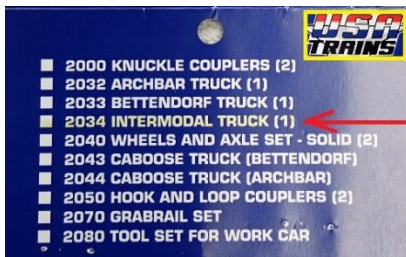
Ted Doskaris, 3-6-2024

Note: If electing to use the conventional CamPac coupler boxes, the roller bearing trucks can still be used.

First to be described is Option 1 using USA Trains Intermodal Truck:

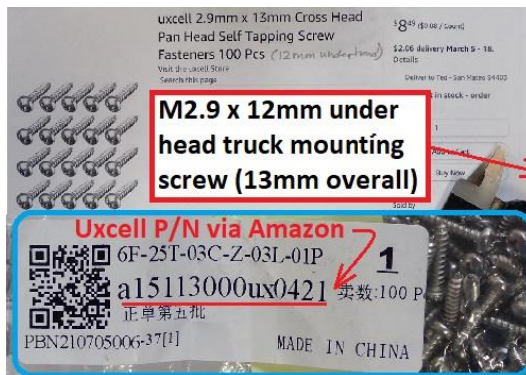
The Installer is to obtain the USA Trains Intermodal trucks and metal wheels.

Install the metal wheels in the trucks, and remove & discard hook & loop couplers.



Ted Doskaris, 2-28-2024

Additional parts are needed to mount Intermodal trucks. When ordering CamPac coupler boxes, request these additional parts (2 each) from Colin Camarillo via his website:



Ted Doskaris, 3-7-2024

Note: Because Inter-modal trucks are specific to lower Intermodal cars, truck spacer washers are needed

Option 1, Install the USA Trains Intermodal "roller bearing" trucks on the flat car following illustration steps A thru D.

Factory truck mounting screw and washer

Installing USA Trains Intermodal "roller bearing" truck, P/N R2034, on USA Trains American Series Flatcar. **Follow steps A thru D** (Truck to be equipped with USA Trains metal wheels, P/N R2093)

6F-25T-03C-Z-03L-01P
a15113000ux0421
正单第五批 Uxcell brand P/N via Amazon

A2
Truck spacer washer is over frame post

B
Place truck on frame post with spacer washer in place

Longer M2.9mm x 12mm replacement screw with factory washer and small 3mm thick frame post extender bushing

3mm

Enlarged View

Grainger P/N 3ZMR5

C
Insert post extender bushing in truck bolster hole

D
Mount truck with M2.9 x 12mm screw; tighten down screw - backing off slightly if needed so truck can pivot

Truck spacer washer, 0.130 inch thick, Digi-Key P/N RPC9855-ND

A1
Place truck spacer washer over frame post

Ted Doskaris, 2-28-2024



Option 2, Install the Kadee 973 "roller bearing" trucks on the flat car following illustration steps A thru E.

The Installer is to obtain the Kadee 973 trucks that includes metal wheels and Truck Mounting Adapter kit.

#973 BARBER® S-2 ROLLER BEARING
Installing Kadee 973 truck 70-TON
G-Scale 1:29 Scale Metal Trucks (Black)

- All Metal Non-Magnetic 2 Piece Self Equalizing Trucks
- #960 33" Smooth Back All Metal Non-Magnetic Wheels with Free Rolling Insulated Axles
- Clip on Brake Pads
- Mounting Adapters Included

Kadee
G SCALE
1:29 Scale

Made In the U.S.A.



KADEE® TRUCK MOUNTING ADAPTERS



BACHMANN



Use this adapter
 Shim USA TRAINS



PECO
 ARISTO-CRAFT (REA) & LGB

