Installation Guide

Aristo-Craft U25B & CamPac Components

Ted Doskaris

8/7/2020

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

Factory offset truck mounting "eccentrics" are replaced by spacer plates (prototypically lowering loco) that facilitates body mounting Kadee centerset couplers as well as correcting the loco's leaning & instability

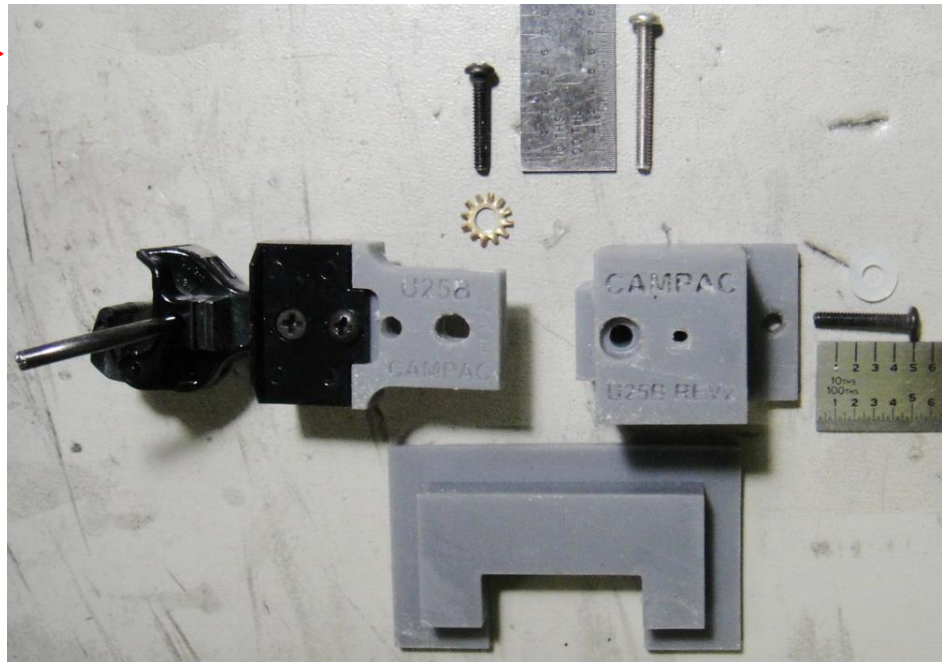
Aristo U25B before & after comparison on 8 foot dia. curve

Installing 3-D Printed Components, including truck spacer plates, pedestals, coupler boxes, and pilot plugs

Overview

- Instructions are provided as a guide for the installer of 3-D printed *CamPac Box*™ and components on the Aristo-Craft brand U25B "G" (1/29) scale Diesel locomotive[1].
- What's done to the front of the loco is also to be done to the rear. (Revisions to loco includes pilots' cutout to accept coupler box and replacing factory offset truck mounting "eccentrics" with truck centering pivot spacer plates.)
  Note: **Only the pilot cutout revisions to accept CamPac boxes™ made to the loco are irrevocable, which will affect the resale value to the possible detriment or benefit of the loco.**
- The installer is to have access to tools and have adequate skills to make cuts and do finish work.
- Tools needed include Phillips type P1, P2 screwdrivers, razor saw, sharp pointed scribe or razor knife to mark cut lines, medium & small size files, and drill bit (~5/16") used to "countersink" small rear hole in coupler box lid. A #2-56 tap is desirable. (Measuring tools include machinist scale, caliper preferred.)
- *CamPac* 3-D printed components include coupler boxes (2), pedestals (2), pilot plugs (2) and truck spacer plates (2). Other items are #2-56 long screw (2) with #2 lock washer (2) and #2-56 flathead screw (4), plus many other screws, etc. items (including bushings & thin washers for mounting trucks) associated with the lowering of the loco.
- **The loco's operation is limited to 8 foot diameter, or greater, curves with CamPac parts installed.**
- Not included: The installer will need to supply a Kadee 907 kit (1) of which all (but plastic box & screws) will be fitted onto each *CamPac Box*. The kit's capsule of 0.010 inch thick shims is to be utilized.

Coupler Box with coupler, Pedestal, Pilot Plug and mounting hardware



Instructions provided to accomplish:

- ✓ Install Kadee kit parts onto *CamPac Box* (coupler box)
- ✓ Remove body shell from chassis
- ✓ Replace factory truck mounting "eccentrics" with *CamPac* spacer plates
- ✓ Reinstall body shell
- ✓ Cut out notch in front & rear pilot to accommodate box
- ✓ Install pilot plug to cover large factory opening on front & rear of loco
- ✓ Install mounting pedestal & coupler box assembly on both ends of loco & align couplers

[1] **Caution**: When operating the locomotive, abrupt excess force (e.g. collision/yanking) to the coupler may result in damage to coupler, coupler box, or other components. Operating the locomotive coupled to a car with truck mount coupler on tight curve track is **incompatible**- car can/will be pulled off track.

Installation Steps:

Step 1 – Coupler Box Preparation

Install selected parts from a Kadee[2] 907 Kit in the *CamPac Box*. (Box to be fastened to pedestal & mounted later)

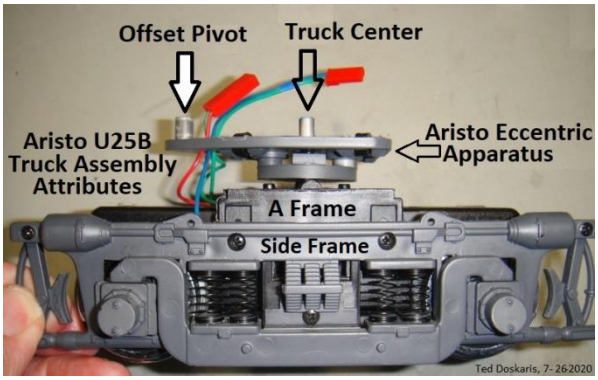
Before fastening lid to box, countersink its rear hole so flathead screw head is flush with lid surface.

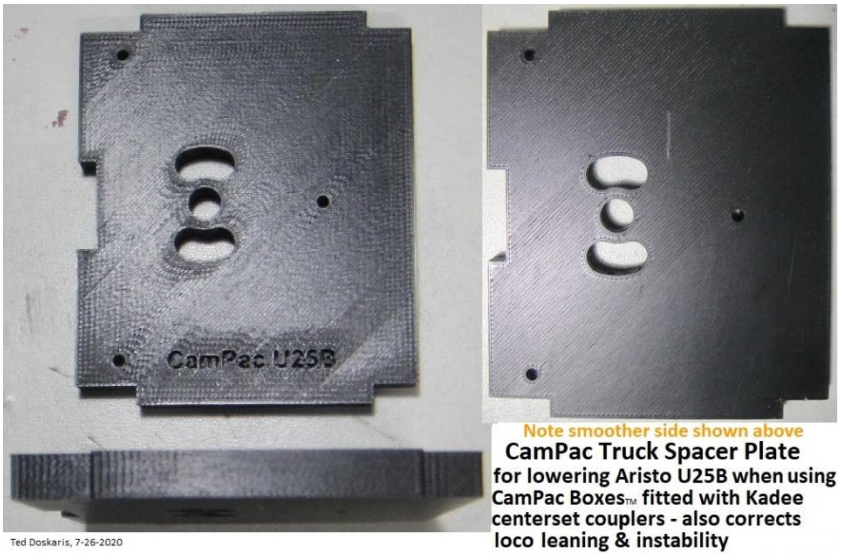
Note: For now, don't mount the box assembly on the pedestal. This will be done in Step 12.

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

Step 2 – Body Shell Removal

In order to replace the factory truck mount "eccentrics "with the *CamPac* lowering spacer plates, the loco must have its body shell removed. This is also needed to remove the factory swinging coupler assemblies



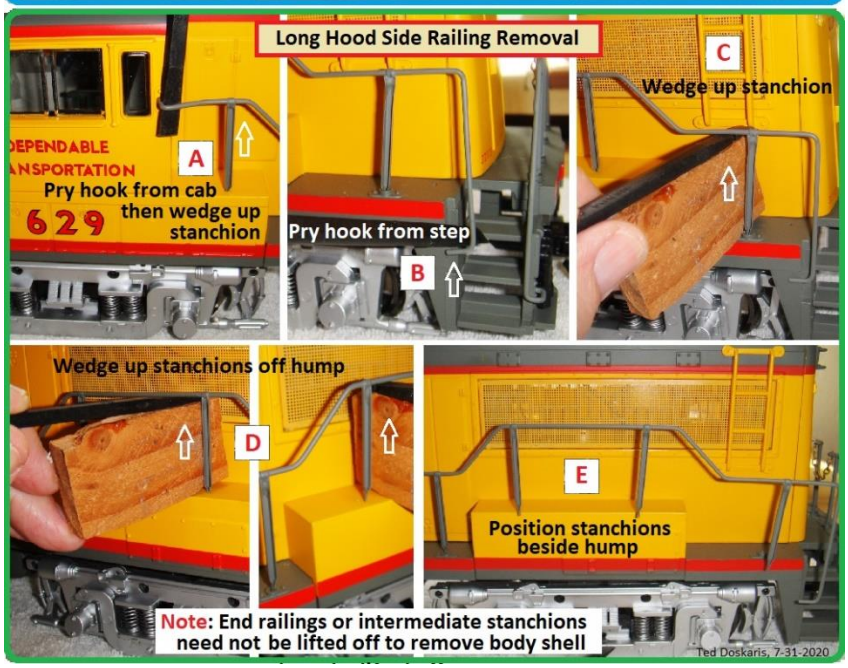


***FIRST*, Deal with the Railings**

It's not necessary to remove all railings before separating the body shell from the chassis.

The front & rear pilot railings can be left in place; however, side railings need only to have a few stanchions & hooks lifted away using a piece of wood & prying tool as illustrated

A Nylon prober / pry tool is preferable to minimize scratching the paint. The example Menda Nylon tool , #35622, can be obtained at low cost from Digi-Key, Mouser, Newark, etc. supply sources or via Amazon



***SECOND*, Dealing with Windows**

When taking off the body shell, it's almost certain the cab sliding widows will fall out because the cab's floor is not fully affixed, so it will partially drop down causing the windows to separate from its channel pockets. This should be prevented before taking apart the loco as illustrated below.

Temporarily taping U25B cab's sliding windows to sides prevents them from falling out when removing body shell

Example painter's tape used

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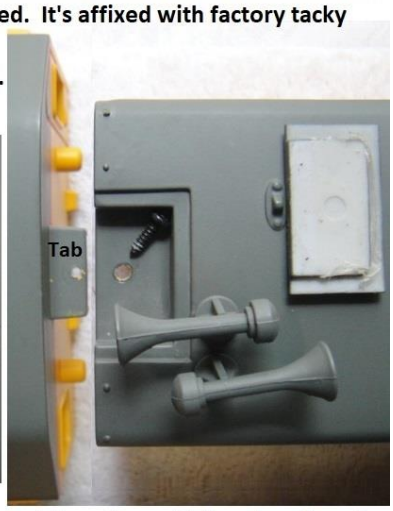
For more details about the cab, including keeping the floor in place, see Appendix A near end of this guide.

***THIRD*, Separating Cab & Hood**

When removing the body shell, the cab need not be separated from the long hood; however, it's easier to work on the loco when doing if damage can be avoided in the process.

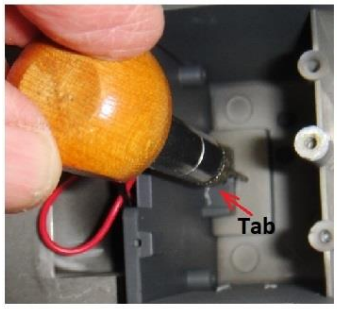
Illustrated is a technique using a Menda Nylon poker / prying tool to pry up the little cover.

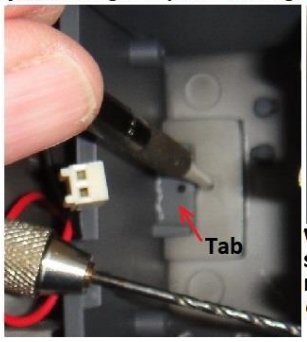
Aristo's U25B cab is attached at top to long hood with hidden screw beneath a removable cover; hence, to separate the two the cover must be dislodged. It's affixed with factory tacky glue that may be difficult to pry up without gouging.



If cover too difficult to remove without gouging, the cab together with long hood can be removed from chassis. Thereafter, to facilitate separating the two, drill hole adjacent to cab's tab from within long hood just enough to poke through and push out cover.

If gouging damage can't be avoided, the cover can be removed later once the cab together with body shell is removed as illustrated





With cover taken off, the screw within recess can be removed; thence separation of cab and long hood

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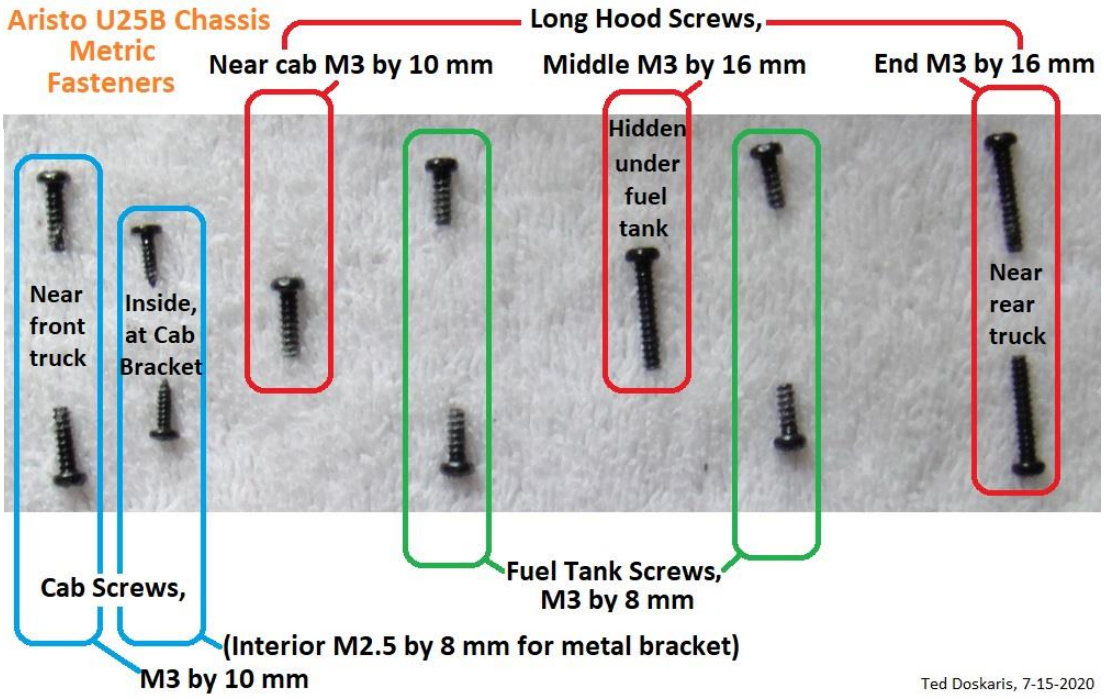
If the cover factory tacky glue is no longer usable to retain it, an example method using Velcro can be done as illustrated.

Of course, any glue residue should be removed from the cover's lip and mating surrounds in the long hood.

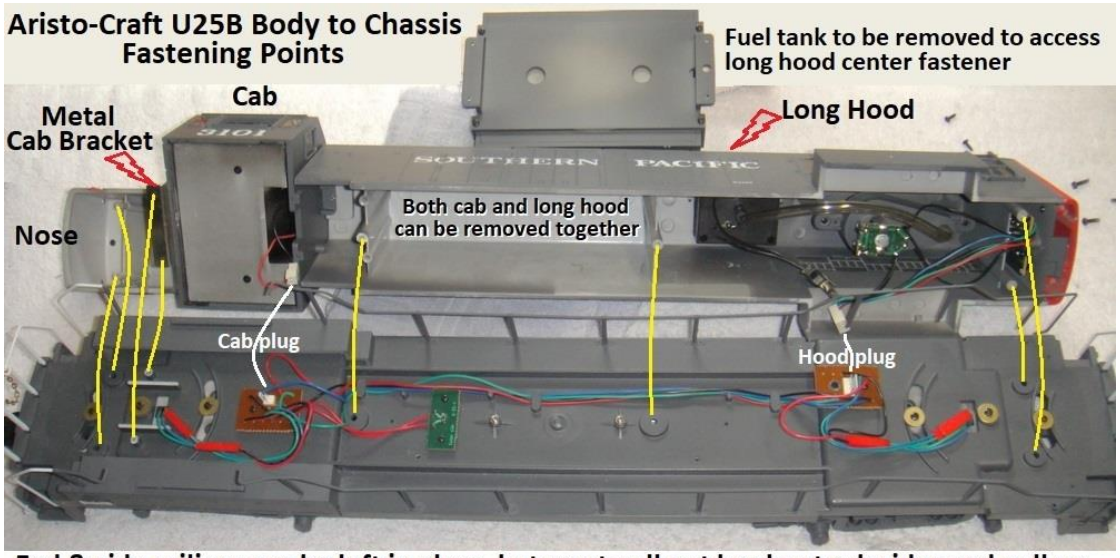
***FOURTH*, Locating Chassis Fasteners**

Factory screws used to fasten the cab and long hood to the chassis are shown from left to right, starting with the cab at the left

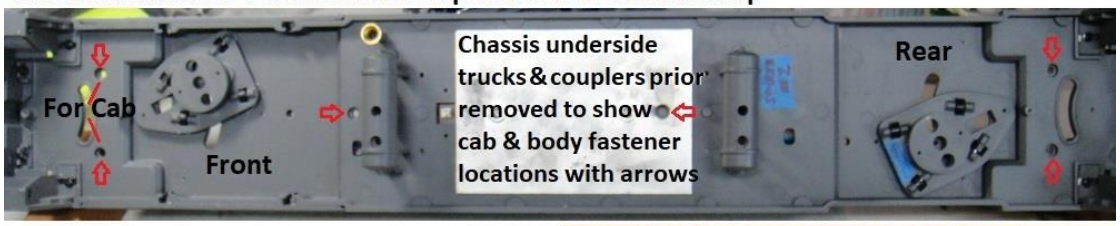


***FINALLY*, Remove Body Shell**

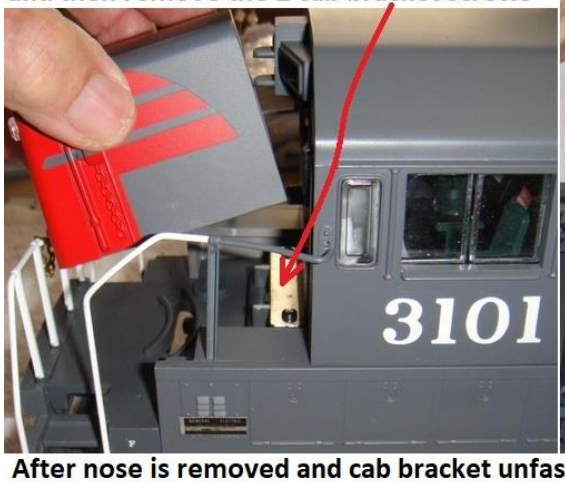
In order to remove the factory coupler assemblies or removing & replacing trucks, the body shell must be taken off by removing its fasteners. Accordingly, carefully place the U25B on its back (with underbody facing up) on a soft surface in such a way so that any delicate components (i.e. horns) are not at risk of damage. Ensure it's braced so not to fall over. Remove the fasteners and the two electrical plugs from the locations as illustrated below.

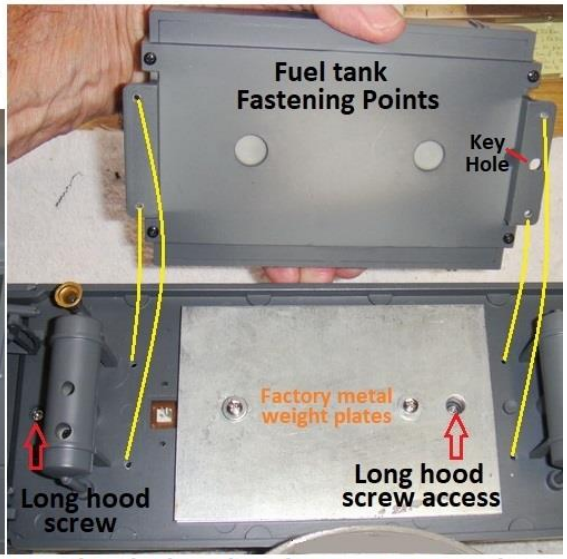


End & side railings can be left in place, but must pull out hooks at cab sides and pull up rear side last 3 or 4 stanchions and pull out end hook at step



With 2 chassis screws removed that retain the low nose, pinch the sides & withdraw it, and then remove the 2 cab bracket screws

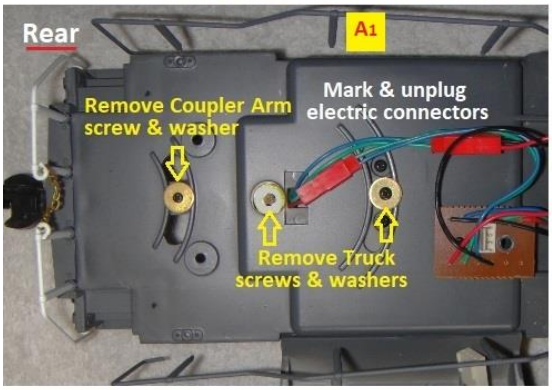


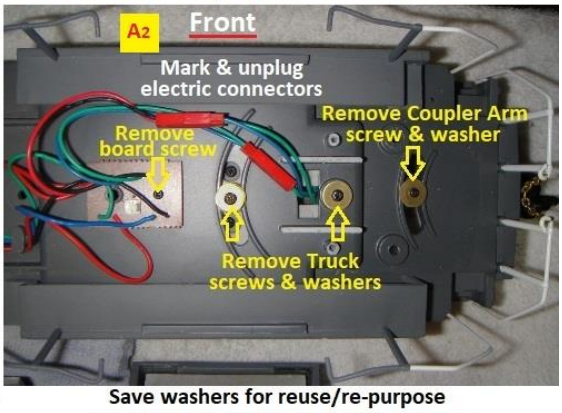


After nose is removed and cab bracket unfastened and 4 long hood screws removed, the cab & hood assembly can be carefully lifted away from the chassis - exposing electrical plugs for cab & hood to be disconnected - freeing up cab & hood. Ted Doskaris, 7-25-2020

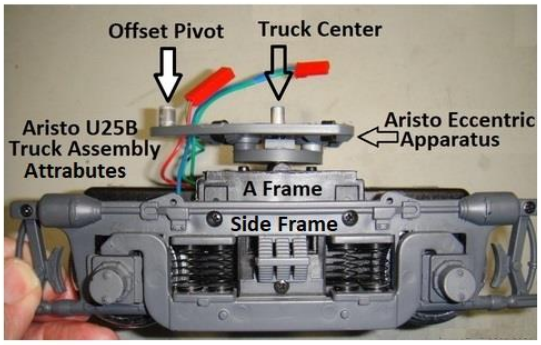
Step 3 – Trucks & Couplers Removal (The sequence of removing the fasteners & trucks is illustrated below.)

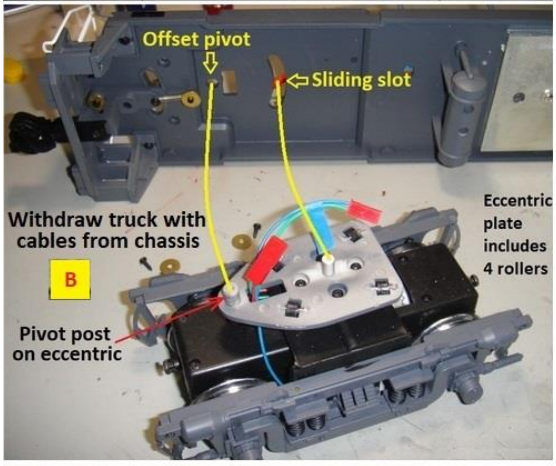
Aristo U25B Truck & Fastener Removal - Chassis, both rear & front

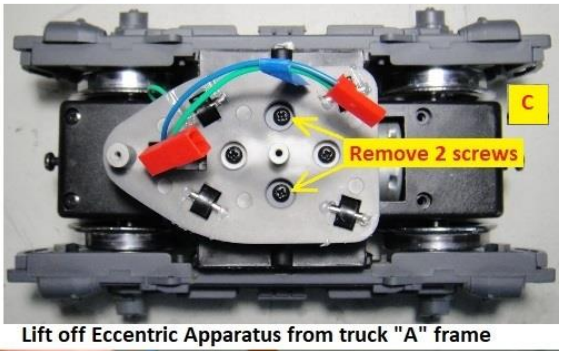




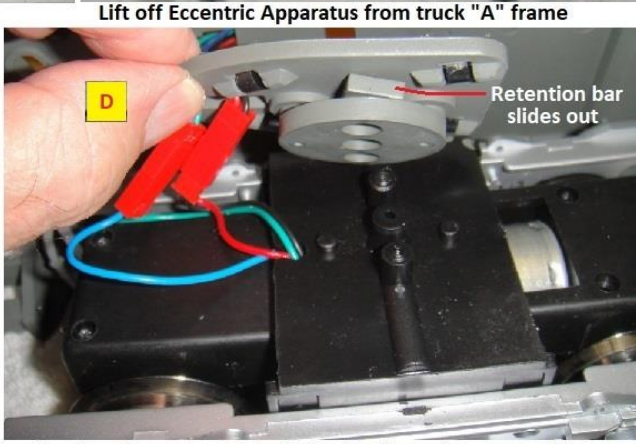
Save washers for reuse/re-purpose
Removal of front & rear trucks are same







Lift off Eccentric Apparatus from truck "A" frame



Trucks to be remounted via CamPac lowering spacer plates

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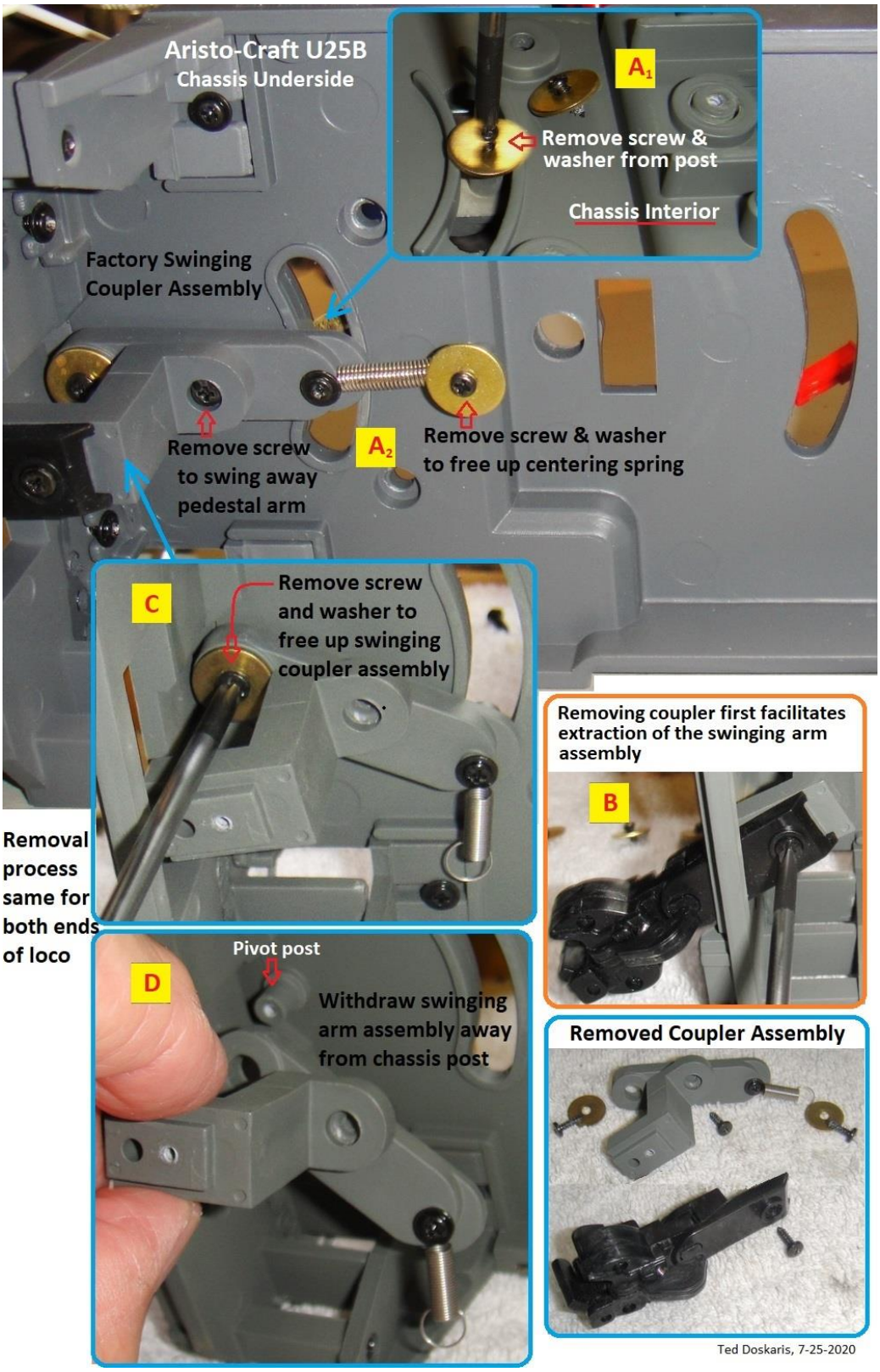
Step 4–Couplers Removal (The sequence of removing the fasteners &coupler assemblies is illustrated below.)

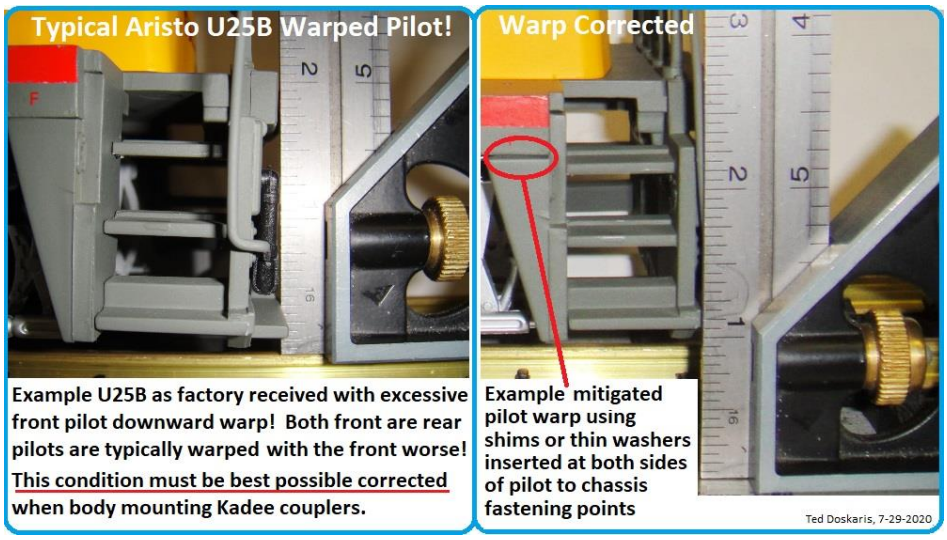


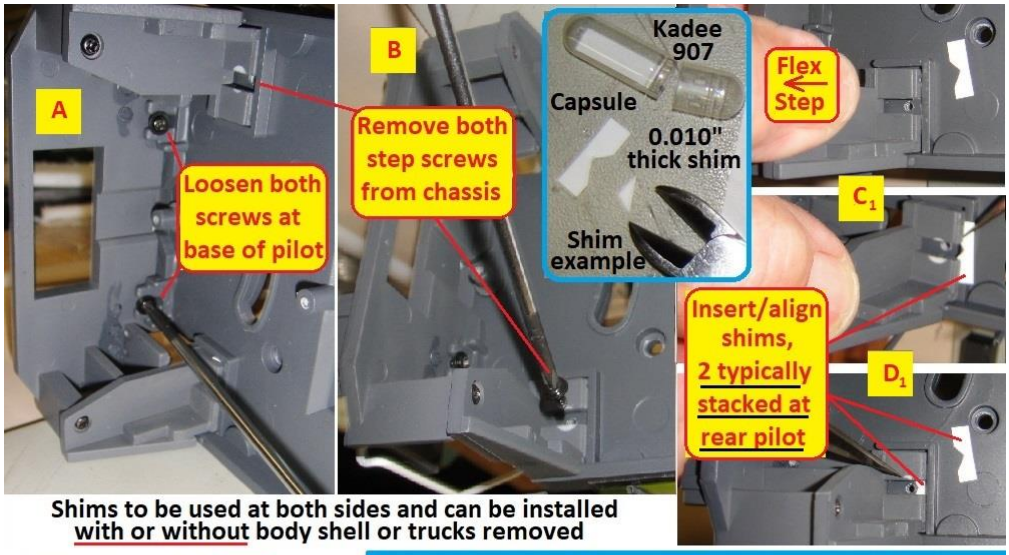
Step 5–Fixing / Mitigating Pilot Warp

The U25B pilots are profoundly warped at both ends of the loco!

<u>This condiion is to be corrected</u> using washers and shims - else once mounted Kadee couplers will not be able to align with the Kadee gauge.

Note: Correcting (or subsequent "tweaking") the warpage can be done whether or not the body shell is fastened to the chassis.



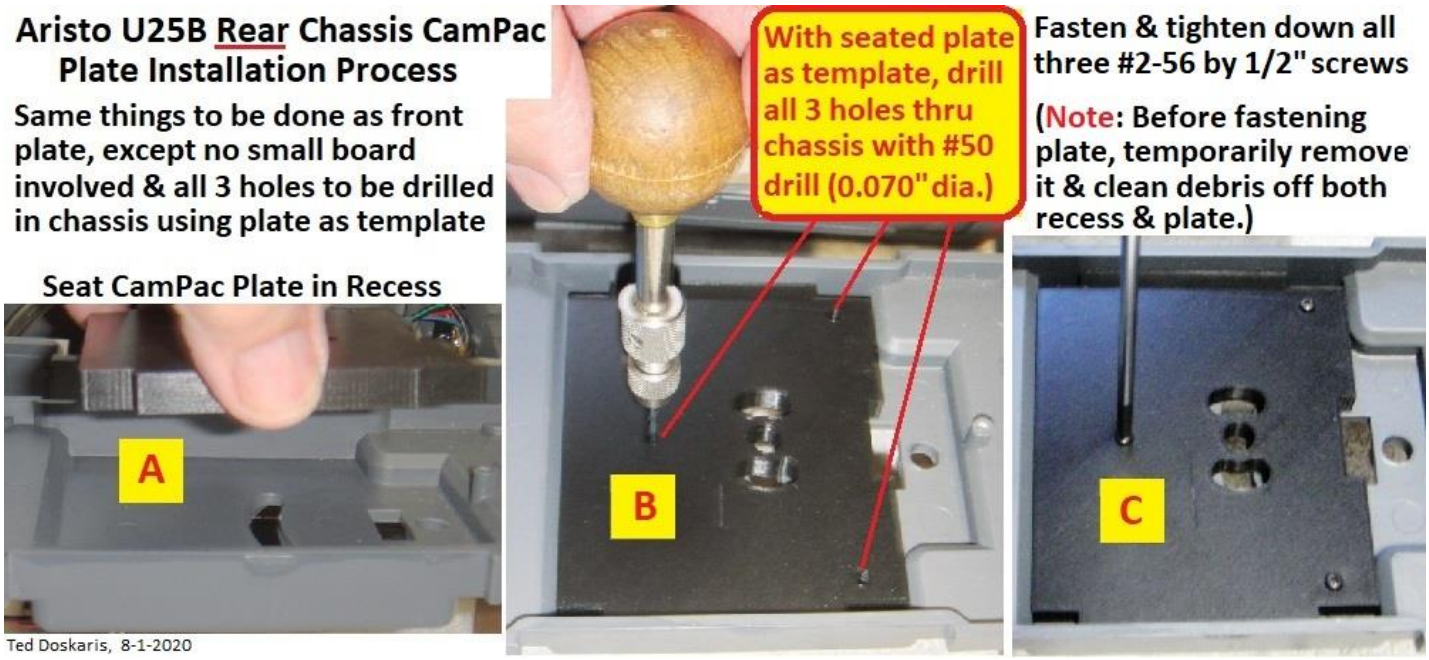


Step 6–Installing CamPac Truck Spacer Plates

Notes: It's preferable the plate's smoother side faces up when installed in the chassis recess.
Though a #2-56 tap is preferable to thread holes once drilled into the chassis; using some downward force on the screws whilst turning should self-thread them into the holes.

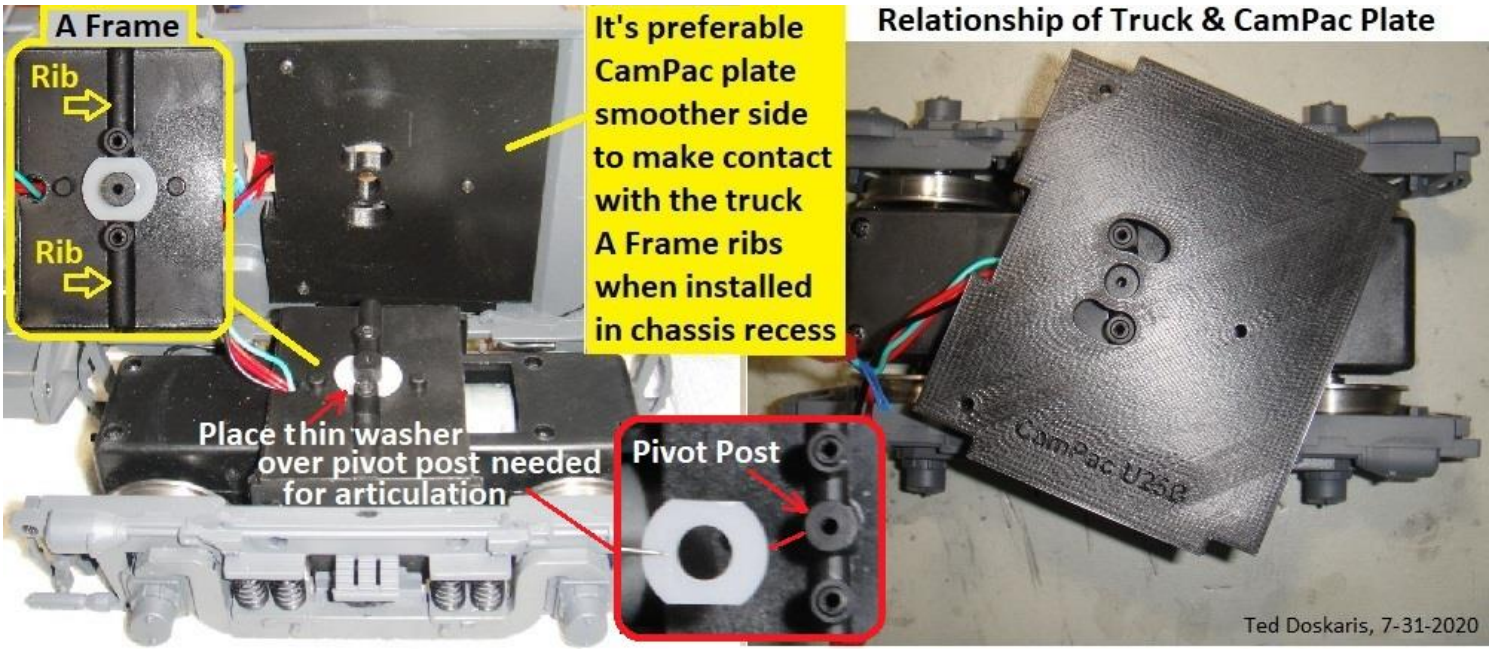
Front Plate:

Rear Plate:



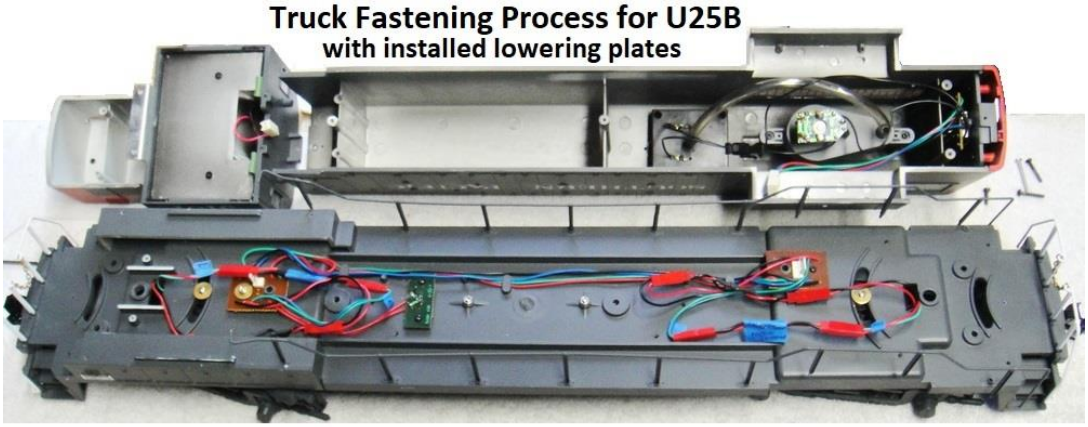
Step 7–Truck Re-Installed with CamPac Plates

As shown below, the truck's A frame center post will now be the pivot point when fastened in the chassis with rotation limits established by the plate's "kidney" pattern. This mimics Aristo locos that include the RS3 and FA/B1.



The thin (0.015 inch thick) washer shown above is required, particularly important when the loco is equipped with later production, rigid mounted, ball bearing motor blocks.

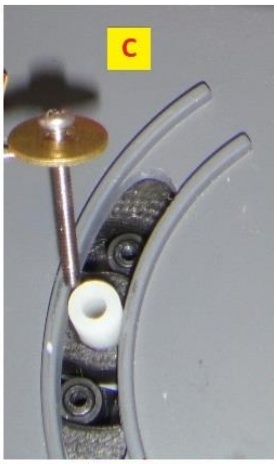
Truck Fastening Process for U25B
with installed lowering plates

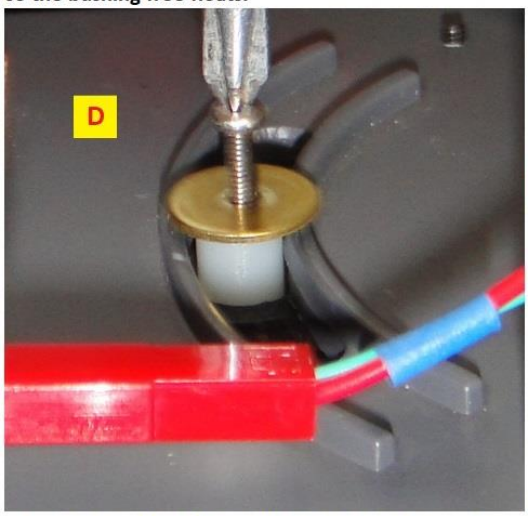


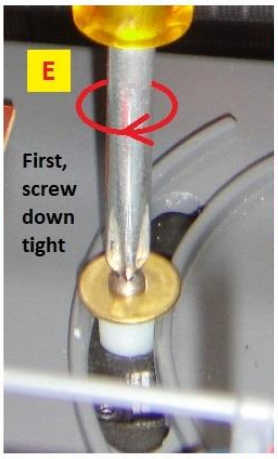
A #2-56 by 3/4 inch long machine screw is used to fasten each truck to the chassis along with factory mini fender washer and 1/4 inch OD by 3/8 inch long plastic bushing.

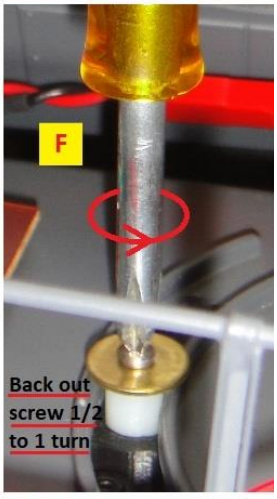
Front & Rear Truck Same

With a little downward pressure, the screw can self thread thru the truck's A frame center post. The screw is first tightened all the way down, and then backed out by 1/2 to 1 turn so the bushing free floats.

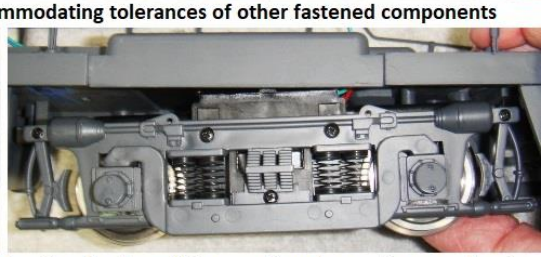








Floating bushing allows truck to rock up & down - accommodating tolerances of other fastened components



Trucks must freely rotate and noticeably rock up & down to allow best possible operational compliance on tracks

Ted Doskaris, 7-24-2020

Step 8 - Body Shell Reinstallation

With the installation of the trucks with CamPac plates now done, reassemble the car body shell and nose on the chassis in the reverse order in which they were removed.

Warning: Because it's likely to pinch the electrical wires during this process, it's best to install the cab first, then the long hood - being careful to dress the wiring away from any pinch points. Once the shell is installed, be mindful that if removing the shell again, there will be an added screw on the long hood (described later) at the tail of the CamPac pedestal that must be removed along with the other factory screws.

Step 9 - Pilot Notch Cutout

Do same for both front & rear pilots

Pilot area marked / scribed to be cut to dimensions as shown.

Desired depth of cutout is 0.260 inch to 0.270 inch max.

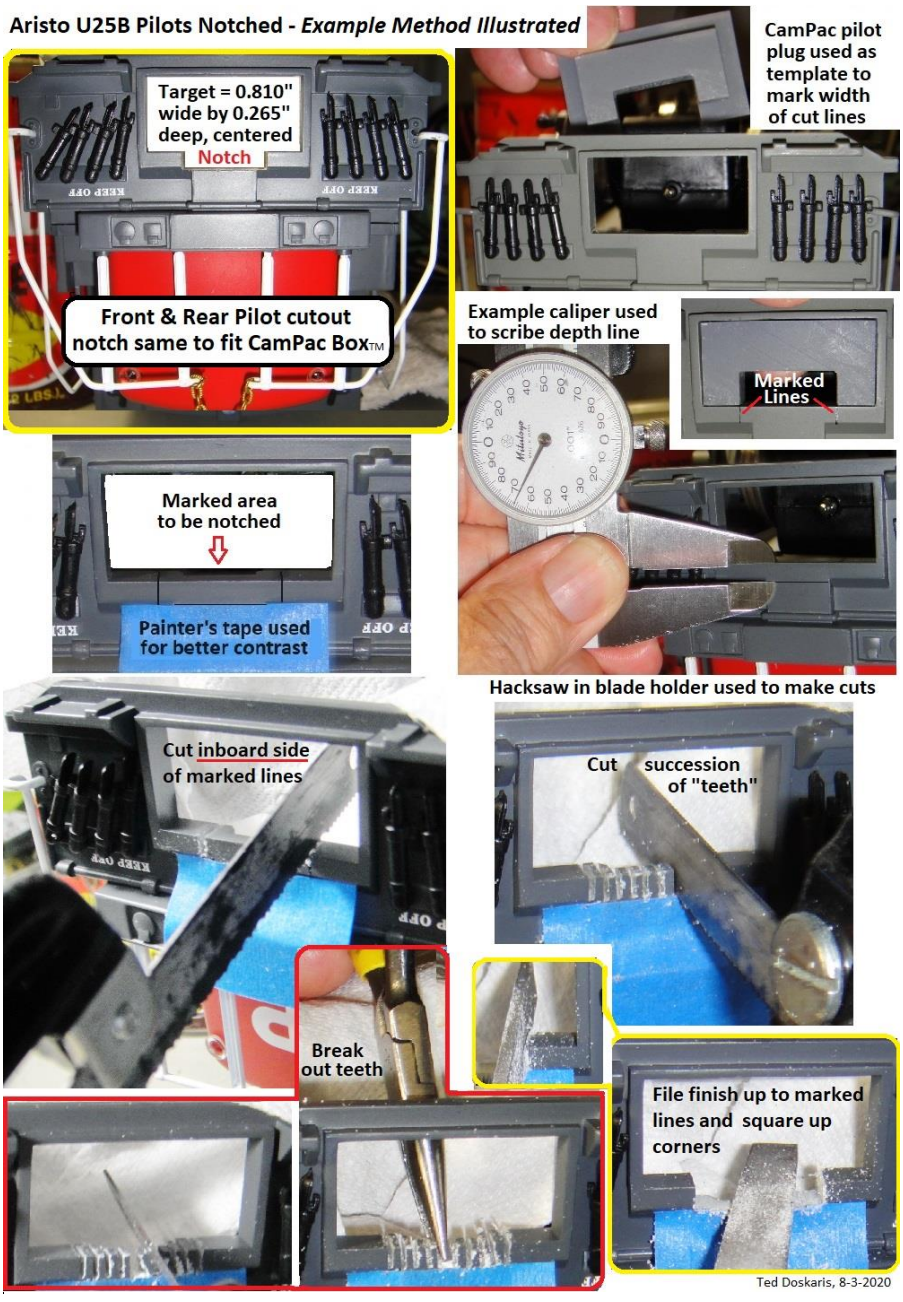
Establish boundary marks for notch cutout.
(Ensure marked area is horizontally centered within overall pilot opening. Using the CamPac pilot plug can establish centering.)

For some loco colors, cutout lines may be poor in contrast. Applying painter's tape beside cut lines may be helpful to improve visibility.

Example method illustrated using razor saw to cut closely spaced successive "comb teeth"

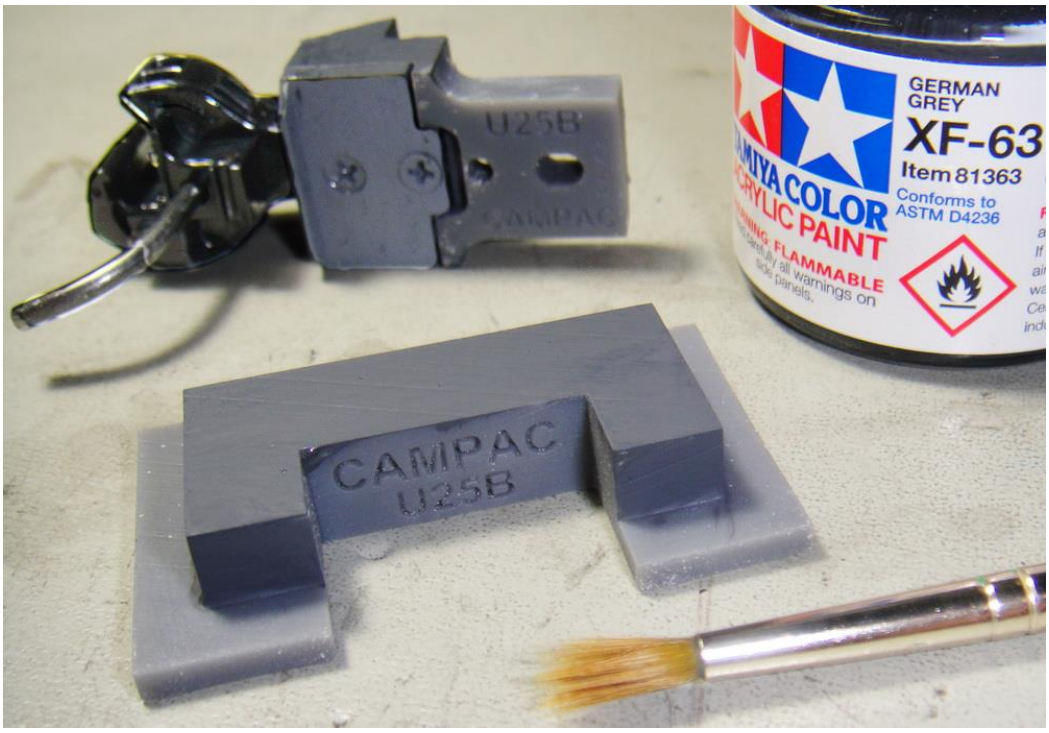
Progressively break out "teeth" starting from center to edges with small needle nose pliers.

Finish to marked boundaries and "square up"corners using files.



Step 10- Pilot Plug Installation

If desired, the CamPac pilot plug (and preassembled CamPac coupler box assembly) can be pre painted to match the loco's livery. This is best done before installing them.



When done with notching out the pilots, install the pilot plugs. If they fit too loose, they can be glued in place. This must be done before installing the CamPac coupler boxes so they will mount centered without binding.

Step 11 - Pedestal Installation

Follow the illustration for sequence of operations.

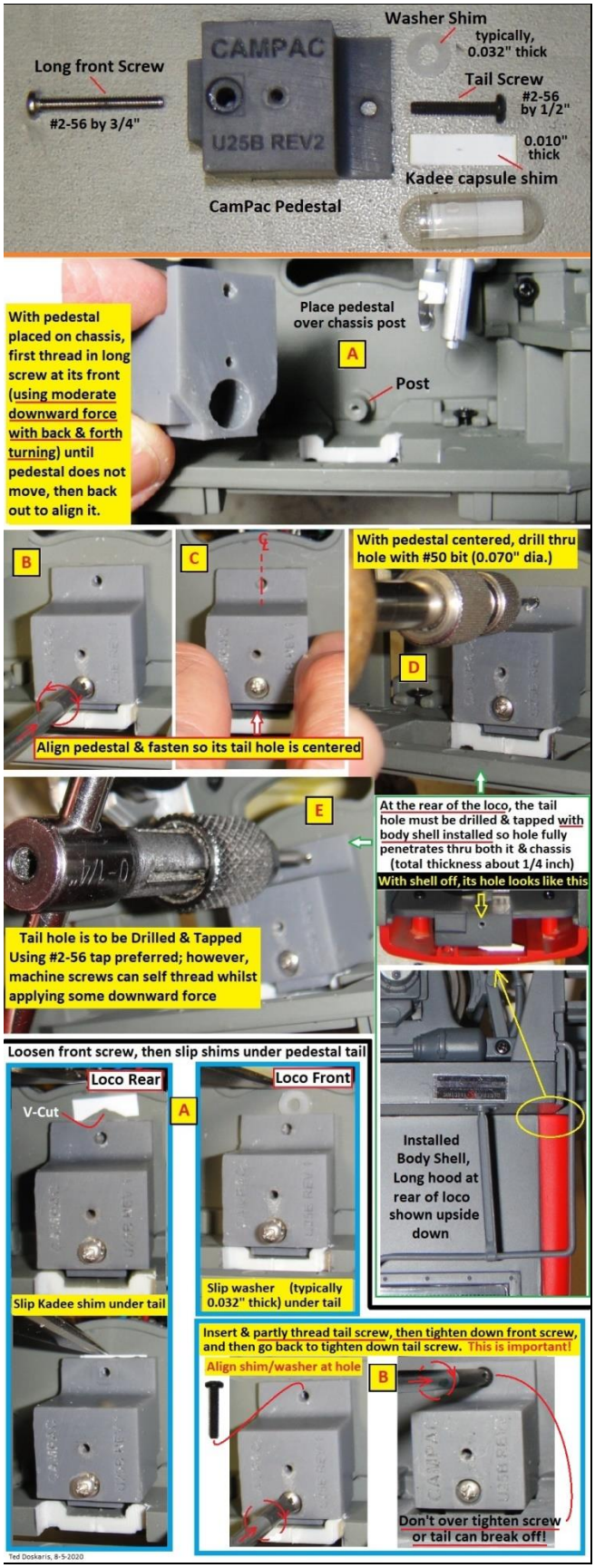
Orient the CamPac pedestal to go over the chassis post formerly used as the pivot for the factory swinging coupler arm. (The pedestal only goes in one way.)

The pedestal must be centered to properly establish where to drill its tail hole in the chassis.

The tail hole to be drilled thru the chassis will also penetrate within the long hood area near the bottom of the back door; hence, the long hood must be installed for this operation.

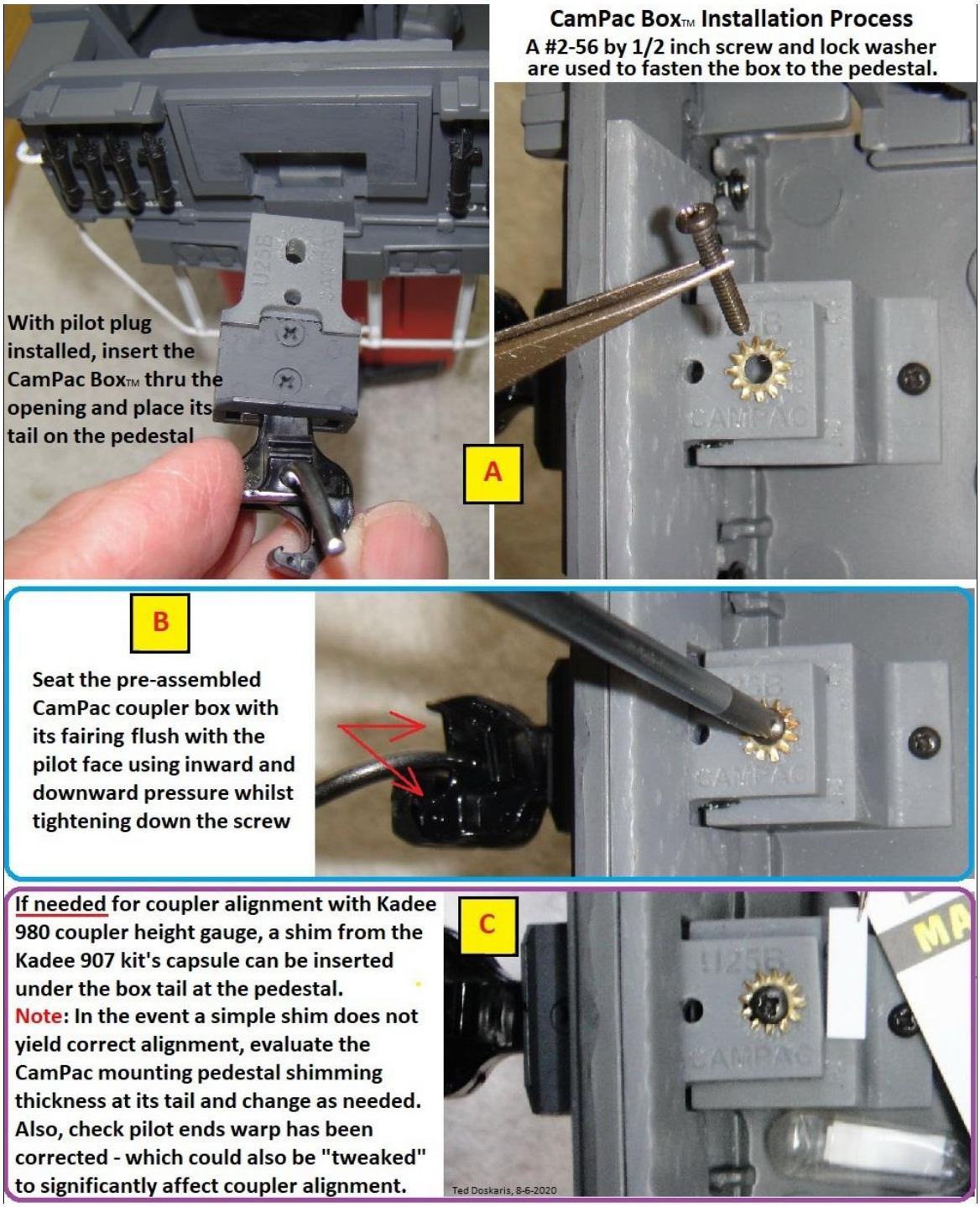
The pedestal tail will need to be shimmed differently for the loco's front and rear. (Typical shim / washer thickness shown in illustration)

Warning: Be sure to torque down the pedestal front screw first, and then torque the tail screw finger tight. (Not doing this sequence will cause the pedestal to be misaligned, or worse, break off its tail!)



Step 12 - Coupler Box Installation

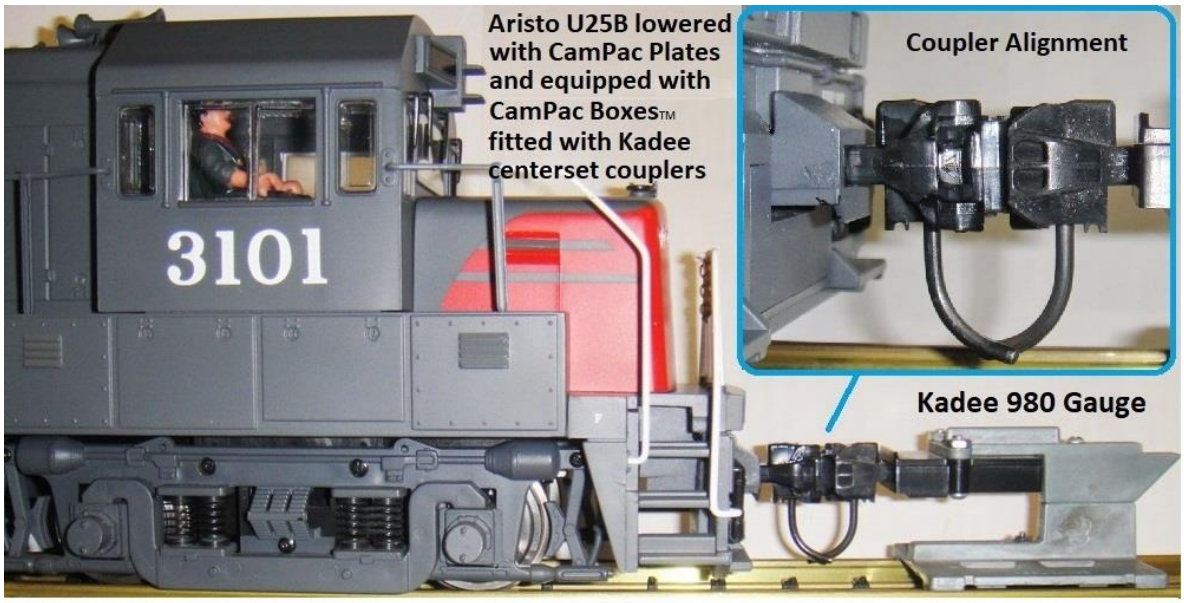
Illustrated is the fastening procedure for the coupler box with preinstalled Kadee centerset coupler, springs & lid from the Kadee 907 kit previously described in Step 1. Follow the sequence of operations shown in the illustration.

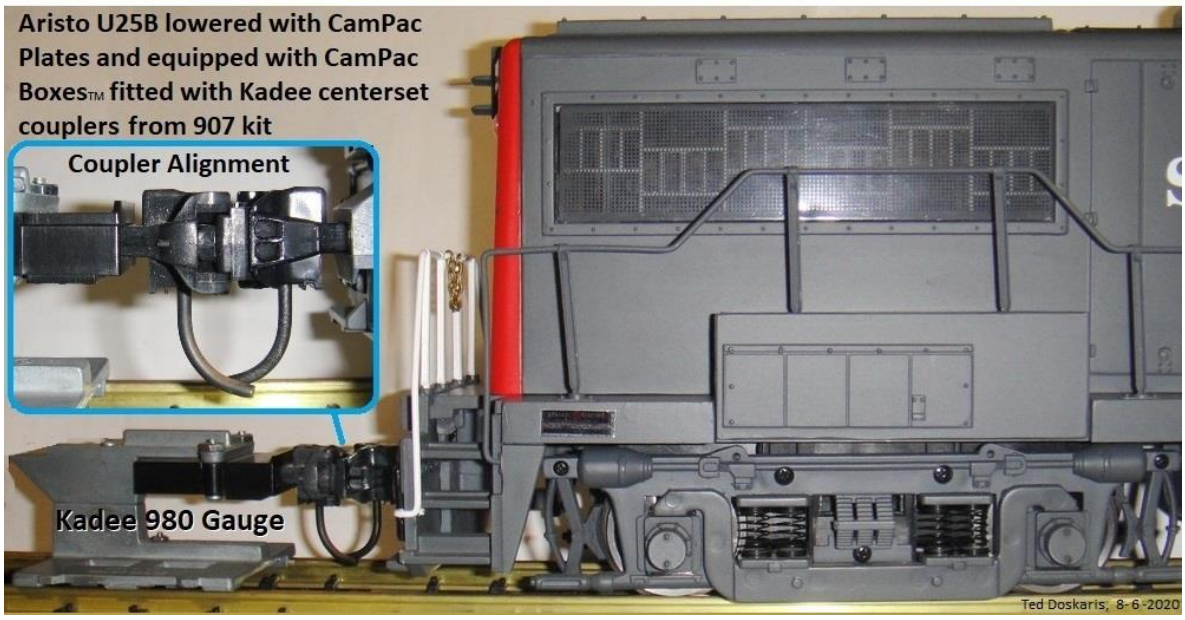


The body shell must be installed when evaluating coupler alignment with Kadee's coupler height gauge *-shown next*.

Note:. Once the body shell is installed, be mindful that if removing the shell again, there is the added screw on the long hood at the tail of the CamPac pedestal that must be removed along with the other factory screws.

Example U25B front & rear coupler alignment illustrated below:





Appendix A - U25B Cab Details

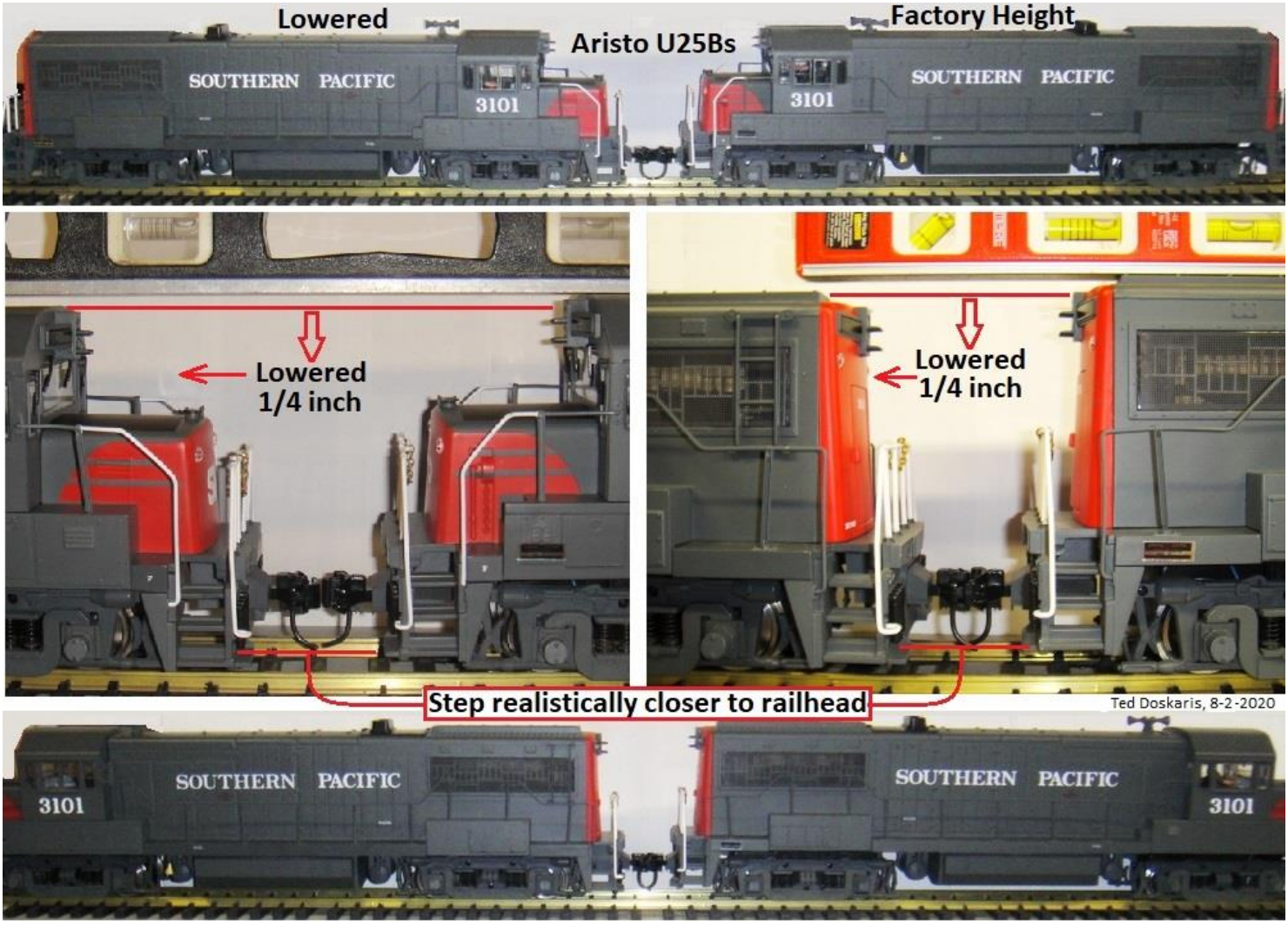
Cab sliding windows are shown taped in place without floor installed.

The floor can be completely removed and reinstalled without difficulty when the sliding windows are taped in place.

On early production U25Bs, the engineer is on the left (wrong) side of the cab. It's best to unfasten and swap both chairs to move the engineer to the right side as illustrated.

Example like kind U25B Loco Comparison

(Showing difference in height with the loco on the left virtually like the prototype)



Operational Advisory:

Layouts with "S" bends having tighter curves of 8 foot in diameter & possibly greater are to have a straight track section the length of an U25B or longest car between opposite diverging paths or risk the U25B coupled car to derail.

!!!*Done*!!!

Congratulations

The Aristo-Craft U25B now looks more like the prototype with capability to perform without leaning over on 8 foot diameter or greater curves when coupled to other body mounted locos or rolling stock having *properly equipped* Kadee centerset type couplers.