

Installation Guide

USA Trains F3 & CamPac Components

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2/6/2019

**USA Trains F3A fitted with CamPac Box™
equipped with Kadee 907 centerset couplers, springs and lid**



Rear diaphragm shortened to 3 flutes - similar to Aristo E8/9 for closer coupling distance



F3A coupled to Streamliner having
body mount Kadee 907



8 foot dia. curve

Installing 3-D Printed pedestal and coupler box components on F3A & B units

Overview

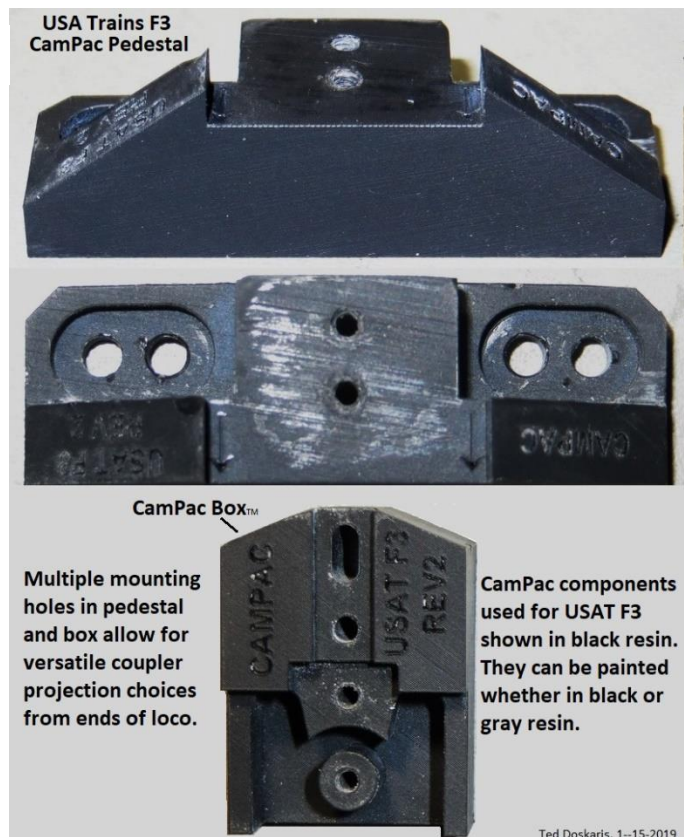
- Instructions are provided as a guide for the installer of 3-D printed *CamPac Box™* and pedestal on the USA Trains brand EMD F3A & B “G” (1/29) scale diesel locomotive¹. With *CamPac* components properly installed, layout operation is intended for 8 foot diameter or greater track curves.
- The rear of the F3A unit is also like both ends of the B unit. (Revision to A unit includes front pilot cutout to accept coupler box. Revisions to A & B units include diaphragm shortening and tweaking cut levers.)
Note: Revisions or modifications 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 4 inch long thin neck Phillips type P1 screwdriver, offset flat tip screwdriver, hack saw in blade hand holder, sharp pencil or pointed scribe or razor knife to mark cut lines, medium & small size files. (Measuring tools include ½ inch wide by 6 inch long machinist scale, caliper optional.)
- *CamPac* 3-D printed components include coupler boxes (2), and pedestals (2). Other items are #2-56 long screw (2), #2-56 flathead screw (2) and #2-56 pan head screw (2)
- Not included: The installer will need to supply a Kadee 907 kit (1) of which all (but the plastic box & lid screw) will be fitted onto each *CamPac Box*.

Coupler Box & Pedestal Relationship



Instructions provided to accomplish:

- ✓ Install Kadee kit parts onto *CamPac Box* (coupler box)
- ✓ Remove & prepare pilot assembly from F3 A unit loco
- ✓ Cut out notch in F3 A front pilot to accommodate box
- ✓ Tweak front & rear cut levers to clear couplers / trip pins
- ✓ Remove body shell - *with exception*
- ✓ Modify diaphragm/s - *or eliminate it*
- ✓ Reinstall Body Shell & Pilot Assy.
- ✓ Install mounting pedestal & coupler box assembly on both ends of loco



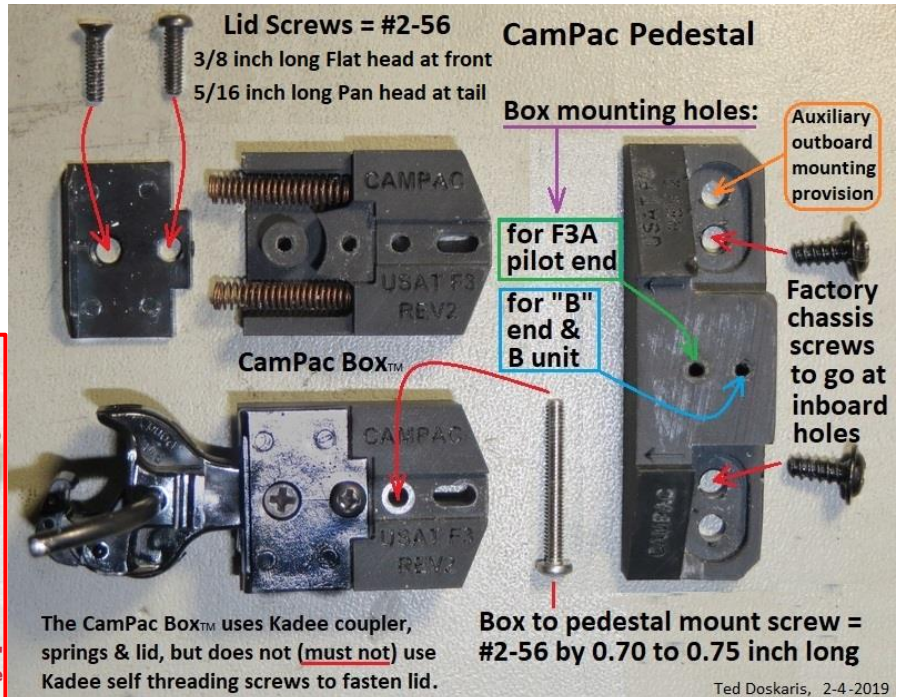
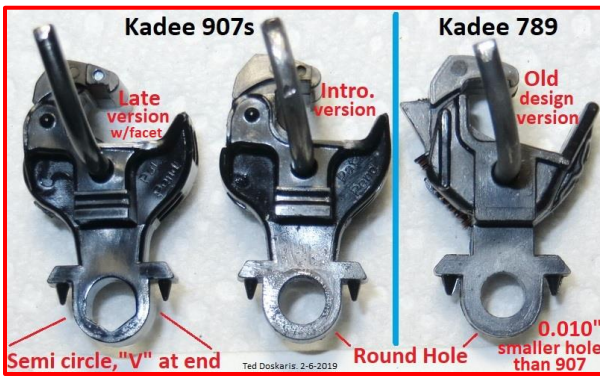
¹ **Caution:** When operating the locomotive, abrupt excess force (e.g. collision/yanking) to the coupler may result in damage to coupler, coupler box, or other components. Operating the locomotive coupled to a car with truck mount coupler on tight curve track is incompatible - the car can be pulled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

Installation Steps:

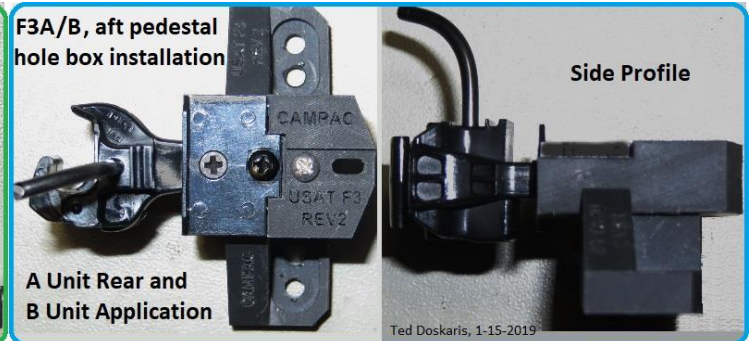
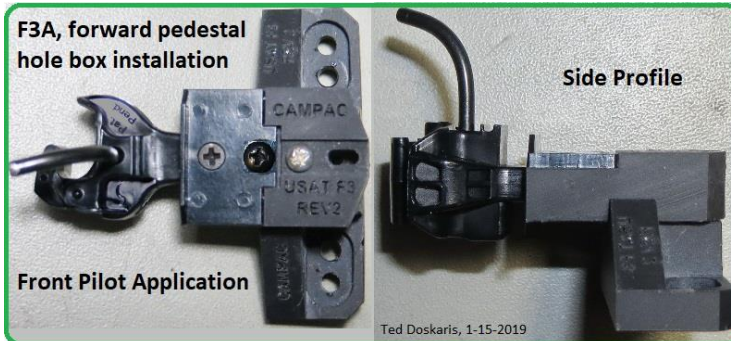
Step 1 – Coupler Box Preparation

Install selected parts from a Kadee² 907 Kit in the *CamPac Box*. (Box to be fastened to pedestal & mounted later)

The CamPac box is optimized for the "G" scale preferential, late version, AAR E type coupler from the Kadee 907 kit not having a completely round shank hole compared to its introduction version or older predecessor coupler from the 789 kit. Both prior version couplers can bind on box mounting post - shank hole would need to be enlarged to fit.



Verify installed coupler freely swings side to side & self-centers. If not, slightly back out lid screws one at a time. Also, try to tighten the lid's tail screw with front screw loosened. Burnishing the coupler shank pivot surfaces can be beneficial, too.



Note: For now, don't mount the box assembly on the pedestal. This will be done in Step 6.

Step 2 - Loco Placement

Without pressing on the F3 delicate side grilles, port holes, windows & wipers, carefully place the loco on its back (with underbody facing up) on a soft surface in such a way so that any delicate roof components (i.e. horns, antenna) are not at risk of damage. Ensure it's braced so not to fall over.

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

Step 3 - Parts to Remove

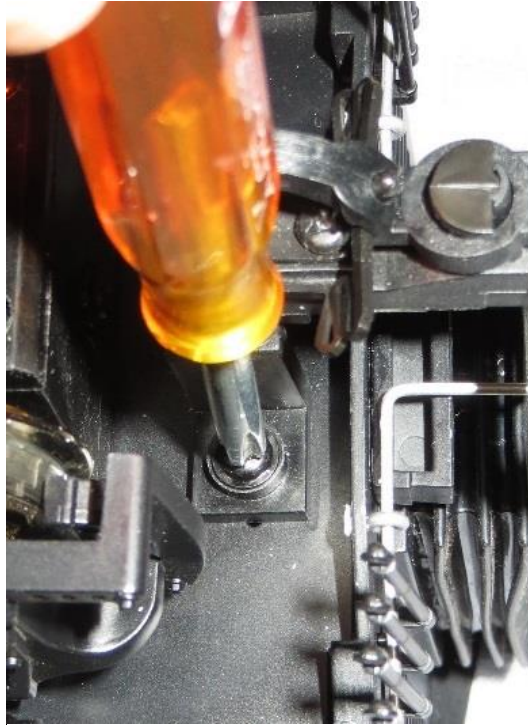
Step 3A

Couplers & Pedestals:

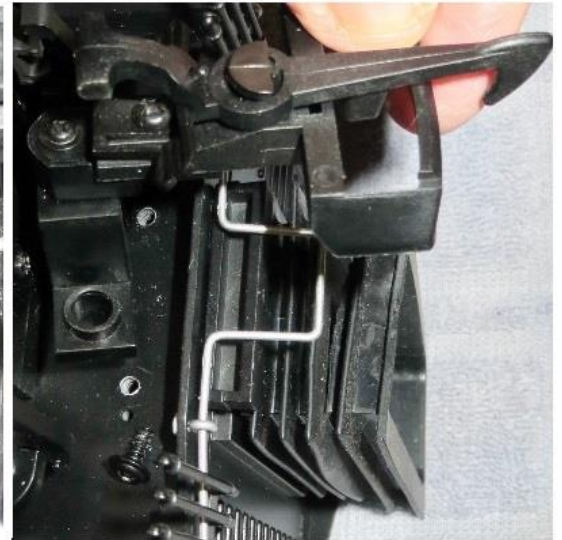
Couplers and pedestals can vary from those illustrated

Remove coupler with pedestal from both ends of the loco.

(First, remove the 2 screws at the base of the pedestal, and then extract it.)



Remove factory (or aftermarket) coupler with pedestal from rear of F3 A unit - both ends of B unit.



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At the F3 A unit pilot end, both the pedestal and coupler are to be removed. The expectation would be to remove the coupler from the pedestal first; however, if equipped with the factory dummy coupler (illustrated), it cannot because it's attached from the pedestal's underside. The pilot cut levers are also to be unhooked from the dummy coupler.



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The pilot to be collectively removed along with factory coupler & pedestal



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Note: If equipped with factory dummy coupler assembly, unfasten the pedestal and the pilot (described next), and then carefully withdraw all together. This would also make it easier should cut levers that are festooned to the "knock-out" plug be difficult to unhook. Withdrawing the dummy coupler and removing the knock-out plug from the pilot are later described in step 5.

Step 3B

F3A Unit Pilot Removal:

For the F3 A unit, its pilot is to be modified (cut out area) to allow for closer coupling distance for which CamPac components are optimized.

Remove the front pilot.

If pilot plug ("knock-out") was not installed, locate it for later use if desiring prototype appearance

(Pilot reinstallation after modified with knock-out plug would be in reverse order.)

Step 3C Body Shell Removal - *for diaphragm*

CamPac box & shortened diaphragm work in concert to facilitate closer coupling distances. Though it's possible to remove the diaphragm without removing the body shell, a modified diaphragm cannot be installed without providing access to the interior. (As an alternative, eliminate the diaphragm as many prototype railroads had done - thus, the body shell need not be removed.)

Caution: With all chassis screws backed out (they may remain in recesses) the chassis can be lifted off the body shell with finger placed in belly hole whilst gently pulling up on one of the trucks. See illustration.

The chassis is very thin and can flex. If too much flexing, stop! Check all screws are indeed backed out.

Step 3D Remove Coupler Springs

Remove factory coupler centering springs at both ends of the chassis because they can interfere when CamPac boxes are installed.

(If choosing destructive method, the long leg of the springs can be cut off from outside - convenient if body shell not removed)

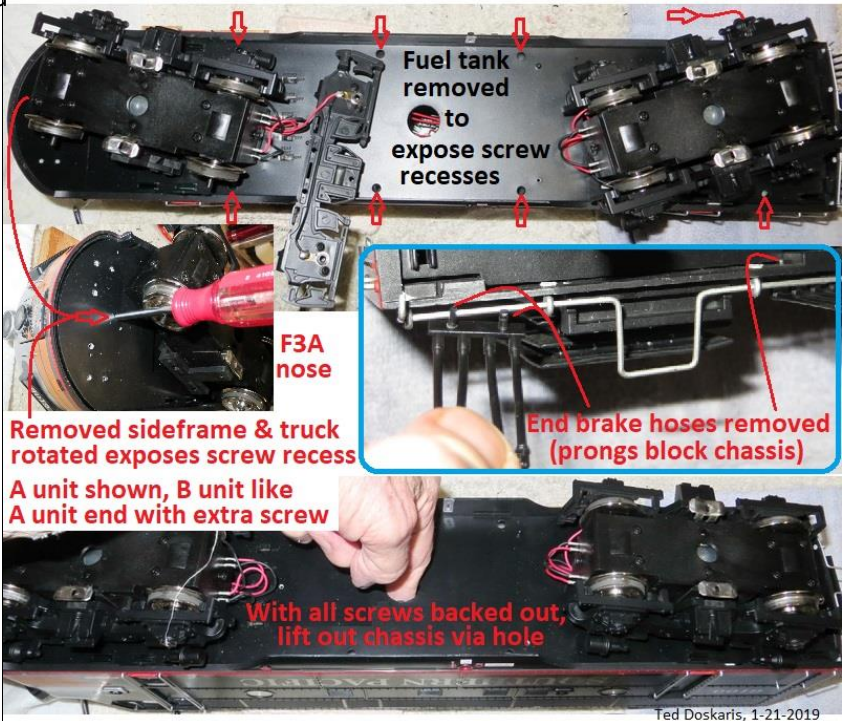


Remove pilot to chassis fasteners (2 possible screws each side) then lift out pilot from chassis crevasse

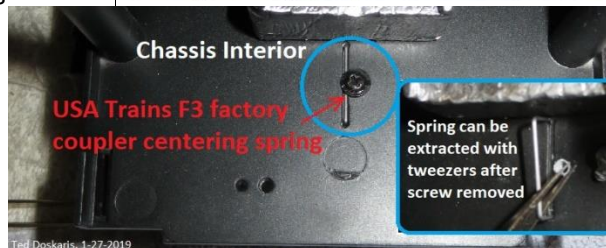


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USA Trains F3 Chassis/Body Shell Fasteners (9 for A unit, 10 for B unit)

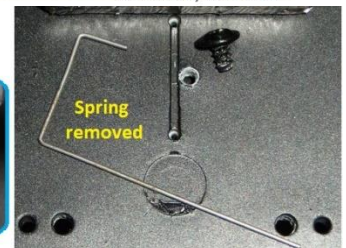


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Chassis Interior
USA Trains F3 factory coupler centering spring

Spring can be extracted with tweezers after screw removed



Spring removed

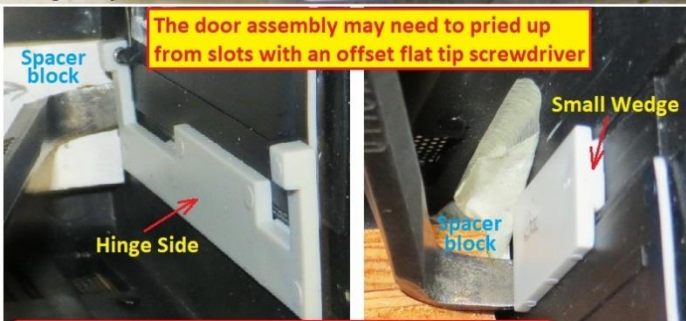
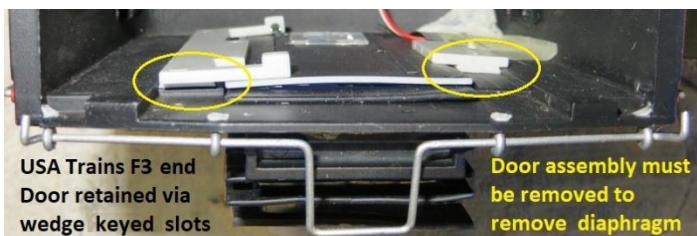
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Note: If choosing to eliminate the diaphragm (with some manipulative acuity required to remove it in order to forego the need of interior access), skip to step 5.

Step 3E Diaphragm Removal - with body shell removed:



Note: Taking out the end door assembly may not require using the above tool to facilitate removing the factory diaphragm for modification, but to remove an installed *modified* diaphragm will likely need the tool.



First, slide up and remove the small trapezoidal shaped wedge before doing same to the hinge side of door



Step 4 Diaphragm Modification

The diaphragm is to be modified (shortened) to allow for closer coupling distance for which CamPac components are optimized – as illustrated below.

USA Trains F3 Diaphragm Modifications (shortened from 6 to 3 flutes)



Caution: Door assembly is susceptible to coming apart when hinge end not held together with door

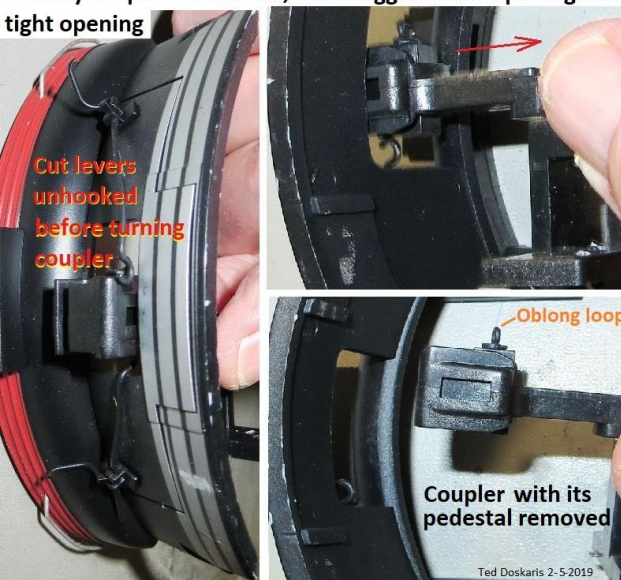
Step 5 - F3 A Unit Pilot Cutout

Step 5A Preparation - *done before cutting pilot body:*

Shown below is F3 A factory dummy coupler with cut levers that must be unhooked. The coupler is to be discarded.



Dummy coupler turned 90°, then wiggled whilst pulling thru tight opening



For clarity, a removed light colored example pilot assembly will be illustrated with "knock-out" plug but cut levers removed.

Note:

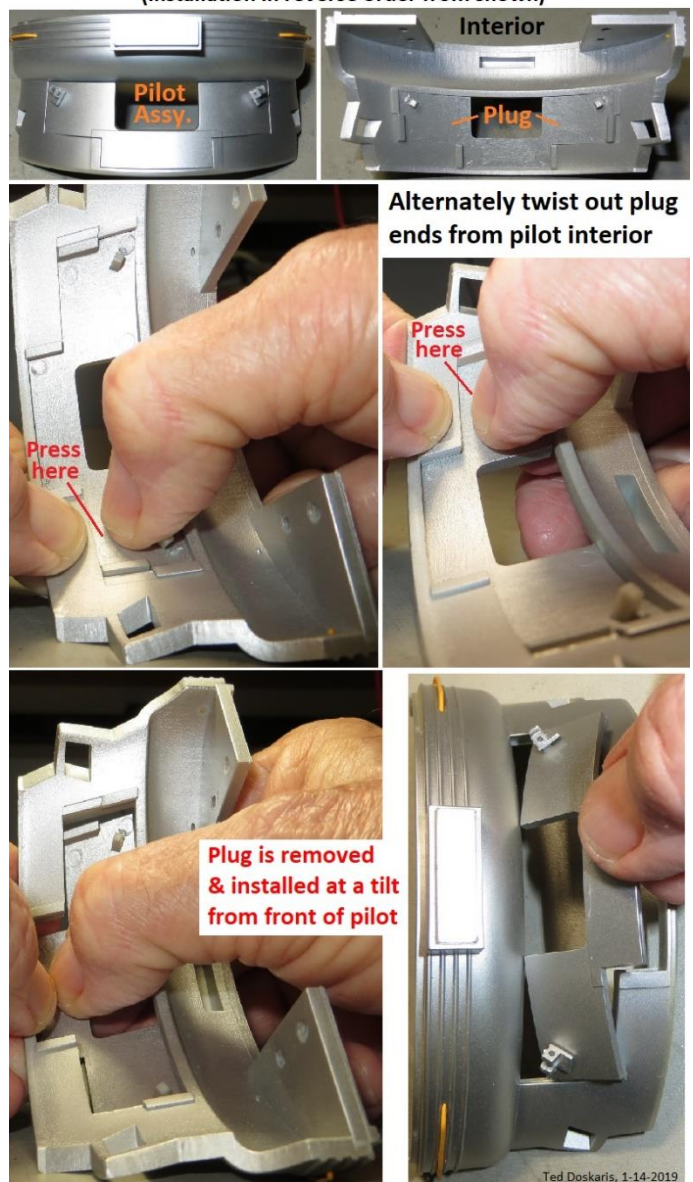
The cutout that is to be performed to the pilot body can be done with knock-out plug and its cut levers installed (albeit with compromised accuracy, added difficulty & some risk of damage). If doing so, the knock-out plug must be properly aligned for best accuracy as illustrated.

The knock-out plug is to be removed and reinstalled to best center it or completely removed when using the preferable method (next page) to make the cutout to the pilot body.

Illustrated is an example method to R & R knock-out



USA Trains F3A Pilot Knock-out Plug Removal Method (Installation in reverse order from shown)

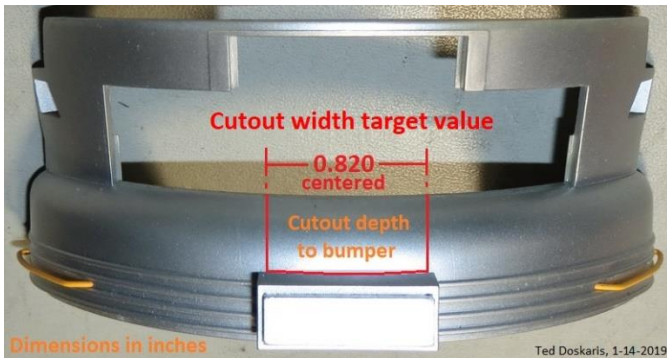


Step 5B Making Cuts

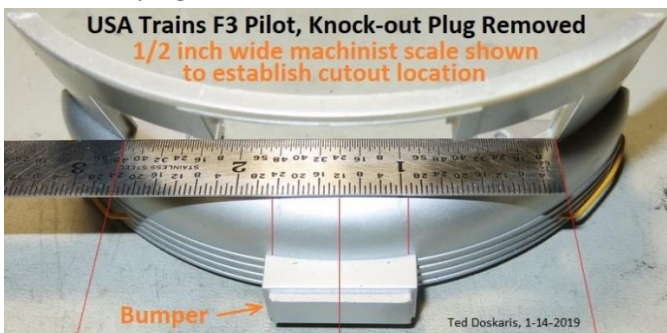
Preferred Cutout Method, Described & Illustrated

With knock-out plug removed, the pilot body area can be marked to the cut dimensions as shown.

Desired target depth of cutout is to pilot's bumper surface. Dimensions shown are in inches.



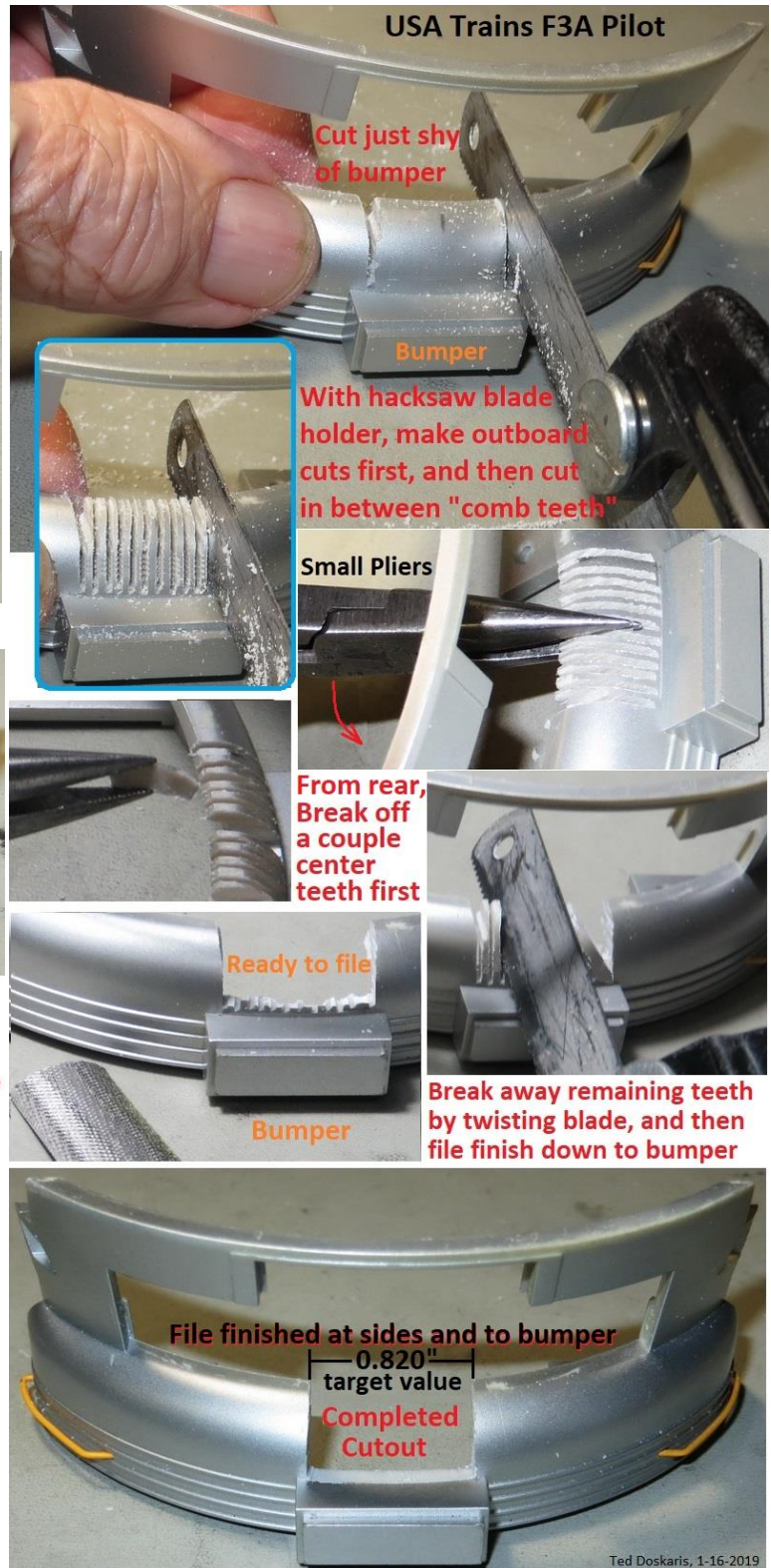
Removed plug facilitates use of machinist scale.



Overall width measures 2 & 3/4 inch
(Center line is at 1 & 3/8 inch)

Initial vertical cuts to bumper: + & - 13/32" from centerline

- Ensure marked area is horizontally centered within overall pilot opening - example using machinist scale shown above.
- Establish boundary marks for cutout width.
- Method illustrated is with pilot held on non-slip matt and using hack saw with blade holder to cut closely spaced successive "comb teeth"
- Progressively break out "teeth" starting from center to edges with small needle nose pliers and twisting saw blade between teeth.
- Finish to marked boundaries and "square up" corners using file.
- When done, reinstall the knock-out plug in reverse order to that shown in Step 5A.

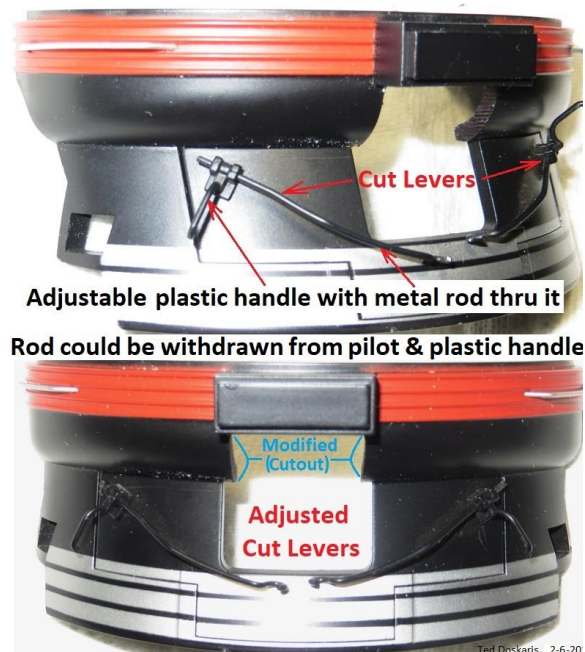


Step 6 CamPac Pedestal & Box Installation

Reinstall body shell, fuel tank & brake hoses - shown in step 3C (If brake hoses too loose, they can be affixed with a semi-permanent glue.)

Step 6A F3A Front Pedestal & Box installation

Before reinstalling modified pilot assembly on chassis, adjust cut levers to clear opening for anticipated swinging coupler trip pin.

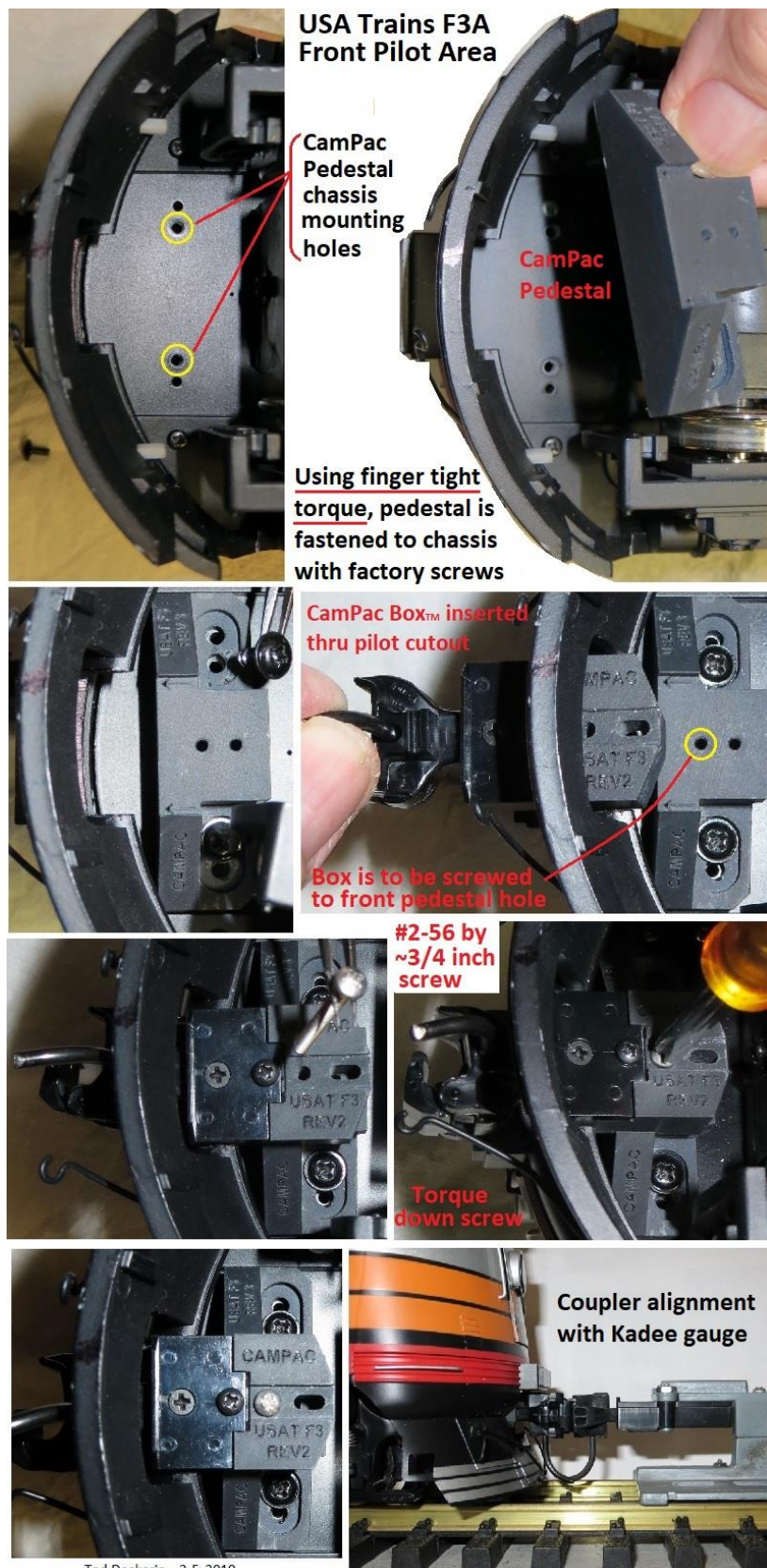


Then, reinstall modified pilot on the chassis in reverse order to that shown in Step 3B (Cut levers can again be adjusted /bent after pilot & coupler box installation to suit preferences.)

Illustrated is the fastening procedure for CamPac pedestal and coupler box with preinstalled Kadee centerset coupler, springs & lid from the Kadee 907 kit previously described in Step 1.

CamPac Box is to be mounted with #2-56 by ~3/4 inch long screw via front pedestal hole. (Long screw distributes thread loading so it can be torqued down with reasonable force.)

Though not depicted in this example, shim/s may be needed to level coupler for alignment with Kadee 980 gauge.



Step 6B F3A Rear & F3B

CamPac Pedestal & Box Installation

Orient pedestal as illustrated.

Note: Pedestal inboard holes are normally used for fastening to chassis with factory screws. Outboard holes provide auxiliary locations should factory chassis holes be stripped out. If using auxiliary holes, the outboard holes in the chassis may need to be enlarged to accept factory mounting screws.

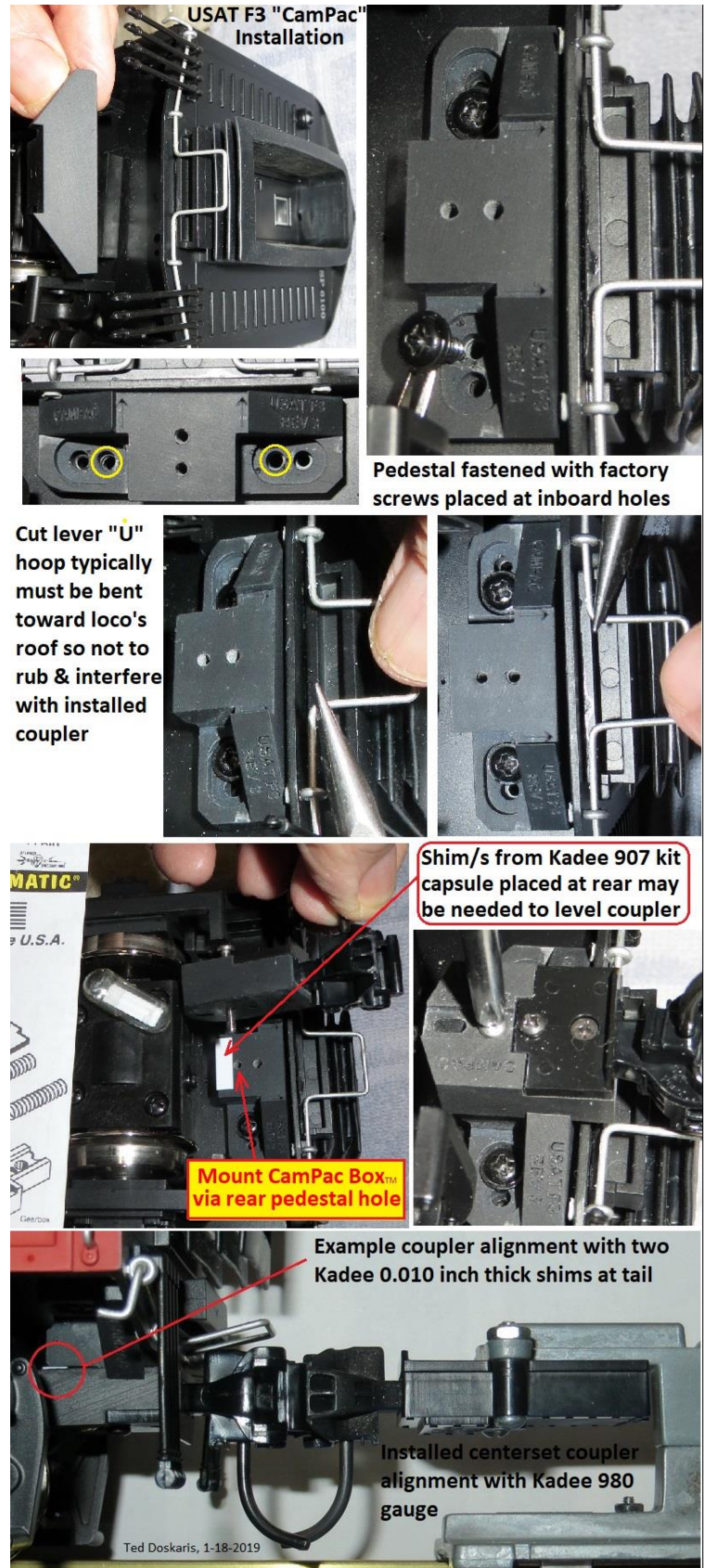
Warning: Fasten pedestal screws using finger tight torque. Too much torque can strip out chassis threads.

When the coupler box assembly is installed, the cut lever will interfere with the coupler. The "U" hoop is to be bent for needed clearance using caution because the metal wire is hardened and subject to breakage. Moreover, the eyelets that retain the cut lever are plastic and subject to breakage.

CamPac Box is to have preinstalled Kadee centerset coupler, springs & lid from the Kadee 907kit previously described in Step 1.

CamPac Box is to be mounted with #2-56 by ~3/4 inch long screw via rear pedestal hole when diaphragm is shortened as intended to 3 flutes. (Long screw distributes thread loading so it can be torqued down with reasonable force.)

Shims may be needed to level coupler for alignment with Kadee 980 gauge.





For information about fitting the USA Trains Streamliner passenger car with body mount Kadee center set couplers, that also afford closer than factory coupling distance, see “vignette” hosted on Greg Elmassian’s Web site, title:

[“USA Trains Streamliner & Kadee 906 Center set Couplers”](#)

Operational Advisory:

Layouts with "S" bends having tight curves (8 foot diameter & possibly greater) are to have a straight track section at least the length of your longest rolling stock between opposite diverging paths or risk derailing the F3’s coupled car and possibly the F3 loco, too.

!!!Done!!!

Congratulations

The USA Trains F3 now looks more like the prototype with capability to perform on tight curves when coupled to other body mounted locos or rolling stock having *properly equipped* Kadee center set type couplers.