

Installation Guide

USA Trains GP Series - CamPac Components

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Example GP7/9 at left & GP38-2 at right are shown with CamPac Box™ with centerset coupler & pilot plug installed. The example unit on the left does not have all factory detail parts installed.

The GP series locos, when fitted with fixed body mounted centerset couplers, are capable to perform on tight curves of 8 foot diameter or greater when coupled to other locos or rolling stock equipped with body mounted couplers.

Installing 3-D Printed Components, including coupler box, pedestal, and pilot plug

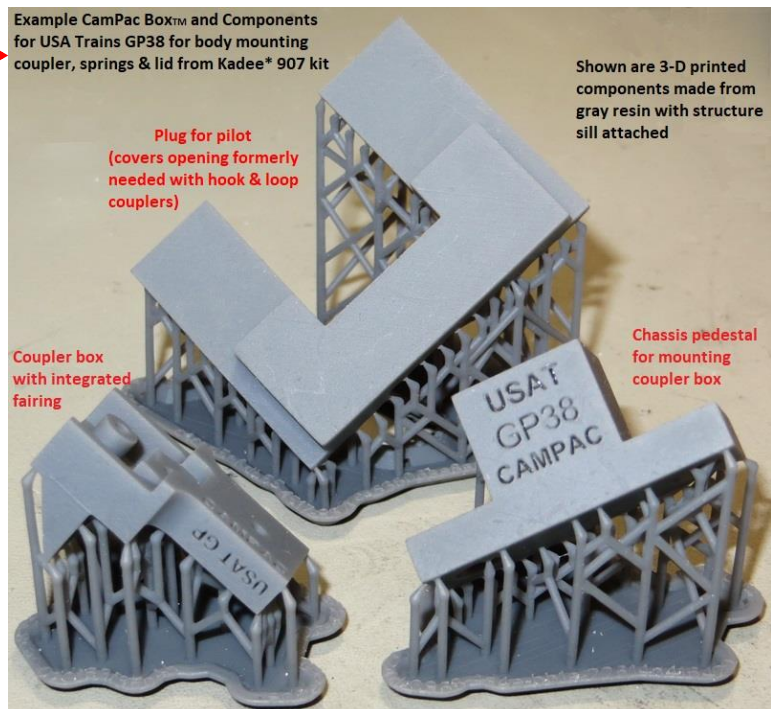
Overview

- Instructions, herein, are provided as a guide for the installer of 3-D printed CamPac Box™ and components on the USA Trains brand GP series (GP7/9, GP30, GP38-2) 1/29 scale Diesel locomotives. (**Note:** For brevity, the USA Trains GP38-2, hence forth, will be referred to as GP38)
- What is done to the front of the loco is also to be done to the rear. (Revision to loco includes pilots' cutout to accept coupler box.) **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 Phillips type P1 screwdriver, razor saw or hack saw in single blade holder, 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. (Measuring tools include machinist scale, caliper preferred; Kadee 980 gauge to verify coupler to railhead alignment)
- CamPac 3-D printed components include coupler boxes with integrated fairing (2), pedestals (2), pilot plug (2). Other items are #2-56 long screw (2) with lock washer (2) and #2-56 flathead screw (4). **Note:** GP7/9 & GP30 use common coupler box (GP38 different). The pedestal and pilot plug are specific to each loco.
- For GP38, flat, hard plastic, spacer (2) to raise up loco are required (normally provided with order) – *described in Step 8 of this guide*. (Step 8 and step 9 only apply to the GP38.)
- Not included: The installer will need to supply a Kadee 907 kit (1) of which all (but the plastic draft gear box) will be fitted onto each CamPac Box.

Pilot Plug, Pedestal & Coupler Box, example GP38 components shown 3-D printed before printing support structure removed.

Instructions provided to accomplish:

- ✓ Install Kadee kit parts onto CamPac Box (coupler box)
- ✓ Cut out notch in front & rear pilot to accommodate box
- ✓ Install mounting pedestal & coupler box assembly on both ends of loco
- ✓ Install pilot plug to cover large factory opening on front & rear of loco
- ✓ **For GP38 only:** Install spacers within chassis crevasse where trucks are mounted

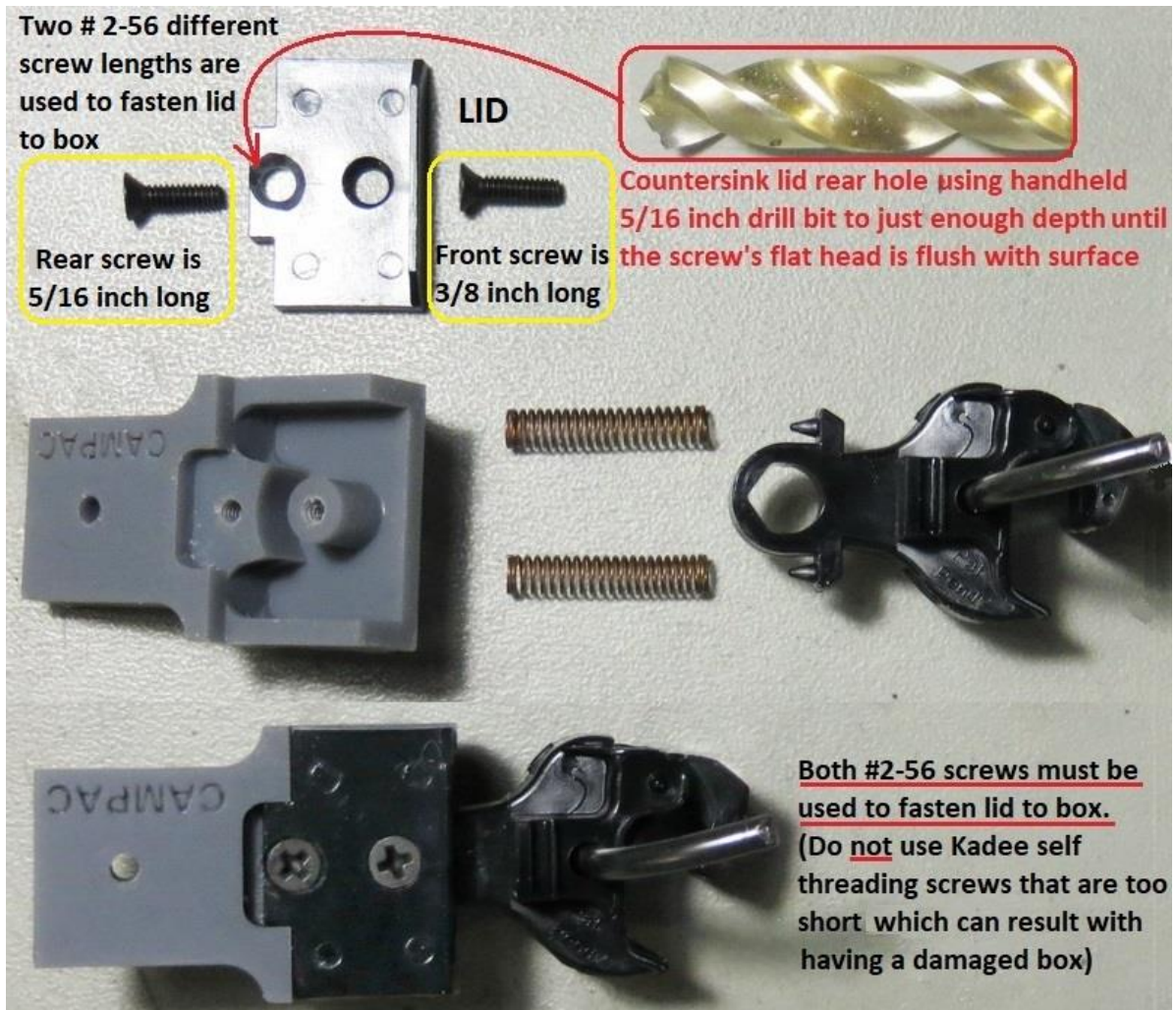


*Kadee is a registered trademark of Kadee Quality Products Co., White City, Oregon, USA.

Installation Steps:

Step 1 – Coupler Box Preparation

Install parts from Kadee¹ Kit onto *CamPac Box*. (Box to be fastened to pedestal and mounted later.)



Ensure lid rear hole is countersunk so flathead screw head is flush with lid surface.

Step 2 - Loco Placement

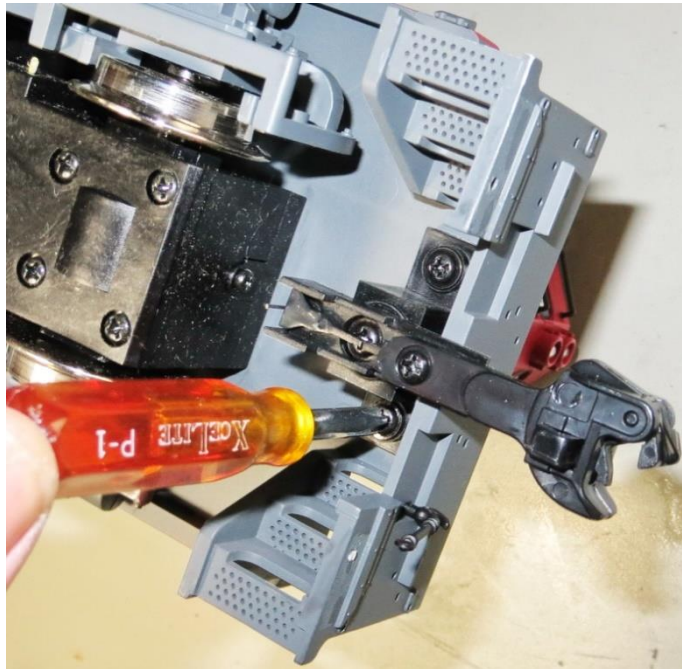
Carefully place the loco on its back (with underbody facing up) on a soft surface in such a way so that any delicate components (i.e. horns) are not at risk of damage. Ensure it is braced so it won't fall over.

Step 3 - Parts to Remove

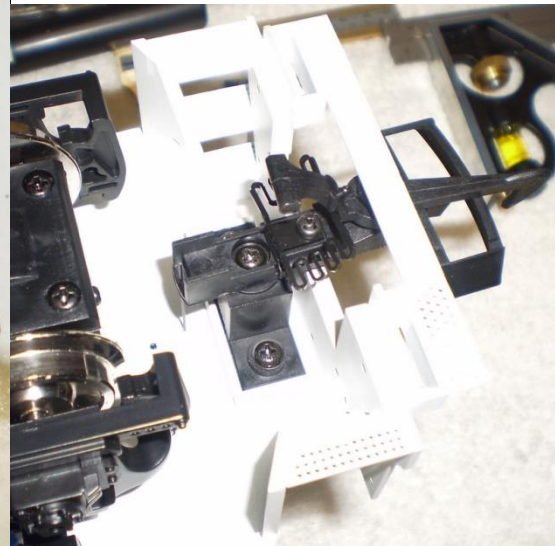
Note: To make it easier to work on the loco, the pilot foot board and cut lever could be removed; however, it's not absolutely necessary. Accordingly, some of the images in this guide may or may not depict such parts. If working on a new loco, it's preferable to not install USAT factory detail parts until later.

¹ Kadee is a registered trademark of Kadee Quality Products Co., White City, Oregon, USA.

Remove factory (or aftermarket) coupler & pedestal from loco chassis. (All GP series locos are similar.)
 Example GP7/9 shown is with USA Trains knuckle coupler - other possibilities include hook & loops.



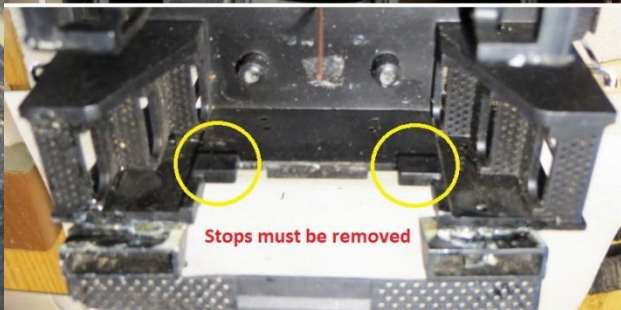
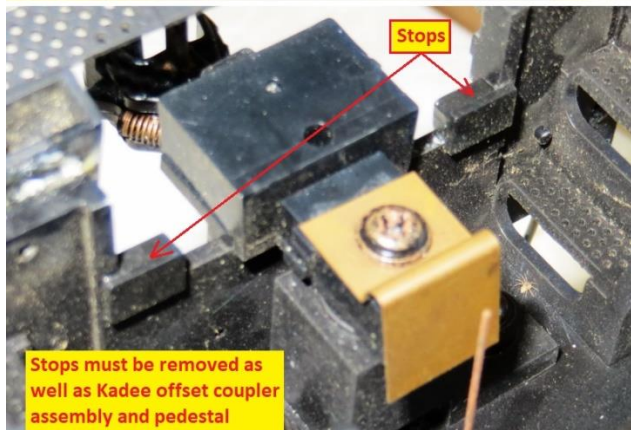
Example GP38 below with Hook & Loop coupler:



Example GP7/9 (Other GPs similar) aftermarket Kadee #785 offset coupler in swinging box - shown below:



“Stops” provided in Kadee #785 kit normally would have been glued in place. Using care, they can be broken away with needle nose pliers



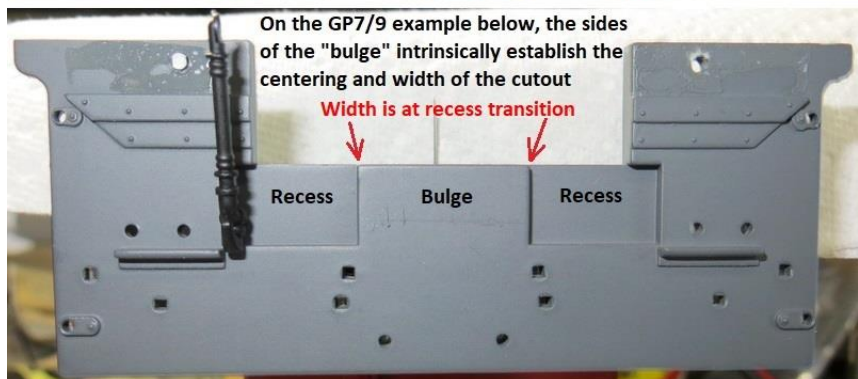
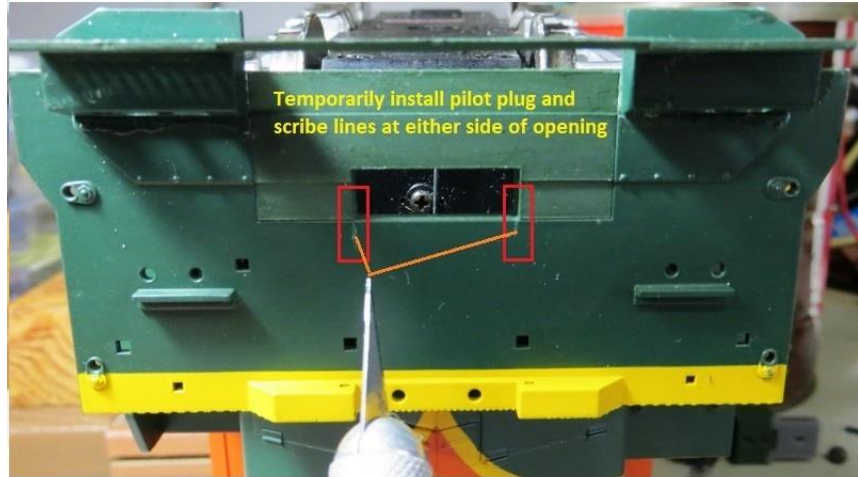
Step 4 - Pilot Cutout

Step 4A - Locating Cutout

Example method is illustrated for locating pilot cutout area

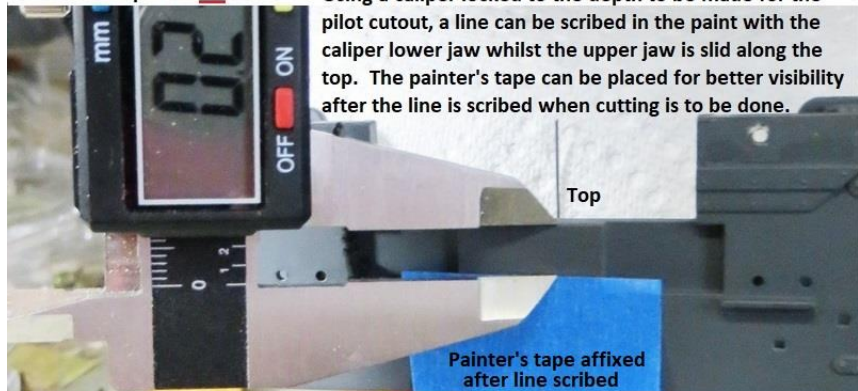
Caution: Before temporarily installing pilot plug, see Step 7 for pilot plug installation and removal techniques

Quick Way to Establish Centered Pilot Cutout Area



Cutout depth for all locos:

Using a caliper locked to the depth to be made for the pilot cutout, a line can be scribed in the paint with the caliper lower jaw whilst the upper jaw is slid along the top. The painter's tape can be placed for better visibility after the line is scribed when cutting is to be done.



For all locos, the cutout can be done by sawing closely spaced comb teeth, then carefully breaking them off, then file finish



Example method is illustrated for making the cutout

Step 4B – Specific Pilot Cutout

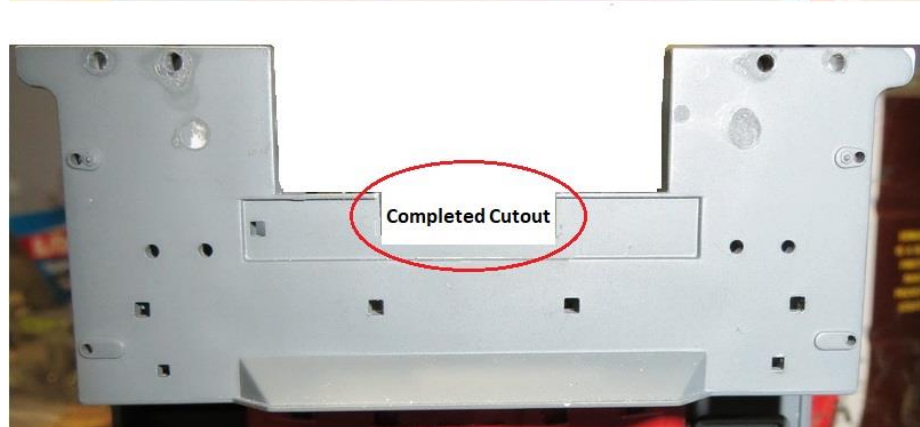
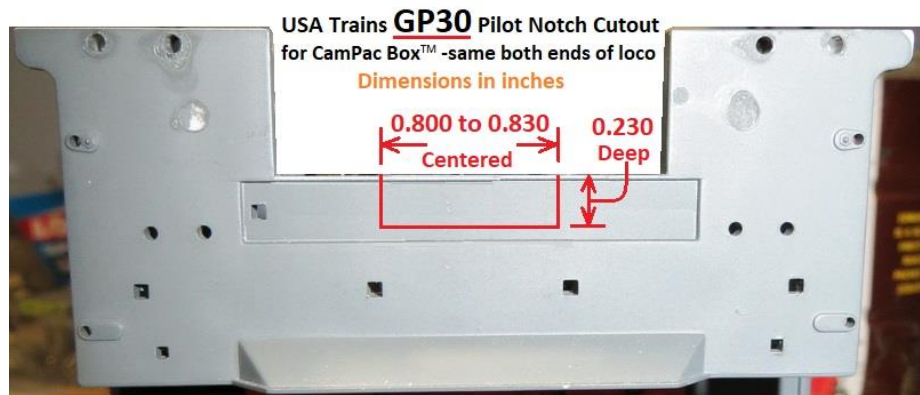
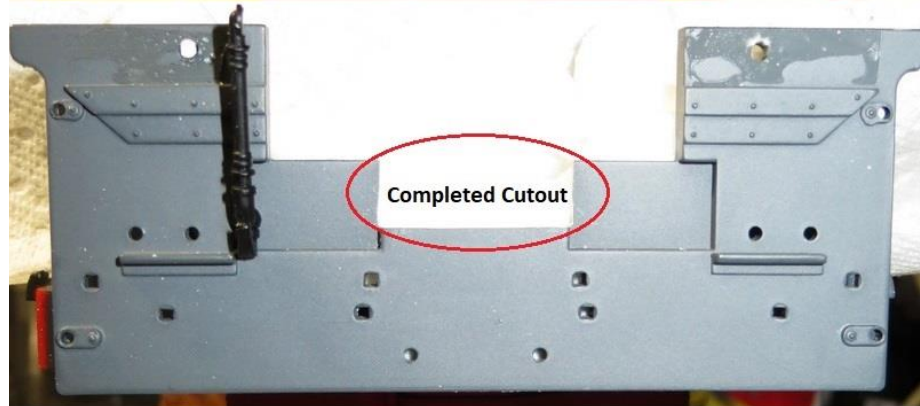
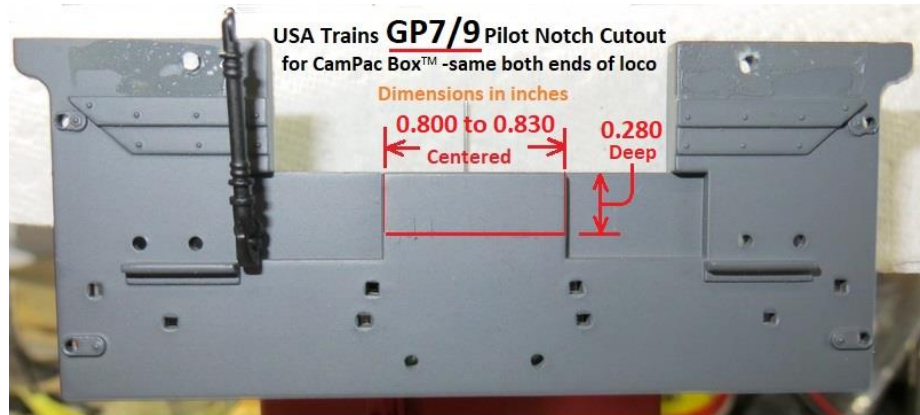
Pilot cutout dimensions are specific to each of the GP locos as indicated in the illustrations.

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

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

A razor saw is preferred to make successive closely spaced comb teeth cuts to remove material. Needle nose pliers can be used to break away "teeth". Finish work is done with file/s.

If foot board is installed on pilot, a hacksaw blade held in a hand holder can be used to fit with the surrounds. This method is shown for the GP38 on next page

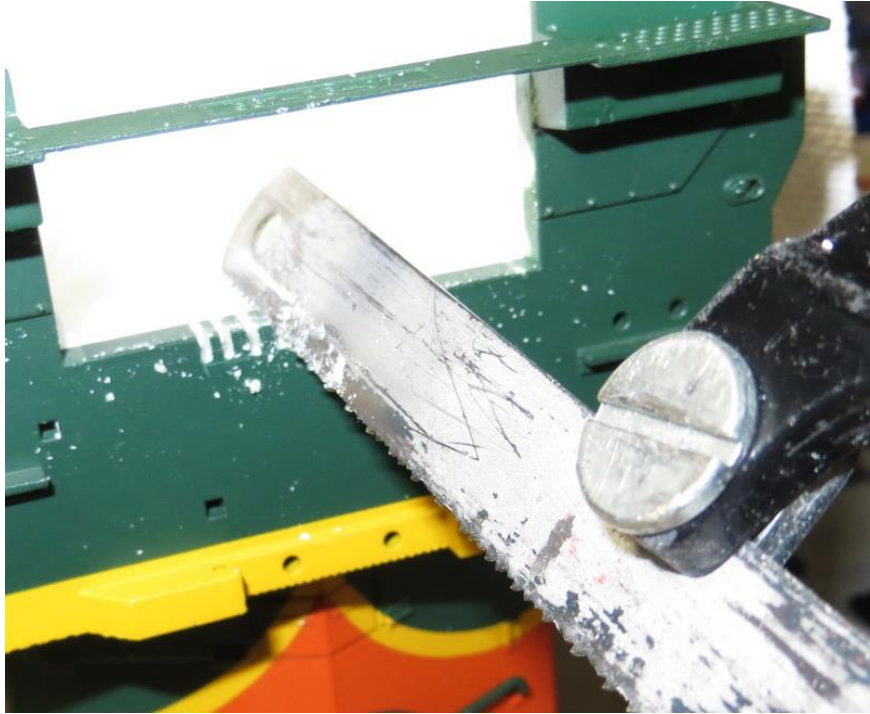


GP38

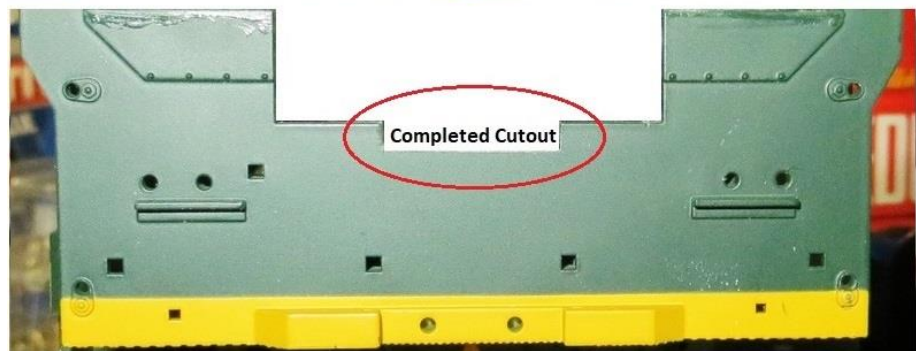
GP38 Advisory:

For **GP38** before making cuts:

If the installer does not employ the truck spacers normally provided with the CamPac components, the pilot notch cutout depth will have to be different (deeper by 0.090"), and the coupler mounting pedestal height will have to be different (trimmed shorter by 0.090").



The notch cutout dimensions shown are valid when having the truck spacer plates installed.

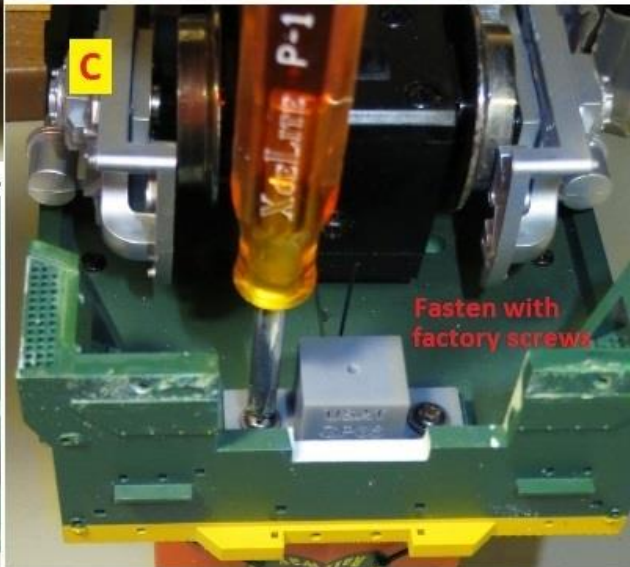
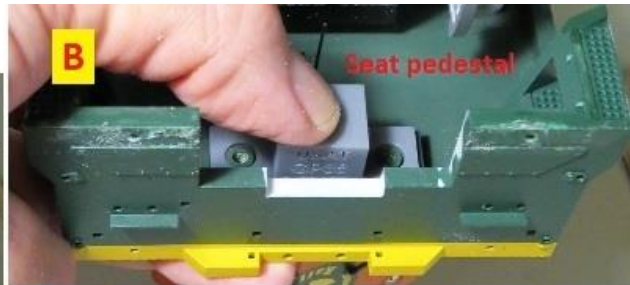


Step 5 - Pedestal Installation – **Example GP38 shown, other GP units same method.**

**CamPac Pedestal Installation,
Example GP38**



Place pedestal with label facing forward as shown.



Pedestal S/B centered within span of pilot opening - then screws fastened with moderate torque.

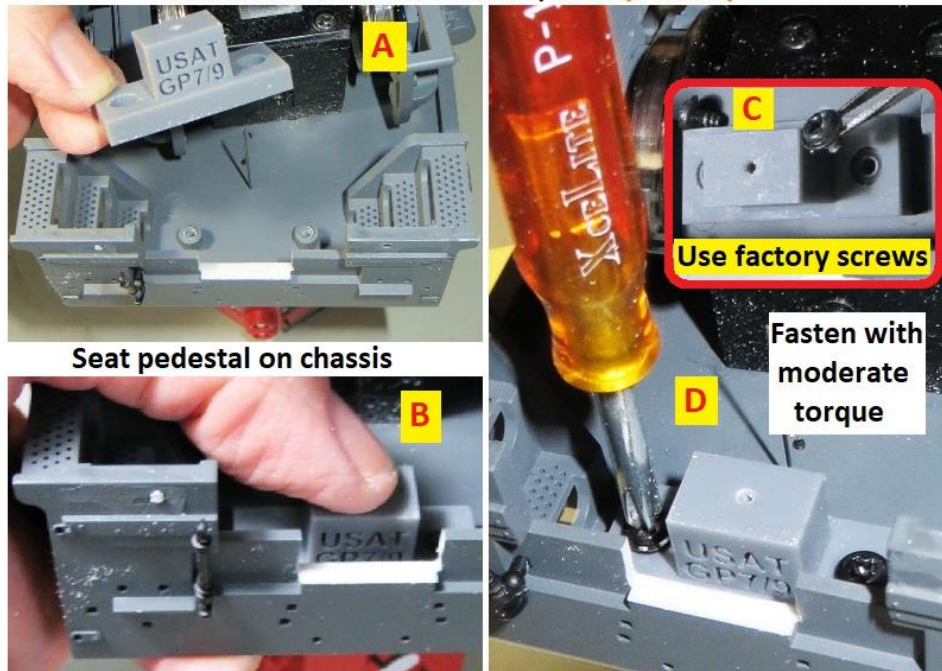
Note: The mounted pedestal top surface height is purposely different than the notched pilot cutout.

CamPac Pedestal Installation, Example GP7/9

Note:

Pedestals as labeled are specific to each of the GP units, whereas, coupler boxes can be common to more than one GP unit.

Place pedestal with its label faced forward as shown. If the pedestal is placed in other direction, the mounted coupler may not align with the Kadee gauge.

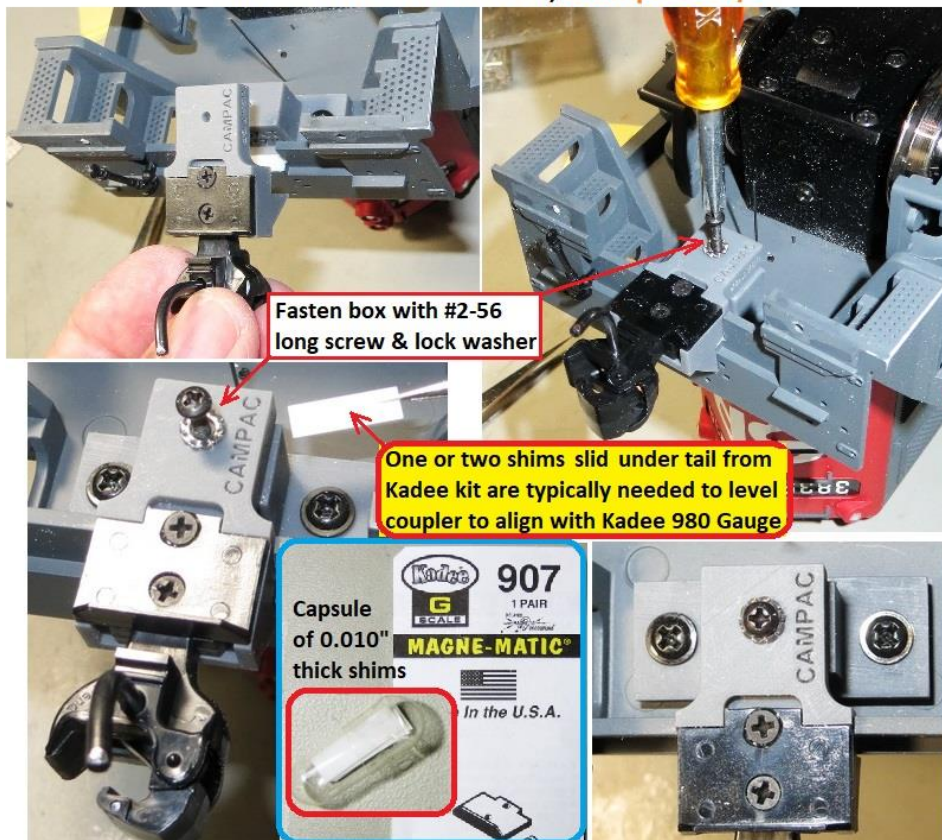


Step 6 - Coupler Box Installation - Example GP7/9 shown, other GP units same method.

CamPac Box™ Installation, Example GP7/9

Note:

When fastening the box to the pedestal, ensure its fairing is placed squarely against the pilot face.

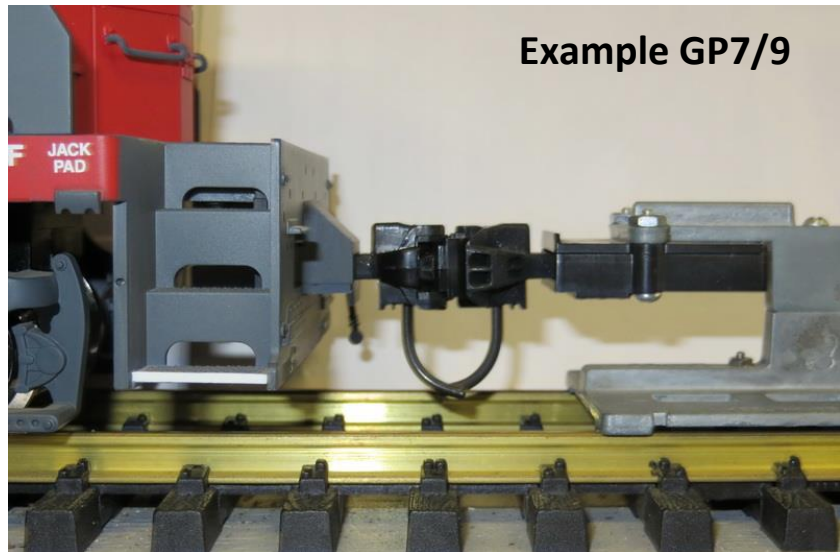


Step 6A Coupler Alignment with Kadee Gauge

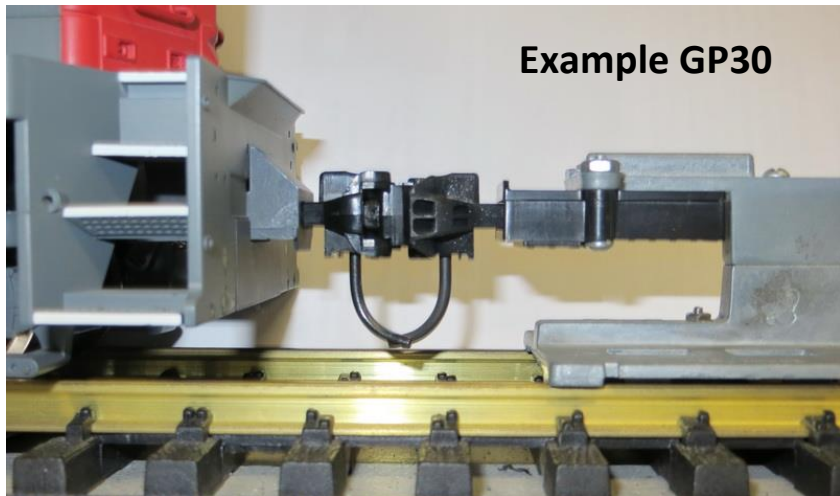
Verify the coupler aligns with the Kadee 980 gauge.

To align the coupler, one or two 0.010 inch thick shims from the Kadee 907 kit are anticipated to be placed between the couple box tail and the pedestal surface.

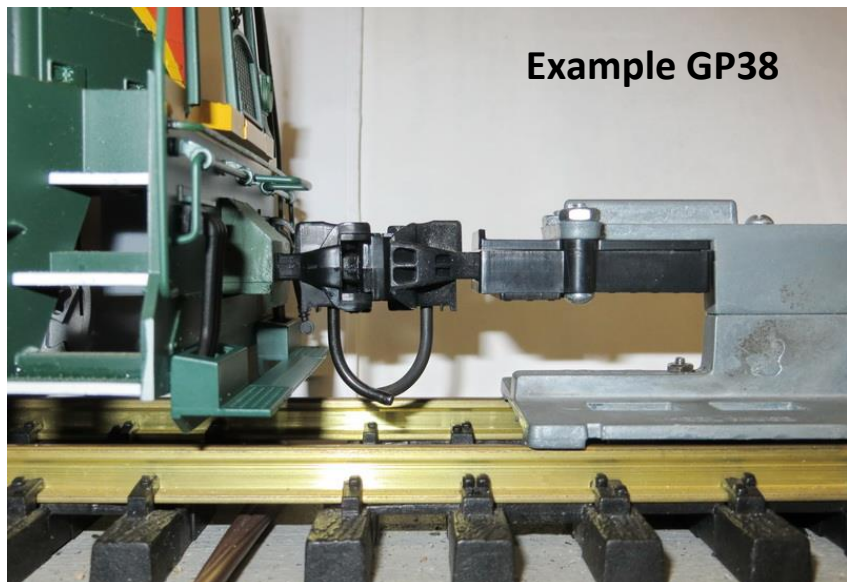
If more than two shims are needed, there may be a gap between the extremity of body shell where it meets chassis. If so, this may have to be corrected as described in the advisory that follows on the next page.



Example GP7/9



Example GP30



Example GP38

Advisory:

Possible Body Shell to Chassis Gap

Depending on factory production inconsistency during the molding process, the chassis may be deformed such that the front or rear end extremity of the shell may not fully seat on the chassis, resulting in the mounted coupler's trip pin hitting parts of the track and coupler misalignment with the Kadee coupler gauge.

If so, this can be remedied by adding another fastener - example. GP38 nose shown



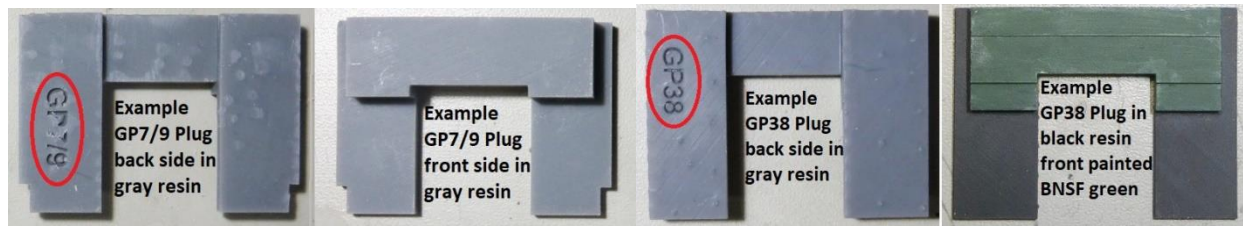
Caution:

Screw location is critical and will be different for different locos and can be different at different ends of a loco

Step 7–Pilot Plugs

Pilot plugs as labeled on their back side are specific to each of the GP units.

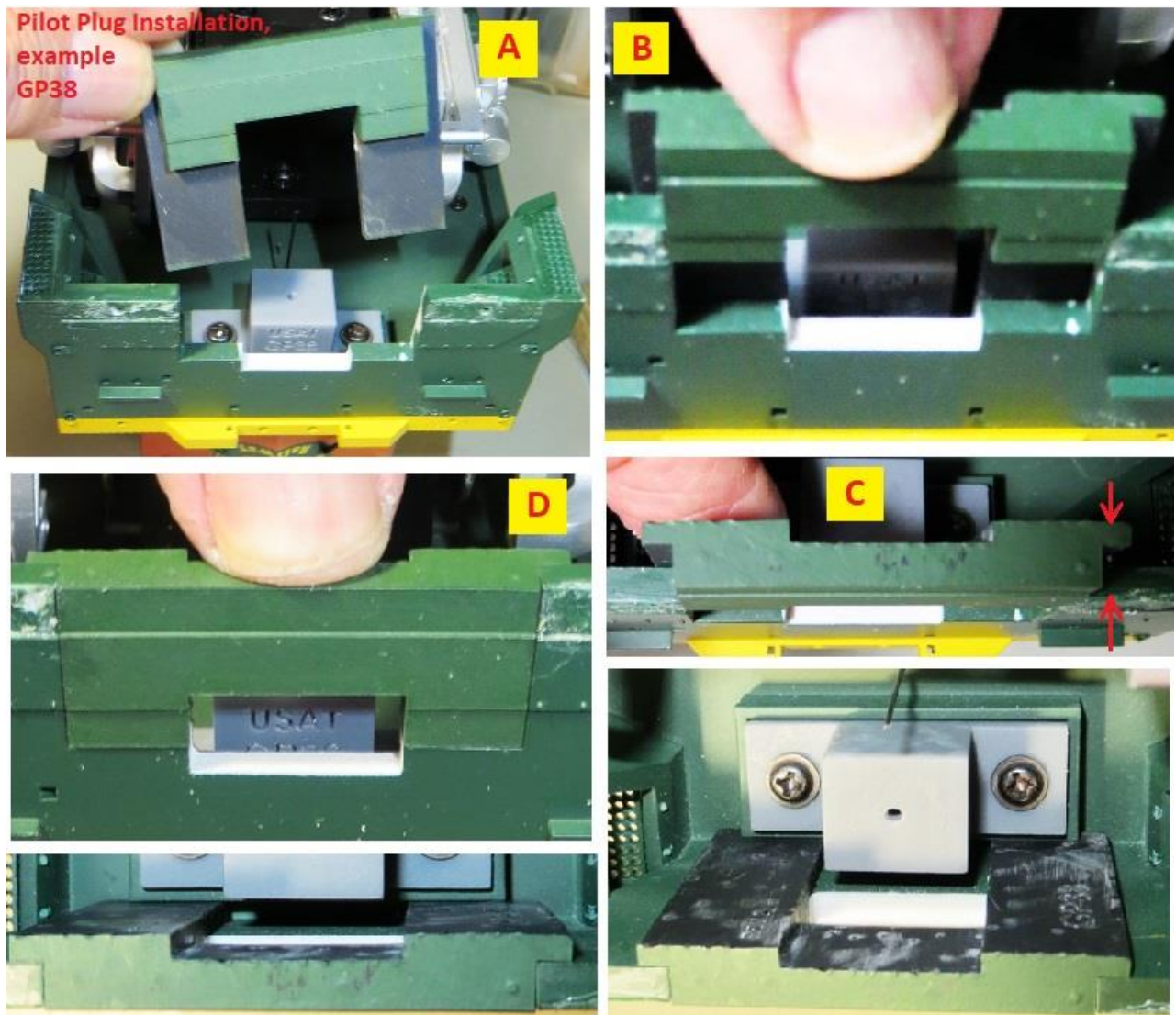
Example GP7/9 and GP 38 shown



Step 7A – Installing Pilot Plugs

Example GP38 shown, other GP units same method.

The pilot plug is installed in the same way on each end of the loco. It's intended to friction fit, but if way too tight do not force; lightly sand away paint at the pilot opening sides. If too loose, apply tacky adhesive on side ears.



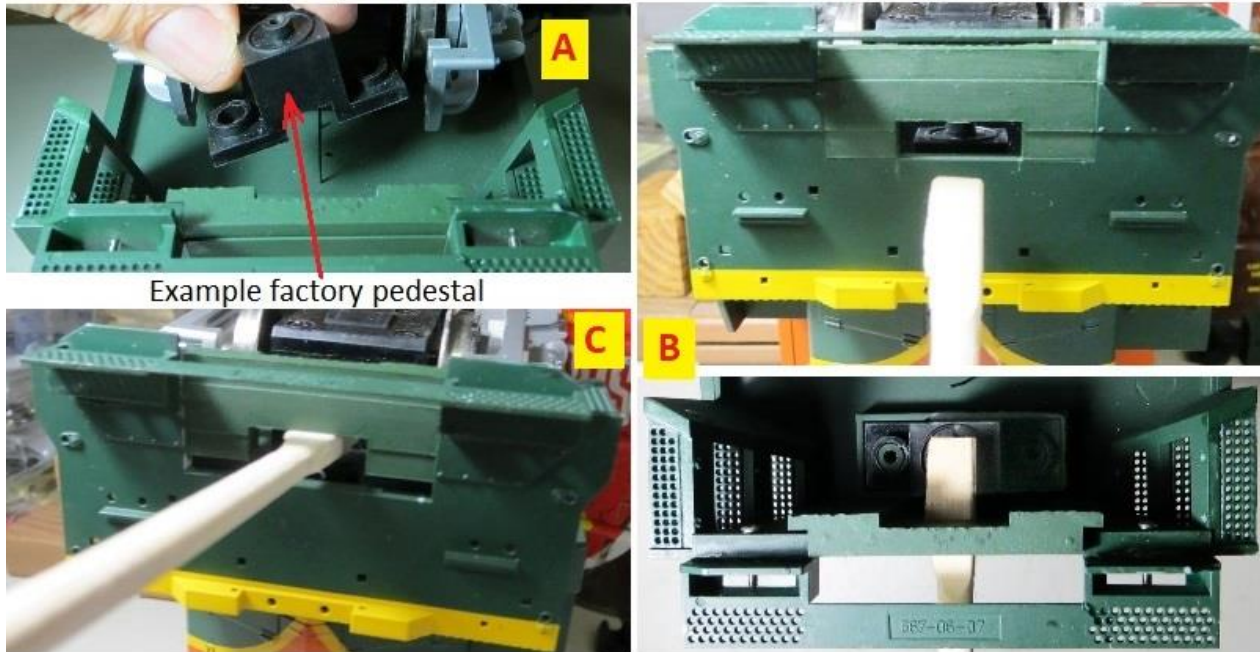
Step7B—Pilot Plug Removal *should the need arise for servicing*

Example shown below is before notch was cutout in pilot, but same method used with pilot notched.

Pilot plug friction fit removal - example method

Example GP38 shown (other GP units similar)

With pedestal (factory or CamPac) seated, use stick within opening to pry up plug.



Step 8 - GP38 ONLY Spacers - *required to raise loco from railhead*

Front and rear spacers are normally provided with other ComPac Components.

Advisory: For the GP38, CamPac components are designed with the use of these spacers... If the installer does not employ the spacers, the pilot notch cutout and pedestal height must be different as previously described in Step 4 advisory for the GP38. Also, the installed pilot plug will result in having an air gap of ~ 0.090" under the mounted coupler box.

Shown below are Lexan hard plastic front & rear spacers used to raise up the GP38 from the railhead. The hard plastic type spacer provides a virtual frictionless surface for the trucks' "A frame" to pivot against during operation

GP38 ONLY Spacers

CamPac Box™ GP38 components are designed for spacers to be placed between trucks and chassis to raise up loco for more prototypical height. (Spacers are ~0.090 inch thick.)

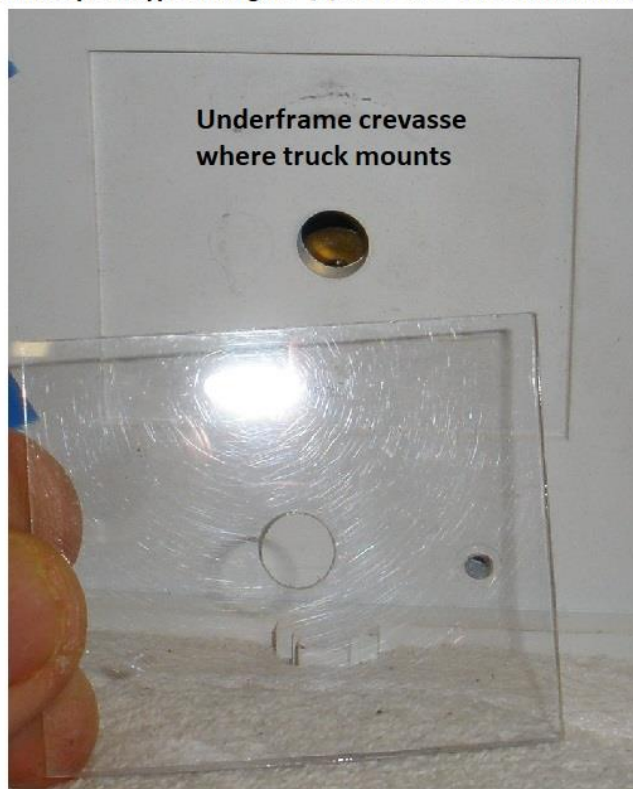
To install spacers, the trucks must be temporarily removed.

To remove the trucks the body shell must be removed from the chassis to gain access. See ["GP38 vignette"](#)

Spacers are retained without glue in crevasses when trucks are remounted to the chassis.

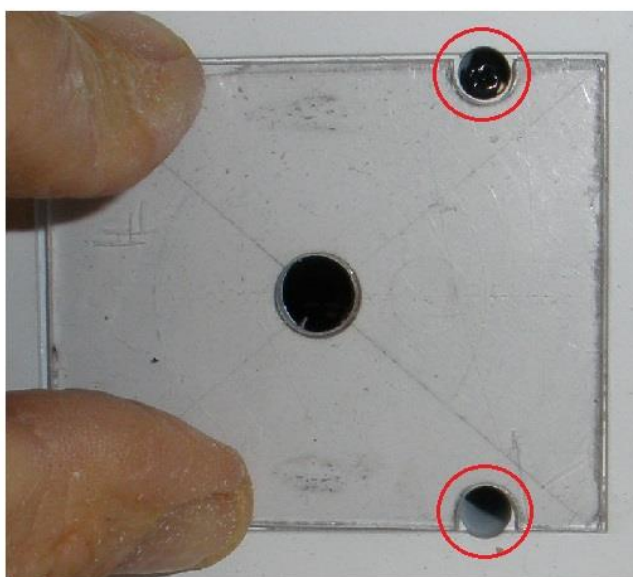
Be sure to orient the spacer with the cutout pockets in the loco's rear crevasse so that the chassis screws can be installed & removed.

FRONT SPACER



REAR SPACER

This spacer includes pockets at rear sides for access to chassis mounting screws

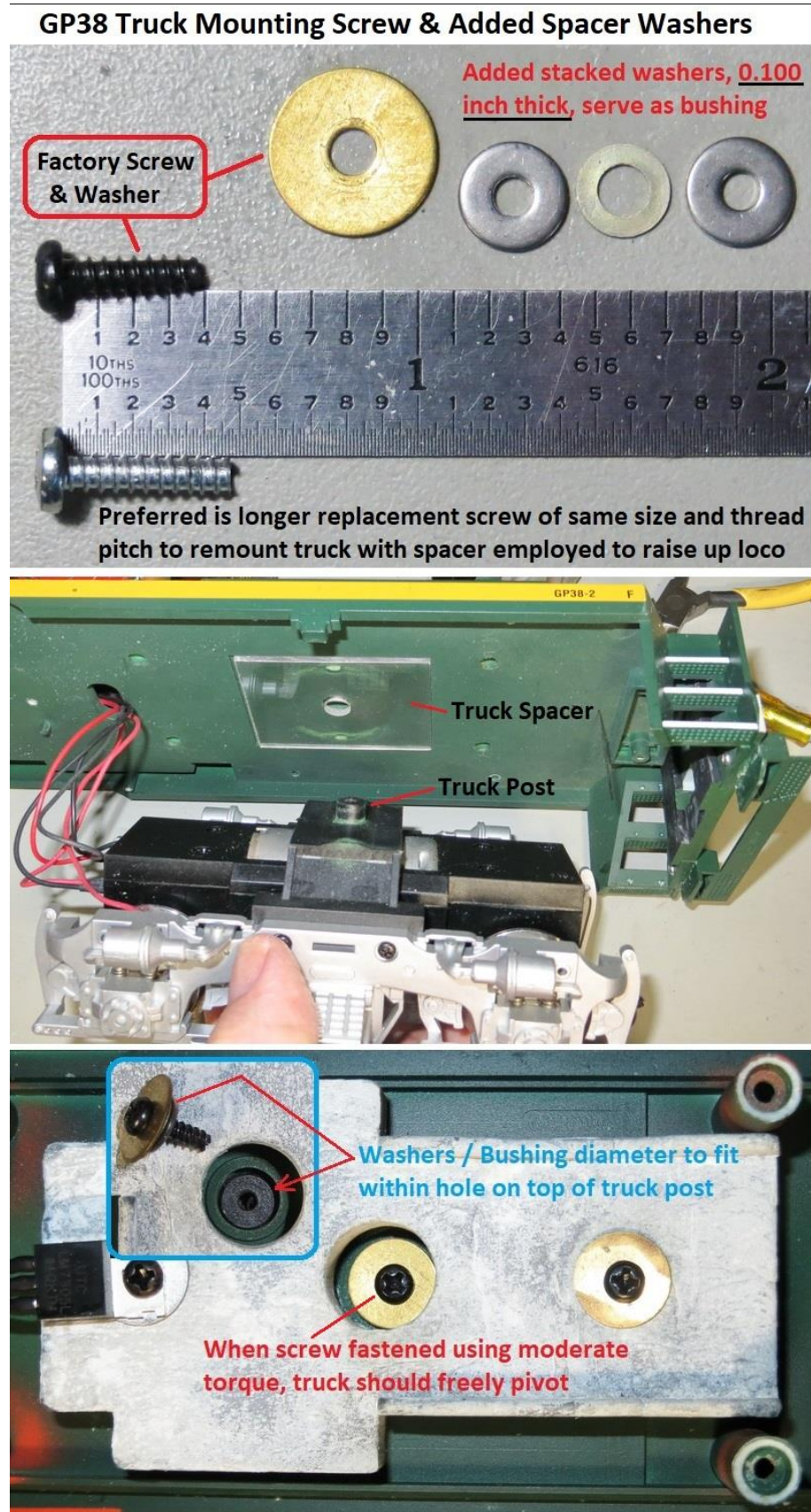


Trucks must be remounted using a bushing (or stacked washers) as illustrated in example.

The Kadee 907 kit's shorter length screw is a possible substitute for the factory truck mounting screw.

The bushing (or stacked washers) makes up for the resultant space within the chassis hole so when the truck is fastened, it's free to pivot.

Bushing height (or stacked washers) is to be 0.100 inch, having diameter similar to truck post, so when mounting screw is torqued down, the truck can freely pivot.

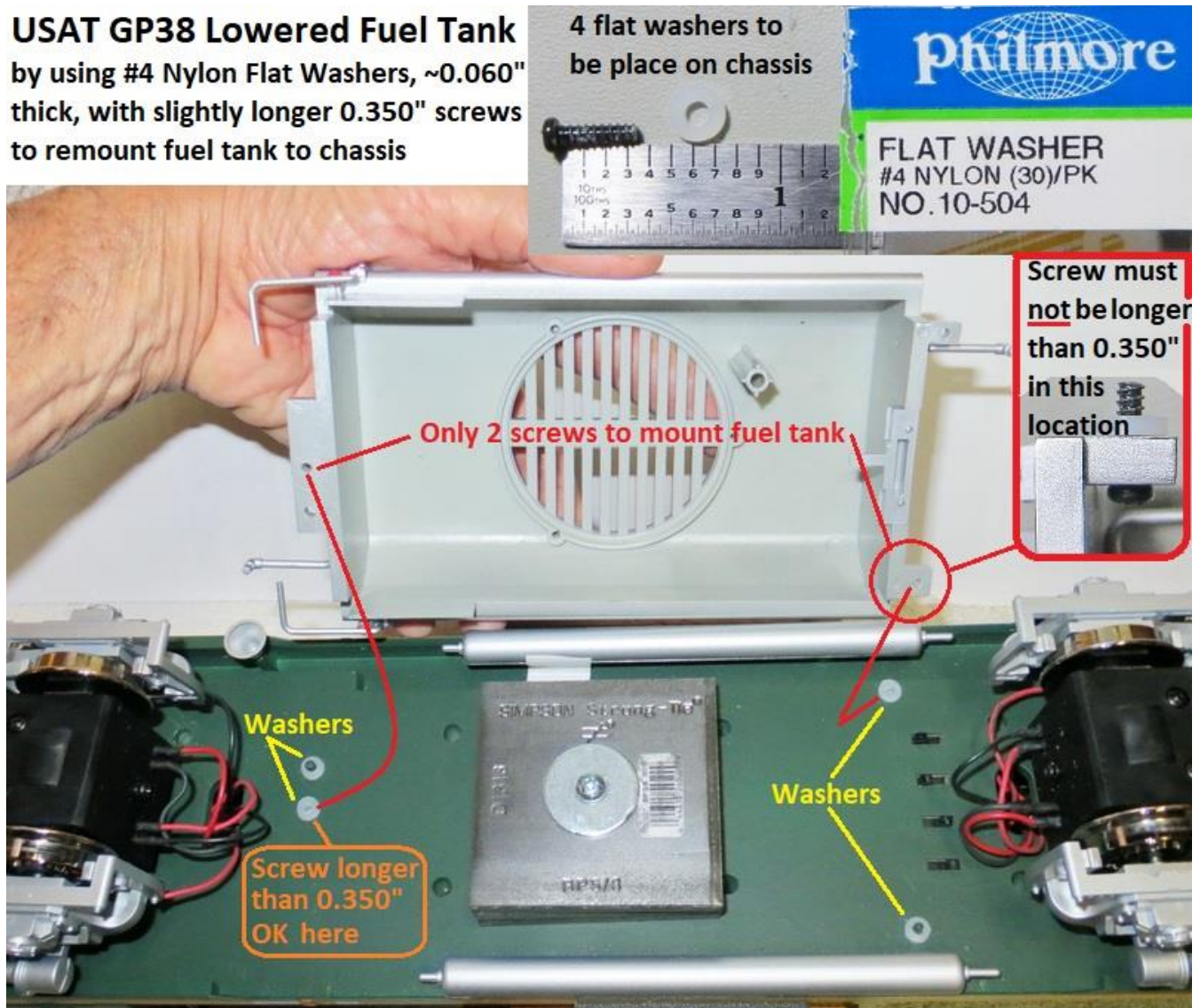


Step 9 – **Optional**, GP38 ONLY, Lowered Fuel Tank

With the GP38 loco raised up, slightly lowering the fuel tank makes for a more realistic appearance with respect to the trucks' side frame brake cylinders when examining a prototype loco.

The installer is to obtain necessary hardware to use.

USAT GP38 Lowered Fuel Tank
by using #4 Nylon Flat Washers, ~0.060" thick, with slightly longer 0.350" screws to remount fuel tank to chassis



Note: Not relevant to lowered fuel tank are metal weight plates added as shown in this example unit.

Completed Examples:

**GP 7/9, without factory
detail parts installed**



**GP30, without factory
detail parts installed**



**GP38, with truck spacers
and factory detail parts
installed**



!!!*Done*!!!

Congratulations

The USA Trains GP loco now looks more like the prototype with capability to perform on tight curves of 8 foot diameter or greater when coupled to other body mounted locos or rolling stock having *properly equipped* Kadee centerset type couplers.