

Installation Guide

USA Trains SD70 - CAMPAC Components

Ted Doskaris

4/27/2018

USA Trains SD70 fitted with CamPac Box™, Rear Pilot Plug and Draft Gear Fairings
(CamPac box equipped with Kadee 907 centerset coupler, springs & lid and Snowplow, including "knock out", modified for swinging box)



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

Overview

- Instructions are provided as a guide for the installer of 3-D printed *CamPac Box*TM and components on the USA Trains brand SD70 "G" (1/29) scale Diesel locomotive¹.
- What's done to the front of the loco is also to be done to the rear, except snowplow not applicable. (Revision to loco includes pilots' cutout to accept coupler box and modification to snowplow center plug "knock out".) **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, 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.)
- CAMPAC 3-D printed components include coupler boxes (2), pedestals (2), pilot plug (1) and fairings (2). Other items are #4-40 long screw (2) with #4 nylon washer (2) and #2-56 flathead screw (4)
- Not included: The installer will need to supply a Kadee 907 kit (1) of which all (but the plastic box) will be fitted onto each *CamPac Box*.

Coupler Box & Pedestal Relationship



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
- ✓ Modify snowplow "knock out" for wider opening to facilitate swinging box and reinstall it
- ✓ Install pilot plug to cover large factory opening on rear of loco
- ✓ Install a draft gear fairing on both ends of loco



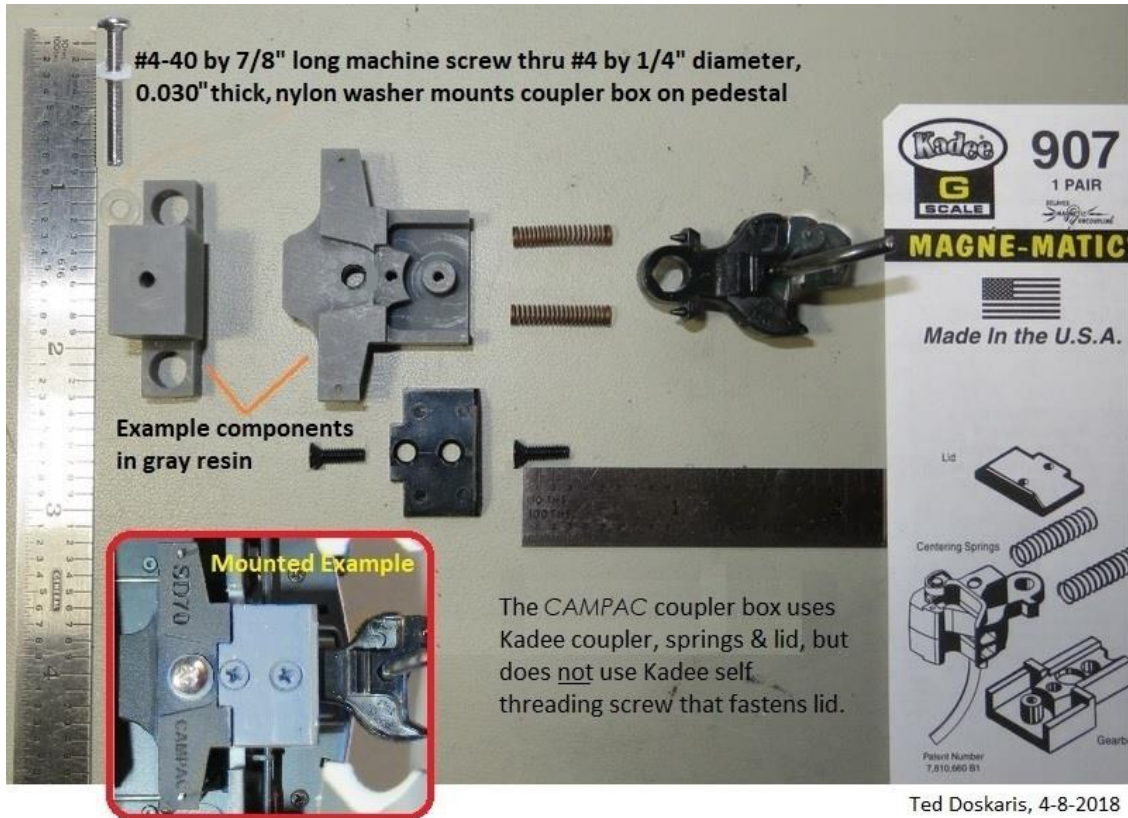
¹ **Caution:** When operating the locomotive, abrupt excess force (e.g. collision/yanking) to the coupler may result in damage to coupler, coupler box, or other components. Operating the locomotive coupled to a car with truck mount coupler on tight curve track is incompatible- car can/will be pulled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

Installation Steps:

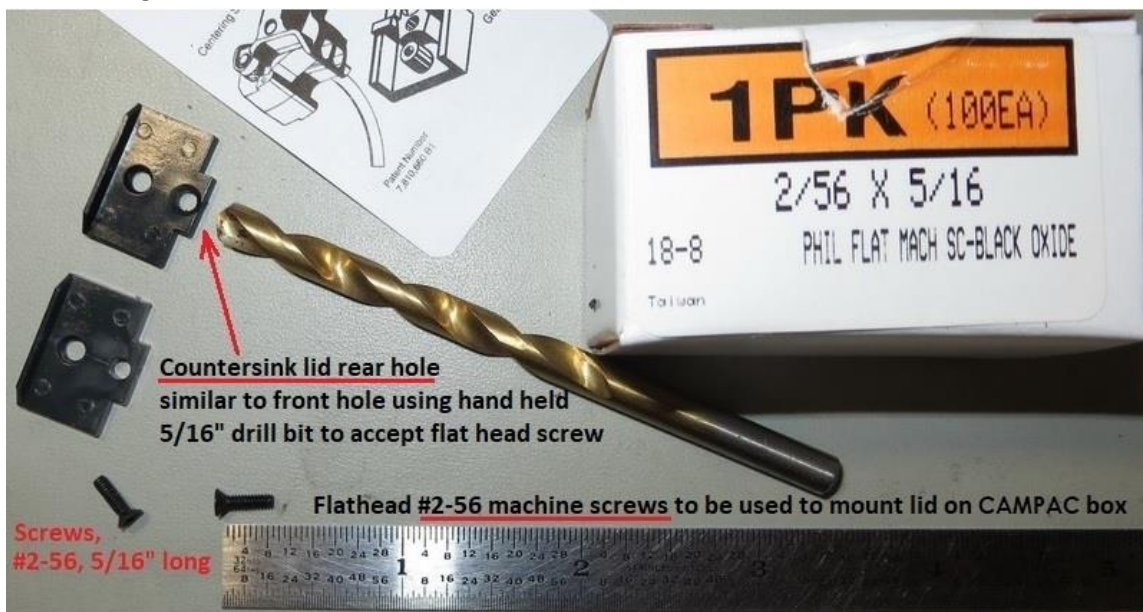
For detail that includes “how to’s”, see [SD70 vignette Appendix H](#) on [elmassian.com](#) web site.

Step 1 – Coupler Box Preparation

Install parts from Kadee² Kit onto *CamPac Box*. (Box to be fastened to pedestal and mounted later.)



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



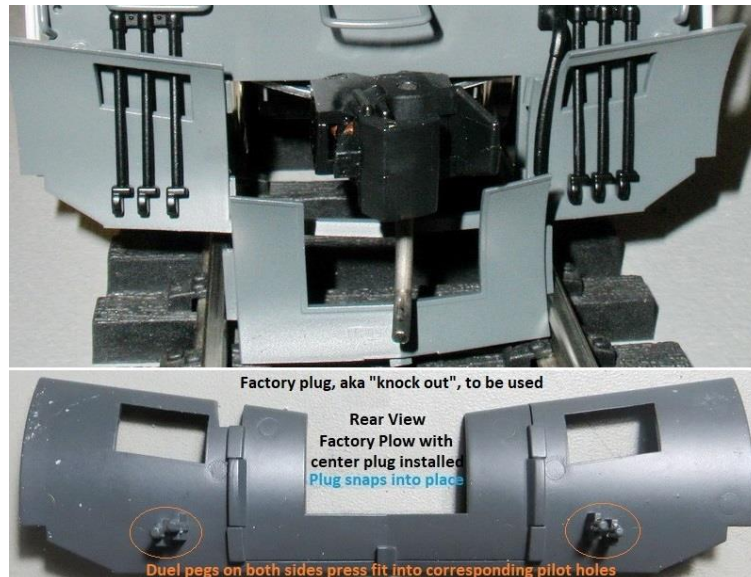
² Kadee is a registered trademark of Kadee Quality Products Co., White City, Oregon, USA.

Step 2 - Loco Placement

Carefully place the SD70 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

Remove the front snowplow. If center plug ("knock out") was not installed, locate it for later use.



Remove the factory (or aftermarket) coupler, and pedestal from loco chassis.

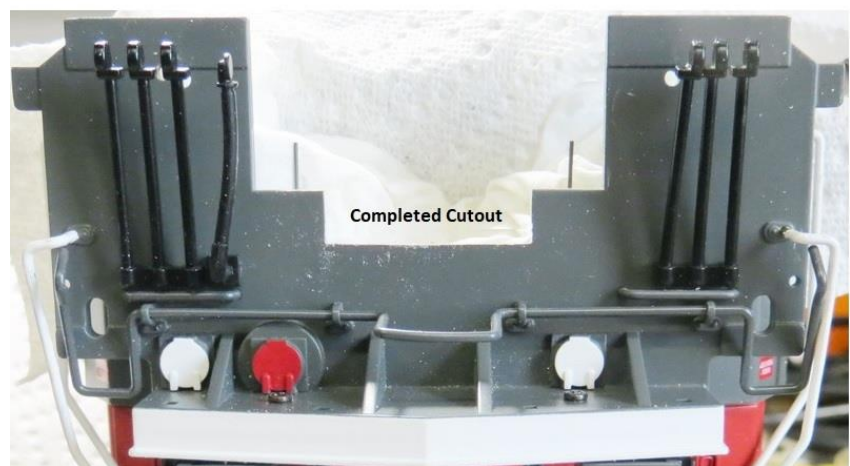
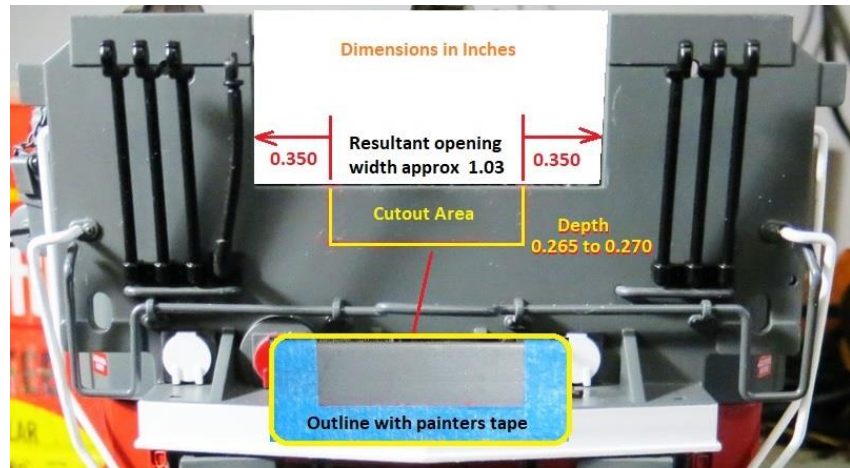


Step 4 - Pilot Cutout

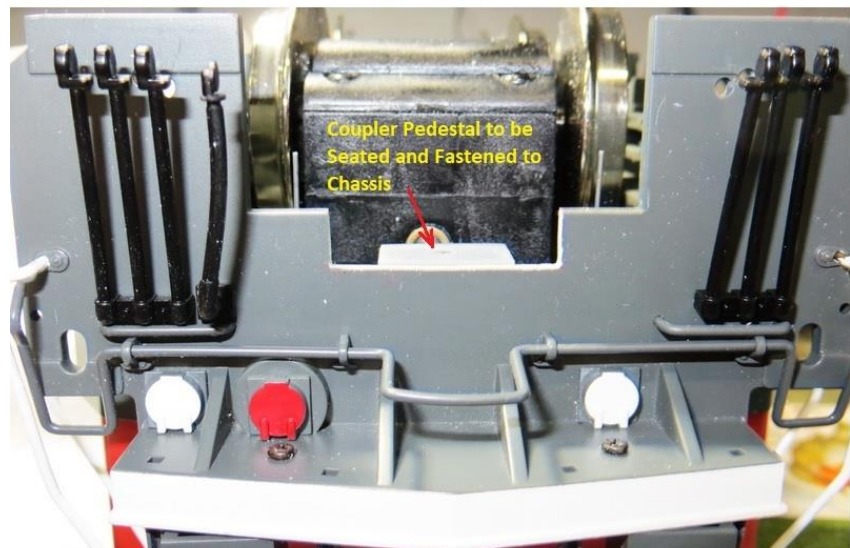
Pilot area marked / scribed to be cut to dimensions as shown.

Target depth of cutout is 0.265" to 0.270"

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



Temporarily seat and fasten pedestal to chassis after cutout done. (Described on next step)



Cutout depth is to be slightly lower than pedestal surface



Step 5 - Pedestal Installation



Mount CAMPAC Pedestal on SD70 Chassis



Chassis double prong centering spring wires



Seat pedestal and check for minimal or no gap between pilot wall - like above example.

(If gap, rotate pedestal 180 degrees and reseat to see if better.)

Pedestal can be slightly moved side to side to best center it within the pilot opening, then fasten screws with moderate torque at base.

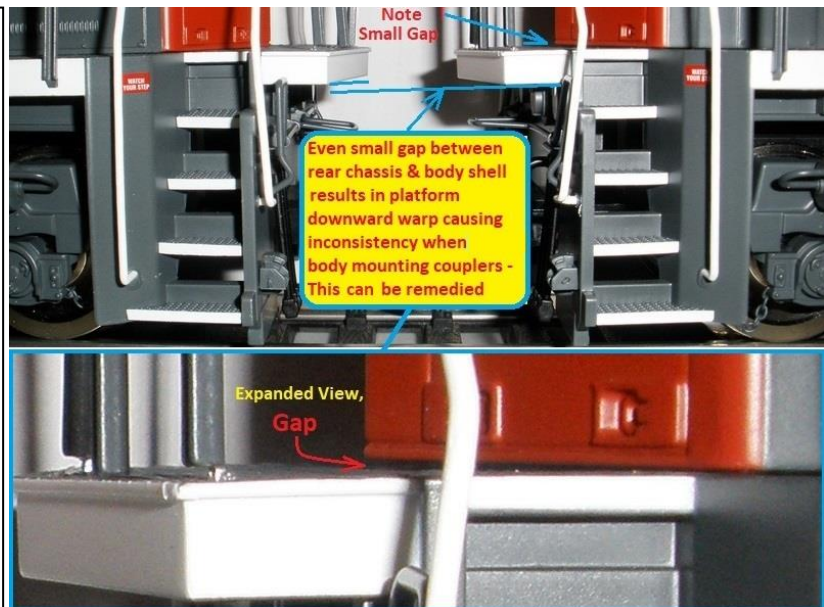
Ensure pedestal is centered within overall span of pilot opening.

Advisory, Going Forward:

Possible Rear Body Shell to Chassis Gap

Depending on factory production inconsistency during the molding process, the chassis may be deformed such that the rear of the long hood shell may not fully seat on the rear most part of 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; see:

[SD70 vignette Appendix F](#) on Greg elmassian.com web site.



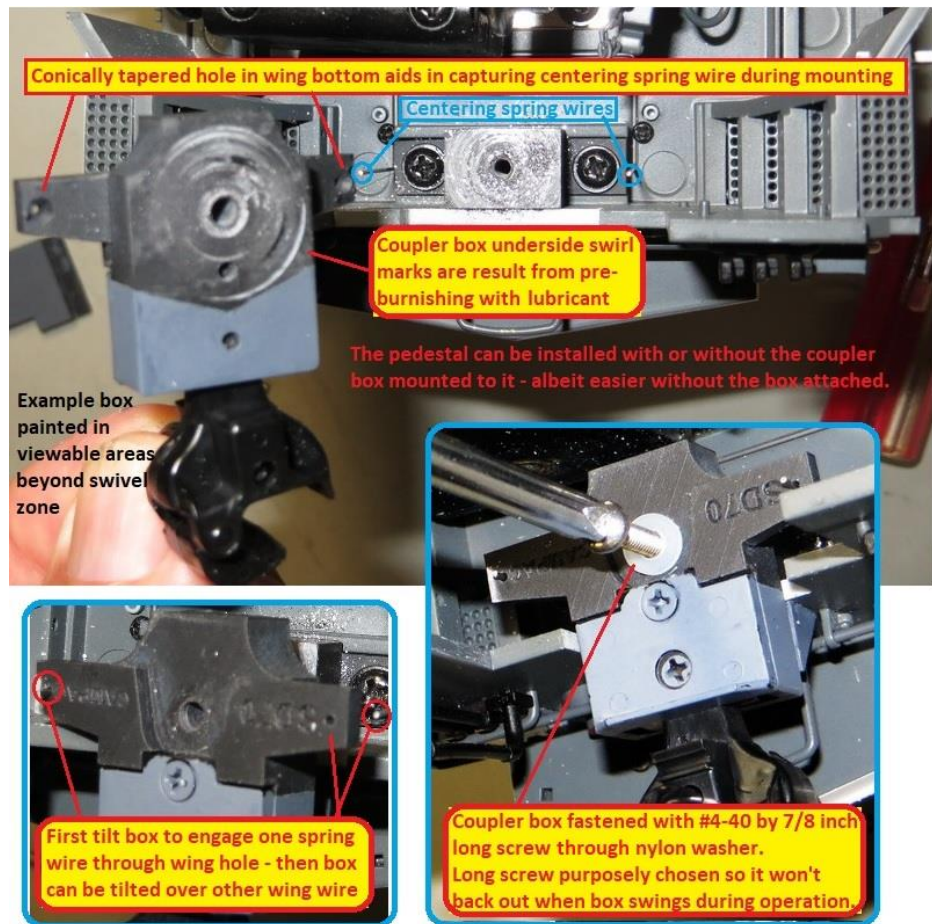
Step 6 - Coupler Box Installation

Advisory:

It's preferable to burnish in and lube the coupler box & pedestal contact surfaces prior to installation.

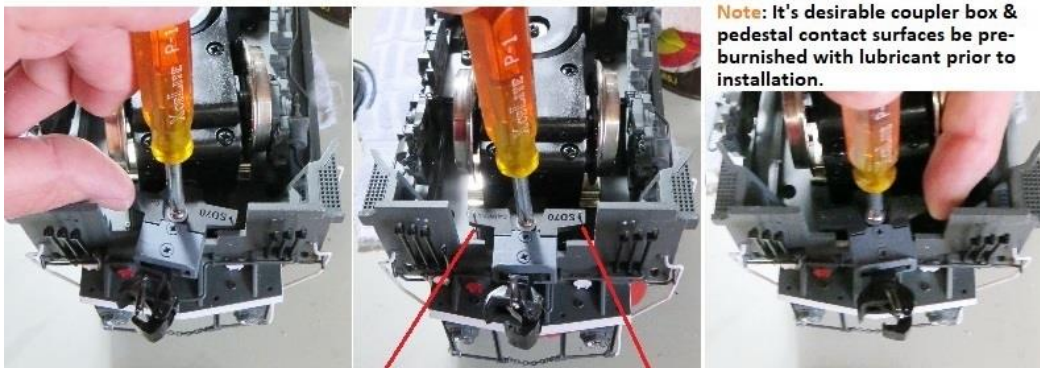
Hob-E-Lube HL651 Dry Graphite with Moly was used in this example, but do not get lube into the pedestal coupler box mounting screw hole.

For "how to" detail, see **Coupler Box & Pedestal Preparation** within [SD70 vignette, Appendix H](#)



Step 7 - Coupler Box Adjustment

Adjusting Coupler Box to Self Center & Freely Swing Side to Side



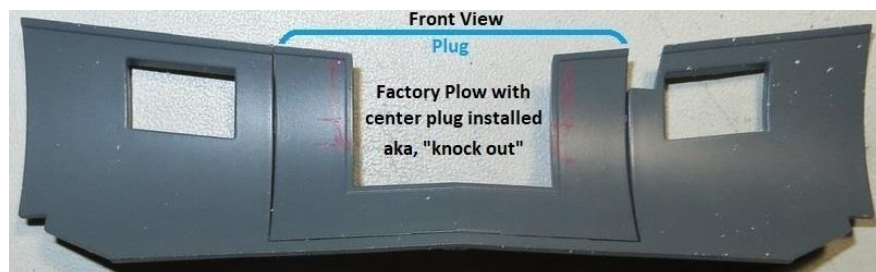
Ensure the loco chassis self centering spring wires are visible through the wing hole on each side of the mounted coupler box. Correct if need be.

Adjustment steps:

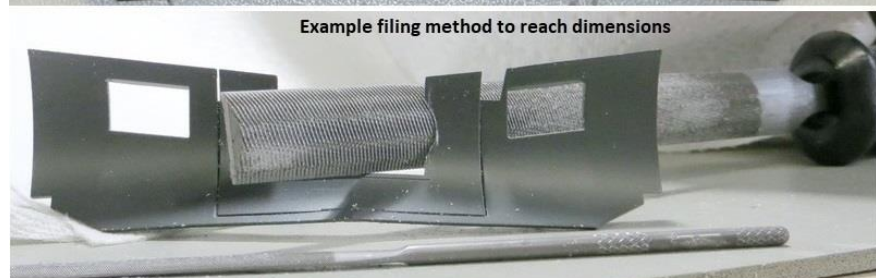
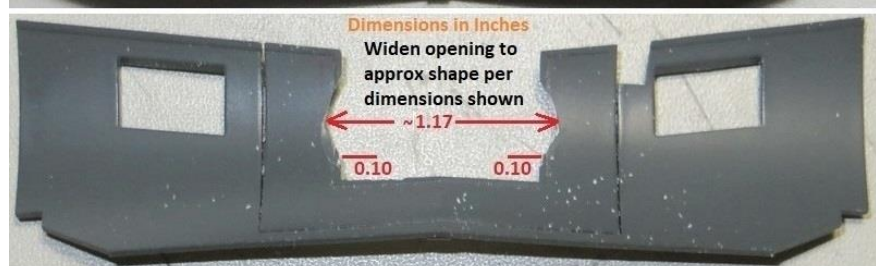
- (1) Initially tighten down coupler box mounting screw so box can barely swing side to side.
- (2) Move box to left extreme and let go. If box does not return to center, loosen screw just enough so it self centers.
- (3) Move box to right extreme and let go. If box does not return to center, loosen screw just enough so it self centers.
- (4) Repeat steps 2 & 3 as needed for consistent right and left self centering. (Screw may need to be slightly tightened or loosened to obtain desired result.)

Step 8 - Snowplow Modification

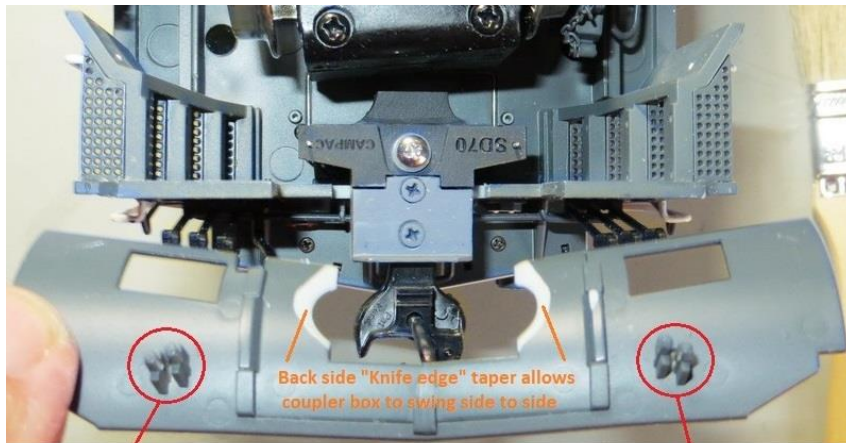
Seat center plug "knock-out" and cut & trim to dimensions as shown. If no knock out, skip to next step.



Note: Plug must be fully seated on both sides & bottom. It will take some manipulation to ensure plug is fully seated - verifiable by being perfectly flush with adjacent surfaces - no gaps at seam lines.



Step 9 - Install Snowplow



Snowplow pegs press fit in corresponding pilot holes



Snowplow slots slips over "hoses" on both sides:



Snowplow pegs to be press fit into corresponding pilot hole pairs:



Shown with center plug ,
"knock out", as modified
installed in snowplow.



Proper snowplow attitude is
established by railing insertion
distance to allow coupler box to
swing without binding at plow top.

Step 11 – Install Rear Pilot Plug

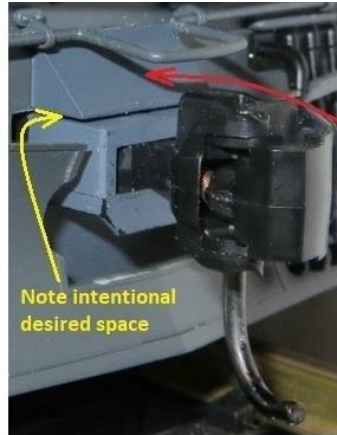
Pilot plug is friction fit, but if too loose, apply tacky adhesive on side ears.

If way too tight, lightly sand pilot opening sides.

(Another pilot plug could be installed at the front pilot in the same way.)



Step 12 – Install Draft Gear Fairings

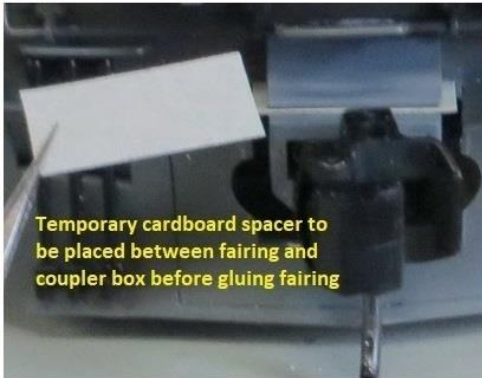
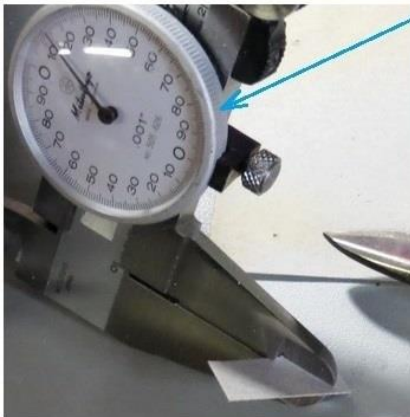


Note intentional desired space

Installation of CAMPAC 3-D Printed Fairing on USA Trains SD70 Loco Front & Rear Pilots (Same method used as shown in example front pilot)

Example Installed Fairing

Cut small piece of cardboard, approximately 0.015 inch thick, to provide space between fairing above coupler box. This is needed to allow coupler box to freely swing side to side without touching / binding against the underside of the fairing.



Temporary cardboard spacer to be placed between fairing and coupler box before gluing fairing

Apply glue (example tacky adhesive) to back surface of fairing (using either back surface is OK since fairing is symmetrical)



Center fairing between cut lever eyelets and press and hold it against pilot for a short time until glue takes hold. Then allow glue to dry before removing cardboard spacer.



Spread thin layer of glue on back side of fairing. (Note this type tacky adhesive is white when wet but will dry to clear color.)

Completed SD70 Front Fairing:



Completed SD70 Rear Fairing:



Operational Advisory:

Layouts with "S" bends having tight curves (8 to 10 foot in diameter & possibly greater) are to have a straight track section the length of an SD70 or greater between opposite diverging paths or risk the SD70's coupled car to derail.

!!!Done!!!

Congratulations

The USA Trains SD70 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 centerset type couplers.