

# PDF MODELS



## PDF Models Skylark Instructions

Thank you for purchasing this PDF Models Loco kit. Please read all instructions before assembly. PDF Model kits use a combination of laser cut acrylic, 3d printed and resin parts. Some of these parts may require sanding smooth before assembly/ painting. Basic hand tools such as a sharp knife/scalpel, screwdrivers, pliers, tweezers, files, Allen keys, etc may be required. TAKE CARE USING SHARP TOOLS! Some parts of the model may want painting before assembly. When working with acrylic, it is important to prep the surface prior to painting as it requires 'keying' to allow the paint to adhere properly. This is best done using p400 wet and dry sandpaper, then using a plastic primer (Halfords grey will work for this), followed by light sanding using p600 or higher wet and dry to get a smooth surface ready to accept your topcoat. 3D printed parts can have some print lines visible. These can be sanded smooth using p240 wet and dry and then primed using a filler/ high-build primer followed by sanding with p400 wet and dry and a coat of plastic primer as with the acrylic parts. Resin parts may require some light sanding before priming with plastic primer. When applying rivets at 5mm intervals before the topcoat glue the rivets on with liquid poly. When dry, paint with primer again and finish with topcoat. Take your time ensuring the prep work is good and you will be able to produce a superb model to be the pride of your railway and bring you much enjoyment!

### Chassis assembly:

Take the frames and lay them out as left and right. There are 2 sets of frame extensions that are handed, these need to be carefully lined up and glued to the front and rear of the frames, a good method is to use 2 bolts pushed through the holes to locate them on the frames. Next take the 4 axle bearings and glue these into the axle holes, take care not to get glue inside the bearings.

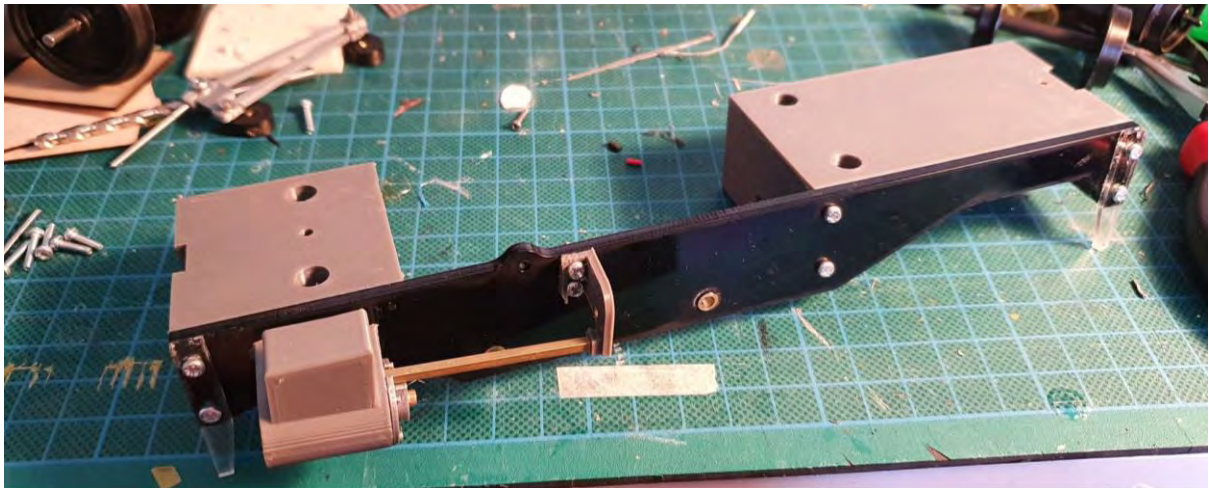


The cylinders are also handed so separate the parts into left and right hand components. Take the cylinders and push in the 3mm dia. Brass tube (DO NOT GLUE AT THIS TIME!) there should be approx. 7mm sticking out to the rear. Slide the rear cylinder cover over the brass tube (again DO

NOT GLUE AT THIS TIME). At the top of the rear cylinder cover you should see a square hole; take the 2mm square brass rod, cut it to 54mm and insert this into the hole to form the slide bar. On the end of the slide bar fits the motion bracket, this also has a square hole and can be pushed into place. Now take the cylinder assembly and fit it to the frames. The cylinders are fitted using 3mm bolt from the inside of the frame, and the motion bracket is fitted using 2mm nuts and bolts through the frame. The rear cylinder cap can now be slid backward slightly to be glued into place. The front cylinder covers can now be glued into place.



There are 2 frame spacers, 1 L shape (front) and one U shape (rear). Using 4 x 2mm x 10mm bolts and 3 x 2mm x 8mm bolts these can now be fitted to the left hand frame.



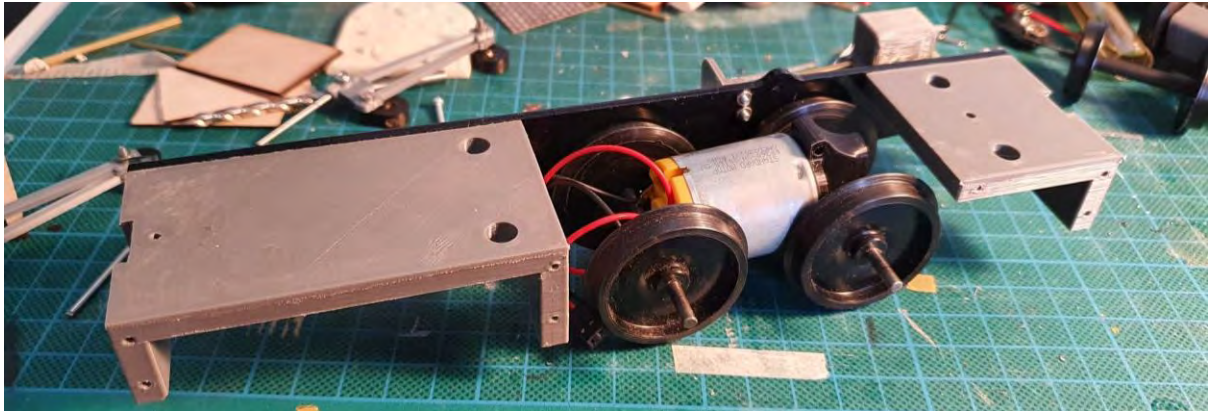
The gearbox is supplied already attached to the front wheelset. The motor requires the worm gear pushing on and can then be fitted into the gearbox and secured using the 2.5mm x 6mm bolts. Best practise is to lubricate the gearbox with oil or a light grease.



The wheelsets can now be fitted to the frame with the frame spacers attached. Start by pushing the front axle through the front bearing in the frame, the gearbox should be fitted with the 'bulge' facing

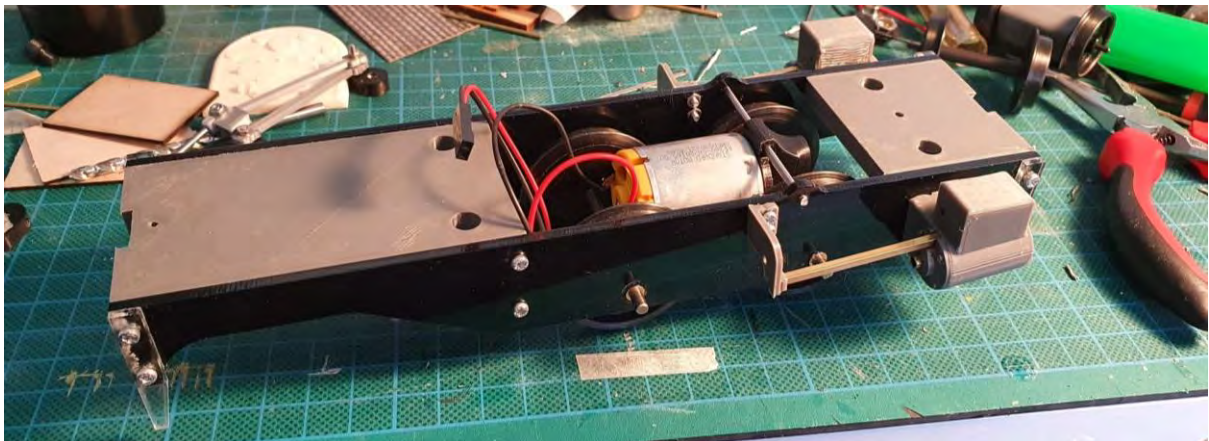


upwards. Once the front axle is fitted it can be rotated so that the motor is facing upwards out of the top of the frames, the rear axle can then be slid through the rear bearing. The motor can now be rotated back down to sit between the rear wheel-set.

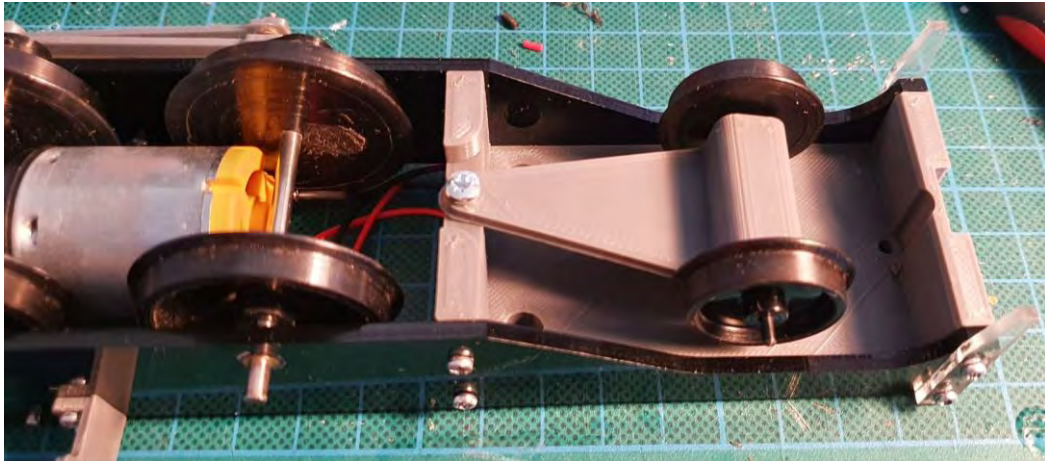


The right hand frame can now be fitted using 4 x 2mm x 10mm bolts and 3 2mm x 8mm bolts.

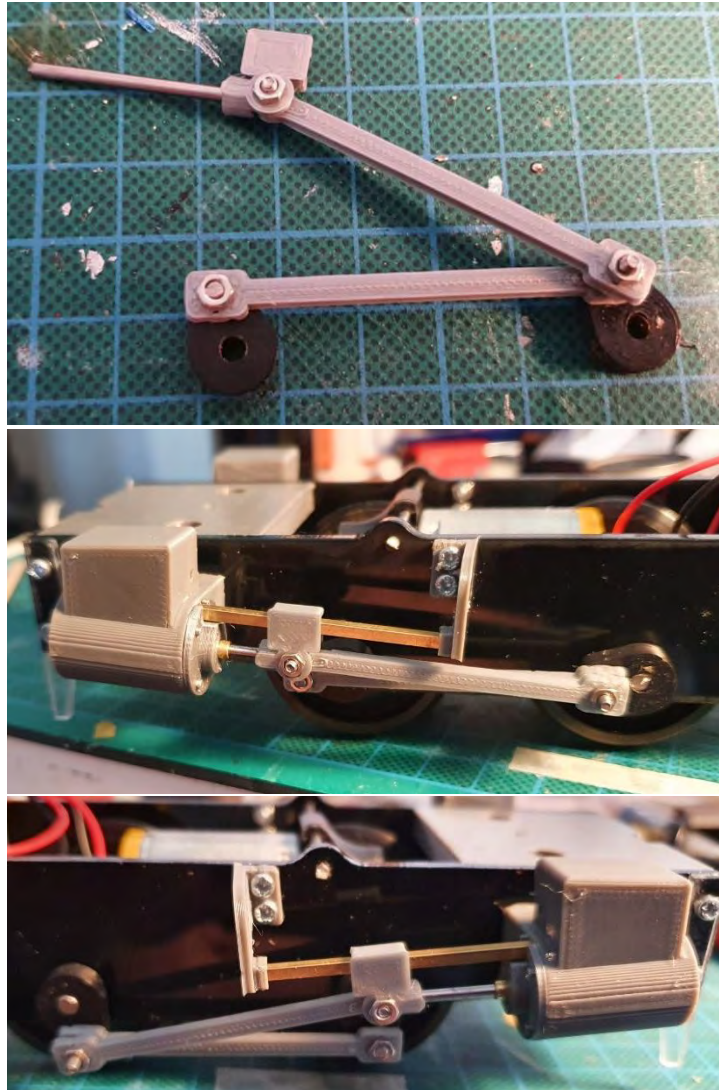
To fit the gearbox into place, push the 2mm steel rod through the hole in the frames above the front axle, thread it through the mounting hole in the gearbox, and push it through the matching hole in the other frame. This prevents the motor and gearbox rotating on the axle and dropping out of the bottom of the locomotive.



Take the pony truck, brass tube and pony wheelset. Open the hole out to take the Brass tube. Push the brass tube into the pony truck and glue into place (careful not to get glue inside the brass!). Carefully remove one wheel from the axle (a vice is very helpful at this point but not essential), slide the axle through the bearing in the pony truck and push the wheel back onto the axle (again a vice is useful but not essential). The pony can now be fitted to the frame spacer using the 3mm x 10mm bolt and nut supplied.



Now we will take a look at the cross-heads, cranks and con-rods. Take the 2 cross-heads and glue in the 2mm rods to make the piston rods. There are 2 connecting rods per side, 1 connecting the cylinder to the rear crank and 1 connecting the front and rear cranks. Take the connecting rod with the small end, this connects to the cross-head at the small end using a 2mm x 6mm bolt and nut. The connecting rod requires countersinking until the bolt fits flush with the face of the rod. The bolt should be on the inside of the rod with the nut on the outside of the cross-head. It is important that the nut and bolt be left loose so that the rod can freely rock back and forward. Next take the Cranks and screw in 2mm x 10mm c/s screws into 2 of the cranks to make the front cranks, and 2mm x 14mm c/s screws into the other 2 cranks to make the rear cranks. It is important the screws are flush with the back of the cranks or they will foul on the chassis sides! Take the 2 front cranks, fit one 2mm bearing to each and secure these with a nut. These now need to be filed until the bolt sits flush with the nut so as not to foul on the cross-head. Now repeat the process on the rear cranks but this time fit 2 bearings before securing with a nut. Take the Con-rods and carefully open out the holes until they freely fit the bearings on the cranks (should be easy to drop the bearings in/ take the bearings out). Remember to set up the cranks and rods as left and right handed. Fit the cranks on the left hand side using a 1.5mm Allen key, these should be fitted facing front dead centre (9 o'clock). **DO NOT OVERTIGHTEN THE GRUB SCREWS AS THEY MAY REQUIRE ADJUSTMENT!!!** The left-hand rods and cross-head can now be fitted. Next, we will be fitting the right hand cranks, its important to set these at 90° compared to the left-hand side. To do this we will be fitting them at bottom dead centre (6 o'clock). The right-hand rods and cross-head can now be fitted.



The chassis is now assembled and should be tested to make sure everything runs smoothly. If there is any binding/ sticking, loosen the cranks and start again with setting them out. When all is working as it should, drop a small amount of oil onto all of the bearings the keep the smooth running.

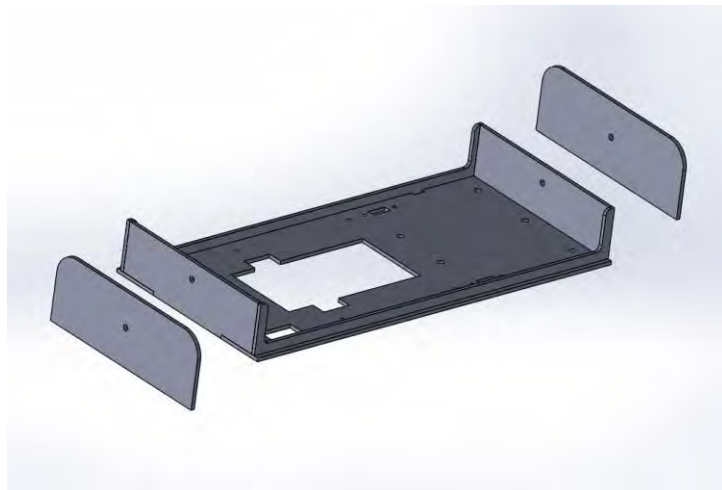
#### Bodywork Assembly:

Starting with the footplate laying down on a flat surface, glue the sole bars on either side. Use a small square to ensure these are at 90° to the footplate.

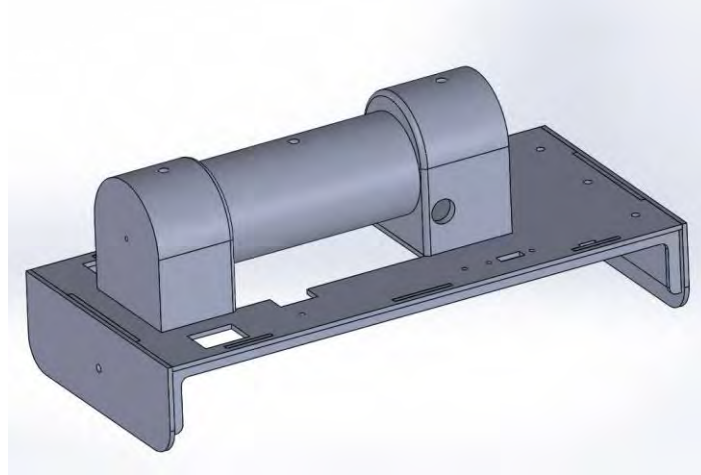




Next glue the buffer beam inner onto either end to strengthen the ends. Now the buffer beams can be glued onto either end, a screw through the coupling hole aids alignment.

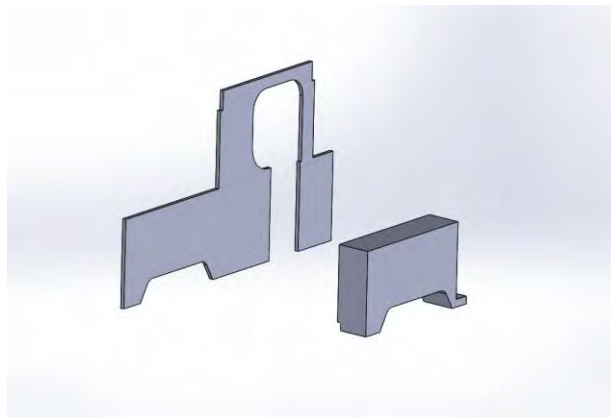


The footplate assembly can now be turned over ready to attach the smokebox, boiler and firebox. Glue 3 nuts in the slots in the smokebox and 2 nuts in the firebox. The smokebox is fitted at the end with the 2 rectangular holes (cylinder cut-outs), fix the smokebox into place using 2 x 3mm x 10mm bolts. The boiler locates on the back of the smokebox and on the ring on the back of the firebox. Connect the boiler (DO NOT GLUE) to the firebox and position both on the footplate, bolt the firebox down using 2 x 3mm x 12mm bolts.

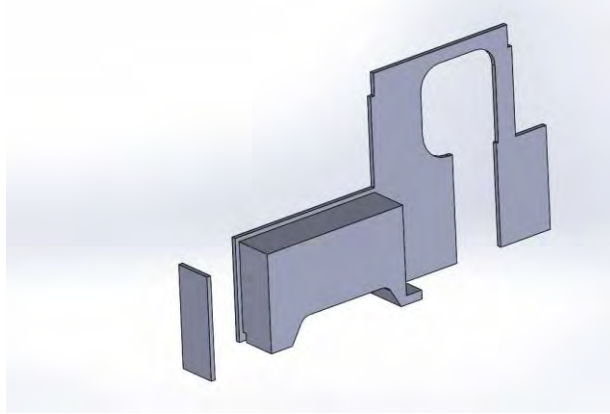


The smokebox door casting can now be glued into place, a bolt or piece of wire can be used to locate the door in the centre of the smokebox. The firebox back-head casting can also be glued into place now. The chimney can now be added to the smokebox. This is a 3 piece assembly starting with the chimney saddle in resin, this has a locating peg to ensure a good fit and should be glued in place. Next up is the brass tube that sits over the saddle casting, again this should be glued. Finally is the chimney cap, again this is a resin casting and fits neatly over the brass tube and should be glued in place. The dome is a resin piece and also has a locating peg into the boiler, this should be glued into place. Finally, the safety valve turret is added over the top of the firebox, again using the locating peg and gluing into position. For now put the footplate to one side.

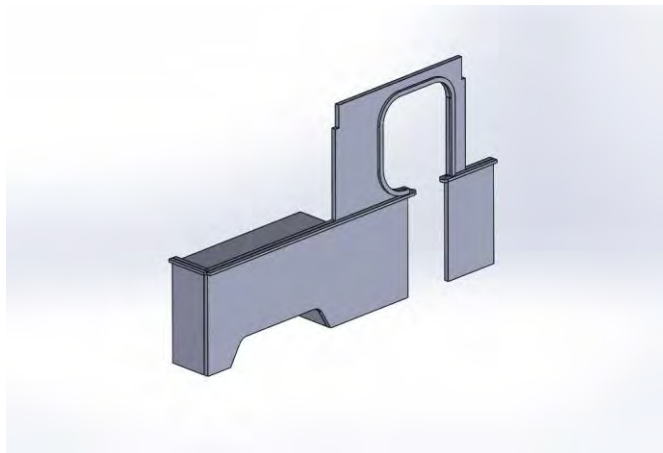
Starting with the one of the side body panels, take the side tank inner and glue this into place making sure the cut-outs at the bottom of the tanks line up and that the bolting flanges are facing rearward (towards the cab).



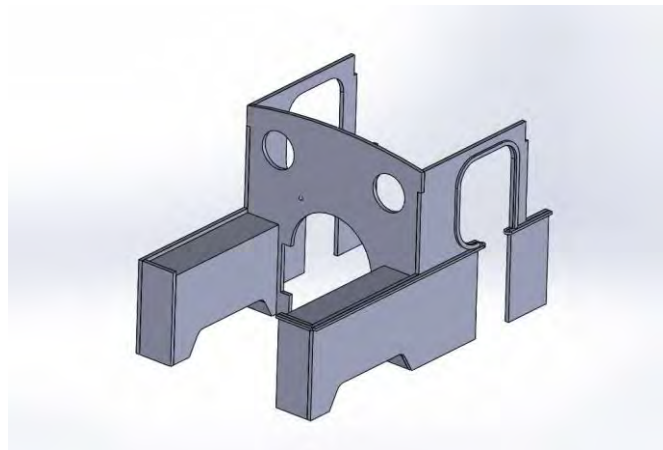
Next take the side tank front piece and glue this to the front of the side tank inner, be careful to make sure this lines up neatly with the side piece.



The beading can now be added along the top edge of the tank, around the cab and across the top of the coal bunker. Repeat this for the other side.

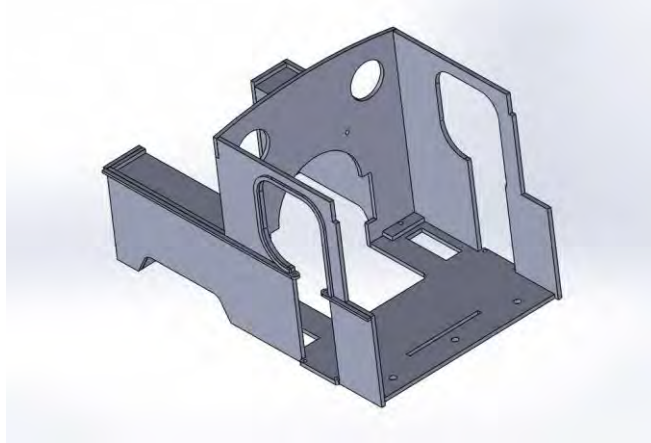


Now we can take the cab front and join the 2 sides together. The cab front is tabbed on the top corners of the cab front and is glued to the rear side of the side tank inners.

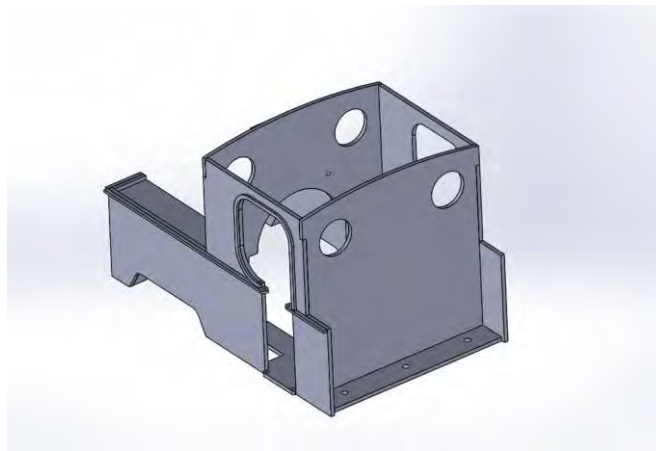


The cab floor is next to be fitted and is glued to the inside edge of the cab sides.

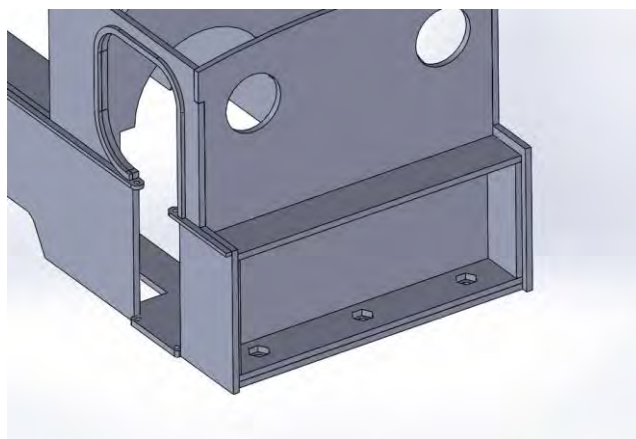




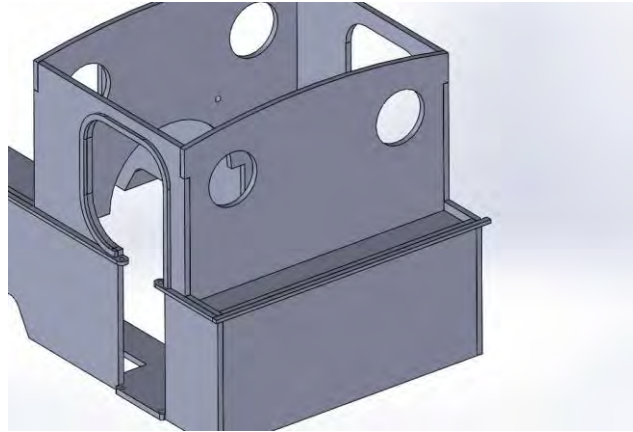
The cab back-sheet can now be glued into place using the 2 tabs in the top corners to aid alignment.



Working in the coal bunker, there is a mounting plate with 3 hexagonal holes in it. This is glued into the cab floor and provides space for fitting 3 nuts which need to be carefully be glued into place. There are 2 rectangular spacers that are now glued one either side in the coal bunker to provide support for the plate on the top of the coal bunker.



The back of the coal bunker can now be glued into place and the final piece of beading added to the top edge.



The handrails either side of the cab opening are made using the rod supplied and pushed through the holes in the beading and located in the matching holes in the cab floor.

The cab can now be fitted to the footplate. Using 2 x 2mm x 6mm bolts screw the side-tanks to the footplate and using 2 x 2mm x 8mm long bolts screw through the footplate into the 2 outer holes in the coal bunker. This now leaves 1 hole in the centre of the smokebox and 1 hole in the centre of the coal bunker free. These are used to bolt the footplate down to the chassis using 2 x 3mm x 10mm long bolts fitted through the frame spacers.

The model is now assembled and can be detailed to suit your taste using the parts supplied. Once you're happy with the model the final stage is to glue the cab roof on.