

## Rapier 20hp Locomotive Assembly Instructions

Ransome and Rapier of Ipswich first manufactured narrow gauge diesel locomotives in 1932 using 2 and 3 cylinder Ailsa Craig engines. Unfortunately records prior to 1934 have been lost but it appears that about 100 of these locomotives were built up to the end of 1939. The kit is based on the 2 cylinder (20hp) example that is currently at Amberley which is a hybrid of loco numbers 80 and 82. No 82 started life at Scrooby (15 minutes' drive from where this kit is manufactured) before going to the Ashover light railway and then Amberley.



### General Assembly Instructions

Do take time to read through the instructions and understand how the parts fit together before reaching for the glue pot. Where ever possible parts have been designed to be symmetrical but occasionally parts have to be left or right handed so take care to follow the instructions carefully at these points.

### Gluing

The 3D printed components in this kit are best glued with a good quality cyano glue (e.g. "Roket Max"). When fixing parts to pre-painted parts, aero modeller's "canopy glue" works well without any risk of "smoking" the paint surface.

## Painting

This is very much a matter of personal choice. The 3D printed parts are easily painted with either acrylic or enamel model paints. We also find acrylic car paint in an aerosol works very well. The small components are best painted before fixing to the larger assemblies.

The majority of the body work parts are 3D printed in resin with a much higher resolution than most other kits on the market leaving near invisible layer lines. If you do want to remove the last traces of these lines you will find the resin sands easily with wet and dry paper.

The outer frame plates are one of the few remaining "PLA" parts and we find that priming with an auto "filler primer" from an aerosol can is an easy way of removing printing marks from these.

## Tools

The following tools will be required:

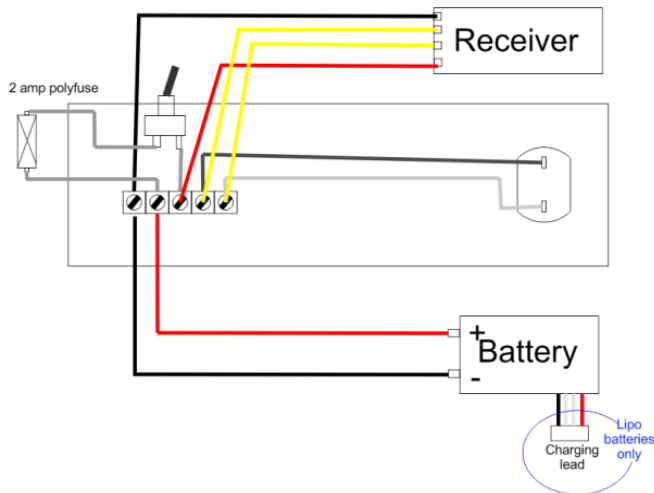
- A sharp modelling knife or scalpel
- 1.5mm, 2 mm and 3mm drill bits (to clean out various holes)
- A small file, wet and dry paper or an emery board "nail file"
- A pair of side cutters or "snips"

The following tools are recommended

- A cutting matt
- Round and flat section "needle files"

## Radio Control

The kit comes with the chassis pre-wired for simple “Forwards-Stop-Backwards” control with a battery holder for 6 AAA batteries . Our locomotive kit chassis include a 5-way screw connector block. This is to facilitate the fitting of a remote control if required.



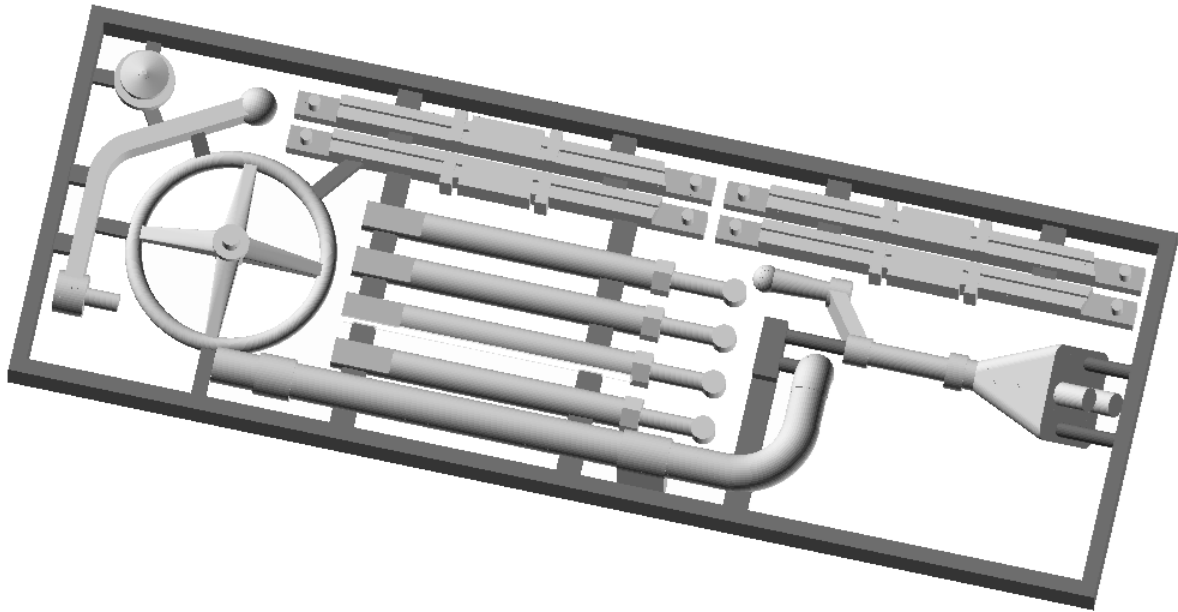
However if you fancy fitting radio control there is sufficient room in the bonnet cavity to accommodate either a 3 cell lipo battery and a Deltang RX60 or a 4 cell AAA Nimh battery pack and a Locoremote Mini B (pre wired leads recommended). In the latter case we would recommend one of the 6 volt motors.

### Points to note

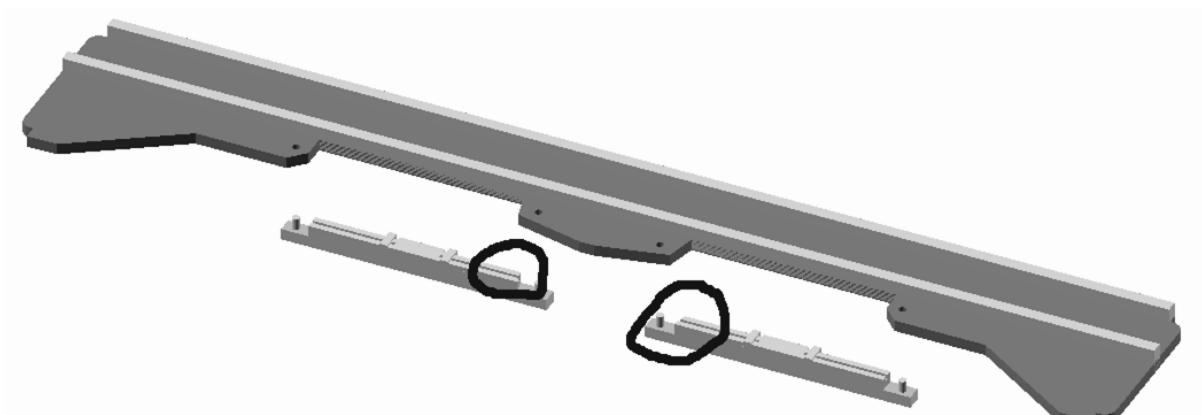
- 1) Do observe the polarity , i.e. black to black; red to red .Getting this wrong could wreck the receiver.
- 2) The kits come fitted with a switch that has been wired as a “change over” with center off. We suggest that you change the switch for a simple on-off switch, or at the very least rewire the existing switch. Using “as is” could result in the polarity to the receiver module being reversed !
- 3) If when you test the loco, it goes backwards when the transmitter/phone says forwards; then transpose the two output wires (yellow in the diagram) from the receiver.
- 4) If you are using a lipo battery we strongly recommend that you attach the battery to the bonnet side with some Velcro. Leave the little charging lead loose towards the top so that you can connect the charger relatively easily.

## Step 1 – SLS Component Preparation

The majority of the SLS components are joined together with little sprues (the dark areas in the picture) and will need separating with a sharp knife, scalpel or modelers side cutters. These components take acrylic modelling paint very well and it is suggested you paint them before assembly.



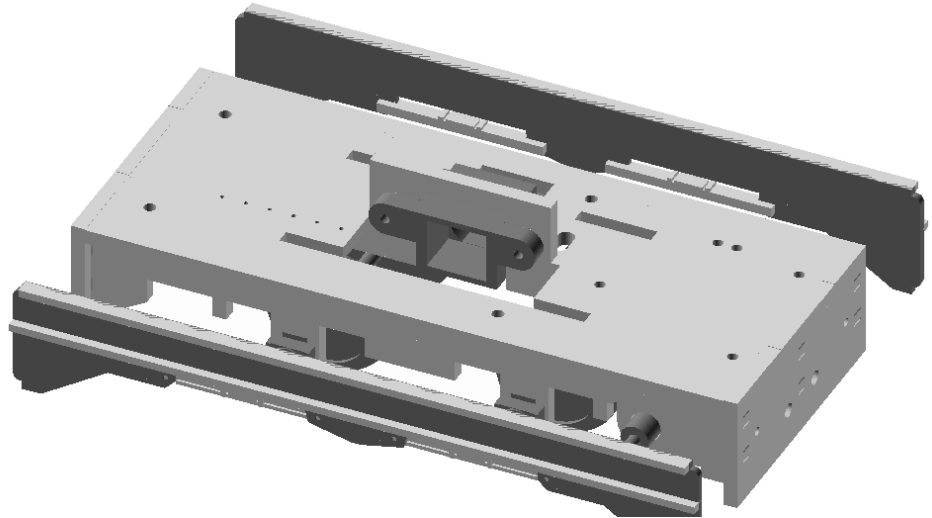
## Step 2 – Springs



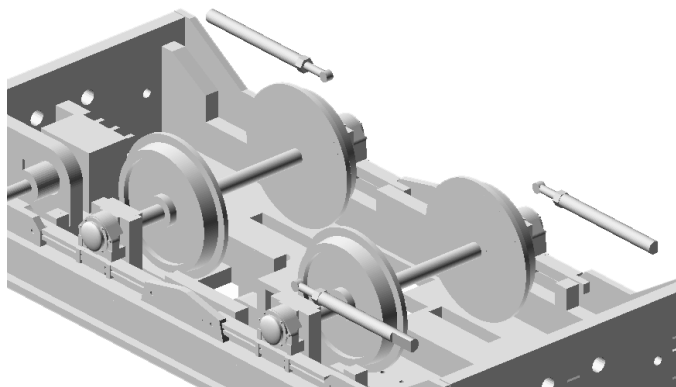
Glue two of the springs into their locating holes in the outer frame plates. Note these parts are “handed” and the sloped cut outs go in the centre. The flat surface of the spring is at the bottom and the slightly raised “clips” are at the top. Repeat for other side.

### Step 3 - Fitting outer frames

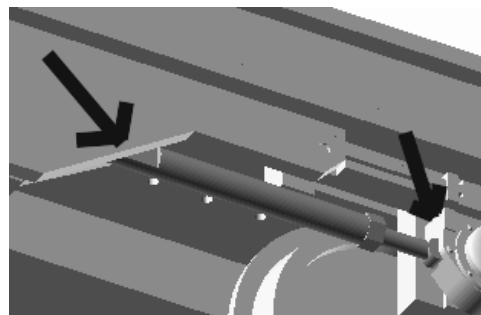
Glue the outer frames assemblies to either side of the chassis. Take care to ensure the top surfaces are flush with top of the footplate protruding lugs at each end of the chassis are even. In fact temporarily holding the buffer beams in place helps to ensure this..



### Step 4 - Fitting thrust rods



Glue three “thrust rods” into place between axle boxes and the frames ends (see below)



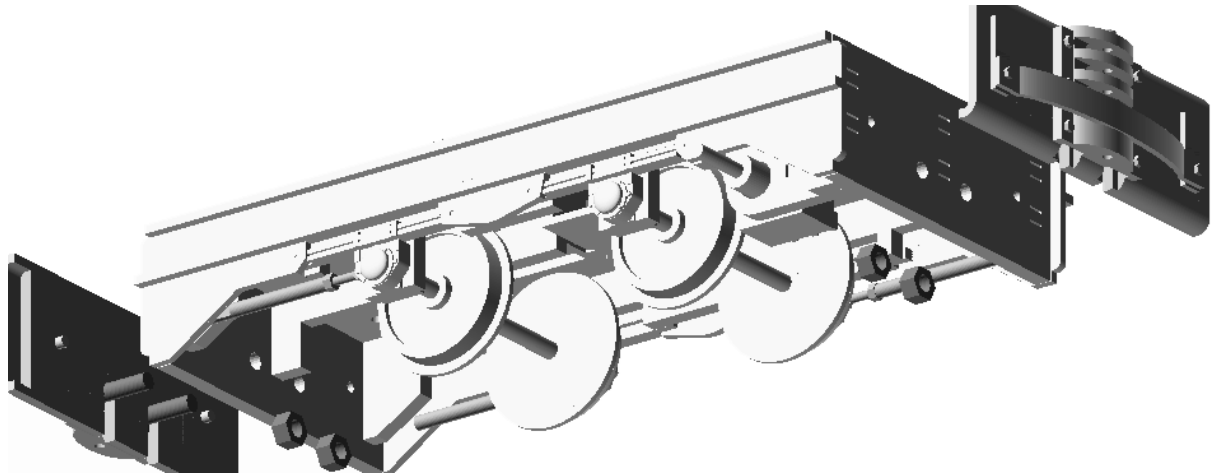
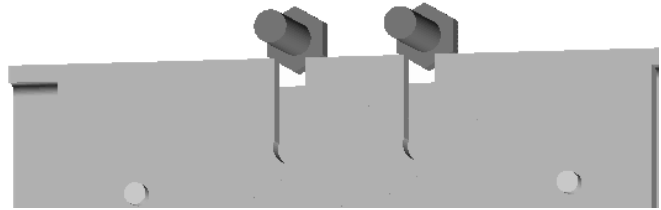
The round ends locate in a little socket in the axle box side and there is a little flat to glue onto the frame.

N.B. There is a spare “thrust rod” in case you decide to move the switch and you want to fill the gap.

### Step 5 - Buffers

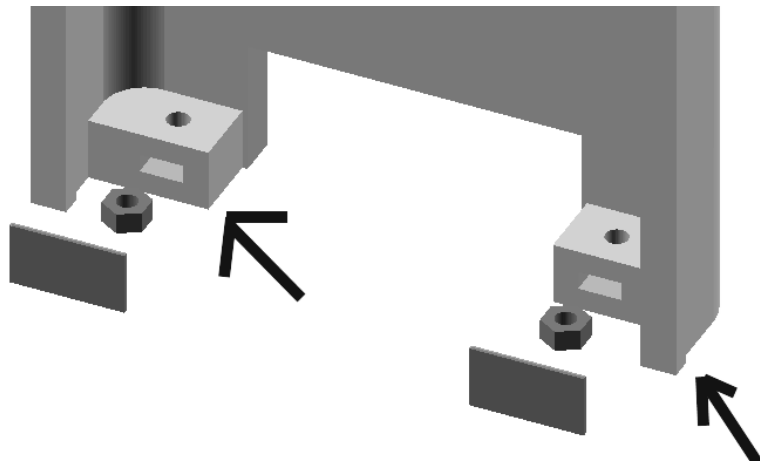
Clean out the slots in the buffer beams and slide two M3 bolt heads into the slots.

Bolt the buffer beams onto the chassis securing with 4 M3 nuts.



### Step 6 - Cab front preparation

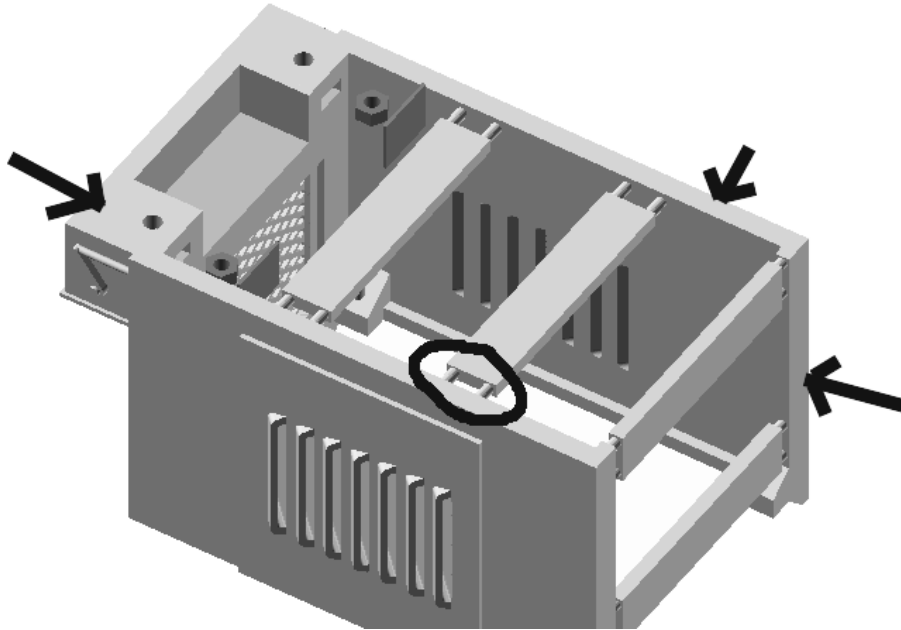
This is 3D printed resin part and the bottom surfaces (indicated by the arrows) will need a light sanding (with supplied board) so that the part sits flat on the footplate/



Clean out the two bolt holes in the "nut cages" with a 2mm drill bit. Now place two M2 nuts in their sockets and glue the thin plastic retaining plates in place to trap them.

## Step 7 - Bonnet preparation

First clean up the bottom and side faces (indicated by arrows) with emery board so the bonnet fits squarely on the footplate next to the cab sheet properly.

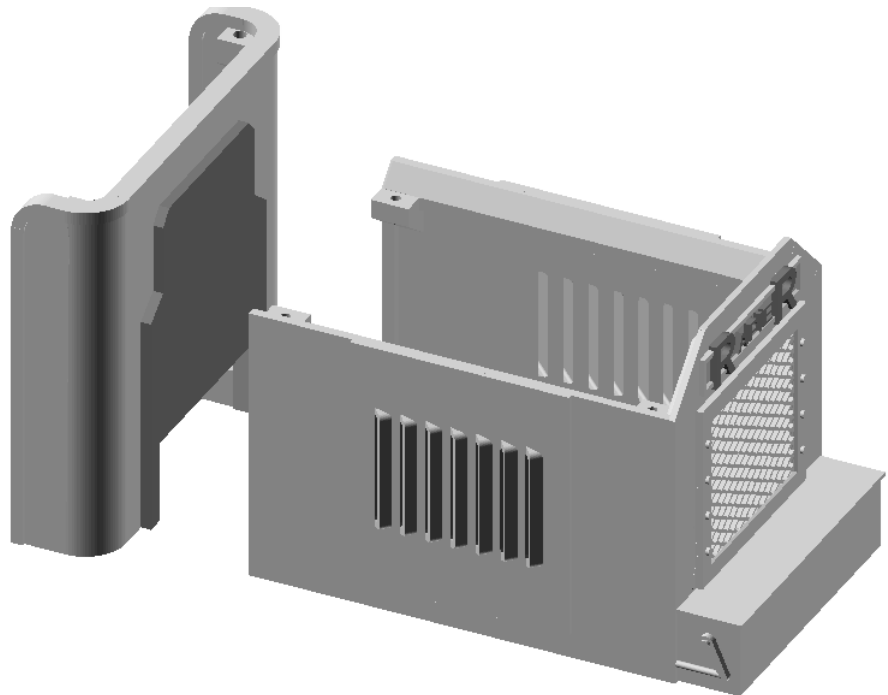


Next carefully remove the bottom rectangular printing supports by snipping the joining cylinders (circled) with side cutters .

Fit the M2 nuts into their cages as before and glue on retaining plates.

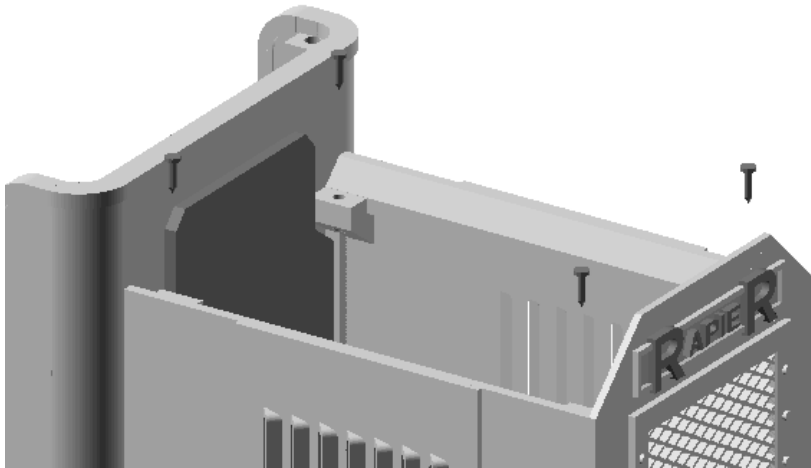
Remove rear two printing supports.

Now glue the bonnet to the cab front on a flat surface

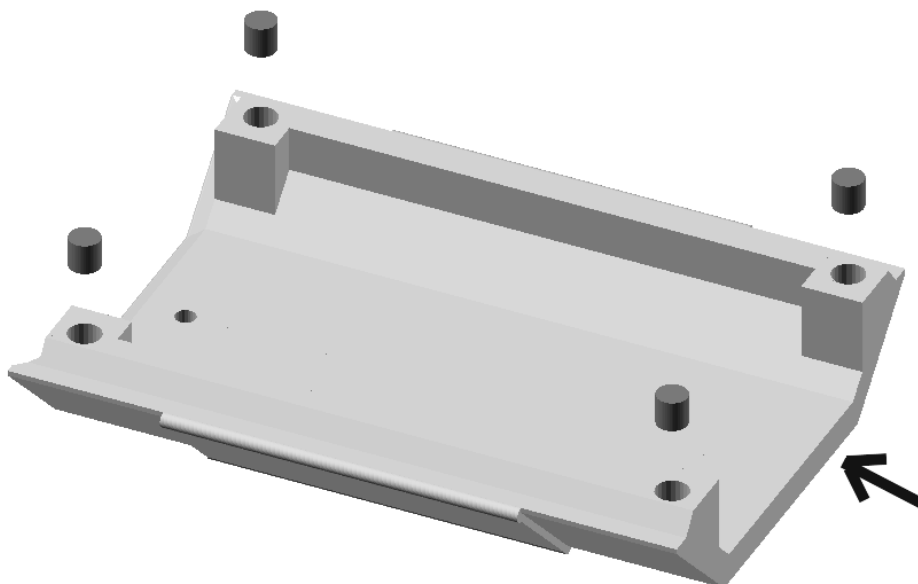


### Step 8 – Bonnet top preparation

Carefully clean out the four catch holes in the top of the bonnet sides with a 1mm drill. Take four of the supplied steel pins, cut them to about 5mm long (**please wear eye protection while doing this**) and glue them into these holes.



Clean up the rear face of the bonnet top (arrowed) with the emery board so that bonnet top fits on the bonnet.



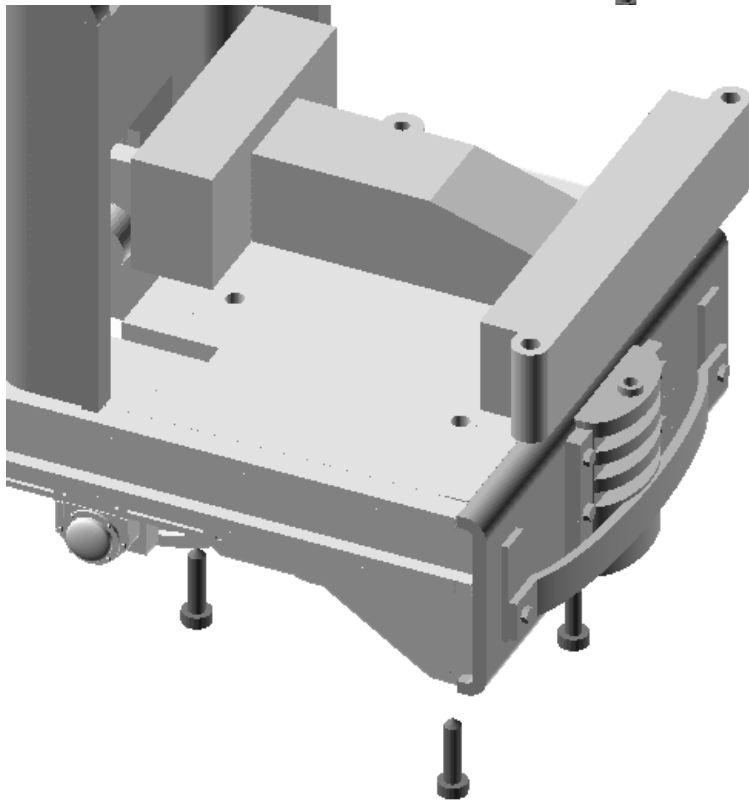
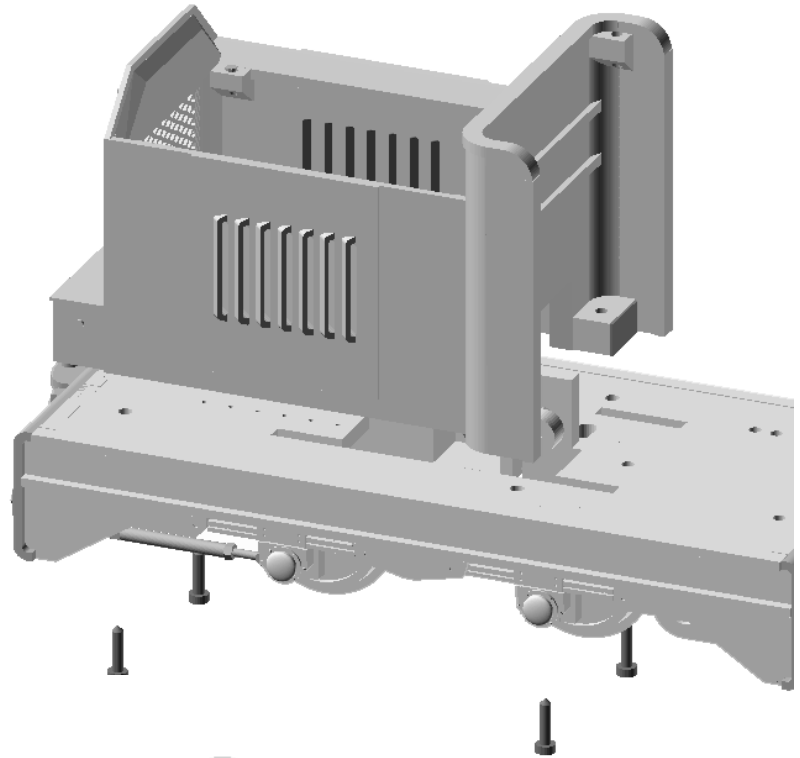
Clean out the four holes with a 3mm drill bit and then glue a magnet into each hole.

Test fit the bonnet top, it should lightly snap into place.



## Step 9 - Main assembly

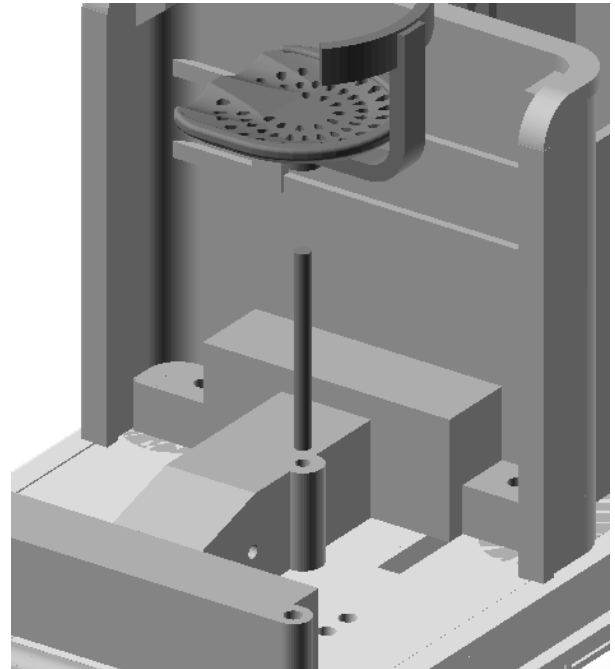
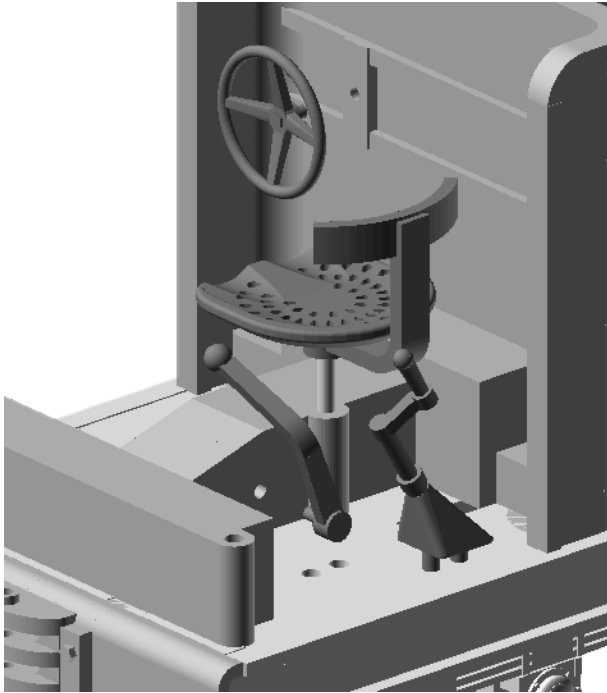
Bolt the bonnet to the footplate with four M2 bolts up into the captive nuts. Do the 2 rear ones first as they are the most awkward due to the position of the wheels. Get them started, then fit and tighten the front pair before finally tightening the rear pair.



Fix the rear sandbox/transmission tunnel to the back of the footplate with three self tapping screws.

## Step 10 – Cab details

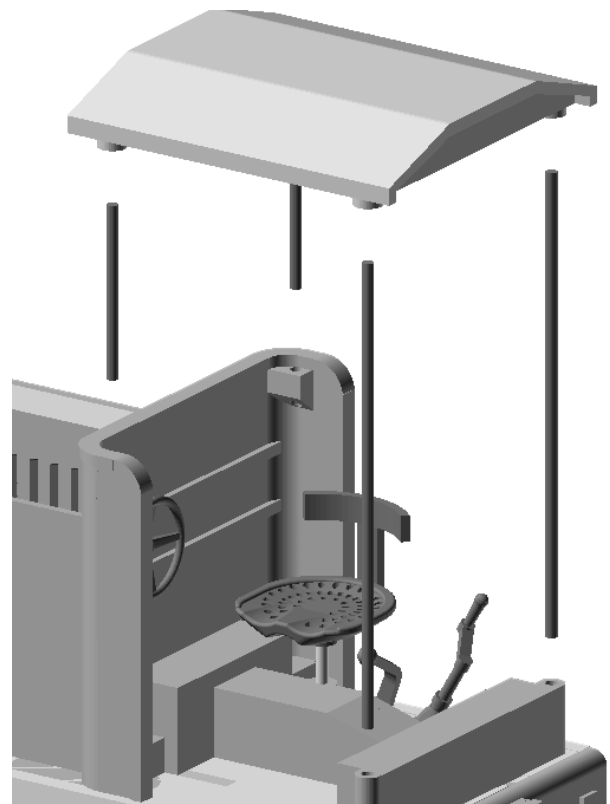
Fix the bucket seat to the 2mm diameter, 26mm long rod and then fix push the rod into its socket on the side of the transmission tunnel.



Glue the gear lever , brake handle and regulator wheel in place.

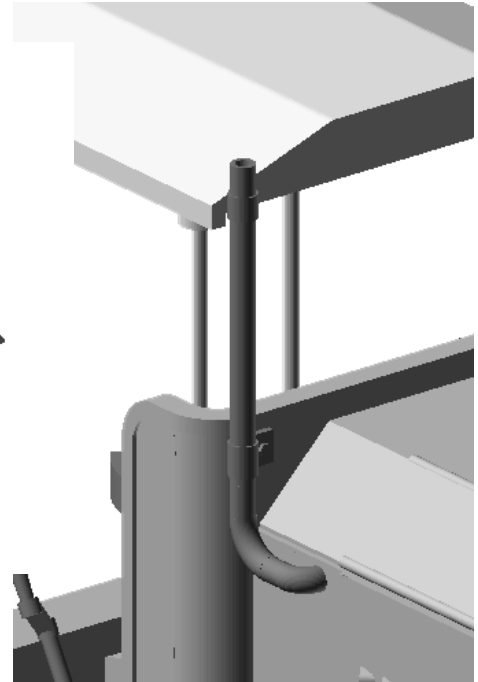
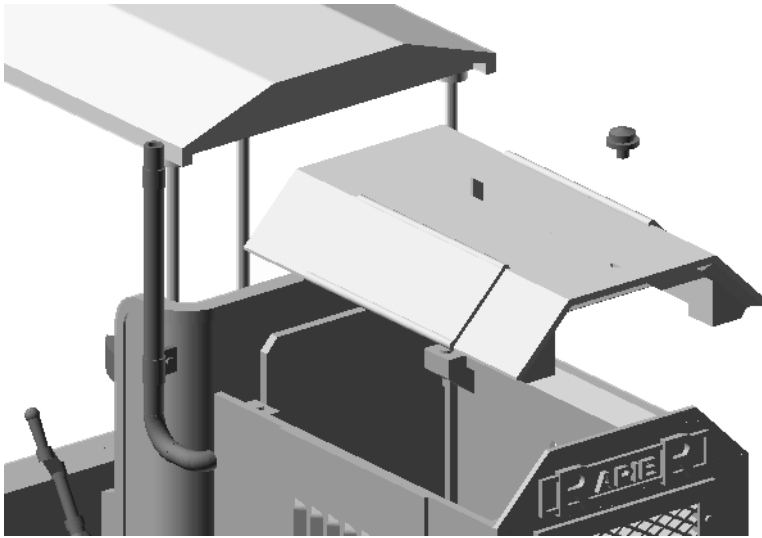
Fit the two 2mm diameter, 30mm long rods into their sockets in the cab front (clean out the holes with a 2mm drill first if necessary). Fit the two 80mm long rods into the sockets in the rear sand box.

Now glue the cab roof to the top of the rods.

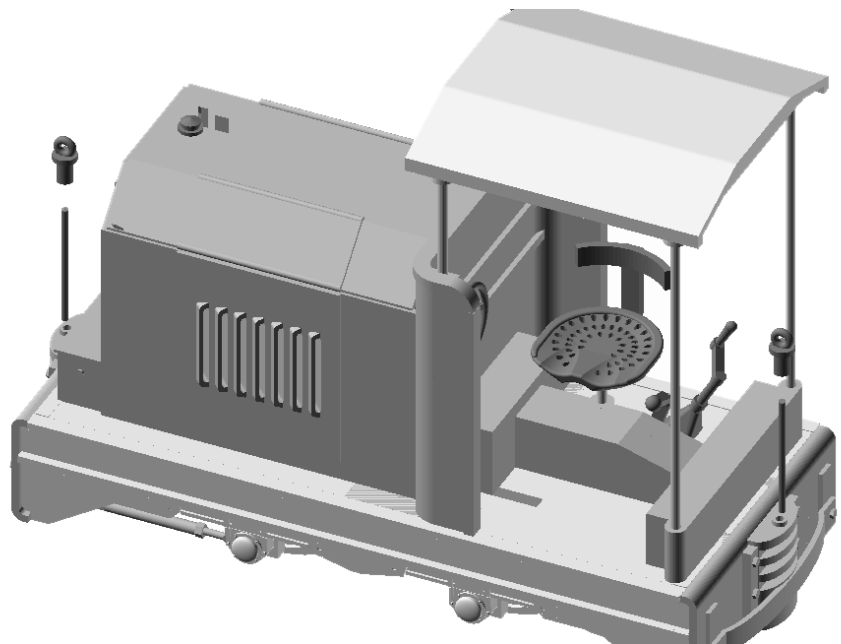


### Step 11 - Finishing touches

Glue the radiator filler cap to the bonnet top. Glue the exhaust to the cab front and bonnet side



Clean out the holes in the coupler eyes with a 1.5 mm drill and glue in the 1.5mm diameter coupling pins. Push the pins into their holes in the buffer beam.



**Job Done!**

## Parts List

<b>Part</b>	<b>Quantity</b>	
Chassis	1	
<i>Resin parts</i>		
Bonnet Assembly	1	
Bonnet Top	1	
Cab sheet	1	
Cab roof	1	
<i>PLA parts</i>		
Transmission Tunnel	1	
Outer Frames	2	
<i>Nylon parts</i>		
Buffer Beams	2	
Detail set	1	
Seat	1	
Coupling Pin Heads	2	
<i>Ironmongery</i>		
M3 nut and bolt	4	
M2 nut and bolt	4	
M2 self tapper	4	
Coupling chains	2	
2mm dia Rod (80 mm long)	2	
2mm dia Rod (30 mm long)	2	
2mm dia Rod (26 mm long)	1	
1.5mm dia Rod (26 mm long)	2	
Track Nails	4	
Magnets (3 x3 mm)	4	