

WARRIOR



Thank you for buying this locomotive kit from Boot Lane Works, please read all the instructions carefully before assembly.

Tools & Adhesives

I recommend a few tools to help you assemble your kit –

- Small Bench Vice
- Modelling Knife (*I use a scalpel*)
- Tweezers, Pliers, etc...
- Needle Files, various shapes
- Wet & Dry abrasive paper (*the mixed selection from Halfords is very good*)
- Selection of small twist drills, including 1.5mm & 2mm diameter
- A 90-degree angle (*I use a set block, but a small set square will work well*)
- Personally, can't manage without my small, tapered reamer, look for them on eBay!
TAKE CARE WITH THE REAMER - MAKE A SMALL CUT, TRY, AND CUT AGAIN

I also recommend the following adhesives –

- Super Glue
I use Gorilla Super Glue
- Dichloromethane, A liquid solvent for the acrylic
I use E.M.A. Model Supplies "Plastic Weld"

THE RESIN PARTS ARE BRITTLE AND MUST BE HANDLED WITH CARE

The resin is hardened by an ultraviolet light process but continues to adsorb the light after the process. Please ensure the resin is thoroughly painted to stop the hardening process.

THE ACRYLIC IS ALSO BRITTLE, CARE SHOULD BE TAKEN DURING CONSTRUCTION

******* IMPORTANT *******

Please bear in mind that this kit, although intended for garden use, is a reasonably small power unit, designed for hauling a handful of wagons or a couple of carriages.

We DO NOT guarantee this model if used for “Heavy Haulage”!

A freelance model, WARRIOR was inspired by the British Rail 08 Class locomotive.

We are confident that this model is our easiest to build, to date.

*There are two gearboxes provided in this kit -
One fits the 3/6v motor supplied with the kit, complete with two M2.5 5mm securing screws.
The gearbox for the supplied motor has a smaller mount hole than the larger motor, below.*

The second gearbox has a different a fixture mount to fit an MFA 385 5 Pole Motor (6-15v). This motor is not supplied, but the gearbox is included should the customer wish to “upgrade” to the larger motor.

Also included is a nylon worm gear that has been bored to 2.2mm to fit the MFA 385.

LET’S GET STRAIGHT INTO IT, AND BUILD THE CHASSIS...

There are included within the kit, a couple of jigs to enable a reasonably easy build, and (I promise you) an idiot-proof system to quarter the outside cranks.

We will start with the wheelsets.

Locate the six Peter Binnie 29mm wheels, the three axles (*one already has a grey gear centred on it*), two of the small brass top-hat bushes and the two white printed tube jigs with a small hole down the centre.

Take a plain axle and carefully push a wheel onto either end. I use a small, tapered reamer to open the hole in the back of the wheel very slightly, to help the wheel start onto the axle. Be careful, if you are using a reamer, take only a tiny twist...

As you push the wheels on, take care to keep them square to the axles. We want to avoid wheel “wobble”. I used a small vice to push the wheels onto the axles.

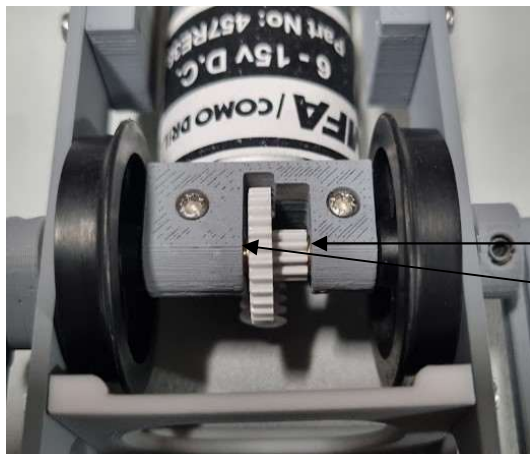
Using the white tube jigs as a depth gauge, push the wheels onto the axle.
You can use both gauges simultaneously (*as in the image*), or one on its own for each end in turn.

The jigs are the correct depth to ensure that wheels are pushed onto the axle to give you a “back-to-back” of 28mm. And they will give you equal lengths of axle on each side, on which to mount your cranks later in the build.



Repeat the process for the second plain axle.

The third axle requires a brass top-hat bush be placed either side of the grey gear, between the wheel & grey gear. The lip of the brass top-hat bush must be flush against the grey gear on both sides. Again, use the white tube jig to ensure the wheels are pushed onto the axle to the correct depth.



Locate the two gearbox parts.

(Photo is VARSITY, but the gearbox is the same on WARRIOR)

The two halves of the gearbox are held together with two M2 8mm panhead screws.

Clamp the two gearbox parts over the axle. The two, brass top-hat bushes are clamped up against the grey gear with the lips visible between the grey gear and gearbox.

Do not attach the motor yet, it's much easier to build the motion without the constraint of the motor.

Next, you need to press the cranks onto the crank bushes.

Locate the six bushes, six M3 grub screws, six white printed cranks & the Allen key supplied. A few spares have been provided.

Using a vice, squeeze the bush into the crank.

The hole for the grub screw in the bush needs to align with the hole in the crank. I did not use any adhesive to attach the crank to the bush; it was just a push fit.

After testing, my cranks have not moved on the bushes, but it's obviously a possibility, and you may wish to use an adhesive?

CRANKS

Once you've pushed the bushes into the cranks, you need to locate the six 10mm conehead M2 screws.

Fix the screws into the cranks, there is a countersunk hole printed into the crank.

I painted the cranks before fixing the screws.

The image shows the cranks for VARSITY, WARRIOR has six cranks in total, all with the same length crank pins.

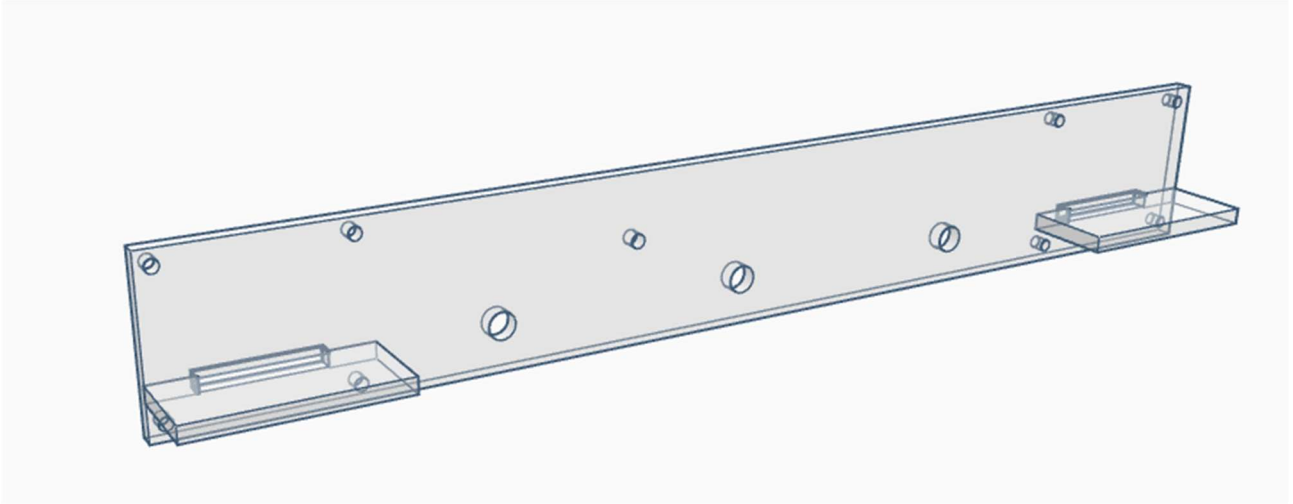


LET'S PUT THE FRAMES TOGETHER

This is very easy, you will need the two 2mm acrylic frameplates and the four steps.

Using the recommended liquid adhesive, fit the four 2mm acrylic steps into the frames. There are locating slots in the frames.

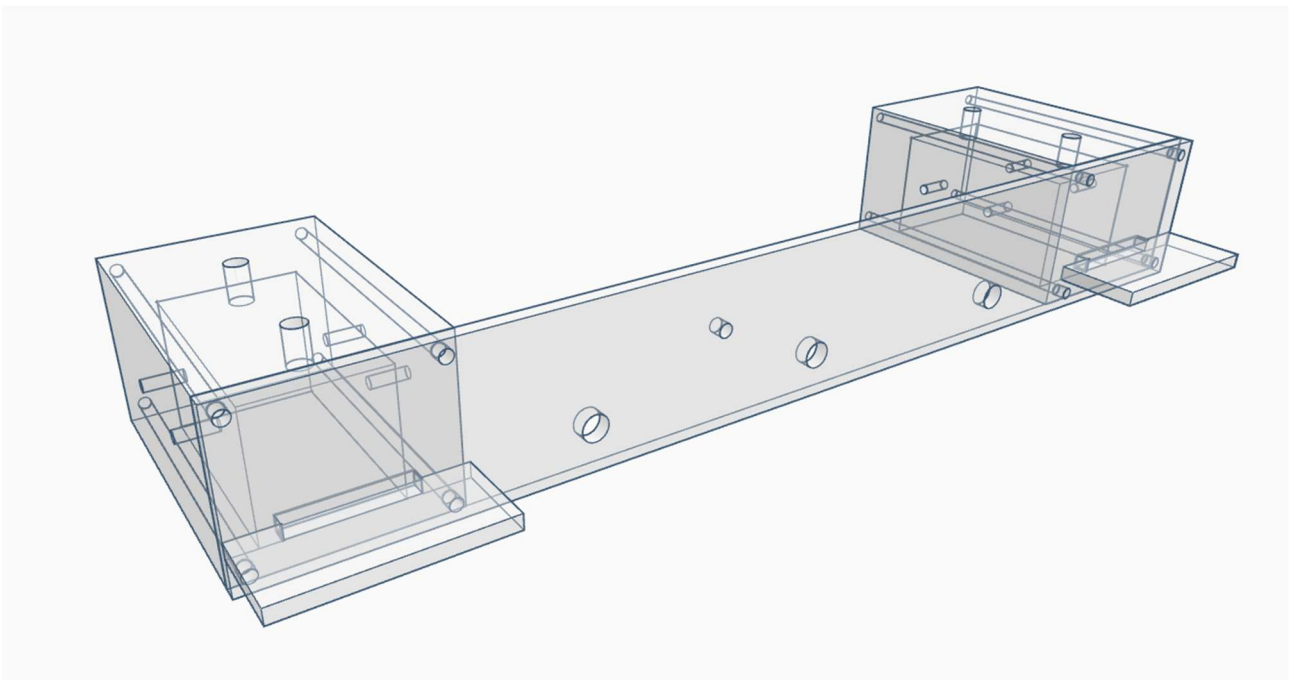
Once the frames & steps were glued together, we painted them prior to assembly of the chassis.



Next, locate the two stretcher (or spacer) blocks. These are printed in white material.

The holes in the stretchers take either M2 or M3 screws, we recommend that you top these with M2 & M3 taps. It is not 100% necessary, the screw will self-tap into the prints, but it is easier if they are tapped beforehand.

Take the two stretchers and attach at the front and back of one plateframe using x8 8mm panhead screws (x4 screws for each stretcher).



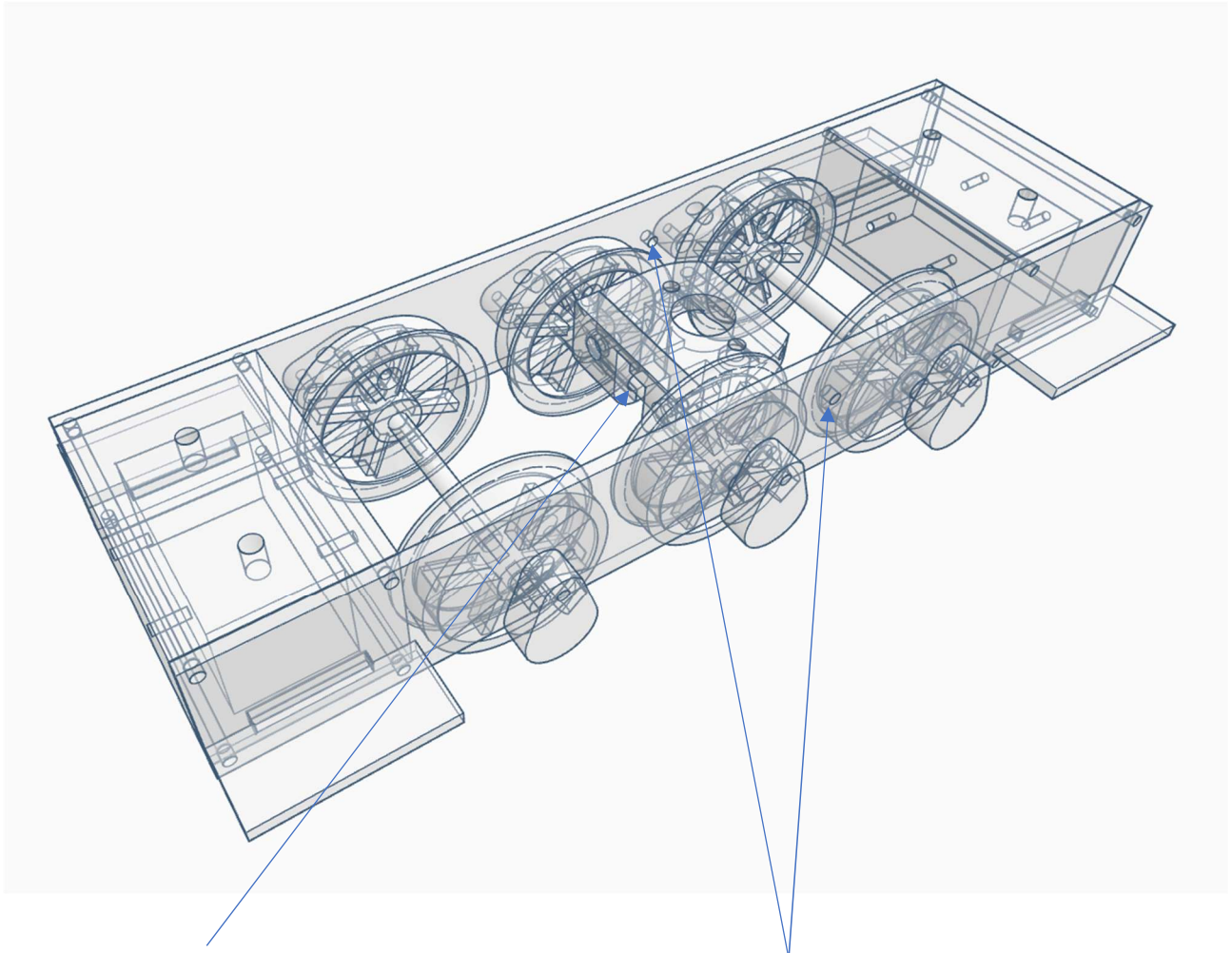
Notice the orientation of the stretchers, which are interchangeable. The two M3 holes are at the top of the stretcher and are used to attach the body to the chassis.

Before you attach the second frameplate, you will need to locate your three wheelsets and slide on the remaining six brass top hat bushes.

One bush per axle end, the rim of the top hat bush needs to go up against the wheel.

Each bush locates into a 4mm hole in the frameplate.

With all three wheelsets in place and both frameplates in position, use another x8 8mm panhead screws to secure the second frameplate to the stretchers.



NOTE - the gearbox is located on the centre driving axle & the two small holes in the frames must be symmetrical with each other.

ALSO NOTE - The wheelset with the gearbox must go in the correct way round, rotate it on the axle and ensure that the 2mm holes in the frameplates & gearbox align.

FITTING THE CRANKS.

Now place three cranks on the end of each axle on one side of the locomotive.
Tighten all three Allen screws, ensuring that the axle end is flush with the front face of the crank.

Now loosely place the remaining cranks on the other side of the chassis.

Using the two quartering jigs supplied, place one over the cranks that have been tightened (rotating the wheels to line the cranks up with the jig).
Turn the chassis over to access the loose cranks and using the second quartering jig, place it over the cranks (rotating the cranks to line them up with the jig).
With all the cranks held by the jigs, tighten the remaining Allen screws.

That's it.

Your six coupled chassis is quartered, and ready for the rods.

Locate two coupling rods (there are a couple of spares), x6 M2 nuts, x6 M2 washers & x6 short white ABS tubes.

You will need to work all three crank pin on one side, then the other side.

First place the washers over the crankpins, they should sit up against the face of the cranks.

Next the white ABS tubes.

Then the rod over all three crankpins and the ABS tubes.

Finally, the M2 nuts.

The nuts tighten against the ABS tube, which is very slightly deeper than the rod. The rod rotates around the ABS tube.

The washer acts as a spacer between the rod and the crank.

Repeat on the other side.

And you should have a free rolling chassis. If it is not, check that all the rods are free and not clamped by a nut?

The gearbox is held in place by a length of 2mm brass rod. Cut the rod to 50mm length, pass it through the frameplates, the long hole in the gearbox and through the other frameplate.

KEEP THE JIGS SAFE - THEY WILL COME IN HANDY IF YOU EVER NEED TO SERVICE YOUR MODEL IN THE FUTURE

***IMPORTANT – PLEASE ADD A LITTLE OIL TO THE GREY GEAR WHEEL
ALSO OIL THE BRASS BEARINGS AND THE RODS.
BUT MOSTLY, ESURE THE GREY GEAR IS LUBRICATED REGULARLY***

THE BODY

The body is almost entirely built up from 2mm laser-cut acrylic.

We rub-down the acrylic prior to building to give the liquid adhesive and paint a good bonding surface.

**TAKE CARE WITH THE CAB SIDES - THESE SNAPPED WHEN WE BUILT THE DISPLAY MODEL
WE RECOMMEND THAT YOU GLUE THE CAB SIDE TOGETHER BEFORE RUBBING DOWN**

Most of the body locates with slots and tab construction.

We started with the cab doors. These are 1mm acrylic there are two door pieces per side, they glue together to make one 2mm door that fits inside the cab side piece,

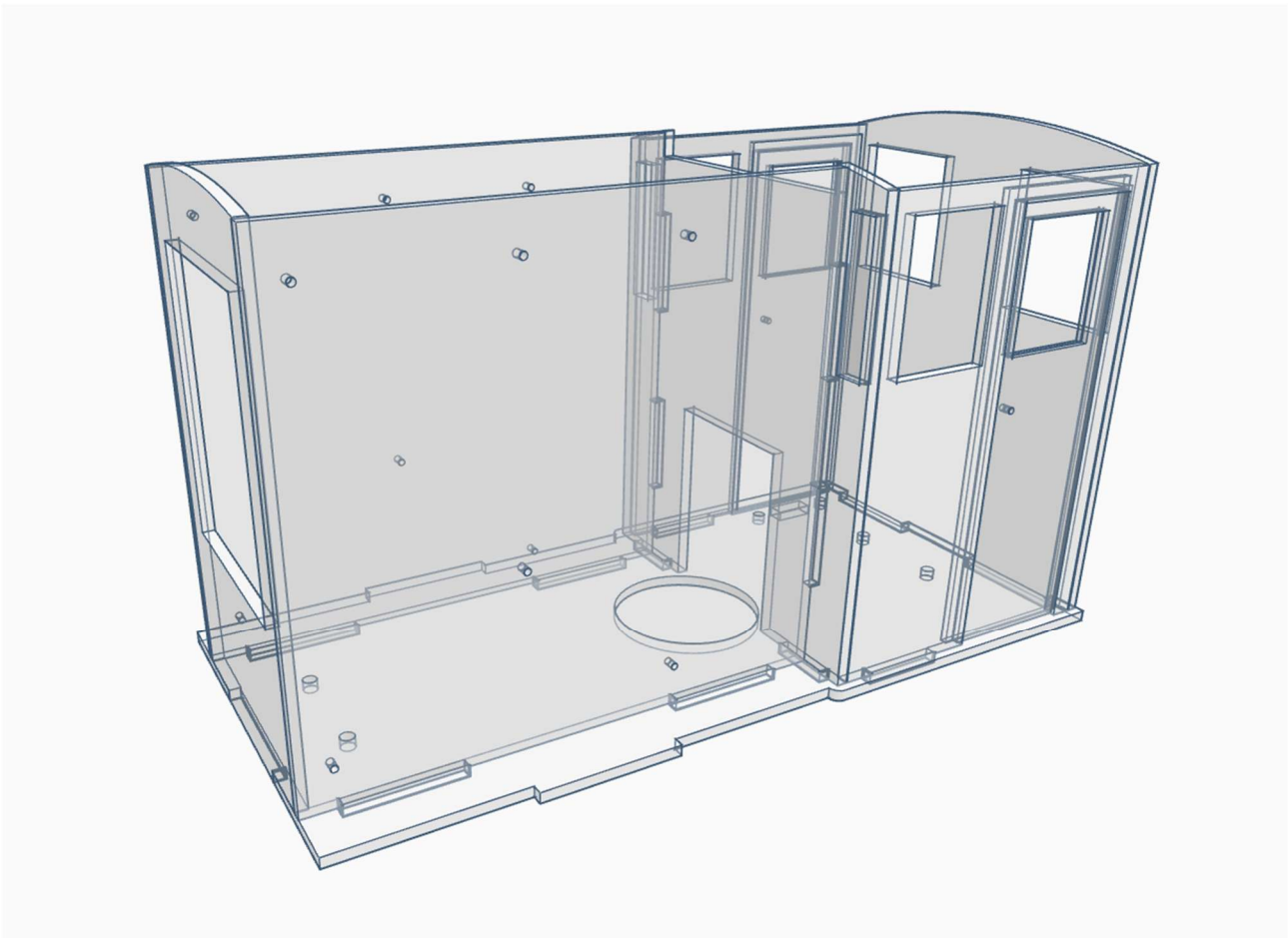
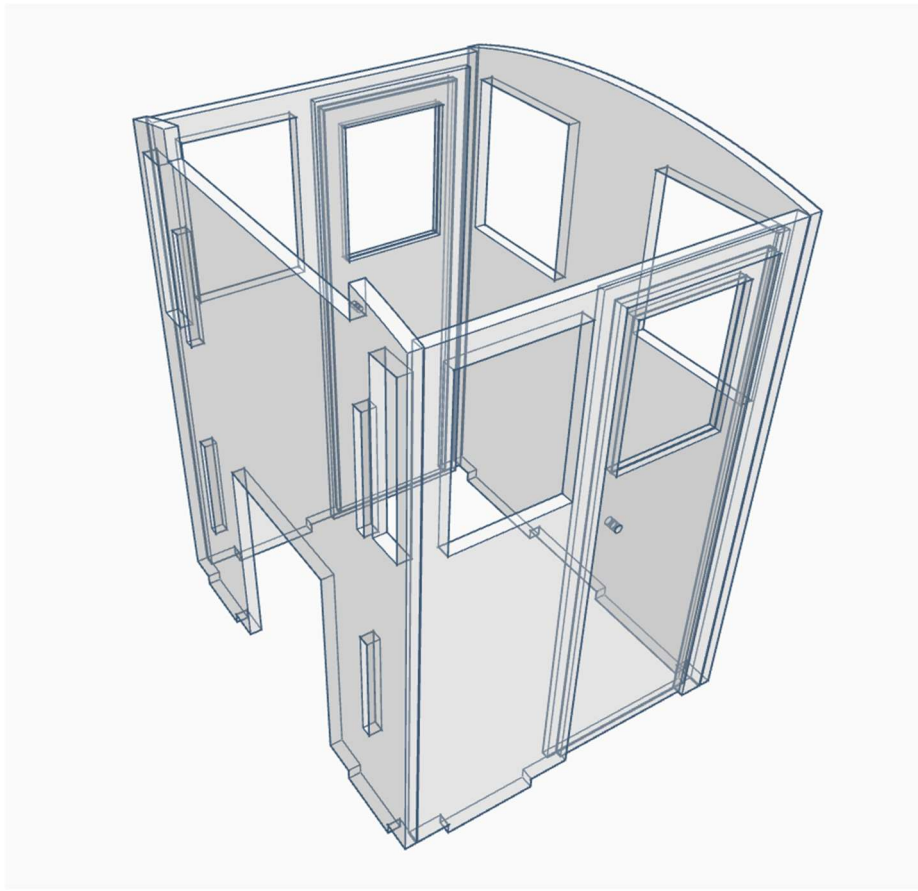


Left, two door halves together



Right, the door placed into the cab side

The cab consists of two sides, rear and front sections.
The bonnet consists of two sides & a front.
All of it locates in slots on the footplate.



There are several printed details -

Window frames: rear cab, front cab, cab sides and doors.

Battery/toolboxes: on either side of the bonnet (there are also two 1mm acrylic tops for these).

Radiator: this is printed in two parts and should be glued together, back-to-back (it was designed to be an ideal place to hide a speaker for a sound card, and the grill is “see through” for this reason).

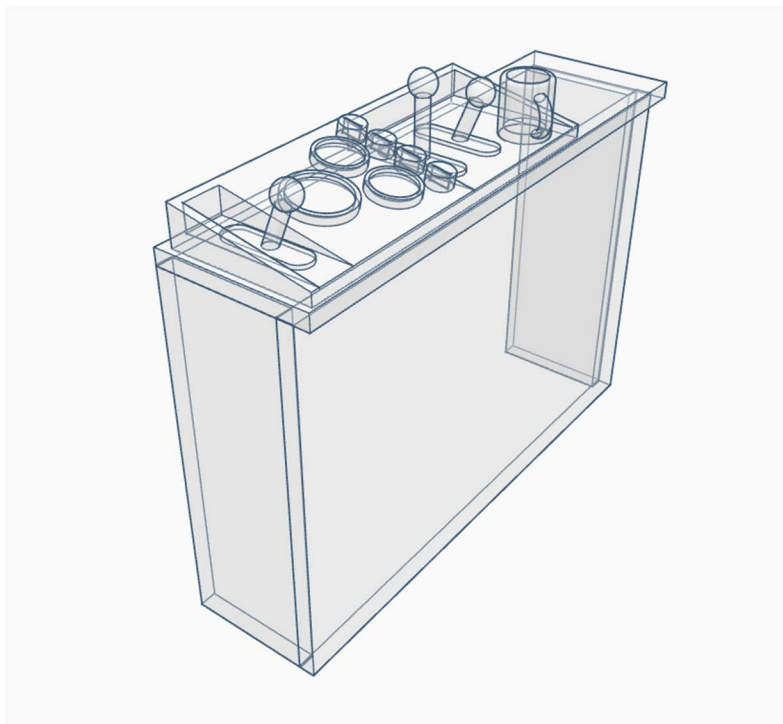
Buffers.

Resin printed handles: if you use these you will need to open the holes out to 2mm. (the holes were cut to 1.5mm to allow customers to customize the model, if they wish).

Resin printed control desk: self-explanatory... (but we do expect to see the tea mug in the cab!)

Extra 1mm acrylic parts -

Bonnet doors: see the photographs below, align the 1.5mm holes with the 2mm bonnet acrylic.



An electronic copy of these instructions can be found at -
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THE ROOF

The roof is built from a piece of cut black styrene and a printed frame. Glue the two together to create a removable roof.

A 1mm styrene strip provide rain strips for the cab roof.

2mm acrylic control desk -

The control desk is made from two sides a top and a front panel.

The whole fits inside the cab, and the control panel fits on top.



Where did I leave my cuppa?

