

## Trefor Quarries Mill Wagon

This model is based on the wooden bodied wagons used at the Trefor granite quarries (originally spelt "Trevor") on the Lleyn Peninsula of North Wales. The wagons were top loaded at the stone crushing mill located on the quarry's bottom level with granite road chippings. They were then taken down a rope worked incline and locomotive hauled to a quay side tippler where the chippings were tipped into a hopper for later loading into ships.



### 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.

Most parts are attached to their frets by small sections of half cuts. To remove parts either cut through the remaining material from the front with a thin sharp blade (e.g. a scalpel) on a cutting mat or turn the whole fret over and with the aid of a steel ruler aligned with the pieces side, cut lightly with a knife to break through the remaining wood.



DO NOT simply try and twist the parts out of the fret, there is a risk that the part may tear. The laser cutting process will leave a degree of edge discolouration. If you plan to leave you model unpainted now is the time to lightly sand the edges to remove this discolouration.

## Gluing

Wood and MDF parts may be glued with PVA wood glue, Cyanoacrylate adhesive (super-glue) or epoxy resin (Araldite). Beware of very cheap glues, their joints may fail! If you do use a “super-glue”, go for one which takes a few seconds to set rather than an instant “grab” one. This will give you a few seconds to adjust the parts position before it is too late.

Nylon parts (e.g. corner plates and floor supports) are best fixed with Cyano/super glue to the wooden parts but EMA Plastic Weld is best for gluing nylon to nylon.

## Painting

This is very much a matter of personal choice. As MDF is used for some parts of this model it is highly recommended that all parts are either painted or protected with acrylic varnish, especially if you like to run your trains on rainy days. MDF is very absorbent so you will need several coats of whatever you choose. Small tins of exterior wood stain/varnish in a variety of colours are available from your DIY chain store.

The body which is laser cut from poplar plywood is less critical. We like to apply a light wood stain followed by a couple of light coats of modeller’s matt varnish from a small “rattle can”. However you may also apply a light coat of interior acrylic varnish (from a DIY store) applied with ¼inch brush.

## Tools

The following tools will be required:

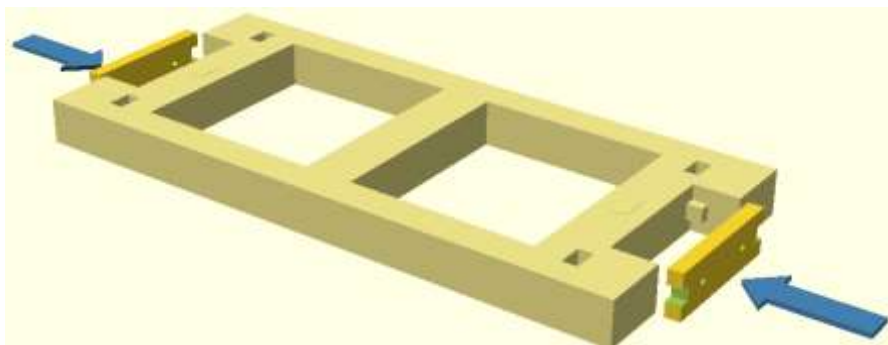
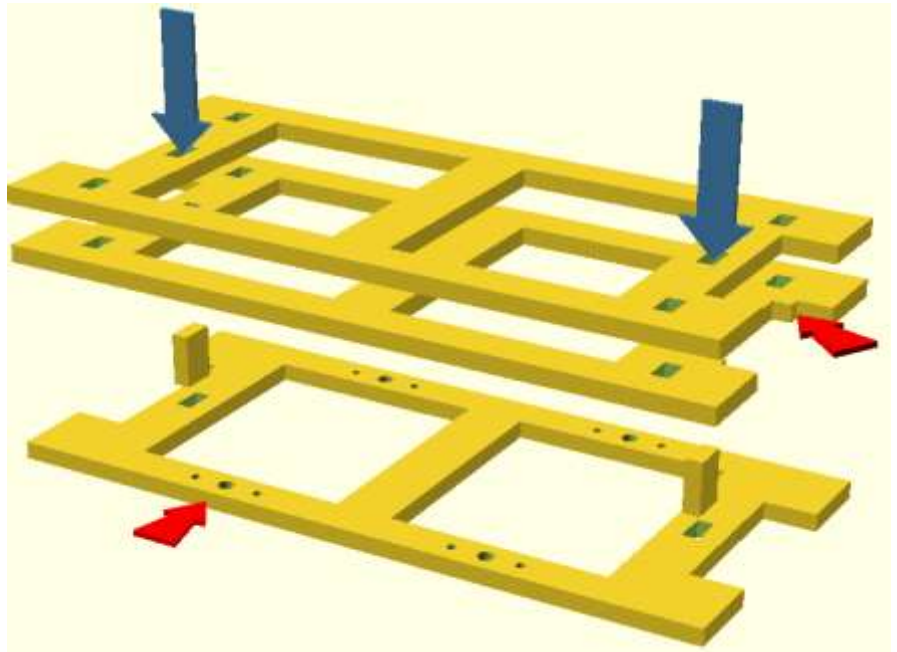
- A sharp modelling knife or scalpel
- 2 mm drill bit
- A small file, sand paper or an emery board “nail file”
- A small “Philips” screw driver, size 0

The following tools are recommended

- A cutting matt
- A small steel ruler
- Some small clamps, bulldog clips or rubber bands
- Round and flat section “needle files”
- A metal working vice or a wood working vice
- A black permanent marker pen

## Step 1 – Chassis

PVA wood glue is recommended for these steps or if you want to use a super-glue DON'T use an "instant grab type". Glue the 3 "chassis plates" together using the small rectangular locating pegs at each end. Note the sequence of axle box holes; small tab on "buffer"; and no tab of the three plates. Make sure the parts are squeezed together properly. Wipe out any glue that oozes into the body end locating holes.



Now glue the two buffer mounting plates of your choice (see below) onto the ends between the two dumb buffers. Once the glue has set, lightly sand the edges of the "plates" that now form the sole bars and dumb buffers to remove any excess glue and to provide a good surface to paint or varnish.

*Now paint or varnish the complete chassis assembly to seal it against moisture.*

Three pairs of buffer mounting plates are provided. A pair with 2 holes each for use with the supplied bell-mouth couplers. A pair with single pilot holes if you want to use a buffer with a single mounting screw, and finally a pair of blank plates for anything we haven't thought of.

Also provided are 4 rectangles to increase the length of the dumb buffers if you want to model a more prototypical dumb buffer and hook arrangement.

## Step 2 - Wheels

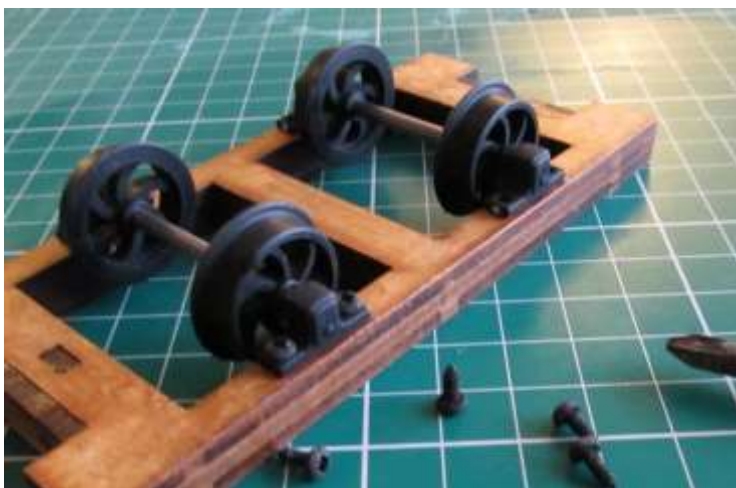
Place the supplied wheel setting jig in your vice. Push a pair of wheels onto an axle and push them in from the ends about 6mm. Now manoeuvre the complete assembly into the jig as shown, gently moving the wheels in and out until it fits nicely.



## Step 3 – Axle boxes

Cut the four 3D printed axle boxes from their connecting sprues.

**N.B. don't trim off the round locating peg!**

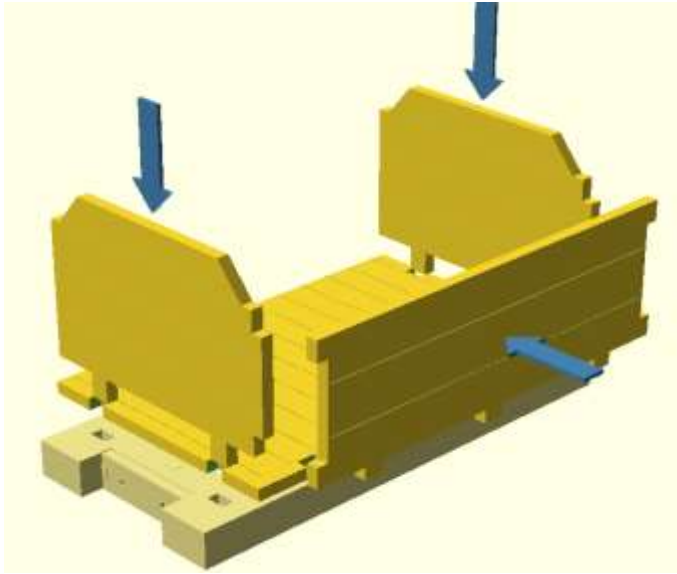


It is suggested that you chemically blacken (e.g. Carr's Metal Black) the 8 screws that fix the axle boxes in place. If not, you can always put a touch of matt black enamel paint on the screw heads later on.

Place a pair of axle boxes onto an wheel set and fit the two locating pegs into their holes in the chassis. Now secure in place with 4 of the self tapping screws.

Repeat for the other end.

#### Step 4 – Body



Glue one body end and the body side to the floor. Now glue the other end onto the assembly. Finally glue the body onto the chassis. The locating pegs on the body ends should locate in the sockets in the chassis.

Lightly clamp or slip on a rubber band or two. The kit includes a temporary jig to slip over the body ends as shown in the photo, to stop the ends bowing in whilst the glue is setting.

Clean off any glue that oozes out of the joints and allow the glue to dry.

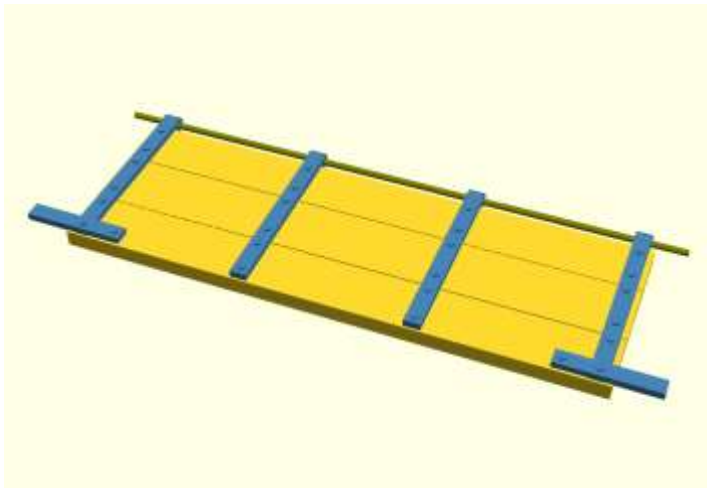
Once dry; paint, stain or varnish the body as you see fit. Don't forget to do the door!



## Step 5 – Door

Separate the 3D printed door hinge plates from their connecting sprues and trim off any sprue residue with a sharp knife. This will leave small white spots on the side of the parts. “Colour in” these white spots with a black permanent marker pen.

The printing process may leave a powdery residue. This is best brushed off with a cheap (clean 😊) tooth brush.



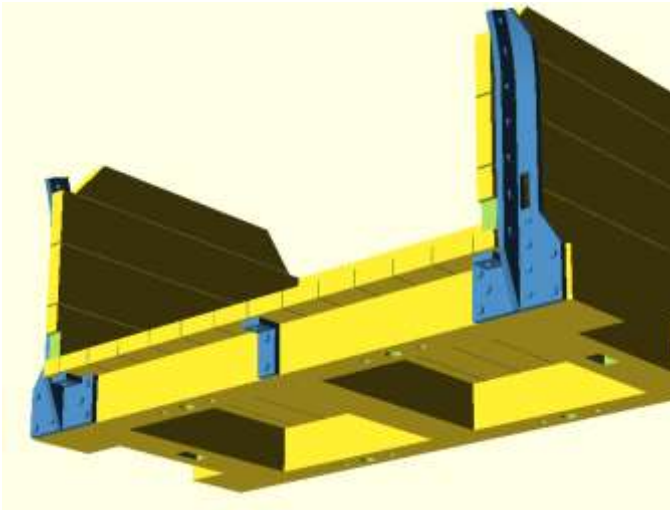
Now thread the hinge rod through the hinge eyes (but don't glue them) and place the hinge plates on the door as shown. One side of the door has engraved lines to help you align the plates evenly.

*Note how the long arms of the outer hinges project outwards.*

Once you're happy with the positioning super glue in place.

## Step 6 – Body work details

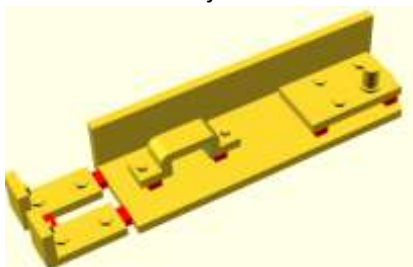
Separate the other 3D printed parts from their connecting sprue; trim and “colour in” with a black permanent marker pen as above



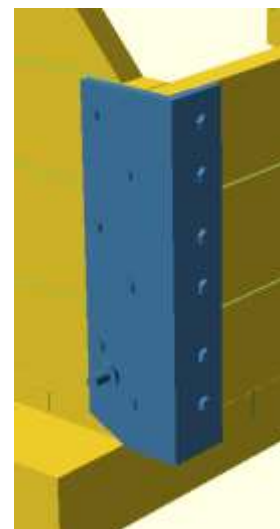
Glue the two “edge supports” either side of the opening as shown. A good quality super glue works well for this.

Glue a floor support angle in the middle of the sole bar as shown.

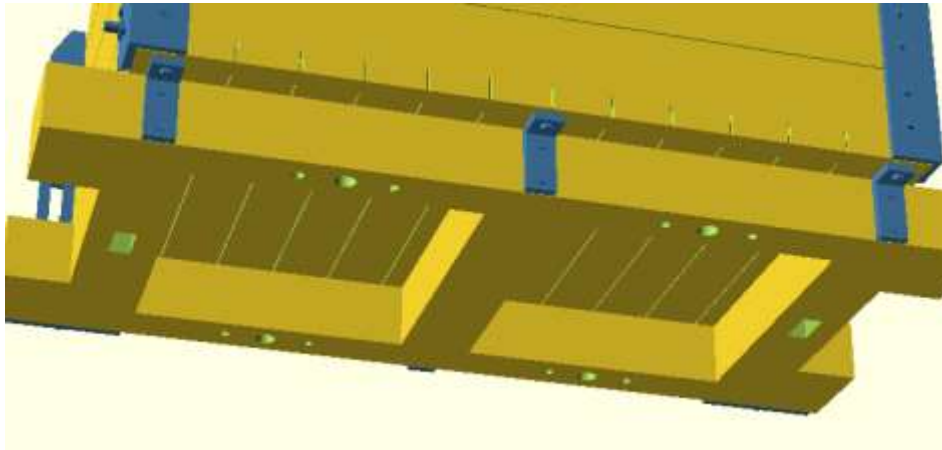
On the other side of the wagon glue the corners plates. Note the chamfer and “spigot” are at the bottom just above the dumb buffer.



Parts of the door latch mechanism are moulded onto the back of these plates and will need removing first. Do not worry if you find printing powder between these 2 parts!



Glue three floor support angles onto the sole bar as shown.



### Step 7 – Door latches



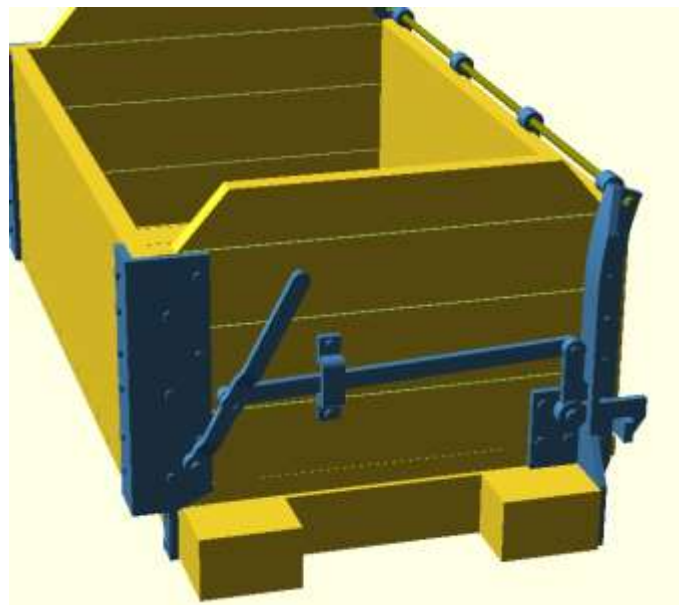
Push, *but do not glue*, the door latches onto their mounting plates. Note there are left and right handed mounting plates. Make sure that the back of the parts are sprue free and flat. You will probably have to clear printing powder from the hole with a small drill bit or piece of wire.

Now super glue the plates onto the body ends as shown below

Now fit the door by sliding the hinge pin through the end supports and hinge eyes. Fix with a drop of super glue on each rod end. *The latch arms are free to pivot at this point.*

Push, *but do not glue*, the door levers onto their mounting spigots on the corner plates. N.B. the lever “cranks out” from the body. Again the holes will probably need cleaning first.

Clip *from behind* the tie arms in place between lever and latch. Once you are happy with the position of all six components; secure with a drop of glue. We recommend EMA Plastic Weld for this.

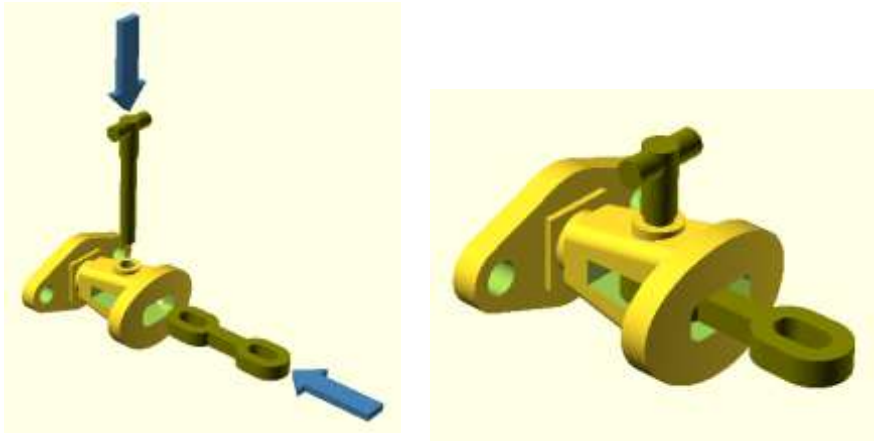


Finally super-glue the tie-arm retaining bracket onto the body end as shown. It is suggested you run a flat file across back of this component to ensure you have flat surface to glue.

## Step 8 – Couplings

The prototype actually had dumb buffers and hook and chain couplings. However to make this model more usable with the majority of SM32 locomotives, the kit comes supplied with 3D printed, sintered nylon bell mouth couplers similar to those as supplied by Hudsons of Leeds ; Ornstein and Koppel etc.

The pair of couplers comes with a pair of “T pins” and a link bar. You will probably need to clean out the pin’s hole with a 2mm drill bit after “de-spruing” the parts.



The modeller has the choice of using this coupling in a prototypical manner; i.e. keeping the link engaged in one buffer and sliding the t-pin in and out of the other ( tweezers recommended) to couple the wagons together.

Alternatively dispense with the link bar and permanently glue the t-pins in place. The small coupling chain may then be slipped over the T-pins to couple in a more conventional garden railway like manner.



Either way, fix the two couplers onto the wagon ends with four self-tapping screws. Again it is suggested you chemically blacken these or use some matt black enamel paint on the screw heads.

Put a spot of lubricating oil on each axle end before the wagon enters service.

**Job Done!**