

ETERNAL STAR



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"

A little about the printing process.

The printer extrudes a filament of plastic, layer by layer, to create an object. As it does so, it can leave tiny ridges along the object.

The printer can also leave a bit of a "squish" from the build-plate and there is usually a tiny "ridge" around the flat surface of the object that was attached to the build-plate.

For best results, clean the ridges off with a file.

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

THESE INSTRUCTIONS ARE FOR THE BODY ONLY – THERE ARE SEPARATE INSTRUCTION FOR THE BOGIES

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

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

ETERNAL STAR was inspired by the George England, Double Fairlie locomotive, LITTLE WONDER, built for the Ffestiniog Railway in 1869.

The model is not to scale, but endeavours to encapsulate the “feel” of such an iconic machine. Many features, such as the “D” shaped fireboxes and the footplate attached to the bogies have been reproduced in the model.



Little Wonder was a Double Fairlie type articulated locomotive designed by Robert Francis Fairlie. It was the first Double Fairlie locomotive on the Ffestiniog Railway and the fourth Double Fairlie locomotive to be built. It was delivered to the railway in July 1869. It was an improvement on earlier designs because it had two fireboxes, instead of one, and this allowed it to steam more freely.

In 1870, Fairlie invited guests to witness Little Wonder in a trial against the Ffestiniog Railway's existing locomotives Mountaineer and Welsh Pony. Amongst those in attendance were the second Duke of Sutherland, the Imperial Russian Commissioners, the Commissioners of the Indian Government, and Captain Tyler of the Board of Trade. Little Wonder hauled a train of 112 wagons weighing 206 tonnes up the line at an average speed of 12 1/2 mph. Welsh Pony was only just able to haul a train of 26 wagons weighing 73 tons at a maximum speed of 5 mph.

Little Wonder was hailed as a great success and attracted attention from around the world. However, various mechanical problems arose, and the engine required frequent repairs. It was withdrawn from service in 1882.

(Wikipedia quote)

Much of the kit is built from laser-cut 2mm acrylic, I thoroughly recommend the use of -

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

At the bottom of these instructions is an image to help you identify the 2mm acrylic parts.

The 1mm acrylic parts are detail pieces, there are two cab spectacle plates, four lower cab-side "kickboards" and four pieces to make up two bunkers on top of the tanks.

Other detail is built up from 3D printed filament (white) parts, such as the firebox & smoke boxes. There are also resin printed parts, such as the chimney's, domes, sandboxes, etc. And brass for the handrails.

LET'S MAKE A START ON THE TANKS

The tanks are just two acrylic boxes, they have two layers, the first layer, or inner box locates with slots, lugs & recesses. The outer box simply fits over the first, inner box and creates both strength and a smooth top surface from which to paint.

I recommend that ALL acrylic parts are "rubbed down" with wet'n'dry prior to assembly, to create a good bonding surface for both adhesive & paint.

Find the Tank Base, Tank Firebox End (Outer), two Tank Sides (Inner) & Tank Smokebox End (Inner). These parts assemble to create a solid box, you may need to put them all together to give an idea of the construction.

Once happy, glue all five parts together.

Then, find the Tank Firebox End (Inner). This part must go the correct way up! If you look carefully at the part, it replicates five holes in the Tank Firebox End (Outer). The smaller holes allow for four M2 screws to attach the firebox to the tank.

The larger single hole allows electronics, etc. to pass through the firebox.

Glue the Tank Firebox End (Inner) into place against the Tank Firebox End (Outer).

There are four further parts to the tank, the two Tank Side (Outer), the Tank Smokebox End (Outer) & the Tank Top.

Glue the two Tank Side (Outer) and Tank Smokebox End (Outer) to your box structure.

I took this opportunity to fill any gaps in the box structure with a little body filler/putty.

Repeat this procedure for the second tank.

If you wish to add rivet detail, I suggest now is a good time.

I add the rivet-heads to a "primed" model.

I attach the rivet-heads by drawing a line or masking a line along where I require the rivets, measuring the desired increments. The display model has rivets at 5mm increments.

I use a tiny blob of Blu-Tack on one of the 2mm brass lengths and pick up the rivet on the Blu-Tack, dap it in a glue (Superglue), and place it in the desired position.

PATIENCE IS THE KEY HERE!

Note: there are two Tank Tops, they are different, as only one has switch holes. I have printed a (white) filament box that fits the switch and simulates the toolbox located on one end of the locomotive only.

SMOKEBOXES

These were primed, rubbed down to achieve the desired finish and rivets applied, prior to adding the other

details, smokebox door, door handles, chimney.

Do not fix the handrail knob, leave this till later.

The smokebox is attached to the front of the tank with 4x M2 8mm Pan Head screws.

The M2 screws should “self-tap” into the (white) filament, screw them in before actually attaching the smokebox, then remove and attach the two parts together.

I tap the holes with an M2 tap prior to assembly. It’s not necessary, but it’s easier to put together.

Do the same for both ends.

FIREBOX

The firebox is again primed and rubbed down to achieve the desired finish. Locate the 2mm acrylic part, Centre Footplate.

The footplate locates under the firebox and is attached with 4x M2 8mm Pan Head screws.

COMPLETING THE BODY STRUCTURE

Both tanks can now be screwed to the firebox assembly using 8x M2 8mm Pan Head screws.

The under-cab water tanks are attached to the body with yet another 4x M2 8mm Pan Head screws. These locate through the Tank Base.

The structure should now be a rigid & solid assembly.

DETAILS

The tank tops should be mirrored. The coal bunkers on the same side of the locomotive, which should also be the same side as the handbrake wheel protruding from the firebox and the firehole doors (obviously)!

The handrail knobs may need the holes opening slightly to allow the 1.5mm brass to pass through.

There are holes for the tank fillers, these are odd, as the driver’s fillers appear halfway down the tanks, while the fireman’s are at the ends!

We have supplied wooden strips to cover the toolbox.

The 1mm acrylic coal bunkers locate in slots on the Tank Top. As does the spectacle plate – be careful here.

The spectacle plate must mirror itself, as the tiny holes locate the regulator rods. (See below)

There are spectacle rims, I placed them on both sides of the plate.

Sandboxes are provided, LITTLE WONDER appears to have been built with square sandboxes that were attached to the footplate. However, we have gone for a latter alteration, in which cylindrical sandboxes attached to the front of the tanks. This allows for greater sideways movement of the bogies in your model.

You should have one odd disk-shaped piece of (white) filament?

This is a former to bend a length of 1.5mm brass for the smokebox handrail...

You will need to bend the brass around something with a tighter diameter, but the curve you are aiming for is the groove in the former!

Once formed, slide a handrail knob (you will need open the holes slightly) until it is central to the curve.

The handrail can now be offered to the smokebox, there are corresponding holes to accept the handrail in the front of the tank.

The handrails in the cab are made from the white ABS tube supplied.

The ABS tube needs to be cut into four lengths of 39mm (do not discard the remaining tube).

Handrail knobs fit into the top of the ABS tube, and a length (26mm) of 1.5mm brass rod locates in the knob and corresponding hole in the Tank Firebox End (Outer).

The four “kickboards” locate in slots in the Centre Footplate, I used a dab of glue to locate ALL the above parts.

We have supplied regulator detail, this is considered speculation, as there are no definitive photographs. The regulator fixes to the top of the firebox, the rods reaching out towards the domes. There are holes in the spectacle plates to accommodate the rods, but the spectacle plates need to “mirror” each other.

The handbrake wheel seems to protrude through the firebox, and we have replicated this. Quite how it travels through the firebox is down to speculation...

However, cut a length of the white ABS tube, poke it down through the hole in the firebox and mount the wheel on top. Allow enough room for the regulator to clear underneath.

There are two fire-doors supplied. These are hinged from the bottom, which makes sense as access on a Fairlie footplate is always tight!

We’ve also included two of our “Oil Pots” should you want to add them to the Tank Top?

We would like to extend our very grateful thanks to David Mees, Glenn Williams & Jon Taylor for their support, enthusiasm and considered discussion during the design process of this model.

An electronic copy of these instructions can be found at -
www.bootlane.org.uk/instructions

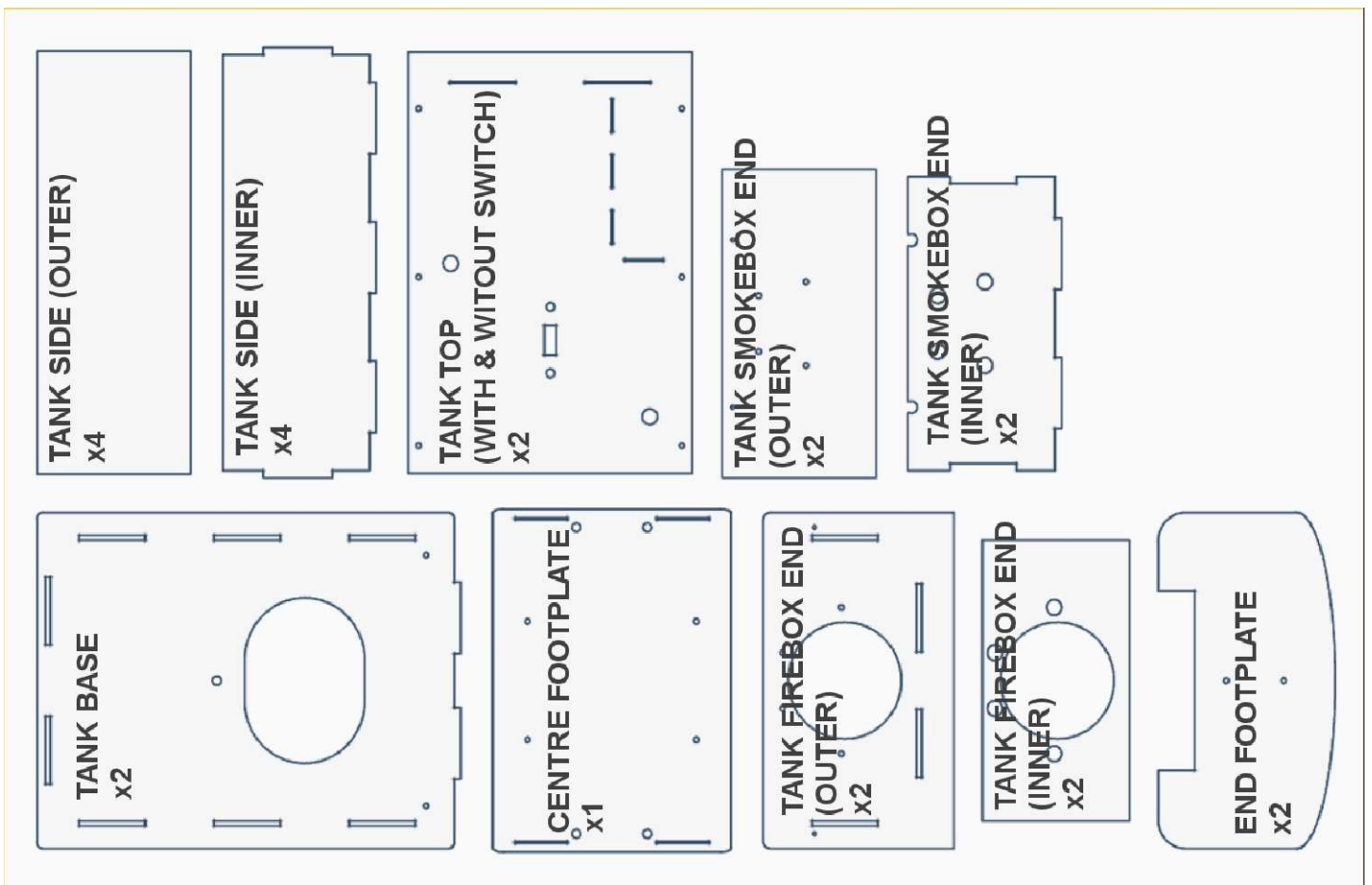
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Find us on Facebook – Boot Lane Works Community





ETERNAL STAR was released by Boot Lane Works in loving memory of a dear friend who was taken from us much too young, Spring 2023.

Rest in peace Matt, our prays are always with you.