



BAKEWELL

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.

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

We apply a Primer/Filler to the filament parts on our display models, which we rub down with 400 to 800 wet'n'dry before applying topcoats. All Halfords rattle cans paints.

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

I have added spare acrylic parts as I did suffer some breakages during construction. There are three frames, and three motion brackets included in your kit!

CHASSIS

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 chassis if used for “Heavy Haulage”!

OK, let’s jump straight in!

This is a long description but bear with me. If we can get this right, everything else will fall into place and your model will run like a dream...

IF YOU HAVE PREVIOUSLY BUILT A CLARA OR LEO FROM BOOT LANE WORKS – NOTE THAT THERE ARE A FEW SUBTLE DESIGN ALTERATIONS WITH THIS KIT

Locate the two 2mm acrylic frames. Be careful with these frames, the strength comes from the frame stretchers. There is a spare frame included with your kit, in case of breakages during construction. Locate two motion brackets (again there is a spare included with the kit), using liquid or super glue, attach the brackets to the frames.

Use a square to ensure the bracket is 90° to the frame.

ENSURE YOU HAVE ONE LEFT & ONE RIGHT FRAME WHEN COMPLETE.

Now locate the two cylinder-blocks, they are marked with a “L” & “R” as they are handed due to their shapes.

Ensure the 2mm brass rod will slide freely into the block - run a 2.5mm drill down the piston-rod hole to ensure there are no obstruction and the brass rod runs freely in the bore.

Attach the front cylinder covers to the cylinder blocks.

Attach left cylinder-blocks to the left acrylic frame using two 8mm M2 screws. I have designed most of the chassis to accept the 8mm M2 screws as self-taping, some of the holes may require opening slightly to get the screw started.

Repeat for the right-hand side.

You will also need the 2mm brass square sections.

The brass square section needs to be approximately 50mm in length, you can trim them once you know exactly how they fit, although there is plenty of excess space in the cylinder block to accept any spare brass rod.

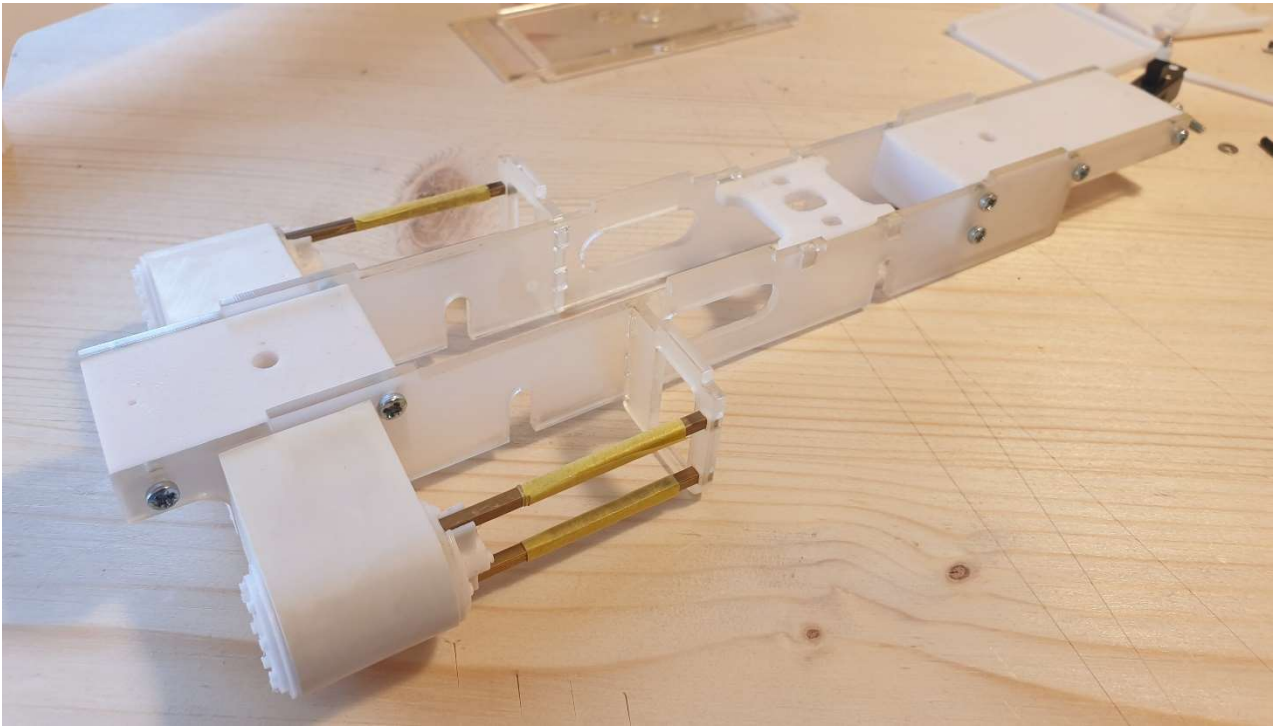
With the motion bracket attached to the frame, fit the slide-bars into the cylinder-block and motion bracket. Ensure the cylinder-block is parallel to the frame.

Locate the two frame stretchers and the motor-plate. The longer stretcher at the rear.

In a slight departure from CLARA & LEO, the motor-plate is now sandwiched between the frames and located using lugs & holes.

Attach one of the frame & cylinder-block assemblies, to the front stretcher, and then repeat with the rear. Once you are happy that everything is square, attach the other frame & cylinder-block assembly.

Don’t forget to sandwich the motor-plate between the frames, the slot on the face is to clear the drive gear on the wheel axle and should face the axle.



The above image is of DRAGONFLY'S chassis with frames, cylinders, slide-bars (2mm square rod), motion brackets, stretchers & motor-plate. BAKEWELL'S chassis is almost identical.

**Looking good so far?
Let's do the wheels!**

To emulate the iconic "Large England" wheels, we have printed four circular wheel inserts for the Peter Binnie wheels.

The inserts push into a 29mm wheel from the front of the wheel, I used a vice to squeeze the inserts into the wheels.

Squeeze all four inserts into all four 29mm wheels.

Do this for all four wheels. You may wish to tidy the wheels a little at this stage. Binnie wheels tend to have slight flash marks on the flanges, part of the injection process. I use a file to tidy up the wheels.

Next, add the crankpins. You should have six conehead screws, 2x 16mm, 2x 12mm & 2x 10mm.

The 16mm screws for the rear wheels (for connecting & coupling rods).

The 12mm screws for the front wheels (coupling rods only).

The 10mm screws for the crossheads.

Do the rear wheelset first.

You will need two wheels, two 16mm conehead screws, the $\frac{1}{8}$ inch axle with the gear and two brass top-hat bushes. NOTE – There are four axles with your BAKEWELL kit, the shorter two are for the locomotive.

Screw the 16mm into each insert.

Slide a bush onto the axle (*THE AXLE WITH THE GREY PLASTIC GEAR*), the lip of the top hat towards the outside, or wheel.

Next, start pushing a wheel onto the axle. *I use my taper reamer to open the hole in the wheel very slightly, to create an easier start.*

Repeat for the other side, then using your vice, squeeze the two wheels on the axle.

We are looking for a "back-to-back" measurement of 28-29mm. *This means the distance between the back of the two wheels.*

Now do the front wheelset. Remember, the 12mm conehead screws, and you should have the $\frac{1}{8}$ inch axle with no gear. Don't forget the bushes.

Good.

Let's quarter the wheels.

This is easy, don't get worked up over it...

Locomotive driving wheels are quartered. That's to say, the cranks are at 90° to each other. Both wheelsets must be quartered identically to each other. Here's how we are going to do it.

Although the wheels are tight on the axles, they can be twisted. Try it.

Move the wheels around so they are approximately 90° to each other.

Now place one wheelset in the vice so that the jaws grip the edges of the bosses on the inserts. The rest of the wheelset pointing upwards.

Ensure that whatever you do, repeat for both wheelsets... In other words, bottom wheel with crankpin to the left and top wheel crankpin furthest from you.

With the jaws of the vice gripping the bosses to the left, twist the top wheel around so that the crank at the top is furthest away.

With the lower wheel firmly in the vice it is easy to look over the top and see if the top wheel is at 90° to the bottom!

That's it, repeat for both wheelsets. Check your back-to-backs, and then the quartering again.

The wheelsets should now drop into your chassis.

The lip of the bush should sit outside the frame and is kept place between the wheel & the frame.

Locate the printed retaining plate.

It sits in between the frames and screws to the bottom of the stretchers. The plate follows the shape of the frames, and its purpose is to keep the wheelsets in place, pushing up against the bushes.

Once you have ensured a comfortable fit and fixed it into place, try your chassis for free running.

We're on the home stretch now!

Let's fit the motion.

We have supplied a few extra parts in your kit, I found the crosshead can split, so you have spares and I've included a spare set of coupling rods and a spare connecting rod.

Mostly because the rods are (like the original) very fine...

You need two coupling rods (couples the wheelsets), two connecting rods (connects the wheel to the piston rod), & two crossheads.

You will need two M2 half nuts, 10mm conehead screws & steel washers.

Start by screwing the 10mm conehead screws into the connecting rod, there is a countersink printed into the rod. With the screw in place clean the printed area around the screw. This part fits into the crosshead and should be a nice loose fit.

Opening the hole in the crosshead accept the 2mm brass piston rod. The rod will need cutting into 25mm lengths. Make sure the end of the rod is nice and clean.

DO NOT DISCARD THE REMAINING BRASS 2MM ROD!

I opened the hole in the crosshead with a 2mm drill bit. Push the rod in as far as you can. But do not obstruct the bore for the connecting rod.

With the piston rod in place, push the connecting rod into the crosshead and using a washer and nut, tighten the whole assembly.

You should find that the rod and crosshead remain nice and loose, but firmly attached to each other?

Repeat for the other side.

Nearly there, one last fiddly bit!

Locate the four ABS crankpin sleeves. These have been cut to the correct length for your crankpins, there are two lengths, the short ones are for the short crankpins, the longer ones for the long crankpins!

The sleeve fits over the crankpin, and the rod fits over the sleeve.

An M2 washer fits on the end of the sleeve and the M2 nut captivates the rod while allowing it to move freely on the sleeve.

The bore holes on the rods are reasonably loose on the sleeves, to allow for inaccuracies in the quartering. But, still tight enough to give smooth operation.

The sleeve acts as a spacer on the crankpins, and in a moment, you will be able to tighten the nuts against the tubes but allow the rods to remain free.

The piston rod will need pushing into the cylinder and the assembly rotating until the crosshead lines up with the slide-bar.

With all the rods on, you should now have a free running chassis.

Once you are happy that all is free running, add a tiny amount of super-glue or Loctite to the ends of all four crankpins to ensure they cannot come loose in operation.

Finally, attach the motor. There are two 5mm M3 screws to fit the motor to the motor plate. Remember to lubricate the gears, axles and bushes.

BODY, TENDER & DETAIL

BAKEWELL seeks to emulate the Ffestiniog Railway's later (& larger) George England 0-4-0 tank-engines, WELSH PONY & LITTLE GIANT in their very early running period.

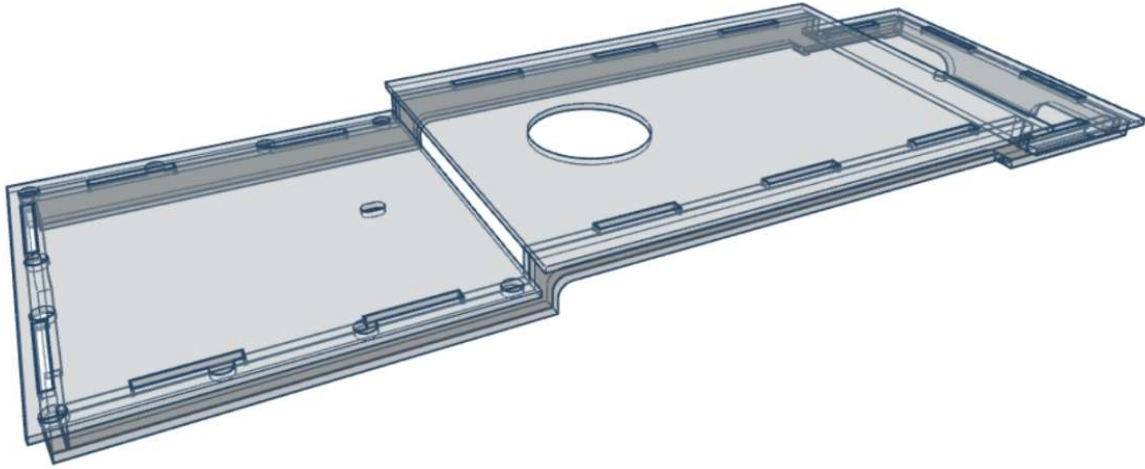
We wish to thank David Mees, Jon Taylor & Glenn Williams for their support during the design phase of this project.

In particular, Glenn and his trusty tape measure!

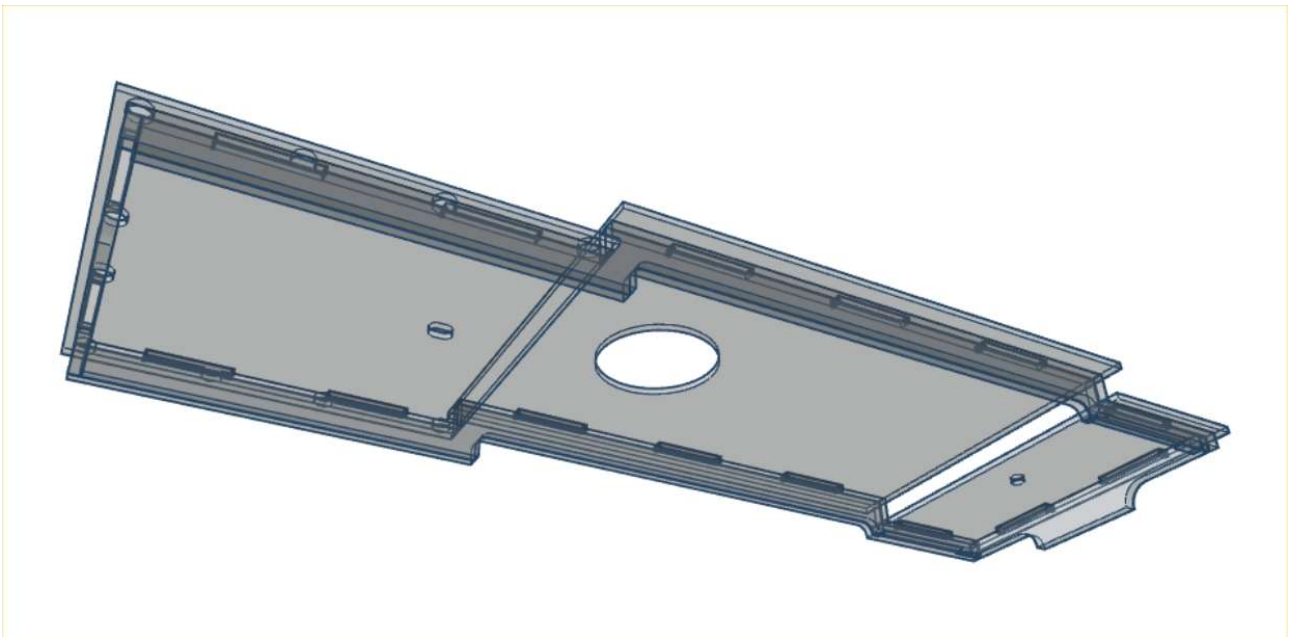


FOOTPLATE

This is a little delicate in the build process and uses a combination of 2mm & 1mm acrylic. Because the acrylic is brittle, there are spares of 2mm acrylic pieces in your kit. Using a liquid glue, attach the pieces together.



The topside of the footplate assembly.



The underside of the footplate assembly

There are two side-frame parts per side, one with locating lugs for the footplate and one without. The part with the lugs is on the inside of the assembly, the outside frame acts as a strengthener. The two end parts are different and only fit their respective end footplates. There are two 1mm footplates (front & back) that fit on top of the above assembly. The front can be glued to the above assembly, the rear needs the cab-sides attaching before offering to the footplate (see below).

CAB FOOTPLATE & SIDE-SHEETS

The cab side-sheets (like the other filament parts) will need some rubbing down and the holes may need opening out to accept the printed handrail knobs.

Note that there are three different variations of handrail knob, a simple 1.5mm straight hole version, a 90° hole version and a blind (no hole) version.

The 90° hole knobs are for the corners of the side-sheets.

The blind knobs are for the tender.

Using a countersink drill, open the holes in the base of the top 1mm acrylic footplate. Then with ten of the M2 8mm conehead screws, attach the side-sheets to the footplate. The object is to have the screwheads flush with the base of the footplate.

I have found no other method of attaching the two rear 1mm acrylic footplates together than with either glue, or double-sided tape?

There are cutouts on the footplates to accept the microswitch supplied, should you choose to use it.

There are also holes in the firebox for your wiring runs, again should you choose to use it.

SMOKEBOX, FIREBOX & SADDLETANK

The model was originally designed so that the firebox & smokebox could be screwed to the footplate and the saddletank could lift away from the main body. And indeed, this is still the case.

However, after construction of the display model, I glued the firebox & smokebox to the Saddletank and found that the whole assembly happily screws to the frame front & rear as one piece.

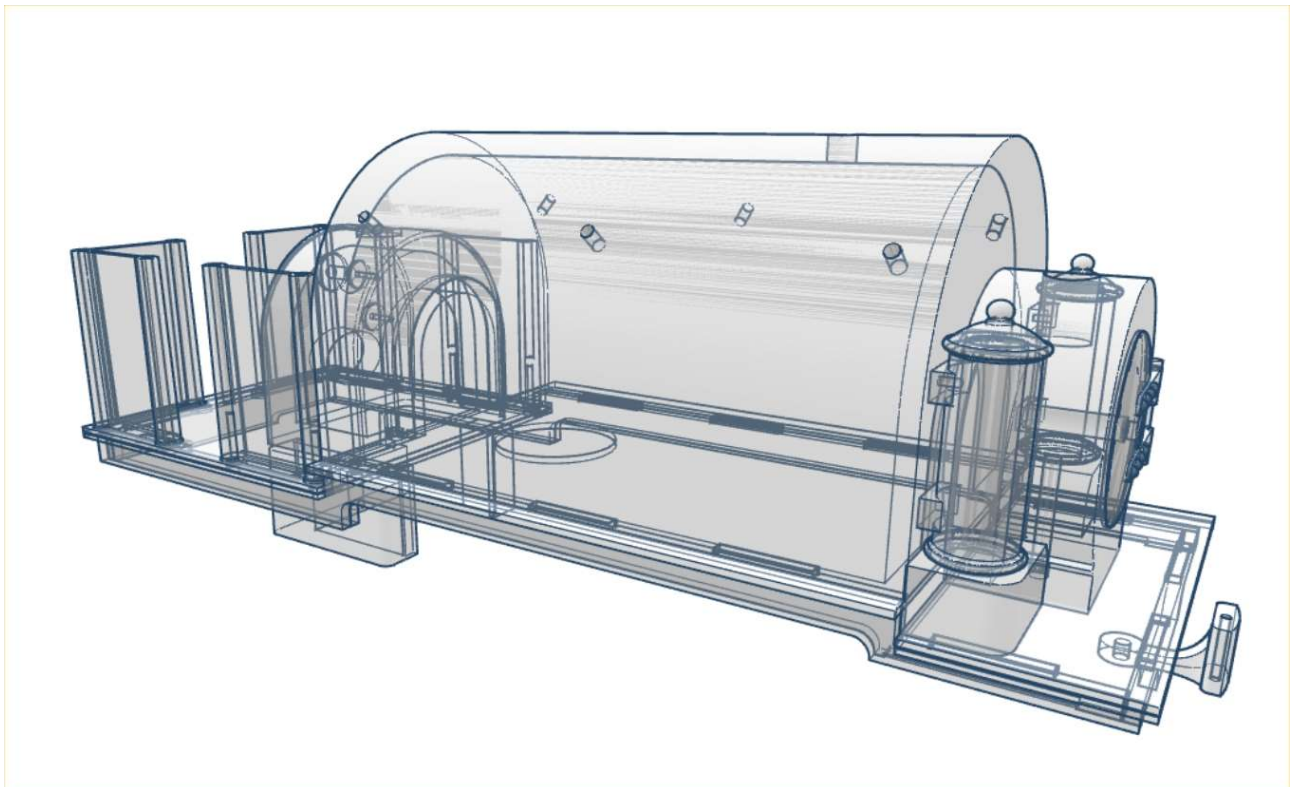
Both options are open to the builder.

There are further detail parts printed in white filament.

A lower firebox part, which screws to the frames (M2 8mm panhead).

Two sand-pot mounts (the original machines had “boxes” under the sand-pots).

A coupling screws up, to the underside of the front stretcher. I short length of 1.5mm brass may be bent into a hook and pushed into the coupling.



RESIN & OTHER DETAIL

We have pre-curved the 1mm acrylic front cab-sheet, it should fit comfortably between the firebox & saddletank. There are four spectacle frames supplied with the kit.

There are several printed resin detail parts, including a nameplate mount (*ensure you mount this high enough on the saddletank, unlike the ones I placed on the display model...*)

Also, a regulator, gauge glass, firedoor, smokebox door & dart, reversing lever, tank filler, chimney, sand-pots & safety valve chute.

We have included rivets, (Nail Art!)

It is obviously your choice whether to rivet or not.

The tanks were riveted, although rivet patterns differ from photograph to photograph...

I have found the best way to attach these are to mark a length of masking tape with 3-5mm pencil markings. Fix the tape along the line you wish to place your rivets and, using the point of your modelling knife (or a special tool, I also use a tiny dab of BluTac on a pencil tip), stab a rivet, dab it in your chosen glue and place it alongside the tape next to the mark. Prime the surface prior to riveting, then prime again after riveting. Repeat, repeat, repeat, repeat, repeat, repeat, have a cuppa (or treat yourself to a Single Malt)!!!

TENDER

The tender is built up entirely of white filament prints.

There are four brass top hat bushes that fit into the four axle boxes. The holes in the axle boxes will need opening out slightly to receive the bushes.

Glue the axle boxes to one side first, then fit the axles (having first pressed the curly spoked Binnie wheels on first. Then attach the axle boxes to the other side of the main frame.

The body attaches to the main frame with two M2 8mm panhead screws from the top, self-taping into the mainframe.

A short length of 2mm brass (remember I advised you to retain the brass earlier!!!) can be used at the front of the tender stretcher to act as a drawbar pin and allow the tender to be “close coupled” to the locomotive.

I have added images below, it seemed easier than trying to place them in the text?

A PDF copy of these instructions can be found at –
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