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MATTY "MKII"

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 –

- 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° angle *(I use a set block, but a small set square will work well)*
- I 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 ridge 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

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 with run like a dream…

Locate the motor-plate and motor. Attach the motor using the two M3 5mm screws.
The slot in the face of the motor-plate faces away from the motor and is there to give clearance to the axle drive gear.
DO NOT screw the motor up tight, you need some play to fit the axles later.

Now locate the two frame stretchers and the two acrylic frames.

Using the M2 8mm screws, screw one of the stretchers to a frame. The screws will self-tap into the printed stretch piece. Then attach the other stretcher to the other end of the frame.

Offer the motor & motor-plate to the frame assembly. *(I recommend that the motor power wires are connected to the motor, prior to this procedure)*

The slots in the frames give clearance for the motor (32mm gauge only), which is otherwise too wide to be accommodated within the frames, and you will need to do a little juggling to attach the second frame.

The front & rear inner buffer beams can be glued into place now, they are identical, the larger holes are to allow for the motor & mount plate adjustment through the rear buffer beam should be monted towards the top of the locomotive. You should be able to reach the motor mount screws with a long screwdriver through the rear inner buffer beam.

I usually paint the frames at this stage. A quick primer, then topcoat (usually black!)

That wasn't too bad, was it?
Let's do the wheels!

There are eight printed inserts for the Binnie wheels, two inserts for each wheel, one with a hole for the crankpin and the other, a counterbalance weight. The inserts push into the wheel from the front and are a good tight fit, but not so tight as to push the wheel out of shape! I found the best way to fit the inserts is to offer them both to the wheel (they have very slight tapers to help you get started). With the two inserts in position, place the wheel and inserts into a vice and squeeze the whole assembly together.
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. There are 4x M2 12mm conehead screws.

Do one wheelset at a time.
You will need two wheels, two 12mm conehead screws, the ⅛ inch axle with the gear and two brass top-hat bushes.
Screw the 12mm screws into each insert.
Slide a bush onto the axle, 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 (32mm gauge) or 40/41mm (45mm gauge). *This means the distance between the back of the two wheels.*
Now do the other wheelset, you should have the ⅛ inch axle with no gear. Don't forget the bushes.

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 inserts. The rest of the wheelset pointing upwards.
Ensure that whatever you do, repeat for both wheelsets…
I placed my wheelset in the vice, jaws griping the inserts and the lower crank towards my left, then I twisted the top wheel around so that it's crank was at the top of furthest away from me.
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 your quartering, again.

The wheelsets will 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.

We're on the home stretch now!
Let's fit the rods.

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!
We have supplied two spare rods in your kit.

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.

With everything together, it's time to adjust the motor.
Try and allow a little play between the worm and gear. Do not push them to tightly together as this will wear the worm. A little play here is a good thing.
Having said that, if the two are too far apart the gear will strip the worm…

THE BODY

Use the image at the end of this document to identify the 2mm acrylic parts.
Not included in the image are the cab sides (X2), also the Buffer Beams (inner & outer) are X2!

Build on a flat surface, I use a piece of marble, and use a square of some sort to ensure true 90° angles.

NOTE – There are holes in the cab front and bonnet rear that allow any wiring to pass from the cab to bonnet – ensure you align these holes before starting the build.
You will also notice I have created 3mm holes in the cab front & bonnet front for customers to add lights if you wish? They can be filled if not needed or you don't want to see them.

THE BONNET

Start with the bonnet base, ensure that it sit comfortably on the chassis and the lugs locate in the slots. The slots may need opening with a needle file.

Locate the rear bonnet piece and glue this to the bonnet base.
The rear section sits “on top” of the base, flush against the end. Ensure you get a perfect 90° angle between the two pieces.

Next attach the bonnet sides, one at a time.
They sit flush with the front of the base plate.
Finish the bonnet off with the front section, its placement of reasonably obvious, the corner cut-outs at its base sitting flush with the bonnet sides.

I also attached the resin printed bonnet grills (X4) with a dab of superglue at this stage of the build. Their positioning is a matter of personal choice, just ensure they are all the same way up *(I’ve made that mistake before!)*

THE CAB

Start with a cab side and glue it to the cab floor. The side sits on top of the floor, flush with the edges. The cab front & back also sits on the floor, inside the cab sides.

Now you need to bring the cab & bonnet together, I also took the opportunity to ensure the whole also sat comfortably on the frames.

The front footplate sits on top of the frames at the front (obviously) and should slide under the bonnet front.

I painted the body before offering it to the chassis.
The body attaches to the chassis with two M3 screws, self-tap into the holes in the frame stretchers.

DETAIL

The kit include brass handrail detail, together with resin printed handrail knobs, these locate in the holes on the rear cab sheet.

Window frames locate on the outside of the cab, and allow the 1mm acrylic windows to be offered up from inside the cab. A tiny dab of PVA glue will hold the window glass in place and dry clear.

The resin printed radiator grill is offered up from inside the bonnet.

The buffer secure to the outer buffer beams through the inner buffer beams with two M2 8mm screws and held in place with two M2 nuts behind the inner buffer beams.

<u>BONNET & ROOF</u>

There are two printed frames for the bonnet & roof styrene sheet to be attached and engraved detail into the styrene.
I suggest that the styrene is attached using two short lengths of wood with the frame upside down on the wood with the styrene curved between the wood and frame. Use weight to force the whole downward & together. I use a couple of house bricks, but a few heavy books would just as well.

NOTE - The bonnet styrene should be flush at one end with the frame, to clear the cab front.

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