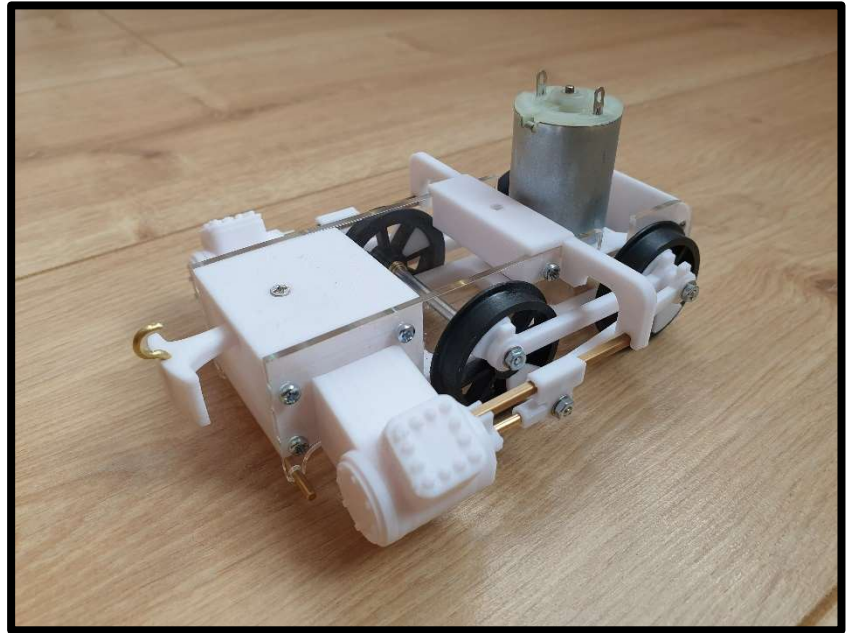


## “Nō 8” BOGIE



Thank you for buying this chassis 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
- Tweezers, Pliers, screwdrivers, etc...
- 2mm diameter twist drill
- A countersink drill bit
- 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*

This kit contains two power bogies for use with our ETERNAL STAR locomotive kit.

These bogie kits are sold in either 32mm gauge or 45mm gauge.

Each bogie has one 3-6v motor, we have tested the ETERNAL STAR kit with two powered bogies and with only one bogie powered. On both tests the model ran satisfactorily.

This kit is also sold separately for modelers who may wish self-build. The bogie kit is still sold as a pair.

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”!**

### *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 these with an abrasive prior to painting and rubbing down.*

*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, or very carefully with a knife!*

**OK, let's jump straight in!**

**This description is for ONE bogie, simply repeat the process for the second bogie!**

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...

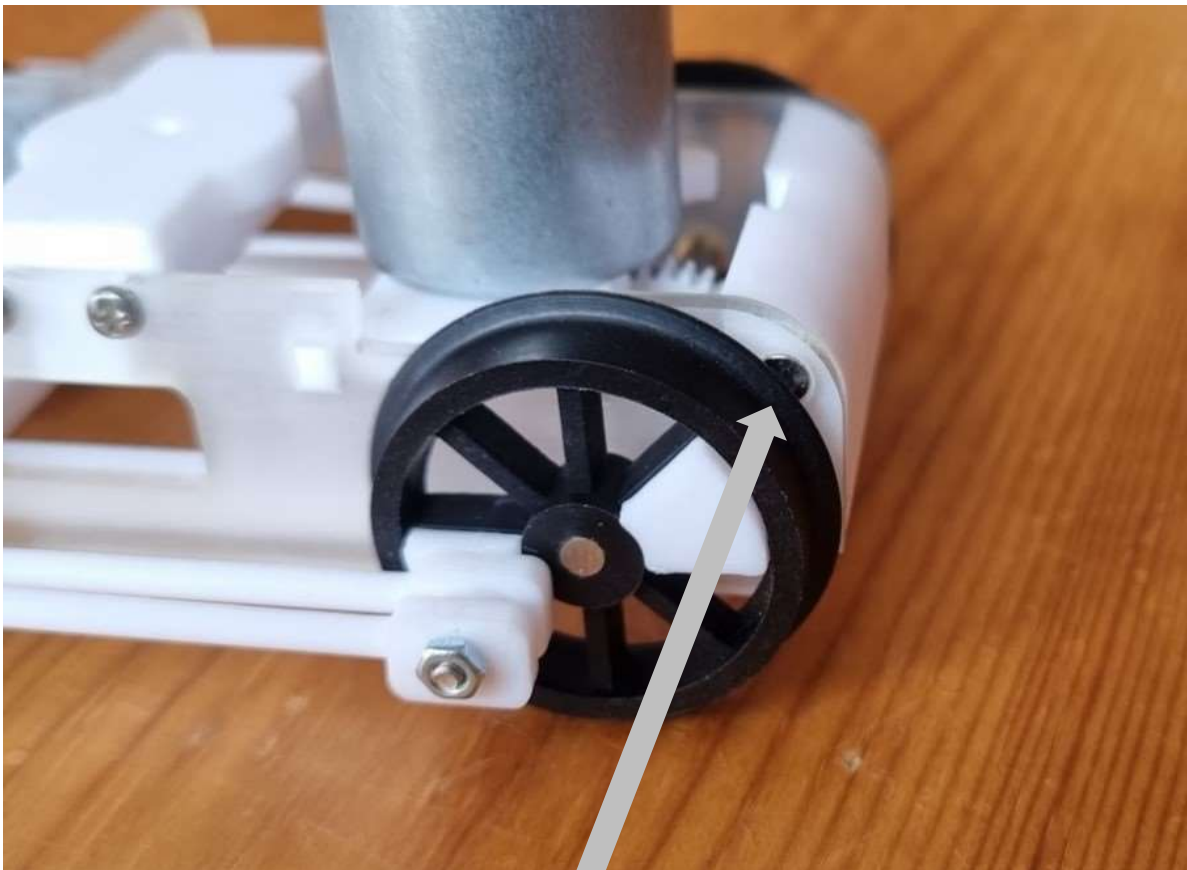
Locate the two cylinder-blocks, these are marked "L" & "R" on the back faces.

You may need to open out the piston rod bore holes; the piston rods are 2mm brass rods. Check to see if the rods pass down the cylinder freely?

You will also need to check that the slide bars (which need to be trimmed to 48mm in length) pass into the cylinder block.

Now attach the front cylinder covers, I use a dab of superglue.

Locate the frame plates, you will need to countersink the two holes at the rear of the frames. This is to allow the use of two M2 8MM conehead screws to attach the rear stretcher. This is in turn, to allow the rear wheelset clearance from the screws.



*The rear stretcher screw (conehead) countersunk into the acrylic to allow rear wheelset clearance*

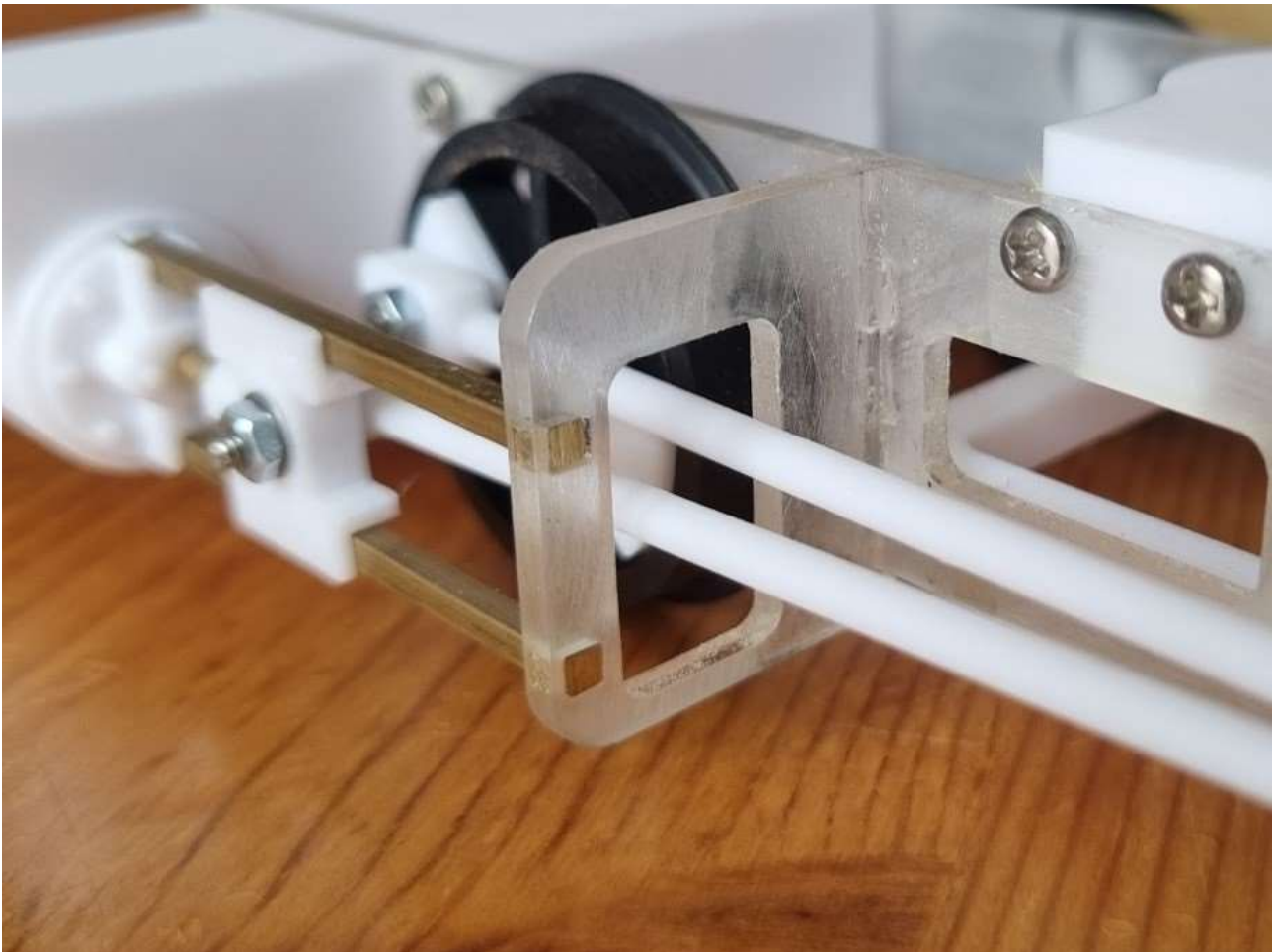
Locate one of the motion brackets and attach it to one of the frames in the two slots in the frame. I use a liquid glue, but any plastic adhesive will work.

Ensure the bracket is on the same side as your countersunk holes!

The motion bracket is flush with the top of the frame and hangs below the underside of the frame.

Ensure you get the motion bracket square to the frame.

SEE IMAGE BELOW



Locate the cylinder block relevant to the frame and attach 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.

**It is important to get the cylinder parallel to the frames, ensure they are not tilted up or down.**

Repeat for the other side.

You should now have two frame, cylinder & motion bracket assemblies.

Locate the front frame stretchers. The rear stretchers have a curved rear. Attach (with three M2 8mm screws) a frame plate assembly.

Now attach the rear stretcher using two M2 8mm conehead screws.

Locate the motor mounting plate into the locating holes in the frame plate.

Now offer both frames together.

The motor mount plate has a clearance slot on one side, this allows clearance to the axle drive gear, and should face downwards (towards the track) and to the rear of the bogie.

With both stretchers and the motor mount sandwiched between the frames, locate the carrier plate and fit it between the frames. It is attached with four M8 8MM screws and is arranged so that the circular shape is uppermost to carry the locomotive body.

The hole in the carrier plate accepts one of the M3 screws that attach the body from above.

*I usually paint the frames at this stage, without any brass or motion.  
A quick primer, then topcoat (usually black!)*

Cut four 48mm lengths from the 2mm square brass section supplied.  
These are the slide bars and locate into the rear of the cylinders through the rear of the motion bracket. A tiny dab of glue may be required to stop them from moving?

### **Looking good so far? 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. You need six conehead screws in total, 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 1/8 inch axle with the gear and two brass top-hat bushes.

Screw the 16mm 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 front wheelset. Remember, the 12mm conehead screws, and you should have the 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 identical 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 gripping 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.

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.**

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 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. This part fits into the back of 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 two 30mm lengths. Make sure the end of the rod is nice and clean with no sharp edges.

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.

#### **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.

Offer the coupling rod to both crankpins on one side of the bogie.

Personally, I add the ABS bush, M2 washer & nut, and tighten the front one first, as it is less accessible under the slidebars.

Annoyingly, on this bogie kit, you will need to place the crosshead onto the slidebars and push the piston rod into the cylinder block; offer the connecting rod up through the motion bracket and attach with a M2 washer & nut...

Then attach the rear of the connecting rod onto the rear crankpin and fix with a M2 washer & nut on top of the coupling rod.

Repeat for the other side.

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

If not, try and locate where there is a bind.

Usually it's the quartering, opening out the holes in the rods a little will cure this.

If your chassis is running freely, then attach the motor. There are two 5mm M3 screws to fit the motor.

After much experimentation, I have eliminated the adjustment of the motor relevant to the gears. Just screw the motor to the motor plate and away you go!

There are four remaining screws

Two M2 8mm coneheads.

Two M2 12mm coneheads.

These are for securing the coupling/buffer into the front frame stretcher and the Front Footplate to the bogie (the footplate acrylic will be with the main locomotive kit acrylic bag).

Countersink holes in the top of the footplate, and using the M2 8mm screw at the back, attach the footplate to the bogie.

The M2 12mm screw goes through the front of the footplate & bogie and captures the buffer/coupling inside the front stretcher.

A PDF copy of this document can be downloaded from -  
[www.bootlane.org.uk/instructions](http://www.bootlane.org.uk/instructions)

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