



St CRISPIN

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 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

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...

Locate the two 2mm acrylic frames. Be careful with these frames, the strength comes from the frame stretchers.

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 2mm 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 and top valve chest covers to the cylinder blocks.

Attach left cylinder-blocks to one of the acrylic frames (they are identical) 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.

Locate the two frame stretchers and the motor-plate. The longer stretcher at the rear, the cut-out for the pony truck is obvious.

In a slight departure from our CLARA & LEO kits, 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.

With the frames taking shape, find the motion bracket. This 2mm acrylic piece drops onto the frame assembly, the slots in the frames allow the motion bracket to lean at the same inclination as the cylinders.

You now need the 2mm brass square section.

The brass square section needs to be approximately 45mm 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.

Slide a 2mm square bar into the back of the motion bracket and then into the square hole in the cylinder. With the slide-bar in place, slide the 2mm round bar into the cylinder and ensure the two brass bars are parallel to each other. Repeat on both sides.

If all is good, glue the motion bracket into place on one frame. This will allow you to disassemble the chassis if needed at a later stage.

Now put the frame assembly to one side.

(I usually paint the whole frame assembly at this stage)

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. There are 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. *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 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 gripping the inserts and the lower crank towards my left, I twisted the top wheel around so that its crank was at the top, 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 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.

The retaining plate also carries a lug at one end to attach the pony truck.

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 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 back of the rod. This part fits into the crosshead and should be a nice loose fit.

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.

The pony truck requires has two top-hat bushes and the remaining 1/8th inch axle, together with the two Binnie 20mm solid spoke wheels.

I found I need to add a little weight to the top of the truck for smooth operation over my railways spring points.

Next attach the motor.

There are two 5mm M3 screws to fit 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 done. 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 MOTOR IS 3-6 VOLTS AND WILL COMFORTABLY PULL A SHORT TRAIN WITH TWO AA BATTERIES – ALTERNATIVLY, USE A MINIB LOCOREMOTE AND FOUR AA BATTERIES

BODY DETAIL

St CRISPIN is based upon the Corris Railway Number 4 built by Kerr Stuart & Company in 1921. There are two distinct versions of this locomotive included in this kit.

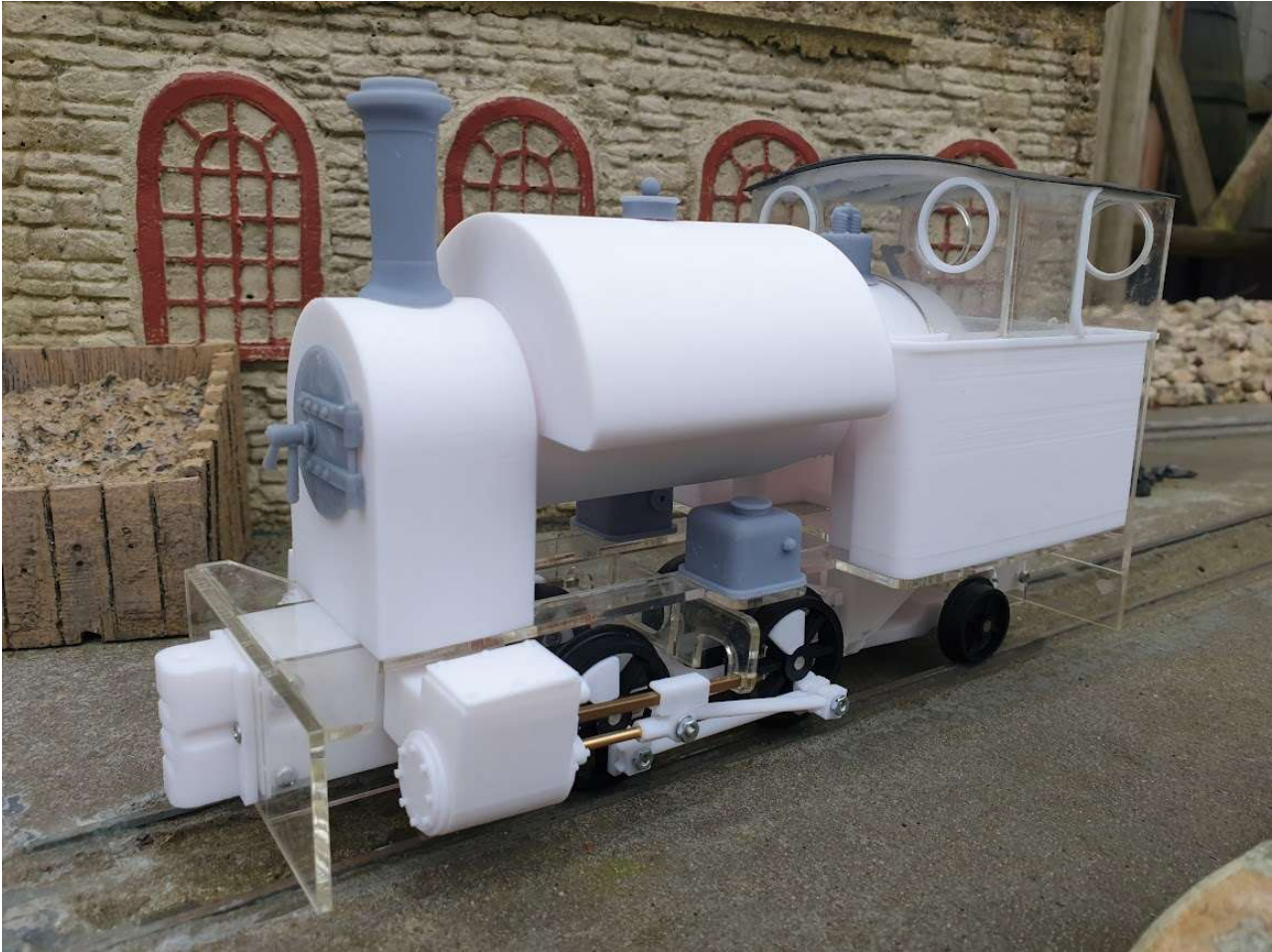
Corris Railway - Number 4

With one entrance to the cab on the right side, on the left side the coal bunker extended to the rear of the locomotive.

Talylyn Railway – EDWARD THOMAS

Number 4 was overhauled by the Hunslet Engine Company in 1952 and returned to the Talylyn with an opening on both sides of the cab.

It was later rebuilt at Pendre with an extended cab and modified cab back-sheet (as the engine is today).



St CRISPIN in Corris guise, with full bunker on the left side.

FOOTPLATE & BOILER

There are two footplates included in the kit, dependant on which version you wish to model. The footplates are cut from one-piece 2mm acrylic.

The boiler is built up from three parts, the smokebox, barrel & firebox. The topside of the barrel is clear for your electronic equipment (as is the saddle-tank).

The smokebox & firebox are the main fixing points for the boiler. Two M3 16mm screws come up from underneath and tap into the smokebox and firebox. The firebox is detailed with a regulator, firehole door & gauge glasses. The saddle tank fits onto the boiler barrel with a locating lug.

BUNKERS

There are three bunkers, all have a locating slot for the front cab sheet. Choose the bunkers suitable for you desired model.

The bunkers are secured to the footplate with four M2 8mm screws.

CAB

The cab is built up from 2mm acrylic pieces.

Glue the sides of the front cab to the inside of the front sheet, there are two printed beading pieces that glue to the edge of the side sheets. The window frames glue into the front sheet, and the 1mm acrylic windows can be offered up from behind the cab-sheet.

The front cab locates into the slot in the bunkers.

The rear cab-sheet need to be glued a buffer-beam. There is a 2mm acrylic “GAUGE” that is used to ensure the buffer-beam is glued correctly to the rear cab-sheet.

Essentially, there need to be 16mm of buffer-beam showing below the cab back-sheet. The GAUGE is 16mm deep.

Place the gauge on top of the buffer-beam, butting the bottom edge of both against a stop. Then butt the cab-sheet against the gauge. Remove the gauge and using liquid glue, fix the cab-sheet & buffer-beam together.

The buffer-beams are held in place by the buffers which are secured to the stretchers with four (two each end) M2 8mm panhead screws.

The roof is formed of the printed frame and the 0.5mm styrene sheet. I suggest gluing these two together prior to fixing the cab. Glue the two parts together “upside-down” using a weight and two lengths of wood to form the styrene to the frame.

The locomotive does not have cab steps, instead, the footplate is cut away at the rear and the footplate drops down on the right side (Corris No 4), and on both sides (Hunslet rebuild).

There are four pieces of 2mm acrylic to build the drop-down footplate. Glue the two pieces together before gluing to the cab.

The 1mm Plastikard strip is for the two rain strips on each side of the roof, and the single strip on the rear cab-sheet.

I needed to add a “chunk” of weight to the inside of the smokebox on the pre-production models, to counteract the rear overhang. I use lead sheet left over from a house referb!

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

A PDF copy of this document can be downloaded from –
www.bootlane.org.uk/instructions

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