



TOFFEE

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"

ABOUT THE PRINTED FILAMENT

THE FILAMENT WILL SOFTEN IF IT GETS HOT - DO NOT LEAVE IN DIRECT SUNLIGHT

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 use a file to clean the surfaces, then apply a primer or a primer/filler and rub back with a wet'n'dry. A little effort with preparation will reward you with great a topcoat.

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 continuing.

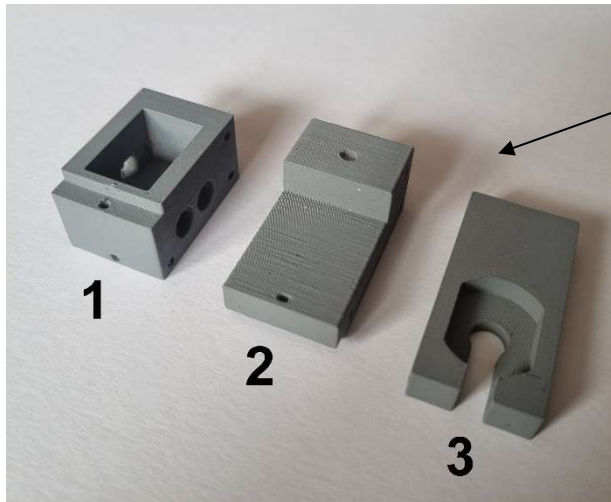
THE ACRYLIC IS ALSO BRITTLE, CARE SHOULD BE TAKEN DURING CONSTRUCTION

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.

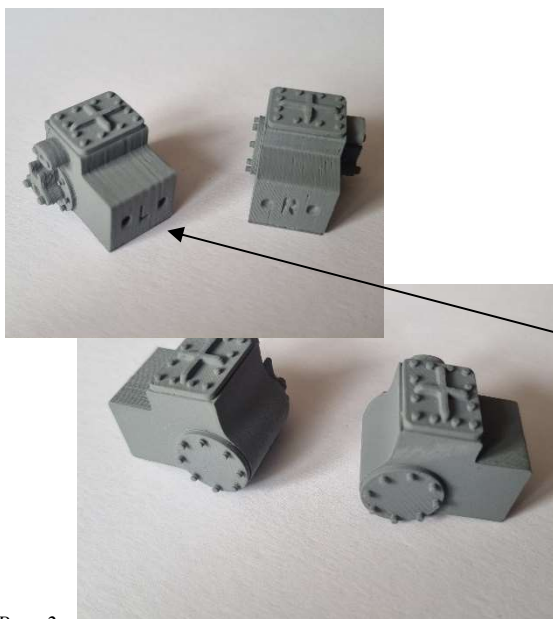
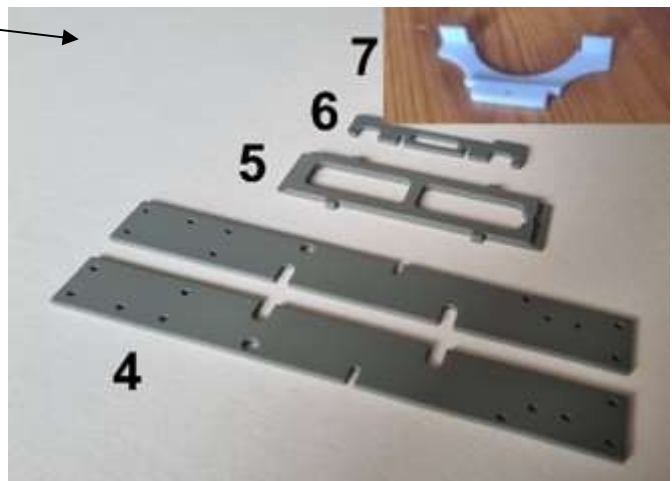
We DO NOT guarantee this chassis if used for “Heavy Haulage”!

Let's start with some part identification...



1. Front Stretcher, it is upside down in the image and the front is facing away from you.
2. Rear Stretcher, this is the right way up and the rear is facing away from you.
3. Motor Mount, this is the right way up and the rear is facing away from you.

4. Frames, a pair. The front is to the right.
5. Retaining Plate, it is symmetrical except for a small notch to the rear. The notch clears the worm gear.
6. Motion Bracket, this is completely symmetrical.
7. Carrier Plate, the top edge in the image is the front of the plate.



These have the front cylinder covers added to the front of the blocks and the valve chest covers to the top of the blocks. These can be attached with a tiny spot of superglue.

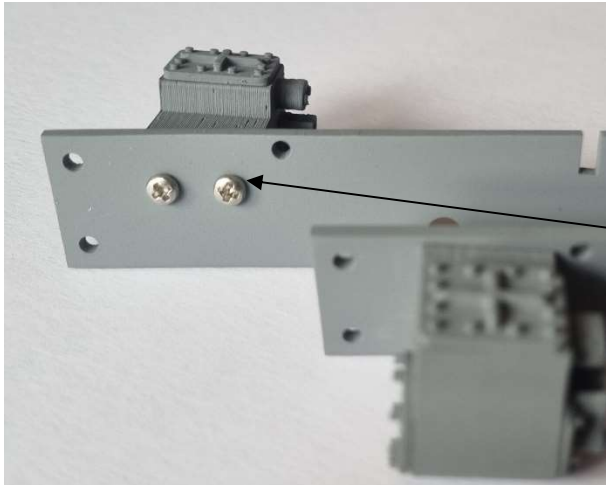
Note that the cylinder blocks are handed and have an “L” & “R” printed into the facing plate between the two screw holes.

OK, let's build the frames...

Build up both cylinder blocks as in the image above, personally I like to run a M2 tap down the holes on all the parts for the M2 screws to screw into later.

However, this is not completely necessary, as the holes can be threaded with the screw.

Before you start, ensure the 2mm brass square section can push into the square hole in the rear of the cylinder block. If necessary, use a modelling knife to clear the square hole a tiny amount.



Take one of the cylinder blocks and a frame and attach the block to the frame through the two holes at the front of the frame using two of the M2 panhead screws.

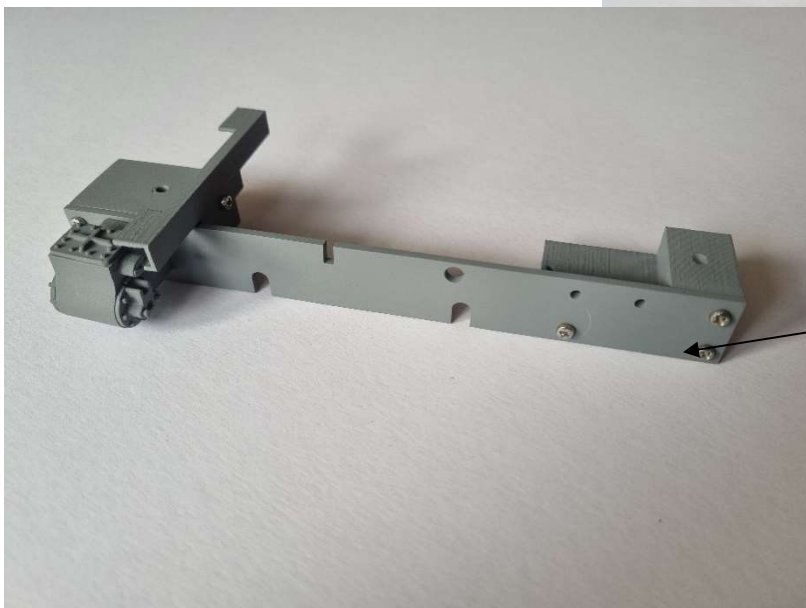
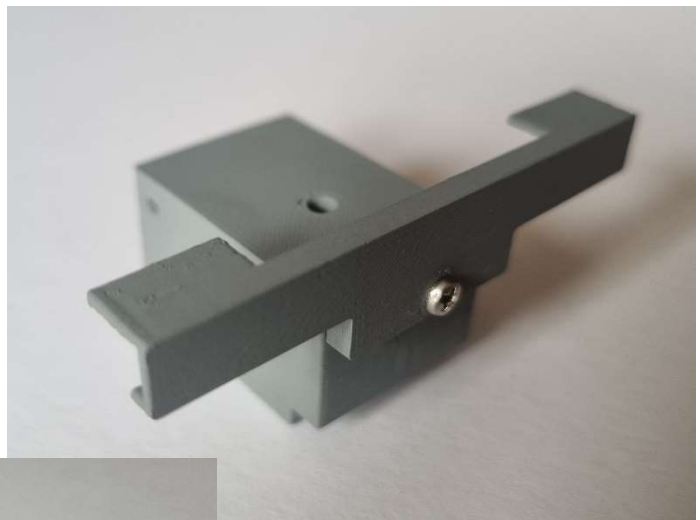
Ensure you have the left block on the outside facing backwards.

Repeat for the other side, and you should end up with a mirrored pair of frames.

Locate the carrier plate and the front stretcher.

NOTE – THE FOLLOWING IMAGES ARE OF MINTY, THE ONLY DIFFERENCE IS THE SHAPE OF THE CARRIER PLATE

Using an M2 screw, attach the two pieces together as in the image. Only nip the two pieces together as you will need to take them apart again later!!!

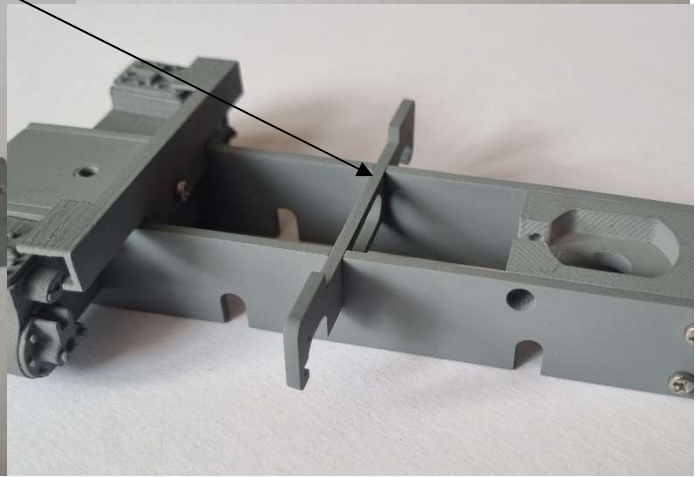
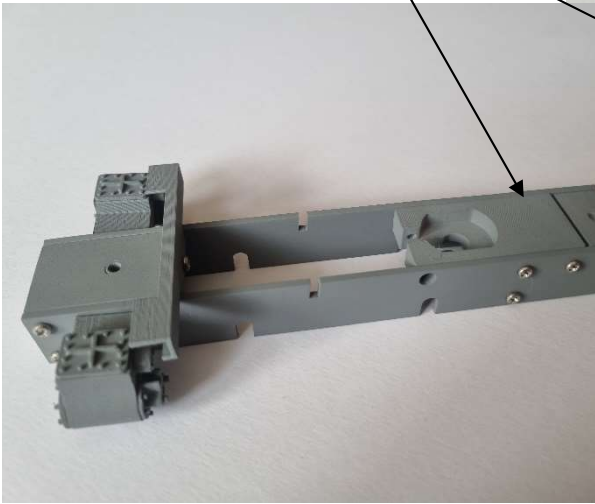
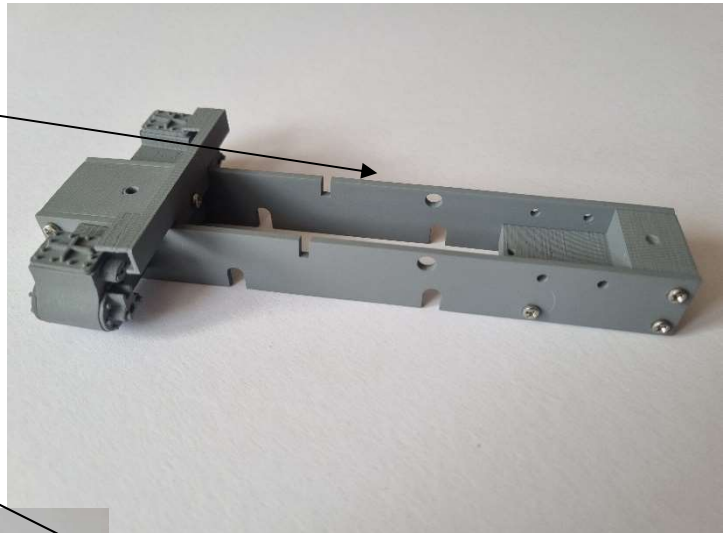


Now take the front & rear stretchers and using a further six M2 screws, attach the stretchers to the two stretchers to the frame-plate.

Now using six more M2 screws, attach the other frame-plate.

Locate the motor-plate and fit it to the chassis using, you've guessed it, another four M2 screws...

Finally, drop the motion bracket into the assembly.
If you do glue it into position, only glue it to one of the frame-plate, so you can disassemble the chassis later if needed.



Well done.

Let's have a go at the wheelsets now...

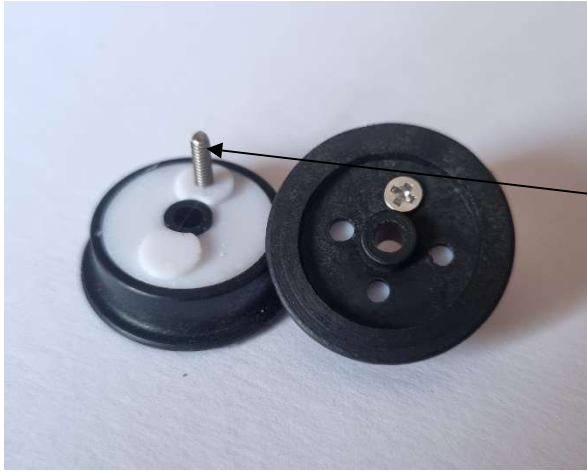
You will need -

- X4 Binnie 20mm wheels
- X4 printed inserts
- X2 10mm M2 conehead screws
- X2 12mm M2 conehead screws
- X2 stainless steel axles (one with a drive gear, one without)
- X4 brass top-hat axle bushes



The two inserts lower right are in grey undercoat, while the other two are still white filament. These last two have been pressed into the Binnie wheels.

Note the two different lengths of M2 conehead screws 10mm & 12mm.



Using a vice, press the wheel inserts into the Binnie wheels.
Ensure that the cross on the printed insert aligns with the cross on the wheel.

Fit the 10mm & 12mm M2 conehead screws into each of the four wheels from the back of the wheel, through the hole in the Binnie wheel.
Keep tightening the screw until it is good & tight and will not go any further.

Squeeze the wheels onto the axles using a vice.

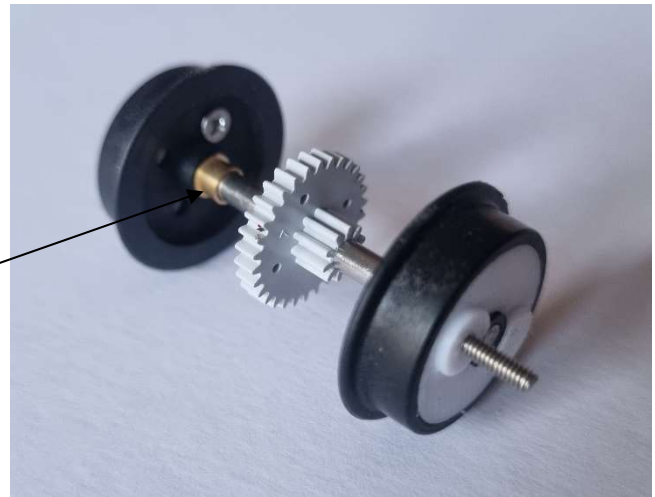
BE CAREFUL

You have two wheels with long crankpins (12mm M2 screws) and two with short crankpins (10mm M2 screws).

Ensure that the long crankpin wheels are pressed onto the axle with the drive-gear.

ALSO

Remember to push the brass top-hat bushes onto the axles prior to pushing on the wheels.
The bushes go on with the lip towards the wheels.



WARNING

It is very important that you maintain a “Back-to-Back” measurement of 28mm (the Back-to-Back is the distance between the back of both wheels on the one axle).

If your Back-to-Back is greater or less than 28mm, you will find the chassis binds up, and an increased likelihood that the chassis will derail in operation.



QUARTERING

This is easy, don't get stressed over it.

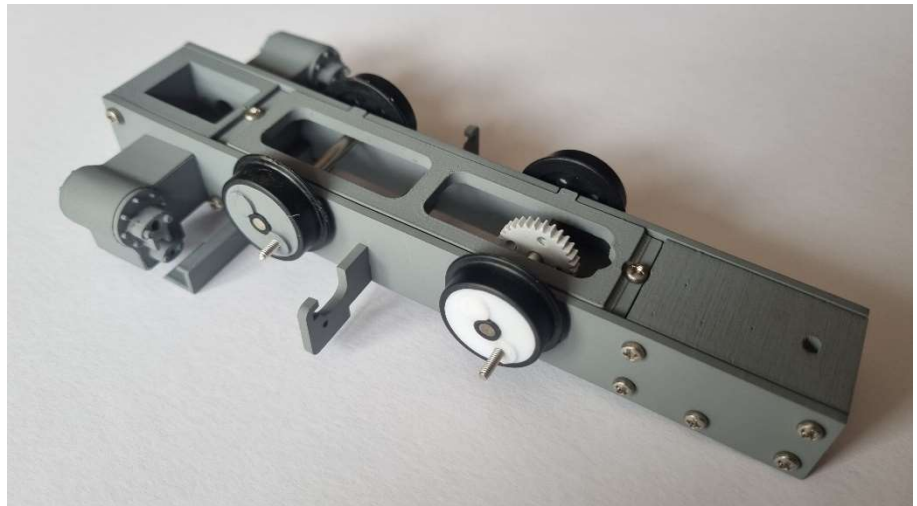
Place a wheelset in the vice, with the jaws just gripping the bosses on the inserts, as shown in the image.

Now, carefully grip the top wheel with your finger & thumb and twist the top wheel so it is 90° to the bottom wheel. *Hold the lower wheel in place also.*

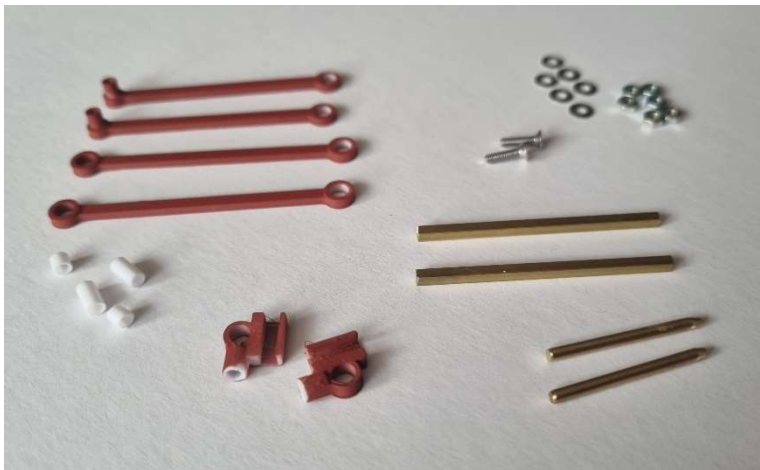
You can get a very good idea of the 90° angle by looking down from the top.
Repeat the process for the other wheelset, remember to get them both pointing the same way.

Finally, drop your wheelsets into the frame assembly. The brass top-hat bushes sit with their lip outside the frame-plates.

Lastly, place the retaining plate into the chassis assembly and screw it down with two 8mm M2 screws. The notch in the retaining plate is at the rear and will allow the worm gear to clear the plate.



**Well done, you're almost there,
A couple of fiddly bits, and you'll have a chassis...**



You will need –
(There are spares of some items with your kit)

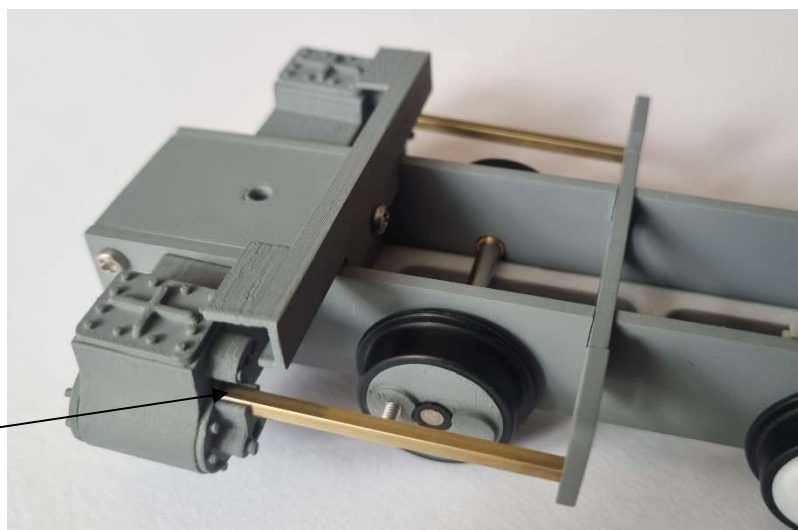
- X2 connecting rods
- X2 coupling rods
- X2 crossheads (a pair)
- X2 8mm M2 conehead screws
- X6 M2 nuts
- X2 short white ABS tubes
- X2 long white ABS tubes
- X2 washer (the photo shows six, our mistake)
- X2 2mm square brass rod
- X2 2mm round brass rod

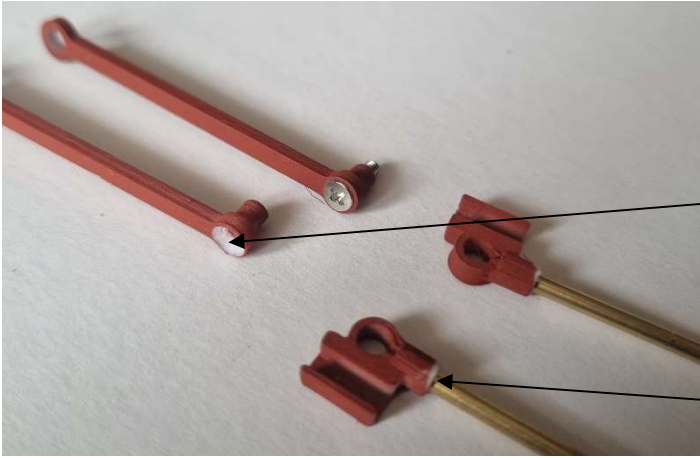
The 2mm brass square rod needs to be cut into two lengths of 45mm.
The 2mm brass round rod need to be cut into two lengths of 30mm.
Use a saw or cutters, but clean up the ends with a file, emery cloth or wet'n'dry to ensure the ends are not rough and jagged.

SLIDE-BARS

Push the 2mm square brass rod onto the cylinder block. The rear end is held in place by the motion bracket.

You may need a tiny dab of glue to hold the slide-bars into place.





MOTION

Using a countersink drill, open the back of the connecting rods to accept the 8mm M2 screws.

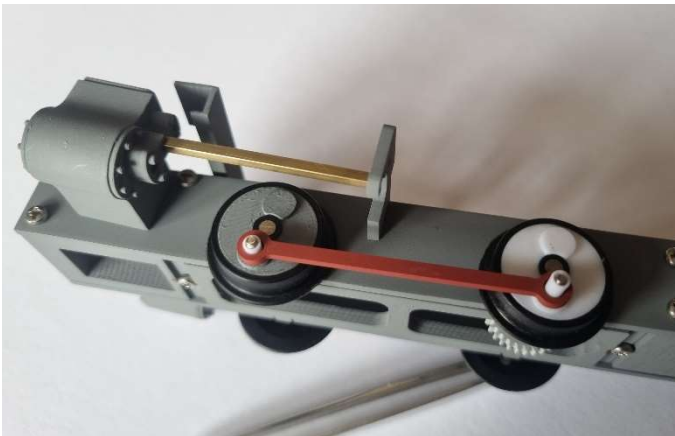
Push the 2mm brass round rods (cut to 30mm) into the crossheads.

Take care here, the crosshead can split. You have spares...

Add a dab of glue if needed.

Push the connecting rod into the crosshead, then add a washer and an M2 nut.

Tighten the nut, the assembly should remain loose once tight.



Place a short white ABS tube over the front (short) crankpin, and a long ABS tube over the rear (long) crankpin.

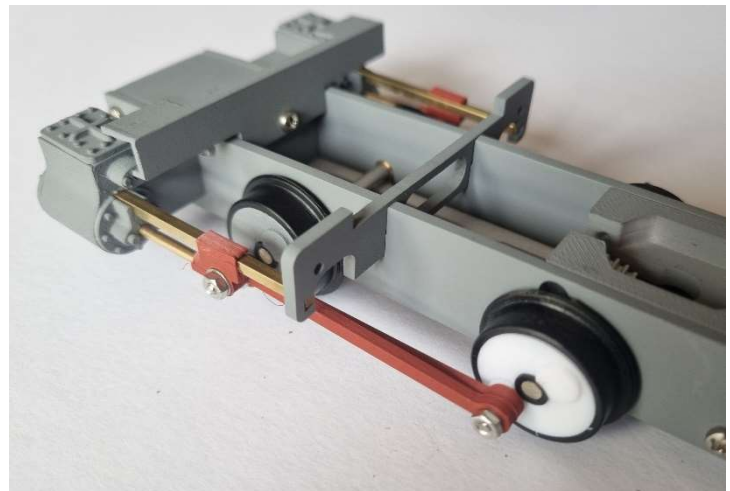
THE COUPLING RODS HAVE A SLIGHTLY RAISED BOSS ON ONE SIDE, THIS BOSS SHOULD BE PLACED AGAINST THE WHEEL FACE

Place one coupling rod over both crankpins and using an M2 nut, captivate the rod in place on the front crankpin.

Slip the crosshead over the slide-bar, push the piston rod into the back of the cylinder and drop the end of the connecting rod onto the rear crankpin.

Use a M2 nut to captivate the rear assembly.

Repeat for the other side.



Hopefully your chassis should now run smoothly!

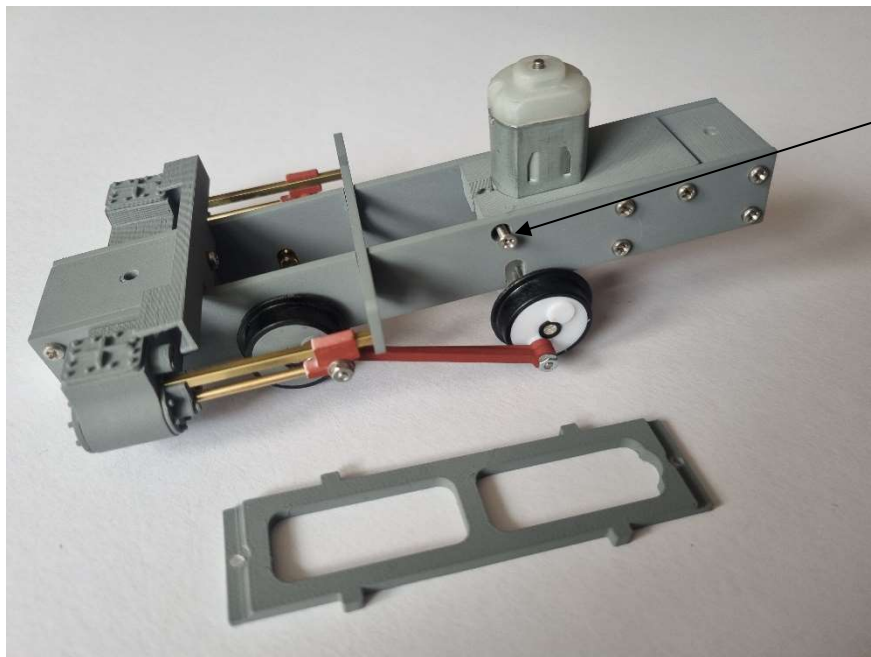
If it doesn't, the likelihood is your quartering is out, take the wheelsets out and check the quartering.

A very quick way to check if it's your quartering, is remove the connecting rods and just try the chassis with only the coupling rods!

Check for other things too, such as rods touching each other, or the piston rod binding in the cylinder block, or the crosshead binding on the slide-bar.

All these issues can be cured by opening out the binding area, with a needle file, or wet'n'dry.

Once you are happy with the chassis, let's attach the motor...

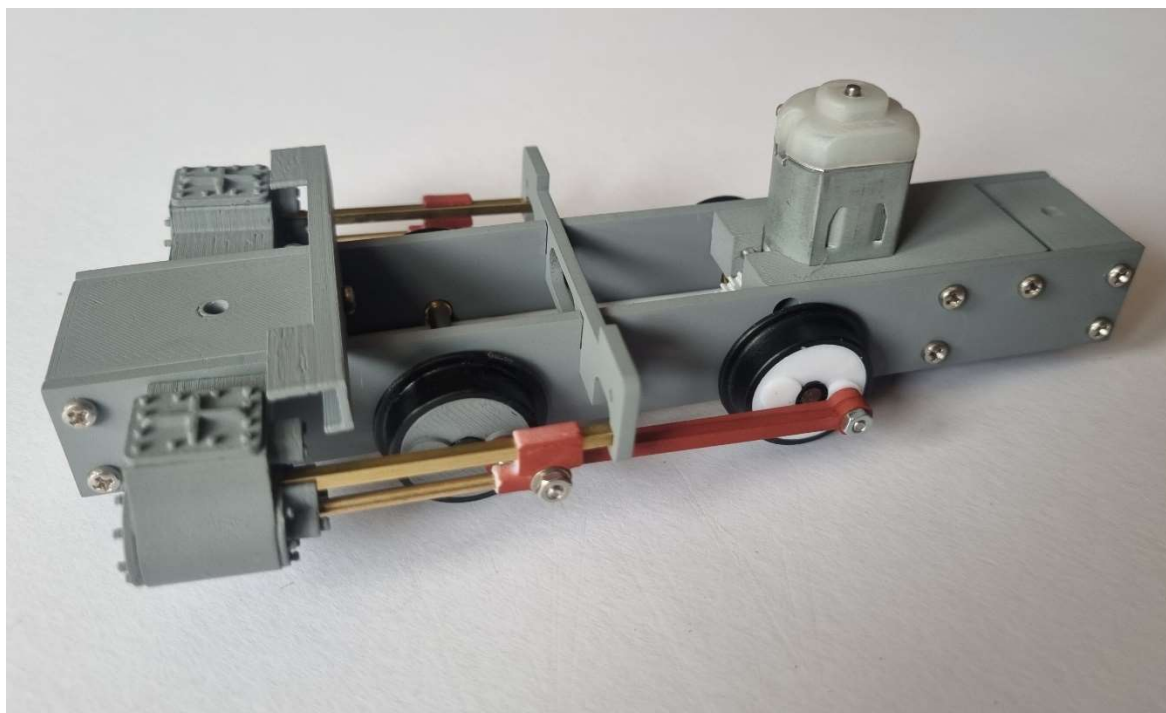


Locate the 16mm M2 conehead screw.

This screw is driven into the motor mount from the **left-hand side** of the chassis.

You will need to either remove or drop the rear wheelset (as in the image) to access the hole.

The motor mount acts as a clamp; the screw needs to go right through both sides of the mount and clamp the two side up tight on the motor.

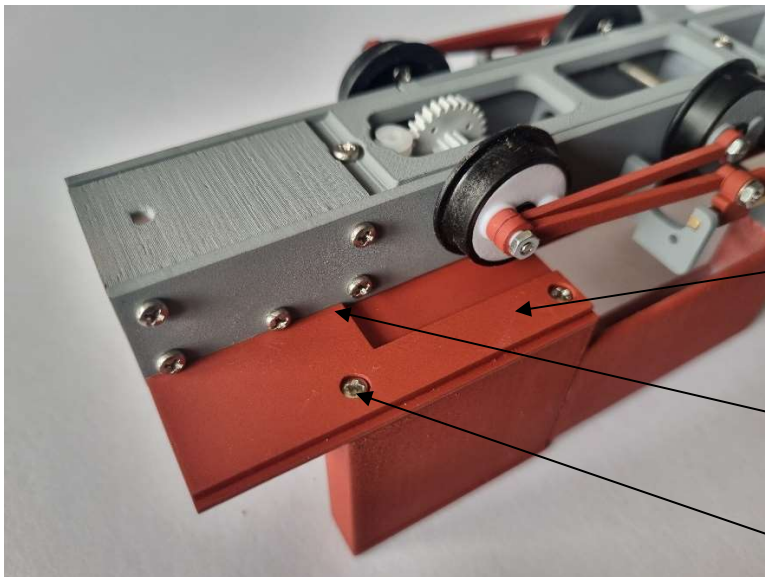


THE MOTOR IS 3-6 VOLTS AND WILL COMFORTABLY PULL A SHORT TRAIN WITH TWO AAA BATTERIES – ALTERNATIVLY, USE A MINIB LOCOREMOTE AND FOUR AAA BATTERIES OR A 3.7V LIPO BATTERY

The rest of this build is easy, and mostly self-explanatory...

THE BODY

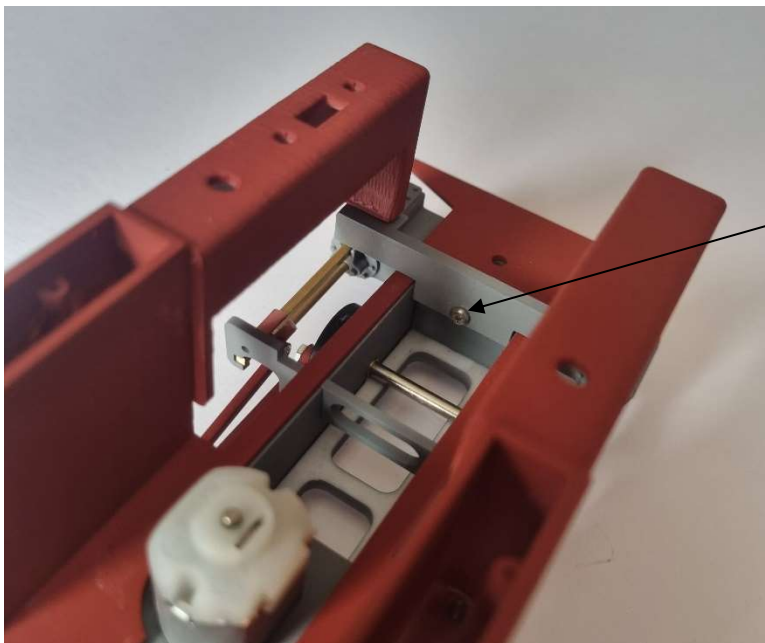
NOTE – THESE ARE FURTHER IMAGES OF MINTY, THE ONLY DIFFERENCE ARE THE TANKS AND CARRIER PLATE – TOFFEE’S SADDLE FITS OVER THE BOILER BARREL



The underside of the running board (1mm acrylic) has two 2mm acrylic pieces that need to be glued on.

I recommend they be affixed with the chassis in place, as they butt up to the frame-plates.

The bunker screws.



The running board is held in place with an 8mm M3 screw through the top of the cab footplate. The front is held in situ by the carrier plate that will need removing from the stretcher, then replacing with the running board in place. By screwing it to the stretcher earlier, it has become much easier to remove and replace now!

The saddle fits over the boiler with a locating lug at the front of the engine and sits on the carrier plate.

The bunkers are screwed from the underside of the running board using four 8mm M2 screws.

The firebox is a one-piece resin print, with gauge frame and regulator detail to be added. The steam dome and safety valve sit on top of the firebox, cut the length of 3mm ABS tubing into two for the safety valve pipes through the roof. They slide into the safety valve.

Resin printed tank fillers, sand dome, chimney, smokebox saddle, smokebox door and smokebox door handle have also been provided.

Five lengths of 1.5mm brass rod have been supplied, one is valve rod detail above the slide-bars. Cut to length and slide in from the motion bracket up to the back of the cylinder block.

The roof uprights are made from four lengths of 1.5mm brass rod, cut to 90mm. The two front ones secure through the bunkers, the holes may need opening out a little.

The rear two locate in the footplate and are rather delicate, as is the whole roof structure.

The roof itself consists of a printed frame (this is symmetrical) and a sheet of 0.5mm black Plastikard.

Open the four holes in the printed part to accept the 1.5mm brass rods. Then join the frame and the sheet two together, allowing an equal overlap all around.

There are two printed angle pieces that fit over the front two uprights to simulate the angle irons on the original locomotive. The cut out on one end drops into the bunker.

There is a 1mm acrylic backrest that fits onto the two rear uprights. Be very careful with this, the acrylic is brittle. We have provided a spare!

The boiler barrel is fixed to the loco with a 16mm M3 screw, it goes up through the front stretcher, the 1mm running board, the smokebox saddle and into the boiler barrel/smokebox.

Finally, buffers & buffer-beams are screwed to the stretchers with last four 8mm M2 screws.

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

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