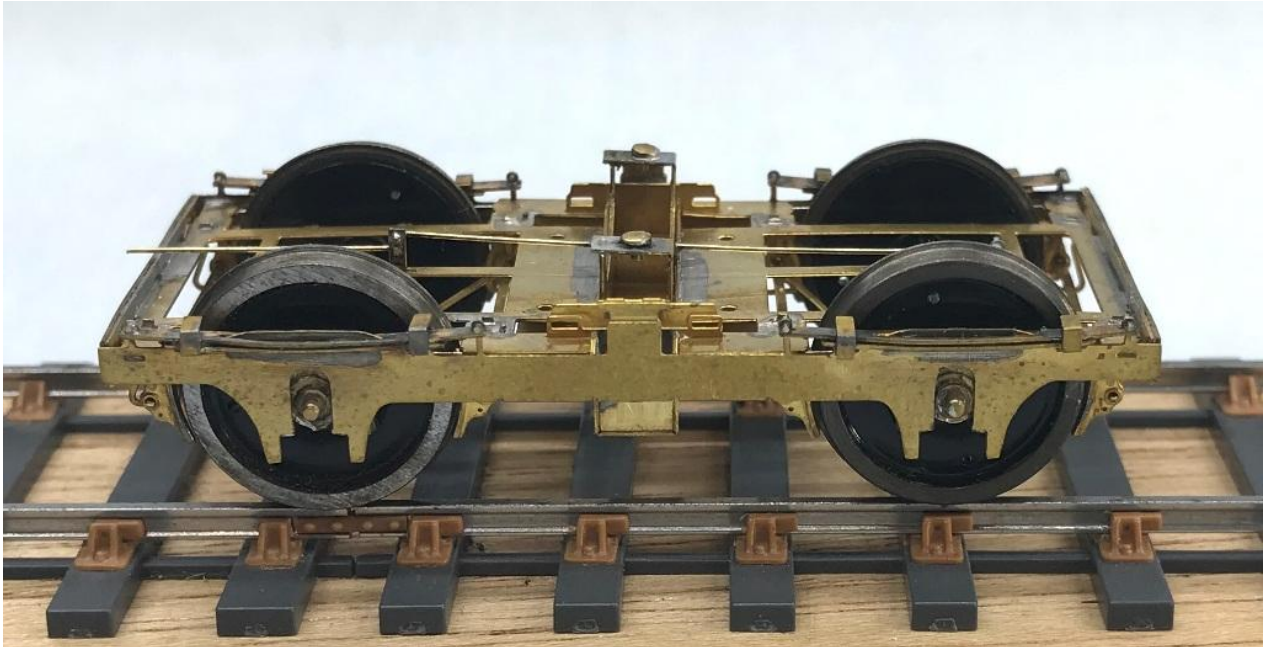


E.07 8'6" Light Gresley Bogie Instructions - v2 May 2022

This set of instructions covers Rumney Models kit E.07. This is designed to build into fully sprung subframe for the light version of the 8'6" Gresley coach bogie as fitted to a wide range of LNER passenger stock. The kit will require sideframes and bolster spring parts to complete. The kit is not really suitable for the 8'6" heavy bogies as these were of a different profile. A kit for these (along with the 8'0" versions) is a distinct possibility for future release depending on sales of these.



Construction Notes

Read through the instructions first and familiarise yourself with the components. Drawings and photographs taken during the construction of the test etches are included to attempt to make my waffle clearer. Note that not every photo is of this particular kit but suitably illustrate the item in question.

All fold lines are through 90° with the fold line on the inside unless stated otherwise.

Everyone has their own soldering methods. I now use an Antex 50W temperature controlled soldering iron with predominantly 145° solder and La-Co paste flux.

Check all holes before removing parts from the fret. The drawing process for etching if you use a CAD program as I do is extremely accurate but the actual etching process itself not an exact science. If the fret is slightly over etched then there is no problem but if they are under etched the holes will need enlarging. I find that this is easiest to do before removing parts from the fret. The hole sizes will be noted at the appropriate points.

Modification Notes

For some inexplicable reason an error crept into the production artwork for these bogie subframes. This is annoying because it wasn't on the test etch. The problem is that the holes for the secondary spring wire on part 10 (bolster) don't quite match up with the slots in the bolster guide. To correct the issue you will need to drift the small holes on part 10 outwards using a 0.4mm drill. This only needs to be by 0.25mm each side. The error is small but it is enough to stop the secondary spring wire passing through the slots on the bolster guide.

Technical

These coach bogies are designed to be built fully sprung with both primary (wheels to bogie) and secondary (bogie to bolster) suspensions arranged by steel guitar wire 'leaf' springs. The suspension is designed to provide 0.42mm deflection on both the primary and secondary springs using 0.009" guitar wire with 180g total load. The primary suspension is arranged in individual springs that are soldered to the spring carriers in which the wheel bearings sit. For this you will need a suitable flux. I use Carr's Black label. Secondary springs are arranged on the two point contact between two simple supports principle and are simply fitted into place.

If your coach weighs significantly more than 180g then you should consider using 0.010" steel wire for the primary springs but leave the secondary springs at 0.009". Suitable guitar wire should be available from your local music shop.

Ride height of the coach can be adjusted using pads mounted on the coach underframe. This is covered towards the end of the instructions.

Materials list

Spring wire and pins to act as a bearing point between bogies and body are included castings but you will need to obtain some other items to complete.

Your favourite brand of 3'7" wheels and bearings are of course required along. I use Exactoscale products but Alan Gibson or Ultrascale will suit.

Pinpoint bearings will be needed. I use Alan Gibson as their waisted ones are nice and deep and save having to carve out too much on the backs of the axleboxes.

You will need suitable sideframes. I would currently recommend using the MJT sides and bolster parts (MJT 2411: LNER Gresley 8'6" standard). They aren't perfect but come out the right sort of width. You could try the recent Hornby bogies but I don't think they look quite as good as the MJT ones and they will require a lot more work to make them fit the subframe; not least thinning them down by about 1mm to get a suitable width. Gresley bogies should be about 7'3" (29mm) over the outer vertical faces of the sideframes. The Rumney Models subframe is 25mm over the outside of the frames so each sideframe should be about 2mm between the back and the vertical front face. When the 21st century catches up with Rumney Models and I get a 3D printer I will look at doing printed parts to complete the bogie.

The following size of wire will be needed. Eileen's Emporium is a good source for these and they do mixed size packs if you don't want huge quantities of one size.

0.31mm Brakegear and cosmetic springs

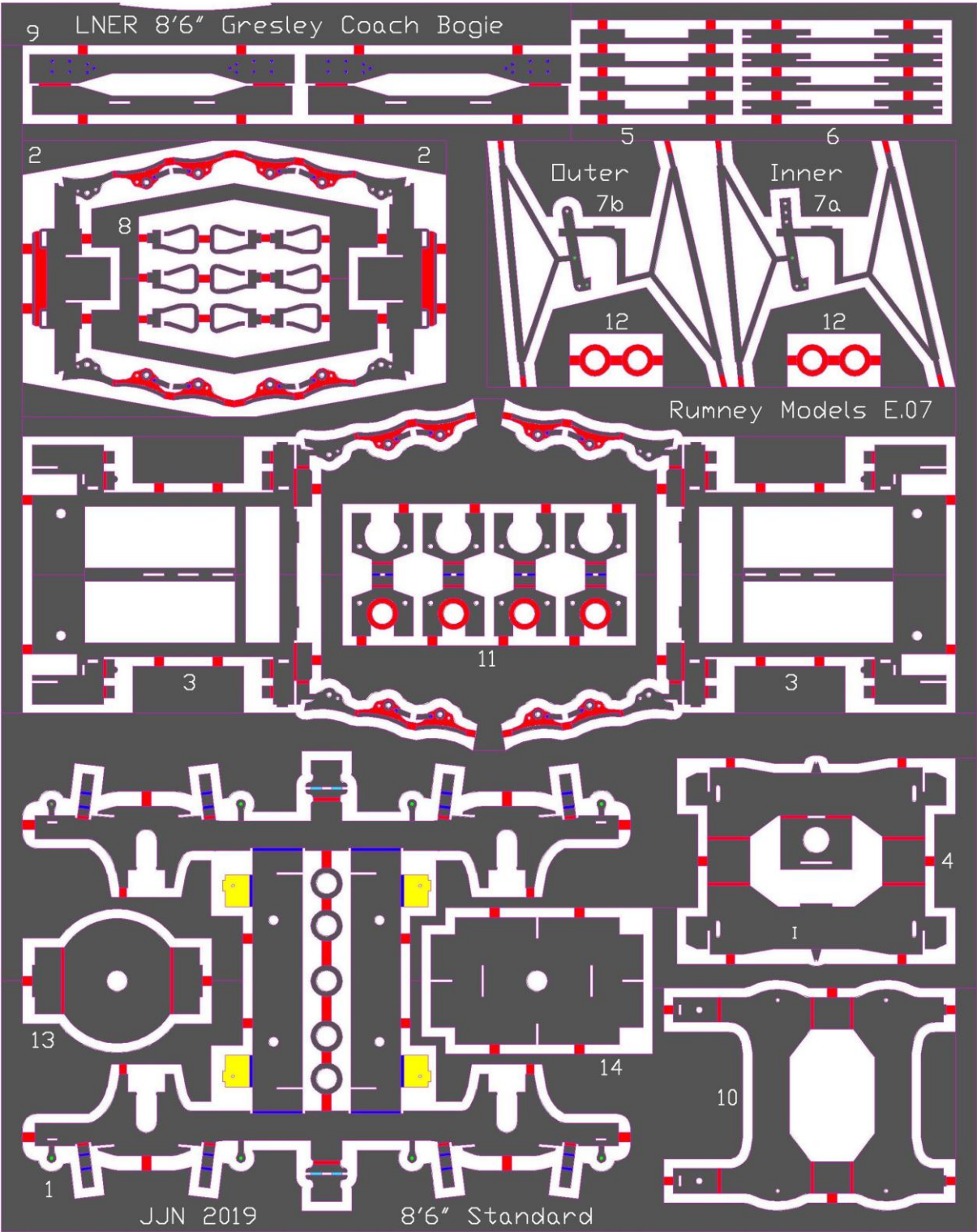
Bolts, nuts and tube will be needed to fix the bogie to the body. There are two options:

- M2 bolts and nuts + 2.5mm outside diameter, 2mm inside diameter brass tube
- or
- 10BA bolts and nuts + 2.5mm outside diameter, 1.5mm inside diameter brass tube

I dislike using screw threads as a bearing surface hence the tubing.

Contact details for the above suppliers can be found at the end of the instructions.

Parts Diagram



Parts List

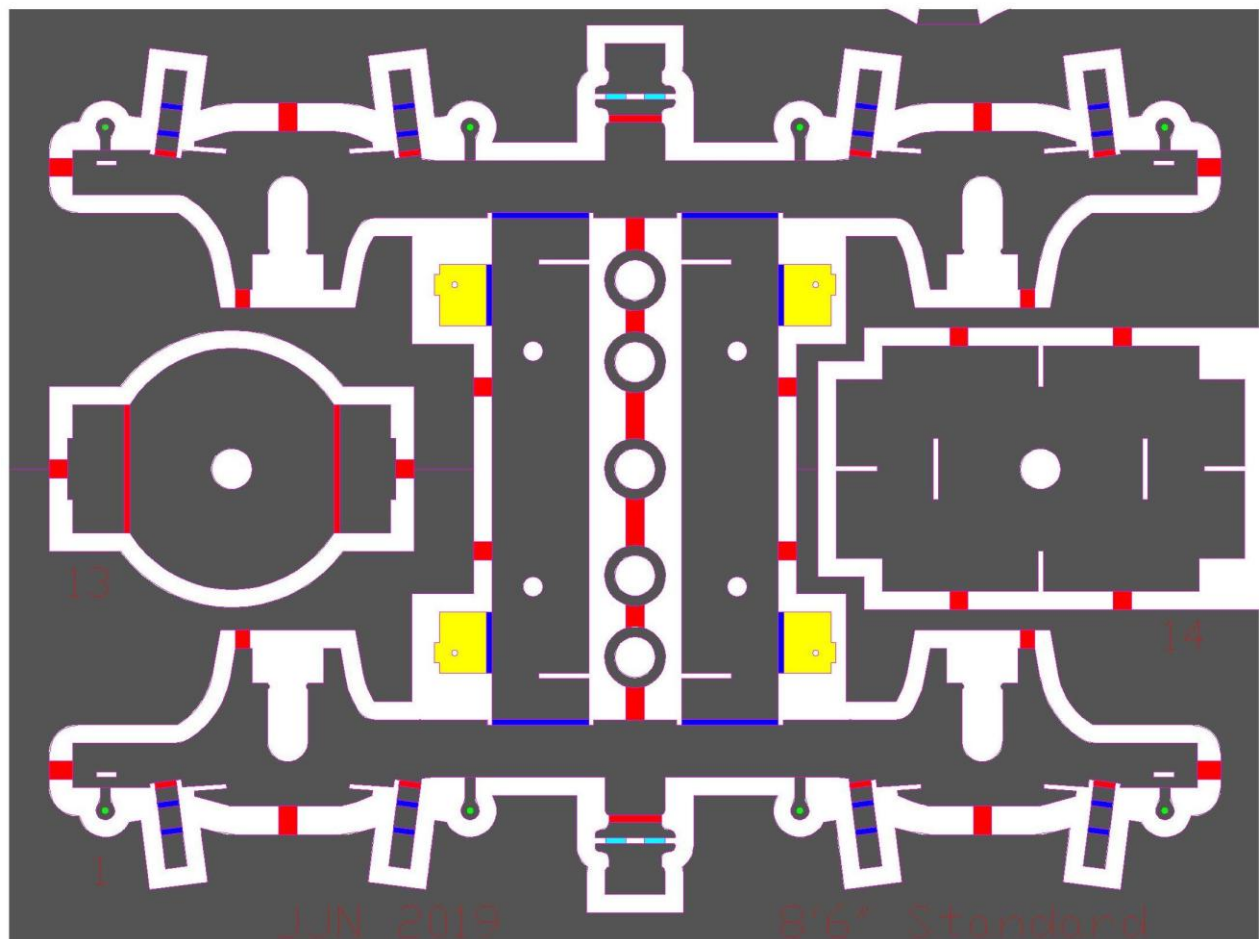
- | | |
|--------------------------------|-----------------------------|
| 1 - Main bogie assembly | 8 - Brake yolk safety loops |
| 2 - Inner brake shoes | 9 - Ends |
| 3 - Top plate | 10 - Bolster |
| 4 - Bolster guide | 11 - Spring carriers |
| 5 - Lower leaf springs | 12 - Bearing washers |
| 6 - Upper leaf springs | 13 - Bogie pivot plate |
| 7a - Brake rigging (Inner end) | 14 - Pivot locating plate |
| 7b - Brake rigging (outer end) | |

Construction

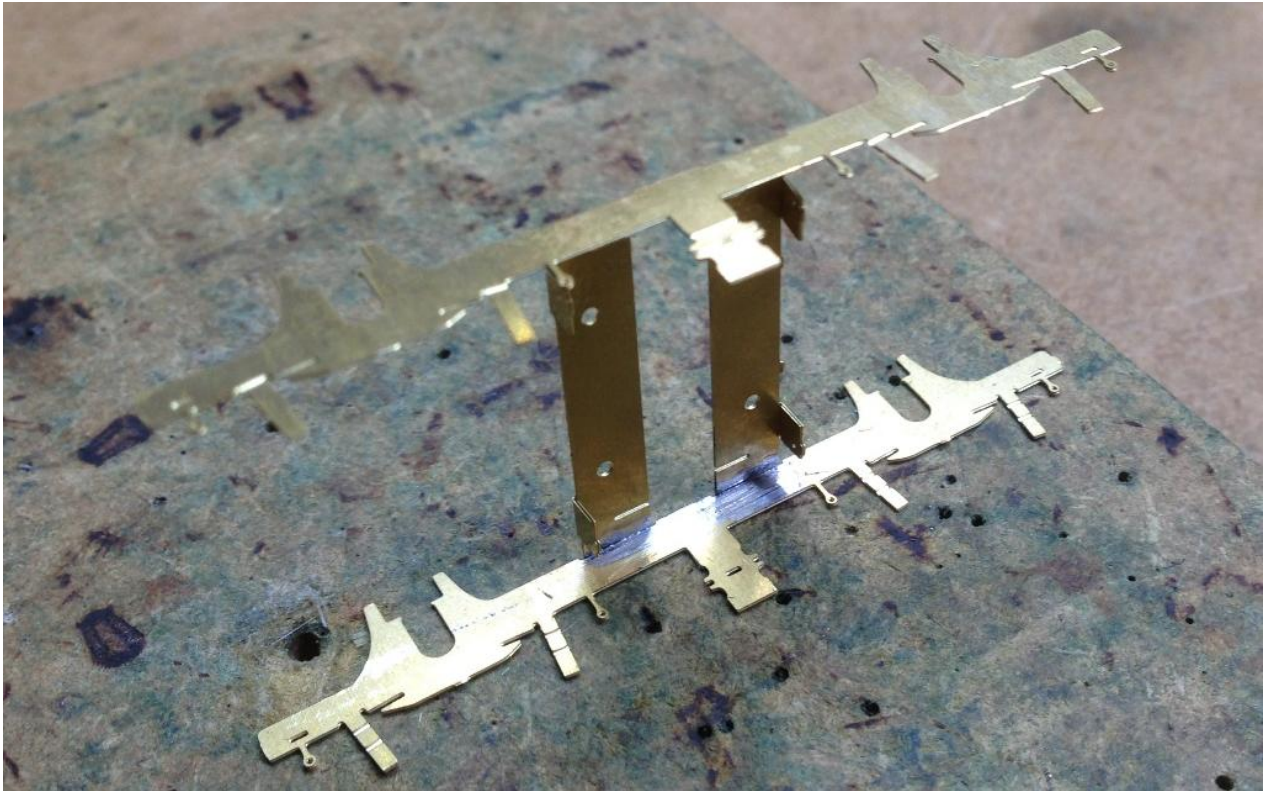
Bogie Frame

Check that the holes in the spring hangers on the main bogie assembly (shaded green in Fig.1) can accept 0.31mm wire and remove from the fret. Remove the washers from the middle of the stretcher between the sideframes and put in a safe place for later.

Fig.1

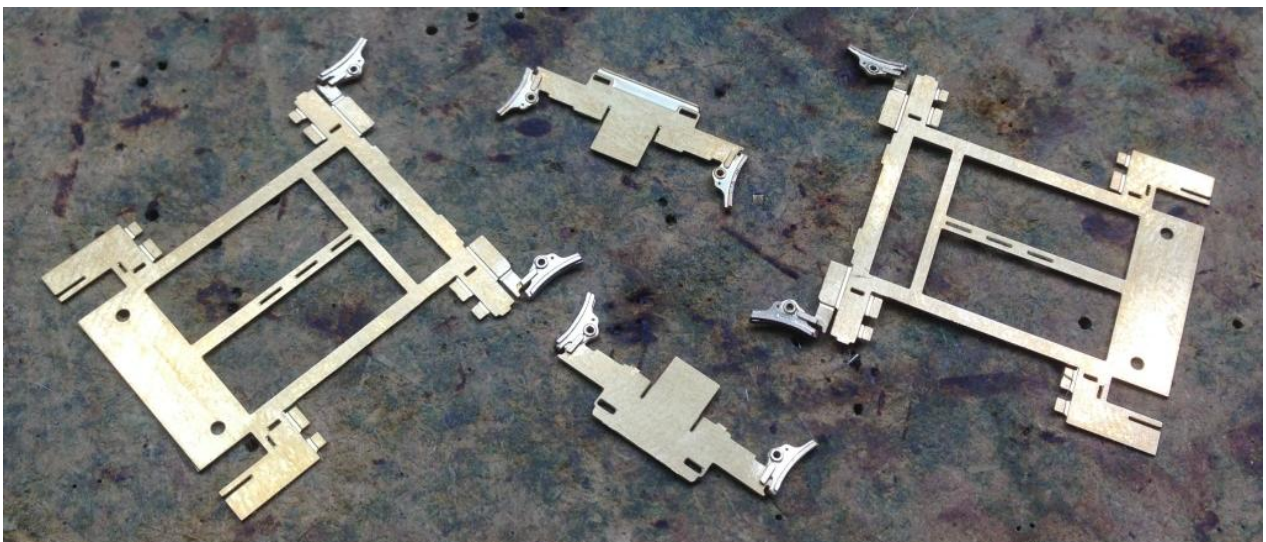


Fold the sideframes up each side of the central stretcher. Make sure that the fold lines are at 90° and reinforce the fold lines with solder. Also fold up the four tabs on the main stretcher. These are shaded yellow in Fig.1.



In the middle of each side at the top there is detail that is supposed to represent the top part of the bolster. The furthest most part from the sideframe should be folded through 180° with the fold line on the outside about the fold lines shaded cyan in Fig.1. Solder the folded part in place.

The next job is to make up the brake shoes. Remove the inner brake shoes (3) and the top plate (4) from the fret. The brake shoes themselves come in three parts, a full thickness layer, attached to the larger part, which will form the middle and then two half etched detail layers for the outsides. The detail layers are designed to wrap around the full thickness middle. Use the 0.5mm holes etched in the middle of them to align the three parts and solder together.



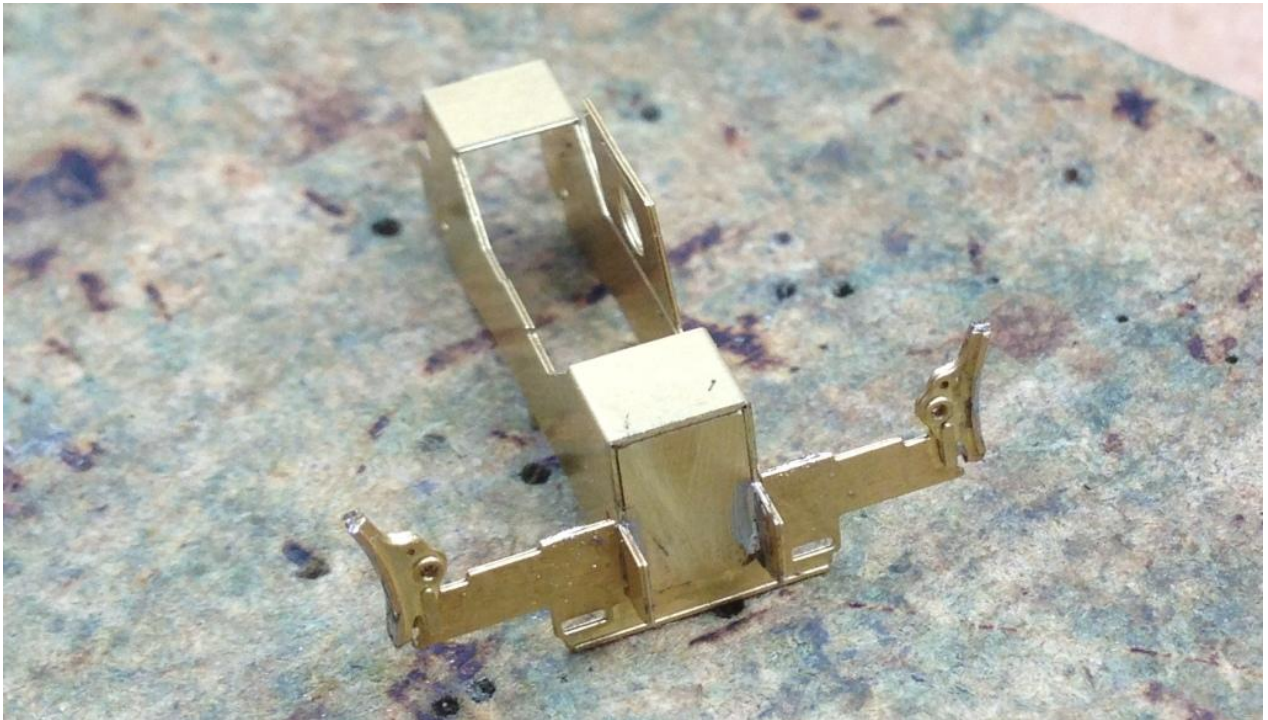
Fold up all the small tabs on the top plates and fold the brakes up so that they appear as per the image below. Solder the brake shoes in place at the sides.



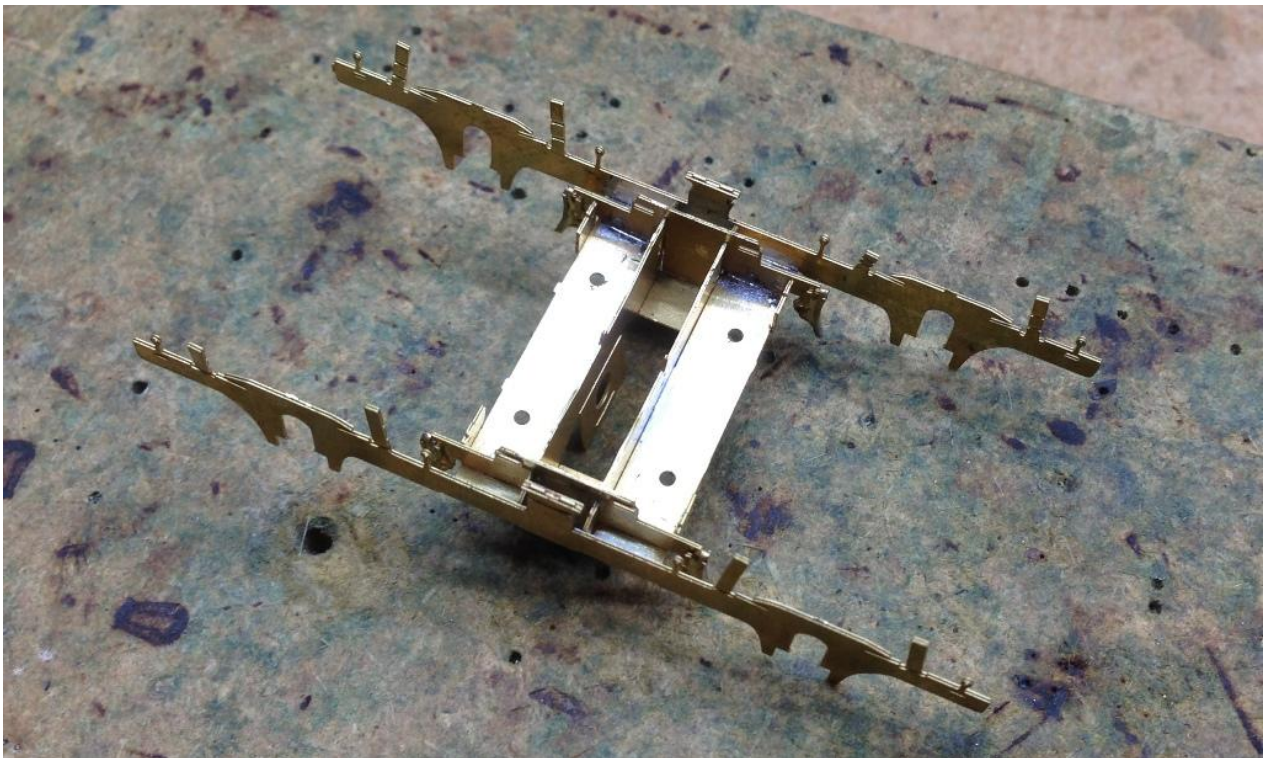
Remove the bolster guide (5) from the fret and fold into a C shape.

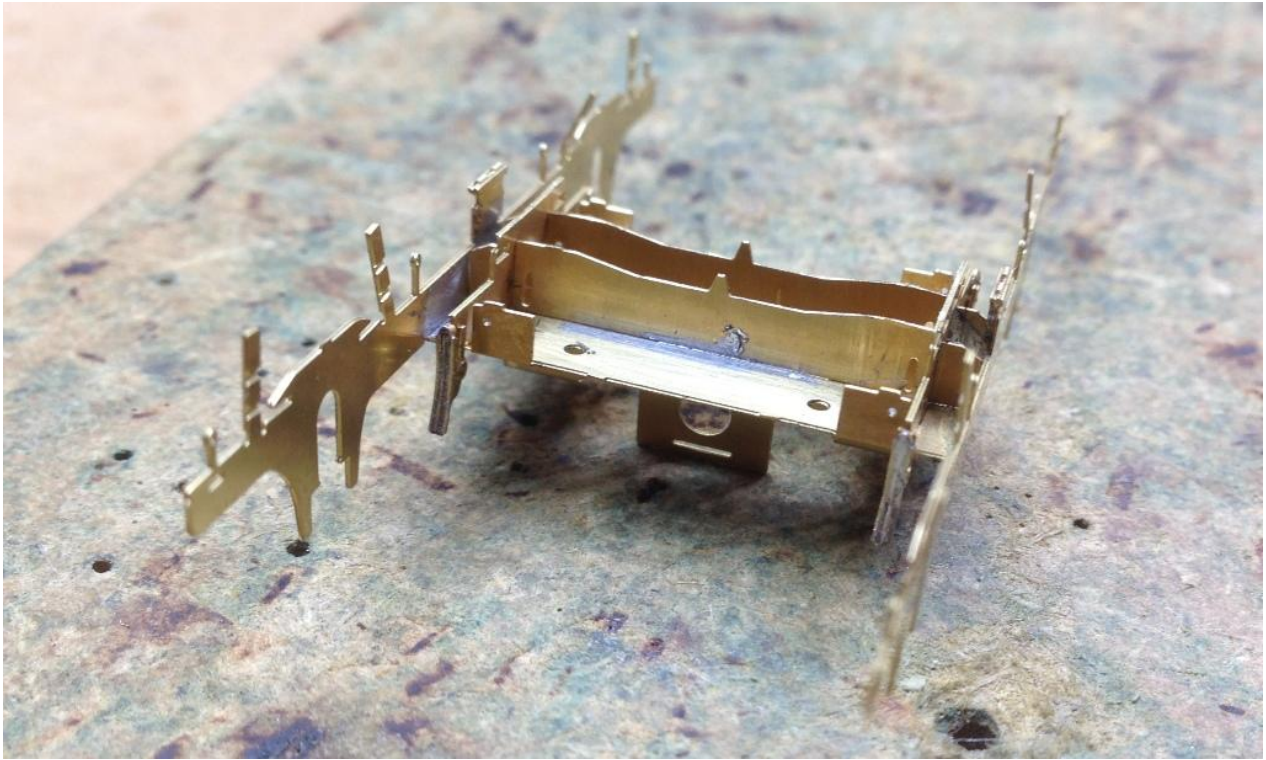


The inner brake shoes locate onto the bolster guide using the slots in the middle of the inner brake shoes and the outsides of the bolster guide to form the centre of the bogie. See the image below. Making sure that the two parts are fully home in their slots solder the inner brake shoes to the bolster guide.

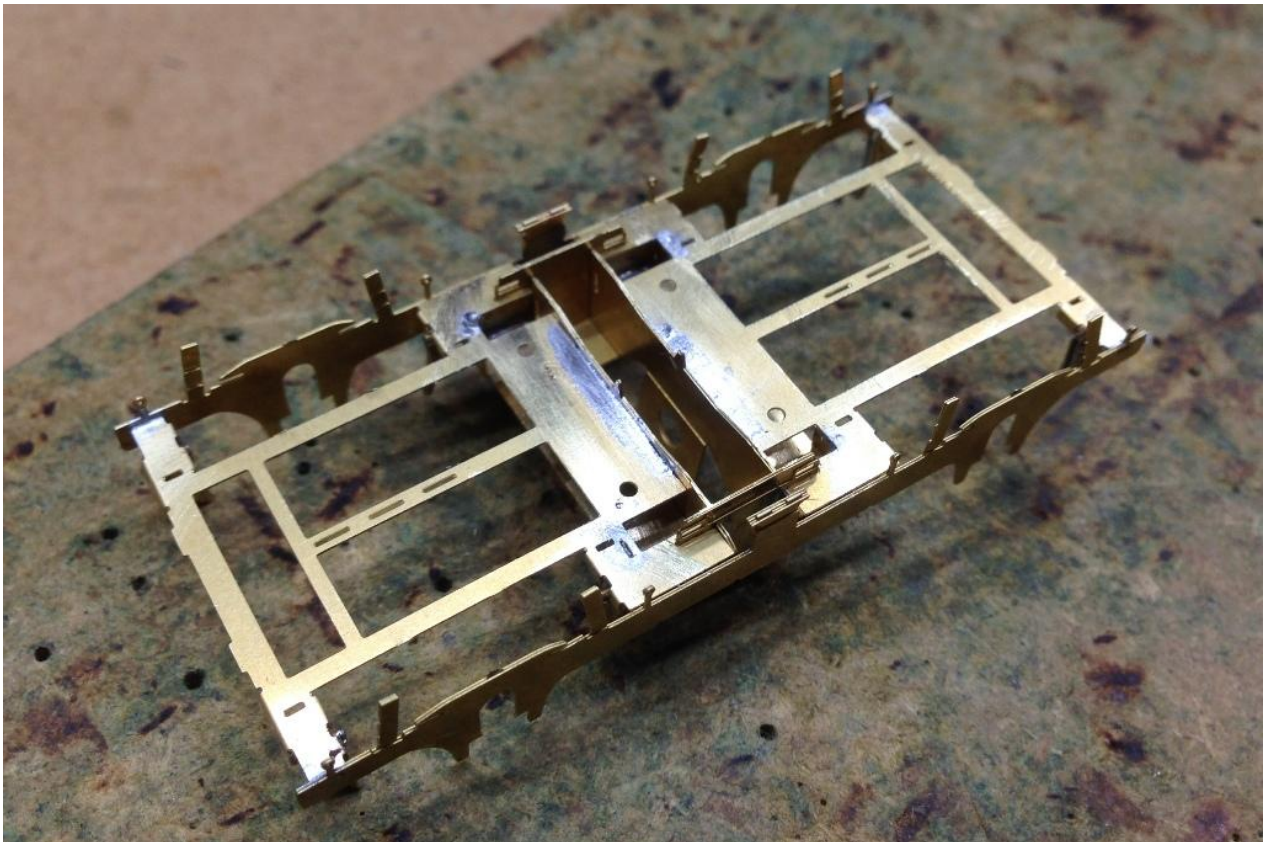


Fit the bolster guide/inner brake shoes to the central stretcher on the main bogie. The bolster guide will fit between the two parts to the stretcher and the inner brake shoes partially locate into slots on the stretcher. Solder in place making sure that everything is home properly and square.

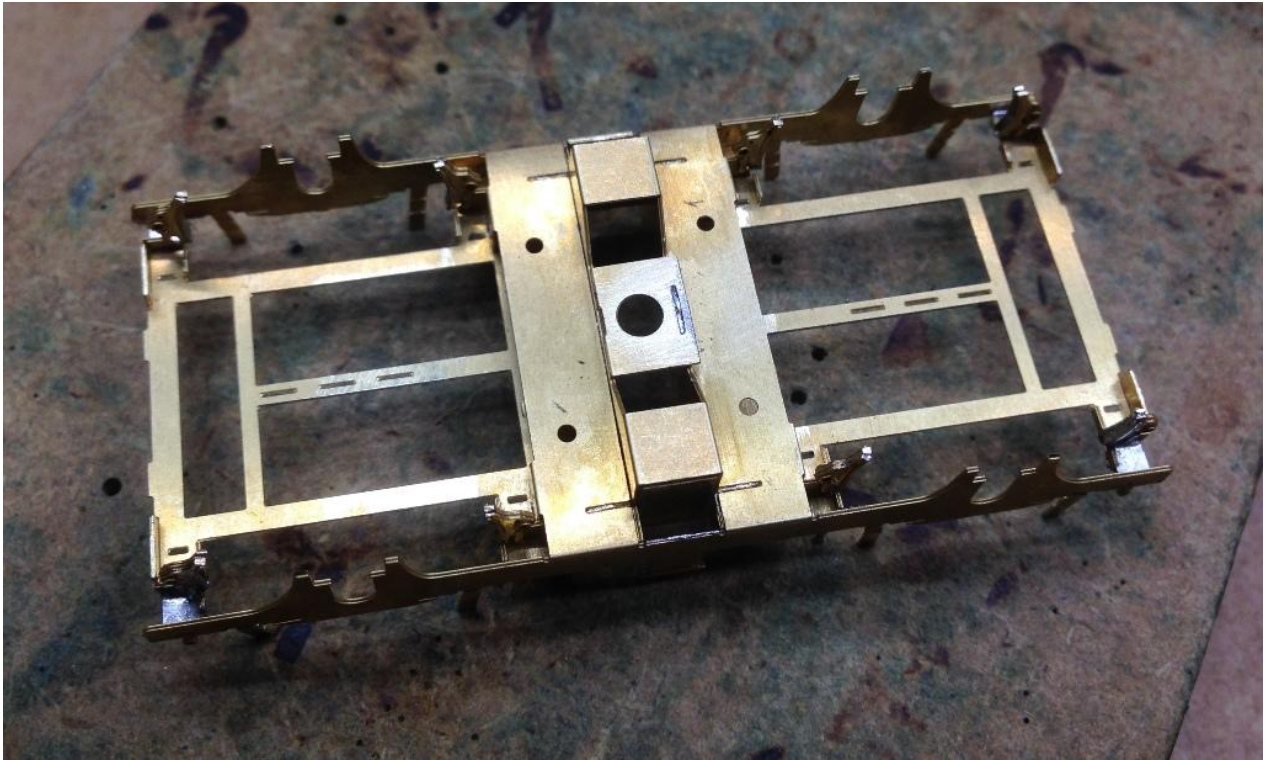




Fit the top plates in place using the tabs and slots on the top plate and the slots on the sideframes and the tabs fold up parts on the stretcher. Obviously the top plates are arranged so that the brakes face downwards in the bogie. Solder in place.



Fold over the small part with hole in the bottom of the bolster guide. There is a tab and slot to locate it on the other side of the bolster guide. Solder in place.



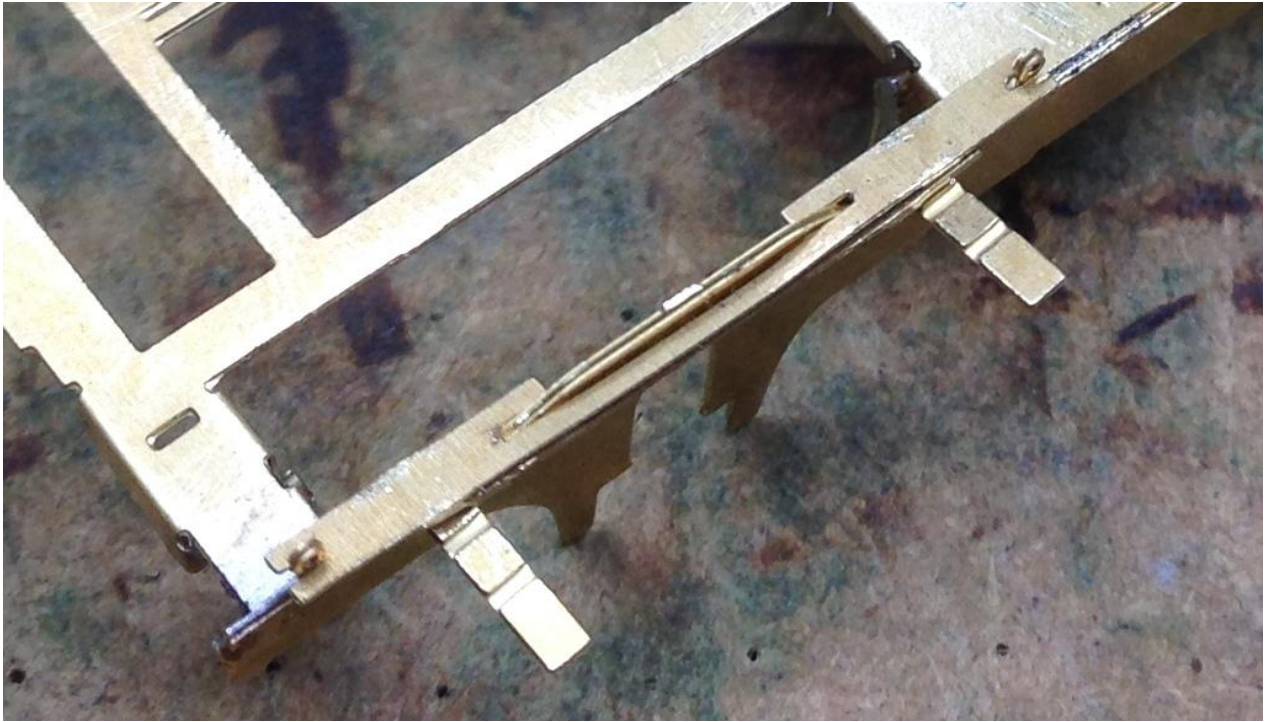
Cosmetic Primary Springs

Next we will construct the cosmetic primary springs and safety loops. These are quite distinctive and visible on the real things and it is worth making the effort to replicate them. It's only really the top two leaves on the spring that you can see so I have only included these.

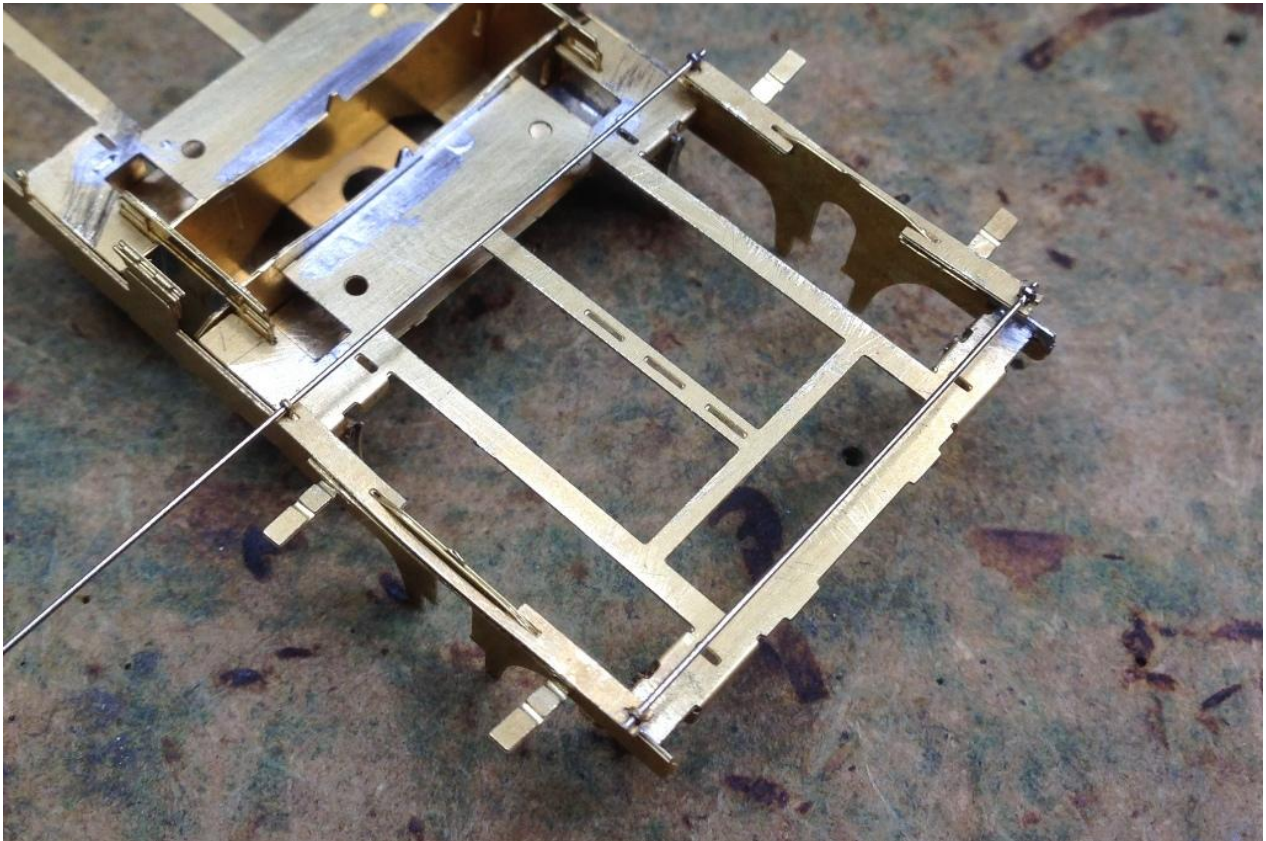
Remove the lower leaf springs (5) from the fret. They locate into slots on sideframes either side of the raised section above the axle slot. First they will need bending to the right profile. There is a curved cut out in the main fret just above the ends (9) to help you get the correct profile. Once they are curved the lower leaf springs can be fitted to the main bogie assembly.



Remove the upper leaf springs (6) from the fret. These sit above the lower leaf springs using slots to locate over the raised section above the axle slot. Again they will need curving so they sit nicely above the lower leaf spring.



With the lower and upper leaf springs fitted on both sides at one end thread two lengths of 0.31mm wire through the holes in the spring hangers. These were the ones shaded green in Fig.1. Solder everything in place making sure the upper leaf springs are hard up against the wire.



Trim the wire so that it only goes as far as the side of the upper leaf spring. Fold over the safety loops at the fold line nearest the sideframe so that they point upwards outside of the springs. See image below.



Solder the safety loops to the upper leaf spring at the top.



The final fold can be made in the safety loops so that they point towards the inside of the bogie and the fold line reinforced with solder.



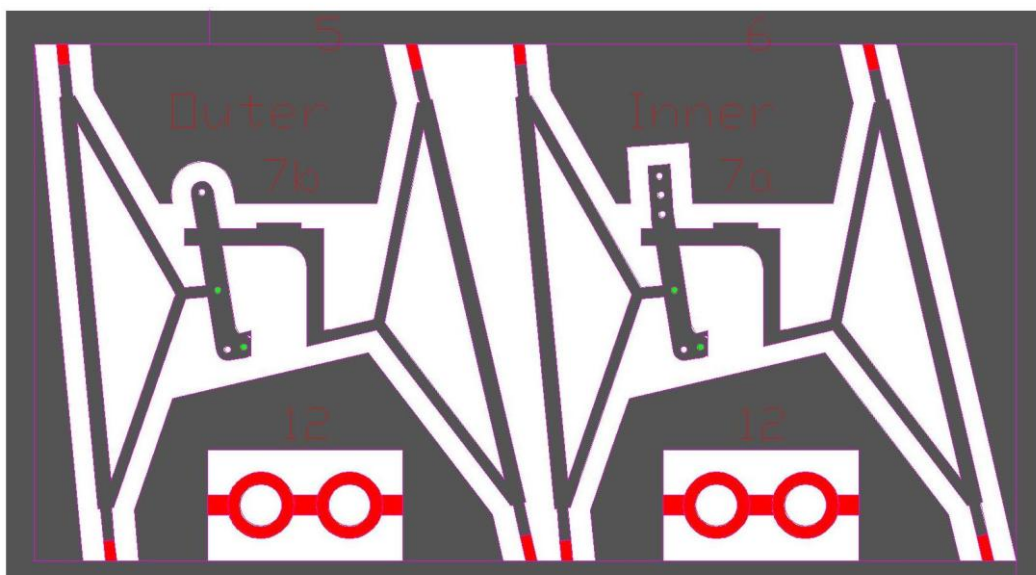
Repeat for the other end.

Brake Rigging

There are two sets of brake rigging one for the inner end of the bogie (7a) and one for the outer end (7b). So far the bogie is the same at both ends but the brakegear is arranged so that the links point towards the vacuum cylinders in the middle of the coach. So, once in place, the brakegear will define the inner end of the bogie which will face towards the middle of the coach when fitted. You should do one set (outer or inner) at a time and then do the other so as to avoid confusion. As the images begin with the inner set we will start with that.

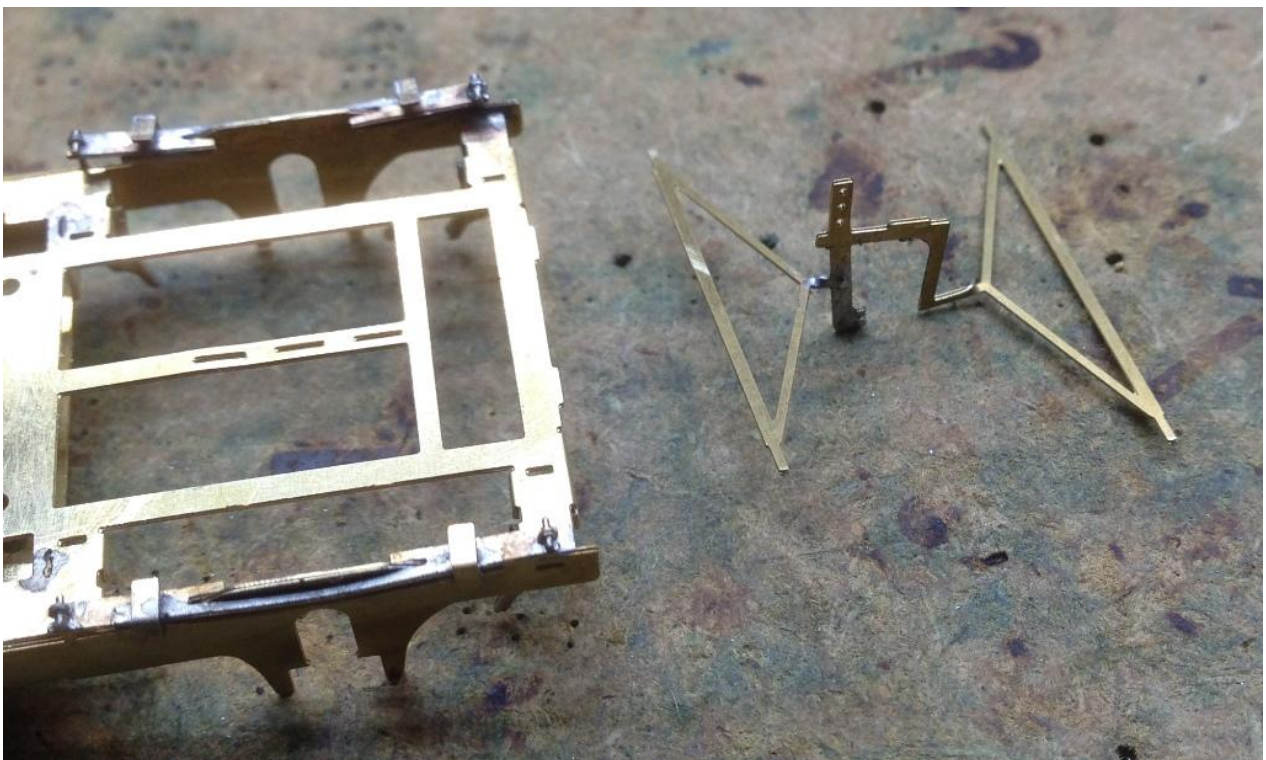
Remove the brake rigging (Inner end) (7a) from the fret. I haven't included etched overlays with this kit but you may wish to add a little detail. Solder short lengths of 0.31mm wire into the holes shaded green in Fig.2. Then trim the wire so that it resembles bolt heads.

Fig.2

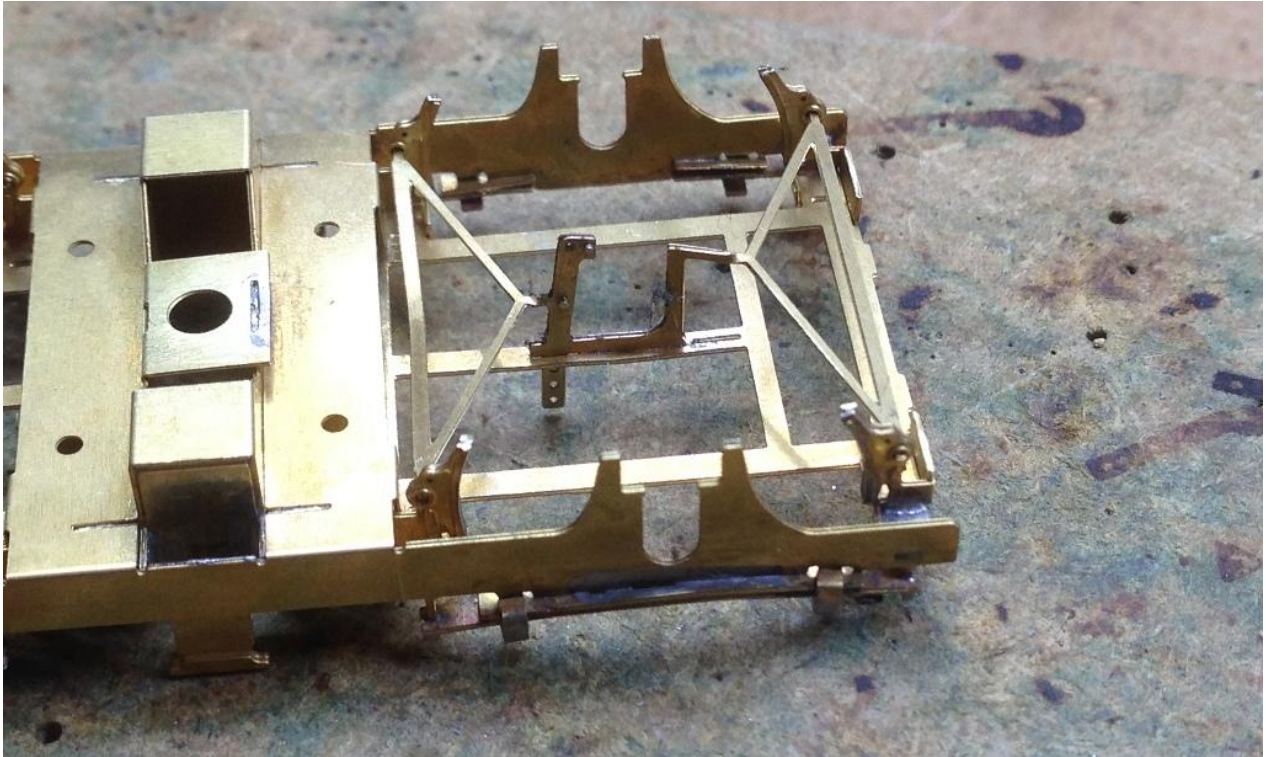




Twist the yokes through 90° just beyond the tip of the triangle.

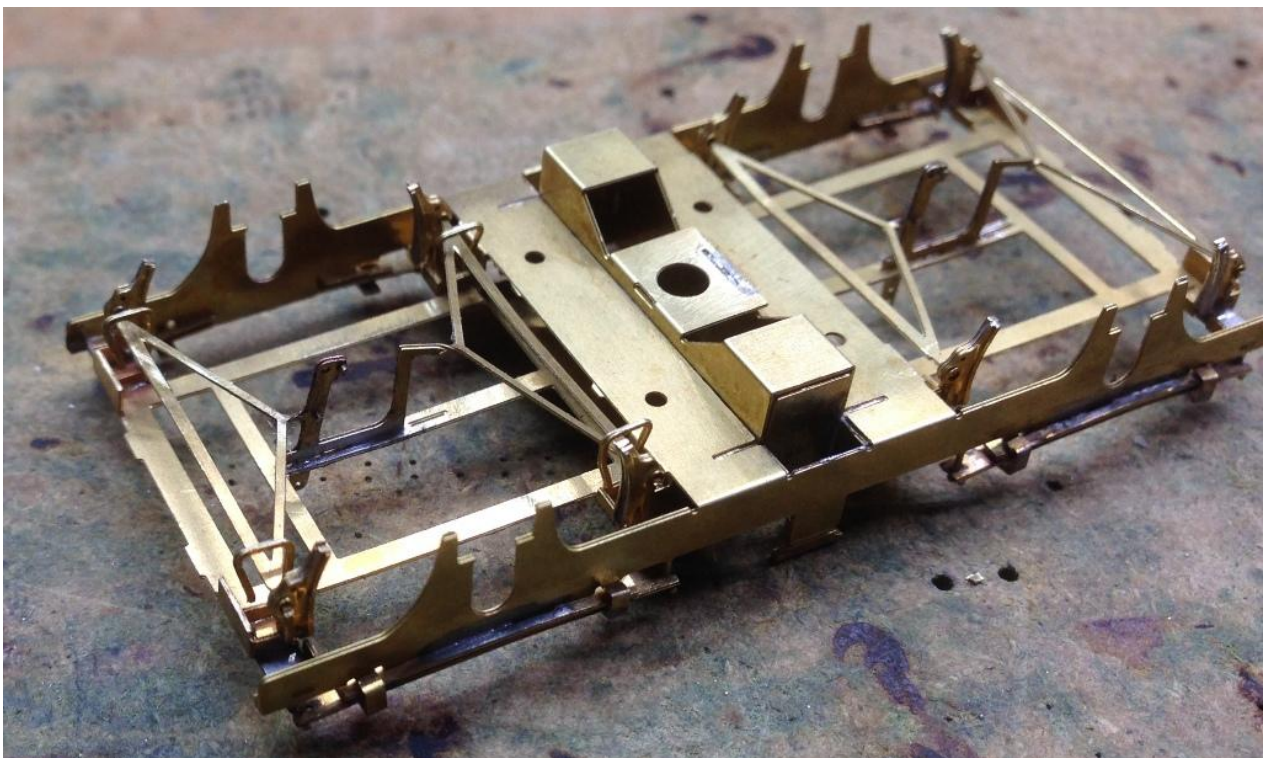


Fit the inner brake rigging to the bogie so that clasp brake hanger (the longer vertical part right next to the yoke) is towards the middle of the bogie. There are slots in the top plate to help locate the brake rigging (see image below). It doesn't matter which end of the bogie you choose.



Repeat the above steps with the brake rigging (outer end) (7b). This set obviously goes at the other end of the bogie but this time the clap brake hanger goes towards the outside of the bogie (see image below).

Remove the brake yolk safety loops (8) from the fret. Each safety loop has a little slot in it so that you can pass the yoke through it and a tab at the bottom which locates into a slot in the top plate. The yokes should be arranged so that the little slot faces away from the axle at each end.



The next job is to use wire to connect up the two sets of brakegear. Cut two lengths of 0.31mm wire to about 20mm long and make a 90° bend very close to one end of the wire. There are holes in the top of the clasp brake hangers on both sets of rigging into which you can insert this short end of the bent wire. There are also supports on the top of the bolster guide to support the other end of the wire. The link between the two sets of brakegear should go into the top hole on the inner set of brake rigging. Solder in place, especially to the supports (see image below) then trim so that the wire is absolutely flush with the inside of the supports to allow the bolster to fit.



Another similar piece of wire approximately 15mm long can be soldered into the lower of the two holes on the inner set of brake rigging to represent the link to the vacuum cylinder (see image above).

Ends

Remove the ends (9) from the fret and push out the half etched holes to represent rivets. The ends should be folded double with the fold line on the outside of the fold and soldered together. Note that the side with the rivet detail on is slightly longer than the side with the slots.



Locate the ends on the top plates using the slots in the ends and tabs on the top plates to align them and solder in place. The long straight edge of the ends goes at the top of the bogie.

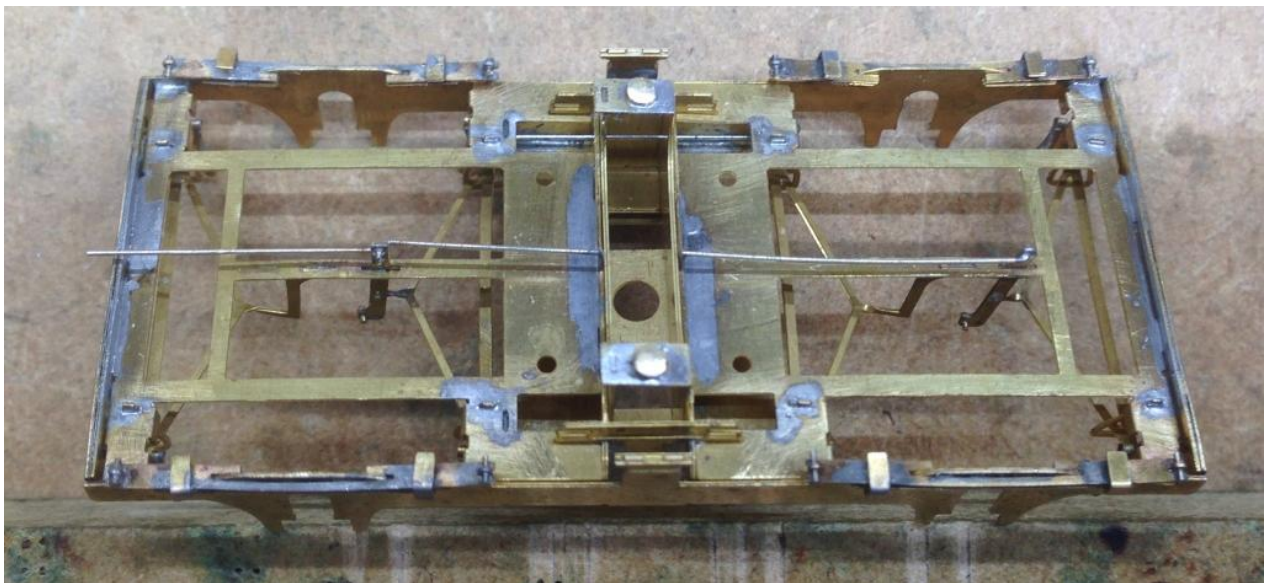
Bolster

As mentioned at the beginning, an error crept into the production artwork. This means that the holes for the secondary spring wire on part bolster (10) don't quite match up with the slots in the bolster guide. To correct the issue you will need to drift the small holes on the bolster outwards using a 0.4mm drill. This only needs to be by 0.25mm each side. The error is small but it is enough to stop the secondary spring wire passing through the slots on the bolster guide.

Remove the bolster (10) from the fret. The bolster folds into a C shape like the bolster guide but with two parts across the top that locate via slots and tabs. Make sure everything is at 90°. Solder the two top parts in place. Cut the tails of the four pins provided in the kit so that there is only 2/3mm left attached to the head. The pins fit into the two parts across the top of the bolster. Check the fit and open the holes out if necessary. Solder the pins in place. Check the fit of the bolster in the guide. If it's tight then twist the bolster slightly out of square to narrow it.

Cut two lengths of 0.009" steel spring wire to 16mm long. These need to be fitted in place with the bolster in the bolster guide. The spring wire fits through the holes in the parts that folded up form the spacer through slots in the bolster guide and holes in the bolster. The tabs on the top plates that point downwards should be enough to retain the spring. You may need to bend the wire slightly as you fit it to get it past these tabs.

It's all pretty tight around these tabs with the wheels fitted so you may find you need to bend the tabs away from the wheels a little, especially if using EM wheels.



Spring Carriers

The spring carriers (11) can now be assembled. They are designed to be folded double and the springing wire soldered to the carrier using the etched slot as a guide. Make sure when soldering the wire that it is firmly in place.

The pinpoint bearings will need to be fitted at the same time. I use Alan Gibson waisted bearings as they are nice and deep but because of this you may find that the carriers need packing out a little to take up any slop. Bearing washers (12) are included for this purpose. There should be a good fit between the axles and the bearings with ideally no sideways movement at all. If you don't want to use the Gibson ones at least make sure you use a waisted type of bearing to avoid having to remove any more material from the axlebox casting than is necessary.

I find the easiest way to assemble the spring carriers is to make a small jig consisting of an off cut of mdf or wood with a 2mm hole drilled into it.

There are three half etched lines in the middle of the spring carrier. Fold the spring carrier double about the middle fold line with the fold line on the outside. The spring carrier can then be placed so that the bearing locates through the hole in the carrier and the wood. The bearing can then be soldered in place. The spring wire can then be located in through its etched guide slot and soldered in place using a suitable flux. I use Carr's black label. The spring wire needs to extend at least 8.5mm either side of the point where it is attached to the carrier. They will need to be trimmed but do this whilst checking against the bogie after cleaning the carrier up.



Test fit the carriers and shorten the springs at the ends if required. If you find you need to add washers to remove slop then do so to the outside of the spring carrier. This will have the added advantage of reducing the bearing surface area between carrier and axleguard which is a good thing.

You may also need to tweak the brake a little to avoid contact with the wheel treads when the bogie is under weight.

Sideframes

As stated at the beginning of the instructions I would currently recommend MJT sideframes. They actually come out a little under scale width wise but are a lot less work than using the modern Hornby ones. You will need to remove the representation of the primary springs and also slot them for the bearings. The bolster spring detail will need tidying up and then can be fitted, after tweaking, into the small hole in the underside of the stretcher.

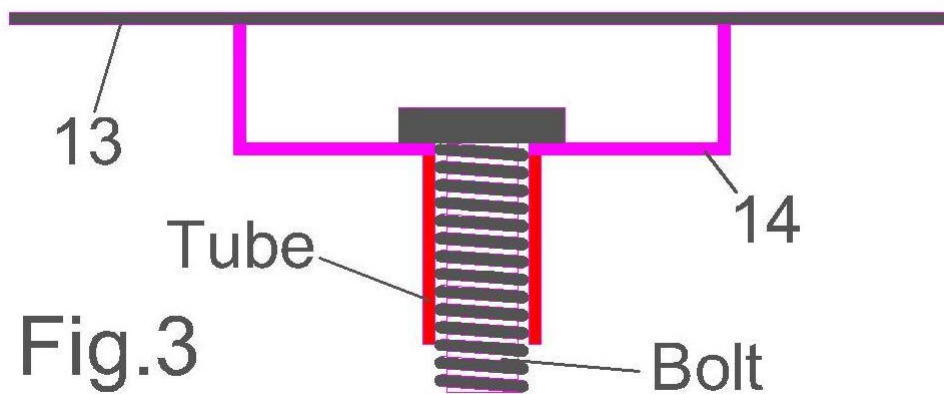
Pivoting points and adjustment

I dislike using screw threads as bearing surfaces and so have etched the holes in the bogies to 2.5mm diameter in order to be able to use a sleeve of 2.5mm outside diameter brass tube with the locating bolts. It may be a little extra work but there will be no catching of the bogies on the pivot bolt when moving up and down or turning.

If you are fitting the bogies to a Bachmann Mk1 then use M2 bolts with a sleeve of 2.5mm outside diameter, 2mm inside diameter tubing. The M2 bolts will nicely self tap into the existing locating holes in the plastic Bachmann bolster. Make the tube 7mm long and screw thread on the M2 bolt 10mm long.

If you are fitting to a kit built coach then you can use the bogie pivot plate (24) and pivot locating plate (25) provided. You can either use M2 or 10BA bolts. If using 10BA bolts you will need 2.5mm outside diameter, 1.5mm inside diameter brass tube to use as a sleeve. This will need opening out slightly for the 10BA bolt.

Remove the bogie pivot plate from the fret and fold into a channel. The locating bolt can then be soldered in place from the inside of the channel. The hole in the bogie pivot plate is 2mm so I would suggest that you open it out to 2.5mm if using 10BA bolts and use the brass tube sleeve to align. This assembly can then be soldered to the pivot locating plate using the tabs and slots as an aid. See Fig. 3 below.



The pivot locating plates have lines etched at the mid points of the sides to help align them on the coach floor. The intersection of these four lines will mark the pivot centre.

Height adjustment is via pads over the top of the bolster and attached to the underside of the coach. These can be made out of plasticard or metal sheet. Ideally, if you are using plasticard, there should be a metal layer acting as the bearing surface for the pins on the bolster, 0.005" or 0.010" sheet would be fine; perhaps a scrap piece from the fret? Make sure that each of the pads is the same thickness and then the coach will sit completely level.

Notes on weighting

The bogies are designed to operate on a load of 180g. They can be used on heavier coaches but you will need to up the gauge of the primary springs. This was noted in the technical section at the beginning. On lighter coaches you should add some weight to bring the total coach weight up to around 180g with the weight evenly distributed. Include the weight of the bogies in the 180g.

Painting

I now use Halfords grey primer in a tin through an airbrush with cellulose thinners to prime just about everything, including plastics. The primer is synthetic and has no adverse effects on the types of plastics used on RTR railway models and kits. The cellulose thinners used evaporate so quickly that they don't have time to attack the plastic. You can then put your choice of paint over the top including cellulose. Don't use the red oxide in a tin on plastic though as it won't adhere and the paint will just come off.

Justin Newitt - Revied May 2020

Suppliers List

Eileen's Emporium (brass wire, tube, nuts and bolts)
Unit 19.12 Highnam Business Centre
Newent Road
Gloucester
GL2 8DN
www.eileensemporium.com

Alan Gibson (Pinpoint bearings)
PO Box 597
Oldham
OL1 9FQ
www.alangibsonworkshop.com

Dart Castings/MJT (cosmetic sideframes)
17 Hurst Close
Staplehurst
Kent
TN12 0BX
www.dartcastings.co.uk