Rumney Models LMS & MR Loco Bogie Instructions

Introduction

This set of instructions covers Rumney Models kits X.29A, X.29B, X.29C, X.29D & X.29E. These are a range of replacement LMS and Midland locomotive bogies commissioned by Pete Tarver. They are sprung as per the prototype with sprung compensating beams either side of a frame and are P4 only. The range can be summarised as follows:

- **X.29A** - LMS 6'6" trailing bogie - For 2P 0-4-4Ts & 4MT 2-6-4Ts
- **X.29B** - LMS 6'6" leading bogie - For Black Fives, Jubilees, Patriots and Royal Scots
- **X.29C** - LMS 6'3" leading bogie - For Patriots and Jubilees
- **X.29D** - MR 6'6" leading bogies - For Compound 4-4-0s
- **X.29E** - MR 6'0" leading bogies - For Bogie Singles, 1P & 2P 4-4-0s

The kits differ slightly in detail but follow the same principles, hence one set of instructions for all of them.

Springing

The kits are designed to be sprung using guitar wire 'leaf' springs. 12 thou wire is included with the kit, but you may find a bit of trial and error necessary as it is very much going to depend on the loco weight and its weight distribution. The bogie should be set up so that the spring beams coincide with the shadow ones attached to the frames. This will give a 0.5mm deflection of the spring which is ideal.

Wire of different thicknesses can easily be had in the form of replacement guitar top strings. These will be available from your local music shop or online. You want a plain steel string (some guitar strings are wound and come in different materials such as phosphor bronze), and these come in various thicknesses from 8 gauge (8 thou) to at least 15 gauge (15 thou). The wire included with the kit is Ernie Ball but other makes are available.

8 and 9 gauge strings will probably be too light for these bogies (8 gauge definitely will) so if you find there is little deflection in you springs perhaps try starting at 10 gauge. If you find that you need 14 or 15 gauge strings please get in touch and tell me how you managed to get your loco so heavy or consider shifting some weight onto the drivers.

Ride Heights

The bogies are designed to fit to frames that are a prototypical height above rail level. Our models may not conform to the prototype. The heights to the frame spacer/bearing surface for each of the bogies is summarised as follows:

- X.29A - 11mm
- X.29B - 10.83mm
- X.29C - 10.83mm
- X.29D - 7.6mm (without bolster top) or 8mm (with bolster top)
- X.29E - 8mm (without bolster top) or 8.4mm (with bolster top)

For the LMS bogies (X.29A-C), you can always pack the top of the bolster if the dimension is greater than the above but if it is less you may need to modify the bolster top (part 10). This is not possible for the Midland bogies (X.29D & X.29E) so if the distance is less than 7.6mm (X.29D) or 8mm (X.29E) you will need to modify the frames and use the bolster top/frame spacer (part 10) provided.

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.

Etches

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. Use an appropriate drill or a tapered reamer.

Remove one part at a time from the fret.

The instructions will assume that tags connecting parts to the fret will be cleaned up on removal of a part unless it is specified specifically in the instructions not to.

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

This means that when it says fold something up the folds should be made through 90° with the fold line on the inside. If the fold is to be done in any other way it will say so.

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.

Materials List

You will need a few items to be able to build the bogie:

- 4 x High Level Standard 2mm Hornblocks - From High Level Kits
- 0.31mm, 0.4mm, 0.5mm & 0.6mm wire. Cambrian Models are good source for these.
- M2 bolt and nut plus 2.5mmx2mm tube for bolt sleeve

Wheels

Wheels on the LMS bogies (X.29A-C) are 3’3½” and those on the MR bogie (X.29D) are 3’6”. You can use Ultrascale or Gibson but you may need to check the fit as the depth of bosses varies. Ultrascale 3’3½” wheels may need an axle washer to take out any sideplay, Gibson wheels should not need any washers and Ultrascale 3’6” wheels may need the boss thinning down. Check before you fit the wheels on the axles.

Bogie Brakes

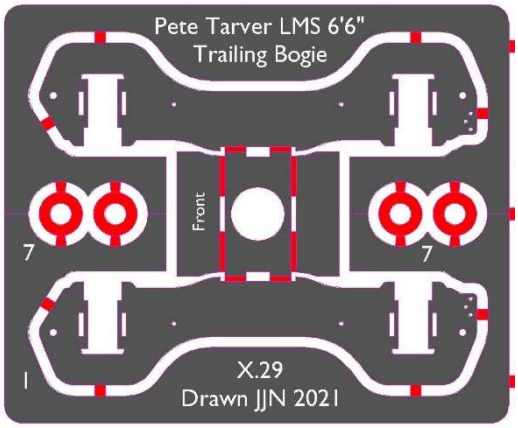
The Midland 6’0” bogies were originally fitted with brakes attached to the bogie frames. These were later removed. A set of 3D printed bogies brakes (Rumney Models code **X.29EBR)** is available to complement the MR 6’0” bogies X.29E if you’re modelling an early locomotive.

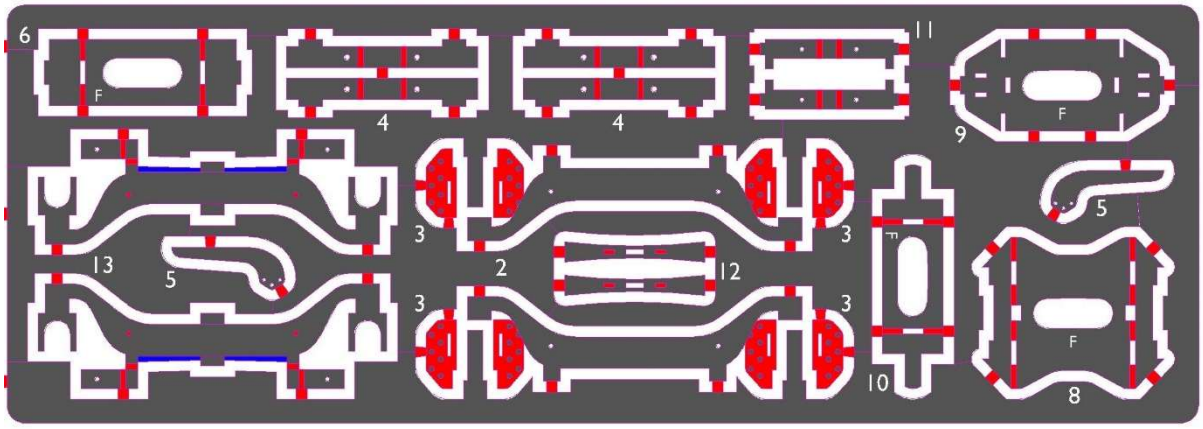
Parts Lists

Parts are numbered in suggested build order. The etch layouts are shown over the next two pages.

X.29A - LMS 6’6” Trailing Bogie

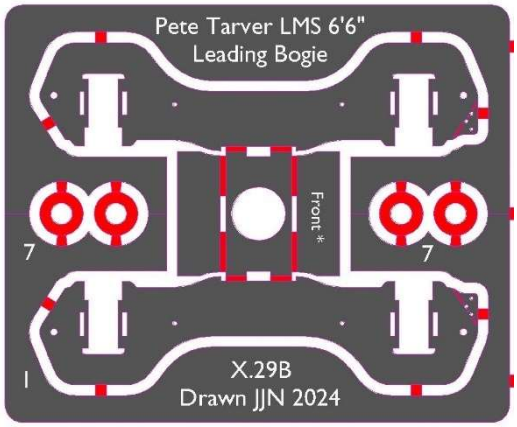
1 - Frames
2 - Shadow beam and inner hornguide detail
3 - Outer hornguide detail
4 - Hornguides
5 - Guard irons
6 - Frames spacer
7 - Axle washers
8 - Bolster base
9 - Spring plank
10 - Bolster top
11 - Spring pillars
12 - Spring plank detail
13 - Sprung Beams

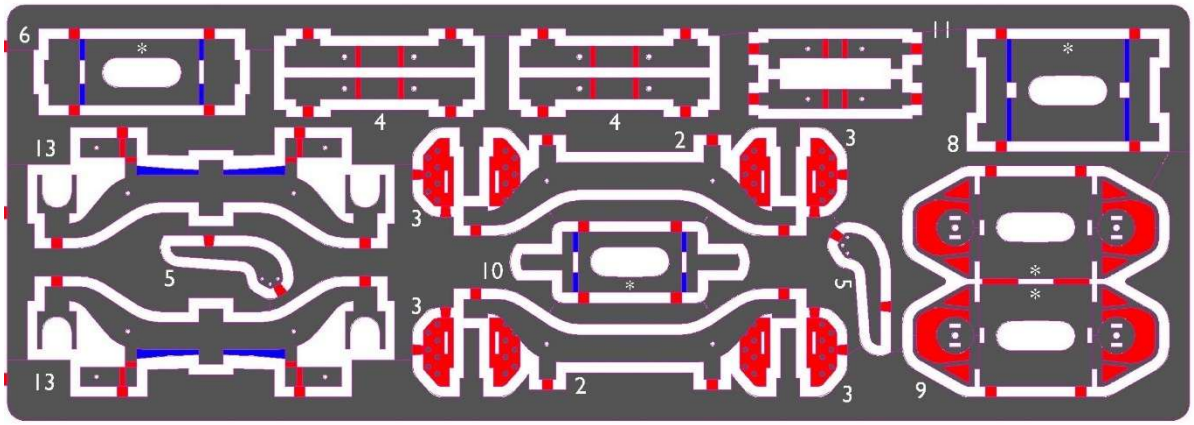




X.29B - LMS 6’6” Leading Bogie

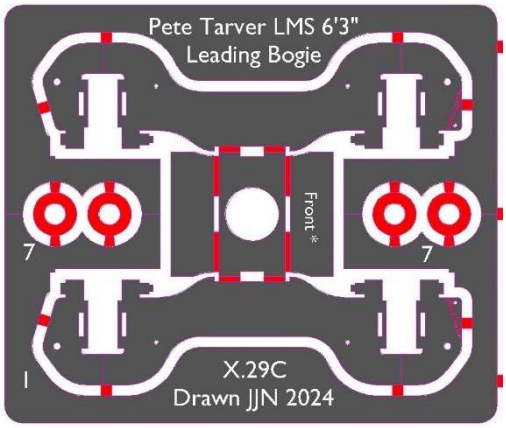
1 - Frames
2 - Shadow beam and inner hornguide detail
3 - Outer hornguide detail
4 - Hornguides
5 - Guard irons
6 - Frames spacer
7 - Axle washers
8 - Bolster base
9 - Spring plank
10 - Bolster top
11 - Spring pillars
13 - Sprung Beams

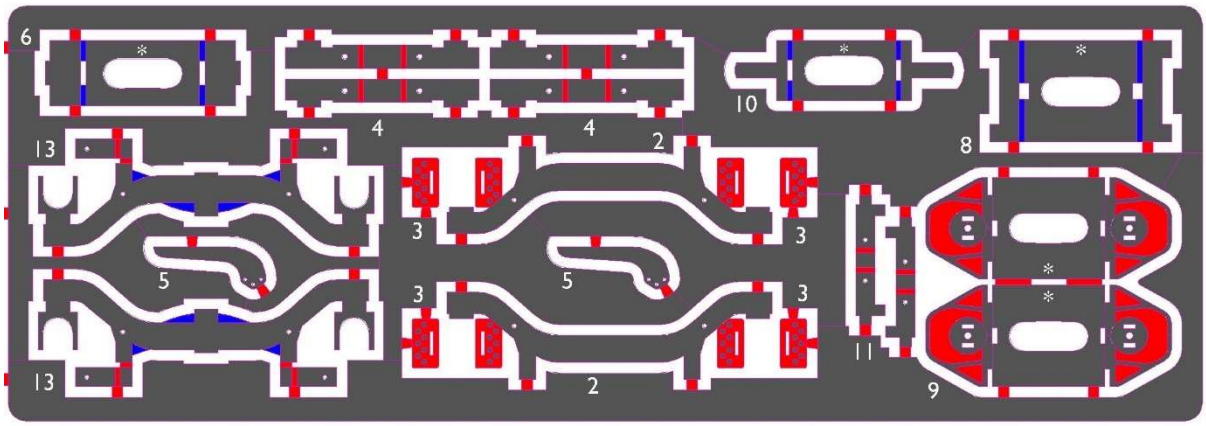




X.29C - LMS 6’3” Leading Bogie

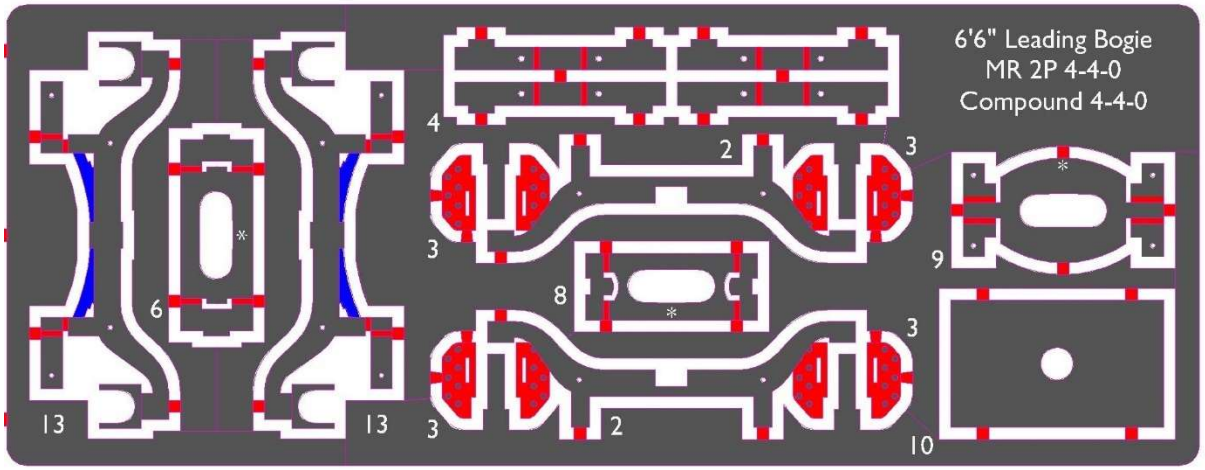
1 - Frames
2 - Shadow beam and inner hornguide detail
3 - Outer hornguide detail
4 - Hornguides
5 - Guard irons
6 - Frames spacer
7 - Axle washers
8 - Bolster base
9 - Spring plank
10 - Bolster top
11 - Spring pillars
13 - Sprung Beams



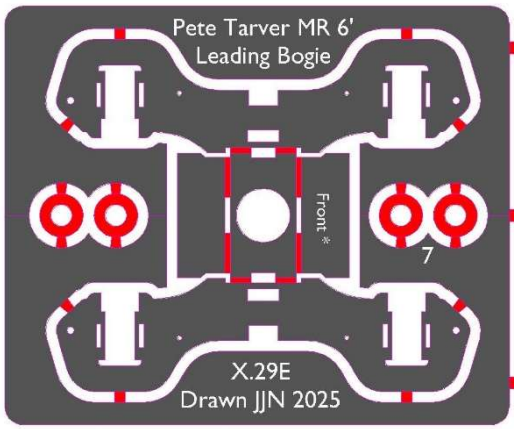


X.29D - MR 6’6” Leading Bogie

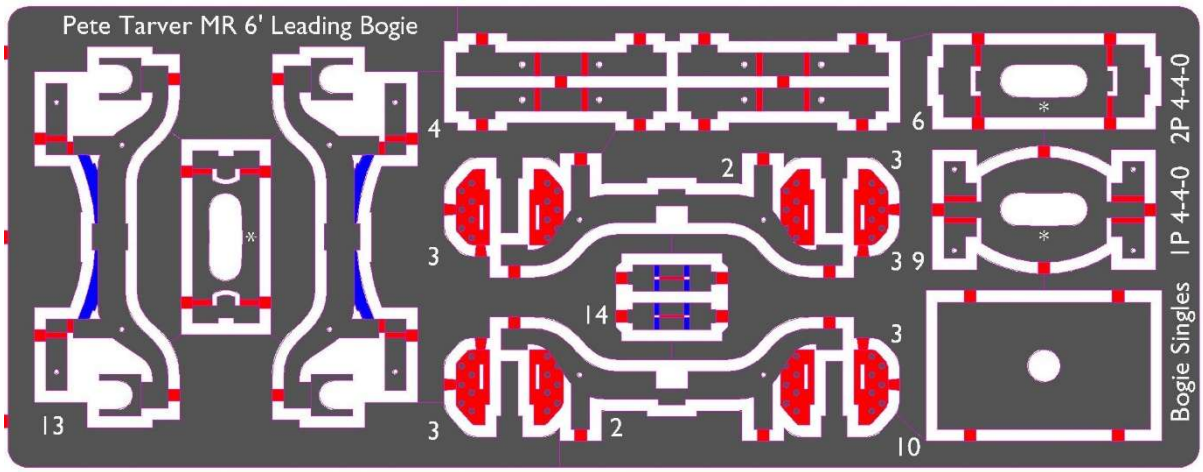
1 - Frames
2 - Shadow beam and inner hornguide detail
3 - Outer hornguide detail
4 - Hornguides
6 - Frames spacer
7 - Axle washers
8 - Bolster base
9 - Spring plank
10 - Bolster top/Frame spacer
13 - Sprung Beams



X.29E - MR 6’0” Leading Bogie

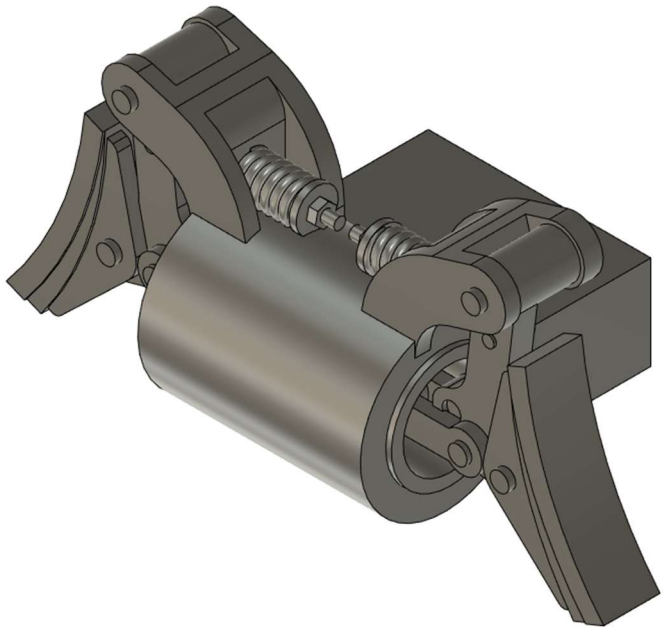


1 - Frames
2 - Shadow beam and inner hornguide detail
3 - Outer hornguide detail
4 - Hornguides
6 - Frames spacer
7 - Axle washers
8 - Bolster base
9 - Spring plank
10 - Bolster top/Frame spacer
13 - Sprung Beams
14 - Bogie Brakes Bracket Detail



Parts Illustration

X.29EBR - MR 6’0” Bogie Brakes



Construction

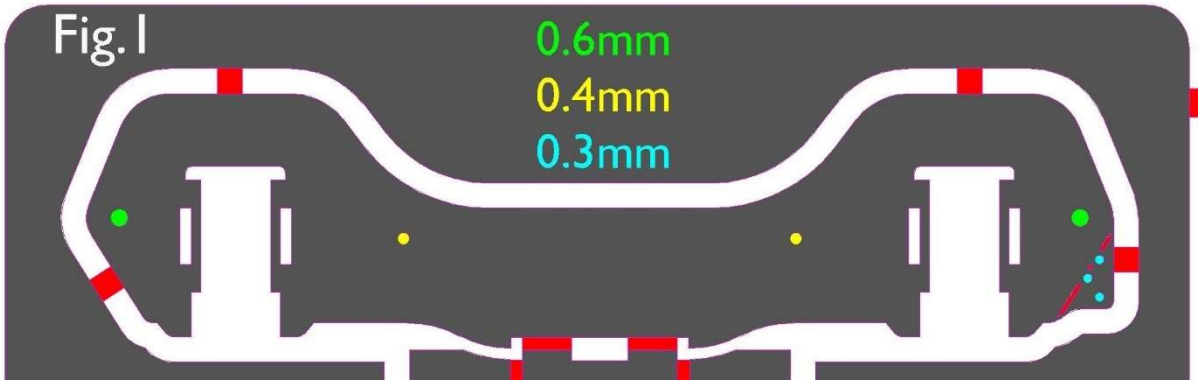
A Note on Orientation

Before beginning construction note that several items are marked for front of the bogie. On the trailing bogie this is with an F and on the others with a *. These need to all go the same way. The front of the bogie is the end towards the front of the loco. This is all down to the fact that the slots in the bogie for the retaining bolt form a slight arc and all need to line up correctly. If you start putting things on the wrong way around, you may find there is no sideways movement.

Frames

Start with the frames (1). Whilst still attached to the fret check the fit of the holes etched in the sideframes using drills or a tapered broach and pieces of wire. There are 0.6mm holes for the cross stays, 0.4mm holes to locate the shadow beams and 0.3mm holes for the guard irons. See Fig.1 below.

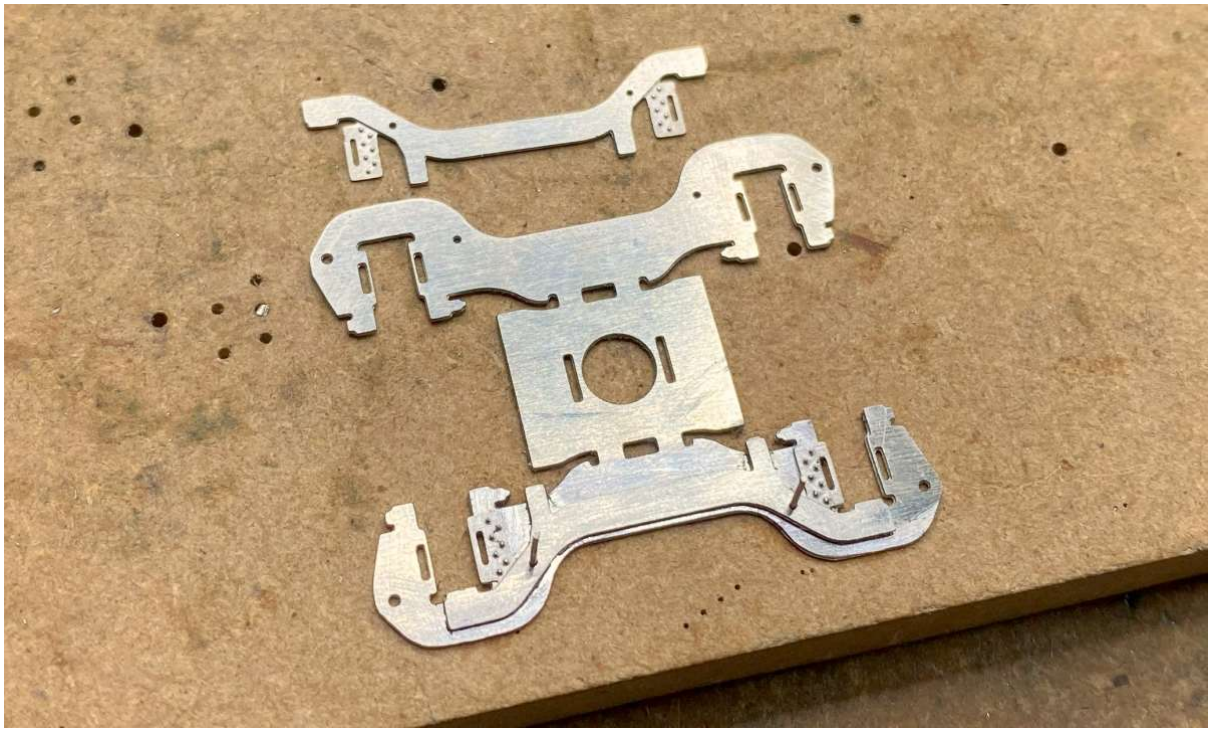
Note that there are no guard irons with the Midland bogie as they were always attached to the loco frames. Also, there is the option on the 6'3" bogie to either have guard irons or not. Patriots had guard irons attached to the loco frames, but Jubilees had them on the bogie.



Remove the bogie frame from the fret but keep flat for the moment.

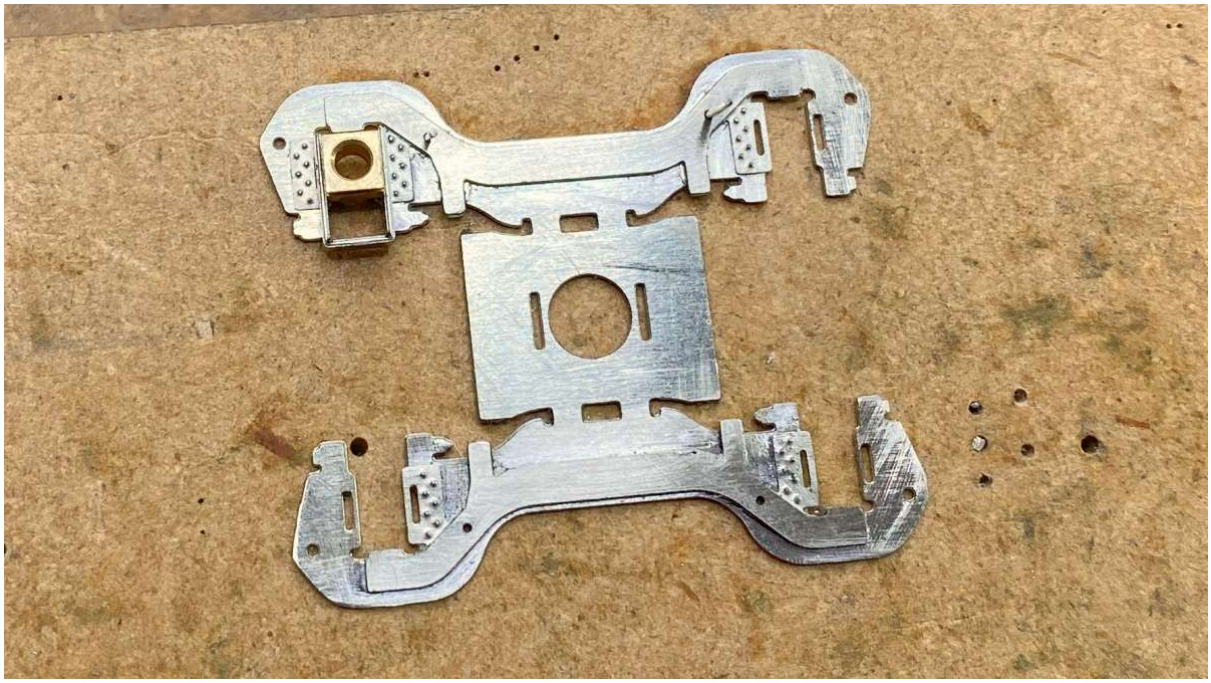
If you are building a 6'3" bogie without guard irons, use a piercing saw to cut the frames along the half etched lines just inside of the 3 holes for the guard irons so that the side frames are the same at both ends. Tidy the bend around the cross stay area with a file.

Make sure that the two small holes on the shadow beams (2) can accept 0.4mm wire and remove from the fret. Solder to the frames whilst the frames are flat using 0.4mm wire through the small holes to align things. They go on the outside of the bogie. This is the side with no fold lines on.



Make sure the holes in the hornguides (4) can accept 0.4mm wire and remove from the fret. Fold into a U shape. Fit the hornguides to the outside of the frames with the hornguide detail (3) in between using the slots and tabs provided. Note that the hornguides go upside down with the connecting bar between the two sides of the hornguides towards the bottom of the bogie. This will be cut out when everything is soldered together. Solder the hornguide to the hornguide detail and frames but don't solder the hornguide to the shadow beam at this stage. There is scope for some adjustment on the inner tabs in case the bearings are narrow.

Clean up the High Level Minibloxs and polish the bearing surfaces. Fit them in place between the sides of the hornguides with the circular boss towards the bogie and the slot end outwards. Adjust the inner side of the hornguide if necessary and solder to the shadow beams. It is best to try and retain each bearing in its specific slot so mark them in some way. The bearings may be slightly different so you may find they don't fit properly if you mix them up.



If fitting guard irons (5) do this now using 0.31mm wire to align things. Again, these go on the outside of the bogie. Solder in place.

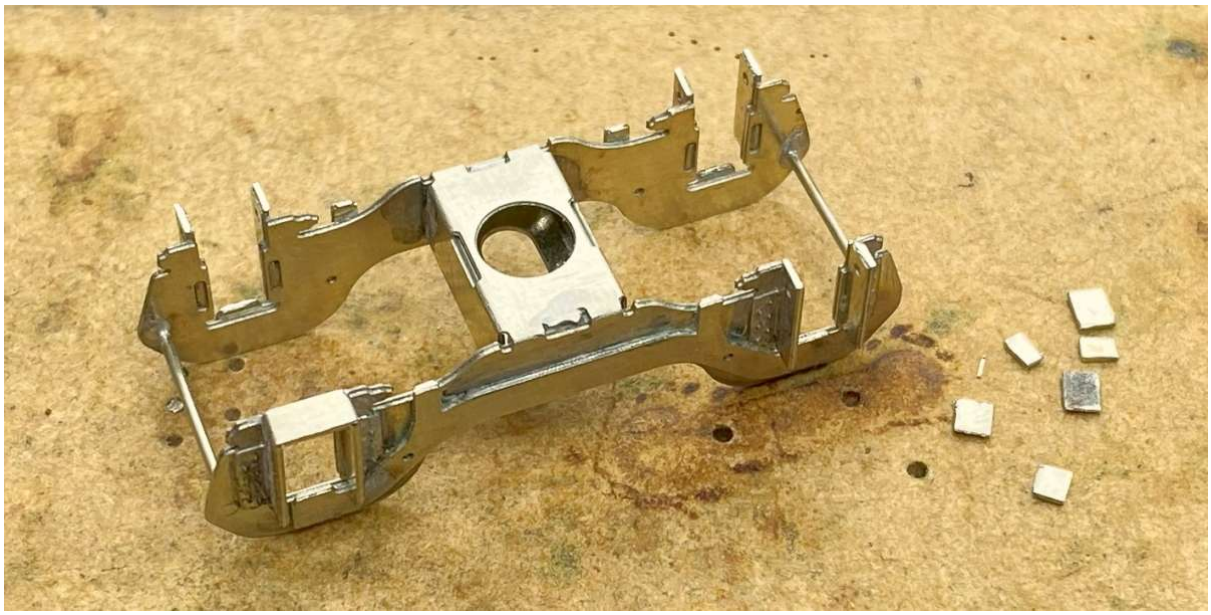
Also at this stage, before folding the frames up, it is worth reading pages 17 and 18 regarding pickups if you're having thoughts about fitting them as you may wish to drill 4 extra holes which will be easier while the frames are still flat.

At this point I would fold up the frame and fit the frame spacer (6) before cleaning everything up. It can be easier to clean up the frames while it is flat, however it is easy to accidentally fold the frame up, or worse the wrong way, while doing this. Fold up the sides of the frames making sure they are at 90° to the spacer. When you're happy they are at 90° then fold up the two spacers one of which will be marked for the front.

Fold the frame spacer (6) into a U shape and drop into the inside of the frames so the tabs locate into the slots in the bottom of the frames. Solder the frame spacer to the frames at these tabs only and solder up the frames at the same time.

Fit lengths of 0.6mm wire through the holes at the ends of the frames for the cross stays. Solder in place and cut flush on the outside of the frames.

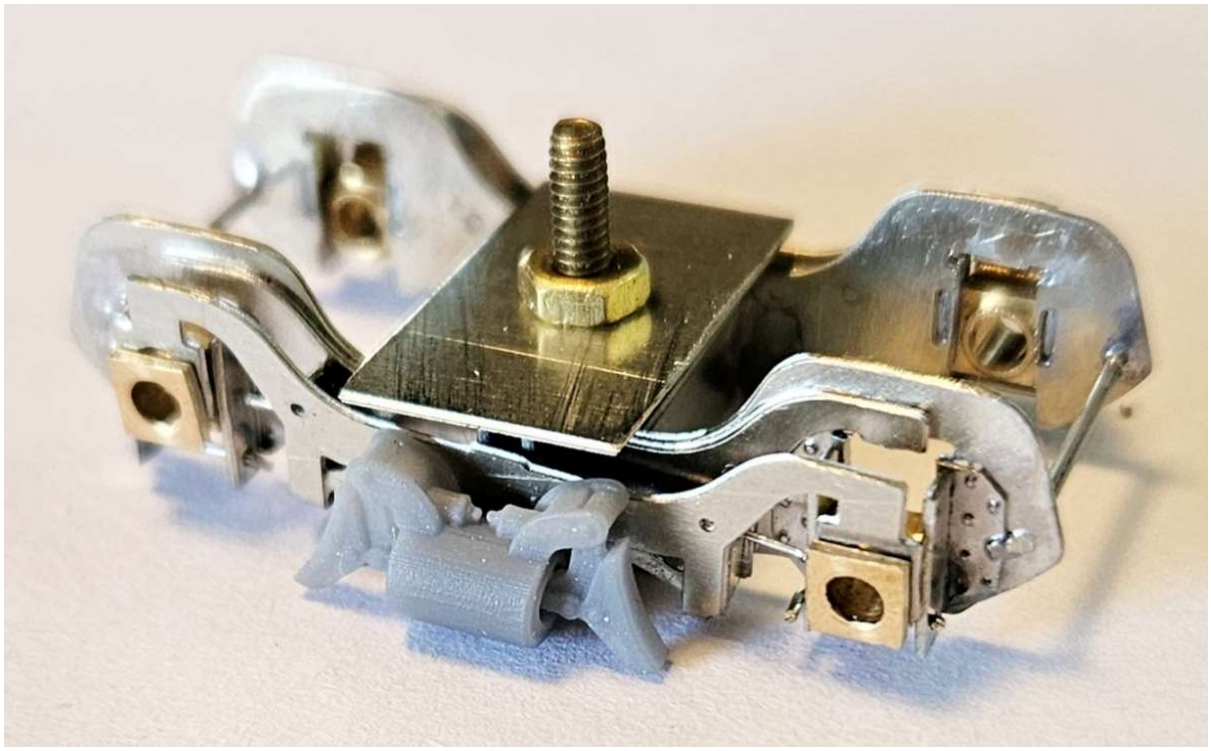
The frames can now be cleaned up and, with the hornguides securely fixed in place you can cut them at the bottom. If you haven't already cut and trim the 0.31mm wire you used to locate the guard irons in place with to resemble bolts.



As mentioned earlier, the MR 6'0" bogies were originally fitted with brakes on the bogies. These were attached via brackets that were fixed to the bottom of the frames. The bogie brakes were later removed but the frame bracket remained. If you are modelling a loco that used this bogie but didn't have brakes, you will need to add the bogie brakes bracket detail (14).

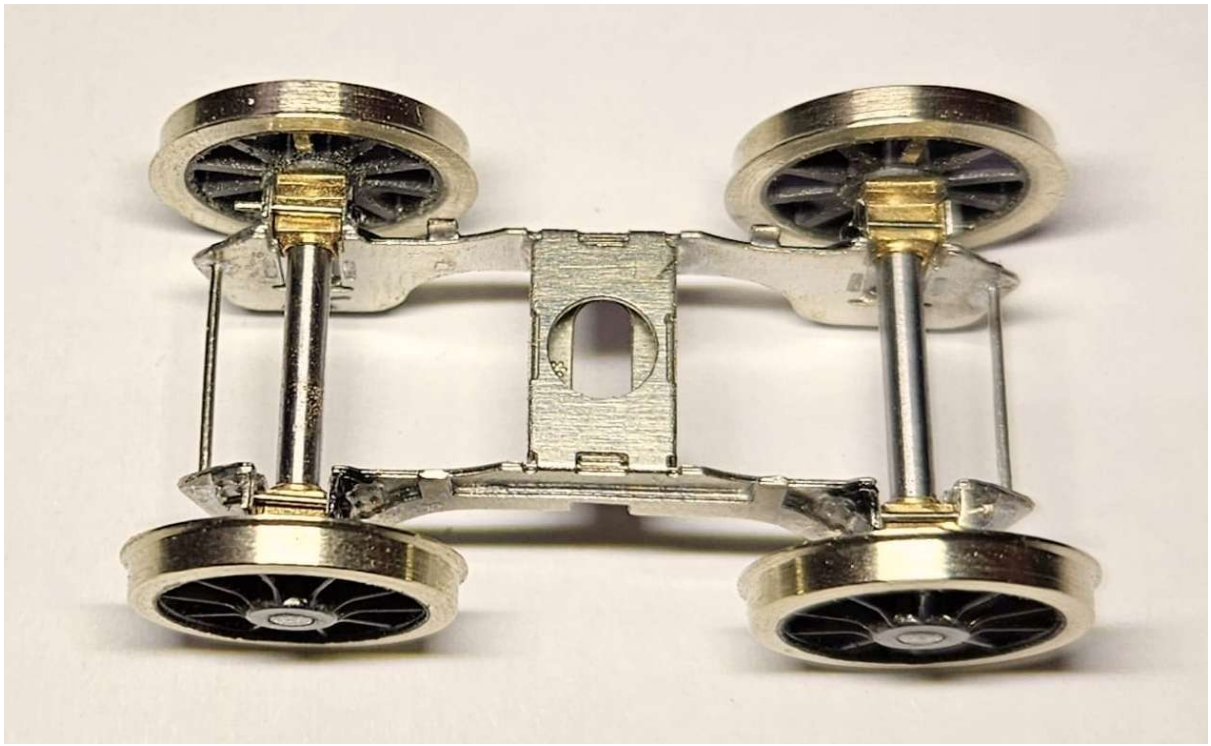
This folds up into a C shape and is fitted into the slot in the middle of the sideframes. Add a short length of 0.3mm wire, flush at the sides of the bracket, into the slot in the bracket to complete.

If you are fitting the bogie brakes, then you need to leave the bracket off and the 3D printed brakes fit into the same slot in the bogie sideframes. Clean up the remnants of the printing supports and tweak the locating boss on the back if necessary. The brakes are symmetrical, so it doesn't matter which way around to do this. You may want to leave glueing the brakes in place until the bogie is complete.



Wheels

Fit the wheels, checking to see if the bosses need thinning or axle washer (7) need to be added. Once in place the bearings can be retained by 0.5mm wire through the holes in the hornguides.



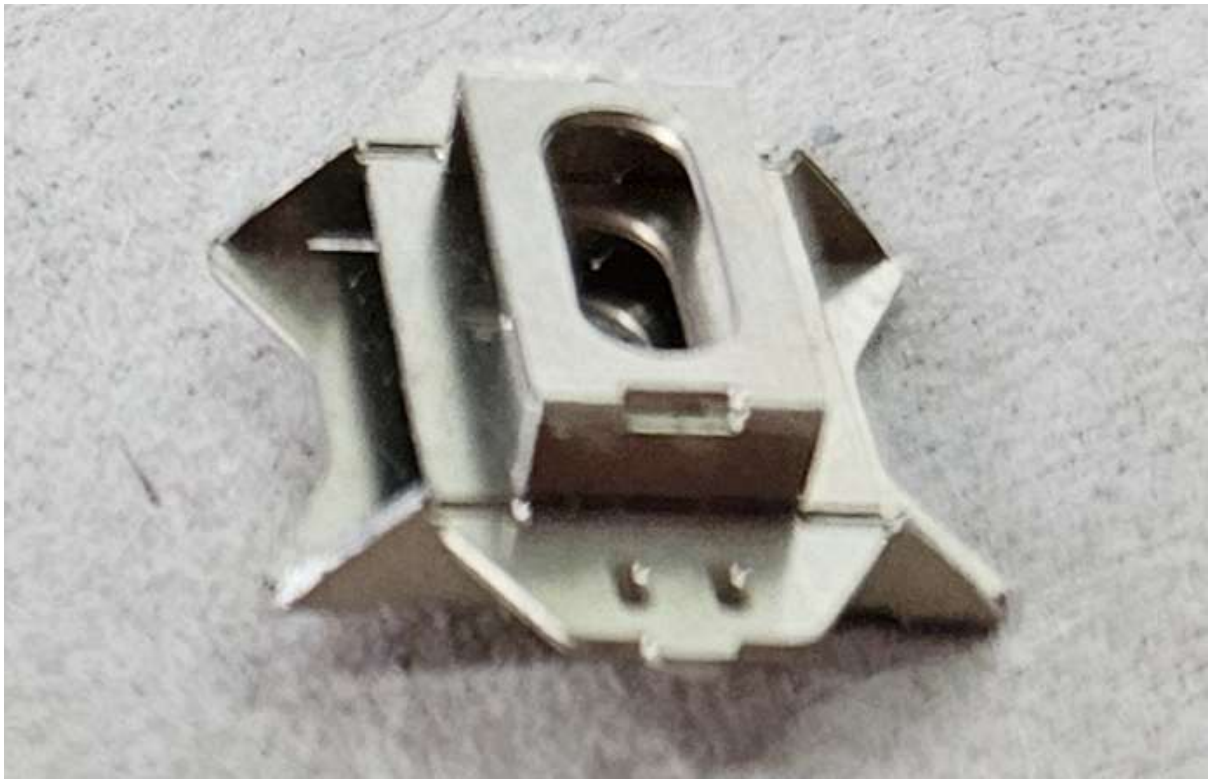
Guard Irons

If you have guard irons fitted bend them to shape.

Bolsters

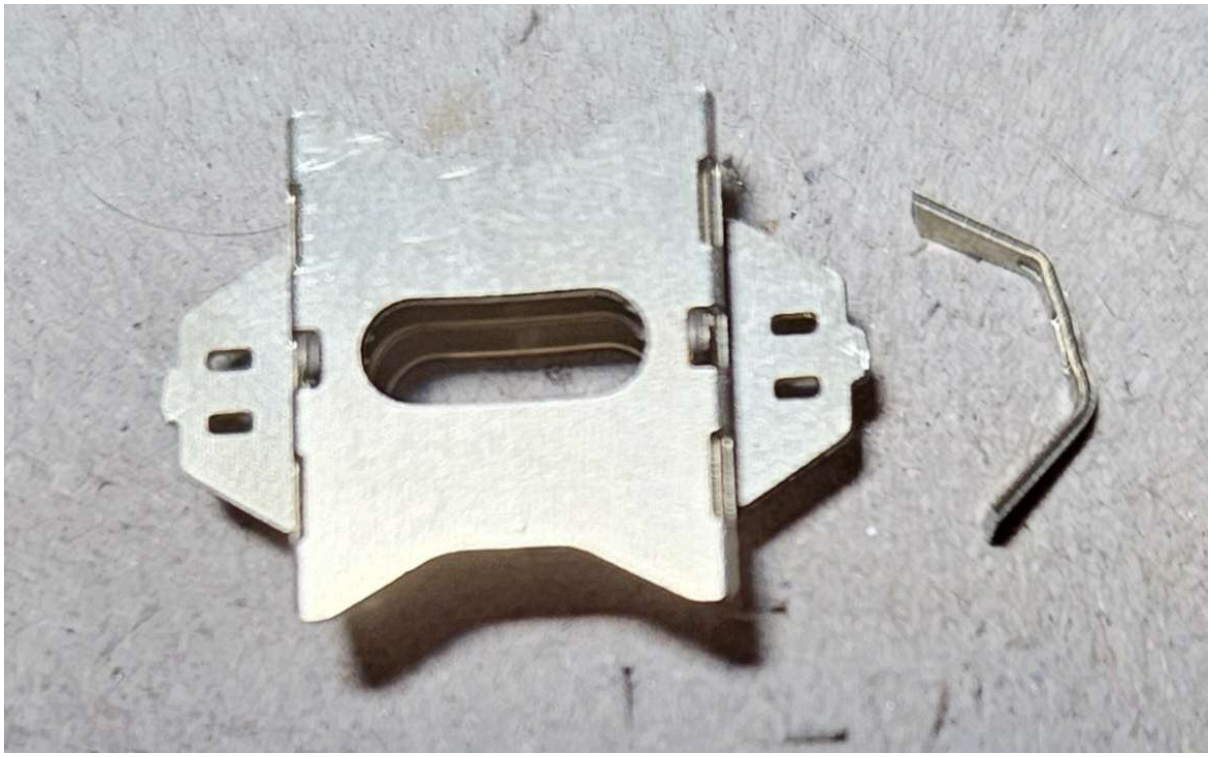
There are three different bolster arrangements so they will be covered separately though they all essentially do the same thing. A reminder that when it says fold something up the folds should be through 90° with the fold line on the inside unless it says otherwise.

Fold up bolster base (8) noting which side is front. Fit to the spring plank (9) using the slots and tabs provided and solder in place. Make sure that the front on both parts face the same way. Fold up bolster top (10). Insert through the slots in the sides of the spring plank on the opposite side to the bolster base and solder in place when fully home.

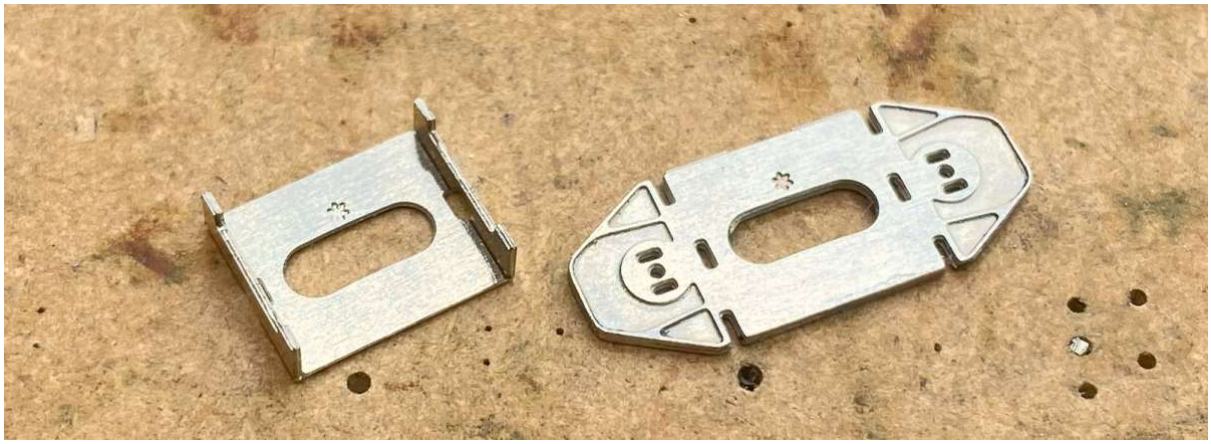


Make sure the holes in the spring pillars (11) can accept 0.4mm wire then fold into a U shape and fit into the slots towards the outer edges of the spring plank. Note the spring pillars are flat on the outside and the little tabs at the ends face inwards. Solder in place.

Bend and fit spring plank detail (12) to outer edges of spring plank. Solder in place and make tab and slot good.



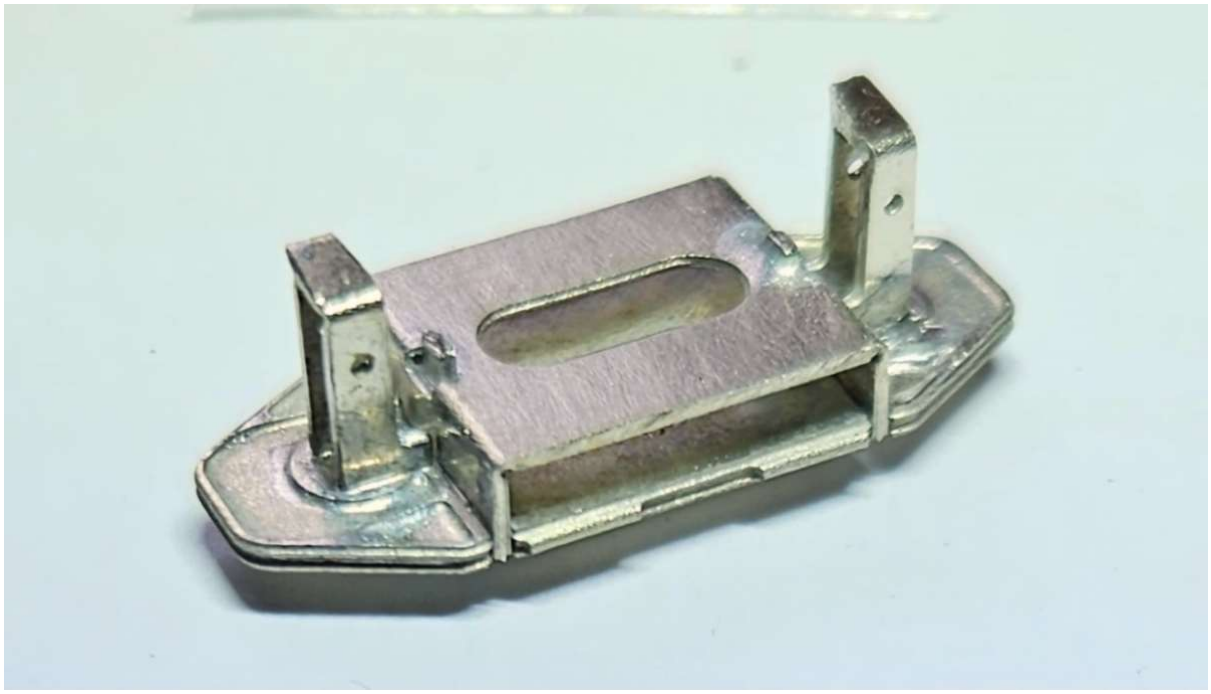
Fold up bolster base (8) noting which side is front. Remove the spring plank (9) and fold double so that the two sides lay against each other. The fold here is through 180° with the fold line on the outside. Give the edge where the fold lines are a little squeeze with some pliers to make sure the two sides lay completely flat against each other then solder together.



Fit the bolster base to the spring plank using the tabs and slots provided, noting where the front is on each part and solder in place.

Fold up the bolster top (10). Insert through the slots in the sides of the spring plank on the opposite side to the bolster base and solder in place when fully home, again noting where the front is.

Make sure the holes in the spring pillars (11) can accept 0.4mm wire then fold into a U shape and fit into the slots towards the outer edges of the spring plank. Note the spring pillars are flat on the outside and the little tabs at the ends face inwards. Solder in place.



X.29D&E - MR 6'6" & 6'0" Leading Bogies

Fold up bolster base (8) noting which side is front. Make sure the four holes in the spring plank (9) can accept 0.4mm wire and remove from the fret. Fold up the four 'ears' with the holes in, making sure they are at 90°. Fit the bolster base to the spring plank using the tabs and slots provided so that it is on the same side as the folded-up ears. Make sure the front side on both parts are the same end. Solder in place, paying particular attention to the four ears.

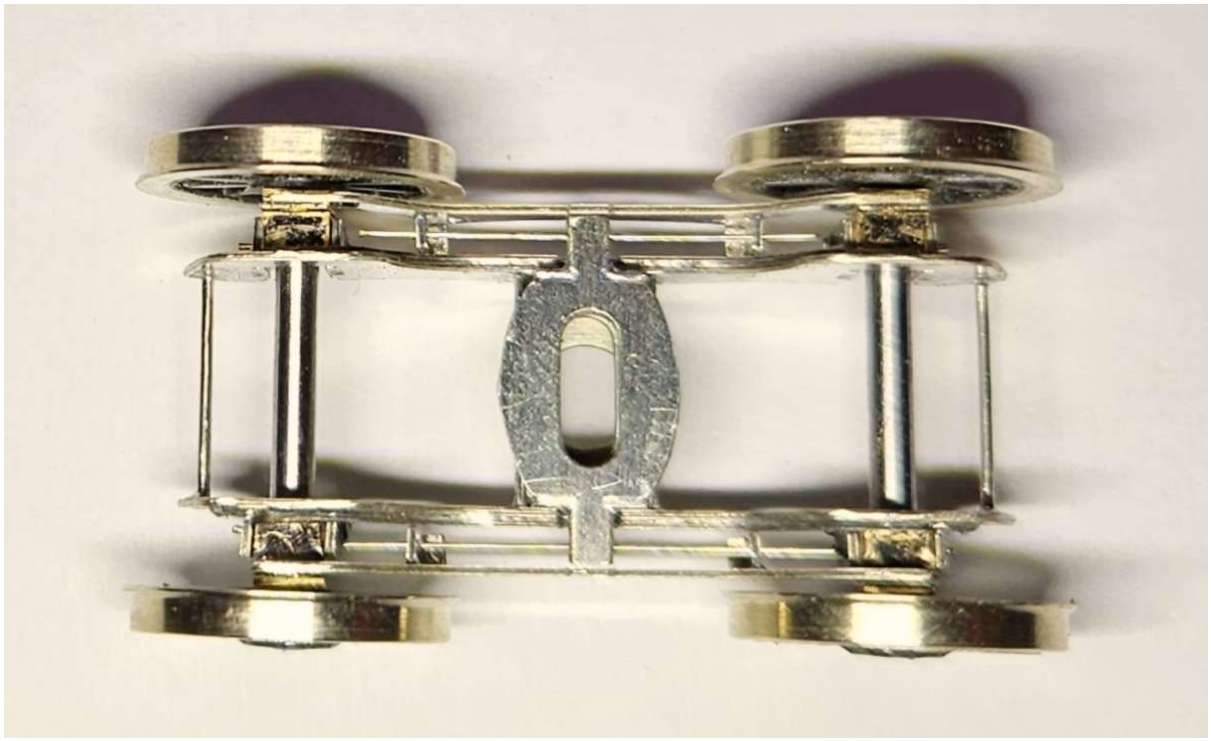
The bolster top/frame spacer (10) is provided as a frame spacer and bearing surface with a 2mm hole etched in to attach to the loco frame. Depending on the height from your loco frames to the top of the rails you may need it or not. If the distance is 7.6mm then you will not need it, but you will need a flat surface for the bogie to bear on. If the distance is 8mm or more then you will need it and maybe some packing.

Sprung Beam (All Kits)

Check the fit of the outer ends of the spring beams (13) in the slots in the High Level Minibloxs. The etched hoops are supposed to fit around the circular parts of the bearing in the slot. Adjust if necessary. Make sure the holes in the spring plank are 0.4mm diameter then fold up. Solder together.

Cut the spring wire into two lengths. The wire needs to be about 21mm for the 6’6” bogies and about 20mm for the 6’3” bogie. The wires pass through the sprung beam and spring pillar (see image below). They should naturally sit between the sides of the hornguides which will retain them.

Probably the best way to assemble is to fit the sprung beams to the bolster and then drop that over the frames. The sprung beam sits in the slots in the High Level Minibloxs.

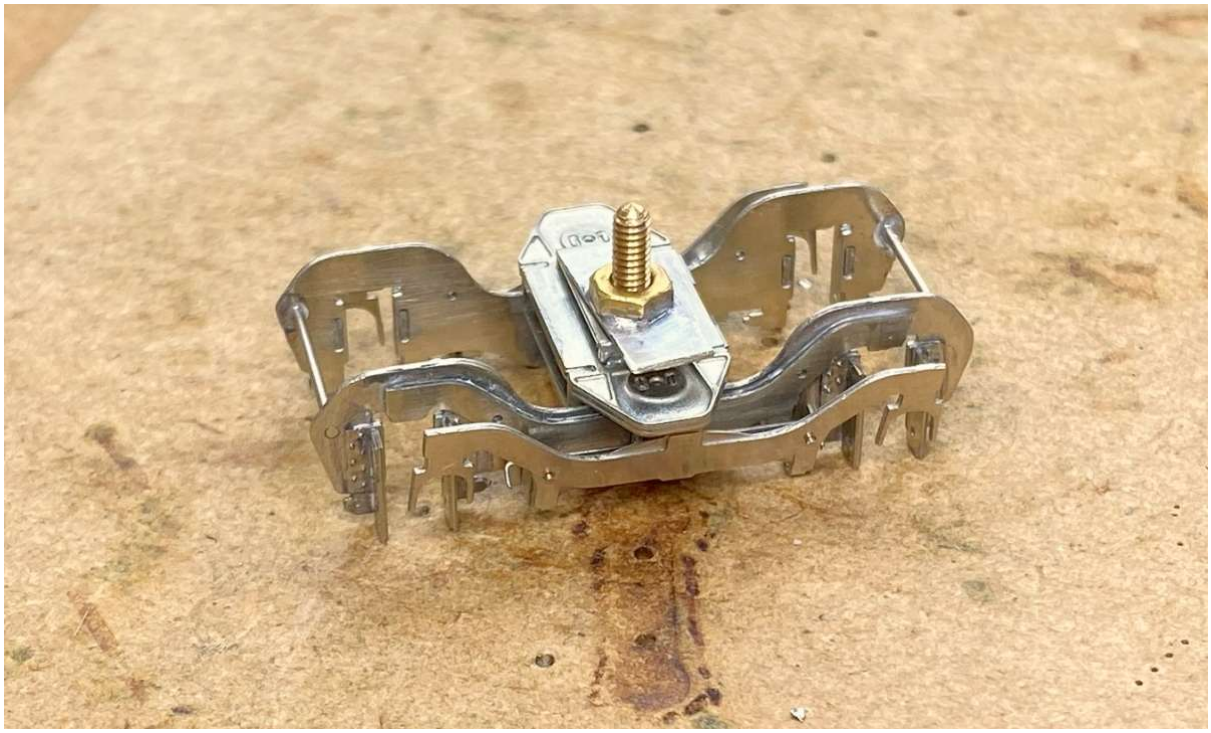


Retaining

The slots in the centre of the bogies are etched to 2.5mm wide. This is so you can use a sleeve of 2.5mm x 2mm tube over an M2 bolt to avoid the bolt thread being used as a bearing surface. Never a good idea. The M2 bolt can then be fitted into an M2 nut which can be fixed to the inside of the frames. The slot in the bogie will give enough movement. The length of the tube will vary depending on the bogie you are making and may need to be longer if you find you need to add some packing between the bogie and frames:

- LMS bogies (X.29A, B & C) - 5.5mm
- Midland Bogies (X.29D & E) - 3mm

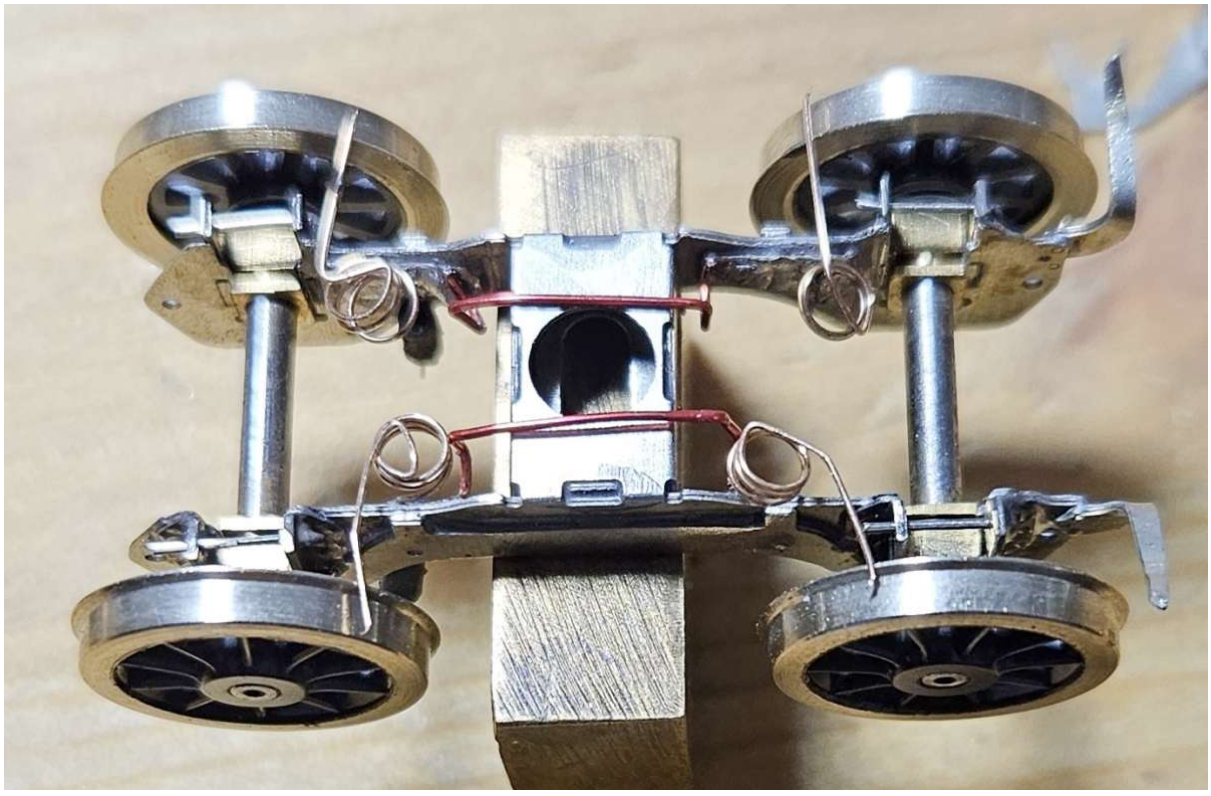
Pete added side control to his (see the image at the bottom of page 19) as can you if required.



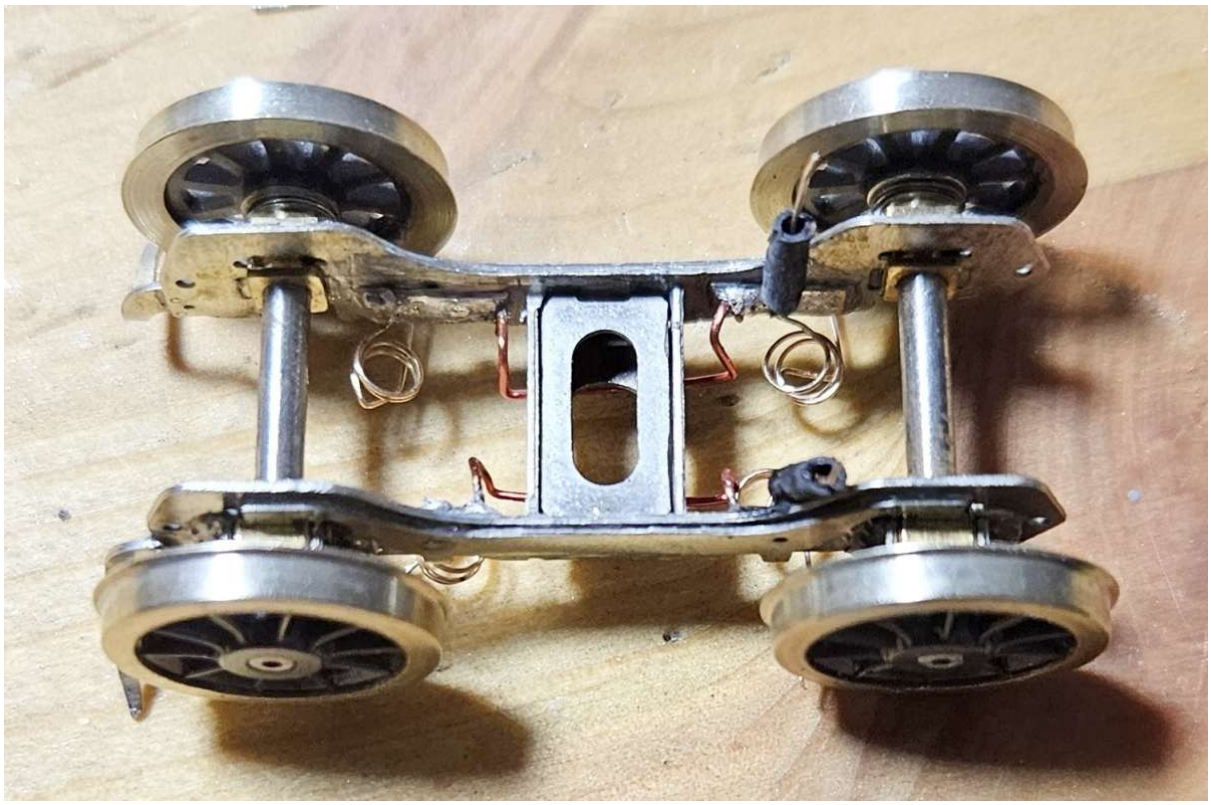
Pickups

You may consider fitting pickups to the bogie, especially on 4 coupled engines. These are Pete's notes on fitting pickups to his 2P tank bogie.

Note that any copper clad additions on the frames need to sit below the level of the central spacer, both to allow the spacer to spring as it should and help prevent shorting. Also note that any wires between the axles need to be underhung , not sitting above the frame as in the above right hand photo, for the same reason of affecting the springing.



The link wire as fitted below is pretty much out of sight, but a more elegant solution would be to drill 4 holes in the central spacer and pass it through, making sure these are close to the edge so as not to interfere with the fixing screw/tube. As noted at the beginning, these holes would be easier to drill prior to folding up the frames.



Justin Newitt and Pete Tarver - June 2025