LMS 1P 0-4-4T Chassis Instructions (Craftsman kit)

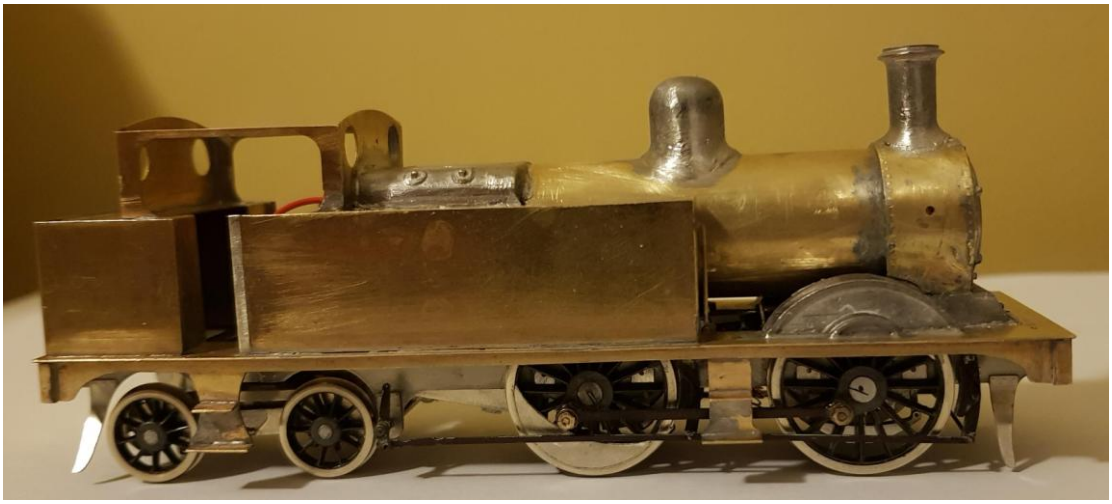
Introduction

This chassis kit is designed to suit the Craftsman kit with CSB springing built in. Another variant to cover the forthcoming Bachmann model is likely to be produced on the release of that model, but expressions of interest would be welcome.

The test etch was designed to scale, and during the build it showed a few small errors in the Craftsman kit. As these aren't really noticeable without measuring – it looks like a 1P after all and it was assumed that 'the market' would prefer a chassis to suit the kit as designed (aside from modifications required during the build, it also allows for retro fitting in a pre built body). So if you notice a few slight modifications to the craftsman body in the photographs that's why. If there is interest in a scale chassis (and if this isn't latterly covered by the variant for the Bachmann body) this could be done but does incur tooling costs, though the CAD is complete.

During the course of the build there were a few modifications that were found necessary to the Craftsman body that may be useful for those building it 'as it comes':

- Valance needs 0.5mm packing pieces from buffer beam sides to get the width right.
- Tank top/insert goes too far back into the cab and will need shortening
- Buffers (either castings supplied or Alan Gibson sprung ones) need packing plates on most prototypes.
- Tank bottom beading's needed. I will probably fabricate from 5 thou sheet material.
- I couldn't get the roll and join boiler to a shape I was happy with so I replaced it with tube.



Reference books

Wild Swan, Midland Engines No. 1 1833 and 2228 class bogie passenger tanks. ISBN 1 874103 50 X

Midland Record Bumper Preview Edition. Article on Midland Railway Motor Trains in the Midland, LMS & BR period by Bob Essery, which includes some useful close up detail shots of these locos.

Construction Notes

Read through the instructions first and familiarise yourself with the components.

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

Inside motion - How much you can fit will depend on the gauge you are working in. All will fit in P4 but you will need to modify the outer slidebars. You will need to leave out the outer slidebars completely in EM (or you won't be able to fit the csb wire and you will only be able to fit the inner slidebars and the valve gear eccentrics.

Spring wire

The gauge of spring wire you will need for both the driving wheels and bogie will vary depending on the weight of the body. You should start with the flowing combinations for the given weight:

Loco Weight	Driving Wheel Spring	Bogie Spring
130g	12	10
175g	13	11
235g	14	12
310g	15	13

Spring wires are given in thousands of an inch. They also correspond with the gauge of wire sold for guitar strings. Sufficient 14 and 12 thou wire is included with the kit. If you wish to change the gauge guitar wire is readily available as single strings from music shops and online. Only use plain/unwound steel springs.

Additional components

0.5mm wire
0.8mm wire
1mm wire
10 BA nut and bolt
M2 nut and bolt
2.5mm x 2mm brass tube (for bogie)
1 x 2mm pin point top hat bearing (as used on coaches and wagons)

High level bearings (the hornguides that come with them aren't used as they are built into the chassis)

- 2 axles 1/8" (standard)
- 2 axles 2mm

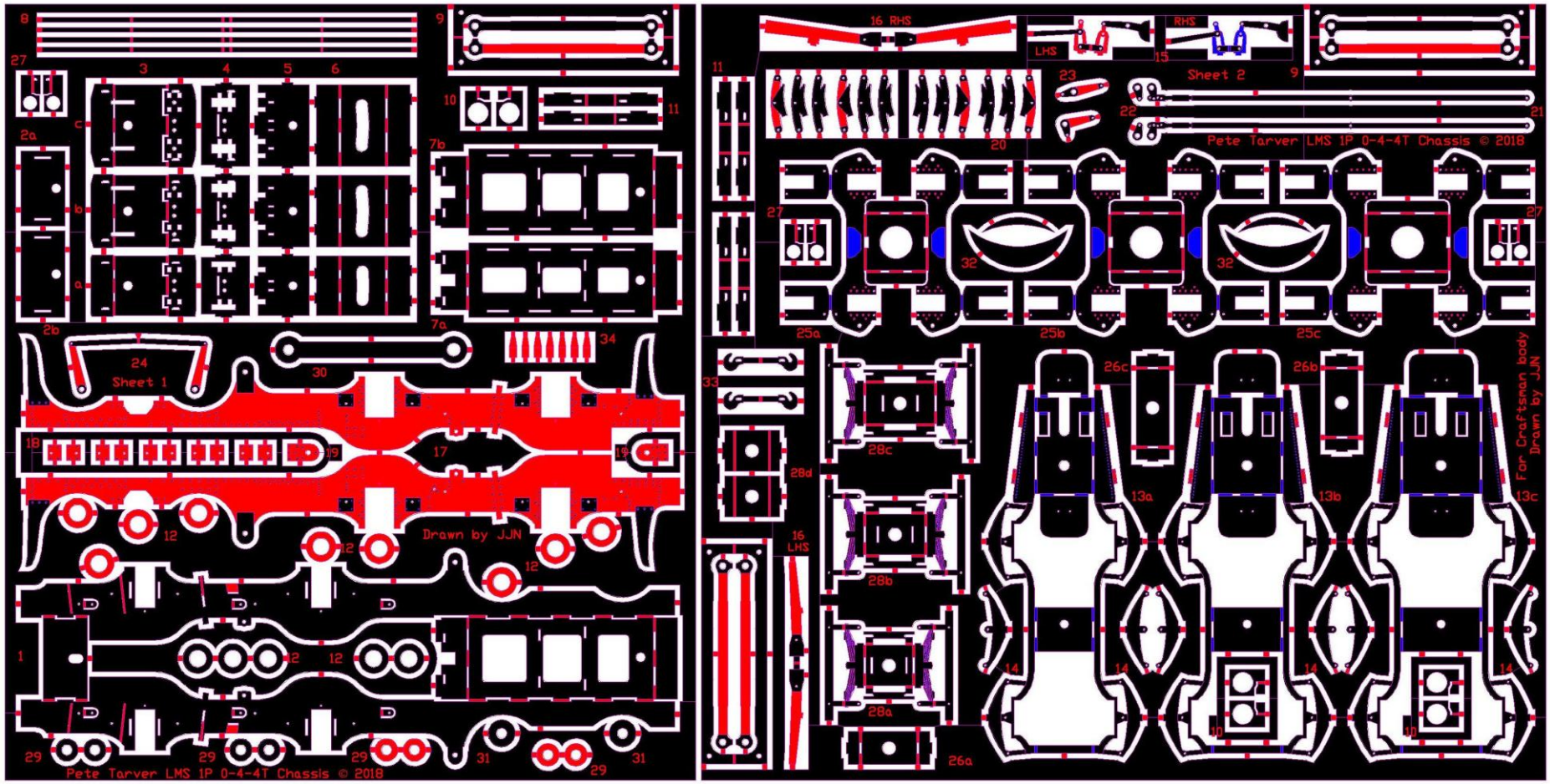
Gear box & motor

- The test etch used High Level Road Runner Compact + 45:1 gearbox and Mashima 1424 motor

Wheels (Ultrascale are recommended)

- Driving wheels - 2 axles Standard LMS/Midland (plain rim) 5'3"
- Bogie wheels - 2 axles GWR 3'0.5" 10 spoke

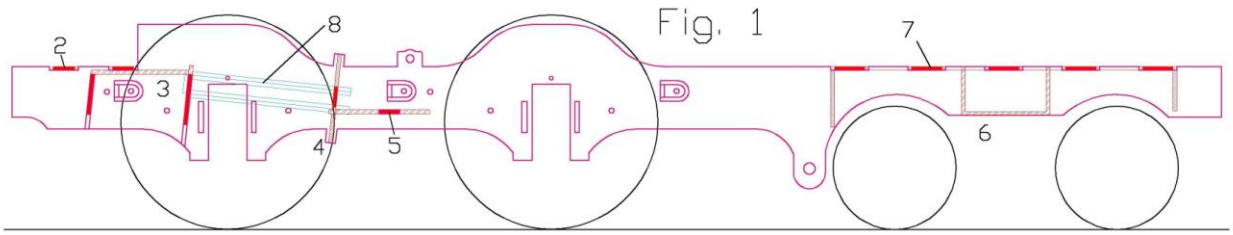
Push pull gear (if required), buffers & cab backhead from Alan Gibson
18.5mm OD tube for boiler if you have difficulty rolling the boiler in the kit.
Pickups


Sheet 1
Drawn by JJN
Pete Tarver LMS 1P 0-4-4T Chassis © 2018
Sheet 2
Pete Tarver LMS 1P 0-4-4T Chassis © 2018
For Craftsman body
Drawn by JJN

LMS 1P chassis Parts List

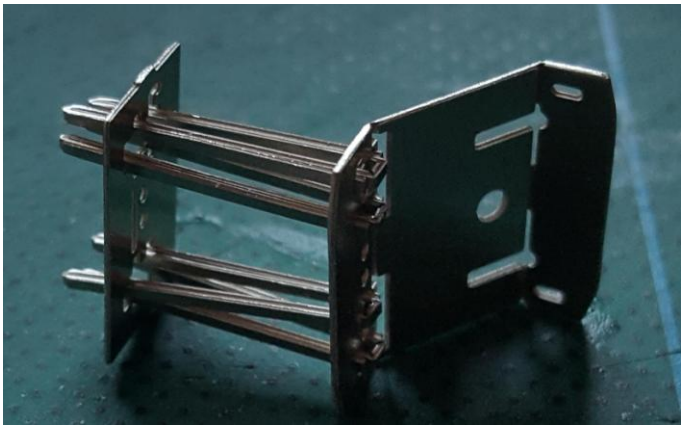
1 - Mainframes
2a - Front spacer (OO)
2b - Front Spacer (EM)
3-6a - Spacers (OO)
3-6b - Spacers (EM)
3-6c - Spacers (P4)
7a - Rear spacer (OO)
7b - Rear spacer (EM)
8 - Slidebars
9 - Coupling rods
10 - Driving wheel spring carriers
11 - Driving wheel hornguides
12 - Driving wheel washers
13a - Keeper plate (OO)
13b - Keeper plate (EM)
13c - Keeper plate (P4)
14 - Driving wheel spring overlays
15 - Valve gear eccentrics
16 - Valve gear connecting rods
17 - Frame overlays
18 - Brake hanger overlays
19 - Brake shaft bracket overlays
20 - Brake shoes
21 - Brakegear links
22 - Brakegear link overlays
23 - Steam brake crank
24 - Hand brake crank and link
25a - Bogie frame (OO)
25b - Bogie frame (EM)
25c - Bogie frame (P4)
26a - Bogie frame spacer (OO)
26b - Bogie frame spacer (EM)
26c - Bogie frame spacer (P4)
27 - Bogie wheel spring carriers
28a - Bogie bolster (OO)
28b - Bogie bolster (OO)
28c - Bogie bolster (OO)
28d - Bogie bolster frame spacer
29 - Bogie wheel washers
30 - Bogie link
31 - Bogie retaining bolt washer
32 - Balance weights
33 - Coupling hooks
34 - Boiler sheeting clamps

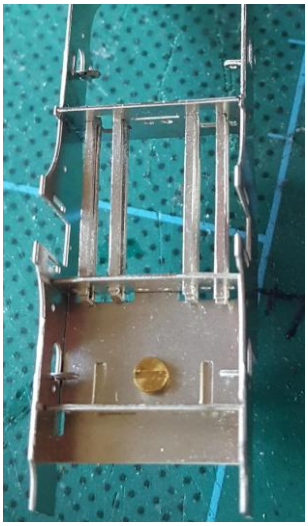
Basic Assembly Sequence and Notes

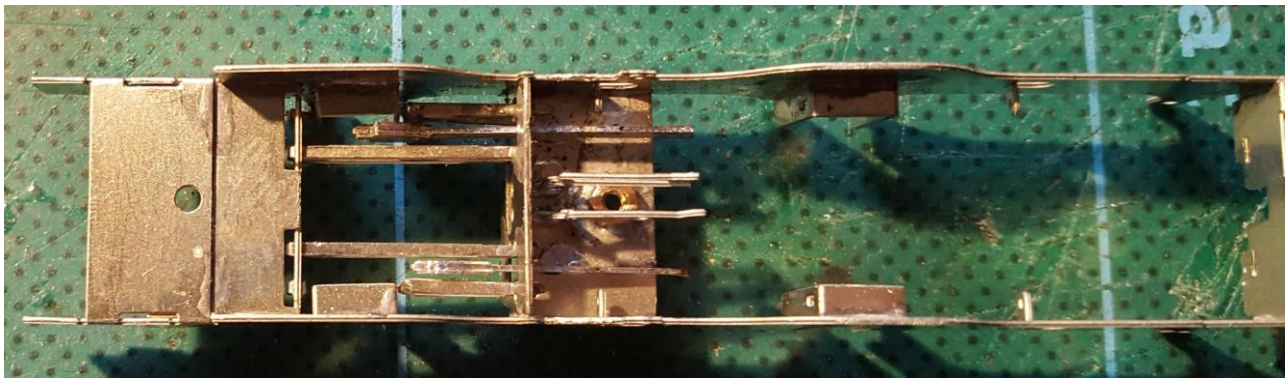


1 - Mainframes (1) - Fold out the 6 small CSB fulcrum points and fold up chassis if building in P4. If you are building in EM/OO you will need to remove the spacers and file off fold tabs and fit spacers 2a or 2b and 7a or 7b depending on gauge.

2 - Frame spacers (3-6) - Fold up appropriate set. See Fig 1. If fitting slidebars (8) you must fold them up (outer fold lines are 180° with the fold line on the outside - inner fold lines are through 90°) and fit to spacer 3 before fitting to the chassis. The spacer slides in from below and you will need to add spacer 4 to the assembly and slide that in as well. Solder a 10BA nut to spacer 5 over the round hole. Fit spacers 5 (so that the nut is on top of the spacer and 6 before soldering in place. Note that there is a correct and only way to fit spacer 6. If the tabs and slots aren't lining up it's round the wrong way!

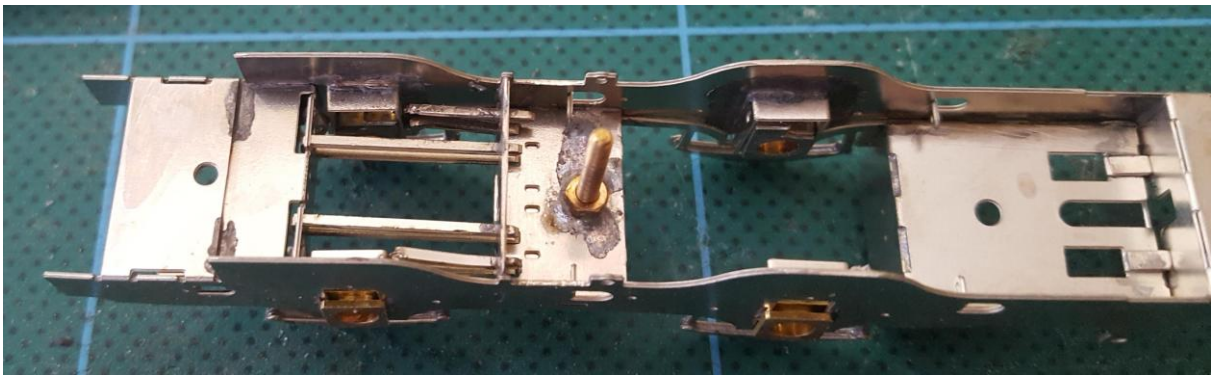






3 - Coupling rods (9). There are two types one has two half etched rods and the others a full thickness and half etched one. They are designed to be assembled with the rods attached to the fret. Fold the fret with the two different thickness rods double. Separate the fret with the two half etched rods along the fold line Use the holes to register these half frets with the folded up fret. The holes will accept 1mm wire. Solder together.

4 - Driving wheel spring carriers (10) - Fold out spring tab and solder to back of bearing.



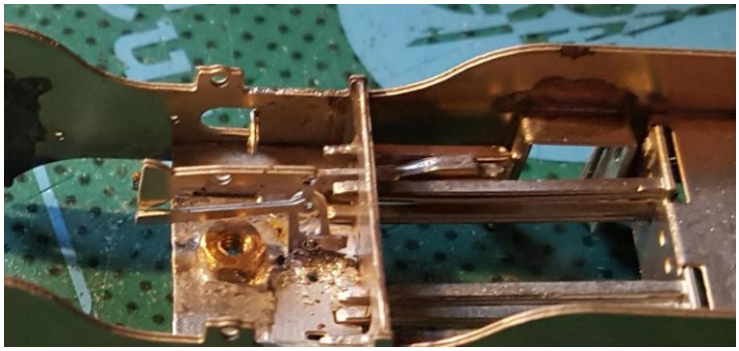
5 - Hornguides (11) - These locate in the slots in the mainframes. Note one of the slots is a little big to allow for slight adjustment (bearings may vary a little). Keep bearings assigned to hornguides. If you are building your chassis in P4 you will need to remove part of the outer slidebars to get the front axle hornguides to fit.

6 - Driving wheels - Driving wheel washers (12) are provided if needed to remove sideplay.

7 - Keeper plate (13a, b or c depending on gauge). Push out rivets on ashpan sides. Add driving wheel spring overlays (14). Fold up keeper plate into channel and fold down the two ashpan formers. Fold over the two tabs on the spacer at the ashpan end through 180° with the fold line on the outside and solder in place. Check against chassis. The two tabs at the back locate the keeper plate in the rear frame spacer, then use 10BA bolt to fasten to spacer 5.

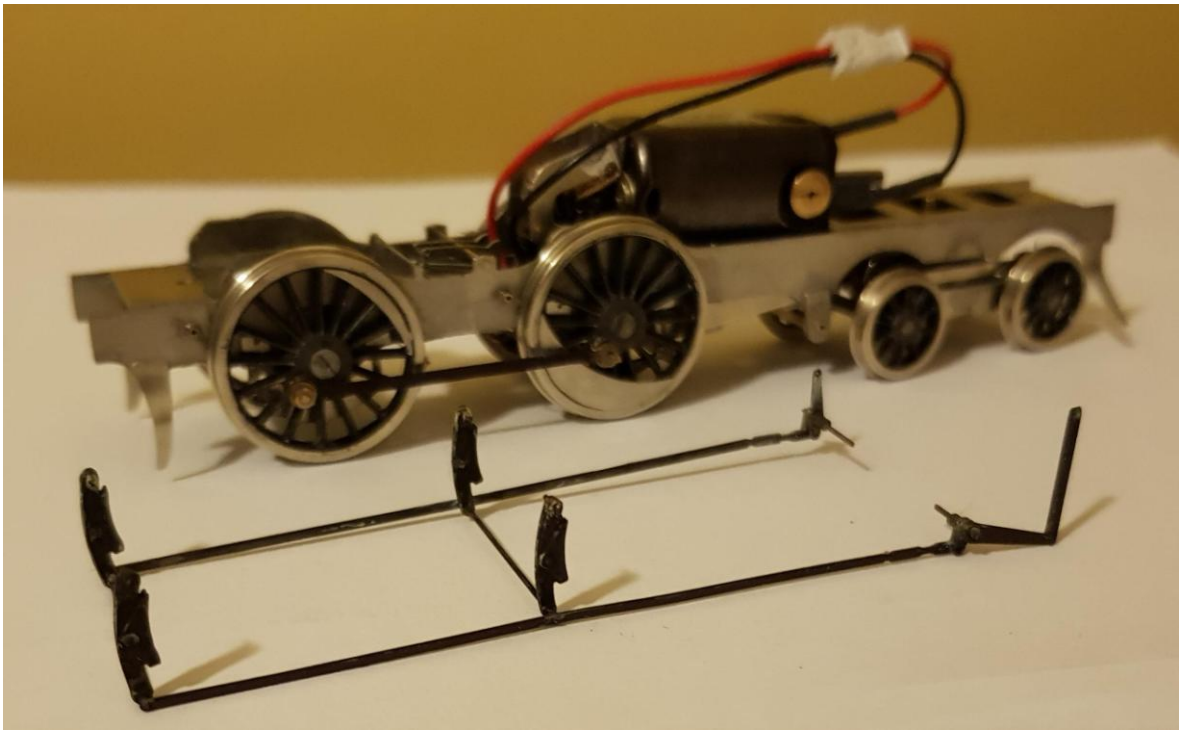
There is a little depth to locate a thin pcb strip on spacers for adding pickups to. An ashpan can be created from 0.005" brass or similar. You will need a piece 19.5mm x 27.5 rolled to shape.

8 - Valve gear (15 & 16). Do one part at a time as there is a correct side for them. Each part folds double and locates into slot in frame spacer 5. Valve gear eccentrics (15) go in the middle, valve gear connecting rods (16) on the outside. RHS and LHS are viewed from the top of the chassis looking from the rear. Solder 0.5mm wire in place before fitting to resemble the joints and a reversing shaft from 0.8mm wire can be added to the eccentrics and frame spacers once fitted.



9 - Frame overlays (17). Press out half etched rivets on the back and fit to chassis. Use 0.5mm wire through holes for brake hangers and 1mm wire through holes for brake shaft to align. Shape guard irons. Add brake hanger overlays (18). Note these come in pairs to go each side of the axle. Add brake shaft bracket overlays (19).

10 - Brake gear. All holes use 0.5mm wire except for the brake shaft which uses 1mm. Laminate together the brake shoes (20). Fit 0.5mm wire in centre hole on each shoe to resemble a rivet. Fit to chassis. Fit brakegear link overlays (22) to brakegear links (21) and fit to chassis.



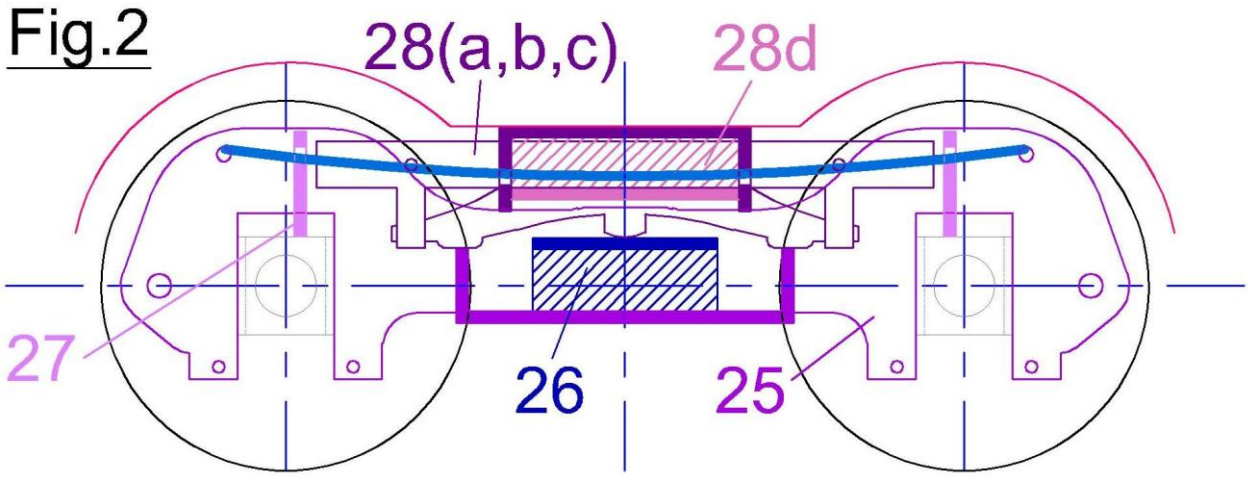
The test chassis was built with 0.5mm ID tube in the frames, and wire stubs in the breakgear assembly, so that it can be clipped on and off as required for maintenance, painting, etc. This is something you may want to consider doing.

11 - Brake Shaft. Fit brake shaft (1mm wire) along with appropriate steam brake crank (23) (various positions and can be fitted to either side) and hand brake crank and link (24) (LHS Folds double. Use 0.5mm wire for rivet).

12 - Bogie

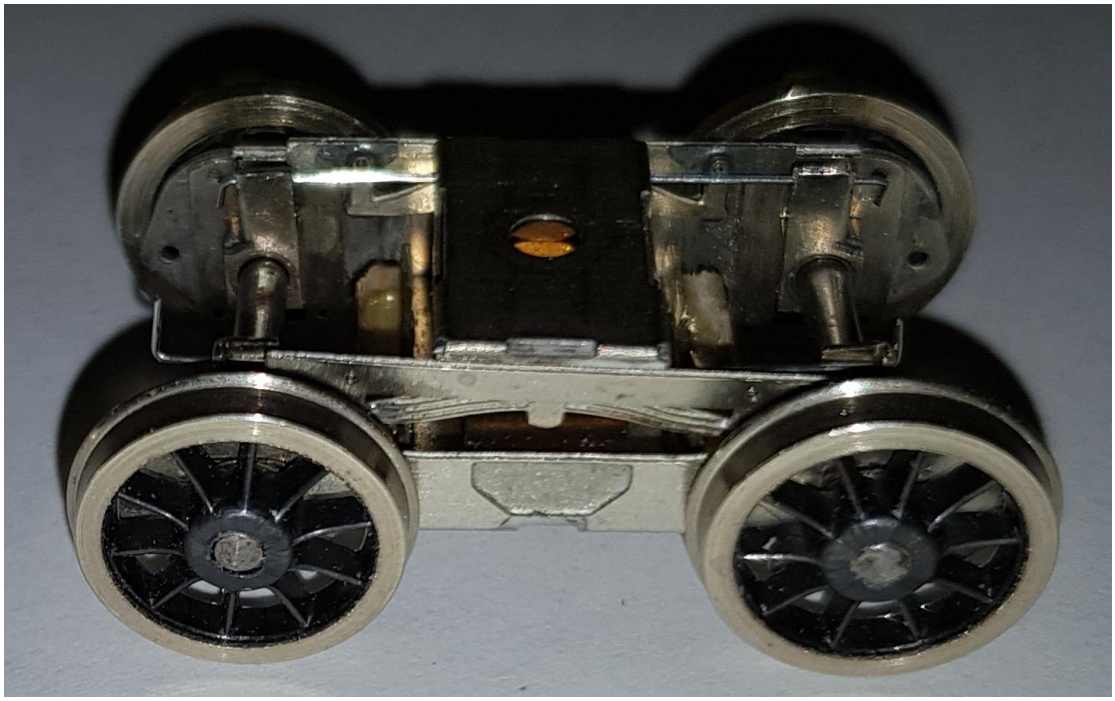
Refer to Fig.2 below if necessary.

- Fold out spring carrying tab bogie wheel spring carriers (27) and fit to 2mm hornblocks. Note the tabs are handed and tab with the small hole in for the spring wire will go on the inside of the bogie.
- Press out rivets on bogie frame (25 a, b or c). Check fit of bearing making sure they are in the correct position with the tabs on the outer ends. Adjust if necessary. Fold over bearing guide and solder in place with 0.5mm wire in bottom pair of holes to locate and resemble bolts. Note that the single hole on each 'hornguide' in the top outer quadrant is for retaining the spring wire. Do not fill. Fold up rest of the bogie. Solder 0.8mm wire in place at ends to act as stays.
- Fit bogie frame spacer (26a, b or c) to middle of bogie using slot and tab. Solder in place.
- Fold up bogie bolster (28a, b or c). The fold lines around the central rectangle with hole in are through 90°, the other four are through 180° with the fold line on the outside. Solder together with 0.5mm wire through the holes in the cosmetic 'compensating beam' to resemble bolts.
- Fold up the bogie bolster frame spacer (28) and solder in place inside the 'box' of the bogie bolster using the tabs and slots provided. Solder in place.

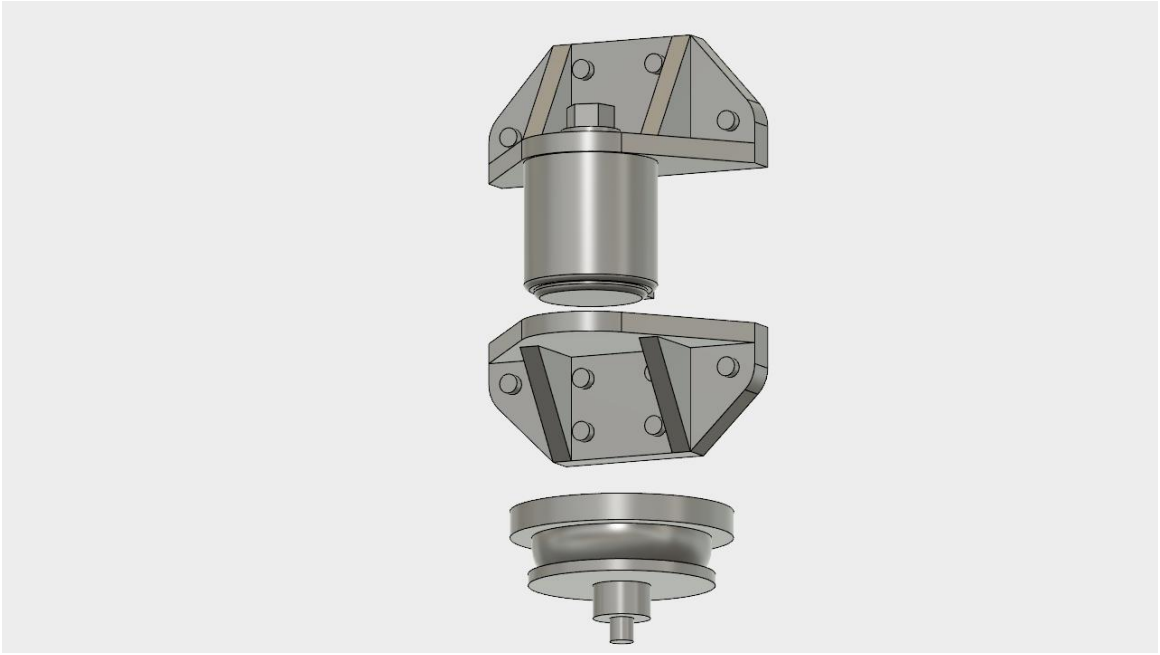


To assemble the bogie:

- Make two long L shaped springs from the spring wire approximately 26mm x 1.5mm
- Fit hornblocks to bogie frame
- Place bolster on top of bogie. Note the correct way up for this. The large flat side of the spacer should go up against the chassis. Fit spring wire through hornblock then bolster then hornblock on other axle. Fit short tail of spring into hole on bogie frame mentioned earlier to retain.
- Fit wheels. Bogie wheel washers (29) are included if required.



- The kit also includes 3D printed bogie detailing, which has yet to be fitted to the test build. It comes as three parts sprued together and should be arranged as below when fitting (use superglue or 2 part epoxy). There are recesses for the two brackets.



13 - Fitting Bogie

- One end of the bogie link (30) has a 2mm hole and the other a 2.5mm hole. Into the 2mm hole solder a 2mm pin point top hat bearing (note don't use a waisted type).
- Remove keeper plate and fit the bogie link with the top hat bearing facing upwards. Slide the part in through the rear ashpan former then bend upwards and locate into hole in rear keeper plate spacer. Once the keeper plate is refitted the bogie link should stay in place.
- Form pin and retaining bolt for bogie. Use M2 bolt with 4.5mm length of 2.5mm x 2mm tube solder over thread and M2 nut with bogie retaining bolt washer (31) soldered to it.

- Fit bogie to bogie link. There are slots in the bogie bolster to receive the link. Refit keeper plate. Fit the retaining bolt with sleeve. This passes through bogie frame then bogie bolster, bogie link and finally the frame spacer. Use the nut with washer soldered to it to retain.

Side control springs can be used, fitting them through holes in ashpan formers on keeper plate with them acting on bogie pivot shaft. No idea on gauge of wire yet so some trial and error may be necessary.

14 - Sundries

- Balance weights (32). They should be arranged as follows. The front wheel is shown as per the left hand side. The right hand side should be a mirror of this.

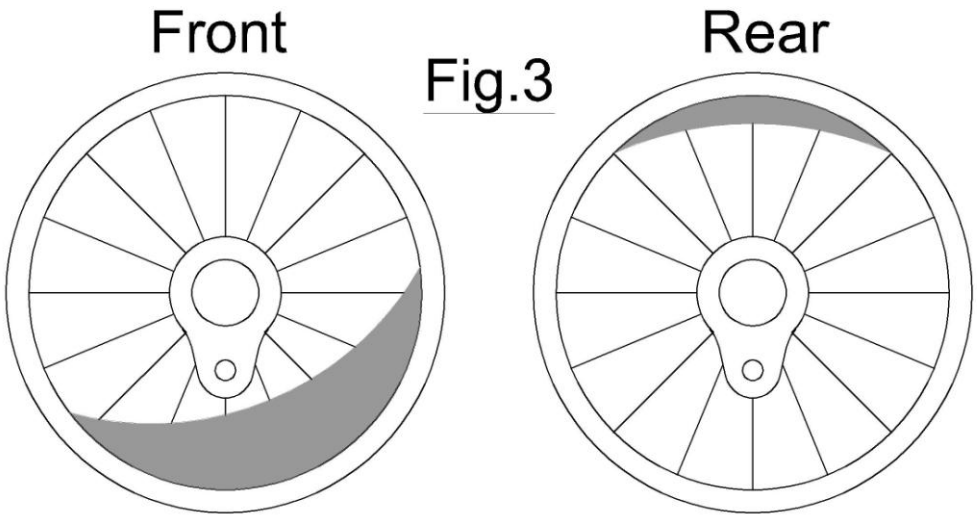
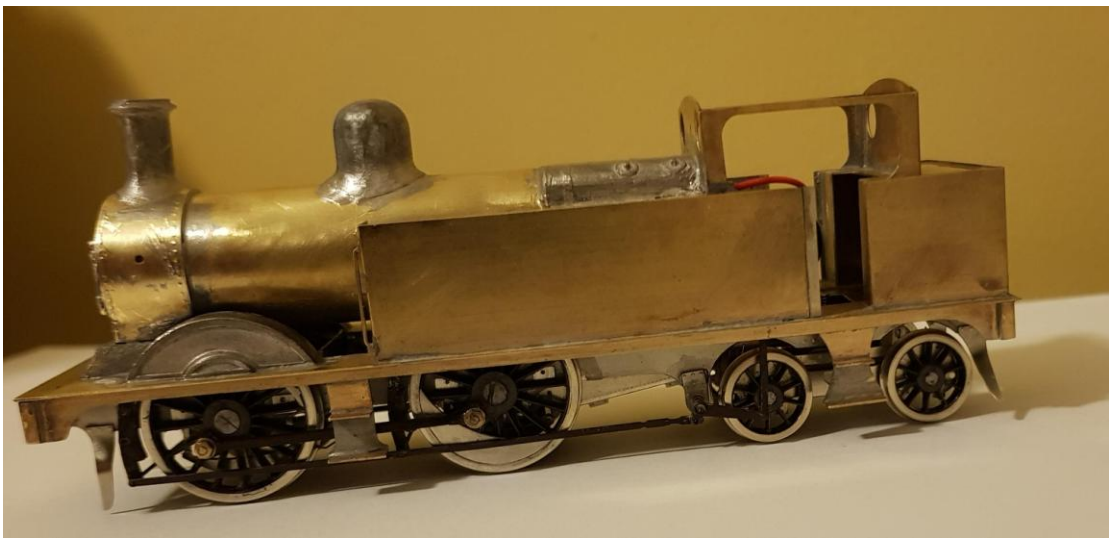


Fig.3

- Coupling hooks (33). Fold double and solder together.
- Boiler sheeting clamps (round top boilers only - 34)



Pete Tarver & Justin Newitt 2018